

Dry-Type Transformer Family



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Revision notes

Volume 2—Commercial Distribution, CA08100003E

Tab 2—Transformers

| Revision date | Section | Change page(s) | Description |
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| 08/24/2017 | 2.1 | V2-T2-2–V2-T2-4 | Content edits |
| 08/24/2017 | 2.1 | V2-T2-6–V2-T2-11 | Content edits |
| 08/24/2017 | 2.1 | V2-T2-13 | Content edits |
| 08/24/2017 | 2.1 | V2-T2-19 | Content edits |
| 08/24/2017 | 2.1 | V2-T2-26–V2-T2-28 | Content edits |
| 08/24/2017 | 2.2 | V2-T2-31 | Content edits |
| 08/24/2017 | 2.2 | V2-T2-63 | Content edits |
| 08/24/2017 | 2.3 | V2-T2-66, V2-T2-67 | Content edits |
| 08/24/2017 | 2.3 | V2-T2-75 | Content edits |
| 08/24/2017 | 2.3 | V2-T2-79–V2-T2-82 | Content edits |
| 08/24/2017 | 2.3 | V2-T2-86–V2-T2-91 | Content edits |
| 08/24/2017 | 2.4 | V2-T2-94 | Content edits |
| 08/24/2017 | 2.5 | V2-T2-97, V2-T2-98 | Content edits |
| 08/24/2017 | 2.5 | V2-T2-104–V2-T2-114 | Content edits |
| 08/24/2017 | 2.5 | V2-T2-116, V2-T2-117 | Content edits |
| 08/24/2017 | 2.5 | V2-T2-119, V2-T2-120 | Content edits |
| 08/24/2017 | 2.5 | V2-T2-134 | Content edits |
| 08/24/2017 | 2.5 | V2-T2-147 | Content edits |
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| 08/24/2017 | 2.6 | V2-T2-161–V2-T2-164 | Content edits |
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| 08/24/2017 | 2.6 | V2-T2-173, V2-T2-174 | Content edits |
| 08/24/2017 | 2.6 | V2-T2-177 | Content edits |
| 08/24/2017 | 2.6 | V2-T2-190–V2-T2-195 | Content edits |
| 08/24/2017 | 2.6 | V2-T2-202 | Content edits |



Powering Business Worldwide

Type DT-3

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Product Description

Note: The following pages provide listings for most standard transformer ratings and catalog numbers. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Types DS-3, DT-3

- Ventilated, NEMA 2 enclosure standard
- Suitable for indoor applications, outdoors when weathershields are also installed
- Upright mounting only
- 220°C insulation system
- 150°C rise standard; 115°C or 80°C rise optional
- Available in single-phase ratings 15–167 kVA, 600 volts primary (DS-3)
- Available in three-phase ratings 15–1500 kVA and up to 600 volts primary (DT-3)

Application Description

DOE 2016 compliant energy-efficient transformers are specifically designed to meet the energy efficiency standards set forth in “CFR Title 10 Chapter II Part 431, Appendix A of Subpart K 2016”. Surveys have shown that the average loading of low-voltage dry-type distribution transformers, over a 24-hour period, is approximately 35%. DOE 2016 compliant transformers are optimized to offer maximum efficiency at 35% of nameplate rating.

The range of products covered by DOE 2016 is:

DOE 2016 Product Range

| Rating | Voltage Class | Voltage |
|------------------------------------|-------------------|-------------------|
| | Primary voltage | 34.5 kV and below |
| | Secondary voltage | 600V and below |
| Low-Voltage Dry-Type Rating | Single-phase | 10–833 kVA |
| | Three-phase | 15–2500 kVA |
| Liquid Rating | Single-phase | 10–833 kVA |
| | Three-phase | 15–2500 kVA |

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Transformers that are currently specifically excluded from the scope of CFR Title 10 Chapter II Part 431, Appendix A of Subpart K 2016 include:

- Liquid-filled transformers below 10 kVA
- Low-voltage dry-type transformers below 15 kVA
- AC and DC drives transformers
- Rectifier transformers designed for high harmonics
- Autotransformers
- Non-distribution transformers, such as UPS transformers
- Special impedance or regulation transformers
- Regulating transformers
- Sealed and non-ventilated transformers
- Machine tool transformers
- Welding transformers
- Transformers with tap ranges greater than 15%
- Transformers with a frequency other than 60 Hz
- Grounding transformers
- Testing transformers

Efficiency levels set forth in DOE 2016.

DOE 2016 Efficiency Levels

Low-Voltage Dry-Type Distribution Transformers (600V and below)

| Single-Phase | | Three-Phase | |
|--------------|------------|-------------|------------|
| kVA | Efficiency | kVA | Efficiency |
| 15 | 97.70 | 15 | 97.89 |
| 25 | 98.00 | 30 | 98.23 |
| 37.5 | 98.20 | 45 | 98.40 |
| 50 | 98.30 | 75 | 98.60 |
| 75 | 98.50 | 112.5 | 98.74 |
| 100 | 98.60 | 150 | 98.83 |
| 167 | 98.70 | 225 | 98.94 |
| 250 | 98.80 | 300 | 99.02 |
| 333 | 98.90 | 500 | 99.14 |
| — | — | 750 | 99.23 |
| — | — | 1000 | 99.28 |

Features, Benefits and Functions

- 60 Hz operation (except as noted)
- Short-term overload capability as required by ANSI
- Meet NEMA ST-20 sound levels
- Transformer core and coil covered with a fungus-resistant varnish to seal out moisture and other contaminants, and prevent the growth of fungus
- The core and coil assembly is grounded to the transformer enclosure by means of a visible flexible copper ground strap. The copper ground strap is sized per the NEC to be a grounding conductor. Three-phase DOE 2016 efficient transformers are provided with a bonding ground bar attached to the bottom panel for compliance with NEC 450.10(A)
- Transformers manufactured in enclosures 939, 940, 942, 943, 944 and 945 are UL Listed to be installed indoors (without weathershields) with just 2 inches of clearance on the sides and behind the transformer
- Double neutral
- Meet federal energy efficiency requirements for low-voltage dry-type distribution transformers effective as of January 1, 2016
- cUL Energy Verified in accordance with energy standards: CFR Title 10 Chapter II Part 431, Appendix A of Subpart K and CSA C802.2-12 Update No. 1 May 2013 by Underwriters Laboratories Inc.

Standards and Certifications

- UL® listed



Industry Standards

All Eaton low-voltage dry-type distribution transformers are built and tested in accordance with applicable NEMA, ANSI and IEEE Standards. All 600 volt class transformers are UL listed unless otherwise noted.

Seismically Qualified

Eaton manufactured low-voltage dry-type distribution transformers are seismically qualified and exceed requirements of the Uniform Building Code (UBC), International Building Code (IBC) and California Code Title 24.

Catalog Number Selection

Please refer to Section 2.7 **Page V2-T2-162**.

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Product Selection

Additional Product Selection information begins on **Page V2-T2-165**.

Single-Phase—Type DS-3 60 Hz DOE 2016 Energy-Efficient—Aluminum Windings

208 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ^① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|--------|----------------|-----------------------------|----------------|-------------------|--------------------|
| 15 | 150 | FR842A | E0260A | 200 (91) | WS45A | WMB05 | T29M11S1516 |
| 25 | | FR842A | | 275 (125) | WS45A | WMB05 | T29M11S2516 |
| 37.5 | | FR843A | | 310 (141) | WS43A | WMB04 | T29M11S3716 |
| 50 | | FR843A | | 390 (177) | WS43A | WMB04 | T29M11S5016 |
| 75 | | FR844A | E0551A | 650 (295) | WS44A | WMB04 | T29R11S7516 |
| 100 | | FR844A | EA29R11 | 690 (313) | WS44A | WMB04 | T29R11S9916 |

277 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ^① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|--------|----------------|-----------------------------|----------------|-------------------|--------------------|
| 15 | 150 | FR842A | 262C | 210 (95) | WS45A | WMB05 | T27M11S1516 |
| 25 | | FR842A | | 289 (131) | WS45A | WMB05 | T27M11S2516 |
| 37.5 | | FR843A | | 326 (148) | WS43A | WMB04 | T27M11S3716 |
| 50 | | FR843A | | 410 (186) | WS43A | WMB04 | T27M11S5016 |
| 75 | | FR844A | | 683 (310) | WS44A | WMB04 | T27M11S7516 |
| 100 | | FR844A | | 725 (329) | WS44A | WMB04 | T27M11S9916 |

600 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ^① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|--------|----------------|-----------------------------|----------------|-------------------|--------------------|
| 15 | 150 | FR842A | 262B | 212 (96) | WS45A | WMB05 | T60M11S1516 |
| 25 | | FR842A | | 292 (133) | WS45A | WMB05 | T60M11S2516 |
| 37.5 | | FR843A | | 329 (149) | WS43A | WMB04 | T60M11S3716 |
| 50 | | FR843A | | 413 (188) | WS43A | WMB04 | T60M11S5016 |
| 75 | | FR844A | | 689 (313) | WS44A | WMB04 | T60M11S7516 |
| 100 | | FR844A | | 731 (332) | WS44A | WMB04 | T60M11S9916 |

Notes

^① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase—Type DS-3 60 Hz DOE 2016 Energy-Efficient—Aluminum Windings

208 x 416 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ^① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|--------|----------------|-----------------------------|----------------|-------------------|--------------------|
| 15 | 150 | FR842A | E03XF | 204 (93) | WS45A | WMB05 | T18P11S1516 |
| 25 | | FR842A | | 281 (128) | WS45A | WMB05 | T18P11S2516 |
| 37.5 | | FR843A | | 316 (143) | WS43A | WMB04 | T18P11S3716 |
| 50 | | FR843A | | 398 (181) | WS43A | WMB04 | T18P11S5016 |
| 75 | | FR844A | | 663 (301) | WS44A | WMB04 | T18P11S7516 |
| 100 | | FR844A | | 704 (320) | WS44A | WMB04 | T18P11S9916 |

240 x 480 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ^① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|--------|----------------|-----------------------------|----------------|-------------------|--------------------|
| 15 | 150 | FR842A | 3XA | 210 (95) | WS45A | WMB05 | T20P11S1516 |
| 25 | | FR842A | | 289 (131) | WS45A | WMB05 | T20P11S2516 |
| 37.5 | | FR843A | | 326 (148) | WS43A | WMB04 | T20P11S3716 |
| 50 | | FR843A | | 410 (186) | WS43A | WMB04 | T20P11S5016 |
| 75 | | FR844A | | 683 (310) | WS44A | WMB04 | T20P11S7516 |
| 100 | | FR844A | | 725 (329) | WS44A | WMB04 | T20P11S9916 |
| 167 | | FR814E | 288A | 1665 (756) | WS13 | — | T48M11S6716 |
| 15 | 115 | FR842A | 3XA | 212 (96) | WS45A | WMB05 | T20P11F1516 |
| 25 | | FR842A | | 292 (133) | WS45A | WMB05 | T20P11F2516 |
| 37.5 | | FR843A | | 329 (149) | WS43A | WMB04 | T20P11F3716 |
| 50 | | FR843A | | 414 (188) | WS43A | WMB04 | T20P11F5016 |
| 75 | | FR844A | | 689 (313) | WS44A | WMB04 | T20P11F7516 |
| 100 | | FR844A | | 732 (332) | WS44A | WMB04 | T20P11F9916 |
| 15 | 80 | FR842A | 3XA | 289 (131) | WS45A | WMB05 | T20P11B1516 |
| 25 | | FR843A | | 326 (148) | WS43A | WMB04 | T20P11B2516 |
| 37.5 | | FR843A | | 410 (186) | WS43A | WMB04 | T20P11B3716 |
| 50 | | FR844A | | 683 (310) | WS44A | WMB04 | T20P11B5016 |
| 75 | | FR844A | | 725 (329) | WS44A | WMB04 | T20P11B7516 |

Notes

^① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase—Type DS-3 60 Hz DOE 2016 Energy-Efficient—Copper Windings

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208 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|--------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR842A | E0260A | 216 (98) | WS45A | WMB05 | T29M11S1516CU |
| 25 | | FR842A | | 295 (134) | WS45A | WMB05 | T29M11S2516CU |
| 37.5 | | FR843A | | 440 (200) | WS43A | WMB04 | T29M11S3716CU |
| 50 | | FR843A | | 450 (204) | WS43A | WMB04 | T29M11S5016CU |
| 75 | | FR844A | E0551A | 890 (404) | WS44A | WMB04 | T29R11S7516CU |
| 100 | | FR844A | | 950 (431) | WS44A | WMB04 | T29R11S9916CU |

277 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|--------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR842A | 262C | 238 (108) | WS45A | WMB05 | T27M11S1516CU |
| 25 | | FR842A | | 326 (148) | WS45A | WMB05 | T27M11S2516CU |
| 37.5 | | FR843A | | 485 (220) | WS43A | WMB04 | T27M11S3716CU |
| 50 | | FR843A | | 497 (225) | WS43A | WMB04 | T27M11S5016CU |
| 75 | | FR844A | | 982 (446) | WS44A | WMB04 | T27M11S7516CU |
| 100 | | FR844A | | 1048 (476) | WS44A | WMB04 | T27M11S9916CU |

600 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|--------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR842A | 262B | 241 (109) | WS45A | WMB05 | T60M11S1516CU |
| 25 | | FR842A | | 329 (149) | WS45A | WMB05 | T60M11S2516CU |
| 37.5 | | FR843A | | 490 (222) | WS43A | WMB04 | T60M11S3716CU |
| 50 | | FR843A | | 501 (227) | WS43A | WMB04 | T60M11S5016CU |
| 75 | | FR844A | | 991 (450) | WS44A | WMB04 | T60M11S7516CU |
| 100 | | FR844A | | 1058 (480) | WS44A | WMB04 | T60M11S9916CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase—Type DS-3 60 Hz DOE 2016 Energy-Efficient—Copper Windings

208 x 416 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ^① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|--------|----------------|-----------------------------|----------------|-------------------|----------------|
| 15 | 150 | FR842A | E03XF | 246 (112) | WS45A | WMB05 | T18P11S1516CU |
| 25 | | FR842A | | 336 (153) | WS45A | WMB05 | T18P11S2516CU |
| 37.5 | | FR843A | | 500 (227) | WS43A | WMB04 | T18P11S3716CU |
| 50 | | FR843A | | 511 (232) | WS43A | WMB04 | T18P11S5016CU |
| 75 | | FR844A | | 1011 (459) | WS44A | WMB04 | T18P11S7516CU |
| 100 | | FR844A | | 1079 (490) | WS44A | WMB04 | T18P11S9916CU |

240 x 480 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ^① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|--------|----------------|-----------------------------|----------------|-------------------|----------------|
| 15 | 150 | FR842A | 3XA | 258 (117) | WS45A | WMB05 | T20P11S1516CU |
| 25 | | FR842A | | 353 (160) | WS45A | WMB05 | T20P11S2516CU |
| 37.5 | | FR843A | | 525 (238) | WS43A | WMB04 | T20P11S3716CU |
| 50 | | FR843A | | 537 (244) | WS43A | WMB04 | T20P11S5016CU |
| 75 | | FR844A | | 1062 (482) | WS44A | WMB04 | T20P11S7516CU |
| 100 | | FR844A | | 1133 (514) | WS44A | WMB04 | T20P11S9916CU |
| 167 | | FR814E | 288A | 1748 (794) | WS13 | — | T48M11S6716CU |
| 15 | 115 | FR842A | 3XA | 218 (99) | WS45A | WMB05 | T20P11F1516CU |
| 25 | | FR842A | | 298 (135) | WS45A | WMB05 | T20P11F2516CU |
| 37.5 | | FR843A | | 444 (202) | WS43A | WMB04 | T20P11F3716CU |
| 50 | | FR843A | | 455 (207) | WS43A | WMB04 | T20P11F5016CU |
| 75 | | FR844A | | 899 (408) | WS44A | WMB04 | T20P11F7516CU |
| 100 | | FR844A | | 960 (436) | WS44A | WMB04 | T20P11F9916CU |
| 15 | 80 | FR842A | 3XA | 353 (160) | WS45A | WMB05 | T20P11B1516CU |
| 25 | | FR843A | | 525 (238) | WS43A | WMB04 | T20P11B2516CU |
| 37.5 | | FR843A | | 537 (244) | WS43A | WMB04 | T20P11B3716CU |
| 50 | | FR844A | | 1062 (482) | WS44A | WMB04 | T20P11B5016CU |
| 75 | | FR844A | | 1133 (514) | WS44A | WMB04 | T20P11B7516CU |

Notes

^① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

208 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|-------------|
| 15 | 150 | FR939 | 280E | 233 (106) | WS57 | WMB05 | V29M28T1516 | |
| 30 | | FR940 | | 400 (182) | WS58 | WMB05 | V29M28T3016 | |
| 45 | | FR940 | | 442 (201) | WS58 | WMB05 | V29M28T4516 | |
| 75 | | FR942 | | 602 (273) | WS59 | WMB04 | V29M28T7516 | |
| 112.5 | | FR943 | 324A | 976 (443) | WS60 | WMB04 | V29R28T1216 | |
| 150 | | FR943 | | 1254 (569) | WS60 | WMB04 | V29R28T4916 | |
| 225 | | FR944 | | 1624 (737) | WS61 | — | V29R28T2216 | |
| 300 | | Contact local Eaton representative | | | | | | V29E28T3316 |
| 500 | | | | | | | | V29E28T5516 |
| 15 | 115 | FR939 | 280E | 243 (110) | WS57 | WMB05 | V29M28F1516 | |
| 30 | | FR940 | | 419 (190) | WS58 | WMB05 | V29M28F3016 | |
| 45 | | FR940 | | 450 (205) | WS58 | WMB05 | V29M28F4516 | |
| 75 | | FR942 | | 635 (288) | WS59 | WMB04 | V29M28F7516 | |
| 112.5 | | FR943 | 324A | 1031 (468) | WS60 | WMB04 | V29R28F1216 | |
| 150 | | FR943 | | 1316 (597) | WS60 | WMB04 | V29R28F4916 | |
| 225 | | FR944 | | 1715 (778) | WS61 | — | V29R28F2216 | |
| 300 | | Contact local Eaton representative | | | | | | V29R28F3316 |
| 500 | | | | | | | | V29E28F5516 |
| 15 | 80 | FR939 | 280E | 249 (113) | WS57 | WMB05 | V29M28B1516 | |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V29M28B3016 | |
| 45 | | FR942 | | 599 (272) | WS59 | WMB04 | V29M28B4516 | |
| 75 | | FR943 | | 1031 (468) | WS60 | WMB04 | V29M28B7516 | |
| 112.5 | | FR943 | 324A | 1338 (607) | WS60 | WMB04 | V29R28B1216 | |
| 150 | | FR944 | | 1709 (776) | WS61 | — | V29R28B4916 | |
| 225 | | Contact local Eaton representative | | | | | | V29R28B2216 |
| 300 | | | | | | | | V29R28B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings**208 Delta Volts to 480Y/277 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | | |
|-------|------------------------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|-------------|-------------|
| 15 | 150 | FR939 | E0342B | 225 (102) | WS57 | WMB05 | V29M47T1516 | | |
| 30 | | FR940 | | 402 (183) | WS58 | WMB05 | V29M47T3016 | | |
| 45 | | FR940 | | 436 (198) | WS58 | WMB05 | V29M47T4516 | | |
| 75 | | FR942 | | 623 (283) | WS59 | WMB04 | V29M47T7516 | | |
| 112.5 | | FR943 | | E0351A | 987 (448) | WS60 | WMB04 | V29R47T1216 | |
| 150 | | FR943 | | | 1253 (569) | WS60 | WMB04 | V29R47T4916 | |
| 225 | | FR944 | | | 2257 (1025) | WS61 | — | V29R47T2216 | |
| 300 | | Contact local Eaton representative | | | | | | V29E47T3316 | |
| 500 | | | | | | | | V29E47T5516 | |
| 15 | | 115 | | FR939 | E0342B | 250 (114) | WS57 | WMB05 | V29M47F1516 |
| 30 | FR940 | | 442 (201) | WS58 | | WMB05 | V29M47F3016 | | |
| 45 | FR940 | | 598 (271) | WS58 | | WMB05 | V29M47F4516 | | |
| 75 | FR942 | | 617 (280) | WS59 | | WMB04 | V29M47F7516 | | |
| 112.5 | FR943 | | E0351A | 977 (444) | | WS60 | WMB04 | V29R47F1216 | |
| 150 | FR943 | | | 2257 (1025) | | WS60 | WMB04 | V29R47F4916 | |
| 225 | FR944 | | | 2450 (1112) | | WS61 | — | V29R47F2216 | |
| 300 | Contact local Eaton representative | | | | | | V29E47F3316 | | |
| 500 | | | | | | | V29E47F5516 | | |
| 15 | 80 | | FR939 | E0342B | | 249 (113) | WS57 | WMB05 | V29M47B1516 |
| 30 | | FR940 | 455 (206) | | WS58 | WMB05 | V29M47B3016 | | |
| 45 | | FR942 | 599 (272) | | WS59 | WMB04 | V29M47B4516 | | |
| 75 | | FR943 | 1031 (468) | | WS60 | WMB04 | V29M47B7516 | | |
| 112.5 | | FR943 | E0351A | | 1338 (607) | WS60 | WMB04 | V29R47B1216 | |
| 150 | | FR944 | | | 1709 (776) | WS61 | — | V29R47B4916 | |
| 225 | | Contact local Eaton representative | | | | | | V29R47B2216 | |
| 300 | | | | | | | | V29E47B3316 | |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

240 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR939 | 280C | 236 (107) | WS57 | WMB05 | V24M28T1516 |
| 30 | | FR940 | | 402 (183) | WS58 | WMB05 | V24M28T3016 |
| 45 | | FR940 | | 448 (203) | WS58 | WMB05 | V24M28T4516 |
| 75 | | FR942 | | 622 (282) | WS59 | WMB04 | V24M28T7516 |
| 112.5 | | FR943 | 324B | 1022 (464) | WS60 | WMB04 | V24R28T1216 |
| 150 | | FR943 | | 1191 (541) | WS60 | WMB04 | V24R28T4916 |
| 225 | | FR944 | | 1678 (762) | WS61 | — | V24R28T2216 |
| 300 | | FR945 | | 2415 (1096) | WS62 | — | V24R28T3316 |
| 500 | | Contact local Eaton representative | | | | | V24E28T5516 |
| 15 | 115 | FR939 | 280C | 243 (110) | WS57 | WMB05 | V24M28F1516 |
| 30 | | FR940 | | 419 (190) | WS58 | WMB05 | V24M28F3016 |
| 45 | | FR940 | | 450 (205) | WS58 | WMB05 | V24M28F4516 |
| 75 | | FR942 | | 635 (288) | WS59 | WMB04 | V24M28F7516 |
| 112.5 | | FR943 | 324B | 1031 (468) | WS60 | WMB04 | V24R28F1216 |
| 150 | | FR943 | | 1316 (597) | WS60 | WMB04 | V24R28F4916 |
| 225 | | Contact local Eaton representative | | | | | V24E47F2216 |
| 300 | | | | | | | V24R28F3316 |
| 500 | | | | | | | V24E28F5516 |
| 15 | 80 | FR939 | 280C | 249 (113) | WS57 | WMB05 | V24M28B1516 |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V24M28B3016 |
| 45 | | FR942 | | 599 (272) | WS59 | WMB04 | V24M28B4516 |
| 75 | | FR943 | | 1031 (468) | WS60 | WMB04 | V24M28B7516 |
| 112.5 | | FR943 | 324B | 1338 (607) | WS60 | WMB04 | V24R28B1216 |
| 150 | | FR944 | | 1709 (776) | WS61 | — | V24R28B4916 |
| 225 | | Contact local Eaton representative | | | | | V24E28B2216 |
| 300 | | | | | | | V24E28B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings**240 Delta Volts to 480Y/277 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|-------------|
| 15 | 150 | FR939 | E0317A | 224 (102) | WS57 | WMB05 | V24M47T1516 | |
| 30 | | FR940 | | 422 (192) | WS58 | WMB05 | V24M47T3016 | |
| 45 | | FR940 | | 444 (202) | WS58 | WMB05 | V24M47T4516 | |
| 75 | | FR942 | | 635 (288) | WS59 | WMB04 | V24M47T7516 | |
| 112.5 | | FR943 | E0351C | 1017 (462) | WS60 | WMB04 | V24R47T1216 | |
| 150 | | FR943 | | 1275 (579) | WS60 | WMB04 | V24R47T4916 | |
| 225 | | FR944 | | 2274 (1032) | WS61 | — | V24R47T2216 | |
| 300 | | Contact local Eaton representative | | | | | | V24E47T3316 |
| 500 | | | | | | | | V24E47T5516 |
| 15 | 115 | FR939 | E0317A | 243 (110) | WS57 | WMB05 | V24M47F1516 | |
| 30 | | FR940 | | 419 (190) | WS58 | WMB05 | V24M47F3016 | |
| 45 | | FR940 | | 450 (205) | WS58 | WMB05 | V24M47F4516 | |
| 75 | | FR942 | | 635 (288) | WS59 | WMB04 | V24M47F7516 | |
| 112.5 | | FR943 | E0351C | 1031 (468) | WS60 | WMB04 | V24R47F1216 | |
| 150 | | FR943 | | 1316 (597) | WS60 | WMB04 | V24R47F4916 | |
| 225 | | Contact local Eaton representative | | | | | | V24E47F2216 |
| 300 | | | | | | | | V24E47F3316 |
| 500 | | | | | | | | V24E47F5516 |
| 15 | 80 | FR939 | E0317A | 249 (113) | WS57 | WMB05 | V24M47B1516 | |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V24M47B3016 | |
| 45 | | FR942 | | 599 (272) | WS59 | WMB04 | V24M47B4516 | |
| 75 | | FR943 | | 1031 (468) | WS60 | WMB04 | V24M47B7516 | |
| 112.5 | | FR943 | E0351C | 1338 (607) | WS60 | WMB04 | V24R47B1216 | |
| 150 | | FR944 | | 1709 (776) | WS61 | — | V24R47B4916 | |
| 225 | | Contact local Eaton representative | | | | | | V24E47B2216 |
| 300 | | | | | | | | V24E47B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

480 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR939 | 280B | 225 (102) | WS57 | WMB05 | V48M28T1516 |
| 30 | | FR940 | | 409 (186) | WS58 | WMB05 | V48M28T3016 |
| 45 | | FR940 | | 416 (189) | WS58 | WMB05 | V48M28T4516 |
| 75 | | FR942 | | 570 (259) | WS59 | WMB04 | V48M28T7516 |
| 112.5 | | FR943 | | 976 (443) | WS60 | WMB04 | V48M28T1216 |
| 150 | | FR943 | | 1239 (563) | WS60 | WMB04 | V48M28T4916 |
| 225 | | FR944 | | 1624 (737) | WS61 | — | V48M28T2216 |
| 300 | | FR945 | | 2283 (1036) | WS62 | — | V48M28T3316 |
| 500 | | Contact local Eaton representative | | | | | V48M28T5516 |
| 750 | | | | | | | V48D28T7716 |
| 1000 | | | | | | | V48D28T1116 |
| 15 | 115 | FR939 | 280B | 231 (105) | WS57 | WMB05 | V48M28F1516 |
| 30 | | FR940 | | 399 (181) | WS58 | WMB05 | V48M28F3016 |
| 45 | | FR940 | | 429 (195) | WS58 | WMB05 | V48M28F4516 |
| 75 | | FR942 | | 605 (275) | WS59 | WMB04 | V48M28F7516 |
| 112.5 | | FR943 | | 982 (446) | WS60 | WMB04 | V48M28F1216 |
| 150 | | FR943 | | 1253 (569) | WS60 | WMB04 | V48M28F4916 |
| 225 | | FR944 | | 1633 (741) | WS61 | — | V48M28F2216 |
| 300 | | FR945 | | 2104 (955) | WS62 | — | V48M28F3316 |
| 500 | | Contact local Eaton representative | | | | | V48M28F5516 |
| 15 | 80 | FR939 | 280B | 237 (108) | WS57 | WMB05 | V48M28B1516 |
| 30 | | FR940 | | 433 (197) | WS58 | WMB05 | V48M28B3016 |
| 45 | | FR942 | | 570 (259) | WS58 | WMB05 | V48M28B4516 |
| 75 | | FR943 | | 982 (446) | WS59 | WMB04 | V48M28B7516 |
| 112.5 | | FR943 | | 1274 (578) | WS60 | WMB04 | V48M28B1216 |
| 150 | | FR944 | | 1628 (739) | WS60 | WMB04 | V48M28B4916 |
| 225 | | FR945 | | 2207 (1002) | WS61 | — | V48M28B2216 |
| 300 | | FR924 | | 2877 (1306) | WS40 | — | V48M28B3316 |
| 500 | | Contact local Eaton representative | | | | | V48M28B5516 |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings**480 Delta Volts to 240 Delta Volts with 120 Volt Lighting Tap on Phase B ^①**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ^② | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|-----------------------------|----------------|-------------------|----------------|
| 15 | 150 | FR939 | 282B | 231 (105) | WS57 | WMB05 | V48M22T1516 |
| 30 | | FR940 | | 399 (181) | WS58 | WMB05 | V48M22T3016 |
| 45 | | FR940 | | 426 (193) | WS58 | WMB05 | V48M22T4516 |
| 75 | | FR942 | | 581 (264) | WS59 | WMB04 | V48M22T7516 |
| 112.5 | | FR943 | | 964 (438) | WS60 | WMB04 | V48M22T1216 |
| 150 | | FR943 | | 1275 (579) | WS60 | WMB04 | V48M22T4916 |
| 225 | | FR944 | | 1618 (735) | WS61 | — | V48M22T2216 |
| 300 | | FR945 | | 2437 (1106) | WS62 | — | V48M22T3316 |
| 500 | | Contact local Eaton representative | | | | | V48M22T5516 |
| 750 | | | | | | | V48D22T7716 |
| 1000 | | | | | | | V48D22T1116 |
| 15 | 115 | FR939 | 282B | 250 (114) | WS57 | WMB05 | V48M22F1516 |
| 30 | | FR940 | | 405 (184) | WS58 | WMB05 | V48M22F3016 |
| 45 | | FR940 | | 428 (194) | WS58 | WMB05 | V48M22F4516 |
| 75 | | FR942 | | 612 (278) | WS59 | WMB04 | V48M22F7516 |
| 112.5 | | FR943 | | 975 (443) | WS60 | WMB04 | V48M22F1216 |
| 150 | | FR943 | | 1300 (590) | WS60 | WMB04 | V48M22F4916 |
| 225 | | FR944 | | 1732 (786) | WS61 | — | V48M22F2216 |
| 300 | | FR945 | | 1732 (786) | WS62 | — | V48M22F3316 |
| 500 | | Contact local Eaton representative | | | | | V48M22F5516 |
| 15 | 80 | FR939 | 282B | 249 (113) | WS57 | WMB05 | V48M22B1516 |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V48M22B3016 |
| 45 | | FR942 | | 599 (272) | WS59 | WMB04 | V48M22B4516 |
| 75 | | FR943 | | 1031 (468) | WS60 | WMB04 | V48M22B7516 |
| 112.5 | | FR943 | | 1338 (607) | WS60 | WMB04 | V48M22B1216 |
| 150 | | FR944 | | 1709 (776) | WS61 | — | V48M22B4916 |
| 225 | | FR945 | | 2317 (1052) | WS62 | — | V48M22B2216 |
| 300 | | Contact local Eaton representative | | | | | V48M22B3316 |
| 500 | | | | | | | V48M22B5516 |

Notes

① Lighting tap limited to 5% of nameplate full load capacity.

② Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

480 Delta Volts to 400Y/231 Volts

2

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR939 | 280B | 233 (106) | WS57 | WMB05 | V48M34T1516 |
| 30 | | FR940 | | 399 (181) | WS58 | WMB05 | V48M34T3016 |
| 45 | | FR940 | | 416 (189) | WS58 | WMB05 | V48M34T4516 |
| 75 | | FR942 | | 614 (279) | WS59 | WMB04 | V48M34T7516 |
| 112.5 | | FR943 | | 984 (447) | WS60 | WMB04 | V48M34T1216 |
| 150 | | FR943 | | 1240 (563) | WS60 | WMB04 | V48M34T4916 |
| 225 | | FR944 | | 1723 (782) | WS61 | — | V48M34T2216 |
| 300 | | FR945 | | 2347 (1066) | WS62 | — | V48M34T3316 |
| 500 | | Contact local Eaton representative | | | | | V48M34T5516 |
| 15 | 115 | FR939 | 280B | 243 (110) | WS57 | WMB05 | V48M34F1516 |
| 30 | | FR940 | | 419 (190) | WS58 | WMB05 | V48M34F3016 |
| 45 | | FR940 | | 450 (205) | WS58 | WMB05 | V48M34F4516 |
| 75 | | FR942 | | 635 (288) | WS59 | WMB04 | V48M34F7516 |
| 112.5 | | FR943 | | 1031 (468) | WS60 | WMB04 | V48M34F1216 |
| 150 | | FR943 | | 1316 (597) | WS60 | WMB04 | V48M34F4916 |
| 225 | | FR944 | | 1715 (778) | WS61 | — | V48M34F2216 |
| 300 | | FR945 | | 2209 (1003) | WS62 | — | V48M34F3316 |
| 500 | | Contact local Eaton representative | | | | | V48M34F5516 |
| 15 | 80 | FR939 | 280B | 249 (113) | WS57 | WMB05 | V48M34B1516 |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V48M34B3016 |
| 45 | | FR942 | | 599 (272) | WS59 | WMB04 | V48M34B4516 |
| 75 | | FR943 | | 1031 (468) | WS60 | WMB04 | V48M34B7516 |
| 112.5 | | FR943 | | 1338 (607) | WS60 | WMB04 | V48M34B1216 |
| 150 | | FR944 | | 1709 (776) | WS61 | — | V48M34B4916 |
| 225 | | FR945 | | 2317 (1052) | WS62 | — | V48M34B2216 |
| 300 | | FR924 | | 1971 (895) | WS40 | — | V48M34B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings**480 Delta Volts to 480Y/277 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR939 | 280B | 227 (103) | WS57 | WMB05 | V48M47T1516 |
| 30 | | FR940 | | 395 (179) | WS58 | WMB05 | V48M47T3016 |
| 45 | | FR940 | | 433 (197) | WS58 | WMB05 | V48M47T4516 |
| 75 | | FR942 | | 576 (262) | WS59 | WMB04 | V48M47T7516 |
| 112.5 | | FR943 | | 970 (440) | WS60 | WMB04 | V48M47T1216 |
| 150 | | FR943 | | 1253 (569) | WS60 | WMB04 | V48M47T4916 |
| 225 | | FR944 | | 1912 (868) | WS61 | — | V48M47T2216 |
| 300 | | FR945 | | 2294 (1041) | WS62 | — | V48M47T3316 |
| 500 | | Contact local Eaton representative | | | | | V48M47T5516 |
| 15 | 115 | FR939 | 280B | 243 (110) | WS57 | WMB05 | V48M47F1516 |
| 30 | | FR940 | | 419 (190) | WS58 | WMB05 | V48M47F3016 |
| 45 | | FR940 | | 450 (205) | WS58 | WMB05 | V48M47F4516 |
| 75 | | FR942 | | 635 (288) | WS59 | WMB04 | V48M47F7516 |
| 112.5 | | FR943 | | 1031 (468) | WS60 | WMB04 | V48M47F1216 |
| 150 | | FR943 | | 1316 (597) | WS60 | WMB04 | V48M47F4916 |
| 225 | | FR944 | | 1715 (778) | WS61 | — | V48M47F2216 |
| 300 | | FR945 | | 2209 (1003) | WS62 | — | V48M47F3316 |
| 500 | | Contact local Eaton representative | | | | | V48M47F5516 |
| 15 | 80 | FR939 | 280B | 249 (113) | WS57 | WMB05 | V48M47B1516 |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V48M47B3016 |
| 45 | | FR942 | | 599 (272) | WS59 | WMB04 | V48M47B4516 |
| 75 | | FR943 | | 1031 (468) | WS60 | WMB04 | V48M47B7516 |
| 112.5 | | FR943 | | 1338 (607) | WS60 | WMB04 | V48M47B1216 |
| 150 | | FR944 | | 1709 (776) | WS61 | — | V48M47B4916 |
| 225 | | FR945 | | 2317 (1052) | WS62 | — | V48M47B2216 |
| 300 | | FR924 | | 1971 (895) | WS40 | — | V48M47B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

2

600 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR939 | 280A | 226 (103) | WS57 | WMB05 | V60M28T1516 |
| 30 | | FR940 | | 396 (180) | WS58 | WMB05 | V60M28T3016 |
| 45 | | FR940 | | 433 (197) | WS58 | WMB05 | V60M28T4516 |
| 75 | | FR942 | | 610 (277) | WS59 | WMB04 | V60M28T7516 |
| 112.5 | | FR943 | | 1000 (454) | WS60 | WMB04 | V60M28T1216 |
| 150 | | FR943 | | 1250 (568) | WS60 | WMB04 | V60M28T4916 |
| 225 | | FR944 | | 1650 (749) | WS61 | — | V60M28T2216 |
| 300 | | FR945 | | 2300 (1044) | WS62 | — | V60M28T3316 |
| 500 | | Contact local Eaton representative | | | | | V60M28T5516 |
| 15 | 115 | FR939 | 280A | 243 (110) | WS57 | WMB05 | V60M28F1516 |
| 30 | | FR940 | | 419 (190) | WS58 | WMB05 | V60M28F3016 |
| 45 | | FR940 | | 450 (205) | WS58 | WMB05 | V60M28F4516 |
| 75 | | FR942 | | 635 (288) | WS59 | WMB04 | V60M28F7516 |
| 112.5 | | FR943 | | 1031 (468) | WS60 | WMB04 | V60M28F1216 |
| 150 | | FR943 | | 1316 (597) | WS60 | WMB04 | V60M28F4916 |
| 225 | | FR944 | | 1715 (778) | WS61 | — | V60M28F2216 |
| 300 | | FR945 | | 2209 (1003) | WS62 | — | V60M28F3316 |
| 500 | | Contact local Eaton representative | | | | | V60M28F5516 |
| 15 | 80 | FR939 | 280A | 249 (113) | WS57 | WMB05 | V60M28B1516 |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V60M28B3016 |
| 45 | | FR942 | | 599 (272) | WS59 | WMB04 | V60M28B4516 |
| 75 | | FR943 | | 1031 (468) | WS60 | WMB04 | V60M28B7516 |
| 112.5 | | FR943 | | 1338 (607) | WS60 | WMB04 | V60M28B1216 |
| 150 | | FR944 | | 1709 (776) | WS61 | — | V60M28B4916 |
| 225 | | FR945 | | 2317 (1052) | WS62 | — | V60M28B2216 |
| 300 | | FR924 | | 1971 (895) | WS40 | — | V60M28B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings**600 Delta Volts to 480Y/277 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|--------------------|--------------------|
| 15 | 150 | FR939 | 280A | 250 (114) | WS57 | WMB05 | V60M47T1516 | |
| 30 | | FR940 | | 435 (197) | WS58 | WMB05 | V60M47T3016 | |
| 45 | | FR940 | | 476 (216) | WS58 | WMB05 | V60M47T4516 | |
| 75 | | FR942 | | 634 (288) | WS59 | WMB04 | V60M47T7516 | |
| 112.5 | | FR943 | | 1067 (484) | WS60 | WMB04 | V60M47T1216 | |
| 150 | | FR943 | | 1378 (626) | WS60 | WMB04 | V60M47T4916 | |
| 225 | | FR944 | | 2103 (955) | WS61 | — | V60M47T2216 | |
| 300 | | FR945 | | 2523 (1145) | WS62 | — | V60M47T3316 | |
| 500 | | Contact local Eaton representative | | | | | | V60M47T5516 |
| 15 | 115 | FR939 | 280A | 243 (110) | WS57 | WMB05 | V60M47F1516 | |
| 30 | | FR940 | | 419 (190) | WS58 | WMB05 | V60M47F3016 | |
| 45 | | FR940 | | 450 (205) | WS58 | WMB05 | V60M47F4516 | |
| 75 | | FR942 | | 635 (288) | WS59 | WMB04 | V60M47F7516 | |
| 112.5 | | FR943 | | 1031 (468) | WS60 | WMB04 | V60M47F1216 | |
| 150 | | FR943 | | 1316 (597) | WS60 | WMB04 | V60M47F4916 | |
| 225 | | FR944 | | 1715 (778) | WS61 | — | V60M47F2216 | |
| 300 | | FR945 | | 2209 (1003) | WS62 | — | V60M47F3316 | |
| 500 | | Contact local Eaton representative | | | | | | V60M47F5516 |
| 15 | 80 | FR939 | 280A | 249 (113) | WS57 | WMB05 | V60M47B1516 | |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V60M47B3016 | |
| 45 | | FR942 | | 599 (272) | WS59 | WMB04 | V60M47B4516 | |
| 75 | | FR943 | | 1031 (468) | WS60 | WMB04 | V60M47B7516 | |
| 112.5 | | FR943 | | 1338 (607) | WS60 | WMB04 | V60M47B1216 | |
| 150 | | FR944 | | 1709 (776) | WS61 | — | V60M47B4916 | |
| 225 | | FR945 | | 2317 (1052) | WS62 | — | V60M47B2216 | |
| 300 | | FR924 | | 1971 (895) | WS40 | — | V60M47B3316 | |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient—Copper Windings**208 Delta Volts to 208Y/120 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|---------------|
| 15 | 150 | FR939 | 280E | 237 (108) | WS57 | WMB05 | V29M28T1516CU | |
| 30 | | FR940 | | 424 (192) | WS58 | WMB05 | V29M28T3016CU | |
| 45 | | FR940 | | 499 (227) | WS58 | WMB05 | V29M28T4516CU | |
| 75 | | FR942 | | 678 (308) | WS59 | WMB04 | V29M28T7516CU | |
| 112.5 | | FR943 | 324A | 1292 (587) | WS60 | WMB04 | V29R28T1216CU | |
| 150 | | FR943 | | 1410 (640) | WS60 | WMB04 | V29R28T4916CU | |
| 225 | | FR944 | | 1760 (799) | WS61 | — | V29R28T2216CU | |
| 300 | | FR945 | | 2361 (1072) | WS62 | — | V29R28T3316CU | |
| 500 | | Contact local Eaton representative | | | | | | V29E28T5516CU |
| 15 | 115 | FR939 | 280E | 253 (115) | WS57 | WMB05 | V29M28F1516CU | |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V29M28F3016CU | |
| 45 | | FR940 | | 495 (225) | WS58 | WMB05 | V29M28F4516CU | |
| 75 | | FR942 | | 698 (317) | WS59 | WMB04 | V29M28F7516CU | |
| 112.5 | | FR943 | 324A | 1335 (606) | WS60 | WMB04 | V29R28F1216CU | |
| 150 | | FR943 | | 1493 (678) | WS60 | WMB04 | V29R28F4916CU | |
| 225 | | FR944 | | 2186 (992) | WS61 | — | V29R28F2216CU | |
| 300 | | FR945 | | 2696 (1224) | WS62 | — | V29R28F3316CU | |
| 500 | | Contact local Eaton representative | | | | | | V29E28F5516CU |
| 15 | 80 | FR939 | 280E | 251 (114) | WS57 | WMB05 | V29M28B1516CU | |
| 30 | | FR940 | | 489 (222) | WS58 | WMB05 | V29M28B3016CU | |
| 45 | | FR942 | | 700 (318) | WS59 | WMB04 | V29M28B4516CU | |
| 75 | | FR943 | | 1204 (547) | WS60 | WMB04 | V29M28B7516CU | |
| 112.5 | | FR943 | 324A | 1454 (660) | WS60 | WMB04 | V29R28B1216CU | |
| 150 | | FR944 | | 1990 (903) | WS61 | — | V29R28B4916CU | |
| 225 | | FR945 | | 2504 (1137) | WS62 | — | V29R28B2216CU | |
| 300 | | Contact local Eaton representative | | | | | | V29R28B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient—Copper Windings**208 Delta Volts to 480Y/277 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|---------------|
| 15 | 150 | FR939 | E0342B | 245 (111) | WS57 | WMB05 | V29M47T1516CU | |
| 30 | | FR940 | | 428 (194) | WS58 | WMB05 | V29M47T3016CU | |
| 45 | | FR940 | | 503 (228) | WS58 | WMB05 | V29M47T4516CU | |
| 75 | | FR942 | | 676 (307) | WS59 | WMB04 | V29M47T7516CU | |
| 112.5 | | FR943 | E0351A | 1283 (582) | WS60 | WMB04 | V29R47T1216CU | |
| 150 | | FR943 | | 1432 (650) | WS60 | WMB04 | V29R47T4916CU | |
| 225 | | Contact local Eaton representative | | | | | | V29E47T2216CU |
| 300 | | | | | | | | V29E47T3316CU |
| 500 | | | | | | | | V29E47T5516CU |
| 15 | 115 | FR939 | E0342B | 247 (112) | WS57 | WMB05 | V29M47F1516CU | |
| 30 | | FR940 | | 434 (197) | WS58 | WMB05 | V29M47F3016CU | |
| 45 | | FR940 | | 600 (272) | WS58 | WMB05 | V29M47F4516CU | |
| 75 | | FR942 | | 682 (310) | WS59 | WMB04 | V29M47F7516CU | |
| 112.5 | | FR943 | E0351A | 1154 (524) | WS60 | WMB04 | V29R47F1216CU | |
| 150 | | FR943 | | 1500 (681) | WS60 | WMB04 | V29R47F4916CU | |
| 225 | | Contact local Eaton representative | | | | | | V29E47F2216CU |
| 300 | | | | | | | | V29E47F3316CU |
| 500 | | | | | | | | V29E47F5516CU |
| 15 | 80 | FR939 | E0342B | 251 (114) | WS57 | WMB05 | V29M47B1516CU | |
| 30 | | FR940 | | 489 (222) | WS58 | WMB05 | V29M47B3016CU | |
| 45 | | FR942 | | 700 (318) | WS59 | WMB04 | V29M47B4516CU | |
| 75 | | FR943 | | 1204 (547) | WS60 | WMB04 | V29M47B7516CU | |
| 112.5 | | FR943 | E0351A | 1454 (660) | WS60 | WMB04 | V29R47B1216CU | |
| 150 | | FR944 | | 1990 (903) | WS61 | — | V29R47B4916CU | |
| 225 | | Contact local Eaton representative | | | | | | V29E47B2216CU |
| 300 | | | | | | | | V29E47B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient—Copper Windings

240 Delta Volts to 208Y/120 Volts

2

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|---------------|
| 15 | 150 | FR939 | 280C | 238 (108) | WS57 | WMB05 | V24M28T1516CU | |
| 30 | | FR940 | | 458 (208) | WS58 | WMB05 | V24M28T3016CU | |
| 45 | | FR940 | | 478 (217) | WS58 | WMB05 | V24M28T4516CU | |
| 75 | | FR942 | | 697 (316) | WS59 | WMB04 | V24M28T7516CU | |
| 112.5 | | FR943 | 324B | 1103 (501) | WS60 | WMB04 | V24R28T1216CU | |
| 150 | | FR943 | | 1283 (582) | WS60 | WMB04 | V24R28T4916CU | |
| 225 | | FR944 | | 1500 (681) | WS61 | — | V24R28T2216CU | |
| 300 | | FR945 | | 2700 (1226) | WS62 | — | V24R28T3316CU | |
| 500 | | Contact local Eaton representative | | | | | | V24E28T5516CU |
| 15 | 115 | FR939 | 280C | 253 (115) | WS57 | WMB05 | V24M28F1516CU | |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V24M28F3016CU | |
| 45 | | FR940 | | 495 (225) | WS58 | WMB05 | V24M28F4516CU | |
| 75 | | FR942 | | 698 (317) | WS59 | WMB04 | V24M28F7516CU | |
| 112.5 | | FR943 | 324B | 1335 (606) | WS60 | WMB04 | V24R28F1216CU | |
| 150 | | FR943 | | 1493 (678) | WS60 | WMB04 | V24R28F4916CU | |
| 225 | | FR944 | | 2186 (992) | WS61 | — | V24R28F2216CU | |
| 300 | | FR945 | | 2696 (1224) | WS62 | — | V24R28F3316CU | |
| 500 | | Contact local Eaton representative | | | | | | V24E28F5516CU |
| 15 | 80 | FR939 | 280C | 251 (114) | WS57 | WMB05 | V24M28B1516CU | |
| 30 | | FR940 | | 489 (222) | WS58 | WMB05 | V24M28B3016CU | |
| 45 | | FR942 | | 700 (318) | WS59 | WMB04 | V24M28B4516CU | |
| 75 | | FR943 | | 1204 (547) | WS60 | WMB04 | V24M28B7516CU | |
| 112.5 | | FR943 | 324B | 1454 (660) | WS60 | WMB04 | V24R28B1216CU | |
| 150 | | FR944 | | 1990 (903) | WS61 | — | V24R28B4916CU | |
| 225 | | FR945 | | 2504 (1137) | WS62 | — | V24R28B2216CU | |
| 300 | | Contact local Eaton representative | | | | | | V24R28B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient—Copper Windings**240 Delta Volts to 480Y/277 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR939 | E0317A | 250 (114) | WS57 | WMB05 | V24M47T1516CU |
| 30 | | FR940 | | 432 (196) | WS58 | WMB05 | V24M47T3016CU |
| 45 | | FR940 | | 482 (219) | WS58 | WMB05 | V24M47T4516CU |
| 75 | | FR942 | | 700 (318) | WS59 | WMB04 | V24M47T7516CU |
| 112.5 | | FR943 | | 1170 (531) | WS60 | WMB04 | V24M47T1216CU |
| 150 | | FR943 | | 1350 (613) | WS60 | WMB04 | V24M47T4916CU |
| 225 | | Contact local Eaton representative | | | | | V24R47T2216CU |
| 300 | | | | | | | V24E47T3316CU |
| 500 | | | | | | | V24E47T5516CU |
| 15 | 115 | FR939 | E0317A | 253 (115) | WS57 | WMB05 | V24M47F1516CU |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V24M47F3016CU |
| 45 | | FR940 | | 495 (225) | WS58 | WMB05 | V24M47F4516CU |
| 75 | | FR942 | | 698 (317) | WS59 | WMB04 | V24M47F7516CU |
| 112.5 | | FR943 | E0351C | 1335 (606) | WS60 | WMB04 | V24R47F1216CU |
| 150 | | FR943 | | 1493 (678) | WS60 | WMB04 | V24R47F4916CU |
| 225 | | FR944 | | 2186 (992) | WS61 | — | V24R47F2216CU |
| 300 | | Contact local Eaton representative | | | | | V24R47F3316CU |
| 500 | | | | | | | V24E47F5516CU |
| 15 | 80 | FR939 | E0317A | 251 (114) | WS57 | WMB05 | V24M47B1516CU |
| 30 | | FR940 | | 489 (222) | WS58 | WMB05 | V24M47B3016CU |
| 45 | | FR942 | | 700 (318) | WS59 | WMB04 | V24M47B4516CU |
| 75 | | FR943 | | 1204 (547) | WS60 | WMB04 | V24M47B7516CU |
| 112.5 | | FR943 | E0351C | 1454 (660) | WS60 | WMB04 | V24R47B1216CU |
| 150 | | FR944 | | 1990 (903) | WS61 | — | V24R47B4916CU |
| 225 | | Contact local Eaton representative | | | | | V24R47B2216CU |
| 300 | | | | | | | V24R47B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient—Copper Windings

480 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR939 | 280B | 250 (114) | WS57 | WMB05 | V48M28T1516CU |
| 30 | | FR940 | | 415 (188) | WS58 | WMB05 | V48M28T3016CU |
| 45 | | FR940 | | 478 (217) | WS58 | WMB05 | V48M28T4516CU |
| 75 | | FR942 | | 676 (307) | WS59 | WMB04 | V48M28T7516CU |
| 112.5 | | FR943 | | 1263 (573) | WS60 | WMB04 | V48M28T1216CU |
| 150 | | FR943 | | 1410 (640) | WS60 | WMB04 | V48M28T4916CU |
| 225 | | FR944 | | 1883 (855) | WS61 | — | V48M28T2216CU |
| 300 | | FR945 | | 2485 (1128) | WS62 | — | V48M28T3316CU |
| 500 | | Contact local Eaton representative | | | | | V48M28T5516CU |
| 750 | | | | | | | V48D28T7716CU |
| 1000 | | | | | | | V48D28T1116CU |
| 15 | 115 | FR939 | 280B | 241 (109) | WS57 | WMB05 | V48M28F1516CU |
| 30 | | FR940 | | 433 (197) | WS58 | WMB05 | V48M28F3016CU |
| 45 | | FR940 | | 471 (214) | WS58 | WMB05 | V48M28F4516CU |
| 75 | | FR942 | | 665 (302) | WS59 | WMB04 | V48M28F7516CU |
| 112.5 | | FR943 | | 1271 (577) | WS60 | WMB04 | V48M28F1216CU |
| 150 | | FR943 | | 1422 (646) | WS60 | WMB04 | V48M28F4916CU |
| 225 | | FR944 | | 2082 (945) | WS61 | — | V48M28F2216CU |
| 300 | | FR945 | | 2568 (1166) | WS62 | — | V48M28F3316CU |
| 500 | | Contact local Eaton representative | | | | | V48M28F5516CU |
| 15 | 80 | FR939 | 280B | 239 (109) | WS57 | WMB05 | V48M28B1516CU |
| 30 | | FR940 | | 466 (212) | WS58 | WMB05 | V48M28B3016CU |
| 45 | | FR942 | | 667 (303) | WS58 | WMB05 | V48M28B4516CU |
| 75 | | FR943 | | 1147 (521) | WS59 | WMB04 | V48M28B7516CU |
| 112.5 | | FR943 | | 1385 (629) | WS60 | WMB04 | V48M28B1216CU |
| 150 | | FR944 | | 1895 (860) | WS60 | WMB04 | V48M28B4916CU |
| 225 | | FR945 | | 2385 (1083) | WS61 | — | V48M28B2216CU |
| 300 | | Contact local Eaton representative | | | | | V48M28B3316CU |
| 500 | | | | | | | V48M28B5516CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient—Copper Windings**480 Delta Volts to 240 Delta Volts with 120 Volt Lighting Tap on Phase B ^①**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ^② | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|------------------------------------|------------------------------------|----------------|-----------------------------|----------------|-------------------|----------------|-------|
| 15 | 150 | FR939 | 282B | 253 (115) | WS57 | WMB05 | V48M22T1516CU | |
| 30 | | FR940 | | 485 (220) | WS58 | WMB05 | V48M22T3016CU | |
| 45 | | FR940 | | 475 (216) | WS58 | WMB05 | V48M22T4516CU | |
| 75 | | FR942 | | 691 (314) | WS59 | WMB04 | V48M22T7516CU | |
| 112.5 | | FR943 | | 1215 (552) | WS60 | WMB04 | V48M22T1216CU | |
| 150 | | FR943 | | 1366 (620) | WS60 | WMB04 | V48M22T4916CU | |
| 225 | | FR944 | | 2000 (908) | WS61 | — | V48M22T2216CU | |
| 300 | | FR945 | | 2624 (1191) | WS62 | — | V48M22T3316CU | |
| 500 | | Contact local Eaton representative | | | | | V48M22T5516CU | |
| 750 | | | | | | | V48D22T7716CU | |
| 1000 | | | | | | V48D22T1116CU | | |
| 15 | 115 | FR939 | 282B | 300 (136) | WS57 | WMB05 | V48M22F1516CU | |
| 30 | | FR940 | | 485 (220) | WS58 | WMB05 | V48M22F3016CU | |
| 45 | | FR940 | | 467 (212) | WS58 | WMB05 | V48M22F4516CU | |
| 75 | | FR942 | | 665 (302) | WS59 | WMB04 | V48M22F7516CU | |
| 112.5 | | FR943 | | 1200 (545) | WS60 | WMB04 | V48M22F1216CU | |
| 150 | | FR943 | | 1366 (620) | WS60 | WMB04 | V48M22F4916CU | |
| 225 | | FR944 | | 2400 (1090) | WS61 | — | V48M22F2216CU | |
| 300 | | FR945 | | 3000 (1362) | WS62 | — | V48M22F3316CU | |
| 500 | | Contact local Eaton representative | | | | | V48M22F5516CU | |
| 15 | | 80 | | FR939 | 282B | 251 (114) | WS57 | WMB05 |
| 30 | FR940 | | 489 (222) | WS58 | | WMB05 | V48M22B3016CU | |
| 45 | FR942 | | 700 (318) | WS59 | | WMB04 | V48M22B4516CU | |
| 75 | FR943 | | 1204 (547) | WS60 | | WMB04 | V48M22B7516CU | |
| 112.5 | FR943 | | 1454 (660) | WS60 | | WMB04 | V48M22B1216CU | |
| 150 | FR944 | | 1990 (903) | WS61 | | — | V48M22B4916CU | |
| 225 | FR945 | | 2504 (1137) | WS62 | | — | V48M22B2216CU | |
| 300 | Contact local Eaton representative | | | | | V48M22B3316CU | | |
| 500 | | | | | | V48M22B5516CU | | |

Notes

^① Lighting tap limited to 5% of nameplate full load capacity.

^② Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient—Copper Windings

480 Delta Volts to 400Y/231 Volts

2

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR939 | 280B | 260 (118) | WS57 | WMB05 | V48M34T1516CU |
| 30 | | FR940 | | 490 (222) | WS58 | WMB05 | V48M34T3016CU |
| 45 | | FR940 | | 495 (225) | WS58 | WMB05 | V48M34T4516CU |
| 75 | | FR942 | | 683 (310) | WS59 | WMB04 | V48M34T7516CU |
| 112.5 | | FR943 | | 1250 (568) | WS60 | WMB04 | V48M34T1216CU |
| 150 | | FR943 | | 1370 (622) | WS60 | WMB04 | V48M34T4916CU |
| 225 | | FR944 | | 2100 (953) | WS61 | — | V48M34T2216CU |
| 300 | | FR945 | | 2650 (1203) | WS62 | — | V48M34T3316CU |
| 500 | | Contact local Eaton representative | | | | | V48M34T5516CU |
| 15 | 115 | FR939 | 280B | 253 (115) | WS57 | WMB05 | V48M34F1516CU |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V48M34F3016CU |
| 45 | | FR940 | | 495 (225) | WS58 | WMB05 | V48M34F4516CU |
| 75 | | FR942 | | 698 (317) | WS59 | WMB04 | V48M34F7516CU |
| 112.5 | | FR943 | | 1335 (606) | WS60 | WMB04 | V48M34F1216CU |
| 150 | | FR943 | | 1493 (678) | WS60 | WMB04 | V48M34F4916CU |
| 225 | | FR944 | | 2186 (992) | WS61 | — | V48M34F2216CU |
| 300 | | FR945 | | 2696 (1224) | WS62 | — | V48M34F3316CU |
| 500 | | Contact local Eaton representative | | | | | V48M34F5516CU |
| 15 | 80 | FR939 | 280B | 251 (114) | WS57 | WMB05 | V48M34B1516CU |
| 30 | | FR940 | | 489 (222) | WS58 | WMB05 | V48M34B3016CU |
| 45 | | FR942 | | 700 (318) | WS59 | WMB04 | V48M34B4516CU |
| 75 | | FR943 | | 1204 (547) | WS60 | WMB04 | V48M34B7516CU |
| 112.5 | | FR943 | | 1454 (660) | WS60 | WMB04 | V48M34B1216CU |
| 150 | | FR944 | | 1990 (903) | WS61 | — | V48M34B4916CU |
| 225 | | FR945 | | 2504 (1137) | WS62 | — | V48M34B2216CU |
| 300 | | Contact local Eaton representative | | | | | V48M34B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient—Copper Windings**480 Delta Volts to 480Y/277 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|
| 15 | 150 | FR939 | 280B | 260 (118) | WS57 | WMB05 | V48M47T1516CU |
| 30 | | FR940 | | 431 (196) | WS58 | WMB05 | V48M47T3016CU |
| 45 | | FR940 | | 457 (207) | WS58 | WMB05 | V48M47T4516CU |
| 75 | | FR942 | | 673 (306) | WS59 | WMB04 | V48M47T7516CU |
| 112.5 | | FR943 | | 1110 (504) | WS60 | WMB04 | V48M47T1216CU |
| 150 | | FR943 | | 1432 (650) | WS60 | WMB04 | V48M47T4916CU |
| 225 | | FR944 | | 2100 (953) | WS61 | — | V48M47T2216CU |
| 300 | | FR945 | | 2650 (1203) | WS62 | — | V48M47T3316CU |
| 500 | | Contact local Eaton representative | | | | | V48M47T5516CU |
| 15 | 115 | FR939 | 280B | 271 (123) | WS57 | WMB05 | V48M47F1516CU |
| 30 | | FR940 | | 431 (196) | WS58 | WMB05 | V48M47F3016CU |
| 45 | | FR940 | | 485 (220) | WS58 | WMB05 | V48M47F4516CU |
| 75 | | FR942 | | 730 (331) | WS59 | WMB04 | V48M47F7516CU |
| 112.5 | | FR943 | | 1146 (520) | WS60 | WMB04 | V48M47F1216CU |
| 150 | | FR943 | | 1432 (650) | WS60 | WMB04 | V48M47F4916CU |
| 225 | | FR944 | | 2150 (976) | WS61 | — | V48M47F2216CU |
| 300 | | FR945 | | 2700 (1226) | WS62 | — | V48M47F3316CU |
| 500 | | Contact local Eaton representative | | | | | V48M47F5516CU |
| 15 | 80 | FR939 | 280B | 254 (115) | WS57 | WMB05 | V48M47B1516CU |
| 30 | | FR940 | | 476 (216) | WS58 | WMB05 | V48M47B3016CU |
| 45 | | FR942 | | 670 (304) | WS58 | WMB05 | V48M47B4516CU |
| 75 | | FR943 | | 1110 (504) | WS59 | WMB04 | V48M47B7516CU |
| 112.5 | | FR943 | | 1385 (629) | WS60 | WMB04 | V48M47B1216CU |
| 150 | | FR944 | | 2100 (953) | WS60 | WMB04 | V48M47B4916CU |
| 225 | | FR945 | | 2650 (1203) | WS61 | — | V48M47B2216CU |
| 300 | | Contact local Eaton representative | | | | | V48M47B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient—Copper Windings

2

600 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR939 | 280A | 250 (114) | WS57 | WMB05 | V60M28T1516CU |
| 30 | | FR940 | | 441 (200) | WS58 | WMB05 | V60M28T3016CU |
| 45 | | FR940 | | 460 (209) | WS58 | WMB05 | V60M28T4516CU |
| 75 | | FR942 | | 712 (323) | WS59 | WMB04 | V60M28T7516CU |
| 112.5 | | FR943 | | 1260 (572) | WS60 | WMB04 | V60M28T1216CU |
| 150 | | FR943 | | 1420 (645) | WS60 | WMB04 | V60M28T4916CU |
| 225 | | FR944 | | 1890 (858) | WS61 | — | V60M28T2216CU |
| 300 | | FR945 | | 2450 (1112) | WS62 | — | V60M28T3316CU |
| 500 | | Contact local Eaton representative | | | | | V60M28T5516CU |
| 15 | 115 | FR939 | 280A | 253 (115) | WS57 | WMB05 | V60M28F1516CU |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V60M28F3016CU |
| 45 | | FR940 | | 495 (225) | WS58 | WMB05 | V60M28F4516CU |
| 75 | | FR942 | | 698 (317) | WS59 | WMB04 | V60M28F7516CU |
| 112.5 | | FR943 | | 1335 (606) | WS60 | WMB04 | V60M28F1216CU |
| 150 | | FR943 | | 1493 (678) | WS60 | WMB04 | V60M28F4916CU |
| 225 | | FR944 | | 2186 (992) | WS61 | — | V60M28F2216CU |
| 300 | | FR945 | | 2696 (1224) | WS62 | — | V60M28F3316CU |
| 500 | | Contact local Eaton representative | | | | | V60M28F5516CU |
| 15 | 80 | FR939 | 280A | 251 (114) | WS57 | WMB05 | V60M28B1516CU |
| 30 | | FR940 | | 489 (222) | WS58 | WMB05 | V60M28B3016CU |
| 45 | | FR942 | | 700 (318) | WS59 | WMB04 | V60M28B4516CU |
| 75 | | FR943 | | 1204 (547) | WS60 | WMB04 | V60M28B7516CU |
| 112.5 | | FR943 | | 1454 (660) | WS60 | WMB04 | V60M28B1216CU |
| 150 | | FR944 | | 1990 (903) | WS61 | — | V60M28B4916CU |
| 225 | | FR945 | | 2504 (1137) | WS62 | — | V60M28B2216CU |
| 300 | | Contact local Eaton representative | | | | | V60M28B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient—Copper Windings**600 Delta Volts to 480Y/277 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|---------------|
| 15 | 150 | FR939 | 280A | 233 (106) | WS57 | WMB05 | V60M47T1516CU | |
| 30 | | FR940 | | 431 (196) | WS58 | WMB05 | V60M47T3016CU | |
| 45 | | FR940 | | 472 (214) | WS58 | WMB05 | V60M47T4516CU | |
| 75 | | FR942 | | 673 (306) | WS59 | WMB04 | V60M47T7516CU | |
| 112.5 | | FR943 | | 1110 (504) | WS60 | WMB04 | V60M47T1216CU | |
| 150 | | FR943 | | 1450 (658) | WS60 | WMB04 | V60M47T4916CU | |
| 225 | | FR944 | | 1913 (869) | WS61 | — | V60M47T2216CU | |
| 300 | | FR945 | | 2600 (1180) | WS62 | — | V60M47T3316CU | |
| 500 | | Contact local Eaton representative | | | | | | V60M47T5516CU |
| 15 | 115 | FR939 | 280A | 253 (115) | WS57 | WMB05 | V60M47F1516CU | |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V60M47F3016CU | |
| 45 | | FR940 | | 495 (225) | WS58 | WMB05 | V60M47F4516CU | |
| 75 | | FR942 | | 698 (317) | WS59 | WMB04 | V60M47F7516CU | |
| 112.5 | | FR943 | | 1335 (606) | WS60 | WMB04 | V60M47F1216CU | |
| 150 | | FR943 | | 1493 (678) | WS60 | WMB04 | V60M47F4916CU | |
| 225 | | FR944 | | 2186 (992) | WS61 | — | V60M47F2216CU | |
| 300 | | FR945 | | 2696 (1224) | WS62 | — | V60M47F3316CU | |
| 500 | | Contact local Eaton representative | | | | | | V60M47F5516CU |
| 15 | 80 | FR939 | 280A | 251 (114) | WS57 | WMB05 | V60M47B1516CU | |
| 30 | | FR940 | | 489 (222) | WS58 | WMB05 | V60M47B3016CU | |
| 45 | | FR942 | | 700 (318) | WS59 | WMB04 | V60M47B4516CU | |
| 75 | | FR943 | | 1204 (547) | WS60 | WMB04 | V60M47B7516CU | |
| 112.5 | | FR943 | | 1454 (660) | WS60 | WMB04 | V60M47B1216CU | |
| 150 | | FR944 | | 1990 (903) | WS61 | — | V60M47B4916CU | |
| 225 | | FR945 | | 2504 (1137) | WS62 | — | V60M47B2216CU | |
| 300 | | Contact local Eaton representative | | | | | | V60M47B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Accessories

Please refer to Section 2.7 **Page V2-T2-167**.

2

Technical Data and Specifications

Frequency

Eaton standard low-voltage dry-type distribution transformers are designed for 60 Hz operation. Transformers required for other frequencies are available and must be specifically designed.

Overload Capability

Short-term overload is designed into transformers as required by ANSI. Low-voltage dry-type distribution transformers will deliver 200% nameplate load for one-half hour, 150% load for one hour and 125% load for four hours without being damaged, provided that a constant 50% load precedes and follows the overload. See ANSI C57.96-01.250 for additional limitations.

Continuous overload capacity is not deliberately designed into a transformer because the design objective is to be within the allowed winding temperature rise with nameplate loading.

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Insulation System Classification

| Ambient | + Winding Rise | + Hot Spot | = Temp. Class |
|---------|----------------|------------|---------------|
| 40°C | 55°C | 10°C | 105°C |
| 40°C | 80°C | 30°C | 150°C |
| 25°C | 135°C | 20°C | 180°C |
| 40°C | 115°C | 30°C | 185°C |
| 40°C | 150°C | 30°C | 220°C |

The design life of transformers having different insulation systems is the same—the lower-temperature systems are designed for the same life as the higher-temperature systems.

Enclosures

Eaton's ventilated transformers, Types DS-3 and DT-3, use a NEMA 2 rated (drip-proof) enclosure as standard, and are rated NEMA 3R with the addition of weathershields. Transformers manufactured in enclosures 939, 940, 942, 943, 944 and 945 are UL Listed to be installed indoors (without weathershields) with just 2 inches clearance on the sides and rear of the transformer.

Winding Terminations

Primary and secondary windings are terminated in the wiring compartment. Ventilating transformers have leads brought out to terminals that are pre-drilled to accept Cu/Al lugs. Aluminum-wound transformers have aluminum terminals; copper-wound models have copper terminals; aluminum and copper transformers include double neutral. **Lugs are not supplied with these transformers.** Eaton recommends external cables be rated 75°C for ventilated designs.

Series-Multiple Windings

Series-multiple windings consist of two similar coils in each winding that can be connected in series or parallel (multiple). Transformers with series-multiple windings are designated with an "x" or "/" between the voltage ratings, such as voltages of "120/240" or "240 x 480." If the series-multiple winding is designated by an "x," the winding can be connected only for a series or parallel.

With the "/" designation, a mid-point also becomes available in addition to the series or parallel connection. As an example, a 120 x 240 winding can be connected for either 120 (parallel) or 240 (series), but a 120/240 winding can be connected for 120 (parallel), or 240 (series), or 240 with a 120 mid-point.

For additional information, please refer to Section 2.7 **Page V2-T2-167**.

Sound Levels

All Eaton 600 volt class DOE 2016 low-voltage general-purpose dry-type distribution transformers are designed to meet NEMA ST-20 sound levels listed here. These are the sound levels measured in a soundproof environment. Actual sound levels measured at an installation will likely be higher (as much as 15 dB greater) due to electrical connections and environmental conditions. Lower sound levels are available and should be specified when the transformer is going to be installed in an area where sound may be a concern.

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilating (up to 1.2 kV) | | Encapsulated (up to 1.2 kV) |
|------------------------------|--|-----------------|-----------------------------|
| | K-Factor 1, 4, 9 | K-Factor 13, 20 | |
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Note

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

DOE 2016 Energy-Efficient K-Factor Rated Transformers



Product Description

A common industry term for the amount of harmonics produced by a given load is the K-factor. The larger the K-factor, the more harmonics are present. Linear loads, for example, have a K-factor of 1. Transformers may carry a K-factor rating to define the transformer's ability to withstand the additional heating generated by harmonic currents.

Applications

Eaton K-Factor transformers are specifically designed to withstand the harmful overheating effects caused by harmonics generated by nonlinear (non-sinusoidal) loads. These loads include computers, laser printers, copiers and other office equipment, as well as video monitors and other electronic equipment. Eaton K-Factor transformers are not simply over-sized transformers. The core and coils of our K-Factor transformers are specially designed to have reduced induction levels, which results in a reduction in stray losses. Oversized (200% rated) neutrals and electrostatic shielding are typical features found in our K-Factor transformers. Eaton K-Factor transformers are manufactured with the same high-quality construction features as our other ventilated transformer products, including NEMA 2 enclosures as standard.

Contents

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| DOE 2016 Energy-Efficient K-Factor Rated Transformers | |
| Features, Benefits and Functions | V2-T2-30 |
| Standards and Certifications | V2-T2-30 |
| Product Selection | V2-T2-31 |
| Accessories | V2-T2-63 |
| Technical Data and Specifications | V2-T2-63 |

Calculating the K-Factor

All nonlinear waveforms can be broken down mathematically into a fundamental frequency and its harmonics. IEEE C57.110 establishes a direct relationship between these harmonics and transformer heating. Underwriters Laboratories has established a similar relationship, the K-factor, which is derived by summing the square of the percentage current at a given harmonic level multiplied by the square of the harmonic order.

$$K = \sum (I_h)^2 (h)^2$$

I_h = Percent Current at Harmonic h

h = Harmonic Order, i.e., 3rd, 5th, 7th

For example, a load that is 90% of the fundamental, 30% of the third harmonic, and 20% of the fifth harmonic would yield $(.9)^2(1)^2 + (.3)^2(3)^2 + (.2)^2(5)^2$ or a K-factor of 2.62. This load would require an Eaton KT-4 transformer with a K-factor rating of 4.

Transformers that carry a K-factor rating define the transformer's ability to withstand a given harmonic load while operating within the transformer's insulation class.

An analysis of harmonic loads and a calculation of the K-factor must be made to properly apply transformers in any building or facility. Note that the calculated K-factor is not constant because nonlinear loads change throughout the day as equipment and lighting is turned off and on. These harmonic loads also change over the life of the building or facility as equipment is added or removed.

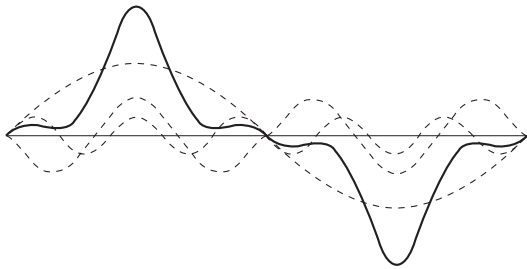
Harmonic Currents

Harmonic currents are found in nonlinear loads. These currents are generated by various types of equipment including switching mode power supplies that abruptly switch current on and off during each line cycle. Switching mode power supplies or diode-capacitor power supplies convert AC line voltage to low voltage DC. This process is accomplished by charging capacitors during each line cycle with narrow pluses

of current that are time-coincident with line voltage peaks. Examples of this equipment include electronic ballasts for fluorescent lighting, personal computers, printers, fax machines, electronic and medical test equipment, uninterruptible power supplies, and solid-state motor drives.

Note: Nonlinear is synonymous with the term non-sinusoidal.

Harmonic Currents Found in Nonlinear Loads Cause Wave Shape Distortion and Create Added Stresses on Transformers

**Features, Benefits and Functions**

- 600 volt class standard
- Three-phase, 480 delta–208Y/120 volt standard
- Single-phase, 240 x 480 volt–120/240 volt standard
- 150°C rise standard, 80°C and 115°C available
- Three-phase neutrals sized for 200% of rated current
- The core and coil assembly is grounded to the transformer enclosure by means of a visible flexible copper ground strap. The copper ground strap is sized per the NEC to be a grounding conductor. Three-phase DOE 2016 efficient transformers are provided with a bonding ground bar attached to the bottom panel for compliance with NEC 450.10(A)
- Electrostatic shield

Note: Electrostatic shields do not reduce harmonic levels. However, because of the nature of switching mode loads, these shields do reduce transient noise in the system, which may affect sensitive computer loads.

- Aluminum windings (copper optional)
 - Class 220°C insulation
 - Reduced core flux density
- Note:** Reduced core flux prevents the core from saturation and overheating due to voltage distortions caused by harmonic currents.
- Indoor enclosures (weathershields optional, for outdoor applications)
 - Coils designed to minimize stray losses
 - K4, K13 standard
 - K9, K20, K30 optional
 - Low sound level (–3 dB, –5 dB) available as options

Standards and Certifications

- UL listed

**Industry Standards**

All Eaton low-voltage dry-type distribution transformers are built and tested in accordance with applicable NEMA, ANSI and IEEE Standards. All 600 volt class transformers are UL listed unless otherwise noted.

Seismically Qualified

Eaton manufactured low-voltage dry-type distribution transformers are seismically qualified and exceed requirements of the Uniform Building Code (UBC), International Building Code (IBC) and California Code Title 24.

Catalog Number Selection

Please refer to Section 2.7
Page V2-T2-162.

Product Selection

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

K-4 480 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|--|
| 15 | 150 | FR940 | 283B | 407 (185) | WS58 | WMB05 | H48M28T1516 | |
| 30 | | FR940 | | 437 (198) | WS58 | WMB05 | H48M28T3016 | |
| 45 | | FR940 | | 439 (199) | WS58 | WMB05 | H48M28T4516 | |
| 75 | | FR942 | | 599 (272) | WS59 | WMB04 | H48M28T7516 | |
| 112.5 | | FR943 | | 987 (448) | WS60 | WMB04 | H48M28T1216 | |
| 150 | | FR944 | | 1637 (743) | WS61 | — | H48M28T4916 | |
| 225 | | FR944 | | 1642 (745) | WS61 | — | H48M28T2216 | |
| 300 | | FR945 | | 2394 (1087) | WS62 | — | H48M28T3316 | |
| 500 | | Contact local Eaton representative | | | | | H48M28T5516 | |
| 15 | 115 | FR940 | 283B | 402 (183) | WS58 | WMB05 | H48M28F1516 | |
| 30 | | FR940 | | 415 (188) | WS58 | WMB05 | H48M28F3016 | |
| 45 | | FR942 | | 619 (281) | WS59 | WMB04 | H48M28F4516 | |
| 75 | | FR943 | | 984 (447) | WS60 | WMB04 | H48M28F7516 | |
| 112.5 | | FR943 | | 1236 (561) | WS60 | WMB04 | H48M28F1216 | |
| 150 | | FR944 | | 1662 (755) | WS61 | — | H48M28F4916 | |
| 225 | | FR945 | | 2353 (1068) | WS62 | — | H48M28F2216 | |
| 300 | | FR945 | | 2198 (998) | WS62 | — | H48M28F3316 | |
| 500 | | Contact local Eaton representative | | | | | H48M28F5516 | |
| 15 | 80 | FR940 | 283B | 415 (188) | WS58 | WMB05 | H48M28B1516 | |
| 30 | | FR940 | | 437 (198) | WS58 | WMB05 | H48M28B3016 | |
| 45 | | FR942 | | 619 (281) | WS58 | WMB05 | H48M28B4516 | |
| 75 | | FR943 | | 1027 (466) | WS59 | WMB04 | H48M28B7516 | |
| 112.5 | | FR944 | | 1643 (746) | WS60 | WMB04 | H48M28B1216 | |
| 150 | | FR944 | | 1710 (776) | WS60 | — | H48M28B4916 | |
| 225 | | FR924 | | 2680 (1217) | WS40 | — | H48M28B2216 | |
| 300 | | Contact local Eaton representative | | | | | H48M28B3316 | |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

2

K-4 480 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR940 | 283B | 427 (194) | WS58 | WMB05 | H48M47T1516 |
| 30 | | FR940 | | 459 (208) | WS58 | WMB05 | H48M47T3016 |
| 45 | | FR940 | | 461 (209) | WS58 | WMB05 | H48M47T4516 |
| 75 | | FR942 | | 629 (286) | WS59 | WMB04 | H48M47T7516 |
| 112.5 | | FR943 | | 1036 (471) | WS60 | WMB04 | H48M47T1216 |
| 150 | | FR944 | | 1719 (780) | WS61 | — | H48M47T4916 |
| 225 | | FR944 | | 1724 (783) | WS61 | — | H48M47T2216 |
| 300 | | FR945 | | 2514 (1141) | WS62 | — | H48M47T3316 |
| 500 | | Contact local Eaton representative | | | | | H48M47T5516 |
| 15 | 115 | FR940 | 283B | 422 (192) | WS58 | WMB05 | H48M47F1516 |
| 30 | | FR940 | | 436 (198) | WS58 | WMB05 | H48M47F3016 |
| 45 | | FR942 | | 650 (295) | WS59 | WMB04 | H48M47F4516 |
| 75 | | FR943 | | 1033 (469) | WS60 | WMB04 | H48M47F7516 |
| 112.5 | | FR943 | | 1298 (589) | WS60 | WMB04 | H48M47F1216 |
| 150 | | FR944 | | 1745 (792) | WS61 | — | H48M47F4916 |
| 225 | | FR945 | | 2471 (1122) | WS62 | — | H48M47F2216 |
| 300 | | FR945 | | 2308 (1048) | WS62 | — | H48M47F3316 |
| 500 | | Contact local Eaton representative | | | | | H48M47F5516 |
| 15 | 80 | FR939 | 283B | 267 (121) | WS57 | WMB05 | H48M47B1516 |
| 30 | | FR940 | | 459 (208) | WS58 | WMB05 | H48M47B3016 |
| 45 | | FR942 | | 650 (295) | WS59 | WMB04 | H48M47B4516 |
| 75 | | FR943 | | 1078 (490) | WS60 | WMB04 | H48M47B7516 |
| 112.5 | | FR944 | | 1725 (783) | WS61 | — | H48M47B1216 |
| 150 | | FR944 | | 1796 (815) | WS61 | — | H48M47B4916 |
| 225 | | FR924 | | 2814 (1278) | WS40 | — | H48M47B2216 |
| 300 | | Contact local Eaton representative | | | | | H48M47B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

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DOE 2016 Energy-Efficient K-Factor Rated Transformers

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

K-4 600 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lbs (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|-------------------|----------------|-------------------|----------------|
| 15 | 150 | FR940 | 283E | 427 (194) | WS58 | WMB05 | H60M28T1516 |
| 30 | | FR940 | | 459 (208) | WS58 | WMB05 | H60M28T3016 |
| 45 | | FR940 | | 461 (209) | WS58 | WMB05 | H60M28T4516 |
| 75 | | FR942 | | 629 (286) | WS59 | WMB04 | H60M28T7516 |
| 112.5 | | FR943 | | 1036 (471) | WS60 | WMB04 | H60M28T1216 |
| 150 | | FR944 | | 1719 (780) | WS61 | — | H60M28T4916 |
| 225 | | FR944 | | 1724 (783) | WS61 | — | H60M28T2216 |
| 300 | | FR945 | | 2514 (1141) | WS62 | — | H60M28T3316 |
| 500 | | Contact local Eaton representative | | | | | H60M28T5516 |
| 15 | 115 | FR940 | 283E | 422 (192) | WS58 | WMB05 | H60M28F1516 |
| 30 | | FR940 | | 436 (198) | WS58 | WMB05 | H60M28F3016 |
| 45 | | FR942 | | 650 (295) | WS59 | WMB04 | H60M28F4516 |
| 75 | | FR943 | | 1033 (469) | WS60 | WMB04 | H60M28F7516 |
| 112.5 | | FR943 | | 1298 (589) | WS60 | WMB04 | H60M28F1216 |
| 150 | | FR944 | | 1745 (792) | WS61 | — | H60M28F4916 |
| 225 | | FR945 | | 2471 (1122) | WS62 | — | H60M28F2216 |
| 300 | | FR945 | | 2308 (1048) | WS62 | — | H60M28F3316 |
| 500 | | Contact local Eaton representative | | | | | H60M28F5516 |
| 15 | 80 | FR939 | 283E | 267 (121) | WS57 | WMB05 | H60M28B1516 |
| 30 | | FR940 | | 459 (208) | WS58 | WMB05 | H60M28B3016 |
| 45 | | FR942 | | 650 (295) | WS59 | WMB04 | H60M28B4516 |
| 75 | | FR943 | | 1078 (490) | WS60 | WMB04 | H60M28B7516 |
| 112.5 | | FR944 | | 1725 (783) | WS61 | — | H60M28B1216 |
| 150 | | FR944 | | 1796 (815) | WS61 | — | H60M28B4916 |
| 225 | | FR924 | | 2814 (1278) | WS40 | — | H60M28B2216 |
| 300 | | Contact local Eaton representative | | | | | H60M28B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

K-4 600 Delta Volts to 480Y/277 Volts

2

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR940 | 283E | 427 (194) | WS58 | WMB05 | H60M47T1516 |
| 30 | | FR940 | | 459 (208) | WS58 | WMB05 | H60M47T3016 |
| 45 | | FR940 | | 461 (209) | WS58 | WMB05 | H60M47T4516 |
| 75 | | FR942 | | 629 (286) | WS59 | WMB04 | H60M47T7516 |
| 112.5 | | FR943 | | 1036 (471) | WS60 | WMB04 | H60M47T1216 |
| 150 | | FR944 | | 1719 (780) | WS61 | — | H60M47T4916 |
| 225 | | FR944 | | 1724 (783) | WS61 | — | H60M47T2216 |
| 300 | | FR945 | | 2514 (1141) | WS62 | — | H60M47T3316 |
| 500 | | Contact local Eaton representative | | | | | H60M47T5516 |
| 15 | 115 | FR940 | 283E | 422 (192) | WS58 | WMB05 | H60M47F1516 |
| 30 | | FR940 | | 436 (198) | WS58 | WMB05 | H60M47F3016 |
| 45 | | FR942 | | 650 (295) | WS59 | WMB04 | H60M47F4516 |
| 75 | | FR943 | | 1033 (469) | WS60 | WMB04 | H60M47F7516 |
| 112.5 | | FR943 | | 1298 (589) | WS60 | WMB04 | H60M47F1216 |
| 150 | | FR944 | | 1745 (792) | WS61 | — | H60M47F4916 |
| 225 | | FR945 | | 2471 (1122) | WS62 | — | H60M47F2216 |
| 300 | | FR945 | | 2308 (1048) | WS62 | — | H60M47F3316 |
| 500 | | Contact local Eaton representative | | | | | H60M47F5516 |
| 15 | 80 | FR939 | 283E | 267 (121) | WS57 | WMB05 | H60M47B1516 |
| 30 | | FR940 | | 459 (208) | WS58 | WMB05 | H60M47B3016 |
| 45 | | FR942 | | 650 (295) | WS59 | WMB04 | H60M47B4516 |
| 75 | | FR943 | | 1078 (490) | WS60 | WMB04 | H60M47B7516 |
| 112.5 | | FR944 | | 1725 (783) | WS61 | — | H60M47B1216 |
| 150 | | FR944 | | 1796 (815) | WS61 | — | H60M47B4916 |
| 225 | | FR924 | | 2814 (1278) | WS40 | — | H60M47B2216 |
| 300 | | Contact local Eaton representative | | | | | H60M47B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

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DOE 2016 Energy-Efficient K-Factor Rated Transformers

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

K-4 480 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR940 | 283B | 418 (190) | WS58 | WMB05 | H48M28T1516CU |
| 30 | | FR940 | | 458 (208) | WS58 | WMB05 | H48M28T3016CU |
| 45 | | FR940 | | 480 (218) | WS58 | WMB05 | H48M28T4516CU |
| 75 | | FR943 | | 1274 (578) | WS60 | WMB04 | H48M28T7516CU |
| 112.5 | | FR943 | | 1818 (825) | WS60 | WMB04 | H48M28T1216CU |
| 150 | | FR944 | | 2105 (956) | WS61 | — | H48M28T4916CU |
| 225 | | FR945 | | 2674 (1214) | WS62 | — | H48M28T2216CU |
| 300 | | FR945 | | 2737 (1243) | WS62 | — | H48M28T3316CU |
| 500 | | Contact local Eaton representative | | | | | H48M28T5516CU |
| 15 | 115 | FR940 | 283B | 414 (188) | WS58 | WMB05 | H48M28F1516CU |
| 30 | | FR940 | | 417 (189) | — | — | H48M28F3016CU |
| 45 | | FR942 | | 684 (311) | WS59 | WMB04 | H48M28F4516CU |
| 75 | | FR943 | | 1083 (492) | WS60 | WMB04 | H48M28F7516CU |
| 112.5 | | FR943 | | 1394 (633) | WS60 | WMB04 | H48M28F1216CU |
| 150 | | FR944 | | 2103 (955) | WS61 | — | H48M28F4916CU |
| 225 | | FR945 | | 2150 (976) | — | — | H48M28F2216CU |
| 300 | | Contact local Eaton representative | | | | | H48M28F3316CU |
| 500 | | | | | | | H48M28F5516CU |
| 15 | 80 | FR940 | 283B | 440 (200) | WS58 | WMB05 | H48M28B1516CU |
| 30 | | FR940 | | 482 (219) | WS58 | WMB05 | H48M28B3016CU |
| 45 | | FR942 | | 669 (304) | WS59 | WMB04 | H48M28B4516CU |
| 75 | | FR943 | | 1210 (549) | WS60 | WMB04 | H48M28B7516CU |
| 112.5 | | FR943 | | 1287 (584) | WS60 | WMB04 | H48M28B1216CU |
| 150 | | FR944 | | 2138 (971) | WS61 | — | H48M28B4916CU |
| 225 | | FR945 | | 2727 (1238) | — | — | H48M28B2216CU |
| 300 | | Contact local Eaton representative | | | | | H48M28B3316CU |

Notes

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

2

K-4 480 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR940 | 283B | 439 (199) | WS58 | WMB05 | H48M47T1516CU |
| 30 | | FR940 | | 481 (218) | WS58 | WMB05 | H48M47T3016CU |
| 45 | | FR940 | | 504 (229) | WS58 | WMB05 | H48M47T4516CU |
| 75 | | FR943 | | 1338 (607) | WS60 | WMB04 | H48M47T7516CU |
| 112.5 | | FR943 | | 1909 (867) | WS60 | WMB04 | H48M47T1216CU |
| 150 | | FR944 | | 2210 (1003) | WS61 | — | H48M47T4916CU |
| 225 | | FR945 | | 2808 (1275) | WS62 | — | H48M47T2216CU |
| 300 | | FR945 | | 2874 (1305) | WS62 | — | H48M47T3316CU |
| 500 | | Contact local Eaton representative | | | | | H48M47T5516CU |
| 15 | 115 | FR940 | 283B | 435 (197) | WS58 | WMB05 | H48M47F1516CU |
| 30 | | FR940 | | 438 (199) | WS58 | WMB05 | H48M47F3016CU |
| 45 | | FR942 | | 718 (326) | WS59 | WMB04 | H48M47F4516CU |
| 75 | | FR943 | | 1137 (516) | WS60 | WMB04 | H48M47F7516CU |
| 112.5 | | FR943 | | 1464 (665) | WS60 | WMB04 | H48M47F1216CU |
| 150 | | FR944 | | 2208 (1003) | WS61 | — | H48M47F4916CU |
| 225 | | FR945 | | 1764 (801) | WS62 | — | H48M47F2216CU |
| 300 | | Contact local Eaton representative | | | | | H48M47F3316CU |
| 500 | | | | | | | H48M47F5516CU |
| 15 | 80 | FR940 | 283B | 462 (208) | WS58 | WMB05 | H48M47B1516CU |
| 30 | | FR940 | | 506 (230) | WS58 | WMB05 | H48M47B3016CU |
| 45 | | FR942 | | 702 (319) | WS59 | WMB04 | H48M47B4516CU |
| 75 | | FR943 | | 1271 (577) | WS60 | WMB04 | H48M47B7516CU |
| 112.5 | | FR943 | | 1351 (614) | WS60 | WMB04 | H48M47B1216CU |
| 150 | | FR944 | | 2245 (1019) | WS61 | — | H48M47B4916CU |
| 225 | | FR945 | | 2863 (1300) | WS62 | — | H48M47B2216CU |
| 300 | | Contact local Eaton representative | | | | | H48M47B3316CU |

Notes

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DOE 2016 Energy-Efficient K-Factor Rated Transformers

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

K-4 600 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|---------------|
| 15 | 150 | FR940 | 283E | 439 (199) | WS58 | WMB05 | H60M28T1516CU | |
| 30 | | FR940 | | 481 (218) | WS58 | WMB05 | H60M28T3016CU | |
| 45 | | FR940 | | 504 (229) | WS58 | WMB05 | H60M28T4516CU | |
| 75 | | FR943 | | 1338 (607) | WS60 | WMB04 | H60M28T7516CU | |
| 112.5 | | FR943 | | 1909 (867) | WS60 | WMB04 | H60M28T1216CU | |
| 150 | | FR944 | | 2210 (1003) | WS61 | — | H60M28T4916CU | |
| 225 | | FR945 | | 2808 (1275) | WS62 | — | H60M28T2216CU | |
| 300 | | FR945 | | 2874 (1305) | WS62 | — | H60M28T3316CU | |
| 500 | | Contact local Eaton representative | | | | | | H60M28T5516CU |
| 15 | 115 | FR940 | 283E | 435 (197) | WS58 | WMB05 | H60M28F1516CU | |
| 30 | | FR940 | | 438 (199) | WS58 | WMB05 | H60M28F3016CU | |
| 45 | | FR942 | | 718 (326) | WS59 | WMB04 | H60M28F4516CU | |
| 75 | | FR943 | | 1137 (516) | WS60 | WMB04 | H60M28F7516CU | |
| 112.5 | | FR943 | | 1464 (665) | WS60 | WMB04 | H60M28F1216CU | |
| 150 | | FR944 | | 2208 (1003) | WS61 | — | H60M28F4916CU | |
| 225 | | FR945 | | 1764 (801) | WS62 | — | H60M28F2216CU | |
| 300 | | Contact local Eaton representative | | | | | | H60M28F3316CU |
| 500 | | | | | | | | H60M28F5516CU |
| 15 | 80 | FR940 | 283E | 462 (208) | WS58 | WMB05 | H60M28B1516CU | |
| 30 | | FR940 | | 506 (230) | WS58 | WMB05 | H60M28B3016CU | |
| 45 | | FR942 | | 702 (319) | WS59 | WMB04 | H60M28B4516CU | |
| 75 | | FR943 | | 1271 (577) | WS60 | WMB04 | H60M28B7516CU | |
| 112.5 | | FR943 | | 1351 (614) | WS60 | WMB04 | H60M28B1216CU | |
| 150 | | FR944 | | 2245 (1019) | WS61 | — | H60M28B4916CU | |
| 225 | | FR945 | | 2863 (1300) | WS62 | — | H60M28B2216CU | |
| 300 | | Contact local Eaton representative | | | | | | H60M28B3316CU |

Notes

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

K-4 600 Delta Volts to 480Y/277 Volts

2

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR940 | 283E | 439 (199) | WS58 | WMB05 | H60M47T1516CU |
| 30 | | FR940 | | 481 (218) | WS58 | WMB05 | H60M47T3016CU |
| 45 | | FR940 | | 504 (229) | WS58 | WMB05 | H60M47T4516CU |
| 75 | | FR943 | | 1338 (607) | WS60 | WMB04 | H60M47T7516CU |
| 112.5 | | FR943 | | 1909 (867) | WS60 | WMB04 | H60M47T1216CU |
| 150 | | FR944 | | 2210 (1003) | WS61 | — | H60M47T4916CU |
| 225 | | FR945 | | 2808 (1275) | WS62 | — | H60M47T2216CU |
| 300 | | FR945 | | 2874 (1305) | WS62 | — | H60M47T3316CU |
| 500 | | Contact local Eaton representative | | | | | H60M47T5516CU |
| 15 | 115 | FR940 | 283E | 435 (197) | WS58 | WMB05 | H60M47F1516CU |
| 30 | | FR940 | | 438 (199) | WS58 | WMB05 | H60M47F3016CU |
| 45 | | FR942 | | 718 (326) | WS59 | WMB04 | H60M47F4516CU |
| 75 | | FR943 | | 1137 (516) | WS60 | WMB04 | H60M47F7516CU |
| 112.5 | | FR943 | | 1464 (665) | WS60 | WMB04 | H60M47F1216CU |
| 150 | | FR944 | | 2208 (1003) | WS61 | — | H60M47F4916CU |
| 225 | | FR945 | | 1764 (801) | WS62 | — | H60M47F2216CU |
| 300 | | Contact local Eaton representative | | | | | H60M47F3316CU |
| 500 | | | | | | | H60M47F5516CU |
| 15 | 80 | FR940 | 283E | 462 (208) | WS58 | WMB05 | H60M47B1516CU |
| 30 | | FR940 | | 506 (230) | WS58 | WMB05 | H60M47B3016CU |
| 45 | | FR942 | | 702 (319) | WS59 | WMB04 | H60M47B4516CU |
| 75 | | FR943 | | 1271 (577) | WS60 | WMB04 | H60M47B7516CU |
| 112.5 | | FR943 | | 1351 (614) | WS60 | WMB04 | H60M47B1216CU |
| 150 | | FR944 | | 2245 (1019) | WS61 | — | H60M47B4916CU |
| 225 | | FR945 | | 2863 (1300) | WS62 | — | H60M47B2216CU |
| 300 | | Contact local Eaton representative | | | | | H60M47B3316CU |

Notes

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings**K-9 480 Delta Volts to 208Y/120 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|------------------------------------|------------------------------------|----------------|------------------|----------------|--------------------|--------------------|-------|
| 15 | 150 | FR940 | 283B | 406 (184) | WS58 | WMB05 | B48M28T1516 | |
| 30 | | FR940 | | 416 (189) | WS58 | WMB05 | B48M28T3016 | |
| 45 | | FR942 | | 594 (270) | WS59 | WMB04 | B48M28T4516 | |
| 75 | | FR943 | | 1012 (459) | WS60 | WMB04 | B48M28T7516 | |
| 112.5 | | FR943 | | 1297 (589) | WS60 | WMB04 | B48M28T1216 | |
| 150 | | FR944 | | 1652 (750) | WS61 | — | B48M28T4916 | |
| 225 | | FR945 | | 2379 (1080) | WS62 | — | B48M28T2216 | |
| 300 | | FR924 | | 1910 (867) | WS40 | — | B48M28T3316 | |
| 500 | | Contact local Eaton representative | | | | | B48M28T5516 | |
| 15 | | 115 | | FR940 | 283B | 412 (187) | WS58 | WMB05 |
| 30 | FR940 | | 437 (198) | WS58 | | WMB05 | B48M28F3016 | |
| 45 | FR942 | | 619 (281) | WS59 | | WMB04 | B48M28F4516 | |
| 75 | FR943 | | 977 (444) | WS60 | | WMB04 | B48M28F7516 | |
| 112.5 | FR944 | | 1760 (799) | WS61 | | — | B48M28F1216 | |
| 150 | FR944 | | 1682 (764) | WS61 | | — | B48M28F4916 | |
| 225 | FR924 | | 1927 (875) | WS40 | | — | B48M28F2216 | |
| 300 | FR924 | | 2894 (1314) | WS40 | | — | B48M28F3316 | |
| 500 | Contact local Eaton representative | | | | | B48M28F5516 | | |
| 15 | 80 | | FR940 | 283B | | 420 (191) | WS58 | WMB05 |
| 30 | | FR940 | 438 (199) | | WS58 | WMB05 | B48M28B3016 | |
| 45 | | FR943 | 927 (421) | | WS60 | WMB04 | B48M28B4516 | |
| 75 | | FR943 | 1098 (498) | | WS60 | WMB04 | B48M28B7516 | |
| 112.5 | | FR944 | 1939 (880) | | WS61 | — | B48M28B1216 | |
| 150 | | FR945 | 2400 (1090) | | WS62 | — | B48M28B4916 | |
| 225 | | FR924 | 2816 (1278) | | WS40 | — | B48M28B2216 | |
| 300 | | Contact local Eaton representative | | | | | B48M28B3316 | |

Notes

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

2

K-9 480 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|--------------------|
| 15 | 150 | FR940 | 283B | 426 (194) | WS58 | WMB05 | B48M47T1516 |
| 30 | | FR940 | | 437 (198) | WS58 | WMB05 | B48M47T3016 |
| 45 | | FR942 | | 624 (283) | WS59 | WMB04 | B48M47T4516 |
| 75 | | FR943 | | 1063 (482) | WS60 | WMB04 | B48M47T7516 |
| 112.5 | | FR943 | | 1362 (618) | WS60 | WMB04 | B48M47T1216 |
| 150 | | FR944 | | 1496 (679) | WS61 | — | B48M47T4916 |
| 225 | | FR945 | | 2458 (1116) | WS62 | — | B48M47T2216 |
| 300 | | FR924 | | 2014 (914) | WS40 | — | B48M47T3316 |
| 500 | | Contact local Eaton representative | | | | | B48M47T5516 |
| 15 | 115 | FR940 | 283B | 433 (196) | WS58 | WMB05 | B48M47F1516 |
| 30 | | FR940 | | 459 (208) | WS58 | WMB05 | B48M47F3016 |
| 45 | | FR942 | | 650 (295) | WS59 | WMB04 | B48M47F4516 |
| 75 | | FR943 | | 1026 (466) | WS60 | WMB04 | B48M47F7516 |
| 112.5 | | FR944 | | 1848 (839) | WS61 | — | B48M47F1216 |
| 150 | | FR944 | | 1766 (802) | WS61 | — | B48M47F4916 |
| 225 | | FR924 | | 2023 (919) | WS40 | — | B48M47F2216 |
| 300 | | FR924 | | 3039 (1380) | WS40 | — | B48M47F3316 |
| 500 | | Contact local Eaton representative | | | | | B48M47F5516 |
| 15 | 80 | FR940 | 283B | 420 (191) | WS58 | WMB05 | B48M47B1516 |
| 30 | | FR940 | | 457 (207) | WS58 | WMB05 | B48M47B3016 |
| 45 | | FR943 | | 973 (442) | WS60 | WMB04 | B48M47B4516 |
| 75 | | FR943 | | 1153 (523) | WS60 | WMB04 | B48M47B7516 |
| 112.5 | | FR944 | | 1939 (880) | WS61 | — | B48M47B1216 |
| 150 | | FR945 | | 2537 (1152) | WS62 | — | B48M47B4916 |
| 225 | | FR924 | | 2957 (1342) | WS40 | — | B48M47B2216 |
| 300 | | Contact local Eaton representative | | | | | B48M47B3316 |

Notes

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings**K-9 600 Delta Volts to 208Y/120 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|--------------------|
| 15 | 150 | FR940 | 283E | 426 (194) | WS58 | WMB05 | B60M28T1516 |
| 30 | | FR940 | | 437 (198) | WS58 | WMB05 | B60M28T3016 |
| 45 | | FR942 | | 624 (283) | WS59 | WMB04 | B60M28T4516 |
| 75 | | FR943 | | 1063 (482) | WS60 | WMB04 | B60M28T7516 |
| 112.5 | | FR943 | | 1362 (618) | WS60 | WMB04 | B60M28T1216 |
| 150 | | FR944 | | 1496 (679) | WS61 | — | B60M28T4916 |
| 225 | | FR945 | | 2458 (1116) | WS62 | — | B60M28T2216 |
| 300 | | FR924 | | 2014 (914) | WS40 | — | B60M28T3316 |
| 500 | | Contact local Eaton representative | | | | | B60M28T5516 |
| 15 | 115 | FR940 | 283E | 433 (196) | WS58 | WMB05 | B60M28F1516 |
| 30 | | FR940 | | 459 (208) | WS58 | WMB05 | B60M28F3016 |
| 45 | | FR942 | | 650 (295) | WS59 | WMB04 | B60M28F4516 |
| 75 | | FR943 | | 1026 (466) | WS60 | WMB04 | B60M28F7516 |
| 112.5 | | FR944 | | 1848 (839) | WS61 | — | B60M28F1216 |
| 150 | | FR944 | | 1766 (802) | WS61 | — | B60M28F4916 |
| 225 | | FR924 | | 2023 (919) | WS40 | — | B60M28F2216 |
| 300 | | FR924 | | 3039 (1380) | WS40 | — | B60M28F3316 |
| 500 | | Contact local Eaton representative | | | | | B60M28F5516 |
| 15 | 80 | FR940 | 283E | 420 (191) | WS58 | WMB05 | B60M28B1516 |
| 30 | | FR940 | | 457 (207) | WS58 | WMB05 | B60M28B3016 |
| 45 | | FR943 | | 973 (442) | WS60 | WMB04 | B60M28B4516 |
| 75 | | FR943 | | 1153 (523) | WS60 | WMB04 | B60M28B7516 |
| 112.5 | | FR944 | | 1939 (880) | WS61 | — | B60M28B1216 |
| 150 | | FR945 | | 2537 (1152) | WS62 | — | B60M28B4916 |
| 225 | | FR924 | | 2957 (1342) | WS40 | — | B60M28B2216 |
| 300 | | Contact local Eaton representative | | | | | B60M28B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

K-9 600 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|------------------------------------|------------------------------------|----------------|------------------|----------------|--------------------|--------------------|-------|
| 15 | 150 | FR940 | 283E | 426 (194) | WS58 | WMB05 | B60M47T1516 | |
| 30 | | FR940 | | 437 (198) | WS58 | WMB05 | B60M47T3016 | |
| 45 | | FR942 | | 624 (283) | WS59 | WMB04 | B60M47T4516 | |
| 75 | | FR943 | | 1063 (482) | WS60 | WMB04 | B60M47T7516 | |
| 112.5 | | FR943 | | 1362 (618) | WS60 | WMB04 | B60M47T1216 | |
| 150 | | FR944 | | 1496 (679) | WS61 | — | B60M47T4916 | |
| 225 | | FR945 | | 2458 (1116) | WS62 | — | B60M47T2216 | |
| 300 | | FR924 | | 2014 (914) | WS40 | — | B60M47T3316 | |
| 500 | | Contact local Eaton representative | | | | | B60M47T5516 | |
| 15 | | 115 | | FR940 | 283E | 433 (196) | WS58 | WMB05 |
| 30 | FR940 | | 459 (208) | WS58 | | WMB05 | B60M47F3016 | |
| 45 | FR942 | | 650 (295) | WS59 | | WMB04 | B60M47F4516 | |
| 75 | FR943 | | 1026 (466) | WS60 | | WMB04 | B60M47F7516 | |
| 112.5 | FR944 | | 1848 (839) | WS61 | | — | B60M47F1216 | |
| 150 | FR944 | | 1766 (802) | WS61 | | — | B60M47F4916 | |
| 225 | FR924 | | 2023 (919) | WS40 | | — | B60M47F2216 | |
| 300 | FR924 | | 3039 (1380) | WS40 | | — | B60M47F3316 | |
| 500 | Contact local Eaton representative | | | | | B60M47F5516 | | |
| 15 | 80 | | FR940 | 283E | | 420 (191) | WS58 | WMB05 |
| 30 | | FR940 | 457 (207) | | WS58 | WMB05 | B60M47B3016 | |
| 45 | | FR943 | 973 (442) | | WS60 | WMB04 | B60M47B4516 | |
| 75 | | FR943 | 1153 (523) | | WS60 | WMB04 | B60M47B7516 | |
| 112.5 | | FR944 | 1939 (880) | | WS61 | — | B60M47B1216 | |
| 150 | | FR945 | 2537 (1152) | | WS62 | — | B60M47B4916 | |
| 225 | | FR924 | 2957 (1342) | | WS40 | — | B60M47B2216 | |
| 300 | | Contact local Eaton representative | | | | | B60M47B3316 | |

Notes

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DOE 2016 Energy-Efficient K-Factor Rated Transformers

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

K-9 480 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|---------------|
| 15 | 150 | FR940 | 283B | 430 (195) | WS58 | WMB05 | B48M28T1516CU | |
| 30 | | FR940 | | 505 (229) | WS58 | WMB05 | B48M28T3016CU | |
| 45 | | FR942 | | 699 (317) | WS59 | WMB04 | B48M28T4516CU | |
| 75 | | FR943 | | 1103 (501) | WS60 | WMB04 | B48M28T7516CU | |
| 112.5 | | FR943 | | 1424 (646) | WS60 | WMB04 | B48M28T1216CU | |
| 150 | | FR944 | | 2132 (968) | WS61 | — | B48M28T4916CU | |
| 225 | | FR945 | | 2628 (1193) | WS62 | — | B48M28T2216CU | |
| 300 | | FR924 | | 3400 (1544) | WS40 | — | B48M28T3316CU | |
| 500 | | Contact local Eaton representative | | | | | | B48M28T5516CU |
| 15 | 115 | FR940 | 283B | 398 (181) | WS58 | WMB05 | B48M28F1516CU | |
| 30 | | FR940 | | 478 (217) | WS58 | WMB05 | B48M28F3016CU | |
| 45 | | FR942 | | 658 (299) | WS59 | WMB04 | B48M28F4516CU | |
| 75 | | FR943 | | 1115 (506) | WS60 | WMB04 | B48M28F7516CU | |
| 112.5 | | FR944 | | 2150 (976) | WS61 | — | B48M28F1216CU | |
| 150 | | FR944 | | 2013 (914) | WS61 | — | B48M28F4916CU | |
| 225 | | FR945 | | 3043 (1382) | WS62 | — | B48M28F2216CU | |
| 300 | | Contact local Eaton representative | | | | | | B48M28F3316CU |
| 500 | | | | | | | | B48M28F5516CU |
| 15 | 80 | FR940 | 283B | 434 (197) | WS58 | WMB05 | B48M28B1516CU | |
| 30 | | FR940 | | 507 (230) | WS58 | WMB05 | B48M28B3016CU | |
| 45 | | FR942 | | 703 (319) | WS59 | WMB04 | B48M28B4516CU | |
| 75 | | FR943 | | 1112 (505) | WS60 | WMB04 | B48M28B7516CU | |
| 112.5 | | FR944 | | 1927 (875) | WS61 | — | B48M28B1216CU | |
| 150 | | FR945 | | 2013 (914) | WS61 | — | B48M28B4916CU | |
| 225 | | FR945 | | 3345 (1519) | WS62 | — | B48M28B2216CU | |
| 300 | | Contact local Eaton representative | | | | | | B48M28B3316CU |

Notes

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

2

K-9 480 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR940 | 283B | 452 (205) | WS58 | WMB05 | B48M47T1516CU |
| 30 | | FR940 | | 504 (229) | WS58 | WMB05 | B48M47T3016CU |
| 45 | | FR942 | | 691 (314) | WS59 | WMB04 | B48M47T4516CU |
| 75 | | FR943 | | 1171 (532) | WS60 | WMB04 | B48M47T7516CU |
| 112.5 | | FR943 | | 1495 (679) | WS60 | WMB04 | B48M47T1216CU |
| 150 | | FR944 | | 2239 (1016) | WS61 | — | B48M47T4916CU |
| 225 | | FR945 | | 2759 (1253) | WS62 | — | B48M47T2216CU |
| 300 | | FR924 | | 3400 (1544) | WS40 | — | B48M47T3316CU |
| 500 | | Contact local Eaton representative | | | | | B48M47T5516CU |
| 15 | 115 | FR940 | 283B | 418 (190) | WS58 | WMB05 | B48M47F1516CU |
| 30 | | FR940 | | 502 (228) | WS58 | WMB05 | B48M47F3016CU |
| 45 | | FR942 | | 691 (314) | WS59 | WMB04 | B48M47F4516CU |
| 75 | | FR943 | | 1171 (532) | WS60 | WMB04 | B48M47F7516CU |
| 112.5 | | FR944 | | 2258 (1025) | WS61 | — | B48M47F1216CU |
| 150 | | FR944 | | 2114 (960) | WS61 | — | B48M47F4916CU |
| 225 | | FR945 | | 3195 (1451) | WS62 | — | B48M47F2216CU |
| 300 | | Contact local Eaton representative | | | | | B48M28F3316CU |
| 500 | | | | | | | B48M28F5516CU |
| 15 | 80 | FR940 | 283B | 456 (207) | WS58 | WMB05 | B48M47B1516CU |
| 30 | | FR940 | | 532 (242) | WS58 | WMB05 | B48M47B3016CU |
| 45 | | FR942 | | 738 (335) | WS59 | WMB04 | B48M47B4516CU |
| 75 | | FR943 | | 1168 (530) | WS60 | WMB04 | B48M47B7516CU |
| 112.5 | | FR944 | | 2023 (919) | WS61 | — | B48M47B1216CU |
| 150 | | FR945 | | 3195 (1451) | WS61 | — | B48M47B4916CU |
| 225 | | FR945 | | 3512 (1595) | WS62 | — | B48M47B2216CU |
| 300 | | Contact local Eaton representative | | | | | B48M28B3316CU |

Notes

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DOE 2016 Energy-Efficient K-Factor Rated Transformers

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

K-9 600 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|---------------|
| 15 | 150 | FR940 | 283E | 452 (205) | WS58 | WMB05 | B60M28T1516CU | |
| 30 | | FR940 | | 504 (229) | WS58 | WMB05 | B60M28T3016CU | |
| 45 | | FR942 | | 691 (314) | WS59 | WMB04 | B60M28T4516CU | |
| 75 | | FR943 | | 1171 (532) | WS60 | WMB04 | B60M28T7516CU | |
| 112.5 | | FR943 | | 1495 (679) | WS60 | WMB04 | B60M28T1216CU | |
| 150 | | FR944 | | 2239 (1016) | WS61 | — | B60M28T4916CU | |
| 225 | | FR945 | | 2759 (1253) | WS62 | — | B60M28T2216CU | |
| 300 | | FR924 | | 3400 (1544) | WS40 | — | B60M28T3316CU | |
| 500 | | Contact local Eaton representative | | | | | | B60M28T5516CU |
| 15 | 115 | FR940 | 283E | 418 (190) | WS58 | WMB05 | B60M28F1516CU | |
| 30 | | FR940 | | 502 (228) | WS58 | WMB05 | B60M28F3016CU | |
| 45 | | FR942 | | 691 (314) | WS59 | WMB04 | B60M28F4516CU | |
| 75 | | FR943 | | 1171 (532) | WS60 | WMB04 | B60M28F7516CU | |
| 112.5 | | FR944 | | 2258 (1025) | WS61 | — | B60M28F1216CU | |
| 150 | | FR944 | | 2114 (960) | WS61 | — | B60M28F4916CU | |
| 225 | | FR945 | | 3195 (1451) | WS62 | — | B60M28F2216CU | |
| 300 | | Contact local Eaton representative | | | | | | B60M28F3316CU |
| 500 | | | | | | | | B60M28F5516CU |
| 15 | 80 | FR940 | 283E | 456 (207) | WS58 | WMB05 | B60M28B1516CU | |
| 30 | | FR940 | | 532 (242) | WS58 | WMB05 | B60M28B3016CU | |
| 45 | | FR942 | | 738 (335) | WS59 | WMB04 | B60M28B4516CU | |
| 75 | | FR943 | | 1168 (530) | WS60 | WMB04 | B60M28B7516CU | |
| 112.5 | | FR944 | | 2023 (919) | WS61 | — | B60M28B1216CU | |
| 150 | | FR945 | | 3195 (1451) | WS61 | — | B60M28B4916CU | |
| 225 | | FR945 | | 3512 (1595) | WS62 | — | B60M28B2216CU | |
| 300 | | Contact local Eaton representative | | | | | | B60M28B3316CU |

Notes

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

2

K-9 600 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR940 | 283E | 452 (205) | WS58 | WMB05 | B60M47T1516CU |
| 30 | | FR940 | | 504 (229) | WS58 | WMB05 | B60M47T3016CU |
| 45 | | FR942 | | 691 (314) | WS59 | WMB04 | B60M47T4516CU |
| 75 | | FR943 | | 1171 (532) | WS60 | WMB04 | B60M47T7516CU |
| 112.5 | | FR943 | | 1495 (679) | WS60 | WMB04 | B60M47T1216CU |
| 150 | | FR944 | | 2239 (1016) | WS61 | — | B60M47T4916CU |
| 225 | | FR945 | | 2759 (1253) | WS62 | — | B60M47T2216CU |
| 300 | | FR924 | | 3400 (1544) | WS40 | — | B60M47T3316CU |
| 500 | | Contact local Eaton representative | | | | | B60M47T5516CU |
| 15 | 115 | FR940 | 283E | 418 (190) | WS58 | WMB05 | B60M47F1516CU |
| 30 | | FR940 | | 502 (228) | WS58 | WMB05 | B60M47F3016CU |
| 45 | | FR942 | | 691 (314) | WS59 | WMB04 | B60M47F4516CU |
| 75 | | FR943 | | 1171 (532) | WS60 | WMB04 | B60M47F7516CU |
| 112.5 | | FR944 | | 2258 (1025) | WS61 | — | B60M47F1216CU |
| 150 | | FR944 | | 2114 (960) | WS61 | — | B60M47F4916CU |
| 225 | | FR945 | | 3195 (1451) | WS62 | — | B60M47F2216CU |
| 300 | | Contact local Eaton representative | | | | | B60M47F3316CU |
| 500 | | | | | | | B60M47F5516CU |
| 15 | 80 | FR940 | 283E | 456 (207) | WS58 | WMB05 | B60M47B1516CU |
| 30 | | FR940 | | 532 (242) | WS58 | WMB05 | B60M47B3016CU |
| 45 | | FR942 | | 738 (335) | WS59 | WMB04 | B60M47B4516CU |
| 75 | | FR943 | | 1168 (530) | WS60 | WMB04 | B60M47B7516CU |
| 112.5 | | FR944 | | 2023 (919) | WS61 | — | B60M47B1216CU |
| 150 | | FR945 | | 3195 (1451) | WS61 | — | B60M47B4916CU |
| 225 | | FR945 | | 3512 (1595) | WS62 | — | B60M47B2216CU |
| 300 | | Contact local Eaton representative | | | | | B60M47B5516CU |

Notes

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DOE 2016 Energy-Efficient K-Factor Rated Transformers

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

K-13 480 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|-------------|
| 15 | 150 | FR940 | 283B | 406 (184) | WS58 | WMB05 | N48M28T1516 | |
| 30 | | FR940 | | 416 (189) | WS58 | WMB05 | N48M28T3016 | |
| 45 | | FR942 | | 594 (270) | WS59 | WMB04 | N48M28T4516 | |
| 75 | | FR943 | | 1012 (459) | WS60 | WMB04 | N48M28T7516 | |
| 112.5 | | FR943 | | 1297 (589) | WS60 | WMB04 | N48M28T1216 | |
| 150 | | FR944 | | 1425 (647) | WS61 | — | N48M28T4916 | |
| 225 | | FR945 | | 2341 (1063) | WS62 | — | N48M28T2216 | |
| 300 | | Contact local Eaton representative | | | | | | N48M28T3316 |
| 500 | | | | | | | | N48M28T5516 |
| 15 | 115 | FR940 | 283B | 412 (187) | WS58 | WMB05 | N48M28F1516 | |
| 30 | | FR940 | | 437 (198) | WS58 | WMB05 | N48M28F3016 | |
| 45 | | FR942 | | 619 (281) | WS59 | WMB04 | N48M28F4516 | |
| 75 | | FR943 | | 977 (444) | WS60 | WMB04 | N48M28F7516 | |
| 112.5 | | FR944 | | 1760 (799) | WS61 | — | N48M28F1216 | |
| 150 | | FR944 | | 1682 (764) | WS61 | — | N48M28F4916 | |
| 225 | | FR924 | | 1927 (875) | WS40 | — | N48M28F2216 | |
| 300 | | Contact local Eaton representative | | | | | | N48M28F3316 |
| 500 | | | | | | | | N48M28F5516 |
| 15 | 80 | FR940 | 283B | 420 (191) | WS58 | WMB05 | N48M28B1516 | |
| 30 | | FR940 | | 438 (199) | WS58 | WMB05 | N48M28B3016 | |
| 45 | | FR943 | | 927 (421) | WS60 | WMB04 | N48M28B4516 | |
| 75 | | FR943 | | 1098 (498) | WS60 | WMB04 | N48M28B7516 | |
| 112.5 | | FR944 | | 1939 (880) | WS61 | — | N48M28B1216 | |
| 150 | | FR945 | | 2400 (1090) | WS62 | — | N48M28B4916 | |
| 225 | | Contact local Eaton representative | | | | | | N48M28B2216 |
| 300 | | | | | | | | N48M28B3316 |

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

K-13 480 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|-------------|
| 15 | 150 | FR940 | 283B | 426 (194) | WS58 | WMB05 | N48M47T1516 | |
| 30 | | FR940 | | 437 (198) | WS58 | WMB05 | N48M47T3016 | |
| 45 | | FR942 | | 624 (283) | WS59 | WMB04 | N48M47T4516 | |
| 75 | | FR943 | | 1063 (482) | WS60 | WMB04 | N48M47T7516 | |
| 112.5 | | FR943 | | 1362 (618) | WS60 | WMB04 | N48M47T1216 | |
| 150 | | FR944 | | 1496 (679) | WS61 | — | N48M47T4916 | |
| 225 | | FR945 | | 2458 (1116) | WS62 | — | N48M47T2216 | |
| 300 | | Contact local Eaton representative | | | | | | N48M47T3316 |
| 500 | | | | | | | | N48M47T5516 |
| 15 | 115 | FR940 | 283B | 433 (196) | WS58 | WMB05 | N48M47F1516 | |
| 30 | | FR940 | | 459 (208) | WS58 | WMB05 | N48M47F3016 | |
| 45 | | FR942 | | 650 (295) | WS59 | WMB04 | N48M47F4516 | |
| 75 | | FR943 | | 1026 (466) | WS60 | WMB04 | N48M47F7516 | |
| 112.5 | | FR944 | | 1848 (839) | WS61 | — | N48M47F1216 | |
| 150 | | FR944 | | 1766 (802) | WS61 | — | N48M47F4916 | |
| 225 | | FR924 | | 2023 (919) | WS40 | — | N48M47F2216 | |
| 300 | | Contact local Eaton representative | | | | | | N48M47F3316 |
| 500 | | | | | | | | N48M47F5516 |
| 15 | 80 | FR940 | 283B | 420 (191) | WS58 | WMB05 | N48M47B1516 | |
| 30 | | FR940 | | 457 (207) | WS58 | WMB05 | N48M47B3016 | |
| 45 | | FR943 | | 973 (442) | WS60 | WMB04 | N48M47B4516 | |
| 75 | | FR943 | | 1153 (523) | WS60 | WMB04 | N48M47B7516 | |
| 112.5 | | FR944 | | 1939 (880) | WS61 | — | N48M47B1216 | |
| 150 | | FR945 | | 2537 (1152) | WS62 | — | N48M47B4916 | |
| 225 | | Contact local Eaton representative | | | | | | N48M47B2216 |
| 300 | | | | | | | | N48M47B3316 |

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DOE 2016 Energy-Efficient K-Factor Rated Transformers

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings**K-13 600 Delta Volts to 208Y/120 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|--------------------|--------------------|
| 15 | 150 | FR940 | 283E | 426 (194) | WS58 | WMB05 | N60M28T1516 | |
| 30 | | FR940 | | 437 (198) | WS58 | WMB05 | N60M28T3016 | |
| 45 | | FR942 | | 624 (283) | WS59 | WMB04 | N60M28T4516 | |
| 75 | | FR943 | | 1063 (482) | WS60 | WMB04 | N60M28T7516 | |
| 112.5 | | FR943 | | 1362 (618) | WS60 | WMB04 | N60M28T1216 | |
| 150 | | FR944 | | 1496 (679) | WS61 | — | N60M28T4916 | |
| 225 | | FR945 | | 2458 (1116) | WS62 | — | N60M28T2216 | |
| 300 | | Contact local Eaton representative | | | | | | N60M28T3316 |
| 500 | | | | | | | | N60M28T5516 |
| 15 | 115 | FR940 | 283E | 433 (196) | WS58 | WMB05 | N60M28F1516 | |
| 30 | | FR940 | | 459 (208) | WS58 | WMB05 | N60M28F3016 | |
| 45 | | FR942 | | 650 (295) | WS59 | WMB04 | N60M28F4516 | |
| 75 | | FR943 | | 1026 (466) | WS60 | WMB04 | N60M28F7516 | |
| 112.5 | | FR944 | | 1848 (839) | WS61 | — | N60M28F1216 | |
| 150 | | FR944 | | 1766 (802) | WS61 | — | N60M28F4916 | |
| 225 | | FR924 | | 2023 (919) | WS40 | — | N60M28F2216 | |
| 300 | | Contact local Eaton representative | | | | | | N60M28F3316 |
| 500 | | | | | | | | N60M28F5516 |
| 15 | 80 | FR940 | 283E | 420 (191) | WS58 | WMB05 | N60M28B1516 | |
| 30 | | FR940 | | 457 (207) | WS58 | WMB05 | N60M28B3016 | |
| 45 | | FR943 | | 973 (442) | WS60 | WMB04 | N60M28B4516 | |
| 75 | | FR943 | | 1153 (523) | WS60 | WMB04 | N60M28B7516 | |
| 112.5 | | FR944 | | 1939 (880) | WS61 | — | N60M28B1216 | |
| 150 | | FR945 | | 2537 (1152) | WS62 | — | N60M28B4916 | |
| 225 | | Contact local Eaton representative | | | | | | N60M28B2216 |
| 300 | | | | | | | | N60M28B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

2

K-13 600 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|-------------|
| 15 | 150 | FR940 | 283E | 426 (194) | WS58 | WMB05 | N60M47T1516 | |
| 30 | | FR940 | | 437 (198) | WS58 | WMB05 | N60M47T3016 | |
| 45 | | FR942 | | 624 (283) | WS59 | WMB04 | N60M47T4516 | |
| 75 | | FR943 | | 1063 (482) | WS60 | WMB04 | N60M47T7516 | |
| 112.5 | | FR943 | | 1362 (618) | WS60 | WMB04 | N60M47T1216 | |
| 150 | | FR944 | | 1496 (679) | WS61 | — | N60M47T4916 | |
| 225 | | FR945 | | 2458 (1116) | WS62 | — | N60M47T2216 | |
| 300 | | Contact local Eaton representative | | | | | | N60M47T3316 |
| 500 | | | | | | | | N60M47T5516 |
| 15 | 115 | FR940 | 283E | 433 (196) | WS58 | WMB05 | N60M47F1516 | |
| 30 | | FR940 | | 459 (208) | WS58 | WMB05 | N60M47F3016 | |
| 45 | | FR942 | | 650 (295) | WS59 | WMB04 | N60M47F4516 | |
| 75 | | FR943 | | 1026 (466) | WS60 | WMB04 | N60M47F7516 | |
| 112.5 | | FR944 | | 1848 (839) | WS61 | — | N60M47F1216 | |
| 150 | | FR944 | | 1766 (802) | WS61 | — | N60M47F4916 | |
| 225 | | Contact local Eaton representative | | | | | | N60M47F2216 |
| 300 | | | | | | | | N60M47F3316 |
| 500 | | | | | | | | N60M47F5516 |
| 15 | 80 | FR940 | 283E | 420 (191) | WS58 | WMB05 | N60M47B1516 | |
| 30 | | FR940 | | 457 (207) | WS58 | WMB05 | N60M47B3016 | |
| 45 | | FR943 | | 973 (442) | WS60 | WMB04 | N60M47B4516 | |
| 75 | | FR943 | | 1153 (523) | WS60 | WMB04 | N60M47B7516 | |
| 112.5 | | FR944 | | 1939 (880) | WS61 | — | N60M47B1216 | |
| 150 | | FR945 | | 2537 (1152) | WS62 | — | N60M47B4916 | |
| 225 | | Contact local Eaton representative | | | | | | N60M47B2216 |
| 300 | | | | | | | | N60M47B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

DOE 2016 Energy-Efficient K-Factor Rated Transformers

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

K-13 480 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|---------------|
| 15 | 150 | FR940 | 283B | 430 (195) | WS58 | WMB05 | N48M28T1516CU | |
| 30 | | FR940 | | 480 (218) | WS58 | WMB05 | N48M28T3016CU | |
| 45 | | FR942 | | 658 (299) | WS59 | WMB04 | N48M28T4516CU | |
| 75 | | FR943 | | 1115 (506) | WS60 | WMB04 | N48M28T7516CU | |
| 112.5 | | FR943 | | 1424 (646) | WS60 | WMB04 | N48M28T1216CU | |
| 150 | | FR944 | | 2132 (968) | WS61 | — | N48M28T4916CU | |
| 225 | | FR945 | | 2628 (1193) | WS62 | — | N48M28T2216CU | |
| 300 | | Contact local Eaton representative | | | | | | N48M28T3316CU |
| 500 | | | | | | | | N48M28T5516CU |
| 15 | 115 | FR940 | 283B | 398 (181) | WS58 | WMB05 | N48M28F1516CU | |
| 30 | | FR940 | | 478 (217) | WS58 | WMB05 | N48M28F3016CU | |
| 45 | | FR942 | | 658 (299) | WS59 | WMB04 | N48M28F4516CU | |
| 75 | | FR943 | | 1115 (506) | WS60 | WMB04 | N48M28F7516CU | |
| 112.5 | | FR944 | | 2150 (976) | WS61 | — | N48M28F1216CU | |
| 150 | | FR944 | | 2013 (914) | WS61 | — | N48M28F4916CU | |
| 225 | | FR945 | | 3043 (1382) | WS62 | — | N48M28F2216CU | |
| 300 | | Contact local Eaton representative | | | | | | N48M28F3316CU |
| 500 | | | | | | | | N48M28F5516CU |
| 15 | 80 | FR940 | 283B | 434 (197) | WS58 | WMB05 | N48M28B1516CU | |
| 30 | | FR940 | | 507 (230) | WS58 | WMB05 | N48M28B3016CU | |
| 45 | | FR942 | | 703 (319) | WS59 | WMB04 | N48M28B4516CU | |
| 75 | | FR943 | | 1112 (505) | WS60 | WMB04 | N48M28B7516CU | |
| 112.5 | | FR944 | | 1927 (875) | WS61 | — | N48M28B1216CU | |
| 150 | | FR945 | | 3043 (1382) | | — | N48M28B4916CU | |
| 225 | | Contact local Eaton representative | | | | | | N48M28B2216CU |
| 300 | | | | | | | | N48M28B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

K-13 480 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|--|
| 15 | 150 | FR940 | 283B | 452 (205) | WS58 | WMB05 | N48M47T1516CU | |
| 30 | | FR940 | | 504 (229) | WS58 | WMB05 | N48M47T3016CU | |
| 45 | | FR942 | | 691 (314) | WS59 | WMB04 | N48M47T4516CU | |
| 75 | | FR943 | | 1171 (532) | WS60 | WMB04 | N48M47T7516CU | |
| 112.5 | | FR943 | | 1495 (679) | WS60 | WMB04 | N48M47T1216CU | |
| 150 | | FR944 | | 2239 (1016) | WS61 | — | N48M47T4916CU | |
| 225 | | FR945 | | 2759 (1253) | WS62 | — | N48M47T2216CU | |
| 300 | | Contact local Eaton representative | | | | | N48M47T3316CU | |
| 500 | | | | | | N48M47T5516CU | | |
| 15 | 115 | FR940 | 283B | 418 (190) | WS58 | WMB05 | N48M47F1516CU | |
| 30 | | FR940 | | 502 (228) | WS58 | WMB05 | N48M47F3016CU | |
| 45 | | FR942 | | 691 (314) | WS59 | WMB04 | N48M47F4516CU | |
| 75 | | FR943 | | 1171 (532) | WS60 | WMB04 | N48M47F7516CU | |
| 112.5 | | FR944 | | 2258 (1025) | WS61 | — | N48M47F1216CU | |
| 150 | | FR944 | | 2114 (960) | WS61 | — | N48M47F4916CU | |
| 225 | | Contact local Eaton representative | | | | | N48M47F2216CU | |
| 300 | | | | | | | N48M47F3316CU | |
| 500 | | | | | | N48M47F5516CU | | |
| 15 | 80 | FR940 | 283B | 456 (207) | WS58 | WMB05 | N48M47B1516CU | |
| 30 | | FR940 | | 532 (242) | WS58 | WMB05 | N48M47B3016CU | |
| 45 | | FR942 | | 738 (335) | WS59 | WMB04 | N48M47B4516CU | |
| 75 | | FR943 | | 1168 (530) | WS60 | WMB04 | N48M47B7516CU | |
| 112.5 | | FR944 | | 2023 (919) | WS61 | — | N48M47B1216CU | |
| 150 | | FR945 | | 3195 (1451) | WS61 | — | N48M47B4916CU | |
| 225 | | Contact local Eaton representative | | | | | N48M47B2216CU | |
| 300 | | | | | | | N48M47B3316CU | |

Notes

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DOE 2016 Energy-Efficient K-Factor Rated Transformers

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

K-13 600 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|---------------|
| 15 | 150 | FR940 | 283E | 452 (205) | WS58 | WMB05 | N60M28T1516CU | |
| 30 | | FR940 | | 504 (229) | WS58 | WMB05 | N60M28T3016CU | |
| 45 | | FR942 | | 691 (314) | WS59 | WMB04 | N60M28T4516CU | |
| 75 | | FR943 | | 1171 (532) | WS60 | WMB04 | N60M28T7516CU | |
| 112.5 | | FR943 | | 1495 (679) | WS60 | WMB04 | N60M28T1216CU | |
| 150 | | FR945 | | 2239 (1016) | WS61 | — | N60M28T4916CU | |
| 225 | | FR945 | | 2759 (1253) | WS62 | — | N60M28T2216CU | |
| 300 | | FR924 | | 3400 (1544) | WS40 | — | N60M28T3316CU | |
| 500 | | Contact local Eaton representative | | | | | | N60M28T5516CU |
| 15 | 115 | FR940 | 283E | 418 (190) | WS58 | WMB05 | N60M28F1516CU | |
| 30 | | FR940 | | 502 (228) | WS58 | WMB05 | N60M28F3016CU | |
| 45 | | FR942 | | 691 (314) | WS59 | WMB04 | N60M28F4516CU | |
| 75 | | FR943 | | 1171 (532) | WS60 | WMB04 | N60M28F7516CU | |
| 112.5 | | FR944 | | 2258 (1025) | WS61 | — | N60M28F1216CU | |
| 150 | | FR944 | | 2114 (960) | WS61 | — | N60M28F4916CU | |
| 225 | | FR945 | | 3195 (1451) | WS62 | — | N60M28F2216CU | |
| 300 | | Contact local Eaton representative | | | | | | N60M28F3316CU |
| 500 | | | | | | | | N60M28F5516CU |
| 15 | 80 | FR940 | 283E | 456 (207) | WS58 | WMB05 | N60M28B1516CU | |
| 30 | | FR940 | | 532 (242) | WS58 | WMB05 | N60M28B3016CU | |
| 45 | | FR942 | | 738 (335) | WS59 | WMB04 | N60M28B4516CU | |
| 75 | | FR943 | | 1168 (530) | WS60 | WMB04 | N60M28B7516CU | |
| 112.5 | | FR944 | | 2023 (919) | WS61 | — | N60M28B1216CU | |
| 150 | | FR945 | | 3195 (1451) | WS61 | — | N60M28B4916CU | |
| 225 | | FR945 | | 3512 (1595) | WS62 | — | N60M28B2216CU | |
| 300 | | Contact local Eaton representative | | | | | | N60M28B3316CU |

Notes

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

2

K-13 600 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|---------------|
| 15 | 150 | FR940 | 283E | 452 (205) | WS58 | WMB05 | N60M47T1516CU | |
| 30 | | FR940 | | 504 (229) | WS58 | WMB05 | N60M47T3016CU | |
| 45 | | FR942 | | 691 (314) | WS59 | WMB04 | N60M47T4516CU | |
| 75 | | FR943 | | 1171 (532) | WS60 | WMB04 | N60M47T7516CU | |
| 112.5 | | FR943 | | 1495 (679) | WS60 | WMB04 | N60M47T1216CU | |
| 150 | | FR945 | | 2239 (1016) | WS61 | — | N60M47T4916CU | |
| 225 | | FR945 | | 2759 (1253) | WS62 | — | N60M47T2216CU | |
| 300 | | Contact local Eaton representative | | | | | | N60M47T3316CU |
| 500 | | | | | | | | N60M47T5516CU |
| 15 | 115 | FR940 | 283E | 418 (190) | WS58 | WMB05 | N60M47F1516CU | |
| 30 | | FR940 | | 502 (228) | WS58 | WMB05 | N60M47F3016CU | |
| 45 | | FR942 | | 691 (314) | WS59 | WMB04 | N60M47F4516CU | |
| 75 | | FR943 | | 1171 (532) | WS60 | WMB04 | N60M47F7516CU | |
| 112.5 | | FR944 | | 2258 (1025) | WS61 | — | N60M47F1216CU | |
| 150 | | FR944 | | 2114 (960) | WS61 | — | N60M47F4916CU | |
| 225 | | FR945 | | 3195 (1451) | WS62 | — | N60M47F2216CU | |
| 300 | | Contact local Eaton representative | | | | | | N60M47F3316CU |
| 500 | | | | | | | | N60M47F5516CU |
| 15 | 80 | FR940 | 283E | 456 (207) | WS58 | WMB05 | N60M47B1516CU | |
| 30 | | FR940 | | 532 (242) | WS58 | WMB05 | N60M47B3016CU | |
| 45 | | FR942 | | 738 (335) | WS59 | WMB04 | N60M47B4516CU | |
| 75 | | FR943 | | 1168 (530) | WS60 | WMB04 | N60M47B7516CU | |
| 112.5 | | FR944 | | 2023 (919) | WS61 | — | N60M47B1216CU | |
| 150 | | FR945 | | 3195 (1451) | WS61 | — | N60M47B4916CU | |
| 225 | | FR945 | | 3512 (1595) | WS62 | — | N60M47B2216CU | |
| 300 | | Contact local Eaton representative | | | | | | N60M47B3316CU |

Notes

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings**K-20 480 Delta Volts to 208Y/120 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | Contact local Eaton representative | | | | | G48M28T1516 |
| 30 | | | | | | | G48M28T3016 |
| 45 | | | | | | | G48M28T4516 |
| 75 | | | | | | | G48M28T7516 |
| 112.5 | | | | | | | G48M28T1216 |
| 150 | | | | | | | G48M28T4916 |
| 225 | | | | | | | G48M28T2216 |
| 300 | | | | | | | G48M28T3316 |
| 500 | | | | | | | G48M28T5516 |
| 15 | | | | | | | 115 |
| 30 | G48M28F3016 | | | | | | |
| 45 | G48M28F4516 | | | | | | |
| 75 | G48M28F7516 | | | | | | |
| 112.5 | G48M28F1216 | | | | | | |
| 150 | G48M28F4916 | | | | | | |
| 225 | G48M28F2216 | | | | | | |
| 300 | G48M28F3316 | | | | | | |
| 500 | G48M28F5516 | | | | | | |
| 15 | 80 | Contact local Eaton representative | | | | | |
| 30 | | | | | | | G48M28B3016 |
| 45 | | | | | | | G48M28B4516 |
| 75 | | | | | | | G48M28B7516 |
| 112.5 | | | | | | | G48M28B1216 |
| 150 | | | | | | | G48M28B4916 |
| 225 | | | | | | | G48M28B2216 |
| 300 | | | | | | | G48M28B3316 |

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

K-20 480 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | Contact local Eaton representative | | | | | G48M47T1516 |
| 30 | | | | | | | G48M47T3016 |
| 45 | | | | | | | G48M47T4516 |
| 75 | | | | | | | G48M47T7516 |
| 112.5 | | | | | | | G48M47T1216 |
| 150 | | | | | | | G48M47T4916 |
| 225 | | | | | | | G48M47T2216 |
| 300 | | | | | | | G48M47T3316 |
| 500 | | | | | | | G48M47T5516 |
| 15 | 115 | Contact local Eaton representative | | | | | G48M47F1516 |
| 30 | | | | | | | G48M47F3016 |
| 45 | | | | | | | G48M47F4516 |
| 75 | | | | | | | G48M47F7516 |
| 112.5 | | | | | | | G48M47F1216 |
| 150 | | | | | | | G48M47F4916 |
| 225 | | | | | | | G48M47F2216 |
| 300 | | | | | | | G48M47F3316 |
| 500 | | | | | | | G48M47F5516 |
| 15 | 80 | Contact local Eaton representative | | | | | G48M47B1516 |
| 30 | | | | | | | G48M47B3016 |
| 45 | | | | | | | G48M47B4516 |
| 75 | | | | | | | G48M47B7516 |
| 112.5 | | | | | | | G48M47B1216 |
| 150 | | | | | | | G48M47B4916 |
| 225 | | | | | | | G48M47B2216 |
| 300 | | | | | | | G48M47B3316 |

Notes

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings**K-20 600 Delta Volts to 208Y/120 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | Contact local Eaton representative | | | | | G60M28T1516 |
| 30 | | | | | | | G60M28T3016 |
| 45 | | | | | | | G60M28T4516 |
| 75 | | | | | | | G60M28T7516 |
| 112.5 | | | | | | | G60M28T1216 |
| 150 | | | | | | | G60M28T4916 |
| 225 | | | | | | | G60M28T2216 |
| 300 | | | | | | | G60M28T3316 |
| 500 | | | | | | | G60M28T5516 |
| 15 | | | | | | | 115 |
| 30 | G60M28F3016 | | | | | | |
| 45 | G60M28F4516 | | | | | | |
| 75 | G60M28F7516 | | | | | | |
| 112.5 | G60M28F1216 | | | | | | |
| 150 | G60M28F4916 | | | | | | |
| 225 | G60M28F2216 | | | | | | |
| 300 | G60M28F3316 | | | | | | |
| 500 | G60M28F5516 | | | | | | |
| 15 | 80 | Contact local Eaton representative | | | | | |
| 30 | | | | | | | G60M28B3016 |
| 45 | | | | | | | G60M28B4516 |
| 75 | | | | | | | G60M28B7516 |
| 112.5 | | | | | | | G60M28B1216 |
| 150 | | | | | | | G60M28B4916 |
| 225 | | | | | | | G60M28B2216 |
| 300 | | | | | | | G60M28B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

2

K-20 600 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | Contact local Eaton representative | | | | | G60M47T1516 |
| 30 | | | | | | | G60M47T3016 |
| 45 | | | | | | | G60M47T4516 |
| 75 | | | | | | | G60M47T7516 |
| 112.5 | | | | | | | G60M47T1216 |
| 150 | | | | | | | G60M47T4916 |
| 225 | | | | | | | G60M47T2216 |
| 300 | | | | | | | G60M47T3316 |
| 500 | | | | | | | G60M47T5516 |
| 15 | 115 | Contact local Eaton representative | | | | | G60M47F1516 |
| 30 | | | | | | | G60M47F3016 |
| 45 | | | | | | | G60M47F4516 |
| 75 | | | | | | | G60M47F7516 |
| 112.5 | | | | | | | G60M47F1216 |
| 150 | | | | | | | G60M47F4916 |
| 225 | | | | | | | G60M47F2216 |
| 300 | | | | | | | G60M47F3316 |
| 500 | | | | | | | G60M47F5516 |
| 15 | 80 | Contact local Eaton representative | | | | | G60M47B1516 |
| 30 | | | | | | | G60M47B3016 |
| 45 | | | | | | | G60M47B4516 |
| 75 | | | | | | | G60M47B7516 |
| 112.5 | | | | | | | G60M47B1216 |
| 150 | | | | | | | G60M47B4916 |
| 225 | | | | | | | G60M47B2216 |
| 300 | | | | | | | G60M47B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings**K-20 480 Delta Volts to 208Y/120 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | Contact local Eaton representative | | | | | G48M28T1516CU |
| 30 | | | | | | | G48M28T3016CU |
| 45 | | | | | | | G48M28T4516CU |
| 75 | | | | | | | G48M28T7516CU |
| 112.5 | | | | | | | G48M28T1216CU |
| 150 | | | | | | | G48M28T4916CU |
| 225 | | | | | | | G48M28T2216CU |
| 300 | | | | | | | G48M28T3316CU |
| 500 | | | | | | | G48M28T5516CU |
| 15 | | | | | | | 115 |
| 30 | G48M28F3016CU | | | | | | |
| 45 | G48M28F4516CU | | | | | | |
| 75 | G48M28F7516CU | | | | | | |
| 112.5 | G48M28F1216CU | | | | | | |
| 150 | G48M28F4916CU | | | | | | |
| 225 | G48M28F2216CU | | | | | | |
| 300 | G48M28F3316CU | | | | | | |
| 500 | G48M28F5516CU | | | | | | |
| 15 | 80 | Contact local Eaton representative | | | | | |
| 30 | | | | | | | G48M28B3016CU |
| 45 | | | | | | | G48M28B4516CU |
| 75 | | | | | | | G48M28B7516CU |
| 112.5 | | | | | | | G48M28B1216CU |
| 150 | | | | | | | G48M28B4916CU |
| 225 | | | | | | | G48M28B2216CU |
| 300 | | | | | | | G48M28B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

K-20 480 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | Contact local Eaton representative | | | | | G48M47T1516CU |
| 30 | | | | | | | G48M47T3016CU |
| 45 | | | | | | | G48M47T4516CU |
| 75 | | | | | | | G48M47T7516CU |
| 112.5 | | | | | | | G48M47T1216CU |
| 150 | | | | | | | G48M47T4916CU |
| 225 | | | | | | | G48M47T2216CU |
| 300 | | | | | | | G48M47T3316CU |
| 500 | | | | | | | G48M47T5516CU |
| 15 | | | | | | | 115 |
| 30 | G48M47F3016CU | | | | | | |
| 45 | G48M47F4516CU | | | | | | |
| 75 | G48M47F7516CU | | | | | | |
| 112.5 | G48M47F1216CU | | | | | | |
| 150 | G48M47F4916CU | | | | | | |
| 225 | G48M47F2216CU | | | | | | |
| 300 | G48M47F3316CU | | | | | | |
| 500 | G48M47F5516CU | | | | | | |
| 15 | 80 | Contact local Eaton representative | | | | | |
| 30 | | | | | | | G48M47B3016CU |
| 45 | | | | | | | G48M47B4516CU |
| 75 | | | | | | | G48M47B7516CU |
| 112.5 | | | | | | | G48M47B1216CU |
| 150 | | | | | | | G48M47B4916CU |
| 225 | | | | | | | G48M47B2216CU |
| 300 | | | | | | | G48M47B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings**K-20 600 Delta Volts to 208Y/120 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | Contact local Eaton representative | | | | | G60M28T1516CU |
| 30 | | | | | | | G60M28T3016CU |
| 45 | | | | | | | G60M28T4516CU |
| 75 | | | | | | | G60M28T7516CU |
| 112.5 | | | | | | | G60M28T1216CU |
| 150 | | | | | | | G60M28T4916CU |
| 225 | | | | | | | G60M28T2216CU |
| 300 | | | | | | | G60M28T3316CU |
| 500 | | | | | | | G60M28T5516CU |
| 15 | | | | | | | 115 |
| 30 | G60M28F3016CU | | | | | | |
| 45 | G60M28F4516CU | | | | | | |
| 75 | G60M28F7516CU | | | | | | |
| 112.5 | G60M28F1216CU | | | | | | |
| 150 | G60M28F4916CU | | | | | | |
| 225 | G60M28F2216CU | | | | | | |
| 300 | G60M28F3316CU | | | | | | |
| 500 | G60M28F5516CU | | | | | | |
| 15 | 80 | Contact local Eaton representative | | | | | |
| 30 | | | | | | | G60M28B3016CU |
| 45 | | | | | | | G60M28B4516CU |
| 75 | | | | | | | G60M28B7516CU |
| 112.5 | | | | | | | G60M28B1216CU |
| 150 | | | | | | | G60M28B4916CU |
| 225 | | | | | | | G60M28B2216CU |
| 300 | | | | | | | G60M28B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

K-20 600 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | Contact local Eaton representative | | | | | G60M47T1516CU |
| 30 | | | | | | | G60M47T3016CU |
| 45 | | | | | | | G60M47T4516CU |
| 75 | | | | | | | G60M47T7516CU |
| 112.5 | | | | | | | G60M47T1216CU |
| 150 | | | | | | | G60M47T4916CU |
| 225 | | | | | | | G60M47T2216CU |
| 300 | | | | | | | G60M47T3316CU |
| 500 | | | | | | | G60M47T5516CU |
| 15 | | | | | | | 115 |
| 30 | G60M47F3016CU | | | | | | |
| 45 | G60M47F4516CU | | | | | | |
| 75 | G60M47F7516CU | | | | | | |
| 112.5 | G60M47F1216CU | | | | | | |
| 150 | G60M47F4916CU | | | | | | |
| 225 | G60M47F2216CU | | | | | | |
| 300 | G60M47F3316CU | | | | | | |
| 500 | G60M47F5516CU | | | | | | |
| 15 | 80 | Contact local Eaton representative | | | | | |
| 30 | | | | | | | G60M47B3016CU |
| 45 | | | | | | | G60M47B4516CU |
| 75 | | | | | | | G60M47B7516CU |
| 112.5 | | | | | | | G60M47B1216CU |
| 150 | | | | | | | G60M47B4916CU |
| 225 | | | | | | | G60M47B2216CU |
| 300 | | | | | | | G60M47B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Accessories

Please refer to Section 2.7 **Page V2-T2-167**.

Technical Data and Specifications

Frequency

Eaton standard low-voltage dry-type distribution transformers are designed for 60 Hz operation. Transformers required for other frequencies are available and must be specifically designed.

Overload Capability

Short-term overload is designed into transformers as required by ANSI. Low-voltage dry-type distribution transformers will deliver 200% nameplate load for one-half hour, 150% load for one hour, and 125% load for four hours without being damaged, provided that a constant 50% load precedes and follows the overload. See ANSI C57.96-01.250 for additional limitations.

Continuous overload capacity is not deliberately designed into a transformer because the design objective is to be within the allowed winding temperature rise with nameplate loading.

Electrostatic Shielding

There are no industry standards for electrostatic shield performance. Eaton-manufactured transformers have been tested by an independent laboratory to meet the following attenuation levels:

- When tested per MIL-Std-220A, Method of Insertion Loss Measurement, with matched impedance no load technique:
 - Common mode noise attenuation:
 - Minus 80 dBA minimum at 0.1 kHz to 1.5 kHz; minus 55 dBA minimum at 1.51 kHz to 100 kHz
 - Normal mode (Transverse mode) noise attenuation:
 - Minus 35 dBA minimum at 1.5 kHz to 10 kHz

- Primary to Secondary Capacitance of 24.74–18.06 picofarads on the range 100–20 kHz

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Insulation System Classification

| Ambient | + Winding Rise | + Hot Spot | = Temp. Class |
|---------|----------------|------------|---------------|
| 40°C | 55°C | 10°C | 105°C |
| 40°C | 80°C | 30°C | 150°C |
| 25°C | 135°C | 20°C | 180°C |
| 40°C | 115°C | 30°C | 185°C |
| 40°C | 150°C | 30°C | 220°C |

The design life of transformers having different insulation systems is the same—the lower-temperature systems are designed for the same life as the higher-temperature systems.

Enclosures

Eaton ventilated transformers, Type KT, use a NEMA 2 rated (drip-proof) enclosure as standard, and are rated NEMA 3R with the addition of weathershields. Transformers manufactured in enclosures 939, 940, 942, 943, 944 and 945 are UL Listed to be installed indoors (without weathershields) with just 2 inches clearance on the sides and behind the transformer.

Winding Terminations

Primary and secondary windings are terminated in the wiring compartment. Ventilating transformers have leads brought out to aluminum pads that are pre-drilled to accept Cu/Al lugs.

Lugs are not supplied with these transformers. Eaton recommends that external cables be rated 75°C for ventilated designs.

Sound Levels

All Eaton 600 volt class general-purpose low-voltage dry-type distribution transformers are designed to meet NEMA ST-20 sound levels listed here. These are the sound levels measured in a soundproof environment. Actual sound levels measured at an installation will likely be higher due to electrical connections and environmental conditions.

Lower sound levels are available and should be specified when the transformer is going to be installed in an area where sound may be a concern.

For additional information, please refer to Section 2.7 **Page V2-T2-171**.

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilated (up to 1.2 kV) | | Encapsulated (up to 1.2 kV) |
|------------------------------|---------------------------------------|-----------------|-----------------------------|
| | K-Factor 1, 4, 9 | K-Factor 13, 20 | |
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Note

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Harmonic Mitigating Transformer

2



Product Description

Note: The following pages provide listings for most standard transformer ratings and catalog numbers. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

The electrical transformer has been a staple of electrical power systems for the past 100+ years. While the types of electrical loads that are being added to our systems today have radically changed, the transformer has stayed relatively the same in design during this time frame. Eaton’s harmonic mitigating transformer (HMT) represents the evolution of the transformer into something that will best provide clean, energy-efficient electricity to power the loads of today and tomorrow. The recent shift of our electrical loads from predominately AC consumers (resistive heating elements, incandescent lighting, three-phase motor load) to DC consumers (such as computers, fax machines,

printers, down to the “wall-wart” that recharges the cell phone) requires that our electrical infrastructure changes as well. These new loads now introduce other currents and frequencies into our electrical power systems—commonly known as “harmonics.” Harmonic currents can cause additional heating, which may cause transformers, generators and conductors to become overloaded. Excessive heat is one of the major reasons that standard transformers and conductors fail prematurely. These harmonic currents have various other effects (such as “loss of ride-through capability,” reduced lifespan and mysterious misoperation of equipment) on the components and loads of an electrical distribution system. Eaton’s HMTs, when used properly within an electrical system, will help keep the loads operating the way the manufacturer designed them and keep the facility’s electrical system free from voltage distortion.

Contents

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| DOE 2016 Energy-Efficient Harmonic Mitigating Transformers | |
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| Standards and Certifications | V2-T2-65 |
| Catalog Number Selection | V2-T2-66 |
| Product Selection | V2-T2-67 |
| Accessories | V2-T2-75 |
| Technical Data and Specifications | V2-T2-75 |

Three-Phase, Type DT-3 HMT, 60 Hz

- Harmonic mitigating (cancellation) transformers are a cost-effective means of treating harmful harmonics in an electrical distribution system
- Reducing harmonic content in electrical systems can result in a more reliable electrical system, lower maintenance costs, less downtime, fewer equipment malfunctions, and lower cooling system capacity
- Available in a variety of phase-shift configurations that allow flexibility to target specific families of harmonics
- Harmonic treatment via electromagnetic flux cancellation
- May be installed as a stand-alone transformer, or included in IFS™
- Available in three-phase ratings, 15–500 kVA, up to 600 volts primary

Features and Benefits

- 480 volt to 208/120 volt standard. Additional voltage combinations available
- 150°C, 115°C or 80°C temperature rise available
- Aluminum windings and terminals standard; copper available
- 200% rated neutral
- Single electrostatic shield for attenuation of common mode and transverse mode noise
- Approximately 98% efficient when operated in systems with 100% nonlinear load profiles
- 220°C insulation system
- Third-party tested for harmonic performance and energy efficiency
- Meet NEMA ST-20 sound standards
- Eliminate circulating harmonic currents in primary windings of transformers
- Enclosures are NEMA 2 drip-proof. The addition of optional weather-shields makes the enclosure NEMA 3R rainproof
- Harmonic cancellation via electromagnetic flux cancellation. Filters, capacitors or other such devices are not used
- Help meet IEEE 519 harmonic limits

Standards and Certifications

- UL listed



Industry Standards

All Eaton low-voltage dry-type transformers are built and tested in accordance with applicable NEMA, ANSI and IEEE standards. Harmonic mitigating transformers are UL listed.

IEEE 519-1992

Proper use of Eaton's harmonic mitigating transformers within your electrical system will help you to meet the harmonic distortion limits as proposed by IEEE 519-1992, "IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems."

Seismic Qualified

Eaton low-voltage dry-type distribution transformers are seismically qualified and exceed the requirements of the Uniform Building Code (UBC), International Building Code (IBC) and California Code Title 24.

2.3

Transformers

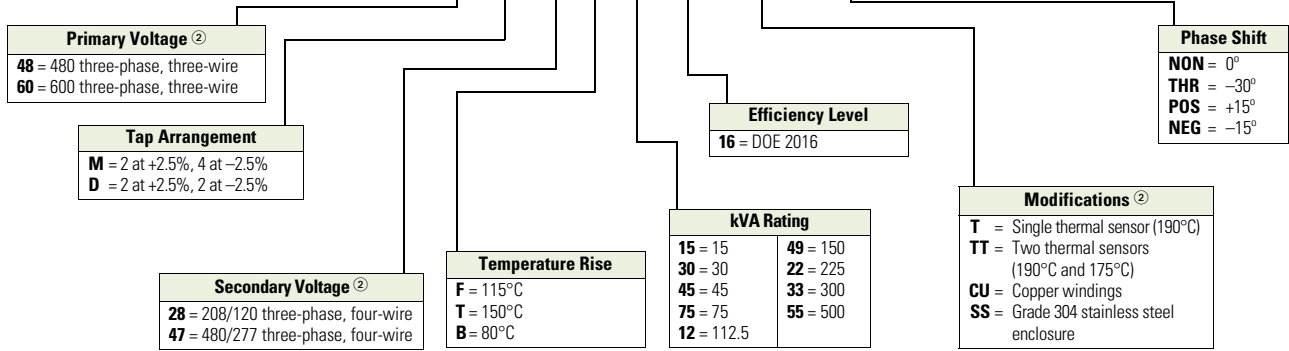
DOE 2016 Energy-Efficient Harmonic Mitigating Transformers

Catalog Number Selection ^①

DOE 2016 Energy-Efficient Harmonic Mitigating Transformers

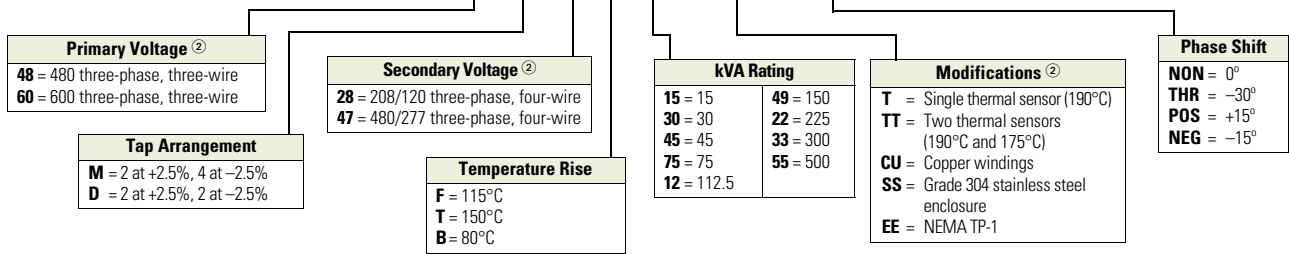
2

X 48 M 28 F 30 16 CUTT NEG



Harmonic Mitigating Transformers

X 48 M 28 F 30 TCUEE NEG



DOE 2016 Efficiency Levels

Dry-Type Distribution Transformers—Low-Voltage (600V and below)

Three-Phase

| kVA | Efficiency |
|-------|------------|
| 15 | 97.89 |
| 30 | 98.23 |
| 45 | 98.40 |
| 75 | 98.60 |
| 112.5 | 98.74 |
| 150 | 98.83 |
| 225 | 98.94 |
| 300 | 99.02 |
| 500 | 99.14 |
| 750 | 99.23 |
| 1000 | 99.28 |

Notes

- ① Do not use to create catalog numbers because all combinations may not be valid.
- ② The most common ratings are shown. Contact Eaton for availability of additional ratings.

Product Selection

Three-Phase—Harmonic Mitigating Transformers 60 Hz DOE 2016 Energy-Efficient—Aluminum Windings

480 Delta Volts to 208/120 Volts—Type NON 0° Phase Shift

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|
| 15 | 150 | Contact local Eaton representative | | | | | X48M28T1516NON |
| 30 | | | | | | | X48M28T3016NON |
| 45 | | | | | | | X48M28T4516NON |
| 75 | | | | | | | X48M28T7516NON |
| 112.5 | | | | | | | X48M28T1216NON |
| 150 | | | | | | | X48M28T4916NON |
| 225 | | | | | | | X48M28T2216NON |
| 300 | | | | | | | X48M28T3316NON |
| 500 | | | | | | | X48M28T5516NON |
| 15 | | | | | | | 115 |
| 30 | X48M28F3016NON | | | | | | |
| 45 | X48M28F4516NON | | | | | | |
| 75 | X48M28F7516NON | | | | | | |
| 112.5 | X48M28F1216NON | | | | | | |
| 150 | X48M28F4916NON | | | | | | |
| 225 | X48M28F2216NON | | | | | | |
| 300 | X48M28F3316NON | | | | | | |
| 500 | X48M28F5516NON | | | | | | |
| 15 | 80 | Contact local Eaton representative | | | | | |
| 30 | | | | | | | X48M28B3016NON |
| 45 | | | | | | | X48M28B4516NON |
| 75 | | | | | | | X48M28B7516NON |
| 112.5 | | | | | | | X48M28B1216NON |
| 150 | | | | | | | X48M28B4916NON |
| 225 | | | | | | | X48M28B2216NON |
| 300 | | | | | | | X48M28B3316NON |

Note

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Harmonic Mitigating Transformers 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

2

600 Delta Volts to 208/120 Volts—Type NON 0° Phase Shift

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|
| 15 | 150 | Contact local Eaton representative | | | | | X60M28T1516NON |
| 30 | | | | | | | X60M28T3016NON |
| 45 | | | | | | | X60M28T4516NON |
| 75 | | | | | | | X60M28T7516NON |
| 112.5 | | | | | | | X60M28T1216NON |
| 150 | | | | | | | X60M28T4916NON |
| 225 | | | | | | | X60M28T2216NON |
| 300 | | | | | | | X60M28T3316NON |
| 500 | | | | | | | X60M28T5516NON |
| 15 | 115 | Contact local Eaton representative | | | | | X60M28F1516NON |
| 30 | | | | | | | X60M28F3016NON |
| 45 | | | | | | | X60M28F4516NON |
| 75 | | | | | | | X60M28F7516NON |
| 112.5 | | | | | | | X60M28F1216NON |
| 150 | | | | | | | X60M28F4916NON |
| 225 | | | | | | | X60M28F2216NON |
| 300 | | | | | | | X60M28F3316NON |
| 500 | | | | | | | X60M28F5516NON |
| 15 | 80 | Contact local Eaton representative | | | | | X60M28B1516NON |
| 30 | | | | | | | X60M28B3016NON |
| 45 | | | | | | | X60M28B4516NON |
| 75 | | | | | | | X60M28B7516NON |
| 112.5 | | | | | | | X60M28B1216NON |
| 150 | | | | | | | X60M28B4916NON |
| 225 | | | | | | | X60M28B2216NON |
| 300 | | | | | | | X60M28B3316NON |

Note

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Harmonic Mitigating Transformers 60 Hz DOE 2016 Energy-Efficient— Copper Windings**480 Delta Volts to 208/120 Volts—Type NON 0° Phase Shift**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|------------------|
| 15 | 150 | Contact local Eaton representative | | | | | X48M28T1516CUNON |
| 30 | | | | | | | X48M28T3016CUNON |
| 45 | | | | | | | X48M28T4516CUNON |
| 75 | | | | | | | X48M28T7516CUNON |
| 112.5 | | | | | | | X48M28T1216CUNON |
| 150 | | | | | | | X48M28T4916CUNON |
| 225 | | | | | | | X48M28T2216CUNON |
| 300 | | | | | | | X48M28T3316CUNON |
| 500 | | | | | | | X48M28T5516CUNON |
| 15 | | | | | | | 115 |
| 30 | X48M28F3016CUNON | | | | | | |
| 45 | X48M28F4516CUNON | | | | | | |
| 75 | X48M28F7516CUNON | | | | | | |
| 112.5 | X48M28F1216CUNON | | | | | | |
| 150 | X48M28F4916CUNON | | | | | | |
| 225 | X48M28F2216CUNON | | | | | | |
| 300 | X48M28F3316CUNON | | | | | | |
| 500 | X48M28F5516CUNON | | | | | | |
| 15 | 80 | Contact local Eaton representative | | | | | |
| 30 | | | | | | | X48M28B3016CUNON |
| 45 | | | | | | | X48M28B4516CUNON |
| 75 | | | | | | | X48M28B7516CUNON |
| 112.5 | | | | | | | X48M28B1216CUNON |
| 150 | | | | | | | X48M28B4916CUNON |
| 225 | | | | | | | X48M28B2216CUNON |
| 300 | | | | | | | X48M28B3316CUNON |

Note

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Harmonic Mitigating Transformers 60 Hz DOE 2016 Energy-Efficient— Copper Windings

2

600 Delta Volts to 208/120 Volts—Type NON 0° Phase Shift

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|------------------|
| 15 | 150 | Contact local Eaton representative | | | | | X60M28T1516CUNON |
| 30 | | | | | | | X60M28T3016CUNON |
| 45 | | | | | | | X60M28T4516CUNON |
| 75 | | | | | | | X60M28T7516CUNON |
| 112.5 | | | | | | | X60M28T1216CUNON |
| 150 | | | | | | | X60M28T4916CUNON |
| 225 | | | | | | | X60M28T2216CUNON |
| 300 | | | | | | | X60M28T3316CUNON |
| 500 | | | | | | | X60M28T5516CUNON |
| 15 | 115 | Contact local Eaton representative | | | | | X60M28F1516CUNON |
| 30 | | | | | | | X60M28F3016CUNON |
| 45 | | | | | | | X60M28F4516CUNON |
| 75 | | | | | | | X60M28F7516CUNON |
| 112.5 | | | | | | | X60M28F1216CUNON |
| 150 | | | | | | | X60M28F4916CUNON |
| 225 | | | | | | | X60M28F2216CUNON |
| 300 | | | | | | | X60M28F3316CUNON |
| 500 | | | | | | | X60M28F5516CUNON |
| 15 | 80 | Contact local Eaton representative | | | | | X60M28B1516CUNON |
| 30 | | | | | | | X60M28B3016CUNON |
| 45 | | | | | | | X60M28B4516CUNON |
| 75 | | | | | | | X60M28B7516CUNON |
| 112.5 | | | | | | | X60M28B1216CUNON |
| 150 | | | | | | | X60M28B4916CUNON |
| 225 | | | | | | | X60M28B2216CUNON |
| 300 | | | | | | | X60M28B3316CUNON |

Note

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Harmonic Mitigating Transformers 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings**480 Delta Volts to 208/120 Volts— Type THR 30° Phase Shift**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|
| 15 | 150 | Contact local Eaton representative | | | | | X48M28T1516THR |
| 30 | | | | | | | X48M28T3016THR |
| 45 | | | | | | | X48M28T4516THR |
| 75 | | | | | | | X48M28T7516THR |
| 112.5 | | | | | | | X48M28T1216THR |
| 150 | | | | | | | X48M28T4916THR |
| 225 | | | | | | | X48M28T2216THR |
| 300 | | | | | | | X48M28T3316THR |
| 500 | | | | | | | X48M28T5516THR |
| 15 | | | | | | | 115 |
| 30 | X48M28F3016THR | | | | | | |
| 45 | X48M28F4516THR | | | | | | |
| 75 | X48M28F7516THR | | | | | | |
| 112.5 | X48M28F1216THR | | | | | | |
| 150 | X48M28F4916THR | | | | | | |
| 225 | X48M28F2216THR | | | | | | |
| 300 | X48M28F3316THR | | | | | | |
| 500 | X48M28F5516THR | | | | | | |
| 15 | 80 | Contact local Eaton representative | | | | | |
| 30 | | | | | | | X48M28B3016THR |
| 45 | | | | | | | X48M28B4516THR |
| 75 | | | | | | | X48M28B7516THR |
| 112.5 | | | | | | | X48M28B1216THR |
| 150 | | | | | | | X48M28B4916THR |
| 225 | | | | | | | X48M28B2216THR |
| 300 | | | | | | | X48M28B3316THR |

Note

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Harmonic Mitigating Transformers 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

600 Delta Volts to 208/120 Volts—Type THR 30° Phase Shift

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|
| 15 | 150 | Contact local Eaton representative | | | | | X60M28T1516THR |
| 30 | | | | | | | X60M28T3016THR |
| 45 | | | | | | | X60M28T4516THR |
| 75 | | | | | | | X60M28T7516THR |
| 112.5 | | | | | | | X60M28T1216THR |
| 150 | | | | | | | X60M28T4916THR |
| 225 | | | | | | | X60M28T2216THR |
| 300 | | | | | | | X60M28T3316THR |
| 500 | | | | | | | X60M28T5516THR |
| 15 | 115 | Contact local Eaton representative | | | | | X60M28F1516THR |
| 30 | | | | | | | X60M28F3016THR |
| 45 | | | | | | | X60M28F4516THR |
| 75 | | | | | | | X60M28F7516THR |
| 112.5 | | | | | | | X60M28F1216THR |
| 150 | | | | | | | X60M28F4916THR |
| 225 | | | | | | | X60M28F2216THR |
| 300 | | | | | | | X60M28F3316THR |
| 500 | | | | | | | X60M28F5516THR |
| 15 | 80 | Contact local Eaton representative | | | | | X60M28B1516THR |
| 30 | | | | | | | X60M28B3016THR |
| 45 | | | | | | | X60M28B4516THR |
| 75 | | | | | | | X60M28B7516THR |
| 112.5 | | | | | | | X60M28B1216THR |
| 150 | | | | | | | X60M28B4916THR |
| 225 | | | | | | | X60M28B2216THR |
| 300 | | | | | | | X60M28B3316THR |

Note

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Harmonic Mitigating Transformers 60 Hz DOE 2016 Energy-Efficient— Copper Windings**480 Delta Volts to 208/120 Volts— Type THR 30° Phase Shift**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|------------------|
| 15 | 150 | Contact local Eaton representative | | | | | X48M28T1516CUTHR |
| 30 | | | | | | | X48M28T3016CUTHR |
| 45 | | | | | | | X48M28T4516CUTHR |
| 75 | | | | | | | X48M28T7516CUTHR |
| 112.5 | | | | | | | X48M28T1216CUTHR |
| 150 | | | | | | | X48M28T4916CUTHR |
| 225 | | | | | | | X48M28T2216CUTHR |
| 300 | | | | | | | X48M28T3316CUTHR |
| 500 | | | | | | | X48M28T5516CUTHR |
| 15 | | | | | | | 115 |
| 30 | X48M28F3016CUTHR | | | | | | |
| 45 | X48M28F4516CUTHR | | | | | | |
| 75 | X48M28F7516CUTHR | | | | | | |
| 112.5 | X48M28F1216CUTHR | | | | | | |
| 150 | X48M28F4916CUTHR | | | | | | |
| 225 | X48M28F2216CUTHR | | | | | | |
| 300 | X48M28F3316CUTHR | | | | | | |
| 500 | X48M28F5516CUTHR | | | | | | |
| 15 | 80 | Contact local Eaton representative | | | | | |
| 30 | | | | | | | X48M28B3016CUTHR |
| 45 | | | | | | | X48M28B4516CUTHR |
| 75 | | | | | | | X48M28B7516CUTHR |
| 112.5 | | | | | | | X48M28B1216CUTHR |
| 150 | | | | | | | X48M28B4916CUTHR |
| 225 | | | | | | | X48M28B2216CUTHR |
| 300 | | | | | | | X48M28B3316CUTHR |

Note

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Harmonic Mitigating Transformers 60 Hz DOE 2016 Energy-Efficient— Copper Windings

2

600 Delta Volts to 208/120 Volts—Type THR 30° Phase Shift

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|------------------|
| 15 | 150 | Contact local Eaton representative | | | | | X60M28T1516CUTHR |
| 30 | | | | | | | X60M28T3016CUTHR |
| 45 | | | | | | | X60M28T4516CUTHR |
| 75 | | | | | | | X60M28T7516CUTHR |
| 112.5 | | | | | | | X60M28T1216CUTHR |
| 150 | | | | | | | X60M28T4916CUTHR |
| 225 | | | | | | | X60M28T2216CUTHR |
| 300 | | | | | | | X60M28T3316CUTHR |
| 500 | | | | | | | X60M28T5516CUTHR |
| 15 | 115 | Contact local Eaton representative | | | | | X60M28F1516CUTHR |
| 30 | | | | | | | X60M28F3016CUTHR |
| 45 | | | | | | | X60M28F4516CUTHR |
| 75 | | | | | | | X60M28F7516CUTHR |
| 112.5 | | | | | | | X60M28F1216CUTHR |
| 150 | | | | | | | X60M28F4916CUTHR |
| 225 | | | | | | | X60M28F2216CUTHR |
| 300 | | | | | | | X60M28F3316CUTHR |
| 500 | | | | | | | X60M28F5516CUTHR |
| 15 | 80 | Contact local Eaton representative | | | | | X60M28B1516CUTHR |
| 30 | | | | | | | X60M28B3016CUTHR |
| 45 | | | | | | | X60M28B4516CUTHR |
| 75 | | | | | | | X60M28B7516CUTHR |
| 112.5 | | | | | | | X60M28B1216CUTHR |
| 150 | | | | | | | X60M28B4916CUTHR |
| 225 | | | | | | | X60M28B2216CUTHR |
| 300 | | | | | | | X60M28B3316CUTHR |

Note

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Accessories

Harmonic mitigating transformers are available with the same options and accessories as general-purpose ventilated transformers. Please refer to Section 2.7 **Page V2-T2-167**.

Technical Data and Specifications

Frequency

Eaton standard low-voltage dry-type distribution transformers are designed for 60 Hz operation. Transformers required for other frequencies are available and must be specifically designed.

Overload Capacity

Short-term overload is designed into transformers as required by ANSI. Dry-type distribution transformers will deliver 200% nameplate load for one-half hour; 150% load for one hour and 125% load for four hours without being damaged, provided that a constant 50% load precedes and follows the overload. See ANSI C57.96-01.250 for additional limitations.

Continuous overload capacity is not deliberately designed into a transformer because the design objective is to be within the allowed winding temperature rise with nameplate loading.

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Insulation System Classification

| Ambient | + Winding Rise | + Hot Spot | = Temp. Class |
|---------|----------------|------------|---------------|
| 40°C | 55°C | 10°C | 105°C |
| 40°C | 80°C | 30°C | 150°C |
| 25°C | 135°C | 20°C | 180°C |
| 40°C | 115°C | 30°C | 185°C |
| 40°C | 150°C | 30°C | 220°C |

The design life of transformers having different insulation systems is the same—the lower-temperature systems are designed for the same life as the higher-temperature systems.

Enclosures

Eaton ventilated transformers use a NEMA 2 rated (drip-proof) enclosure as a standard, and are rated NEMA 3R with the addition of weathershields. Transformers manufactured in enclosures 939, 940, 942, 943, 944 and 945 are UL Listed to be installed indoors (without weathershields) with just 2 inches clearance on the sides and behind the transformer.

Sound Levels

All Eaton 600 volt class general-purpose low-voltage dry-type distribution transformers are designed to meet NEMA ST-20 levels listed here.

Lower sound levels are available and must be designed specially.

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventiladed (up to 1.2 kV) | | Encapsulated (up to 1.2 kV) |
|------------------------------|---------------------------------------|-----------------|-----------------------------|
| | K-Factor 1, 4, 9 | K-Factor 13, 20 | |
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Note

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Demystifying Harmonic Mitigating Transformer Myths

2

Aren't "power factor corrected" computer power supplies fixing all harmonics?

The use of power factor corrected computer power supplies is a great first start to reducing harmonic currents in your facility. These are becoming prevalent in server applications, but have not "crossed-over" into the laptop computer/business computer. Remember also that, once the computer power supply harmonics are addressed, you will still need to address the harmonic currents coming from the variety of other equipment in your facility.

Don't K-rated transformers fix harmonics?

The K-rated transformer was created to address the additional heat being produced by standard delta-wye transformers when feeding nonlinear loads. The goal of the K-rated transformer is to dissipate the heat produced over a larger area, thus providing the illusion of correction. The K-rated transformer does nothing to reduce the root issue of harmonic currents or correct power quality issues. Because of their larger size, they also consume additional energy to "do the same work" and are counter-productive to an energy-efficient electrical distribution design.

Don't you need two HMTs for any correction to occur?

The design of HMTs allows them to address different families of harmonic currents in different ways. A single HMT will treat the triplen (3rd, 9th, 15th and so on) harmonic currents in its secondary winding. The 5th, 7th, 17th and 19th harmonic family is treated on a system basis through a technique known as "phase shifting."

This phase shift does occur between the Type NON and Type THR, and the Type POS and Type NEG harmonic mitigating transformers—and this can also occur between a Type NON and a standard delta-wye transformer (that is probably already existing within your facility). See our Sample HMT Applications area for additional information.

The cost of HMTs is too high!

While the initial cost of HMTs is typically 1.5 to 4 times the cost of a standard transformer (due to the additional design, materials and labor involved in creating the magnetics necessary to reduce harmonic impact)—to not use an HMT in a harmonic environment will actually cost you 250% more energy loss in the transformer. Due to the relatively long life of a transformer (20–30 years), these additional energy costs easily overshadow the initial one-time first cost increment.

If I use one HMT, don't I need to change all my transformers?

Most facilities have only a percentage (typically 20–25%) of their electrical system that really requires the use of an HMT. This means in a typical building that only a few areas are either critical (meaning high requirements for "clean" power) or have high concentrations of electronic, nonlinear loads—requiring the use of the HMT in those specific areas. The harmonic mitigating transformer is a weapon in your arsenal in providing a complete, properly designed electrical system for today and tomorrow.

Transformer Technology Table Explanation

In understanding the product placement of the HMT, it becomes useful to have some "rule of thumb" understanding to compare products. Looking at one of the aspects of an HMT—price—you can see that, if a standard delta-wye transformer had a cost of one unit, a K-13 transformer would cost about double and an HMT would cost 1.5 to 4 times the unit cost. What's impressive to compare is the next column of information—"Energy Savings." If the amount of energy used to power today's loads is compared against a standard delta-wye transformer (that was never designed to feed today's types of loads), you can easily see that the HMT is designed to meet the issue head-on! Referring to the table's information, you can see that it would take 30% more energy to power the same computer loads with a K-13 transformer, whereas an HMT would take 25% less energy to feed those same

computer loads. (This is due to the fact that the HMT has a different design than a standard delta-wye transformer and addresses the root issue of harmonic currents.) A good analogy is to look at the incandescent light bulb versus a compact fluorescent lamp—you might pay a bit more up front, but because of the large energy savings (because of the harmonic loading), you soon realize that the upfront cost pales in comparison to the potential of energy saved. Eaton would be happy to provide you with an estimation calculator to help you determine the amount of payback and return on investment (ROI) based on the incremental cost of the HMT. It's very typical to return the price differential between the HMT and a standard transformer with a few years—thus using the additional 20 to 30 years of energy savings to add to your bottom line.

Transformer Technology Comparison ^①

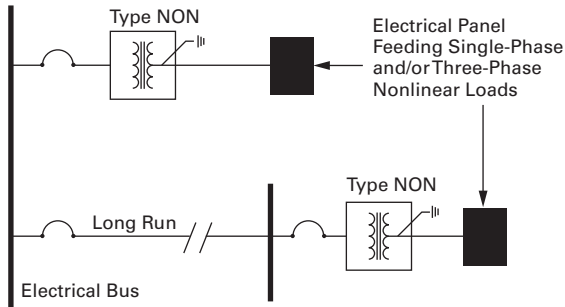
| Transformer Type | Cost | Energy Savings | Power Quality |
|--------------------|--------|----------------|----------------------------|
| Standard delta-wye | if 1X | if 1X | Not designed for harmonics |
| K-13 | 1.5–2X | –0.3X | Bulked up—doesn't help |
| HMT | 2.5X | 2.5X | Corrects root issue |

Note

^① Comparing cost, energy savings and power quality performance between the "commonly used" transformer types.

Sample HMT Applications

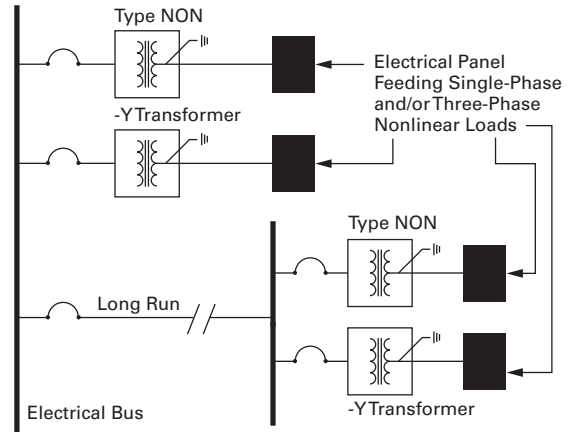
Typical Application of Type NON Transformer



Installation of a Type NON transformer provides an effective treatment of triplen (3rd, 9th, 15th and so on) harmonic currents that are generated by loads connected to the transformer. Triplen harmonic currents are treated in the secondary windings of the transformer due to the transformer's low zero sequence impedance. Type NON transformers do not need to be used in combination with other transformers to treat triplen harmonic currents. A single Type NON transformer may be installed, or multiple units can be applied.

Type NON transformers are an ideal solution for treating triplen harmonics generated by personal computers, printers, fax machines and other office equipment, as well as by single-phase electronic ballasts, and single-phase electronic testing or monitoring devices.

Typical Application of Type NON Transformer with a Standard Delta-Wye Transformer

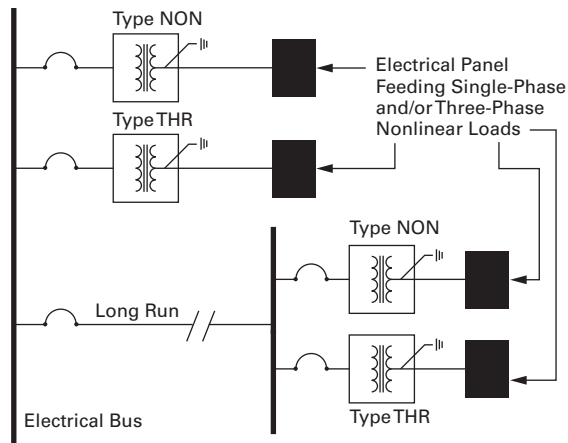


When a delta-wye transformer exists in an electrical distribution system, the addition of a Type NON transformer offers an economical solution for treating harmonic currents. The 30° phase-shift created between a Type NON harmonic mitigating transformer and a delta-wye transformer (standard transformer or K-Factor transformer) provides treatment of 5th, 7th, 17th and 19th harmonic currents. These harmonic currents are canceled in the common electrical bus that feeds the transformers. Additionally,

triplen (3rd, 9th, 15th and so on) harmonic currents generated by the loads connected to the Type NON transformer will be treated in the secondary windings of the Type NON transformer due to its low zero sequence impedance. When using two or more transformers to treat harmonics, it is better that the load be split equally between the transformers to receive the maximum benefit.

Note: Triplen currents will still circulate in the delta-wye transformer for additional waste. See figure on **Page V2-T2-78** to correct.

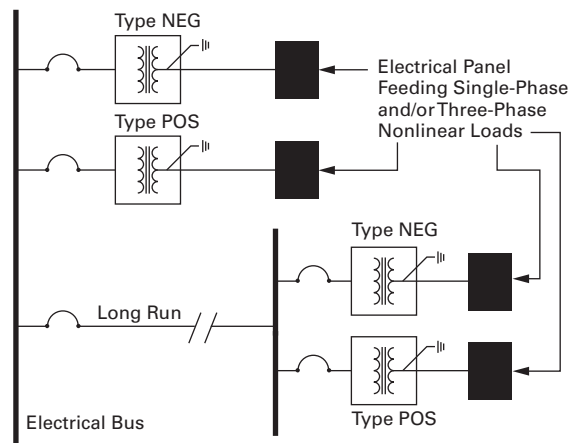
Optimum Application of Type NON and Type THR Transformers



When you're searching for an optimum harmonic correction solution in an electrical distribution system, the combination of a Type NON and Type THR transformer offers a great solution. The 30° phase shift created between Type NON and type THR harmonic mitigating transformers provides treatment of 5th, 7th, 17th and 19th harmonic currents. These harmonic currents are canceled in the common electrical bus that feeds the transformers. Additionally,

triplen (3rd, 9th, 15th and so on) harmonic currents generated by the loads will be treated in the secondary windings of HMTs. This will ensure that these currents will not circulate in the primary of the transformer creating additional heat, voltage distortion and wasted energy loss. When using two or more transformers to treat harmonics, it is better that the load be split equally between the transformers to receive the maximum benefit.

Typical Application of Type NEG and Type POS Transformers



The combination of a Type POS (+15° phase-shift) transformer and a Type NEG (-15° phase-shift) transformer effectively treats 5th, 7th, 17th and 19th harmonic currents. These harmonic currents are canceled in the common electrical bus that feeds the transformers. Additionally, triplen (3rd, 9th, 15th and so on) harmonic

currents generated by the loads connected to these transformers will be treated in their secondary windings due to their low zero sequence impedance. When using two or more transformers to treat harmonics, it is better that the load be split equally between the transformers to receive the maximum benefit.

Type EP and EPT**Contents**

| Description | Page |
|---|-----------------|
| General-Purpose Encapsulated Transformers | |
| Catalog Number Selection | V2-T2-80 |
| Product Selection | V2-T2-80 |
| Single-Phase | V2-T2-80 |
| Three-Phase | V2-T2-86 |
| Accessories | V2-T2-95 |
| Technical Data and Specifications | V2-T2-95 |

Product Description

Note: The following pages provide listings for most standard transformer ratings and catalog numbers. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Type EP and EPT

- Encapsulated design
- Suitable for indoor or outdoor applications
- Totally enclosed, non-ventilated enclosures
- Enclosures are NEMA 3R rated
- Mountable in any position indoors and upright-only outdoors
- 180°C insulation system
- 115°C rise standard; 80°C optional
- Available in ratings through 37.5 kVA single-phase; 75 kVA three-phase
- Types EP and EPT encapsulated transformers are specifically excluded from the scope of U.S. DOE energy efficiency requirements

Application Description

The basic purpose of a transformer is voltage transformation as near as practically possible to the load for economy and distribution of power. Typical loads for dry-type distribution transformers include lighting, heating, air conditioners, fans and machine tools. Such loads are found in commercial, institutional, industrial and residential structures.

Features, Benefits and Functions

- 60 Hz operation (50/60 Hz optional)
- Short-term overload capability as required by ANSI
- Meet NEMA ST-20 sound levels

Standards and Certifications

- UL listed
- CSA certified

**Industry Standards**

All Eaton dry-type distribution and control transformers are built and tested in accordance with applicable NEMA, ANSI and IEEE Standards. All 600 volt class transformers are UL listed unless otherwise noted.

Seismically Qualified

Eaton manufactured dry-type distribution transformers are seismically qualified and exceed requirements of the Uniform Building Code (UBC), International Building Code (IBC), and California Code Title 24.

Catalog Number SelectionPlease refer to Section 2.7 **Page V2-T2-162**.

2

Product SelectionAdditional Product Selection information begins on **Page V2-T2-165**.**Single-Phase Encapsulated—Type EP, 60 Hz****Type EP 0.05–37.5 kVA****120 x 240 Volts to 120/240 Volts** ①

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|------|--------------------|------|------|---------------|-------|-----------------------|----------------|----------------|-------------------|
| | FCAN | FCBN | | | | | | | |
| 0.25 | — | — | EP | 115 | FR57P | 3E | 13 (6) | Indoor–Outdoor | S10N11P26P |
| 0.5 | — | — | | | FR57P | | 16 (7) | | S10N11P51P |
| 0.75 | — | — | | | FR67P | | 29 (13) | | S10N11P76P |
| 1 | — | — | | | FR67P | | 31 (14) | | S10N11P01P |
| 1.5 | — | — | | | FR67P | | 42 (19) | | S10N11P16P |
| 2 | — | — | | | FR68P | | 42 (19) | | S10N11P02P |
| 3 | — | — | | | FR176 | | 55 (25) | | S10N11S03N |
| 5 | — | — | | | FR177 | | 113 (51) | | S10N11S05N |
| 7.5 | — | — | | | FR178 | | 123 (56) | | S10N11S07N |
| 10 | — | — | | | FR179 | | 193 (88) | | S10N11S10N |
| 15 | — | — | | | FR180 | | 216 (98) | | S10N11S15N |
| 25 | — | — | | | FR182 | | 375 (170) | | S10N11S25N |

208 Volts to 120/240 Volts ①

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|------|--------------------|------|------|---------------|-------|-----------------------|----------------|----------------|-------------------|
| | FCAN | FCBN | | | | | | | |
| 0.25 | — | — | EP | 115 | FR57P | 26A | 13 (6) | Indoor–Outdoor | S29N11P26P |
| 0.5 | — | — | | | FR57P | | 16 (7) | | S29N11P51P |
| 0.75 | — | — | | | FR67P | | 29 (13) | | S29N11P76P |
| 1 | — | — | | | FR67P | | 31 (14) | | S29N11P01P |
| 1.5 | — | — | | | FR67P | | 42 (19) | | S29N11P16P |
| 2 | — | — | | | FR68P | | 42 (19) | | S29N11P02P |
| 3 | — | — | | | FR176 | | 65 (30) | | S29N11S03N |
| 5 | — | — | | | FR177 | | 113 (51) | | S29N11S05N |
| 7.5 | — | — | | | FR178 | | 123 (56) | | S29N11S07N |
| 10 | — | — | | | FR179 | | 193 (88) | | S29N11S10N |
| 15 | — | — | | | FR180 | | 216 (98) | | S29N11S15N |
| 25 | — | — | | | FR182 | | 395 (179) | | S29N11S25N |

Notes

① Contact Eaton for availability of 0.05–0.25 kVA designs.

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase Encapsulated—Type EP, 60 Hz

277 Volts to 120/240 Volts ①

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|------|--------------------|------|------|---------------|--------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 0.25 | — | — | EP | 115 | FR57P | 524A | 13 (6) | Indoor–Outdoor | S27N11P26P |
| 0.5 | — | — | | | FR58AP | | 26 (12) | | S27N11P51P |
| 0.75 | — | — | | | FR58AP | | 29 (13) | | S27N11P76P |
| 1 | — | — | | | FR59AP | | 31 (14) | | S27N11P01P |
| 1.5 | — | — | | | FR67P | | 42 (19) | | S27N11P16P |
| 2 | — | — | | | FR176P | | 65 (30) | | S27N11P02P |
| 3 | — | — | | | FR176 | | 55 (25) | | S27N11S03N |
| 5 | — | — | | | FR177 | | 113 (51) | | S27N11S05N |
| 7.5 | — | — | | | FR178 | | 123 (56) | | S27N11S07N |
| 10 | — | — | | | FR179 | | 193 (88) | | S27N11S10N |
| 15 | — | — | | | FR180 | | 180 (82) | | S27N11S15N |
| 25 | — | — | | | FR182 | | 375 (170) | | S27N11S25N |

240 x 480 Volts to 120/240 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-------|--------------------|------|------|---------------|--------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 0.050 | — | — | EP | 115 | FR52 | 3A | 7 (3) | Indoor–Outdoor | S20N11S81N |
| 0.075 | — | — | | | FR54 | | 7 (3) | | S20N11S85N |
| 0.100 | — | — | | | FR54 | | 7 (3) | | S20N11S82N |
| 0.150 | — | — | | | FR55 | | 8 (4) | | S20N11S83N |
| 0.25 | — | — | | | FR57P | | 12 (5) | | S20N11P26P |
| 0.5 | — | — | | | FR57P | | 16 (7) | | S20N11P51P |
| 0.75 | — | — | | | FR58AP | | 26 (12) | | S20N11P76P |
| 1 | — | — | | | FR67P | | 31 (14) | | S20N11P01P |
| 1.5 | — | — | | | FR67P | | 42 (19) | | S20N11P16P |
| 2 | — | — | | | FR68P | | 42 (19) | | S20N11P02P |
| 3 | — | — | | | FR176 | | 65 (30) | | S20N11S03N |
| 3 | ② | ② | | | FR176 | | 65 (30) | | S20K11S03N |
| 5 | — | — | | | FR177 | | 113 (51) | | S20N11S05N |
| 5 | ② | ② | | | FR177 | 9A | 105 (48) | | S20K11S05N |
| 7.5 | — | — | | | FR178 | 3A | 105 (48) | | S20N11S07N |
| 7.5 | ② | ② | | | FR178 | 9A | 123 (56) | | S20K11S07N |
| 10 | — | — | | | FR179 | 3A | 193 (88) | | S20N11S10N |
| 10 | ② | ② | | | FR179 | 9A | 193 (88) | | S20K11S10N |
| 15 | — | — | | | FR180 | 3A | 216 (98) | | S20N11S15N |
| 15 | ③ | ③ | | | FR180 | 23A | 216 (98) | | S20L11S15N |
| 25 | — | — | | | FR182 | 3A | 385 (175) | | S20N11S25N |
| 25 | ③ | ③ | | | FR182 | 23A | 375 (170) | | S20L11S25N |
| 37.5 | ③ | ③ | | | FR300A | 248A | 735 (334) | | S20L11S37 ④ |

Notes

- ① Contact Eaton for availability of 0.05–0.25 kVA designs.
 ② 1 at +10% FCBN at 240 volts; 2 at –5% FCBN at 480 volts.
 ③ 2 at +5% FCBN at 240 volts; 4 at –2.5% FCBN at 480 volts.
 ④ Floor-mount only.

Contact your local Eaton sales office for CE Mark transformer requirements.
 For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.
 Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase Encapsulated—Type EP, 60 Hz

2

190/200/208/220 x 380/400/416/440 Volts to 110/220 Volts 50/60 Hz—Export Model IP 22 Rated

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 0.5 | — | — | EP | 115 | FR67 | 538A | 34 (15) | Indoor–Outdoor | S40N14S51CE |
| 1 | — | — | | | FR67 | | 42 (19) | | S40N14S01CE |
| 1.5 | — | — | | | FR176 | | 46 (21) | | S40N14S16CE |
| 2 | — | — | | | FR176 | | 65 (30) | | S40N14S02CE |
| 3 | — | — | | | FR177 | | 113 (51) | | S40N14S03CE |
| 5 | — | — | | | FR178 | | 140 (64) | | S40N14S05CE |
| 7.5 | — | — | | | FR179 | | 193 (88) | | S40N14S07CE |
| 10 | — | — | | | FR180 | | 216 (98) | | S40N14S10CE |
| 15 | — | — | | | FR182 | | 375 (170) | | S40N14S15CE |

120/208/240/277 Volts to 120/240 Volts 60 Hz

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------|------|---------------|--------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 1 | — | — | EP | 115 | FR67P | ① | 42 (19) | Indoor–Outdoor | S54N11P01 |
| 1.5 | — | — | | | FR176P | | 65 (30) | | S54N11P16 |
| 2 | — | — | | | FR176P | | 65 (30) | | S54N11P02 |
| 3 | — | — | | | FR177 | | 113 (51) | | S54N11S03 |
| 5 | — | — | | | FR178 | | 140 (64) | | S54N11S05 |
| 7.5 | — | — | | | FR179 | | 193 (88) | | S54N11S07 |
| 10 | — | — | | | FR180 | | 216 (98) | | S54N11S10 |

240 x 480 Volts to 120/240 Volts Stainless Steel ②

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 1 | — | — | EP | 115 | FR67P | 3A | 34 (15) | Indoor–Outdoor | S20N11P01PSS |
| 2 | — | — | | | FR68P | | 46 (21) | | S20N11P02PSS |
| 3 | — | — | | | FR176 | | 65 (30) | | S20N11S03SS |
| 5 | — | — | | | FR177 | | 113 (51) | | S20N11S05SS |
| 7.5 | — | — | | | FR178 | | 123 (56) | | S20N11S07SS |
| 10 | — | — | | | FR179 | | 193 (88) | | S20N11S10SS |
| 15 | — | — | | | FR180 | | 205 (93) | | S20N11S15SS |
| 25 | — | — | | | FR182 | | 375 (170) | | S20N11S25SS |

Notes

① Refer to your local Eaton sales office.

② NEMA 3R, 304 stainless steel enclosure; 316 stainless steel enclosure available as an option.

Contact your local Eaton sales office for CE Mark transformer requirements.

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase Encapsulated—Type EP, 60 Hz

480 Volts to 120/240 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 1 | — | 2 at -5% | EP | 115 | FR67P | 2D | 31 (14) | Indoor–Outdoor | S48G11P01P |
| 1.5 | — | 2 at -5% | | | FR67P | | 42 (19) | | S48G11P16P |
| 2 | — | 2 at -5% | | | FR68P | | 42 (19) | | S48G11P02P |
| 3 | — | 2 at -5% | | | FR176 | | 65 (30) | | S48G11S03N |
| 3 | 2 at +2.5% | 2 at -2.5% | | | FR176 | 16A | 65 (30) | | S48D11S03N |
| 5 | — | 2 at -5% | | | FR177 | 2D | 113 (51) | | S48G11S05N |
| 5 | 2 at +2.5% | 2 at -2.5% | | | FR177 | 16A | 113 (51) | | S48D11S05N |
| 7.5 | — | 2 at -5% | | | FR178 | 2D | 123 (56) | | S48G11S07N |
| 7.5 | 2 at +2.5% | 2 at -2.5% | | | FR178 | 16A | 123 (56) | | S48D11S07N |
| 10 | — | 2 at -5% | | | FR179 | 2D | 193 (88) | | S48G11S10N |
| 10 | 2 at +2.5% | 2 at -2.5% | | | FR179 | 16A | 193 (88) | | S48D11S10N |
| 15 | — | 2 at -5% | | | FR180 | 2D | 216 (98) | | S48G11S15N |
| 15 | 2 at +2.5% | 2 at -2.5% | | | FR180 | 16A | 216 (98) | | S48D11S15N |
| 25 | — | 2 at -5% | | | FR182 | 2D | 385 (175) | | S48G11S25N |
| 25 | 2 at +2.5% | 4 at -2.5% | | | FR132 | 83A | 410 (186) | | S48M11S25N |

480 Volts to 120/240 Volts Stainless Steel, Copper Windings ^①

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 10 | 2 at +2.5% | 2 at -2.5% | EP | 115 | FR179 | 16A | 210 (95) | Indoor–Outdoor | S48D11S10CUSS |
| 15 | 2 at +2.5% | 2 at -2.5% | | | FR180 | | 235 (107) | | S48D11S15SSCU |
| 25 | 2 at +2.5% | 4 at -2.5% | | | FR182 | 83A | 415 (188) | | S48M11S25SSCU |

600 Volts to 120/240 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|------|--------------------|------------|------|---------------|--------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 0.5 | — | 2 at -5% | EP | 115 | FR57P | 2I | 16 (7) | Indoor–Outdoor | S60G11P51P |
| 0.75 | — | 2 at -5% | | | FR58AP | | 26 (12) | | S60G11P76P |
| 1 | — | 2 at -5% | | | FR67P | | 31 (14) | | S60G11P01P |
| 1.5 | — | 2 at -5% | | | FR67P | | 42 (19) | | S60G11P16P |
| 2 | — | 2 at -5% | | | FR68P | | 42 (19) | | S60G11P02P |
| 3 | — | 2 at -5% | | | FR176 | | 65 (30) | | S60G11S03N |
| 5 | — | 2 at -5% | | | FR177 | | 105 (48) | | S60G11S05N |
| 7.5 | — | 2 at -5% | | | FR178 | | 123 (56) | | S60G11S07N |
| 10 | — | 2 at -5% | | | FR179 | | 193 (88) | | S60G11S10N |
| 15 | — | 4 at -2.5% | | | FR180 | 527A | 216 (98) | | S60J11S15N |
| 25 | — | 4 at -2.5% | | | FR182 | | 385 (175) | | S60J11S25N |
| 25 | 2 at +2.5% | 4 at -2.5% | | | FR132 | 83B | 395 (180) | | S60M11S25N |

Notes

^① NEMA 3R, 304 stainless steel enclosure; 316 stainless steel enclosure available as an option.

Contact your local Eaton sales office for CE Mark transformer requirements.

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase Shielded—Type EP, 60 Hz

2

120 x 240 Volts to 120/240 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------|------|---------------|-------|-----------------------|----------------|----------------|-------------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | — | EP | 115 | FR176 | 90B | 50 (23) | Indoor–Outdoor | S10N11E03N |
| 5 | — | — | | | FR177 | | 90 (41) | | S10N11E05N |
| 7.5 | — | — | | | FR178 | | 123 (56) | | S10N11E07N |
| 10 | — | — | | | FR179 | | 210 (95) | | S10N11E10N |
| 15 | — | — | | | FR180 | | 205 (93) | | S10N11E15N |
| 25 | — | — | | | FR182 | | 375 (170) | | S10N11E25N |

120 Volts to 120 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------|------|---------------|-------|-----------------------|----------------|----------------|-------------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | — | EP | 115 | FR176 | 77A | 60 (27) | Indoor–Outdoor | S12N12E03N |
| 5 | — | — | | | FR177 | | 100 (45) | | S12N12E05N |
| 7.5 | — | — | | | FR178 | | 123 (56) | | S12N12E07N |
| 10 | — | — | | | FR179 | | 180 (82) | | S12N12E10N |
| 15 | — | — | | | FR180 | | 216 (98) | | S12N12E15N |
| 25 | — | — | | | FR182 | | 375 (170) | | S12N12E25N |

208 Volts to 120/240 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------|------|---------------|-------|-----------------------|----------------|----------------|-------------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | — | EP | 115 | FR176 | 578A | 60 (27) | Indoor–Outdoor | S29N11E03N |
| 5 | — | — | | | FR177 | | 135 (61) | | S29N11E05N |
| 7.5 | — | — | | | FR178 | | 95 (43) | | S29N11E07N |
| 10 | — | — | | | FR179 | | 165 (75) | | S29N11E10N |
| 15 | — | — | | | FR180 | | 185 (94) | | S29N11E15N |
| 25 | — | — | | | FR182 | | 375 (170) | | S29N11E25N |

208 Volts to 208 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------|------|---------------|-------|-----------------------|----------------|----------------|-------------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | — | EP | 115 | FR176 | 77B | 65 (30) | Indoor–Outdoor | S29N29E03N |
| 5 | — | — | | | FR177 | | 113 (51) | | S29N29E05N |
| 7.5 | — | — | | | FR178 | | 123 (56) | | S29N29E07N |
| 10 | — | — | | | FR179 | | 195 (89) | | S29N29E10N |
| 15 | — | — | | | FR180 | | 216 (98) | | S29N29E15N |
| 25 | — | — | | | FR182 | | 375 (170) | | S29N29E25N |

Note

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase Shielded—Type EP, 60 Hz

240 Volts to 240 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | — | EP | 115 | FR176 | 77C | 65 (30) | Indoor—Outdoor | S24N24E03N |
| 5 | — | — | | | FR177 | | 113 (51) | | S24N24E05N |
| 7.5 | — | — | | | FR178 | | 123 (56) | | S24N24E07N |
| 10 | — | — | | | FR179 | | 193 (88) | | S24N24E10N |
| 15 | — | — | | | FR180 | | 216 (98) | | S24N24E15N |
| 25 | — | — | | | FR182 | | 375 (170) | | S24N24E25N |

277 Volts to 120/240 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | — | EP | 115 | FR176 | 513B | 65 (30) | Indoor—Outdoor | S27N11E03N |
| 5 | — | — | | | FR177 | | 113 (51) | | S27N11E05N |
| 7.5 | — | — | | | FR178 | | 75 (34) | | S27N11E07N |
| 10 | — | — | | | FR179 | | 162 (74) | | S27N11E10N |
| 15 | — | — | | | FR180 | | 216 (98) | | S27N11E15N |
| 25 | — | — | | | FR182 | | 375 (170) | | S27N11E25N |

240 x 480 Volts to 120/240 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|------|--------------------|------|------|---------------|--------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 0.25 | — | — | EP | 115 | FR57P | 90A | 12 (5) | Indoor—Outdoor | S20N11E26P |
| 0.50 | — | — | | | FR57P | | 16 (7) | | S20N11E51P |
| 0.75 | — | — | | | FR58AP | | 26 (12) | | S20N11E76P |
| 1 | — | — | | | FR67P | | 31 (14) | | S20N11E01P |
| 1.5 | — | — | | | FR67P | | 42 (19) | | S20N11E16P |
| 2 | — | — | | | FR68P | | 42 (19) | | S20N11E02P |
| 3 | — | — | | | FR176 | | 65 (30) | | S20N11E03A |
| 5 | — | — | | | FR177 | | 113 (51) | | S20N11E05A |
| 7.5 | — | — | | | FR178 | | 123 (56) | | S20N11E07A |
| 10 | — | — | | | FR179 | | 166 (75) | | S20N11E10A |
| 15 | — | — | | | FR180 | | 216 (98) | | S20N11E15A |
| 25 | ① | ① | | | FR182 | 526A | 375 (170) | | S20L11E25A |

Notes

① 2 at +5% FCBN at 240 volts; 4 at –2.5% FCBN at 480 volts.

Contact your local Eaton sales office for CE Mark transformer requirements.

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Encapsulated—Type EPT, 60 Hz

2

Type EPT 3–75 kVA



240 Delta Volts to 208Y/120 Volts

| Full Capacity Taps | | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|--------------------|------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| kVA | FCAN | FCBN | | | | | | | |
| 9 | — | 2 at -5% | EPT | 115 | FR103 | 70C | 190 (86) | Indoor–Outdoor | Y24G28T09N ① |
| 15 | — | 2 at -5% | | | FR95 | | | | 275 (125) |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84C | 422 (191) | | Y24M28T30N |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | | | 660 (299) |

380 Delta Volts to 190Y/110 Volts

| Full Capacity Taps | | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|--------------------|------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| kVA | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 70F | 116 (53) | Indoor–Outdoor | Y38G19T03A ① |
| 6 | — | 2 at -5% | | | FR200 | | | | 165 (75) |
| 9 | — | 2 at -5% | | | FR95 | 72R | 275 (125) | | Y38G19T09A ① |
| 15 | — | 2 at -5% | | | FR95 | | | | 275 (125) |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84AC | 422 (191) | | Y38M19T30A |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | | | 660 (299) |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1275 (580) | | Y38M19T75A ② |

380 Delta Volts to 208Y/120 Volts

| Full Capacity Taps | | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|--------------------|------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| kVA | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 70D | 116 (53) | Indoor–Outdoor | Y38G28T03A ① |
| 6 | — | 2 at -5% | | | FR200 | | | | 70F |
| 9 | — | 2 at -5% | | | FR103 | 70D | 185 (84) | | Y38G28T09A ① |
| 15 | — | 2 at -5% | | | FR95 | | | | 275 (125) |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84H | 422 (191) | | Y38M28T30A |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | | | 84R |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1275 (580) | | Y38M28T75A ② |

Notes

① T-T (Scott T) connected.

② Floor-mount only.

Contact your local Eaton sales office for CE Mark transformer requirements.
 For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.
 Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Encapsulated—Type EPT, 60 Hz

380 Delta Volts to 220Y/127 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 70F | 116 (53) | Indoor—Outdoor | Y38G31T03A ① |
| 6 | — | 2 at -5% | | | FR200 | | 165 (75) | | Y38G31T06A ① |
| 9 | — | 2 at -5% | | | FR103 | 70M | 195 (89) | | Y38G31T09A ① |
| 15 | — | 2 at -5% | | | FR95 | 70F | 275 (125) | | Y38G31T15A ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84R | 422 (191) | | Y38M31T30A |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y38M31T45A |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1275 (580) | | Y38M31T75A ② |

380 Delta Volts to 220 Delta Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 74K | 116 (53) | Indoor—Outdoor | Y38G25T03A ① |
| 6 | — | 2 at -5% | | | FR200 | | 180 (82) | | Y38G25T06A ① |
| 9 | — | 2 at -5% | | | FR103 | | 195 (89) | | Y38G25T09A ① |
| 15 | — | 2 at -5% | | | FR95 | | 275 (125) | | Y38G25T15A ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | ③ | 422 (191) | | Y38M25T30A |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y38M25T45A |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | 85L | 1275 (580) | | Y38M25T75 ② |

380 Delta Volts to 380Y/220 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 70D | 116 (53) | Indoor—Outdoor | Y38G37T03A ① |
| 6 | — | 2 at -5% | | | FR200 | | 165 (75) | | Y38G37T06A ① |
| 9 | — | 2 at -5% | | | FR103 | | 180 (82) | | Y38G37T09A ① |
| 15 | — | 2 at -5% | | | FR95 | | 275 (125) | | Y38G37T15A ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84H | 422 (191) | | Y38M37T30A |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y38M37T45A |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1275 (580) | | Y38M37T75A ② |

380 Delta Volts to 480Y/277 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 70F | 116 (53) | Indoor—Outdoor | Y38G47T03A ① |
| 6 | — | 2 at -5% | | | FR200 | | 180 (82) | | Y38G47T06A ① |
| 9 | — | 2 at -5% | | | FR103 | | 166 (75) | | Y38G47T09A ① |
| 15 | — | 2 at -5% | | | FR95 | | 275 (125) | | Y38G47T15A ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84AB | 422 (191) | | Y38M47T30A |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y38M47T45A |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1275 (580) | | Y38M47T75A ② |

Notes

- ① T-T (Scott T) connected.
- ② Floor-mount only.
- ③ Refer to your Eaton sales office.

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Encapsulated—Type EPT, 60 Hz

2

416 Delta Volts to 208Y/120 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 70V | 116 (53) | Indoor-Outdoor | Y43G28T03A ① |
| 6 | — | 2 at -5% | | | FR200 | | 175 (79) | | Y43G28T06A ① |
| 9 | — | 2 at -5% | | | FR103 | | 190 (86) | | Y43G28T09A ① |
| 15 | — | 2 at -5% | | | FR95 | | 275 (125) | | Y43G28T15A ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84I | 422 (191) | | Y43M28T30A |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y43M28T45A |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1275 (580) | | Y43M28T75A ② |

440 Delta Volts to 220Y/127 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 70G | 116 (53) | Indoor-Outdoor | Y44G31T03A ① |
| 6 | — | 2 at -5% | | | FR200 | | 165 (75) | | Y44G31T06A ① |
| 9 | — | 2 at -5% | | | FR103 | | 166 (75) | | Y44G31T09A ① |
| 15 | — | 2 at -5% | | | FR95 | | 275 (125) | | Y44G31T15A ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84O | 422 (191) | | Y44M31T30A ② |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y44M31T45A |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1275 (580) | | Y44M31T75A ② |

480 Delta Volts to 208Y/120 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 70A | 116 (52) | Indoor-Outdoor | Y48G28T03N ① |
| 6 | — | 2 at -5% | | | FR200 | | 165 (75) | | Y48G28T06N ① |
| 6 | 2 at +2.5% | 2 at -2.5% | | | FR200 | 72B | 165 (75) | | Y48D28T06N ① |
| 9 | — | 2 at -5% | | | FR103 | 70A | 166 (75) | | Y48G28T09N ① |
| 9 | — | 4 at -2.5% | | | FR103 | 503A | 185 (84) | | Y48J28T09N ① |
| 9 | 2 at +2.5% | 2 at -2.5% | | | FR103 | 72B | 185 (84) | | Y48D28T09N ① |
| 15 | — | 2 at -5% | | | FR95 | 70A | 275 (125) | | Y48G28T15N ① |
| 15 | — | 4 at -2.5% | | | FR95 | 503A | 275 (125) | | Y48J28T15N ① |
| 15 | 2 at +2.5% | 2 at -2.5% | | | FR95 | 72B | 275 (125) | | Y48D28T15N ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84A | 422 (191) | | Y48M28T30N |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 720 (327) | | Y48M28T45N |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1275 (580) | | Y48M28T75N ② |

480 Delta Volts to 208Y/120 Volts—Copper Windings

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 15 | 2 at +2.5% | 2 at -2.5% | EPT | 115 | FR95 | 72B | 300 (136) | Indoor-Outdoor | Y48D28T15CU ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84A | 505 (230) | | Y48M28T30CU |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 810 (368) | | Y48M28T45CU |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1450 (659) | | Y48M28T75CU ②③ |

Notes

- ① T-T (Scott T) connected.
- ② Floor-mount only.
- ③ Not CSA certified.

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Encapsulated—Type EPT, 60 Hz**480 Delta Volts to 208Y/120 Volts Stainless Steel** ①

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 70A | 116 (53) | Indoor–Outdoor | Y48G28T03SS ② |
| 6 | 2 at +2.5% | 2 at -2.5% | | | FR200 | 72B | 175 (79) | | Y48D28T06SS ② |
| 9 | 2 at +2.5% | 2 at -2.5% | | | FR103 | | 185 (84) | | Y48D28T09SS ② |
| 15 | 2 at +2.5% | 2 at -2.5% | | | FR95 | | 275 (125) | | Y48D28T15SS ② |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84A | 422 (191) | | Y48M28T30SS |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y48M28T45SS |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1275 (580) | | Y48M28T75SS ③ |

480 Delta Volts to 208Y/120 Volts Stainless Steel—Copper Windings ①

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|------------------------|
| | FCAN | FCBN | | | | | | | |
| 15 | 2 at +2.5% | 2 at -2.5% | EPT | 115 | FR95 | 72B | 275 (125) | Indoor–Outdoor | Y48D28T15CUSS ② |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84A | 504 (229) | | Y48M28T30CUSS |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 810 (368) | | Y48M28T45CUSS |

480 Delta Volts to 220Y/127 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|---------------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 70K | 116 (53) | Indoor–Outdoor | Y48G31T03A ② |
| 6 | — | 2 at -5% | | | FR200 | | 175 (79) | | Y48G31T06A ② |
| 9 | — | 2 at -5% | | | FR103 | 70A | 185 (84) | | Y48G31T09A ② |
| 15 | — | 2 at -5% | | | FR95 | | 275 (125) | | Y48G31T15A ② |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84A | 422 (191) | | Y48M31T30A |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y48M31T45A |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | 84K | 1275 (580) | | Y48M31T75A ③ |

480 Delta Volts to 240 Delta Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 74A | 116 (52) | Indoor–Outdoor | Y48G24T03N ②④ |
| 6 | — | 2 at -5% | | | FR200 | | 165 (75) | | Y48G24T06N ②④ |
| 9 | — | 4 at -2.5% | | | FR103 | 73A | 185 (84) | | Y48J24T09N ②④ |
| 15 | — | 4 at -2.5% | | | FR95 | | 275 (125) | | Y48J24T15N ②④ |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 85A | 422 (191) | | Y48M24T30N ④ |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y48M24T45N ④ |

Notes

① NEMA 3R, 304 stainless steel enclosure; 316 stainless steel enclosure available.

② T-T (Scott T) connected.

③ Floor-mount only.

④ Do not include 120 volt lighting tap.

Contact your local Eaton sales office for CE Mark transformer requirements.

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Encapsulated—Type EPT, 60 Hz

2

480 Delta Volts to 380Y/220 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 70A | 116 (53) | Indoor-Outdoor | Y48G37T03A ① |
| 6 | — | 2 at -5% | | | FR200 | 70R | 165 (75) | | Y48G37T06A ① |
| 9 | — | 2 at -5% | | | FR103 | | 185 (84) | | Y48G37T09A ① |
| 15 | — | 2 at -5% | | | FR95 | | 275 (125) | | Y48G37T15A ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84A | 422 (191) | | Y48M37T30A |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y48M37T45A |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1275 (580) | | Y48M37T75A ② |

480 Delta Volts to 380 Delta Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 74B | 116 (53) | Indoor-Outdoor | Y48G38T03A ① |
| 6 | — | 2 at -5% | | | FR200 | | 165 (75) | | Y48G38T06A ① |
| 9 | — | 2 at -5% | | | FR103 | | 185 (84) | | Y48G38T09A ① |
| 15 | — | 2 at -5% | | | FR95 | 74A | 275 (125) | | Y48G38T15A ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 85A | 422 (191) | | Y48M38T30A |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y48M38T45A |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1297 (593) | | Y48M38T75 ② |

480 Delta Volts to 416Y/240 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR200 | 70A | 165 (75) | Indoor-Outdoor | Y48G51T03A ① |
| 6 | — | 2 at -5% | | | FR200 | | 185 (84) | | Y48G51T06A ① |
| 9 | — | 2 at -5% | | | FR103 | 70S | 185 (84) | | Y48G51T09A ① |
| 15 | — | 2 at -5% | | | FR95 | | 275 (125) | | Y48G51T15A ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84A | 422 (191) | | Y48M51T30A |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y48M51T45A |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1275 (580) | | Y48M51T75A ② |

480 Delta Volts to 440Y/254 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 70A | 116 (53) | Indoor-Outdoor | Y48G35T03A ① |
| 6 | — | 2 at -5% | | | FR200 | | 185 (84) | | Y48G35T06A ① |
| 9 | — | 2 at -5% | | | FR103 | | 185 (84) | | Y48G35T09A ① |
| 15 | — | 2 at -5% | | | FR95 | | 275 (125) | | Y48G35T15A ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84A | 422 (191) | | Y48M35T30A |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y48M35T45A |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1275 (580) | | Y48M35T75A ② |

Notes

① T-T (Scott T) connected.

② Floor-mount only.

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Encapsulated—Type EPT, 60 Hz**480 Delta Volts to 480Y/277 Volts**

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|---------------------|
| | FCAN | FCBN | | | | | | | |
| 9 | 2 at +2.5% | 2 at -2.5% | EPT | 115 | FR103 | 72C | 190 (86) | Indoor–Outdoor | Y48D47T09N ① |
| 15 | 2 at +2.5% | 2 at -2.5% | | | FR95 | | 275 (125) | | Y48D47T15N ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84A | 422 (191) | | Y48M47T30N |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y48M47T45N |

600 Delta Volts to 208Y/120 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|---------------------|
| | FCAN | FCBN | | | | | | | |
| 9 | — | 2 at -5% | EPT | 115 | FR103 | 70B | 185 (84) | Indoor–Outdoor | Y60G28T09N ① |
| 15 | — | 2 at -5% | | | FR95 | | 275 (125) | | Y60G28T15N ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84B | 422 (191) | | Y60M28T30N |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y60M28T45N |

Three-Phase Shielded—Type EPT, 60 Hz**480 Delta Volts to 208Y/120 Volts**

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|---------------------|
| | FCAN | FCBN | | | | | | | |
| 3 | 2 at +2.5% | 2 at -2.5% | EPT | 115 | FR201 | 86B | 116 (52) | Indoor–Outdoor | Y48D28E03A ① |
| 6 | 2 at +2.5% | 2 at -2.5% | | | FR200 | | 165 (75) | | Y48D28E06A ① |
| 9 | 2 at +2.5% | 2 at -2.5% | | | FR103 | | 190 (86) | | Y48D28E09N ① |
| 15 | 2 at +2.5% | 2 at -2.5% | | | FR95 | | 275 (125) | | Y48D28E15B ① |

480 Delta Volts to 240 Delta Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|---------------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 88A | 116 (52) | Indoor–Outdoor | Y48G24E03A ① |
| 6 | — | 2 at -5% | | | FR200 | | 165 (75) | | Y48G24E06A ① |
| 9 | — | 4 at -2.5% | | | FR103 | 505B | 195 (89) | | Y48J24E09A ① |
| 15 | — | 4 at -2.5% | | | FR95 | | 275 (125) | | Y48J24E15A ① |

Notes

① T-T (Scott T) connected.

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

NEMA Type 4X Single-Phase Encapsulated—Type EP, 60 Hz, Grade 304 Stainless Steel ①

2

240 x 480 Volts to 120/240 Volts—Aluminum Windings

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|---------|--------------------|------|------|---------------|----------|-----------------------|----------------|----------------|-----------------|
| | FCAN | FCBN | | | | | | | |
| 0.100 ② | — | — | EP | 115 | FR544X | 3A | 7 (3) | Indoor–Outdoor | S20N11S82SS4X |
| 0.015 ② | — | — | | | FR554X | | 9 (4) | | S20N11S83SS4X |
| 0.250 ② | — | — | | | FR57P4X | | 15 (7) | | S20N11P26SS4X |
| 0.500 ② | — | — | | | FR57P4X | | 14 (6) | | S20N11P51SS4X |
| 0.750 ② | — | — | | | FR58AP4X | | 22 (10) | | S20N11P76SS4X |
| 1 ② | — | — | | | FR67P4X | | 30 (14) | | S20N11P01SS4X |
| 1.5 ② | — | — | | | FR67P4X | | 41 (19) | | S20N11P16SS4X |
| 2 ② | — | — | | | FR68P4X | | 75 (34) | | S20N11P02SS4X |
| 3 | — | — | | | FR1764X | | 68 (31) | | S20N11S03SS4X |
| 3 | ③ | ③ | | | FR1764X | 9A | 67 (30) | | S20K11S03SS4X |
| 5 | — | — | | | FR1774X | 3A | 107 (49) | | S20N11S05SS4X |
| 5 | ③ | ③ | | | FR1774X | 9A | 105 (48) | | S20K11S05SS4X |
| 7.5 | — | — | | | FR1784X | 3A | 129 (58) | | S20N11S07SS4X |
| 7.5 | ③ | ③ | | | FR1784X | 9A | 130 (59) | | S20K11S07SS4X |
| 10 | — | — | | | FR1794X | 3A | 196 (89) | | S20N11S10SS4X |
| 10 | ③ | ③ | | | FR1794X | 9A | 198 (90) | | S20K11S10SS4X |
| 15 | — | — | | | FR1804X | 3A | 215 (98) | | S20N11S15SS4X |
| 15 | ③ | ③ | | | FR1804X | 23A | 215 (98) | | S20L11S15SS4X |
| 25 | — | — | | | FR1824X | 3A | 393 (178) | | S20N11S25SS4X |
| 25 | ④ | ④ | | | FR1824X | 23A | 453 (206) | | S20L11S25SS4X |
| 37.5 | ④ | ④ | | | FR300A4X | 248A | 735 (334) | | S20L11S37SS4X ⑤ |

Notes

- ① Grade 304 stainless steel standard. Grade 316 stainless steel available as an option. Replace suffix "SS" with suffix "S6."
 ② Copper windings provided as standard.
 ③ 1 at +10% FCBN at 240 volts; 2 at –5% FCBN at 480 volts.
 ④ 2 at +5% FCBN at 240 volts; 4 at –2.5% FCBN at 480 volts.
 ⑤ Floor-mount only.

Contact your local Eaton sales office for voltage combinations not shown in the above table. Other voltages and custom features are available upon request.

NEMA Type 4X Single-Phase Encapsulated—Type EP, 60 Hz, Grade 304 Stainless Steel ①**240 x 480 Volts to 120/240 Volts—Copper Windings**

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|---------|--------------------|------|------|------------------|----------|--------------------------|-------------------|----------------|-------------------|
| | FCAN | FCBN | | | | | | | |
| 0.100 ② | — | — | EP | 115 | FR544X | 3A | 7 (3) | Indoor—Outdoor | S20N11S82SS4X |
| 0.015 ② | — | — | | | FR554X | | 9 (4) | | S20N11S83SS4X |
| 0.250 ② | — | — | | | FR57P4X | | 15 (7) | | S20N11P26SS4X |
| 0.500 ② | — | — | | | FR57P4X | | 14 (6) | | S20N11P51SS4X |
| 0.750 ② | — | — | | | FR58AP4X | | 22 (10) | | S20N11P76SS4X |
| 1 ② | — | — | | | FR67P4X | | 30 (14) | | S20N11P01SS4X |
| 1.5 ② | — | — | | | FR67P4X | | 36 (16) | | S20N11P16SS4X |
| 2 ② | — | — | | | FR68P4X | | 41 (19) | | S20N11P02SS4X |
| 3 | — | — | | | FR1764X | | 76 (34) | | S20N11S03CUSS4X |
| 3 | ③ | ③ | | | FR1764X | 9A | 77 (35) | | S20K11S03CUSS4X |
| 5 | — | — | | | FR1774X | 3A | 135 (61) | | S20N11S05CUSS4X |
| 5 | ④ | ④ | | | FR1774X | 9A | 121 (55) | | S20K11S05CUSS4X |
| 7.5 | — | — | | | FR1784X | 3A | 144 (65) | | S20N11S07CUSS4X |
| 7.5 | ④ | ④ | | | FR1784X | 9A | 146 (66) | | S20K11S07CUSS4X |
| 10 | — | — | | | FR1794X | 3A | 229 (104) | | S20N11S10CUSS4X |
| 10 | ④ | ④ | | | FR1794X | 9A | 219 (99) | | S20K11S10CUSS4X |
| 15 | — | — | | | FR1804X | 3A | 236 (107) | | S20N11S15CUSS4X |
| 15 | ④ | ④ | | | FR1804X | 23A | 236 (107) | | S20L11S15CUSS4X |
| 25 | — | — | | | FR300A4X | 3A | 388 (176) | | S20N11S25CUSS4X |
| 25 | ④ | ④ | | | FR300A4X | 23A | 388 (176) | | S20L11S25CUSS4X |
| 37.5 | ④ | ④ | | | FR300A4X | 248A | 775 (352) | | S20L11S37CUSS4X ⑤ |

Notes

- ① Grade 304 stainless steel standard. Grade 316 stainless steel available as an option. Replace suffix "SS" with suffix "S6."
 ② Copper windings provided as standard.
 ③ 1 at +10% FCBN at 240 volts; 2 at -5% FCBN at 480 volts.
 ④ 2 at +5% FCBN at 240 volts; 4 at -2.5% FCBN at 480 volts.
 ⑤ Floor-mount only.

Contact your local Eaton sales office for voltage combinations not shown in the above table.
 Other voltages and custom features are available upon request.

NEMA Type 4X Three-Phase Encapsulated—Type EPT, 60 Hz, Grade 304 Stainless Steel ①

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480 Delta Volts to 208Y/120 Volts—Aluminum Windings

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|---------|-----------------------|----------------|----------------|-----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR2014X | 70A | 125 (57) | Indoor-Outdoor | Y48G28T03SS4X ② |
| 6 | — | 2 at -5% | | | FR2004X | | 165 (75) | | Y48G28T06SS4X ② |
| 6 | 2 at +2.5% | 2 at -2.5% | | | FR2004X | 72B | 171 (78) | | Y48D28T06SS4X ② |
| 9 | — | 2 at -5% | | | FR1034X | 70A | 180 (82) | | Y48G28T09SS4X ② |
| 9 | — | 4 at -2.5% | | | FR1034X | 503A | 192 (87) | | Y48J28T09SS4X ② |
| 9 | 2 at +2.5% | 2 at -2.5% | | | FR1034X | 72B | 196 (89) | | Y48D28T09SS4X ② |
| 15 | 2 at +2.5% | 2 at -2.5% | | | FR954X | | 281 (127) | | Y48D28T15SS4X ② |
| 15 | — | 2 at -5% | | | FR954X | 70A | 269 (122) | | Y48G28T15SS4X ② |
| 15 | — | 4 at -2.5% | | | FR954X | 503A | 268 (121) | | Y48J28T15SS4X ② |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR2434X | 84A | 539 (245) | | Y48M28T30SS4X |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR2444X | | 723 (328) | | Y48M28T45SS4X |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR2454X | | 1277 (580) | | Y48M28T75SS4X ③ |

480 Delta Volts to 208Y/120 Volts—Copper Windings

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|---------|-----------------------|----------------|----------------|-------------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR2014X | 70A | 139 (63) | Indoor-Outdoor | Y48G28T03CUSS4X ② |
| 6 | — | 2 at -5% | | | FR2004X | | 187 (84) | | Y48G28T06CUSS4X ② |
| 6 | 2 at +2.5% | 2 at -2.5% | | | FR2004X | 72B | 188 (85) | | Y48D28T06CUSS4X ② |
| 9 | — | 2 at -5% | | | FR1034X | 70A | 226 (103) | | Y48G28T09CUSS4X ② |
| 9 | — | 4 at -2.5% | | | FR1034X | 503A | 226 (103) | | Y48J28T09CUSS4X ② |
| 9 | 2 at +2.5% | 2 at -2.5% | | | FR1034X | 72B | 231 (105) | | Y48D28T09CUSS4X ② |
| 15 | 2 at +2.5% | 2 at -2.5% | | | FR954X | | 276 (125) | | Y48D28T15CUSS4X ② |
| 15 | — | 2 at -5% | | | FR954X | 70A | 283 (128) | | Y48G28T15CUSS4X ② |
| 15 | — | 4 at -2.5% | | | FR954X | 503A | 299 (136) | | Y48J28T15CUSS4X ② |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR2434X | 84A | 602 (273) | | Y48M28T30CUSS4X |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR2444X | | 829 (376) | | Y48M28T45CUSS4X |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR2454X | | 1452 (659) | | Y48M28T75CUSS4X ③ |

Notes

① Grade 304 stainless steel standard. Grade 316 stainless steel available as an option. Replace suffix "SS" with suffix "S6."

② T-T (Scott T) connected.

③ Floor-mount only.

Contact your local Eaton sales office for voltage combinations not shown in the above table. Other voltages and custom features are available upon request.

Accessories

Please refer to Section 2.7 **Page V2-T2-167**.

Technical Data and Specifications

Frequency

Eaton standard dry-type distribution transformers are designed for 60 Hz operation. Transformers required for other frequencies are available and must be specifically designed.

Overload Capability

Short-term overload is designed into transformers as required by ANSI. Dry-type distribution transformers will deliver 200% nameplate load for one-half hour, 150% load for one hour and 125% load for four hours without being damaged, provided that a constant 50% load precedes and follows the overload. See ANSI C57.96-01.250 for additional limitations.

Continuous overload capacity is not deliberately designed into a transformer because the design objective is to be within the allowed winding temperature rise with nameplate loading.

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Insulation System Classification

| Ambient | + Winding Rise | + Hot Spot | = Temp. Class |
|---------|----------------|------------|---------------|
| 40°C | 55°C | 10°C | 105°C |
| 40°C | 80°C | 30°C | 150°C |
| 25°C | 135°C | 20°C | 180°C |
| 40°C | 115°C | 30°C | 185°C |
| 40°C | 150°C | 30°C | 220°C |

The design life of transformers having different insulation systems is the same—the lower-temperature systems are designed for the same life as the higher-temperature systems.

Enclosures

Eaton encapsulated transformers, Types EP and EPT, use a NEMA 3R rated enclosure as standard. NEMA 4X enclosures (grade 304 or 316 stainless steel) are available as an option.

Winding Terminations

Primary and secondary windings are terminated in the wiring compartment. Encapsulated units have copper leads or stabs brought out for connections. Eaton recommends that external cables be rated 90°C (sized at 75°C ampacity) for encapsulated designs.

Series-Multiple Windings

Series-multiple windings consist of two similar coils in each winding that can be connected in series or parallel (multiple). Transformers with series-multiple windings are designated with an "x" or "/" between the voltage ratings, such as voltages of "120/240" or "240 x 480." If the series-multiple winding is designated by an "x," the winding can be connected only for a series or parallel. With the "/" designation, a mid-point also becomes available in addition to the series or parallel connection. As an example, a 120 x 240 winding can be connected for either 120 (parallel) or 240 (series), but a 120/240 winding can be connected for 120 (parallel), 240 (series) or 240 with a 120 mid-point.

Sound Levels

All Eaton 600 volt class general-purpose dry-type distribution transformers are designed to meet NEMA ST-20 sound levels listed here. These are the sound levels measured in a soundproof environment. Actual sound levels measured at an installation will likely be higher due to electrical connections and environmental conditions.

Lower sound levels are available and should be specified when the transformer is going to be installed in an area where sound may be a concern.

For additional information, please refer to Section 2.7 **Page V2-T2-171**.

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilated (up to 1.2 kV) | | Encapsulated (up to 1.2 kV) |
|---------------------------------|---------------------------------------|-----------------|--------------------------------|
| | K-Factor 1, 4, 9 | K-Factor 13, 20 | |
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Note

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Distribution Transformers

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Motor Drive Isolation Transformers

Product Description

Note: The following pages provide listings for most standard transformer ratings and catalog numbers. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

- Suitable for indoor or outdoor applications (with weathershield)
- Ventilated enclosures
- 220°C insulation system
- 150°C rise standard (self extinguishing), 115°C or 80°C rise optional
- Available in ratings from 7.5 through 1500 kVA
- Motor drive isolation transformers are specifically excluded from the scope of U.S. DOE energy efficiency requirements

Application Description

Drive isolation transformers are specifically designed for use with AC and DC adjustable speed drives. Two winding drive isolation transformers provide:

- Electrical isolation between the incoming line and the drive circuitry
- Voltage conversion of input line to standard drive input voltages
- Minimized line disturbances caused by SCR (silicon controlled rectifiers) firing
- Reduced short-circuit currents and voltage line transients

Drive isolation transformers are specifically sized to the drive kVA requirements and are braced to withstand the mechanical stresses of current reversals and short circuits associated with SCR drives.

Features, Benefits and Functions

- 60 Hz operation (50/60 Hz operation available)
- Short-term overload capability as required by ANSI
- Primary and secondary terminals are front accessible for fast and easy connection
- Slotted screw mounting holes in enclosure and cover reduce installation time
- Sound dampening pads, which isolate the core and coil from the case, reduce noise levels to meet NEMA ST-20
- Core laminations of precision sheared silicon steel are hand stacked to ensure quiet operation
- Terminations are clearly marked for easy identification
- Three-phase transformers have one 5% full capacity tap above and below nominal voltage for incoming source adjustment
- Units are suitable for continuous operation in a 40°C ambient maximum
- Full current neutral
- Thermoguard protection embedded in coils of three-phase models to indicate that high temperatures (approximately 190°C) are present. Thermoguards consist of a set of NC dry contacts
- Three coil delta-wye configurations are used throughout the product line

Standards and Certifications

- ANSI C89.2
- NEMA ST-20
- UL 506
- UL 1561



Seismic Qualified

All Eaton manufactured dry-type distribution transformers are seismically qualified and exceed requirements of the International Building Code (IBC) and California Code Title 24.

Catalog Number SelectionPlease refer to Section 2.7 **Page V2-T2-162**.**2****Product Selection**Additional Product Selection information begins on **Page V2-T2-165**.**Three-Phase Drive Isolation****208 Delta Volts to 460Y/266 Volts**

| hp | kVA | Full Capacity Taps | | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|-----|--------------------|----------|------------------|--------|--------------------------|-------------------|---------------|-----------------|
| | | FCAN | FCBN | | | | | | |
| 5 | 7.5 | 1 at +5% | 1 at -5% | 150 | FR912D | 347B | 158 (72) | WS38 | MD075E86 |
| 7.5 | 11 | | | | FR912D | | 176 (80) | WS38 | MD11E86 |
| 10 | 14 | | | | FR912D | | 149 (68) | WS38 | MD14E86 |
| 15 | 20 | | | | FR912D | | 240 (19) | WS38 | MD20E86 |
| 20 | 27 | | | | FR912D | | 231 (15) | WS38 | MD27E86 |
| 25 | 34 | | | | FR912D | | 310 (141) | WS38 | MD34E86 |
| 30 | 40 | | | | FR912D | | 307 (139) | WS38 | MD40E86 |
| 40 | 51 | | | | FR914D | | 480 (218) | WS39 | MD51E86 |
| 50 | 63 | | | | FR914D | | 485 (220) | WS39 | MD63E86 |
| 60 | 75 | | | | FR914D | | 482 (219) | WS39 | MD75E86 |
| 75 | 93 | | | | FR915D | | 600 (272) | WS39 | MD93E86 |
| 100 | 118 | | | | FR916A | | 658 (299) | WS19 | MD118E86 |
| 125 | 145 | | | | FR916A | | 770 (350) | WS19 | MD145E86 |
| 150 | 175 | | | | FR918A | 321B | 1320 (599) | WS34 | MD175E86 |
| 200 | 220 | | | | FR918A | | 1436 (652) | WS34 | MD220E86 |
| 250 | 275 | | | | FR918A | | ① | WS34 | MD275E86 |
| 300 | 330 | | | | FR919E | | ① | WS35 | MD330E86 |
| 400 | 440 | | | | FR920E | | ① | WS35 | MD440E86 |

Notes

① Contact Eaton.

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Drive Isolation

230 Delta Volts to 230Y/133 Volts

| hp | kVA | Full Capacity Taps | | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|-----|--------------------|----------|---------------------|--------|-----------------------------|-------------------|---------------|----------------|
| | | FCAN | FCBN | | | | | | |
| 5 | 7.5 | 1 at +5% | 1 at -5% | 150 | FR912D | 286A | 158 (72) | WS38 | MD075E88 |
| 7.5 | 11 | | | | FR912D | | 156 (71) | WS38 | MD11E88 |
| 10 | 14 | | | | FR912D | | 158 (72) | WS38 | MD14E88 |
| 15 | 20 | | | | FR912D | | 216 (98) | WS38 | MD20E88 |
| 20 | 27 | | | | FR912D | | 231 (105) | WS38 | MD27E88 |
| 25 | 34 | | | | FR912D | | 310 (141) | WS38 | MD34E88 |
| 30 | 40 | | | | FR912D | | 310 (141) | WS38 | MD40E88 |
| 40 | 51 | | | | FR914D | | 480 (218) | WS39 | MD51E88 |
| 50 | 63 | | | | FR914D | | 500 (227) | WS39 | MD63E88 |
| 60 | 75 | | | | FR914D | | 538 (244) | WS39 | MD75E88 |
| 75 | 93 | | | | FR915D | | 600 (272) | WS39 | MD93E88 |
| 100 | 118 | | | | FR915D | | 600 (272) | WS39 | MD118E88 |
| 125 | 145 | | | | FR916A | | 868 (394) | WS19 | MD145E88 |
| 150 | 175 | | | | FR918A | 318D | 1320 (599) | WS34 | MD175E88 |
| 200 | 220 | | | | FR918A | | 1332 (605) | WS34 | MD220E88 |
| 250 | 275 | | | | FR918A | | 1350 (613) | WS34 | MD275E88 |
| 300 | 330 | | | | FR919E | | 2336 (1061) | WS35 | MD330E88 |
| 400 | 440 | | | | FR920E | | ① | WS35 | MD440E88 |

230 Delta Volts to 460Y/266 Volts

| hp | kVA | Full Capacity Taps | | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|-----|--------------------|----------|---------------------|--------|-----------------------------|-------------------|---------------|----------------|
| | | FCAN | FCBN | | | | | | |
| 5 | 7.5 | 1 at +5% | 1 at -5% | 150 | FR912D | 347A | 158 (72) | WS38 | MD075E89 |
| 7.5 | 11 | | | | FR912D | | 158 (72) | WS38 | MD11E89 |
| 10 | 14 | | | | FR912D | | 158 (72) | WS38 | MD14E89 |
| 15 | 20 | | | | FR912D | | 254 (115) | WS38 | MD20E89 |
| 20 | 27 | | | | FR912D | | 231 (105) | WS38 | MD27E89 |
| 25 | 34 | | | | FR912D | | 310 (141) | WS38 | MD34E89 |
| 30 | 40 | | | | FR912D | | 344 (156) | WS38 | MD40E89 |
| 40 | 51 | | | | FR914D | | 480 (218) | WS39 | MD51E89 |
| 50 | 63 | | | | FR914D | | 457 (207) | WS39 | MD63E89 |
| 60 | 75 | | | | FR914D | | 480 (218) | WS39 | MD75E89 |
| 75 | 93 | | | | FR915D | | 600 (272) | WS39 | MD93E89 |
| 100 | 118 | | | | FR916A | | 941 (427) | WS19 | MD118E89 |
| 125 | 145 | | | | FR916A | | 770 (350) | WS19 | MD145E89 |
| 150 | 175 | | | | FR918A | 321A | 1326 (602) | WS34 | MD175E89 |
| 200 | 220 | | | | FR918A | | 1332 (605) | WS34 | MD220E89 |
| 250 | 275 | | | | FR918A | | 1350 (613) | WS34 | MD275E89 |
| 300 | 330 | | | | FR919E | | 2400 (1090) | WS35 | MD330E89 |
| 400 | 440 | | | | FR920E | | ① | WS35 | MD440E89 |

Notes

① Contact Eaton.

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Drive Isolation**460 Delta Volts to 230Y/133 Volts**

| hp | kVA | Full Capacity Taps | | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|-----|--------------------|----------|---------------|--------|-----------------------|----------------|---------------|----------------|
| | | FCAN | FCBN | | | | | | |
| 5 | 7.5 | 1 at +5% | 1 at -5% | 150 | FR912D | 286D | 193 (88) | WS38 | MD075E91 |
| 7.5 | 11 | | | | FR912D | | 158 (72) | WS38 | MD11E91 |
| 10 | 14 | | | | FR912D | | 158 (72) | WS38 | MD14E91 |
| 15 | 20 | | | | FR912D | | 216 (98) | WS38 | MD20E91 |
| 20 | 27 | | | | FR912D | | 231 (105) | WS38 | MD27E91 |
| 25 | 34 | | | | FR912D | | 340 (154) | WS38 | MD34E91 |
| 30 | 40 | | | | FR912D | | 339 (154) | WS38 | MD40E91 |
| 40 | 51 | | | | FR914D | | 535 (243) | WS39 | MD51E91 |
| 50 | 63 | | | | FR914D | | 480 (218) | WS39 | MD63E91 |
| 60 | 75 | | | | FR914D | | 469 (213) | WS39 | MD75E91 |
| 75 | 93 | | | | FR915D | | 727 (330) | WS39 | MD93E91 |
| 100 | 118 | | | | FR916A | | 770 (350) | WS19 | MD118E91 |
| 125 | 145 | | | | FR916A | | 770 (350) | WS19 | MD145E91 |
| 150 | 175 | | | | FR917 | | 1100 (499) | WS34 | MD175E91 |
| 200 | 220 | | | | FR918A | | 1299 (590) | WS34 | MD220E91 |
| 250 | 275 | | | | FR918A | | 1596 (725) | WS34 | MD275E91 |
| 300 | 330 | | | | FR919E | 318E | 2234 (1014) | WS35 | MD330E91 |
| 400 | 440 | | | | FR919E | | 2400 (1090) | WS35 | MD440E91 |

460 Delta Volts to 400Y/231 Volts

| hp | kVA | Full Capacity Taps | | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|-----|--------------------|----------|---------------|--------|-----------------------|----------------|---------------|----------------|
| | | FCAN | FCBN | | | | | | |
| 5 | 7.5 | 1 at +5% | 1 at -5% | 150 | FR912D | 286D | 193 (88) | WS38 | MD075E75 |
| 7.5 | 11 | | | | FR912D | | 158 (72) | WS38 | MD11E75 |
| 10 | 14 | | | | FR912D | | 158 (72) | WS38 | MD14E75 |
| 15 | 20 | | | | FR912D | | 216 (98) | WS38 | MD20E75 |
| 20 | 27 | | | | FR912D | | 231 (105) | WS38 | MD27E75 |
| 25 | 34 | | | | FR912D | | 340 (154) | WS38 | MD34E75 |
| 30 | 40 | | | | FR912D | | 339 (154) | WS38 | MD40E75 |
| 40 | 51 | | | | FR914D | | 535 (243) | WS39 | MD51E75 |
| 50 | 63 | | | | FR914D | | 480 (218) | WS39 | MD63E75 |
| 60 | 75 | | | | FR914D | | 469 (213) | WS39 | MD75E75 |
| 75 | 93 | | | | FR915D | | 727 (330) | WS39 | MD93E75 |
| 100 | 118 | | | | FR916A | | 770 (350) | WS19 | MD118E75 |
| 125 | 145 | | | | FR916A | | 770 (350) | WS19 | MD145E75 |
| 150 | 175 | | | | FR917 | | 1100 (499) | WS34 | MD175E75 |
| 200 | 220 | | | | FR918A | | 1299 (590) | WS34 | MD220E75 |
| 250 | 275 | | | | FR918A | | 1596 (725) | WS34 | MD275E75 |
| 300 | 330 | | | | FR919E | 318E | 2234 (1014) | WS35 | MD330E75 |
| 400 | 440 | | | | FR919E | | 2400 (1090) | WS35 | MD440E75 |

Note

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Drive Isolation

460 Delta Volts to 460Y/266 Volts

| hp | kVA | Full Capacity Taps | | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|-----|--------------------|----------|---------------|--------|-----------------------|----------------|---------------|-----------------|
| | | FCAN | FCBN | | | | | | |
| 5 | 7.5 | 1 at +5% | 1 at -5% | 150 | FR912D | 286D | 164 (74) | WS38 | MD075E92 |
| 7.5 | 11 | | | | FR912D | | 161 (73) | WS38 | MD11E92 |
| 10 | 14 | | | | FR912D | | 173 (79) | WS38 | MD14E92 |
| 15 | 20 | | | | FR912D | | 231 (105) | WS38 | MD20E92 |
| 20 | 27 | | | | FR912D | | 250 (114) | WS38 | MD27E92 |
| 25 | 34 | | | | FR912D | | 310 (141) | WS38 | MD34E92 |
| 30 | 40 | | | | FR912D | | 310 (141) | WS38 | MD40E92 |
| 40 | 51 | | | | FR914D | | 503 (228) | WS39 | MD51E92 |
| 50 | 63 | | | | FR914D | | 535 (243) | WS39 | MD63E92 |
| 60 | 75 | | | | FR914D | | 535 (243) | WS39 | MD75E92 |
| 75 | 93 | | | | FR916A | | 710 (322) | WS19 | MD93E92 |
| 100 | 118 | | | | FR916A | | 770 (350) | WS19 | MD118E92 |
| 125 | 145 | | | | FR916A | | 866 (393) | WS19 | MD145E92 |
| 150 | 175 | | | | FR917 | | 1100 (499) | WS34 | MD175E92 |
| 200 | 220 | | | | FR918A | | 1100 (499) | WS34 | MD220E92 |
| 250 | 275 | | | | FR918A | | 1469 (667) | WS34 | MD275E92 |
| 300 | 330 | | | | FR919E | 318E | 2587 (1174) | WS35 | MD330E92 |
| 400 | 440 | | | | FR919E | | 2500 (1135) | WS35 | MD440E92 |

Note

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Drive Isolation

480 Delta Volts to 240 Delta Volts

| hp | kVA | Full Capacity Taps | | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|-----|--------------------|----------|---------------|--------|-----------------------|----------------|---------------|----------------|
| | | FCAN | FCBN | | | | | | |
| 5 | 7.5 | 1 at +5% | 1 at -5% | 150 | FR912D | 300A | 193 (88) | WS38 | MD075E77 |
| 7.5 | 11 | | | | FR912D | | 158 (72) | WS38 | MD11E77 |
| 10 | 14 | | | | FR912D | | 158 (72) | WS38 | MD14E77 |
| 15 | 20 | | | | FR912D | | 185 (84) | WS38 | MD20E77 |
| 20 | 27 | | | | FR912D | | 231 (105) | WS38 | MD27E77 |
| 25 | 34 | | | | FR912D | | 329 (149) | WS38 | MD34E77 |
| 30 | 40 | | | | FR912D | | 339 (154) | WS38 | MD40E77 |
| 40 | 51 | | | | FR914D | | 535 (243) | WS39 | MD51E77 |
| 50 | 63 | | | | FR914D | | 480 (218) | WS39 | MD63E77 |
| 60 | 75 | | | | FR914D | | 469 (213) | WS39 | MD75E77 |
| 75 | 93 | | | | FR915D | | 727 (330) | WS39 | MD93E77 |
| 100 | 118 | | | | FR916A | | 770 (350) | WS19 | MD118E77 |
| 125 | 145 | | | | FR916A | | 770 (350) | WS19 | MD145E77 |
| 150 | 175 | | | | FR917 | | 1100 (499) | WS34 | MD175E77 |
| 200 | 220 | | | | FR918A | | 1299 (590) | WS34 | MD220E77 |
| 250 | 275 | | | | FR918A | | 1596 (725) | WS34 | MD275E77 |
| 300 | 330 | | | | FR919E | 348D | 2234 (1014) | WS35 | MD330E77 |
| 400 | 440 | | | | FR919E | | 2400 (1090) | WS35 | MD440E77 |

480 Delta Volts to 480 Delta Volts

| hp | kVA | Full Capacity Taps | | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|-----|--------------------|----------|---------------|--------|-----------------------|----------------|---------------|----------------|
| | | FCAN | FCBN | | | | | | |
| 5 | 7.5 | 1 at +5% | 1 at -5% | 150 | FR912D | 300A | 193 (88) | WS38 | MD075E99 |
| 7.5 | 11 | | | | FR912D | | 158 (72) | WS38 | MD11E99 |
| 10 | 14 | | | | FR912D | | 158 (72) | WS38 | MD14E99 |
| 15 | 20 | | | | FR912D | | 185 (84) | WS38 | MD20E99 |
| 20 | 27 | | | | FR912D | | 231 (105) | WS38 | MD27E99 |
| 25 | 34 | | | | FR912D | | 329 (149) | WS38 | MD34E99 |
| 30 | 40 | | | | FR912D | | 339 (154) | WS38 | MD40E99 |
| 40 | 51 | | | | FR914D | | 535 (243) | WS39 | MD51E99 |
| 50 | 63 | | | | FR914D | | 480 (218) | WS39 | MD63E99 |
| 60 | 75 | | | | FR914D | | 469 (213) | WS39 | MD75E99 |
| 75 | 93 | | | | FR915D | | 727 (330) | WS39 | MD93E99 |
| 100 | 118 | | | | FR916A | | 770 (350) | WS19 | MD118E99 |
| 125 | 145 | | | | FR916A | | 770 (350) | WS19 | MD145E99 |
| 150 | 175 | | | | FR917 | | 1100 (499) | WS34 | MD175E99 |
| 200 | 220 | | | | FR918A | | 1299 (590) | WS34 | MD220E99 |
| 250 | 275 | | | | FR918A | | 1596 (725) | WS34 | MD275E99 |
| 300 | 330 | | | | FR919E | 348D | 2234 (1014) | WS35 | MD330E99 |
| 400 | 440 | | | | FR919E | | 2400 (1090) | WS35 | MD440E99 |

Note

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on [Page V2-T2-204](#).

Three-Phase Drive Isolation

575 Delta Volts to 460Y/266 Volts

| hp | kVA | Full Capacity Taps | | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|-----|--------------------|----------|---------------|--------|-----------------------|----------------|---------------|----------------|
| | | FCAN | FCBN | | | | | | |
| 5 | 7.5 | 1 at +5% | 1 at -5% | 150 | FR912D | 286H | 158 (72) | WS38 | MD075E95 |
| 7.5 | 11 | | | | FR912D | | 158 (72) | WS38 | MD11E95 |
| 10 | 14 | | | | FR912D | | 158 (72) | WS38 | MD14E95 |
| 15 | 20 | | | | FR912D | | 272 (123) | WS38 | MD20E95 |
| 20 | 27 | | | | FR912D | | 266 (121) | WS38 | MD27E95 |
| 25 | 34 | | | | FR912D | | 360 (163) | WS38 | MD34E95 |
| 30 | 40 | | | | FR912D | | 310 (141) | WS38 | MD40E95 |
| 40 | 51 | | | | FR914D | | 504 (229) | WS39 | MD51E95 |
| 50 | 63 | | | | FR914D | | 506 (230) | WS39 | MD63E95 |
| 60 | 75 | | | | FR914D | | 524 (238) | WS39 | MD75E95 |
| 75 | 93 | | | | FR916A | | 730 (331) | WS19 | MD93E95 |
| 100 | 118 | | | | FR916A | | 770 (350) | WS19 | MD118E95 |
| 125 | 145 | | | | FR916A | | 770 (350) | WS19 | MD145E95 |
| 150 | 175 | | | | FR917 | | 1282 (582) | WS34 | MD175E95 |
| 200 | 220 | | | | FR917 | | 1201 (545) | WS34 | MD220E95 |
| 250 | 275 | | | | FR923 | 318F | 702 (319) | WS37 | MD275E95 |
| 300 | 330 | | | | FR919E | | 2263 (1027) | WS35 | MD330E95 |
| 400 | 440 | | | | FR919E | | 2400 (1090) | WS35 | MD440E95 |

575 Delta Volts to 575Y/332 Volts

| hp | kVA | Full Capacity Taps | | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|-----|--------------------|----------|---------------|--------|-----------------------|----------------|---------------|----------------|
| | | FCAN | FCBN | | | | | | |
| 5 | 7.5 | 1 at +5% | 1 at -5% | 150 | FR912D | 286H | 158 (72) | WS38 | MD075E96 |
| 7.5 | 11 | | | | FR912D | | 158 (72) | WS38 | MD11E96 |
| 10 | 14 | | | | FR912D | | 231 (105) | WS38 | MD14E96 |
| 15 | 20 | | | | FR912D | | 231 (105) | WS38 | MD20E96 |
| 20 | 27 | | | | FR912D | | 231 (105) | WS38 | MD27E96 |
| 25 | 34 | | | | FR912D | | 261 (118) | WS38 | MD34E96 |
| 30 | 40 | | | | FR912D | | 310 (141) | WS38 | MD40E96 |
| 40 | 51 | | | | FR914D | | 480 (218) | WS39 | MD51E96 |
| 50 | 63 | | | | FR914D | | 500 (227) | WS39 | MD63E96 |
| 60 | 75 | | | | FR914D | | 538 (244) | WS39 | MD75E96 |
| 75 | 93 | | | | FR916A | | 600 (272) | WS19 | MD93E96 |
| 100 | 118 | | | | FR916A | | 948 (430) | WS19 | MD118E96 |
| 125 | 145 | | | | FR916A | | 868 (394) | WS19 | MD145E96 |
| 150 | 175 | | | | FR917 | | 1320 (599) | WS34 | MD175E96 |
| 200 | 220 | | | | FR917 | | 1332 (605) | WS34 | MD220E96 |
| 250 | 275 | | | | FR918A | 318F | 1350 (613) | WS34 | MD275E96 |
| 300 | 330 | | | | FR919E | | 2336 (1061) | WS35 | MD330E96 |
| 400 | 440 | | | | FR919E | | 2500 (1137) | WS35 | MD440E96 |

Note

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Motor Drive Isolation Transformers

Accessories

- Copper windings
 - Non-standard voltages
 - 50/60 Hz designs
 - Delta-delta configuration
 - 80°C or 115°C rise designs
 - Encapsulated designs (up to 34 kVA). Thermoguards are not available on encapsulated designs
 - Totally enclosed non-ventilated
 - Electrostatic shields
- Please refer to Section 2.7 **Page V2-T2-167**.

Technical Data and Specifications

Frequency

Eaton standard dry-type distribution transformers are designed for 60 Hz operation. Transformers required for other frequencies are available and must be specifically designed.

Overload Capability

Short-term overload is designed into transformers as required by ANSI. Dry-type distribution transformers will deliver 200% nameplate load for one-half hour, 150% load for one hour and 125% load for four hours without being damaged, provided that a constant 50% load precedes and follows the overload. See ANSI C57.96-01.250 for additional limitations.

Continuous overload capacity is not deliberately designed into a transformer because the design objective is to be within the allowed winding temperature rise with nameplate loading.

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Insulation System Classification

| Ambient | + Winding Rise | + Hot Spot | = Temp. Class |
|---------|----------------|------------|---------------|
| 40°C | 55°C | 10°C | 105°C |
| 40°C | 80°C | 30°C | 150°C |
| 25°C | 135°C | 20°C | 180°C |
| 40°C | 115°C | 30°C | 185°C |
| 40°C | 150°C | 30°C | 220°C |

The design life of transformers having different insulation systems is the same—the lower-temperature systems are designed for the same life as the higher-temperature systems.

Enclosures

Eaton ventilated transformers, Type MD, use a NEMA 2 rated (drip-proof) enclosure as standard, and are rated NEMA 3R with the addition of weathershields.

Winding Terminations

Primary and secondary windings are terminated in the wiring compartment. Ventilating transformers have leads brought out to aluminum pads that are pre-drilled to accept Cu/Al lugs. **Lugs are not supplied with these transformers.** Eaton recommends that external cables be rated 75°C for ventilated designs.

Sound Levels

All Eaton 600 volt class general-purpose dry-type distribution transformers are designed to meet NEMA ST-20 sound levels listed here. These are the sound levels measured in a soundproof environment. Actual sound levels measured at an installation will likely be higher due to electrical connections and environmental conditions. Lower sound levels are available and should be specified when the transformer is going to be installed in an area where sound may be a concern.

For additional information, please refer to Section 2.7 **Page V2-T2-171**.

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilated (up to 1.2 kV) | | Encapsulated (up to 1.2 kV) |
|------------------------------|---------------------------------------|-----------------|-----------------------------|
| | K-Factor 1, 4, 9 | K-Factor 13, 20 | |
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Note

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Mini-Power Centers



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Mini-Power Centers

Product Description

Note: The following pages provide listings for most standard transformer ratings and catalog numbers. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

- Encapsulated design
- Suitable for indoor or outdoor applications
- 180°C insulation system
- 115°C rise standard; 80°C rise optional

Application Description

A mini-power center combines three individual components into one NEMA Type 3R enclosure: a main breaker, an encapsulated single-phase (Type EP) or three-phase (EPT) dry-type transformer, and a secondary distribution loadcenter with main breaker. Interconnecting wiring is completed at the factory. Mini-power centers are used wherever there is a 480 volt or 600 volt distribution system and loads requiring 208Y/120 volt, three-phase or 120/240 volt single-phase. Typical installations include:

- Industrial plant assembly lines
- Plant expansions
- Test equipment
- Temporary construction site power
- Sewage disposal plants
- Warehouses
- Car washes
- Parking lots
- Commercial buildings
- Mini-power centers are encapsulated transformers and are outside the scope of U.S. DOE energy efficiency requirements

Features, Benefits and Functions

- 60 Hz operation
- Indoor/outdoor, NEMA 3R
- Primary main breaker
- Secondary main breaker (Type BR plug-in and Type BAB bolt-on branch breakers not included)
- All live parts enclosed for personnel safety
- Cover is hinged to prevent removal and can be padlocked
- Cores are grounded with a copper lead
- Ground bar is supplied to permit grounding of individual secondary circuits
- Neutral bar is grounded to case
- Branch circuits can be easily added or changed using Type BR plug-in breakers and Type BR plug-in and Type BAB bolt-on
- Suitable for service entrance
- Wide range of configurations available:
 - Aluminum windings and plug-in loadcenter chassis standard
 - Copper windings and plug-in loadcenter chassis also available
 - Copper windings and bolt-on loadcenter chassis available

- Short-term overload capability as required by ANSI
- Meet NEMA ST-20 sound levels

Standards and Certifications

- UL listed
- CSA® certified



Industry Standards

All Eaton dry-type distribution and control transformers are built and tested in accordance with applicable NEMA, ANSI and IEEE Standards. All 600 volt class transformers are UL listed unless otherwise noted.

Seismically Qualified

Eaton manufactured dry-type distribution transformers are seismically qualified and exceed requirements of the International Building Code (IBC) and California Code Title 24.

Catalog Number SelectionPlease refer to Section 2.7 **Page V2-T2-162**.**Product Selection**Additional Product Selection information begins on **Page V2-T2-165**.**Single-Phase****480 Volts to 120/240 Volts**

| kVA | Full Capacity Taps FCBN | Frame | Wiring Diagram Number | Weight Lb (kg) | Main Circuit Breaker | | Branch Breakers Max. Number ⁽²⁾⁽³⁾ | | | Max. Amp | Catalog Number |
|-----|-------------------------|-------|-----------------------|----------------|------------------------|-----------|---|----------|--|----------|----------------|
| | | | | | Primary ⁽¹⁾ | Secondary | Single-Pole | Two-Pole | | | |
| 3 | 2 at -5% | FR283 | 97A3K | 105 (47) | EHD2015 | BR215 | 8 | 4 | | 12 | P48G11S03P |
| 5 | 2 at -5% | FR284 | 110A5K | 110 (50) | EHD2020 | BR225 | 12 | 6 | | 20 | P48G11S05P |
| 7.5 | 2 at -5% | FR284 | 109A7K | 125 (56) | EHD2030 | BR230 | 12 | 6 | | 30 | P48G11S07P |
| 10 | 2 at -5% | FR285 | 108A10K | 180 (82) | EHD2040 | BR250 | 12 | 6 | | 40 | P48G11S10P |
| 15 | 2 at -5% | FR286 | 107A15K | 215 (98) | EHD2060 | BR270 | 20 | 10 | | 60 | P48G11S15P |
| 25 | 2 at -5% | FR287 | 106A25K | 373 (169) | EHD2100 | BR2125 | 26 | 13 | | 100 | P48G11S25P |

600 Volts to 120/240 Volts

| kVA | Full Capacity Taps FCBN | Frame | Wiring Diagram Number | Weight Lb (kg) | Main Circuit Breaker | | Branch Breakers Max. Number ⁽²⁾⁽³⁾ | | | Max. Amp | Catalog Number |
|-----|-------------------------|-------|-----------------------|----------------|------------------------|-----------|---|----------|--|----------|----------------|
| | | | | | Primary ⁽¹⁾ | Secondary | Single-Pole | Two-Pole | | | |
| 5 | 2 at -5% | FR284 | 110B5K | 110 (50) | FDB2015 | BR225 | 12 | 6 | | 20 | P60G11S05P |
| 7.5 | 2 at -5% | FR284 | 109B7K | 125 (56) | FDB2030 | BR230 | 12 | 6 | | 30 | P60G11S07P |
| 10 | 2 at -5% | FR285 | 108B10K | 180 (82) | FDB2040 | BR250 | 12 | 6 | | 40 | P60G11S10P |
| 15 | 2 at -5% | FR286 | 107B15K | 215 (98) | FDB2060 | BR270 | 20 | 10 | | 60 | P60G11S15P |
| 25 | 2 at -5% | FR287 | 106B25K | 373 (169) | FDB2100 | BR2125 | 26 | 13 | | 100 | P60G11S25P |

Three-Phase**480 Delta Volts to 208Y/120 Volts**

| kVA | Full Capacity Taps FCBN | Frame | Wiring Diagram Number | Weight Lb (kg) | Main Circuit Breaker | | Branch Breakers Max. Number ⁽²⁾⁽³⁾ | | | Max. Amp | Catalog Number |
|------|-------------------------|--------|-----------------------|----------------|----------------------|-----------|---|----------|------------|----------|----------------|
| | | | | | Primary | Secondary | Single-Pole | Two-Pole | Three-Pole | | |
| 15 | 2 at -5% | FR289A | 105A15K | 320 (145) | EHD3040 | BR350 | 18 | 9 | 6 | 40 | P48G28T15P |
| 22.5 | 2 at -5% | FR290A | 103A21K | 565 (256) | EHD3070 | BR370 | 18 | 9 | 6 | 60 | P48G28T21P |
| 30 | 2 at -5% | FR291A | 104A30K | 635 (288) | EHD3090 | BR3100 | 24 | 12 | 8 | 80 | P48G28T30P |

600 Delta Volts to 208Y/120 Volts

| kVA | Full Capacity Taps FCBN | Frame | Wiring Diagram Number | Weight Lb (kg) | Main Circuit Breaker | | Branch Breakers Max. Number ⁽²⁾⁽³⁾ | | | Max. Amp | Catalog Number |
|------|-------------------------|--------|-----------------------|----------------|----------------------|-----------|---|----------|------------|----------|----------------|
| | | | | | Primary | Secondary | Single-Pole | Two-Pole | Three-Pole | | |
| 15 | 2 at -5% | FR289A | 105D15K | 320 (145) | FDB3030 | BR350 | 18 | 9 | 6 | 40 | P60G28T15P |
| 22.5 | 2 at -5% | FR290A | 103B21K | 565 (256) | FDB3050 | BR370 | 18 | 9 | 6 | 60 | P60G28T21P |
| 30 | 2 at -5% | FR291A | 104B30K | 635 (288) | FDB3070 | BR3100 | 24 | 12 | 8 | 80 | P60G28T30P |

Notes

- ⁽¹⁾ Primary breakers with higher interrupting capacity available. For HFD breaker, add suffix "H." For FD breaker, add suffix "F." For FDC breaker, add suffix "C."
Main breakers are fixed only.
- ⁽²⁾ Combinations can be selected.
- ⁽³⁾ Branch breakers not included. Use Eaton's Type BR.

For 304 grade stainless steel enclosure, replace 10th character of catalog number with an "SS" suffix, e.g., P48G11S03SS, or add "SS" suffix before the addition of "CUB."
For 316 grade stainless steel enclosure, replace 10th character of catalog number with an "S6" suffix, e.g., P48G11S03S6, or add "S6" suffix before the addition of "CUB."
For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

All Copper, Bolt-On Breaker Designs—Single-Phase

480 Volts to 120/240 Volts

| kVA | Full Capacity Taps FCBN | Frame | Wiring Diagram Number | Weight Lb (kg) | Main Circuit Breaker | | Branch Breakers Max. Number ^{②③} | | | Max. Amp | Catalog Number |
|-----|-------------------------|-------|-----------------------|----------------|----------------------|-----------|---|----------|------------|----------|----------------|
| | | | | | Primary ^① | Secondary | Single-Pole | Two-Pole | Three-Pole | | |
| 3 | 2 at -5% | FR306 | 97A3K | 105 (47) | EHD2015L | BAB2015 | 8 | 4 | | 12 | P48G11S03CUB |
| 5 | 2 at -5% | FR307 | 110A5K | 110 (50) | EHD2020L | BAB2025 | 12 | 6 | | 20 | P48G11S05CUB |
| 7.5 | 2 at -5% | FR307 | 109A7K | 110 (50) | EHD2030L | BAB2030 | 12 | 6 | | 30 | P48G11S07CUB |
| 10 | 2 at -5% | FR308 | 108A10K | 180 (82) | EHD2040L | BAB2050 | 12 | 6 | | 40 | P48G11S10CUB |
| 15 | 2 at -5% | FR309 | 108A15K | 215 (98) | EHD2060L | BAB2070 | 24 | 12 | | 60 | P48G11S15CUB |
| 25 | 2 at -5% | FR310 | 106A25K | 385 (175) | EHD2100L | BAB2125 | 26 | 13 | | 100 | P48G11S25CUB |

600 Volts to 120/240 Volts

| kVA | Full Capacity Taps FCBN | Frame | Wiring Diagram Number | Weight Lb (kg) | Main Circuit Breaker | | Branch Breakers Max. Number ^{②③} | | | Max. Amp | Catalog Number |
|-----|-------------------------|-------|-----------------------|----------------|----------------------|-----------|---|----------|------------|----------|----------------|
| | | | | | Primary ^① | Secondary | Single-Pole | Two-Pole | Three-Pole | | |
| 3 | 2 at -5% | FR306 | 97B3K | 105 (47) | FDB2015L | BAB2015 | 8 | 4 | | 12 | P60G11S03CUB |
| 5 | 2 at -5% | FR307 | 110B5K | 110 (50) | FDB2020L | BAB2025 | 12 | 6 | | 20 | P60G11S05CUB |
| 7.5 | 2 at -5% | FR307 | 109B7K | 110 (50) | FDB2030L | BAB2030 | 12 | 6 | | 30 | P60G11S07CUB |
| 10 | 2 at -5% | FR308 | 108B10K | 180 (82) | FDB2040L | BAB2050 | 12 | 6 | | 40 | P60G11S10CUB |
| 15 | 2 at -5% | FR309 | 108B15K | 215 (98) | FDB2060L | BAB2070 | 24 | 12 | | 60 | P60G11S15CUB |
| 25 | 2 at -5% | FR310 | 106B25K | 385 (175) | FDB2100L | BAB2125 | 26 | 13 | | 100 | P60G11S25CUB |

Three-Phase

480 Volts to 208Y/120 Volts

| kVA | Full Capacity Taps FCBN | Frame | Wiring Diagram Number | Weight Lb (kg) | Main Circuit Breaker | | Branch Breakers Max. Number ^{②③} | | | Max. Amp | Catalog Number |
|------|-------------------------|--------|-----------------------|----------------|----------------------|-----------|---|----------|------------|----------|----------------|
| | | | | | Primary | Secondary | Single-Pole | Two-Pole | Three-Pole | | |
| 15 | 2 at -5% | FR289A | 105A15K | 320 (145) | EHD3040L | BAB3050H | 18 | 9 | 6 | 40 | P48G28T15CUB |
| 22.5 | 2 at -5% | FR290A | 103A21K | 565 (257) | EHD3070L | BAB3070H | 18 | 9 | 6 | 60 | P48G28T21CUB |
| 30 | 2 at -5% | FR291A | 104A30K | 635 (288) | EHD3090L | BAB3100H | 24 | 12 | 8 | 80 | P48G28T30CUB |

600 Volts to 208Y/120 Volts

| kVA | Full Capacity Taps FCBN | Frame | Wiring Diagram Number | Weight Lb (kg) | Main Circuit Breaker | | Branch Breakers Max. Number ^{②③} | | | Max. Amp | Catalog Number |
|------|-------------------------|--------|-----------------------|----------------|----------------------|-----------|---|----------|------------|----------|----------------|
| | | | | | Primary | Secondary | Single-Pole | Two-Pole | Three-Pole | | |
| 15 | 2 at -5% | FR289A | 105D15K | 320 (145) | FDB3030L | BAB3050H | 18 | 9 | 6 | 40 | P60G28T15CUB |
| 22.5 | 2 at -5% | FR290A | 103B21K | 565 (257) | FDB3050L | BAB3070H | 18 | 9 | 6 | 60 | P60G28T21CUB |
| 30 | 2 at -5% | FR291A | 104B30K | 635 (288) | FDB3070L | BAB3100H | 24 | 12 | 8 | 80 | P60G28T30CUB |

Notes

- ① Primary breakers with higher interrupting capacity available. For HFD breaker, add suffix "H." For FD breaker, add suffix "F." For FDC breaker, add suffix "C."
- Main breakers are fixed only. UL Listed only, not CSA.
- ② Combinations can be selected.
- ③ Branch breakers not included. Use Eaton's Type BAB.

For 304 grade stainless steel enclosure, replace 10th character of catalog number with an "SS" suffix, e.g., P48G11S03SS, or add "SS" suffix before the addition of "CUB."
 For 316 grade stainless steel enclosure, replace 10th character of catalog number with an "S6" suffix, e.g., P48G11S03S6, or add "S6" suffix before the addition of "CUB."
 For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Mini-Power Centers

Accessories

Please refer to Section 2.7
Page V2-T2-167.

Technical Data and Specifications

Frequency

Eaton standard dry-type distribution transformers are designed for 60 Hz operation. Transformers required for other frequencies must be specifically designed.

Overload Capability

Short-term overload is designed into transformers as required by ANSI. Dry-type distribution transformers will deliver 200% nameplate load for one-half hour, 150% load for one hour and 125% load for four hours without being damaged, provided that a constant 50% load precedes and follows the overload. See ANSI C57.96-01.250 for additional limitations.

Continuous overload capacity is not deliberately designed into a transformer because the design objective is to be within the allowed winding temperature rise with nameplate loading.

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Insulation System Classification

| Ambient | + Winding Rise | + Hot Spot | = Temp. Class |
|---------|----------------|------------|---------------|
| 40°C | 55°C | 10°C | 105°C |
| 40°C | 80°C | 30°C | 150°C |
| 25°C | 135°C | 20°C | 180°C |
| 40°C | 115°C | 30°C | 185°C |
| 40°C | 150°C | 30°C | 220°C |

The design life of transformers having different insulation systems is the same—the lower-temperature systems are designed for the same life as the higher-temperature systems.

Winding Terminations

Eaton recommends that external cables be rated 90°C (sized at 75°C ampacity) for encapsulated designs and 75°C for ventilated designs.

Sound Levels

All Eaton 600 volt class general-purpose dry-type distribution transformers are designed to meet NEMA ST-20 sound levels listed here. These are the sound levels measured in a soundproof environment. Actual sound levels measured at an installation will likely be higher due to electrical connections and environmental conditions. Lower sound levels are available and should be specified when the transformer is going to be installed in an area where sound may be a concern.

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilated (up to 1.2 kV) | | Encapsulated (up to 1.2 kV) |
|------------------------------|---------------------------------------|-----------------|-----------------------------|
| | K-Factor 1, 4, 9 | K-Factor 13, 20 | |
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Note

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. The following pages provide listings for most standard transformer ratings and styles. For all-copper and bolt-on-breaker designs, contact Eaton.

Three-Phase Type DT-3E Totally Enclosed Non-Ventilated



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Totally Enclosed Non-Ventilated Transformers

Product Description

Note: The following pages provide listings for most standard transformer ratings and catalog numbers. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

- Suitable for indoor or outdoor applications
- Totally enclosed, non-ventilated enclosures rated NEMA 3R
- 220°C insulation system
- 150°C rise standard; 115°C or 80°C rise optional
- Totally enclosed non-ventilated transformers are specifically excluded from the scope of U.S. DOE energy efficiency requirements

Application Description

Totally enclosed non-ventilated dry-type transformers are for special applications, where because of adverse atmospheric conditions it is desirable to use a dry-type non-ventilated transformer vs. the ventilated standard unit, which has openings in its enclosure to allow air to flow directly over the core and coil.

In applications where the atmosphere contains conductive, corrosive, or combustible materials, which might damage a transformer, or lint and dust flyings that might block the ventilation passages, the non-ventilated transformer is highly suited. It has no openings in the enclosure. Heat is dissipated by radiating from the surface area of the enclosure. Consequently, the enclosures are larger than those of the standard ventilated type. Non-ventilated transformers are suited for application in the textile, chemical, automotive, petrochemical, foundry, cement, food, paper and other industries.

Features, Benefits and Functions

- 60 Hz operation (50/60 Hz operation available)
- Short-term overload capability as required by ANSI
- Meet NEMA ST-20 sound levels

Standards and Certifications

- UL listed



Industry Standards

All Eaton dry-type distribution and control transformers are built and tested in accordance with applicable NEMA, ANSI and IEEE Standards.

Seismically Qualified

Eaton manufactured dry-type distribution transformers are seismically qualified and exceed requirements of the International Building Code (IBC) and California Code Title 24.

Catalog Number Selection

Please refer to Section 2.7 **Page V2-T2-162**.

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Product Selection

Additional Product Selection information begins on **Page V2-T2-165**.

Single-Phase—Type DS-3E, 60 Hz ^①**240 x 480 Volts to 120/240 Volts +1–5%, –2–5% at 240 Volts Primary; +2–2.5%, –4–2.5% at 480 Volts Primary**

| kVA | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Catalog Number |
|------|-------|---------------|--------|-----------------------|----------------|----------------|
| 15 | DS-3E | 150 | FR817N | 3XA | 350 (159) | T20P11S15NV |
| 25 | DS-3E | 150 | FR818N | 3XA | 350 (159) | T20P11S25NV |
| 37.5 | DS-3E | 150 | FR820N | 3XA | 600 (274) | T20P11S37NV |
| 50 | DS-3E | 150 | FR820N | 3XA | 720 (329) | T20P11S50NV |

Three-Phase—Type DT-3E, 60 Hz ^①**480 Delta Volts to 208Y/120 Volts +2–2.5% FCAN, 4–2.5% FCBN Taps**

| kVA | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Catalog Number |
|-------|-------|---------------|---------|-----------------------|----------------|----------------|
| 15 | DT-3E | 150 | FR912DN | 280B | 480 (217) | V48M28T15NV |
| 30 | DT-3E | 150 | FR912DN | 280B | 480 (217) | V48M28T30NV |
| 45 | DT-3E | 150 | FR915DN | 280B | 600 (272) | V48M28T45NV |
| 75 | DT-3E | 150 | FR916AN | 280B | 760 (344) | V48M28T75NV |
| 112.5 | DT-3E | 150 | FR917N | 280B | 1100 (499) | V48M28T12NV |
| 150 | DT-3E | 150 | FR918AN | 280B | 1300 (589) | V48M28T49NV |
| 225 | DT-3E | 150 | FR919EN | 275A | 2400 (1088) | V48M28T22NV |
| 300 | DT-3E | 150 | FR920EN | 275A | 2900 (1315) | V48M28T33NV |

Notes

^① Transformers Type EPT 75 kVA and smaller three-phase, and Type EP 37.5 kVA and smaller single-phase, are furnished in place of non-ventilated transformers as standard. See general-purpose transformers.

Contact your local Eaton sales office for availability of additional totally enclosed non-ventilated transformers. Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Totally Enclosed Non-Ventilated Transformers

Accessories

Please refer to Section 2.7 **Page V2-T2-167**.

Technical Data and Specifications

Frequency

Eaton standard dry-type distribution transformers are designed for 60 Hz operation. Transformers required for other frequencies are available and must be specifically designed.

Overload Capability

Short-term overload is designed into transformers as required by ANSI. Dry-type distribution transformers will deliver 200% nameplate load for one-half hour, 150% load for one hour and 125% load for four hours without being damaged, provided that a constant 50% load precedes and follows the overload. See ANSI C57.96-01.250 for additional limitations.

Continuous overload capacity is not deliberately designed into a transformer because the design objective is to be within the allowed winding temperature rise with nameplate loading.

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Insulation System Classification

| Ambient | + Winding Rise | + Hot Spot | = Temp. Class |
|---------|----------------|------------|---------------|
| 40°C | 55°C | 10°C | 105°C |
| 40°C | 80°C | 30°C | 150°C |
| 25°C | 135°C | 20°C | 180°C |
| 40°C | 115°C | 30°C | 185°C |
| 40°C | 150°C | 30°C | 220°C |

The design life of transformers having different insulation systems is the same—the lower-temperature systems are designed for the same life as the higher-temperature systems.

Enclosures

Eaton totally enclosed, non-ventilated transformers, Types DS-3E and DT-3E, use a NEMA 3R rated enclosure as standard.

Winding Terminations

Primary and secondary windings are terminated in the wiring compartment. Totally enclosed non-ventilated transformers have leads brought out to aluminum pads that are pre-drilled to accept Cu/Al lugs. **Lugs are not supplied with these transformers.** Eaton recommends external cables be rated 75°C for ventilated designs.

Series-Multiple Windings

Series-multiple windings consist of two similar coils in each winding that can be connected in series or parallel (multiple). Transformers with series-multiple windings are designated with an “x” or “/” between the voltage ratings, such as voltages of “120/240” or “240 x 480.” If the series-multiple winding is designated by an “x,” the winding can be connected only for a series or parallel. With the “/” designation, a mid-point also becomes available in addition to the series or parallel connection. As an example, a 120 x 240 winding can be connected for either 120 (parallel) or 240 (series), but a 120/240 winding can be connected for 120 (parallel), or 240 (series), or 240 with a 120 mid-point.

Note: The preceding pages provide listings for most standard transformer ratings and catalog numbers. For all-copper and bolt-on-breaker designs, contact Eaton. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Three-Phase Type EPTZ Encapsulated

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Class I, Division 2, Hazardous Location Transformers

Product Description

Note: The following pages provide listings for most standard transformer ratings and catalog numbers. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

- Encapsulated design
- Suitable for indoor or outdoor applications
- Totally enclosed, non-ventilated enclosures
- 180°C insulation system
- 115°C rise standard; 80°C rise optional
- Mountable in any position indoors. Upright only outdoors
- Available in ratings up to 600 volts primary, 25 kVA single-phase, 75 kVA three-phase
- Available in NEMA Type 4X enclosure
- Encapsulated transformers, such as Class I, Division 2 transformers, are specifically excluded from the scope of U.S. DOE energy efficiency requirements

Application Description

Type EPZ and EPTZ transformers are labeled as “Suitable for use in Class I, Division 2, Groups A, B, C and D locations, as defined by NEC Article 501, with NEC-recommended installation procedures for dry-type transformers rated under 600 volts nominal operation.”

A Class I, Division 2 location per Section 500 of the NEC is defined as:

1. A location in which volatile flammable liquids or gases are handled, processed or used, but that normally will be confined within closed containers or systems from which they can escape only in case of accidental rupture or breakdown of the container or system.
2. Or, a location where ignitable concentrations of gases or vapors are normally prevented by positive mechanical ventilation and that might become hazardous through failure of the ventilation equipment.

3. Or, a location that is adjacent to a Class I, Division 1 location and ignitable concentrations of gases or vapors might occasionally enter.

Atmospheres classified by NEC Section 500 as Group A includes acetylene. Group B includes gases such as hydrogen and formaldehyde. Group C may contain gases or vapors such as ethyl ether, ethylene, or the equivalent. Atmospheres classified as Group D may contain gases or vapors such as acetone, ammonia, benzene, butane, cyclopropane, ethanol, gasoline, hexane, methanol, methane, natural gas, naphtha, propane or the equivalent.

Features, Benefits and Functions

- NEMA 3R enclosure
- 60 Hz operation
- Aluminum windings (copper optional)
- Short-term overload capability as required by ANSI
- Meet NEMA ST-20 sound levels

Standards and Certifications

- UL listed



Industry Standards

All Eaton dry-type distribution and control transformers are built and tested in accordance with applicable NEMA, ANSI and IEEE Standards.

Seismically Qualified

Eaton manufactured dry-type distribution transformers are seismically qualified and exceed requirements of the International Building Code (IBC) and California Code Title 24.

Catalog Number Selection

Please refer to Section 2.7 **Page V2-T2-162**.

Product Selection

Additional Product Selection information begins on **Page V2-T2-165**.

Single-Phase—Type EPZ, 60 Hz

480 Volts to 120/240 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Catalog Number |
|------|--------------------|------|------|---------------|--------|-----------------------|----------------|----------------|
| | FCAN | FCBN | | | | | | |
| 0.05 | — | — | EPZ | 115 | FR57H | 524H | 13 (6) | Z48N11S51A |
| 0.75 | — | — | | | FR58H | | 21 (10) | Z48N11S76A |
| 1 | — | — | | | FR59H | | 31 (14) | Z48N11S01A |
| 1.5 | — | — | | | FR67H | | 40 (18) | Z48N11S16A |
| 2 | — | — | | | FR68H | | 40 (18) | Z48N11S02A |
| 3 | — | — | | | FR176H | | 65 (30) | Z48N11S03A |
| 5 | — | — | | | FR177H | | 113 (51) | Z48N11S05A |
| 7.5 | — | — | | | FR178H | | 123 (56) | Z48N11S07A |
| 10 | — | — | | | FR179H | | 193 (88) | Z48N11S10A |
| 15 | — | — | | | FR180H | | 234 (107) | Z48N11S15 |
| 25 | — | — | | | FR182H | | 375 (170) | Z48N11S25A |

Three-Phase—Type EPTZ, 60 Hz

480 Delta Volts to 208Y/120 Volts Three-Phase

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Catalog Number |
|-----|--------------------|----------|------|---------------|--------|-----------------------|----------------|----------------|
| | FCAN | FCBN | | | | | | |
| 3 | — | 2 at -5% | EPTZ | 115 | FR201H | 70A | 116 (53) | Z48G28T03A |
| 6 | — | 2 at -5% | | | FR200H | | 143 (65) | Z48G28T06A |
| 9 | — | 2 at -5% | | | FR103H | | 166 (75) | Z48G28T09A |
| 15 | — | 2 at -5% | | | FR95H | | 275 (125) | Z48G28T15A |
| 30 | — | 2 at -5% | | | FR243H | 66A | 523 (239) | Z48G28T30 |
| 45 | — | 2 at -5% | | | FR244H | | 660 (299) | Z48G28T45A |
| 75 | — | 2 at -5% | | | FR245H | | 1275 (580) | Z48G28T75A ① |

480 Delta Volts to 240 Delta Volts with 120 Volt Lighting Tap on B Phase ②

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Catalog Number |
|-----|--------------------|----------|------|---------------|--------|-----------------------|----------------|----------------|
| | FCAN | FCBN | | | | | | |
| 6 | — | 2 at -5% | EPTZ | 115 | FR102H | 95A | 115 (52) | Z48G22T06A |
| 9 | — | 2 at -5% | | | FR97H | | 160 (73) | Z48G22T09A |
| 15 | — | 2 at -5% | | | FR195H | | 340 (155) | Z48G22T15A |
| 30 | — | 2 at -5% | | | FR243H | 62A | 422 (191) | Z48G22T30A |
| 45 | — | 2 at -5% | | | FR244H | | 660 (299) | Z48G22T45A |

Notes

- ① Floor-mount only.
- ② Center Tap capacity limited to 5% of rated kVA.

For 316 grade stainless steel enclosure, replace 10th character of catalog number with an "SS" suffix. Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Class I, Division 2, Hazardous Location Transformers**Accessories**

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Please refer to Section 2.7 **Page V2-T2-167**.**Technical Data and Specifications****Frequency**

Eaton standard dry-type distribution transformers are designed for 60 Hz operation. Transformers required for other frequencies are available and must be specifically designed.

Overload Capability

Short-term overload is designed into transformers as required by ANSI. Dry-type distribution transformers will deliver 200% nameplate load for one-half hour, 150% load for one hour, and 125% load for four hours without being damaged, provided that a constant 50% load precedes and follows the overload. See ANSI C57.96-01.250 for additional limitations.

Continuous overload capacity is not deliberately designed into a transformer because the design objective is to be within the allowed winding temperature rise with nameplate loading.

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Insulation System Classification

| Ambient | + Winding Rise | + Hot Spot | = Temp. Class |
|---------|----------------|------------|---------------|
| 40°C | 55°C | 10°C | 105°C |
| 40°C | 80°C | 30°C | 150°C |
| 25°C | 135°C | 20°C | 180°C |
| 40°C | 115°C | 30°C | 185°C |
| 40°C | 150°C | 30°C | 220°C |

The design life of transformers having different insulation systems is the same—the lower-temperature systems are designed for the same life as the higher-temperature systems.

Enclosures

Eaton encapsulated transformers, Types EPZ and EPTZ, use a NEMA 3R rated enclosure.

Sound Levels

All Eaton 600 volt class general-purpose dry-type distribution transformers are designed to meet NEMA ST-20 sound levels listed here. These are the sound levels measured in a soundproof environment. Actual sound levels measured at an installation will likely be higher due to electrical connections and environmental conditions. Lower sound levels are available and should be specified when the transformer is going to be installed in an area where sound may be a concern.

Winding Terminations

Lugs are not supplied with these transformers. Eaton recommends that external cables be rated 90°C (sized at 75°C ampacity) for encapsulated designs and 75°C for ventilated designs.

Unused tap leads must be properly insulated prior to energization. EPZ and EPTZ transformers are UL and cUL listed.

Series-Multiple Windings

Series-multiple windings consist of two similar coils in each winding that can be connected in series or parallel (multiple). Transformers with series-multiple windings are designated with an "x" or "/" between the voltage ratings, such as voltages of "120/240" or "240 x 480." If the series-multiple winding is designated by an "x," the winding can be connected only for a series or parallel. With the "/" designation, a mid-point also becomes available in addition to the series or parallel connection. As an example, a 120 x 240 winding can be connected for either 120 (parallel) or 240 (series), but a 120/240 winding can be connected for 120 (parallel), 240 (series) or 240 with a 120 mid-point.

Marine Duty Transformers



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Marine Duty Transformers

Product Description

Note: The following pages provide listings for most standard transformer ratings and catalog numbers. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Types EP, EPT

- Encapsulated design
- Suitable for indoor or outdoor applications
- Totally enclosed, non-ventilated enclosures
- Enclosures are NEMA 3R rated
- Mountable in any position indoors and upright-only outdoors
- 180°C insulation system
- 115°C rise standard; 80°C rise optional
- Copper windings standard
- Available in single-phase ratings through 375 kVA (EP)
- Available in three-phase ratings through 75 kVA (EPT)

Types DS-3, DT-3

- Ventilated, NEMA 2 enclosure standard
- Suitable for indoor applications; outdoors when weathershields are also installed
- Upright mounting only
- 220°C insulation system
- 115°C rise standard; 150°C or 80°C rise optional
- Copper windings standard
- Available in single-phase ratings 15–167 kVA and up to 4160 volts primary (DS-3)
- Available in three-phase ratings 15–1500 kVA and up to 4160 volts primary (DT-3)
- cUL Energy Verified in accordance with energy standards: CFR Title 10 Chapter II Part 431, Appendix A of Subpart K and CSA C802.2-12 Update No. 1 May 2013 by Underwriters Laboratories Inc.

Application Description

The basic purpose of a transformer is voltage transformation as near as practically possible to the load for economy and distribution of power. Typical loads for low-voltage dry-type distribution transformers include lighting, heating, air conditioners, fans and machine tools. Such loads are found in commercial, institutional, industrial and residential structures.

Features, Benefits and Functions

- Meets ABS (American Bureau of Shipping) specification
- ABS Type Approval Certificate Number 04-TP517621-X
- 60 Hz operation
- 115°C temperature rise standard
- Copper windings standard
- Short-term overload capability as required by ANSI
- Meet NEMA ST-20 sound levels

Standards and Certifications

- UL listed



Industry Standards

All Eaton low-voltage dry-type distribution and control transformers are built and tested in accordance with applicable NEMA, ANSI and IEEE Standards. All 600 volt class transformers are UL listed unless otherwise noted.

Catalog Number Selection

Please refer to Section 2.7 **Page V2-T2-162**.

2**Product Selection**

Additional Product Selection information begins on **Page V2-T2-165**.

Single-Phase—Type DS-3M Marine Duty 60 Hz DOE 2016 Energy-Efficient**240 x 480 Volts to 120/240 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|
| 15 | 115 | Contact local Eaton representative | | | | | RT20P11F1516CU |
| 25 | | | | | | | RT20P11F2516CU |
| 37.5 | | | | | | | RT20P11F3716CU |
| 50 | | | | | | | RT20P11F5016CU |
| 75 | | | | | | | RT20P11F7516CU |
| 100 | | | | | | | RT20P11F9916CU |

600 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|
| 15 | 115 | Contact local Eaton representative | | | | | RT60M11F1516CU |
| 25 | | | | | | | RT60M11F2516CU |
| 37.5 | | | | | | | RT60M11F3716CU |
| 50 | | | | | | | RT60M11F5016CU |
| 75 | | | | | | | RT60M11F7516CU |
| 100 | | | | | | | RT60M11F9916CU |

Note

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3M Marine Duty 60 Hz DOE 2016 Energy-Efficient

208 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|----------------|
| 15 | 115 | FR939 | 280E | 253 (115) | WS57 | WMB05 | MV29M28F1516CU | |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | MV29M28F3016CU | |
| 45 | | FR940 | | 495 (225) | WS58 | WMB05 | MV29M28F4516CU | |
| 75 | | FR942 | | 698 (317) | WS59 | WMB04 | MV29M28F7516CU | |
| 112.5 | | FR943 | 324A | 1335 (606) | WS60 | WMB04 | MV29R28F1216CU | |
| 150 | | FR943 | | 1493 (678) | WS60 | WMB04 | MV29R28F4916CU | |
| 225 | | FR944 | | 2186 (992) | WS61 | — | MV29R28F2216CU | |
| 300 | | FR945 | | 2696 (1224) | WS62 | — | MV29R28F3316CU | |
| 500 | | Contact local Eaton representative | | | | | | MV29R28F5516CU |

208 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|----------------|
| 15 | 115 | FR939 | E0342B | 247 (112) | WS57 | WMB05 | MV29M47F1516CU | |
| 30 | | FR940 | | 434 (197) | WS58 | WMB05 | MV29M47F3016CU | |
| 45 | | FR940 | | 600 (272) | WS58 | WMB05 | MV29M47F4516CU | |
| 75 | | FR942 | | 682 (310) | WS59 | WMB04 | MV29M47F7516CU | |
| 112.5 | | FR943 | E0351A | 1154 (524) | WS60 | WMB04 | MV29R47F1216CU | |
| 150 | | FR943 | | 1500 (681) | WS60 | WMB04 | MV29R47F4916CU | |
| 225 | | FR944 | | 1918 (871) | WS61 | — | MV29R47F2216CU | |
| 300 | | Contact local Eaton representative | | | | | | MV29R47F3316CU |
| 500 | | | | | | | | MV29R47F5516CU |

240 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|----------------|
| 15 | 115 | FR939 | 280C | 253 (115) | WS57 | WMB05 | MV24M28F1516CU | |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | MV24M28F3016CU | |
| 45 | | FR940 | | 495 (225) | WS58 | WMB05 | MV24M28F4516CU | |
| 75 | | FR942 | | 698 (317) | WS59 | WMB04 | MV24M28F7516CU | |
| 112.5 | | FR943 | 324B | 1335 (606) | WS60 | WMB04 | MV24R28F1216CU | |
| 150 | | FR943 | | 1493 (678) | WS60 | WMB04 | MV24R28F4916CU | |
| 225 | | FR944 | | 2186 (992) | WS61 | — | MV24R28F2216CU | |
| 300 | | FR945 | | 2696 (1224) | WS62 | — | MV24R28F3316CU | |
| 500 | | Contact local Eaton representative | | | | | | MV24R28F5516CU |

240 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|----------------|
| 15 | 115 | FR939 | E0317A | 253 (115) | WS57 | WMB05 | MV24M47F1516CU | |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | MV24M47F3016CU | |
| 45 | | FR940 | | 495 (225) | WS58 | WMB05 | MV24M47F4516CU | |
| 75 | | FR942 | | 698 (317) | WS59 | WMB04 | MV24M47F7516CU | |
| 112.5 | | FR943 | E0351C | 1335 (606) | WS60 | WMB04 | MV24R47F1216CU | |
| 150 | | FR943 | | 1493 (678) | WS60 | WMB04 | MV24R47F4916CU | |
| 225 | | FR944 | | 2186 (992) | WS61 | — | MV24R47F2216CU | |
| 300 | | Contact local Eaton representative | | | | | | MV24R47F3316CU |
| 500 | | | | | | | | MV24R47F5516CU |

Note

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3M Marine Duty 60 Hz DOE 2016 Energy-Efficient**440 Delta Volts to 220Y/127 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|
| 15 | 115 | Contact local Eaton representative | | | | | MV44M31F1516CU |
| 30 | | | | | | | MV44M31F3016CU |
| 45 | | | | | | | MV44M31F4516CU |
| 75 | | | | | | | MV44M31F7516CU |
| 112.5 | | | | | | | MV44M31F1216CU |
| 150 | | | | | | | MV44M31F4916CU |
| 225 | | | | | | | MV44M31F2216CU |
| 300 | | | | | | | MV44M31F3316CU |
| 500 | | | | | | | MV44M31F5516CU |

480 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|
| 15 | 115 | FR939 | 280B | 241 (109) | WS57 | WMB05 | MV48M28F1516CU |
| 30 | | FR940 | | 433 (197) | WS58 | WMB05 | MV48M28F3016CU |
| 45 | | FR940 | | 471 (214) | WS58 | WMB05 | MV48M28F4516CU |
| 75 | | FR942 | | 665 (302) | WS59 | WMB04 | MV48M28F7516CU |
| 112.5 | | FR943 | | 1271 (577) | WS60 | WMB04 | MV48M28F1216CU |
| 150 | | FR943 | | 1422 (646) | WS60 | WMB04 | MV48M28F4916CU |
| 225 | | FR944 | | 2082 (945) | WS61 | — | MV48M28F2216CU |
| 300 | | FR945 | | 2568 (1166) | WS62 | — | MV48M28F3316CU |
| 500 | | Contact local Eaton representative | | | | | MV48M28F5516CU |

480 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|
| 15 | 115 | FR939 | 280B | 271 (123) | WS57 | WMB05 | MV48M47F1516CU |
| 30 | | FR940 | | 431 (196) | WS58 | WMB05 | MV48M47F3016CU |
| 45 | | FR940 | | 485 (220) | WS58 | WMB05 | MV48M47F4516CU |
| 75 | | FR942 | | 730 (331) | WS59 | WMB04 | MV48M47F7516CU |
| 112.5 | | FR943 | | 1146 (520) | WS60 | WMB04 | MV48M47F1216CU |
| 150 | | FR943 | | 1432 (650) | WS60 | WMB04 | MV48M47F4916CU |
| 225 | | FR944 | | 2150 (976) | WS61 | — | MV48M47F2216CU |
| 300 | | FR945 | | 2700 (1226) | WS62 | — | MV48M47F3316CU |
| 500 | | Contact local Eaton representative | | | | | MV48M47F5516CU |

Note

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Marine Duty Transformers

Accessories

Please refer to Section 2.7 **Page V2-T2-167**.

Technical Data and Specifications

Frequency

Eaton standard low-voltage dry-type distribution transformers are designed for 60 Hz operation. Transformers required for other frequencies are available and must be specifically designed.

Overload Capability

Short-term overload is designed into transformers as required by ANSI. Dry-type distribution transformers will deliver 200% nameplate load for one-half hour, 150% load for one hour, and 125% load for four hours without being damaged, provided that a constant 50% load precedes and follows the overload. See ANSI C57.96-01.250 for additional limitations.

Continuous overload capacity is not deliberately designed into a transformer because the design objective is to be within the allowed winding temperature rise with nameplate loading.

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Insulation System Classification

| Ambient | + Winding Rise | + Hot Spot | = Temp. Class |
|---------|----------------|------------|---------------|
| 40°C | 55°C | 10°C | 105°C |
| 40°C | 80°C | 30°C | 150°C |
| 25°C | 135°C | 20°C | 180°C |
| 40°C | 115°C | 30°C | 185°C |
| 40°C | 150°C | 30°C | 220°C |

The design life of transformers having different insulation systems is the same—the lower-temperature systems are designed for the same life as the higher-temperature systems.

Enclosures

Eaton ventilated transformers Types DS-3M and DT-3M use a NEMA 2 rated (drip-proof) enclosure as standard, and are rated NEMA 3R with the addition of weathershields. Eaton encapsulated transformers Types EPM and EPTM use a NEMA 3R rated enclosure. Type DT-3M transformers manufactured in enclosures 939, 940, 942, 943, 944 and 945 are UL Listed to be installed with just 2 inches clearance on the sides and rear of the transformer.

Winding Terminations

Primary and secondary windings are terminated in the wiring compartment. Encapsulated units have copper leads or stabs brought out for connections. Ventilating transformers have leads brought out to aluminum pads that are pre-drilled to accept Cu/Al lugs.

Lugs are not supplied with these transformers. Eaton recommends that external cables be rated 90°C (sized at 75°C ampacity) for encapsulated designs and 75°C for ventilated designs.

Series-Multiple Windings

Series-multiple windings consist of two similar coils in each winding that can be connected in series or parallel (multiple). Transformers with series-multiple windings are designated with an "x" or "/" between the voltage ratings, such as voltages of "120/240" or "240 x 480." If the series-multiple winding is designated by an "x," the winding can be connected only for a series or parallel. With the "/" designation, a mid-point also becomes available in addition to the series or parallel connection. As an example, a 120 x 240 winding can be connected for either 120 (parallel) or 240 (series), but a 120/240 winding can be connected for 120 (parallel), 240 (series) or 240 with a 120 mid-point.

Sound Levels

All Eaton 600 volt class general-purpose low-voltage dry-type distribution transformers are designed to meet NEMA ST-20 sound levels listed here. These are the sound levels measured in a soundproof environment. Actual sound levels measured at an installation will likely be higher due to electrical connections and environmental conditions. Lower sound levels are available and should be specified when the transformer is going to be installed in an area where sound may be a concern.

For additional information, please refer to Section 2.7 **Page V2-T2-171**.

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilated (up to 1.2 kV) K-Factor 1, 4, 9 | Self-Cooled Ventilated (up to 1.2 kV) K-Factor 13, 20 | Encapsulated (up to 1.2 kV) |
|------------------------------|--|---|-----------------------------|
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Type EP Buck-Boost Transformer

2



Buck-Boost and Low-Voltage Lighting Transformers

Product Description

Note: The following pages provide listings for most standard transformer ratings and catalog numbers. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Types EP, EPT

- Encapsulated design
- Suitable for indoor or outdoor applications
- Totally enclosed, non-ventilated enclosures
- Enclosures are NEMA 3R rated
- Mountable in any position indoors and upright-only outdoors
- 180°C insulation system
- 115°C rise standard; 80°C rise optional
- Available in single-phase ratings through 7.5 kVA
- Encapsulated transformers, such as buck-boost and low-voltage lighting transformers, are specifically excluded from the scope of U.S. DOE energy efficiency requirements

Application Description

A buck-boost transformer is used to provide an economical method of correcting a lower or higher voltage rating more suitable for efficient operation of electrical equipment.

Type EP buck-boost transformers are small kVA, single-phase transformers with dual primary and dual secondary windings, and are usually connected as autotransformers by using one unit for single-phase applications and either two or three units banked for three-phase operation. They are primarily used for motor operation and should not be used for motor control circuits, to correct fluctuating line voltage or to obtain a neutral on a delta system. Buck-boost transformers are ideally suited for use with low-voltage lighting systems, such as outdoor lighting.

Contents

| Description | Page |
|--|-----------|
| Motor Drive Isolation Transformers | V2-T2-97 |
| Mini-Power Centers | V2-T2-105 |
| Totally Enclosed Non-Ventilated Transformers | V2-T2-109 |
| Class I, Division 2, Hazardous Location Transformers | V2-T2-112 |
| Marine Duty Transformers | V2-T2-115 |
| Buck-Boost and Low-Voltage Lighting Transformers | |
| Product Selection | V2-T2-121 |
| Accessories | V2-T2-147 |
| Technical Data and Specifications | V2-T2-147 |
| Wiring Diagrams | V2-T2-148 |
| Medium-Voltage Dry-Type Distribution Transformers | V2-T2-149 |

Product Description

Note: The following pages provide listings for most standard transformer ratings and catalog numbers. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Types EP, EPT

- Encapsulated design
- Suitable for indoor or outdoor applications
- Totally enclosed, non-ventilated enclosures
- Enclosures are NEMA 3R rated
- Mountable in any position indoors and upright-only outdoors
- 180°C insulation system
- 115°C rise standard; 80°C rise optional
- Available in single-phase ratings through 7.5 kVA
- Encapsulated transformers, such as buck-boost and low-voltage lighting transformers, are specifically excluded from the scope of U.S. DOE energy efficiency requirements

Application Description

A buck-boost transformer is used to provide an economical method of correcting a lower or higher voltage rating more suitable for efficient operation of electrical equipment.

Type EP buck-boost transformers are small kVA, single-phase transformers with dual primary and dual secondary windings, and are usually connected as autotransformers by using one unit for single-phase applications and either two or three units banked for three-phase operation. They are primarily used for motor operation and should not be used for motor control circuits, to correct fluctuating line voltage or to obtain a neutral on a delta system. Buck-boost transformers are ideally suited for use with low-voltage lighting systems, such as outdoor lighting.

Features, Benefits and Functions

- 60 Hz operation
- 600 volt class insulation
- Short-term overload capability as required by ANSI
- Meet NEMA ST-20 sound levels

Standards and Certifications

- UL listed
- CSA certified



Industry Standards

All Eaton dry-type distribution and control transformers are built and tested in accordance with applicable NEMA, ANSI and IEEE Standards. All 600 volt class transformers are UL listed unless otherwise noted.

Seismically Qualified

Eaton-manufactured dry-type distribution transformers are seismically qualified, and exceed requirements of the International Building Code (IBC) and California Code Title 24.

Catalog Number Selection

Please refer to Section 2.7
Page V2-T2-162.

Product Selection

For quick selection data, refer to the tables on this and the following pages.

Selection Requirements

You should have the following information before selecting a buck-boost transformer:

Line Voltage

The voltage that you want to buck (decrease) or boost (increase). This can be found by measuring the supply line voltage with a voltmeter.

Load Voltage

The voltage at which your equipment is designed to operate. This is listed on the nameplate of the load equipment.

Load Amperes or Load kVA

You do not need to know both—one or the other is sufficient for selection purposes. This information usually can be found on the nameplate of the equipment that you want to operate.

Frequency

The supply line frequency must be the same as the frequency of the equipment to be operated—Eaton's buck-boost transformers operate at 60 Hz only.

Phase

The supply line should be the same as the equipment to be operated—either single- or three-phase.

Transformer Interconnection

For three-phase applications, interconnections of transformers should be made in a junction box. Two or three transformers may be used depending on an open delta (2) or wye (3) connection.

5-Step Selector

The tables that follow will simplify the selection of the buck-boost transformers. There are no calculations needed; simply follow these five steps:

1. Refer to the table having the same output voltage as the equipment you want to operate. For example, if you are installing a 240 volt 6 kVA single-phase load use selection table on the page.
2. Select the available line voltage across the top of the chart that is closest to the actual supply voltage. Therefore, for example, if the available line voltage is 213 volts, use the 212 volt column.
3. Read down the column until you reach an output kVA or amps rating equal to or greater than the load requirements. Since 6 kVA, in the example, is not listed, use the next higher rating, or 7.5 kVA.
4. Read across to the far left columns for the catalog number and quantity of transformers for your application. In this case, you will need one (1) catalog number S10N06P01P.
5. Connect the buck-boost transformer(s) you have selected in accordance with the connection diagram specified at the bottom of the available line voltage column. In this example, Diagram "F" would be used.

Note: For single-phase connections and three-phase open delta connections, inputs and outputs may be reversed. kVA capacity remains constant.

Additional Product Selection information begins on **Page V2-T2-165**.

120 x 240 Volts to 12/24 Volts

| kVA | °C Temp. Rise | Frame | Weight Lb (kg) | Catalog Number |
|------|---------------|--------|----------------|----------------|
| 0.05 | 115 | FR52 | 7 (3) | S10N04A81N |
| 0.10 | 115 | FR54 | 7 (3) | S10N04A82N |
| 0.15 | 115 | FR55 | 8 (4) | S10N04A83N |
| 0.25 | 115 | FR57P | 12 (5) | S10N04P26P |
| 0.50 | 115 | FR57P | 13 (5) | S10N04P51P |
| 0.75 | 115 | FR58AP | 21 (10) | S10N04P76P |
| 1 | 115 | FR67P | 31 (14) | S10N04P01P |
| 1.5 | 115 | FR67P | 40 (18) | S10N04P16P |
| 2 | 115 | FR68P | 40 (18) | S10N04P02P |
| 3 | 115 | FR176 | 65 (29) | S10N04A03N |
| 5 | 115 | FR177 | 113 (51) | S10N04A05N |
| 7.5 | 115 | FR178 | 123 (55) | S10N04A07N |

120 x 240 Volts to 16/32 Volts

| kVA | °C Temp. Rise | Frame | Weight Lb (kg) | Catalog Number |
|------|---------------|--------|----------------|----------------|
| 0.05 | 115 | FR52 | 7 (3) | S10N06A81N |
| 0.10 | 115 | FR54 | 7 (3) | S10N06A82N |
| 0.15 | 115 | FR55 | 8 (4) | S10N06A83N |
| 0.25 | 115 | FR57P | 12 (5) | S10N06P26P |
| 0.50 | 115 | FR57P | 13 (5) | S10N06P51P |
| 0.75 | 115 | FR58AP | 21 (10) | S10N06P76P |
| 1 | 115 | FR67P | 31 (14) | S10N06P01P |
| 1.5 | 115 | FR67P | 40 (18) | S10N06P16P |
| 2 | 115 | FR68P | 40 (18) | S10N06P02P |
| 3 | 115 | FR176 | 65 (29) | S10N06A03N |
| 5 | 115 | FR177 | 113 (51) | S10N06A05N |
| 7.5 | 115 | FR178 | 123 (55) | S10N06A07N |

240 x 480 Volts to 24/48 Volts

| kVA | °C Temp. Rise | Frame | Weight Lb (kg) | Catalog Number |
|------|---------------|--------|----------------|----------------|
| 0.05 | 115 | FR52 | 7 (3) | S20N08A81N |
| 0.10 | 115 | FR54 | 7 (3) | S20N08A82N |
| 0.15 | 115 | FR55 | 8 (4) | S20N08A83N |
| 0.25 | 115 | FR57P | 12 (5) | S20N08P26P |
| 0.50 | 115 | FR57P | 13 (5) | S20N08P51P |
| 0.75 | 115 | FR58AP | 21 (10) | S20N08P76P |
| 1 | 115 | FR67P | 31 (14) | S20N08P01P |
| 1.5 | 115 | FR67P | 40 (18) | S20N08P16P |
| 2 | 115 | FR68P | 40 (18) | S20N08P02P |
| 3 | 115 | FR176 | 65 (29) | S20N08A03N |
| 5 | 115 | FR177 | 113 (51) | S20N08A05N |
| 7.5 | 115 | FR178 | 123 (55) | S20N08A07N |

Note

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase 115 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | 96 | | 100 | | 102 | | Catalog Number | | |
|----------------------|----------|-------------------------|---------|---------------|---------|------------|-------|------------|-------|----------------|------------|------------|
| | | 84 Output kVA | 84 Amps | 91 Output kVA | 91 Amps | Output kVA | Amps | Output kVA | Amps | | Output kVA | Amps |
| 1 | 0.05 | — | — | — | — | 0.24 | 2.09 | — | — | — | — | S10N04A81N |
| 1 | 0.05 | 0.13 | 1.14 | 0.18 | 1.56 | — | — | 0.31 | 2.70 | 0.36 | 3.13 | S10N06A81N |
| 1 | 0.10 | — | — | — | — | 0.48 | 4.17 | — | — | — | — | S10N04A82N |
| 1 | 0.10 | 0.26 | 2.29 | 0.36 | 3.12 | — | — | 0.62 | 5.41 | 0.72 | 6.25 | S10N06A82N |
| 1 | 0.15 | — | — | — | — | 0.72 | 6.25 | — | — | — | — | S10N04A83N |
| 1 | 0.15 | 0.39 | 3.44 | 0.54 | 4.69 | — | — | 0.93 | 8.12 | 1.08 | 9.37 | S10N06A83N |
| 1 | 0.25 | — | — | — | — | 1.2 | 10.4 | — | — | — | — | S10N04P26P |
| 1 | 0.25 | 0.659 | 5.73 | 0.899 | 7.81 | — | — | 1.56 | 13.5 | 1.8 | 15.6 | S10N06P26P |
| 1 | 0.50 | — | — | — | — | 2.4 | 20.8 | — | — | — | — | S10N04P51P |
| 1 | 0.50 | 1.32 | 11.5 | 1.8 | 15.6 | — | — | 3.11 | 27.1 | 3.59 | 31.2 | S10N06P51P |
| 1 | 0.75 | — | — | — | — | 3.6 | 31.2 | — | — | — | — | S10N04P76P |
| 1 | 0.75 | 1.98 | 17.2 | 2.7 | 23.4 | — | — | 4.67 | 40.6 | 5.39 | 46.8 | S10N06P76P |
| 1 | 1 | — | — | — | — | 4.79 | 41.7 | — | — | — | — | S10N04P01P |
| 1 | 1 | 2.64 | 22.9 | 3.59 | 31.2 | — | — | 6.23 | 54.1 | 7.19 | 62.5 | S10N06P01P |
| 1 | 1.5 | — | — | — | — | 7.2 | 62.5 | — | — | — | — | S10N04P16P |
| 1 | 1.5 | 3.95 | 34.4 | 5.39 | 46.9 | — | — | 9.34 | 81.2 | 10.8 | 93.7 | S10N06P16P |
| 1 | 2 | — | — | — | — | 9.58 | 83.3 | — | — | — | — | S10N04P02P |
| 1 | 2 | 5.27 | 45.8 | 7.19 | 62.5 | — | — | 12.5 | 108 | 14.4 | 125 | S10N06P02P |
| 1 | 3 | — | — | — | — | 14.37 | 125.1 | — | — | — | — | S10N04A03N |
| 1 | 3 | 7.92 | 68.7 | 10.77 | 93.6 | — | — | 18.69 | 162.3 | 21.57 | 187.5 | S10N06A03N |
| 1 | 5 | — | — | — | — | 23.95 | 208.5 | — | — | — | — | S10N04A05N |
| 1 | 5 | 13.2 | 115 | 18 | 156 | — | — | 31.15 | 270.5 | 35.95 | 312.5 | S10N06A05N |
| 1 | 7.5 | — | — | — | — | 36 | 312 | — | — | — | — | S10N04A07N |
| 1 | 7.5 | 19.8 | 172 | 27 | 234 | — | — | 46.7 | 406 | 53.9 | 468 | S10N06A07N |
| Connection Diagram ② | | D | | B | | B | | C | | A | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase 115 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | | | | | | | | | Catalog Number |
|----------------------|----------|-------------------------|-------|------------|-------|------------|-------|------------|------|------------|-------|----------------|
| | | 105 Output | | 127 Output | | 130 Output | | 138 Output | | 146 Output | | |
| | | kVA | Amps | kVA | Amps | kVA | Amps | kVA | Amps | kVA | Amps | |
| 1 | 0.05 | 0.48 | 4.17 | 0.54 | 4.58 | — | — | 0.29 | 2.5 | — | — | S10N04A81N |
| 1 | 0.05 | — | — | — | — | 0.41 | 3.54 | — | — | 0.23 | 1.98 | S10N06A81N |
| 1 | 0.10 | 0.96 | 8.33 | 1.1 | 9.17 | — | — | 0.58 | 5.0 | — | — | S10N04A82N |
| 1 | 0.10 | — | — | — | — | 0.82 | 7.08 | — | — | 0.46 | 3.95 | S10N06A82N |
| 1 | 0.15 | 1.44 | 12.5 | 1.6 | 13.7 | — | — | 0.87 | 7.5 | — | — | S10N04A83N |
| 1 | 0.15 | — | — | — | — | 1.3 | 10.6 | — | — | 0.69 | 5.93 | S10N06A83N |
| 1 | 0.25 | 2.39 | 20.8 | 2.63 | 22.9 | — | — | 1.44 | 12.5 | — | — | S10N04P26P |
| 1 | 0.25 | — | — | — | — | 2.03 | 17.7 | — | — | 1.14 | 9.88 | S10N06P26P |
| 1 | 0.50 | 4.79 | 41.6 | 5.27 | 45.8 | — | — | 2.87 | 25 | — | — | S10N04P51P |
| 1 | 0.50 | — | — | — | — | 4.07 | 35.4 | — | — | 2.27 | 19.8 | S10N06P51P |
| 1 | 0.75 | 7.19 | 62.4 | 7.9 | 68.7 | — | — | 4.31 | 37.5 | — | — | S10N04P76P |
| 1 | 0.75 | — | — | — | — | 6.1 | 53.1 | — | — | 3.41 | 29.6 | S10N06P76P |
| 1 | 1 | 9.58 | 83.3 | 10.5 | 91.7 | — | — | 5.75 | 50 | — | — | S10N04P01P |
| 1 | 1 | — | — | — | — | 8.14 | 70.8 | — | — | 4.55 | 39.5 | S10N06P01P |
| 1 | 1.5 | 14.4 | 125 | 15.8 | 137 | — | — | 8.62 | 75 | — | — | S10N04P16P |
| 1 | 1.5 | — | — | — | — | 12.2 | 106 | — | — | 6.82 | 59.3 | S10N06P16P |
| 1 | 2 | 19.2 | 16.7 | 21.1 | 183 | — | — | 11.5 | 100 | — | — | S10N04P02P |
| 1 | 2 | — | — | — | — | 16.3 | 142 | — | — | 9.10 | 79.2 | S10N06P02P |
| 1 | 3 | 28.7 | 249.9 | 31.5 | 275.1 | — | — | 17.3 | 150 | — | — | S10N04A03N |
| 1 | 3 | — | — | — | — | 24.4 | 212.4 | — | — | 13.6 | 118.5 | S10N06A03N |
| 1 | 5 | 47.9 | 416.5 | 52.5 | 458.5 | — | — | 28.7 | 250 | — | — | S10N04A05N |
| 1 | 5 | — | — | — | — | 40.7 | 354 | — | — | 22.7 | 197.5 | S10N06A05N |
| 1 | 7.5 | 71.9 | 624 | 79 | 687 | — | — | 43.1 | 357 | — | — | S10N04A07N |
| 1 | 7.5 | — | — | — | — | 61 | 531 | — | — | 34.1 | 296 | S10N06A07N |
| Connection Diagram ② | | A | | A | | A | | B | | B | | |

Notes

① Additional wiring trough may be required.

② Refer to Page V2-T2-148 for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on Page V2-T2-204.

Single-Phase 120 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | | | 100 | | 104 | | 106 | | Catalog Number |
|----------------------|----------|-------------------------|---------|---------------|---------|------------|-------|------------|-------|------------|-------|----------------|
| | | 88 Output kVA | 88 Amps | 95 Output kVA | 95 Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 1 | 0.05 | — | — | — | — | 0.25 | 2.09 | — | — | — | — | S10N04A81N |
| 1 | 0.05 | 0.14 | 1.15 | 0.19 | 1.56 | — | — | 0.33 | 2.70 | 0.38 | 3.13 | S10N06A81N |
| 1 | 0.10 | — | — | — | — | 0.50 | 4.17 | — | — | — | — | S10N04A82N |
| 1 | 0.10 | 0.28 | 2.29 | 0.38 | 3.12 | — | — | 0.65 | 5.41 | 0.75 | 6.25 | S10N06A82N |
| 1 | 0.15 | — | — | — | — | 0.75 | 6.25 | — | — | — | — | S10N04A83N |
| 1 | 0.15 | 0.41 | 3.44 | 0.56 | 4.69 | — | — | 0.98 | 8.12 | 1.12 | 9.37 | S10N06A83N |
| 1 | 0.25 | — | — | — | — | 1.25 | 10.4 | — | — | — | — | S10N04P26P |
| 1 | 0.25 | 0.687 | 5.73 | 0.937 | 7.81 | — | — | 1.62 | 13.5 | 1.87 | 15.6 | S10N06P26P |
| 1 | 0.50 | — | — | — | — | 2.5 | 20.8 | — | — | — | — | S10N04P51P |
| 1 | 0.50 | 1.37 | 11.5 | 1.87 | 15.6 | — | — | 3.25 | 27.1 | 3.75 | 31.2 | S10N06P51P |
| 1 | 0.75 | — | — | — | — | 3.75 | 31.2 | — | — | — | — | S10N04P76P |
| 1 | 0.75 | 2.06 | 17.2 | 2.82 | 23.4 | — | — | 4.87 | 40.6 | 5.62 | 46.8 | S10N06P76P |
| 1 | 1 | — | — | — | — | 5 | 41.7 | — | — | — | — | S10N04P01P |
| 1 | 1 | 2.75 | 22.9 | 3.75 | 31.2 | — | — | 6.5 | 54.1 | 7.5 | 62.5 | S10N06P01P |
| 1 | 1.5 | — | — | — | — | 7.5 | 62.5 | — | — | — | — | S10N04P16P |
| 1 | 1.5 | 4.12 | 34.4 | 5.62 | 46.9 | — | — | 9.75 | 81.2 | 11.2 | 93.7 | S10N06P16P |
| 1 | 2 | — | — | — | — | 10 | 83.3 | — | — | — | — | S10N04P02P |
| 1 | 2 | 5.5 | 45.8 | 7.5 | 62.5 | — | — | 13 | 108 | 15 | 125 | S10N06P02P |
| 1 | 3 | — | — | — | — | 15 | 125.1 | — | — | — | — | S10N04A03N |
| 1 | 3 | 8.25 | 68.7 | 11.25 | 93.6 | — | — | 19.5 | 162.3 | 22.5 | 187.5 | S10N06A03N |
| 1 | 5 | — | — | — | — | 25 | 208.5 | — | — | — | — | S10N04A05N |
| 1 | 5 | 13.75 | 114.5 | 18.75 | 156 | — | — | 32.5 | 270.5 | 37.5 | 312.5 | S10N06A05N |
| 1 | 7.5 | — | — | — | — | 37.5 | 312 | — | — | — | — | S10N04A07N |
| 1 | 7.5 | 20.6 | 172 | 28.2 | 234 | — | — | 48.7 | 406 | 56.2 | 468 | S10N06A07N |
| Connection Diagram ② | | D | | B | | B | | C | | A | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase 120 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | | | | | | | | | Catalog Number |
|----------------------|----------|-------------------------|-------|------------|-------|------------|-------|------------|------|------------|-------|----------------|
| | | 109 Output | | 132 Output | | 136 Output | | 144 Output | | 152 Output | | |
| | | kVA | Amps | kVA | Amps | kVA | Amps | kVA | Amps | kVA | Amps | |
| 1 | 0.05 | 0.5 | 4.17 | 0.55 | 4.58 | — | — | 0.3 | 2.5 | — | — | S10N04A81N |
| 1 | 0.05 | — | — | — | — | 0.43 | 3.54 | — | — | 0.24 | 1.98 | S10N06A81N |
| 1 | 0.10 | 1.0 | 8.33 | 1.1 | 9.17 | — | — | 0.6 | 5.0 | — | — | S10N04A82N |
| 1 | 0.10 | — | — | — | — | 0.85 | 7.08 | — | — | 0.48 | 3.95 | S10N06A82N |
| 1 | 0.15 | 1.5 | 12.5 | 1.6 | 13.7 | — | — | 0.9 | 7.5 | — | — | S10N04A83N |
| 1 | 0.15 | — | — | — | — | 1.27 | 10.6 | — | — | 0.71 | 5.93 | S10N06A83N |
| 1 | 0.25 | 2.5 | 20.8 | 2.75 | 22.9 | — | — | 1.5 | 12.5 | — | — | S10N04P26P |
| 1 | 0.25 | — | — | — | — | 2.12 | 17.7 | — | — | 1.19 | 9.88 | S10N06P26P |
| 1 | 0.50 | 5 | 41.6 | 5.5 | 45.8 | — | — | 3 | 25 | — | — | S10N04P51P |
| 1 | 0.50 | — | — | — | — | 4.25 | 35.4 | — | — | 2.37 | 19.8 | S10N06P51P |
| 1 | 0.75 | 7.5 | 62.4 | 8.25 | 68.7 | — | — | 4.5 | 37.5 | — | — | S10N04P76P |
| 1 | 0.75 | — | — | — | — | 6.37 | 53.1 | — | — | 3.56 | 29.6 | S10N06P76P |
| 1 | 1 | 10 | 83.3 | 11 | 91.7 | — | — | 6 | 50 | — | — | S10N04P01P |
| 1 | 1 | — | — | — | — | 8.5 | 70.8 | — | — | 4.75 | 39.5 | S10N06P01P |
| 1 | 1.5 | 15 | 125 | 16.5 | 137 | — | — | 9 | 75 | — | — | S10N04P16P |
| 1 | 1.5 | — | — | — | — | 12.7 | 106 | — | — | 7.12 | 59.3 | S10N06P16P |
| 1 | 2 | 20 | 167 | 22 | 183 | — | — | 12 | 100 | — | — | S10N04P02P |
| 1 | 2 | — | — | — | — | 17 | 142 | — | — | 9.5 | 79.2 | S10N06P02P |
| 1 | 3 | 30 | 249.9 | 33 | 275.1 | — | — | 18 | 150 | — | — | S10N04A03N |
| 1 | 3 | — | — | — | — | 25.5 | 212.4 | — | — | 14.25 | 118.5 | S10N06A03N |
| 1 | 5 | 50 | 416.5 | 55 | 458.5 | — | — | 30 | 250 | — | — | S10N04A05N |
| 1 | 5 | — | — | — | — | 42.5 | 354 | — | — | 23.7 | 197.5 | S10N06A05N |
| 1 | 7.5 | 75 | 624 | 82.5 | 687 | — | — | 45 | 375 | — | — | S10N04A07N |
| 1 | 7.5 | — | — | — | — | 63.7 | 531 | — | — | 35.6 | 296 | S10N06A07N |
| Connection Diagram ② | | A | | A | | A | | B | | B | | |

Notes

① Additional wiring trough may be required.

② Refer to Page V2-T2-148 for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on Page V2-T2-204.

Single-Phase 230 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | 199 | | 203 | | 207 | | 209 | | 216 | | Catalog Number |
|----------------------|----------|-------------------------|-------|------------|------|------------|-------|------------|-------|------------|------|------------|-------|----------------|
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 1 | 0.05 | — | — | — | — | 0.43 | 1.88 | 0.48 | 2.08 | — | — | — | — | S10N04A81N |
| 1 | 0.05 | 0.31 | 1.36 | 0.36 | 1.56 | — | — | — | — | — | — | 0.72 | 3.12 | S10N06A81N |
| 1 | 0.10 | — | — | — | — | 0.86 | 3.75 | 0.96 | 4.17 | — | — | — | — | S10N04A82N |
| 1 | 0.10 | 0.62 | 2.71 | 0.72 | 3.12 | — | — | — | — | — | — | 1.44 | 6.25 | S10N06A82N |
| 1 | 0.15 | — | — | — | — | 1.29 | 5.62 | 1.44 | 6.25 | — | — | — | — | S10N04A83N |
| 1 | 0.15 | 0.93 | 4.06 | 1.08 | 4.69 | — | — | — | — | — | — | 2.16 | 9.37 | S10N06A83N |
| 1 | 0.25 | — | — | — | — | 2.15 | 9.37 | 2.39 | 10.4 | — | — | — | — | S10N04P26P |
| 1 | 0.25 | 1.55 | 6.77 | 1.8 | 7.81 | — | — | — | — | — | — | 3.59 | 15.6 | S10N06P26P |
| 1 | 0.50 | — | — | — | — | 4.31 | 18.7 | 4.79 | 20.8 | — | — | — | — | S10N04P51P |
| 1 | 0.50 | 3.11 | 13.5 | 3.6 | 15.6 | — | — | — | — | — | — | 7.19 | 31.2 | S10N06P51P |
| 1 | 0.75 | — | — | — | — | 6.46 | 28.2 | 7.19 | 31.2 | — | — | — | — | S10N04P76P |
| 1 | 0.75 | 4.66 | 20.3 | 5.4 | 23.4 | — | — | — | — | — | — | 10.8 | 46.8 | S10N06P76P |
| 1 | 1 | — | — | — | — | 8.62 | 37.5 | 9.58 | 41.7 | — | — | — | — | S10N04P01P |
| 1 | 1 | 6.23 | 27.1 | 7.2 | 31.2 | — | — | — | — | — | — | 14.4 | 62.5 | S10N06P01P |
| 1 | 1.5 | — | — | — | — | 12.9 | 56.2 | 14.4 | 62.5 | — | — | — | — | S10N04P16P |
| 1 | 1.5 | 9.34 | 40.6 | 10.8 | 46.9 | — | — | — | — | — | — | 21.6 | 93.7 | S10N06P16P |
| 1 | 2 | — | — | — | — | 17.2 | 75 | 19.2 | 83.3 | — | — | — | — | S10N04P02P |
| 1 | 2 | 12.5 | 54.2 | 14.4 | 62.5 | — | — | — | — | — | — | 28.7 | 125 | S10N06P02P |
| 1 | 3 | — | — | — | — | 25.8 | 112.5 | 28.7 | 125.1 | — | — | — | — | S10N04A03N |
| 1 | 3 | 18.6 | 81.3 | 21.6 | 93.6 | — | — | — | — | — | — | 43.2 | 187.5 | S10N06A03N |
| 1 | 5 | — | — | — | — | 43.1 | 187.5 | 47.9 | 208.5 | — | — | — | — | S10N04A05N |
| 1 | 5 | 31.1 | 135.5 | 36 | 156 | — | — | — | — | — | — | 72 | 312.5 | S10N06A05N |
| 1 | 7.5 | — | — | — | — | 64.6 | 282 | 71.9 | 312 | — | — | — | — | S10N04A07N |
| 1 | 7.5 | 46.6 | 203 | 54 | 234 | — | — | — | — | — | — | 108 | 468 | S10N06A07N |
| Connection Diagram ② | | G | | F | | G | | F | | E | | | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase 230 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | 219 | | 242 | | 246 | | 253 | | 260 | | Catalog Number |
|----------------------|----------|-------------------------|-------|------------|-------|------------|-------|------------|-------|------------|-------|------------|------|----------------|
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 1 | 0.05 | 0.96 | 4.16 | 1.0 | 4.38 | — | — | 0.53 | 2.29 | — | — | — | — | S10N04A81N |
| 1 | 0.05 | — | — | — | — | 0.77 | 3.34 | — | — | 0.41 | 1.77 | — | — | S10N06A81N |
| 1 | 0.10 | 1.92 | 8.33 | 2.01 | 8.75 | — | — | 1.05 | 4.58 | — | — | — | — | S10N04A82N |
| 1 | 0.10 | — | — | — | — | 1.53 | 6.67 | — | — | 0.82 | 3.54 | — | — | S10N06A82N |
| 1 | 0.15 | 2.87 | 12.5 | 3.02 | 13.1 | — | — | 1.58 | 6.87 | — | — | — | — | S10N04A83N |
| 1 | 0.15 | — | — | — | — | 2.3 | 10.0 | — | — | 1.22 | 5.31 | — | — | S10N06A83N |
| 1 | 0.25 | 4.79 | 20.8 | 5.03 | 21.9 | — | — | 2.63 | 11.5 | — | — | — | — | S10N04P26P |
| 1 | 0.25 | — | — | — | — | 3.83 | 16.7 | — | — | 2.04 | 8.85 | — | — | S10N06P26P |
| 1 | 0.50 | 9.58 | 41.6 | 10.1 | 43.7 | — | — | 5.27 | 22.9 | — | — | — | — | S10N04P51P |
| 1 | 0.50 | — | — | — | — | 7.67 | 33.3 | — | — | 4.07 | 17.7 | — | — | S10N06P51P |
| 1 | 0.75 | 14.4 | 62.4 | 15.1 | 65.6 | — | — | 7.9 | 34.4 | — | — | — | — | S10N04P76P |
| 1 | 0.75 | — | — | — | — | 11.5 | 50 | — | — | 6.11 | 26.6 | — | — | S10N06P76P |
| 1 | 1 | 19.2 | 83.3 | 20.1 | 87.5 | — | — | 10.5 | 45.8 | — | — | — | — | S10N04P01P |
| 1 | 1 | — | — | — | — | 15.3 | 66.7 | — | — | 8.15 | 35.4 | — | — | S10N06P01P |
| 1 | 1.5 | 28.7 | 125 | 30.2 | 131 | — | — | 15.8 | 68.7 | — | — | — | — | S10N04P16P |
| 1 | 1.5 | — | — | — | — | 23 | 100 | — | — | 12.2 | 53.1 | — | — | S10N06P16P |
| 1 | 2 | 38.3 | 167 | 40.2 | 175 | — | — | 21.1 | 91.7 | — | — | — | — | S10N04P02P |
| 1 | 2 | — | — | — | — | 30.7 | 133 | — | — | 16.3 | 70.8 | — | — | S10N06P02P |
| 1 | 3 | 57.6 | 249.9 | 60.3 | 262.5 | — | — | 31.5 | 137.4 | — | — | — | — | S10N04A03N |
| 1 | 3 | — | — | — | — | 45.9 | 200.1 | — | — | 24.4 | 106.2 | — | — | S10N06A03N |
| 1 | 5 | 96 | 416.5 | 100.5 | 437.5 | — | — | 52.5 | 229 | — | — | — | — | S10N04A05N |
| 1 | 5 | — | — | — | — | 76.5 | 333.5 | — | — | 40.7 | 177 | — | — | S10N06A05N |
| 1 | 7.5 | 144 | 624 | 151 | 656 | — | — | 79 | 344 | — | — | — | — | S10N04A07N |
| 1 | 7.5 | — | — | — | — | 115 | 500 | — | — | 61.1 | 266 | — | — | S10N06A07N |
| Connection Diagram ② | | E | | E | | E | | F | | F | | | | |

Notes

① Additional wiring trough may be required.

② Refer to Page V2-T2-148 for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on Page V2-T2-204.

Single-Phase 240 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | 216 | | 218 | | 225 | | Catalog Number | | |
|----------------------|----------|-------------------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|----------------|-----------------|
| | | 208 Output kVA | 208 Output Amps | 212 Output kVA | 212 Output Amps | 216 Output kVA | 216 Output Amps | 218 Output kVA | 218 Output Amps | | 225 Output kVA | 225 Output Amps |
| 1 | 0.05 | — | — | — | — | 0.45 | 1.88 | 0.5 | 2.08 | — | — | S10N04A81N |
| 1 | 0.05 | 0.32 | 1.35 | 0.38 | 1.56 | — | — | — | — | 0.75 | 3.12 | S10N06A81N |
| 1 | 0.10 | — | — | — | — | 0.9 | 3.75 | 1.0 | 4.17 | — | — | S10N04A82N |
| 1 | 0.10 | 0.65 | 2.71 | 0.75 | 3.12 | — | — | — | — | 1.5 | 6.25 | S10N06A82N |
| 1 | 0.15 | — | — | — | — | 1.35 | 5.62 | 1.5 | 6.25 | — | — | S10N04A83N |
| 1 | 0.15 | 0.98 | 4.06 | 1.12 | 4.69 | — | — | — | — | 2.25 | 9.37 | S10N06A83N |
| 1 | 0.25 | — | — | — | — | 2.25 | 9.37 | 2.5 | 10.4 | — | — | S10N04P26P |
| 1 | 0.25 | 1.62 | 6.77 | 1.87 | 7.81 | — | — | — | — | 3.75 | 15.6 | S10N06P26P |
| 1 | 0.50 | — | — | — | — | 4.5 | 18.7 | 5 | 20.8 | — | — | S10N04P51P |
| 1 | 0.50 | 3.25 | 13.5 | 3.75 | 15.6 | — | — | — | — | 7.5 | 31.2 | S10N06P51P |
| 1 | 0.75 | — | — | — | — | 6.75 | 28.2 | 7.5 | 31.2 | — | — | S10N04P76P |
| 1 | 0.75 | 4.87 | 20.3 | 5.62 | 23.4 | — | — | — | — | 11.2 | 46.8 | S10N06P76P |
| 1 | 1 | — | — | — | — | 9 | 37.5 | 10 | 41.7 | — | — | S10N04P01P |
| 1 | 1 | 6.5 | 27.1 | 7.5 | 31.2 | — | — | — | — | 15 | 62.5 | S10N06A01 |
| 1 | 1.5 | — | — | — | — | 13.5 | 56.2 | 15 | 62.5 | — | — | S10N04P16P |
| 1 | 1.5 | 9.75 | 40.6 | 11.2 | 46.9 | — | — | — | — | 22.5 | 93.7 | S10N06P16P |
| 1 | 2 | — | — | — | — | 18 | 75 | 20 | 83.3 | — | — | S10N04P02P |
| 1 | 2 | 13 | 54.2 | 15 | 62.5 | — | — | — | — | 30 | 125 | S10N06P02P |
| 1 | 3 | — | — | — | — | 27 | 112.5 | 30 | 125.1 | — | — | S10N04A03N |
| 1 | 3 | 19.5 | 81.3 | 22.5 | 93.6 | — | — | — | — | 45 | 187.5 | S10N06A03N |
| 1 | 5 | — | — | — | — | 45 | 187 | 50 | 208 | — | — | S10N04A05N |
| 1 | 5 | 32.5 | 135 | 37.5 | 156 | — | — | — | — | 75 | 312 | S10N06A05N |
| 1 | 7.5 | — | — | — | — | 67.5 | 282 | 75 | 312 | — | — | S10N04A07N |
| 1 | 7.5 | 48.7 | 203 | 56.2 | 234 | — | — | — | — | 112 | 468 | S10N06A07N |
| Connection Diagram ② | | G | | F | | G | | F | | E | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase 240 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | | | | | | | | | Catalog Number |
|----------------------|----------|-------------------------|-------|------------|-------|------------|-------|------------|-------|------------|-------|----------------|
| | | 229 | | 252 | | 256 | | 264 | | 272 | | |
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 1 | 0.05 | 1.0 | 4.16 | 1.05 | 4.38 | — | — | 0.55 | 2.29 | — | — | S10N04A81N |
| 1 | 0.05 | — | — | — | — | 0.8 | 3.33 | — | — | 0.42 | 1.77 | S10N06A81N |
| 1 | 0.10 | 2.0 | 8.33 | 2.1 | 8.75 | — | — | 1.1 | 4.58 | — | — | S10N04A82N |
| 1 | 0.10 | — | — | — | — | 1.6 | 6.67 | — | — | 0.85 | 3.54 | S10N06A82N |
| 1 | 0.15 | 3.0 | 12.5 | 3.15 | 13.1 | — | — | 1.65 | 6.87 | — | — | S10N04A83N |
| 1 | 0.15 | — | — | — | — | 2.4 | 10.0 | — | — | 1.27 | 5.31 | S10N06A83N |
| 1 | 0.25 | 5 | 20.8 | 5.25 | 21.9 | — | — | 2.75 | 11.5 | — | — | S10N04P26P |
| 1 | 0.25 | — | — | — | — | 4 | 16.7 | — | — | 2.12 | 8.85 | S10N06P26P |
| 1 | 0.50 | 10 | 41.6 | 10.5 | 43.7 | — | — | 5.5 | 22.9 | — | — | S10N04P51P |
| 1 | 0.50 | — | — | — | — | 8 | 33.3 | — | — | 4.25 | 17.7 | S10N06P51P |
| 1 | 0.75 | 15 | 62.4 | 15.7 | 65.6 | — | — | 8.25 | 34.4 | — | — | S10N04P76P |
| 1 | 0.75 | — | — | — | — | 12 | 50 | — | — | 6.37 | 26.6 | S10N06P76P |
| 1 | 1 | 20 | 83.3 | 21 | 87.5 | — | — | 11 | 45.8 | — | — | S10N04P01P |
| 1 | 1 | — | — | — | — | 16 | 66.7 | — | — | 8.5 | 35.4 | S10N06P01P |
| 1 | 1.5 | 30 | 125 | 31.5 | 131 | — | — | 16.5 | 68.7 | — | — | S10N04P16P |
| 1 | 1.5 | — | — | — | — | 24 | 100 | — | — | 12.7 | 53.1 | S10N06P16P |
| 1 | 2 | 40 | 167 | 42 | 175 | — | — | 22 | 91.7 | — | — | S10N04P02P |
| 1 | 2 | — | — | — | — | 32 | 133 | — | — | 17 | 70.8 | S10N06P02P |
| 1 | 3 | 60 | 249.9 | 63 | 262.5 | — | — | 33 | 137.4 | — | — | S10N04A03N |
| 1 | 3 | — | — | — | — | 48 | 200.1 | — | — | 25.5 | 106.2 | S10N06A03N |
| 1 | 5 | 100 | 416.5 | 105 | 437.5 | — | — | 55 | 229 | — | — | S10N04A05N |
| 1 | 5 | — | — | — | — | 80 | 333 | — | — | 42.5 | 177 | S10N06A05N |
| 1 | 7.5 | 150 | 624 | 157 | 656 | — | — | 82.5 | 344 | — | — | S10N04A07N |
| 1 | 7.5 | — | — | — | — | 120 | 500 | — | — | 63.7 | 266 | S10N06A07N |
| Connection Diagram ② | | E | | E | | E | | F | | F | | |

Notes

① Additional wiring trough may be required.

② Refer to Page V2-T2-148 for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on Page V2-T2-204.

Three-Phase Open Delta Connection 230 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | | | | | | | | | Catalog Number |
|----------------------|----------|-------------------------|------|------------|------|------------|-------|------------|-------|------------|-------|----------------|
| | | 199 | | 203 | | 207 | | 209 | | 216 | | |
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 2 | 0.05 | — | — | — | — | 0.75 | 1.87 | 0.83 | 2.08 | — | — | S10N04A81N |
| 2 | 0.05 | 0.54 | 1.35 | 0.62 | 1.56 | — | — | — | — | 1.24 | 3.12 | S10N06A81N |
| 2 | 0.10 | — | — | — | — | 1.49 | 3.75 | 1.66 | 4.17 | — | — | S10N04A82N |
| 2 | 0.10 | 1.08 | 2.71 | 1.24 | 3.12 | — | — | — | — | 2.49 | 6.25 | S10N06A82N |
| 2 | 0.15 | — | — | — | — | 2.24 | 5.62 | 2.49 | 6.25 | — | — | S10N04A83N |
| 2 | 0.15 | 1.62 | 4.06 | 1.87 | 4.69 | — | — | — | — | 3.73 | 9.37 | S10N06A83N |
| 2 | 0.25 | — | — | — | — | 3.3 | 9.37 | 4.15 | 10.4 | — | — | S10N04P26P |
| 2 | 0.25 | 2.7 | 6.77 | 3.11 | 7.81 | — | — | — | — | 6.22 | 15.6 | S10N06P26P |
| 2 | 0.50 | — | — | — | — | 7.47 | 18.7 | 8.3 | 20.8 | — | — | S10N04P51P |
| 2 | 0.50 | 5.39 | 13.5 | 6.22 | 15.6 | — | — | — | — | 12.4 | 31.2 | S10N06P51P |
| 2 | 0.75 | — | — | — | — | 11.2 | 28.2 | 12.4 | 31.2 | — | — | S10N04P76P |
| 2 | 0.75 | 8.09 | 20.3 | 9.33 | 23.4 | — | — | — | — | 18.7 | 46.8 | S10N06P76P |
| 2 | 1 | — | — | — | — | 14.9 | 37.5 | 16.6 | 41.7 | — | — | S10N04P01P |
| 2 | 1 | 10.8 | 27.1 | 12.4 | 31.2 | — | — | — | — | 24.9 | 62.5 | S10N06P01P |
| 2 | 1.5 | — | — | — | — | 22.4 | 56.2 | 24.9 | 62.5 | — | — | S10N04P16P |
| 2 | 1.5 | 16.2 | 40.6 | 18.7 | 46.9 | — | — | — | — | 37.3 | 93.7 | S10N06P16P |
| 2 | 2 | — | — | — | — | 29.9 | 75 | 33.2 | 83.3 | — | — | S10N04P02P |
| 2 | 2 | 21.6 | 54.2 | 24.9 | 62.5 | — | — | — | — | 49.8 | 125 | S10N06P02P |
| 2 | 3 | — | — | — | — | 44.7 | 112.5 | 49.8 | 125.1 | — | — | S10N04A03N |
| 2 | 3 | 32.4 | 81.3 | 32.7 | 93.6 | — | — | — | — | 74.7 | 187.5 | S10N06A03N |
| 2 | 5 | — | — | — | — | 74.7 | 187 | 83 | 208 | — | — | S10N04A05N |
| 2 | 5 | 53.9 | 135 | 62.2 | 156 | — | — | — | — | 124 | 312.5 | S10N06A05N |
| 2 | 7.5 | — | — | — | — | 112 | 282 | 124 | 312 | — | — | S10N04A07N |
| 2 | 7.5 | 80.9 | 203 | 93.3 | 234 | — | — | — | — | 187 | 468 | S10N06A07N |
| Connection Diagram ② | | L | | K | | L | | K | | I | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Open Delta Connection 230 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | | | | | | | | | Catalog Number |
|----------------------|----------|-------------------------|-------|------------|-------|------------|------|------------|-------|------------|-------|----------------|
| | | 219 | | 242 | | 246 | | 253 | | 260 | | |
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 2 | 0.05 | 1.66 | 4.17 | 1.74 | 4.37 | — | — | 0.91 | 2.29 | — | — | S10N04A81N |
| 2 | 0.05 | — | — | — | — | 1.33 | 3.33 | — | — | 0.70 | 1.77 | S10N06A81N |
| 2 | 0.10 | 3.32 | 8.33 | 3.48 | 8.75 | — | — | 1.83 | 4.58 | — | — | S10N04A82N |
| 2 | 0.10 | — | — | — | — | 2.65 | 6.67 | — | — | 1.41 | 3.54 | S10N06A82N |
| 2 | 0.15 | 4.98 | 12.5 | 5.23 | 13.1 | — | — | 2.74 | 6.87 | — | — | S10N04A83N |
| 2 | 0.15 | — | — | — | — | 3.98 | 10.0 | — | — | 2.12 | 5.13 | S10N06A83N |
| 2 | 0.25 | 8.3 | 20.8 | 8.71 | 21.9 | — | — | 4.56 | 11.5 | — | — | S10N04P26P |
| 2 | 0.25 | — | — | — | — | 6.64 | 16.7 | — | — | 3.52 | 8.85 | S10N06P26P |
| 2 | 0.50 | 16.6 | 41.7 | 17.4 | 43.7 | — | — | 9.73 | 22.9 | — | — | S10N04P51P |
| 2 | 0.50 | — | — | — | — | 13.3 | 33.3 | — | — | 7.05 | 17.7 | S10N06P51P |
| 2 | 0.75 | 24.9 | 62.4 | 26.1 | 65.6 | — | — | 13.7 | 34.4 | — | — | S10N04P76P |
| 2 | 0.75 | — | — | — | — | 19.9 | 50 | — | — | 10.6 | 26.6 | S10N06P76P |
| 2 | 1 | 33.2 | 83.3 | 34.8 | 87.5 | — | — | 18.3 | 45.8 | — | — | S10N04P01P |
| 2 | 1 | — | — | — | — | 26.5 | 66.7 | — | — | 14.1 | 35.4 | S10N06P01P |
| 2 | 1.5 | 49.8 | 125 | 52.3 | 131 | — | — | 27.4 | 68.7 | — | — | S10N04P16P |
| 2 | 1.5 | — | — | — | — | 39.8 | 100 | — | — | 21.2 | 53.1 | S10N06P16P |
| 2 | 2 | 66.4 | 167 | 69.7 | 175 | — | — | 36.5 | 91.7 | — | — | S10N04P02P |
| 2 | 2 | — | — | — | — | 53.1 | 133 | — | — | 28.2 | 70.8 | S10N06P02P |
| 2 | 3 | 99.6 | 249.9 | 104.4 | 262.5 | — | — | 54.9 | 137.4 | — | — | S10N04A03N |
| 2 | 3 | — | — | — | — | 79.5 | 200 | — | — | 42.3 | 106.2 | S10N06A03N |
| 2 | 5 | 166 | 417 | 174 | 437 | — | — | 91.3 | 229 | — | — | S10N04A05N |
| 2 | 5 | — | — | — | — | 133 | 333 | — | — | 70.5 | 177 | S10N06A05N |
| 2 | 7.5 | 249 | 624 | 261 | 656 | — | — | 137 | 344 | — | — | S10N04A07N |
| 2 | 7.5 | — | — | — | — | 199 | 500 | — | — | 106 | 266 | S10N06A07N |
| Connection Diagram ② | I | | | I | | I | | K | | K | | |

Notes

① Additional wiring trough may be required.

② Refer to Page V2-T2-148 for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on Page V2-T2-204.

Three-Phase Open Delta Connection 240 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | 212 | | 216 | | 218 | | 225 | | Catalog Number |
|----------------------|----------|-------------------------|------|------------|------|------------|-------|------------|-------|------------|-------|----------------|
| | | 208 Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 2 | 0.05 | — | — | — | — | 0.73 | 1.87 | 0.87 | 2.08 | — | — | S10N04A81N |
| 2 | 0.05 | 0.56 | 1.35 | 0.65 | 1.56 | — | — | — | — | 1.3 | 3.12 | S10N06A81N |
| 2 | 0.10 | — | — | — | — | 1.56 | 3.75 | 1.73 | 4.17 | — | — | S10N04A82N |
| 2 | 0.10 | 1.13 | 2.71 | 1.3 | 3.12 | — | — | — | — | 2.6 | 6.25 | S10N06A82N |
| 2 | 0.15 | — | — | — | — | 2.34 | 5.62 | 2.6 | 6.25 | — | — | S10N04A83N |
| 2 | 0.15 | 1.69 | 4.06 | 1.95 | 4.69 | — | — | — | — | 3.9 | 9.37 | S10N06A83N |
| 2 | 0.25 | — | — | — | — | 3.9 | 9.37 | 4.33 | 10.4 | — | — | S10N04P26P |
| 2 | 0.25 | 2.81 | 6.77 | 3.25 | 7.81 | — | — | — | — | 6.49 | 15.6 | S10N06P26P |
| 2 | 0.50 | — | — | — | — | 7.79 | 18.7 | 8.66 | 20.8 | — | — | S10N04P51P |
| 2 | 0.50 | 5.63 | 13.5 | 6.5 | 15.6 | — | — | — | — | 13 | 31.2 | S10N06P51P |
| 2 | 0.75 | — | — | — | — | 11.7 | 28.2 | 13 | 31.2 | — | — | S10N04P76P |
| 2 | 0.75 | 8.44 | 20.3 | 9.75 | 23.4 | — | — | — | — | 19.5 | 46.8 | S10N06P76P |
| 2 | 1 | — | — | — | — | 15.6 | 37.5 | 17.3 | 41.7 | — | — | S10N04P01P |
| 2 | 1 | 11.3 | 27.1 | 13 | 31.2 | — | — | — | — | 26 | 62.5 | S10N06P01P |
| 2 | 1.5 | — | — | — | — | 23.4 | 56.2 | 26 | 62.5 | — | — | S10N04P16P |
| 2 | 1.5 | 16.9 | 40.6 | 19.5 | 46.9 | — | — | — | — | 39 | 93.7 | S10N06P16P |
| 2 | 2 | — | — | — | — | 31.2 | 75 | 34.6 | 83.3 | — | — | S10N04P02P |
| 2 | 2 | 22.5 | 54.2 | 26 | 62.5 | — | — | — | — | 52 | 125 | S10N06P02P |
| 2 | 3 | — | — | — | — | 46.8 | 112.5 | 51.9 | 125.1 | — | — | S10N04A03N |
| 2 | 3 | 33.9 | 81.3 | 39 | 93.6 | — | — | — | — | 78 | 187.5 | S10N06A03N |
| 2 | 5 | — | — | — | — | 77.9 | 187 | 86.6 | 208 | — | — | S10N04A05N |
| 2 | 5 | 56.3 | 135 | 65 | 156 | — | — | — | — | 130 | 312 | S10N06A05N |
| 2 | 7.5 | — | — | — | — | 117 | 282 | 130 | 312 | — | — | S10N04A07N |
| 2 | 7.5 | 84.4 | 203 | 97.5 | 234 | — | — | — | — | 195 | 468 | S10N06A07N |
| Connection Diagram ② | | L | | K | | L | | K | | I | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Open Delta Connection 240 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | | | | | | | | | Catalog Number |
|----------------------|----------|-------------------------|-------|------------|-------|------------|------|------------|-------|------------|-------|----------------|
| | | 229 | | 252 | | 256 | | 264 | | 272 | | |
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 2 | 0.05 | 1.73 | 4.16 | 1.82 | 4.37 | — | — | 0.95 | 2.29 | — | — | S10N04A81N |
| 2 | 0.05 | — | — | — | — | 1.38 | 3.33 | — | — | 0.74 | 1.77 | S10N06A81N |
| 2 | 0.10 | 3.46 | 8.33 | 3.64 | 8.75 | — | — | 1.91 | 4.58 | — | — | S10N04A82N |
| 2 | 0.10 | — | — | — | — | 2.77 | 6.67 | — | — | 1.47 | 3.54 | S10N06A82N |
| 2 | 0.15 | 5.19 | 12.5 | 5.45 | 13.1 | — | — | 2.86 | 6.87 | — | — | S10N04A83N |
| 2 | 0.15 | — | — | — | — | 4.15 | 10.0 | — | — | 2.21 | 5.31 | S10N06A83N |
| 2 | 0.25 | 8.66 | 20.8 | 9.09 | 21.9 | — | — | 4.76 | 11.5 | — | — | S10N04P26P |
| 2 | 0.25 | — | — | — | — | 6.92 | 16.7 | — | — | 3.68 | 8.85 | S10N06P26P |
| 2 | 0.50 | 17.3 | 41.6 | 18.2 | 43.7 | — | — | 9.53 | 22.9 | — | — | S10N04P51P |
| 2 | 0.50 | — | — | — | — | 13.8 | 33.3 | — | — | 7.36 | 17.7 | S10N06P51P |
| 2 | 0.75 | 26 | 62.4 | 27.3 | 65.6 | — | — | 14.3 | 34.4 | — | — | S10N04P76P |
| 2 | 0.75 | — | — | — | — | 20.8 | 50 | — | — | 11 | 26.6 | S10N06P76P |
| 2 | 1 | 34.6 | 83.3 | 36.4 | 87.5 | — | — | 19.1 | 45.8 | — | — | S10N04P01P |
| 2 | 1 | — | — | — | — | 27.7 | 66.7 | — | — | 14.7 | 35.4 | S10N06P01P |
| 2 | 1.5 | 51.9 | 125 | 54.5 | 131 | — | — | 28.6 | 68.7 | — | — | S10N04P16P |
| 2 | 1.5 | — | — | — | — | 41.5 | 100 | — | — | 22.1 | 53.1 | S10N06P16P |
| 2 | 2 | 69.3 | 167 | 72.7 | 175 | — | — | 38.1 | 91.7 | — | — | S10N04P02P |
| 2 | 2 | — | — | — | — | 55.4 | 133 | — | — | 29.4 | 70.8 | S10N06P02P |
| 2 | 3 | 103.8 | 249.9 | 109.2 | 262.5 | — | — | 57.3 | 137.4 | — | — | S10N04A03N |
| 2 | 3 | — | — | — | — | 83.1 | 200 | — | — | 44.1 | 106.2 | S10N06A03N |
| 2 | 5 | 173 | 416 | 182 | 437 | — | — | 95.3 | 229 | — | — | S10N04A05N |
| 2 | 5 | — | — | — | — | 138 | 333 | — | — | 73.6 | 177 | S10N06A05N |
| 2 | 7.5 | 260 | 624 | 273 | 656 | — | — | 143 | 344 | — | — | S10N04A07N |
| 2 | 7.5 | — | — | — | — | 208 | 500 | — | — | 110 | 266 | S10N06A07N |
| Connection Diagram ② | | I | | I | | I | | K | | K | | |

Notes

① Additional wiring trough may be required.

② Refer to Page V2-T2-148 for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on Page V2-T2-204.

WARNING! Three-phase autotransformers should never be used to obtain four-wire output with three-wire input. Four-wire output requires four-wire wye input.

2

On all wye connections, the source neutral must be present and connected to the transformer bank. If source neutral is not present, do not use a wye connection.

Three-Phase Wye Connection 208 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | | | | | | | | | Catalog Number |
|----------------------|----------|-------------------------|------|------------|------|------------|------|------------|-------|------------|-------|----------------|
| | | 152 | | 164 | | 173 | | 180 | | 184 | | |
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 3 | 0.05 | — | — | — | — | 0.75 | 2.08 | — | — | — | — | S10N04A81N |
| 3 | 0.05 | 0.41 | 1.15 | 0.56 | 1.56 | — | — | 0.98 | 2.71 | 1.12 | 3.12 | S10N06A81N |
| 3 | 0.10 | — | — | — | — | 1.50 | 4.17 | — | — | — | — | S10N04A82N |
| 3 | 0.10 | 0.82 | 2.29 | 1.12 | 3.12 | — | — | 1.95 | 5.41 | 2.25 | 6.25 | S10N06A82N |
| 3 | 0.15 | — | — | — | — | 2.25 | 6.25 | — | — | — | — | S10N04A83N |
| 3 | 0.15 | 1.24 | 3.44 | 1.69 | 4.69 | — | — | 2.92 | 8.12 | 3.73 | 9.37 | S10N06A83N |
| 3 | 0.25 | — | — | — | — | 3.75 | 10.4 | — | — | — | — | S10N04P26P |
| 3 | 0.25 | 2.06 | 5.73 | 2.81 | 7.81 | — | — | 4.87 | 13.5 | 5.62 | 15.6 | S10N06P26P |
| 3 | 0.50 | — | — | — | — | 7.5 | 20.8 | — | — | — | — | S10N04P51P |
| 3 | 0.50 | 4.12 | 11.5 | 5.62 | 15.6 | — | — | 9.75 | 27.1 | 11.2 | 31.2 | S10N06P51P |
| 3 | 0.75 | — | — | — | — | 11.2 | 31.2 | — | — | — | — | S10N04P76P |
| 3 | 0.75 | 6.19 | 17.2 | 8.44 | 23.4 | — | — | 14.6 | 40.6 | 16.8 | 46.8 | S10N06P76P |
| 3 | 1 | — | — | — | — | 15 | 41.7 | — | — | — | — | S10N04P01P |
| 3 | 1 | 8.25 | 22.9 | 11.2 | 31.2 | — | — | 19.5 | 54.1 | 22.5 | 62.5 | S10N06P01P |
| 3 | 1.5 | — | — | — | — | 22.5 | 62.5 | — | — | — | — | S10N04P16P |
| 3 | 1.5 | 12.4 | 34.4 | 16.9 | 46.9 | — | — | 29.2 | 81.2 | 33.7 | 93.7 | S10N06P16P |
| 3 | 2 | — | — | — | — | 30 | 83.3 | — | — | — | — | S10N04P02P |
| 3 | 2 | 16.5 | 45.8 | 22.5 | 62.5 | — | — | 39 | 108 | 45 | 125 | S10N06P02P |
| 3 | 3 | — | — | — | — | 45 | 125 | — | — | — | — | S10N04A03N |
| 3 | 3 | 24.7 | 68.7 | 33.6 | 93.6 | — | — | 58.5 | 162.3 | 67.5 | 187.5 | S10N06A03N |
| 3 | 5 | — | — | — | — | 75 | 208 | — | — | — | — | S10N04A05N |
| 3 | 5 | 41.2 | 115 | 56.2 | 156 | — | — | 97.5 | 271 | 112 | 312 | S10N06A05N |
| 3 | 7.5 | — | — | — | — | 112 | 312 | — | — | — | — | S10N04A07N |
| 3 | 7.5 | 61.9 | 172 | 84.4 | 234 | — | — | 146 | 406 | 168 | 468 | S10N06A07N |
| Connection Diagram ② | | P | | N | | N | | O | | M | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

WARNING! Three-phase autotransformers should never be used to obtain four-wire output with three-wire input. Four-wire output requires four-wire wye input.

On all wye connections, the source neutral must be present and connected to the transformer bank. If source neutral is not present, do not use a wye connection.

Three-Phase Wye Connection 208 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | 229 | | 236 | | 250 | | 264 | | Catalog Number |
|----------------------|----------|-------------------------|-------|------------|-------|------------|-------|------------|------|------------|-------|----------------|
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 3 | 0.05 | 1.5 | 4.16 | 1.65 | 4.58 | — | — | 0.9 | 2.5 | — | — | S10N04A81N |
| 3 | 0.05 | — | — | — | — | 1.27 | 3.54 | — | — | 0.71 | 1.98 | S10N06A81N |
| 3 | 0.10 | 3.0 | 8.33 | 3.3 | 9.17 | — | — | 1.8 | 5.0 | — | — | S10N04A82N |
| 3 | 0.10 | — | — | — | — | 2.55 | 7.08 | — | — | 1.42 | 3.95 | S10N06A82N |
| 3 | 0.15 | 4.5 | 12.5 | 4.95 | 13.7 | — | — | 2.7 | 7.5 | — | — | S10N04A83N |
| 3 | 0.15 | — | — | — | — | 3.82 | 10.6 | — | — | 2.14 | 5.93 | S10N06A83N |
| 3 | 0.25 | 7.5 | 20.8 | 8.25 | 22.9 | — | — | 4.5 | 12.5 | — | — | S10N04P26P |
| 3 | 0.25 | — | — | — | — | 6.35 | 17.7 | — | — | 3.56 | 9.88 | S10N06P26P |
| 3 | 0.50 | 15 | 41.6 | 16.5 | 45.8 | — | — | 9 | 25 | — | — | S10N04P51P |
| 3 | 0.50 | — | — | — | — | 12.7 | 35.4 | — | — | 7.12 | 19.3 | S10N06P51P |
| 3 | 0.75 | 22.5 | 62.4 | 24.7 | 68.7 | — | — | 13.5 | 37.5 | — | — | S10N04P76P |
| 3 | 0.75 | — | — | — | — | 19 | 53.1 | — | — | 10.7 | 29.3 | S10N06P76P |
| 3 | 1 | 30 | 83.3 | 33 | 91.7 | — | — | 18 | 50 | — | — | S10N04P01P |
| 3 | 1 | — | — | — | — | 25.5 | 70.8 | — | — | 14.2 | 39.5 | S10N06P01P |
| 3 | 1.5 | 45 | 125 | 49.5 | 137 | — | — | 27 | 75 | — | — | S10N04P16P |
| 3 | 1.5 | — | — | — | — | 38.2 | 106 | — | — | 21.4 | 59.3 | S10N06P16P |
| 3 | 2 | 60 | 167 | 66 | 183 | — | — | 361 | 100 | — | — | S10N04P02P |
| 3 | 2 | — | — | — | — | 51 | 142 | — | — | 28.5 | 79.2 | S10N06P02P |
| 3 | 3 | 90 | 249.9 | 99 | 275.1 | — | — | 54 | 150 | — | — | S10N04A03N |
| 3 | 3 | — | — | — | — | 76.5 | 212.4 | — | — | 46.2 | 118.5 | S10N06A03N |
| 3 | 5 | 150 | 416 | 165 | 458 | — | — | 90 | 250 | — | — | S10N04A05N |
| 3 | 5 | — | — | — | — | 127 | 354 | — | — | 71.2 | 198 | S10N06A05N |
| 3 | 7.5 | 225 | 624 | 274 | 687 | — | — | 135 | 375 | — | — | S10N04A07N |
| 3 | 7.5 | — | — | — | — | 190 | 531 | — | — | 107 | 293 | S10N06A07N |
| Connection Diagram ② | | M | | M | | M | | N | | N | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

WARNING! Three-phase autotransformers should never be used to obtain four-wire output with three-wire input. Four-wire output requires four-wire wye input.

2

On all wye connections, the source neutral must be present and connected to the transformer bank. If source neutral is not present, do not use a wye connection.

Three-Phase Wye Connection 230 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | | | | | | | | | Catalog Number |
|----------------------|----------|-------------------------|------|------------|-------|------------|------|------------|------|------------|-------|----------------|
| | | 183 | | 192 | | 199 | | 208 | | 218 | | |
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 3 | 0.05 | — | — | 0.83 | 2.08 | — | — | 1.65 | 4.58 | 1.66 | 4.17 | S10N04A81N |
| 3 | 0.05 | 0.62 | 1.56 | — | — | 0.54 | 1.35 | — | — | — | — | S10N06A81N |
| 3 | 0.10 | — | — | 1.66 | 4.17 | — | — | 3.3 | 9.17 | 3.32 | 8.35 | S10N04A82N |
| 3 | 0.10 | 1.25 | 3.12 | — | — | 1.08 | 2.71 | — | — | — | — | S10N06A82N |
| 3 | 0.15 | — | — | 2.49 | 6.25 | — | — | 4.95 | 13.7 | 4.98 | 12.5 | S10N04A83N |
| 3 | 0.15 | 1.87 | 4.69 | — | — | 1.62 | 4.06 | — | — | — | — | S10N06A83N |
| 3 | 0.25 | — | — | 4.15 | 10.4 | — | — | 8.2 | 22.9 | 8.3 | 20.9 | S10N04P26P |
| 3 | 0.25 | 3.11 | 7.81 | — | — | 2.70 | 6.77 | — | — | — | — | S10N06P26P |
| 3 | 0.50 | — | — | 8.3 | 20.8 | — | — | 16.5 | 45.8 | 16.6 | 41.7 | S10N04P51P |
| 3 | 0.50 | 6.22 | 15.6 | — | — | 5.39 | 13.5 | — | — | — | — | S10N06P51P |
| 3 | 0.75 | — | — | 12.4 | 31.2 | — | — | 24.7 | 68.8 | 24.9 | 62.6 | S10N04P76P |
| 3 | 0.75 | 9.33 | 23.4 | — | — | 8.09 | 20.3 | — | — | — | — | S10N06P76P |
| 3 | 1 | — | — | 16.6 | 41.7 | — | — | 33 | 91.7 | 33.2 | 83.5 | S10N04P01P |
| 3 | 1 | 12.5 | 31.2 | — | — | 10.8 | 27.1 | — | — | — | — | S10N06P01P |
| 3 | 1.5 | — | — | 24.9 | 62.5 | — | — | 49.5 | 137 | 49.8 | 125 | S10N04P16P |
| 3 | 1.5 | 18.7 | 46.9 | — | — | 16.2 | 40.6 | — | — | — | — | S10N06P16P |
| 3 | 2 | — | — | 33.2 | 83.3 | — | — | 66 | 183 | 66.4 | 167 | S10N04P02P |
| 3 | 2 | 24.9 | 62.5 | — | — | 21.6 | 54.2 | — | — | — | — | S10N06P02P |
| 3 | 3 | — | — | 49.8 | 125.1 | — | — | 99 | 275 | 99.6 | 250.5 | S10N04A03N |
| 3 | 3 | 37.5 | 93.6 | — | — | 32.4 | 81.3 | — | — | — | — | S10N06A03N |
| 3 | 5 | — | — | 83 | 208 | — | — | 165 | 458 | 166 | 417 | S10N04A05N |
| 3 | 5 | 62.2 | 156 | — | — | 53.9 | 135 | — | — | — | — | S10N06A05N |
| 3 | 7.5 | — | — | 124 | 312 | — | — | 247 | 688 | 249 | 626 | S10N04A07N |
| 3 | 7.5 | 93.3 | 234 | — | — | 80.9 | 203 | — | — | — | — | S10N06A07N |
| Connection Diagram ② | | N | | N | | S | | M | | Q | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

WARNING! Three-phase autotransformers should never be used to obtain four-wire output with three-wire input. Four-wire output requires four-wire wye input.

On all wye connections, the source neutral must be present and connected to the transformer bank. If source neutral is not present, do not use a wye connection.

Three-Phase Wye Connection 230 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | | | | | | | | | Catalog Number |
|----------------------|----------|-------------------------|-------|------------|------|------------|-------|------------|-------|------------|------|----------------|
| | | 242 | | 245 | | 253 | | 260 | | 265 | | |
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 3 | 0.05 | 1.74 | 4.37 | — | — | 0.91 | 2.29 | — | — | — | — | S10N04A81N |
| 3 | 0.05 | — | — | 1.33 | 3.33 | — | — | 0.70 | 1.77 | 0.62 | 1.56 | S10N06A81N |
| 3 | 0.10 | 3.48 | 8.75 | — | — | 1.83 | 4.58 | — | — | — | — | S10N04A82N |
| 3 | 0.10 | — | — | 2.65 | 6.67 | — | — | 1.41 | 3.54 | 1.25 | 3.12 | S10N06A82N |
| 3 | 0.15 | 5.23 | 13.1 | — | — | 2.74 | 6.87 | — | — | — | — | S10N04A83N |
| 3 | 0.15 | — | — | 3.98 | 10.0 | — | — | 2.12 | 5.31 | 1.87 | 4.69 | S10N06A83N |
| 3 | 0.25 | 8.71 | 21.9 | — | — | 4.56 | 11.5 | — | — | — | — | S10N04P26P |
| 3 | 0.25 | — | — | 6.63 | 16.7 | — | — | 3.52 | 8.85 | 3.11 | 7.81 | S10N06P26P |
| 3 | 0.50 | 17.4 | 43.7 | — | — | 9.31 | 22.9 | — | — | — | — | S10N04P51P |
| 3 | 0.50 | — | — | 13.3 | 33.3 | — | — | 7.05 | 17.7 | 6.22 | 15.6 | S10N06P51P |
| 3 | 0.75 | 26.1 | 65.6 | — | — | 13.7 | 34.4 | — | — | — | — | S10N04P76P |
| 3 | 0.75 | — | — | 19.9 | 50 | — | — | 10.6 | 26.6 | 9.33 | 23.4 | S10N06P76P |
| 3 | 1 | 34.8 | 87.5 | — | — | 18.3 | 45.8 | — | — | — | — | S10N04P01P |
| 3 | 1 | — | — | 26.5 | 66.7 | — | — | 14.1 | 35.4 | 12.5 | 31.2 | S10N06P01P |
| 3 | 1.5 | 52.3 | 131 | — | — | 27.4 | 68.7 | — | — | — | — | S10N04P16P |
| 3 | 1.5 | — | — | 39.8 | 100 | — | — | 21.2 | 53.1 | 18.7 | 46.9 | S10N06P16P |
| 3 | 2 | 69.7 | 175 | — | — | 36.6 | 91.6 | — | — | — | — | S10N04P02P |
| 3 | 2 | — | — | 53.1 | 133 | — | — | 28.2 | 70.8 | 24.9 | 62.5 | S10N06P02P |
| 3 | 3 | 104.4 | 262.5 | — | — | 54.9 | 137.4 | — | — | — | — | S10N04A03N |
| 3 | 3 | — | — | 79.5 | 200 | — | — | 42.3 | 106.2 | 37.5 | 93.6 | S10N06A03N |
| 3 | 5 | 174 | 437 | — | — | 91.3 | 229 | — | — | — | — | S10N04A05N |
| 3 | 5 | — | — | 133 | 333 | — | — | 70.5 | 177 | 62.2 | 156 | S10N06A05N |
| 3 | 7.5 | 261 | 656 | — | — | 137 | 344 | — | — | — | — | S10N04A07N |
| 3 | 7.5 | — | — | 199 | 500 | — | — | 106 | 266 | 93.3 | 234 | S10N06A07N |
| Connection Diagram ② | | Q | | Q | | R | | R | | S | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

WARNING! Three-phase autotransformers should never be used to obtain four-wire output with three-wire input. Four-wire output requires four-wire wye input.

2

On all wye connections, the source neutral must be present and connected to the transformer bank. If source neutral is not present, do not use a wye connection.

Three-Phase Wye Connection 240 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | | | | | | | | | Catalog Number |
|----------------------|----------|-------------------------|------|------------|-------|------------|-------|------------|-------|------------|-------|----------------|
| | | 190 | | 200 | | 208 | | 218 | | 228 | | |
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 3 | 0.05 | — | — | 0.86 | 2.08 | — | — | 0.86 | 2.08 | 1.73 | 4.17 | S10N04A81N |
| 3 | 0.05 | 0.65 | 1.65 | — | — | 1.27 | 3.05 | — | — | — | — | S10N06A81N |
| 3 | 0.10 | — | — | 1.73 | 4.17 | — | — | 1.73 | 4.17 | 3.46 | 8.34 | S10N04A82N |
| 3 | 0.10 | 1.3 | 3.12 | — | — | 2.55 | 6.12 | — | — | — | — | S10N06A82N |
| 3 | 0.15 | — | — | 2.59 | 6.25 | — | — | 2.59 | 6.25 | 5.20 | 12.5 | S10N04A83N |
| 3 | 0.15 | 1.95 | 4.69 | — | — | 3.82 | 9.16 | — | — | — | — | S10N06A83N |
| 3 | 0.25 | — | — | 4.32 | 10.4 | — | — | 4.32 | 10.4 | 8.66 | 20.9 | S10N04P26P |
| 3 | 0.25 | 3.25 | 7.81 | — | — | 6.3 | 15.1 | — | — | — | — | S10N06P26P |
| 3 | 0.50 | — | — | 8.65 | 20.8 | — | — | 8.65 | 20.8 | 17.3 | 41.7 | S10N04P51P |
| 3 | 0.50 | 6.5 | 15.6 | — | — | 12.7 | 30.4 | — | — | — | — | S10N06P51P |
| 3 | 0.75 | — | — | 13 | 31.2 | — | — | 13 | 31.2 | 26 | 62.6 | S10N04P76P |
| 3 | 0.75 | 9.75 | 23.4 | — | — | 19.2 | 46 | — | — | — | — | S10N06P76P |
| 3 | 1 | — | — | 17.3 | 41.7 | — | — | 17.3 | 41.7 | 34.6 | 83.4 | S10N04P01P |
| 3 | 1 | 13 | 31.2 | — | — | 25.5 | 61.2 | — | — | — | — | S10N06P01P |
| 3 | 1.5 | — | — | 25.9 | 62.5 | — | — | 25.9 | 62.5 | 52 | 125 | S10N04P16P |
| 3 | 1.5 | 19.5 | 46.9 | — | — | 38.2 | 91.6 | — | — | — | — | S10N06P16P |
| 3 | 2 | — | — | 34.6 | 83.3 | — | — | 34.6 | 83.3 | 69.3 | 167 | S10N04P02P |
| 3 | 2 | 26 | 62.5 | — | — | 51 | 122.4 | — | — | — | — | S10N06P02P |
| 3 | 3 | — | — | 51.9 | 125.1 | — | — | 51.9 | 125.1 | 103.8 | 250.2 | S10N04A03N |
| 3 | 3 | 39 | 93.6 | — | — | 76.5 | 183.6 | — | — | — | — | S10N06A03N |
| 3 | 5 | — | — | 86.5 | 208 | — | — | 86.5 | 208 | 173 | 417 | S10N04A05N |
| 3 | 5 | 65 | 156 | — | — | 127.2 | 305.2 | — | — | — | — | S10N06A05N |
| 3 | 7.5 | — | — | 130 | 312 | — | — | 130 | 312 | 260 | 626 | S10N04A07N |
| 3 | 7.5 | 97.5 | 234 | — | — | 192 | 460 | — | — | — | — | S10N06A07N |
| Connection Diagram ② | | N | | N | | M | | R | | Q | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

WARNING! Three-phase autotransformers should never be used to obtain four-wire output with three-wire input. Four-wire output requires four-wire wye input.

On all wye connections, the source neutral must be present and connected to the transformer bank. If source neutral is not present, do not use a wye connection.

Three-Phase Wye Connection 240 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | 256 | | 264 | | 272 | | 277 | | Catalog Number |
|----------------------|----------|-------------------------|-------|------------|------|------------|-------|------------|-------|------------|------|----------------|
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 3 | 0.05 | 1.85 | 4.37 | — | — | 0.95 | 2.29 | — | — | — | — | S10N04A81N |
| 3 | 0.05 | — | — | 1.39 | 3.33 | — | — | 0.74 | 1.77 | 0.65 | 1.56 | S10N06A81N |
| 3 | 0.10 | 3.64 | 8.75 | — | — | 1.91 | 4.58 | — | — | — | — | S10N04A82N |
| 3 | 0.10 | — | — | 2.77 | 6.67 | — | — | 1.47 | 3.54 | 1.3 | 3.12 | S10N06A82N |
| 3 | 0.15 | 5.46 | 13.1 | — | — | 2.86 | 6.87 | — | — | — | — | S10N04A83N |
| 3 | 0.15 | — | — | 4.16 | 10.0 | — | — | 2.21 | 5.31 | 1.95 | 4.69 | S10N06A83N |
| 3 | 0.25 | 9.09 | 21.9 | — | — | 4.76 | 11.5 | — | — | — | — | S10N04P26P |
| 3 | 0.25 | — | — | 6.93 | 16.7 | — | — | 3.68 | 8.85 | 3.25 | 7.81 | S10N06P26P |
| 3 | 0.50 | 18.2 | 43.7 | — | — | 9.53 | 22.9 | — | — | — | — | S10N04P51P |
| 3 | 0.50 | — | — | 13.9 | 33.3 | — | — | 7.36 | 17.7 | 6.5 | 15.6 | S10N06P51P |
| 3 | 0.75 | 27.3 | 65.6 | — | — | 14.3 | 34.4 | — | — | — | — | S10N04P76P |
| 3 | 0.75 | — | — | 20.8 | 50 | — | — | 11 | 26.6 | 9.75 | 23.4 | S10N06P76P |
| 3 | 1 | 36.4 | 87.5 | — | — | 19.1 | 45.8 | — | — | — | — | S10N04P01P |
| 3 | 1 | — | — | 27.7 | 66.7 | — | — | 14.7 | 35.4 | 13 | 31.2 | S10N06P01P |
| 3 | 1.5 | 54.6 | 131 | — | — | 28.6 | 68.7 | — | — | — | — | S10N04P16P |
| 3 | 1.5 | — | — | 41.6 | 100 | — | — | 22.1 | 53.1 | 19.5 | 46.9 | S10N06P16P |
| 3 | 2 | 72.8 | 175 | — | — | 38.1 | 91.7 | — | — | — | — | S10N04P02P |
| 3 | 2 | — | — | 55.4 | 133 | — | — | 29.5 | 70.8 | 26 | 62.5 | S10N06P02P |
| 3 | 3 | 109.2 | 262.5 | — | — | 57.3 | 137.4 | — | — | — | — | S10N04A03N |
| 3 | 3 | — | — | 83.1 | 200 | — | — | 44.1 | 106.2 | 39 | 93.6 | S10N06A03N |
| 3 | 5 | 182 | 437 | — | — | 95.3 | 229 | — | — | — | — | S10N04A05N |
| 3 | 5 | — | — | 139 | 333 | — | — | 73.6 | 177 | 65 | 156 | S10N06A05N |
| 3 | 7.5 | 273 | 656 | — | — | 143 | 344 | — | — | — | — | S10N04A07N |
| 3 | 7.5 | — | — | 208 | 500 | — | — | 110 | 266 | 97.5 | 234 | S10N06A07N |
| Connection Diagram ② | | Q | | Q | | R | | R | | S | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

WARNING! Three-phase autotransformers should never be used to obtain four-wire output with three-wire input. Four-wire output requires four-wire wye input.

2

On all wye connections, the source neutral must be present and connected to the transformer bank. If source neutral is not present, do not use a wye connection.

Three-Phase Wye Connection 460 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | | | | | | | Catalog Number |
|----------------------|----------|-------------------------|--------|------------|--------|------------|--------|------------|--------|----------------|
| | | 406 | | 418 | | 432 | | 438 | | |
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 3 | 0.05 | — | — | 1.66 | 2.08 | — | — | 3.22 | 4.04 | S10N04A81N |
| 3 | 0.05 | 1.25 | 1.57 | — | — | 2.49 | 3.12 | — | — | S10N06A81N |
| 3 | 0.10 | — | — | 3.31 | 4.15 | — | — | 6.62 | 8.31 | S10N04A82N |
| 3 | 0.10 | 2.49 | 3.12 | — | — | 4.97 | 6.24 | — | — | S10N06A82N |
| 3 | 0.15 | — | — | 4.97 | 6.24 | — | — | 9.94 | 12.48 | S10N04A83N |
| 3 | 0.15 | 3.73 | 4.68 | — | — | 7.46 | 9.36 | — | — | S10N06A83N |
| 3 | 0.25 | — | — | 8.28 | 10.39 | — | — | 16.6 | 20.84 | S10N04P26P |
| 3 | 0.25 | 6.22 | 7.81 | — | — | 12.4 | 15.56 | — | — | S10N06P26P |
| 3 | 0.50 | — | — | 16.6 | 20.84 | — | — | 33.2 | 41.67 | S10N04P51P |
| 3 | 0.50 | 12.5 | 15.69 | — | — | 24.69 | 31.25 | — | — | S10N06P51P |
| 3 | 0.75 | — | — | 24.8 | 31.12 | — | — | 49.6 | 62.25 | S10N04P76P |
| 3 | 0.75 | 18.7 | 23.47 | — | — | 37.3 | 46.82 | — | — | S10N06P76P |
| 3 | 1 | — | — | 33.1 | 41.54 | — | — | 66.2 | 83.09 | S10N04P01P |
| 3 | 1 | 24.9 | 31.25 | — | — | 49.7 | 62.38 | — | — | S10N06P01P |
| 3 | 1.5 | — | — | 49.7 | 62.38 | — | — | 99.4 | 124.75 | S10N04P16P |
| 3 | 1.5 | 37.3 | 46.94 | — | — | 74.6 | 93.63 | — | — | S10N06P16P |
| 3 | 2 | — | — | 66.3 | 83.22 | — | — | 133 | 166.93 | S10N04P02P |
| 3 | 2 | 49.7 | 62.38 | — | — | 99.5 | 124.88 | — | — | S10N06P02P |
| 3 | 3 | — | — | 99.3 | 124.64 | — | — | 198.6 | 249.27 | S10N04A03N |
| 3 | 3 | 74.6 | 93.63 | — | — | 149 | 187.01 | — | — | S10N06A03N |
| 3 | 5 | — | — | 166 | 208.35 | — | — | 322 | 404.16 | S10N04A05N |
| 3 | 5 | 125 | 156.89 | — | — | 249 | 312.53 | — | — | S10N06A05N |
| 3 | 7.5 | — | — | 248 | 311 | — | — | 496 | 622 | S10N04A07N |
| 3 | 7.5 | 187 | 235 | — | — | 373 | 468 | — | — | S10N06A07N |
| Connection Diagram ② | | R | | R | | Q | | Q | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

WARNING! Three-phase autotransformers should never be used to obtain four-wire output with three-wire input. Four-wire output requires four-wire wye input.

On all wye connections, the source neutral must be present and connected to the transformer bank. If source neutral is not present, do not use a wye connection.

Three-Phase Wye Connection 460 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | 436 | | 450 | | Catalog Number |
|----------------------|----------|-------------------------|-------|------------|-------|------------|-------|----------------|
| | | 424 Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 3 | 0.05 | — | 1.7 | 2.1 | — | — | — | S10N04A81N |
| 3 | 0.05 | 1.3 | 1.56 | — | — | 2.6 | 3.13 | S10N06A81N |
| 3 | 0.10 | — | — | 3.5 | 4.2 | — | — | S10N04A82N |
| 3 | 0.10 | 2.6 | 3.12 | — | — | 5.2 | 6.25 | S10N06A82N |
| 3 | 0.15 | — | — | 5.2 | 6.25 | — | — | S10N04A83N |
| 3 | 0.15 | 3.9 | 4.68 | — | — | 7.8 | 9.38 | S10N06A83N |
| 3 | 0.25 | — | — | 8.7 | 10.4 | — | — | S10N04P26P |
| 3 | 0.25 | 6.5 | 7.82 | — | — | 13 | 15.6 | S10N06P26P |
| 3 | 0.50 | — | — | 17.4 | 20.9 | — | — | S10N04P51P |
| 3 | 0.50 | 13 | 15.6 | — | — | 26 | 31.2 | S10N06P51P |
| 3 | 0.75 | — | — | 26 | 31.2 | — | — | S10N04P76P |
| 3 | 0.75 | 19.5 | 23.4 | — | — | 39 | 46.9 | S10N06P76P |
| 3 | 1 | — | — | 35 | 42 | — | — | S10N04P01P |
| 3 | 1 | 26 | 31.2 | — | — | 52 | 62.5 | S10N06P01P |
| 3 | 1.5 | — | — | 52 | 62.5 | — | — | S10N04P16P |
| 3 | 1.5 | 39 | 46.8 | — | — | 78 | 93.8 | S10N06P16P |
| 3 | 2 | — | — | 69 | 82.9 | — | — | S10N04P02P |
| 3 | 2 | 52 | 62.5 | — | — | 104 | 125 | S10N06P02P |
| 3 | 3 | — | — | 104 | 125 | — | — | S10N04A03N |
| 3 | 3 | 78 | 93.8 | — | — | 156 | 187.6 | S10N06A03N |
| 3 | 5 | — | — | 174 | 209.2 | — | — | S10N04A05N |
| 3 | 5 | 130 | 156.3 | — | — | 260 | 312.7 | S10N06A05N |
| 3 | 7.5 | — | — | 260 | 312 | — | — | S10N04A07N |
| 3 | 7.5 | 195 | 234 | — | — | 390 | 469 | S10N06A07N |
| Connection Diagram ② | | R | | R | | Q | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage/Output Voltage | | | | 346/380 | | 362/380 | | Catalog Number |
|----------------------|----------|--|-------|--------------------------|-------|---------------|-------|---------------|-------|----------------|
| | | 200/240 Output kVA | Amps | 230/277 Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 1 | 0.25 | 1.25 | 5.2 | 1.44 | 5.2 | 1.98 | 5.2 | 3.95 | 10.4 | S20N08P26P |
| 1 | 0.50 | 2.50 | 10.4 | 2.88 | 10.4 | 3.95 | 10.4 | 7.90 | 20.8 | S20N08P51P |
| 1 | 0.75 | 3.75 | 15.6 | 4.32 | 15.6 | 5.93 | 15.6 | 11.9 | 31.2 | S20N08P76P |
| 1 | 1 | 5.00 | 20.8 | 5.76 | 20.8 | 7.90 | 20.8 | 15.8 | 41.6 | S20N08P01P |
| 1 | 1.5 | 7.50 | 31.2 | 8.64 | 31.2 | 11.9 | 31.2 | 23.8 | 62.5 | S20N08P16P |
| 1 | 2 | 10.0 | 41.6 | 11.5 | 41.6 | 15.8 | 41.6 | 31.6 | 83.3 | S20N08P02P |
| 1 | 3 | 15.0 | 62.5 | 17.3 | 62.5 | 23.8 | 62.5 | 47.5 | 125.0 | S20N08A03N |
| 1 | 5 | 25.0 | 104.0 | 28.8 | 104.0 | 39.5 | 104.0 | 79.0 | 208.0 | S20N08A05N |
| 1 | 7.5 | 37.5 | 156.0 | 43.2 | 156.0 | 59.3 | 156.0 | 118.6 | 312.0 | S20N08A07N |
| Connection Diagram ② | | B | | B | | F | | E | | |

Single-Phase Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage/Output Voltage | | | | 436/480 | | 458/480 | | Catalog Number |
|----------------------|----------|--|-------|--------------------------|-------|---------------|-------|---------------|-------|----------------|
| | | 378/416 Output kVA | Amps | 416/457 Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 1 | 0.25 | 2.16 | 5.2 | 2.38 | 5.2 | 2.50 | 5.2 | 4.99 | 10.4 | S20N08P26P |
| 1 | 0.50 | 4.33 | 10.4 | 4.76 | 10.4 | 4.99 | 10.4 | 9.98 | 20.8 | S20N08P51P |
| 1 | 0.75 | 6.49 | 15.6 | 7.14 | 15.6 | 7.49 | 15.6 | 15.0 | 31.2 | S20N08P76P |
| 1 | 1 | 8.65 | 20.8 | 9.52 | 20.8 | 9.98 | 20.8 | 20.0 | 41.6 | S20N08P01P |
| 1 | 1.5 | 13.0 | 31.2 | 14.3 | 31.2 | 15.0 | 31.2 | 30.0 | 62.5 | S20N08P16P |
| 1 | 2 | 17.3 | 41.6 | 19.0 | 41.6 | 20.0 | 41.6 | 40.0 | 83.3 | S20N08P02P |
| 1 | 3 | 26.0 | 62.5 | 28.6 | 62.5 | 30.0 | 62.5 | 60.0 | 125.0 | S20N08A03N |
| 1 | 5 | 43.3 | 104.0 | 47.6 | 104.0 | 49.9 | 104.0 | 99.8 | 208.0 | S20N08A05N |
| 1 | 7.5 | 64.9 | 156.0 | 71.4 | 156.0 | 74.9 | 156.0 | 149.8 | 312.0 | S20N08A07N |
| Connection Diagram ② | | F | | F | | F | | E | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage/Output Voltage | | 277/230 | | 480/456 | | 504/480 | | 528/480 | | Catalog Number |
|----------------------|----------|--|-------|------------|-------|------------|-------|------------|-------|---------|-------------------|----------------|
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | | | |
| 1 | 0.25 | 1.44 | 6.26 | 5.23 | 11.4 | 5.47 | 11.4 | 2.75 | 5.72 | | S20N08P26P | |
| 1 | 0.50 | 2.88 | 12.5 | 10.4 | 22.8 | 10.9 | 22.8 | 5.49 | 11.4 | | S20N08P51P | |
| 1 | 0.75 | 4.33 | 18.8 | 15.7 | 34.2 | 16.4 | 34.2 | 8.24 | 17.2 | | S20N08P76P | |
| 1 | 1 | 5.76 | 25.0 | 20.9 | 45.6 | 21.8 | 45.6 | 11.0 | 22.9 | | S20N08P01P | |
| 1 | 1.5 | 8.64 | 37.6 | 31.3 | 68.4 | 32.8 | 68.4 | 16.5 | 34.3 | | S20N08P16P | |
| 1 | 2 | 11.5 | 50.1 | 41.8 | 91.2 | 43.7 | 91.2 | 22.0 | 45.8 | | S20N08P02P | |
| 1 | 3 | 17.3 | 75.3 | 62.7 | 136.0 | 65.2 | 136.0 | 33.0 | 68.8 | | S20N08A03N | |
| 1 | 5 | 28.8 | 125.3 | 104.5 | 227.0 | 108.0 | 227.0 | 54.9 | 114.4 | | S20N08A05N | |
| 1 | 7.5 | 43.2 | 187.9 | 156.8 | 341.0 | 163.0 | 341.0 | 82.4 | 171.6 | | S20N08A07N | |
| Connection Diagram ② | | B | | E | | E | | F | | | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Required, 60 Hz

| Unit kVA | Input Available Voltage/Output Voltage | | | | | | | | | | Catalog Number |
|---------------------------------|--|-------|---------------|-------|---------------|-------|---------------|-------|---------------|-------|----------------|
| | 362/380 | | 346/416 | | 430/473 | | 400/480 | | 436/480 | | |
| | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 0.25 | 6.52 | 10.4 | 3.75 | 5.2 | 4.26 | 5.2 | 4.33 | 5.2 | 4.33 | 5.2 | S20N08P26P |
| 0.50 | 13.0 | 20.8 | 7.50 | 10.4 | 8.52 | 10.4 | 8.65 | 10.4 | 8.65 | 10.4 | S20N08P51P |
| 0.75 | 19.6 | 31.2 | 11.2 | 15.6 | 12.8 | 15.6 | 13.0 | 15.6 | 13.0 | 15.6 | S20N08P76P |
| 1 | 26.1 | 41.6 | 15.0 | 20.8 | 17.0 | 20.8 | 17.3 | 20.8 | 17.3 | 20.8 | S20N08P01P |
| 1.5 | 39.1 | 62.4 | 22.5 | 31.2 | 25.5 | 31.2 | 26.0 | 31.2 | 26.0 | 31.2 | S20N08P16P |
| 2 | 52.2 | 83.2 | 30.0 | 41.6 | 34.1 | 41.6 | 34.6 | 41.6 | 34.6 | 41.6 | S20N08P02P |
| 3 | 78.4 | 125.0 | 45.0 | 62.5 | 51.2 | 62.5 | 52.0 | 62.5 | 52.0 | 62.5 | S20N08A03N |
| 5 | 130.4 | 208.0 | 75.1 | 104.0 | 85.2 | 104.0 | 86.6 | 104.0 | 86.6 | 104.0 | S20N08A05N |
| 7.5 | 195.6 | 312.0 | 112.6 | 156.0 | 127.8 | 156.0 | 129.9 | 156.0 | 129.9 | 156.0 | S20N08A07N |
| Connection Diagram ^① | I | | N | | K | | N | | K | | |
| Units Required ^② | 2 | | 3 | | 2 | | 3 | | 2 | | |

Three-Phase Required, 60 Hz

| Unit kVA | Input Available Voltage/Output Voltage | | | | | | | | Catalog Number |
|---------------------------------|--|-------|---------------|-------|---------------|-------|---------------|-------|----------------|
| | 460/483 | | 457/380 | | 504/480 | | 528/480 | | |
| | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 0.25 | 8.7 | 10.4 | 4.12 | 6.25 | 9.08 | 10.9 | 4.76 | 5.72 | S20N08P26P |
| 0.50 | 17.4 | 20.8 | 8.23 | 12.5 | 18.2 | 21.8 | 9.51 | 11.4 | S20N08P51P |
| 0.75 | 26.1 | 31.2 | 12.3 | 18.8 | 27.2 | 32.8 | 14.3 | 17.2 | S20N08P76P |
| 1 | 34.8 | 41.6 | 16.5 | 25.0 | 36.3 | 43.7 | 19.0 | 22.9 | S20N08P01P |
| 1.5 | 52.2 | 62.4 | 24.7 | 37.5 | 54.5 | 65.5 | 28.5 | 34.3 | S20N08P16P |
| 2 | 69.6 | 83.2 | 32.9 | 50.0 | 72.6 | 87.4 | 38.0 | 45.8 | S20N08P02P |
| 3 | 104.6 | 125.0 | 49.5 | 75.2 | 109.7 | 131.3 | 57.2 | 68.8 | S20N08A03N |
| 5 | 174.0 | 208.0 | 82.3 | 125.1 | 181.6 | 218.4 | 95.1 | 114.4 | S20N08A05N |
| 7.5 | 261.0 | 312.0 | 123.5 | 187.6 | 272.4 | 327.6 | 142.7 | 171.6 | S20N08A07N |
| Connection Diagram ^① | I | | N | | I | | K | | |
| Units Required ^② | 2 | | 3 | | 2 | | 2 | | |

Notes

^① Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

^② Additional wiring trough may be required.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Open Delta Connection 480 Volt Output Required, 60 Hz

| Units Required ^① | Input Available Voltage | | 575 | | 575 | | Catalog Number ^② |
|---------------------------------|-------------------------|-------|---------------|-------|---------------|------|-----------------------------|
| | 600 Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 2 | 4.3 | 5.1 | — | — | — | — | S20N11P51P |
| 2 | — | — | — | — | 4.1 | 4.9 | S60G11P51P |
| 2 | 6.5 | 7.8 | — | — | — | — | S20N11P76P |
| 2 | — | — | — | — | 6.2 | 7.4 | S60G11P76P |
| 2 | 8.6 | 10.3 | — | — | — | — | S20N11P01P |
| 2 | — | — | — | — | 8.3 | 9.9 | S60G11P01P |
| 2 | 13.0 | 15.6 | — | — | — | — | S20N11P16P |
| 2 | — | — | — | — | 12.4 | 14.9 | S60G11P16P |
| 2 | 17.2 | 20.6 | — | — | — | — | S20N11P02P |
| 2 | — | — | — | — | 16.5 | 19.8 | S60G11P02P |
| 2 | 25.8 | 31 | — | — | — | — | S20N11S03N |
| 2 | — | — | — | — | 24.8 | 29.8 | S60G11P03P |
| 2 | 43.2 | 51.9 | — | — | — | — | S20N11S05N |
| 2 | — | — | — | — | 41 | 49.3 | S60G11S05N |
| 2 | 65 | 78.1 | — | — | — | — | S20N11S07N |
| 2 | — | — | — | — | 62 | 74.5 | S60G11S07N |
| 2 | 86 | 103.4 | — | — | — | — | S20N11S10N |
| 2 | — | — | 83 | 99.8 | — | — | S60G11S10N |
| 2 | 130 | 156.3 | — | — | — | — | S20N11S15N |
| 2 | — | — | 124 | 149.1 | — | — | S60N11S15N |
| 2 | 216 | 259.8 | — | — | — | — | T20P11S2516 |
| 2 | — | — | 207 | 248.9 | — | — | S60J11S25N |
| 2 | 324 | 389.7 | — | — | — | — | T20P11S3716 |
| 2 | 432 | 519.6 | — | — | — | — | T20P11S5016 |
| Connection Diagram ^③ | I | | J | | T | | |

Notes

- ① Additional wiring trough may be required.
 - ② On transformers supplied with standard taps, taps must be placed at nominal settings.
 - ③ Refer to **Page V2-T2-148** for buck-boost wiring diagrams.
- Autotransformers can be used only where local electric codes permit and isolation of the two circuits is not required.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase 480 Volt Output Required, 60 Hz

| Units Required ^① | Input Available Voltage | | 575 | | 575 | | Catalog Number ^② |
|---------------------------------|-------------------------|-------|---------------|------|---------------|------|-----------------------------|
| | 600 Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 1 | 2.5 | 5.2 | — | — | — | — | S20N11P51P |
| 1 | — | — | — | — | 2.4 | 5 | S60G11P51P |
| 1 | 3.7 | 7.7 | — | — | — | — | S20N11P76P |
| 1 | — | — | — | — | 3.6 | 7.5 | S60G11P76P |
| 1 | 5.0 | 10.4 | — | — | — | — | S20N11P01P |
| 1 | — | — | — | — | 4.8 | 10 | S60G11P01P |
| 1 | 7.5 | 15.6 | — | — | — | — | S20N11P16P |
| 1 | — | — | — | — | 7.2 | 15 | S60G11P16P |
| 1 | 10 | 20.8 | — | — | — | — | S20N11P02P |
| 1 | — | — | — | — | 9.6 | 20 | S60G11P02P |
| 1 | 15 | 31.2 | — | — | — | — | S20N11S03N |
| 1 | — | — | — | — | 14.3 | 29.7 | S60G11P03P |
| 1 | 25 | 52 | — | — | — | — | S20N11S05N |
| 1 | — | — | — | — | 24 | 50 | S60G11S05N |
| 1 | 37.5 | 78.1 | — | — | — | — | S20N11S07N |
| 1 | — | — | — | — | 36 | 75 | S60G11S07N |
| 1 | 50 | 104.1 | — | — | — | — | S20N11S10N |
| 1 | — | — | 43 | 100 | — | — | S60G11S10N |
| 1 | 75 | 156.2 | — | — | — | — | S20N11S15N |
| 1 | — | — | 72 | 150 | — | — | S60N11S15N |
| 1 | 125 | 260.4 | — | — | — | — | T20P11S2516 |
| 1 | — | — | 120 | 250 | — | — | S60J11S25N |
| 1 | 187 | 389.6 | — | — | — | — | T20P11S3716 |
| 1 | 250 | 520.8 | — | — | — | — | T20P11S5016 |
| Connection Diagram ^③ | E | | H | | U | | |

Notes

① Additional wiring trough may be required.

② On transformers supplied with standard taps, taps must be placed at nominal settings.

③ Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Autotransformers can be used only where local electric codes permit and isolation of the two circuits is not required.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Buck-Boost and Low-Voltage Lighting Transformers

Accessories

Please refer to Section 2.7 Page V2-T2-167.

Technical Data and Specifications

Frequency

Eaton buck-boost transformers are designed for 60 Hz operation.

Overload Capability

Short-term overload is designed into transformers as required by ANSI. Dry-type distribution transformers will deliver 200% nameplate load for one-half hour, 150% load for one hour, and 125% load for four hours without being damaged, provided that a constant 50% load precedes and follows the overload. See ANSI C57.96-01.250 for additional limitations.

Continuous overload capacity is not deliberately designed into a transformer because the design objective is to be within the allowed winding temperature rise with nameplate loading.

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Insulation System Classification

| Ambient | + Winding Rise | + Hot Spot | = Temp. Class |
|---------|----------------|------------|---------------|
| 40°C | 55°C | 10°C | 105°C |
| 40°C | 80°C | 30°C | 150°C |
| 25°C | 135°C | 20°C | 180°C |
| 40°C | 115°C | 30°C | 185°C |
| 40°C | 150°C | 30°C | 220°C |

The design life of transformers having different insulation systems is the same—the lower-temperature systems are designed for the same life as the higher-temperature systems.

Enclosures

Eaton encapsulated buck-boost transformers use a NEMA 3R rated enclosure.

Winding Terminations

Primary and secondary windings are terminated in the wiring compartment. Encapsulated units have copper leads or stabs brought out for connections. **Lugs are not supplied with these transformers.** Eaton recommends that external cables be rated 90°C (sized at 75°C ampacity) for encapsulated designs.

Series-Multiple Windings

Series-multiple windings consist of two similar coils in each winding that can be connected in series or parallel (multiple). Transformers with series-multiple windings are designated with an “x” or “/” between the voltage ratings, such as voltages of “120/240” or “240 x 480.” If the series-multiple winding is designated by an “x,” the winding can be connected only for a series or parallel. With the “/” designation, a mid-point also becomes available in addition to the series or parallel connection. As an example, a 120 x 240 winding can be connected for either 120 (parallel) or 240 (series), but a 120/240 winding can be connected for 120 (parallel), 240 (series) or 240 with a 120 mid-point.

Sound Levels

All Eaton 600 volt class general-purpose dry-type distribution transformers are designed to meet NEMA ST-20 sound levels listed here. These are the sound levels measured in a soundproof environment. Actual sound levels measured at an installation will likely be higher due to electrical connections and environmental conditions. Lower sound levels are available and should be specified when the transformer is going to be installed in an area where sound may be a concern.

For additional information, please refer to Section 2.7 Page V2-T2-171.

Note: When installation is to be made on a grounded system, consideration must be given to the resulting voltage. Thus, on a 208 grounded wye/120 system, the voltage can be boosted to 240 volts but the voltage to ground will be 139 volts. If 240/120 volts with a mid-point ground is needed, a standard two-winding transformer must be used.

The following formulas can be used to calculate specific requirements.

For single-phase:

$$\text{LOAD kVA} = \frac{\text{Load Voltage} \times \text{Full Line Amperes}}{1000}$$

For three-phase:

$$\text{LOAD kVA} = \frac{\text{Line Load Voltage} \times 1.73 \times \text{Full Load Amperes}}{1000}$$

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilated (up to 1.2 kV) | | Encapsulated (up to 1.2 kV) |
|---------------------------------|---------------------------------------|-----------------|--------------------------------|
| | K-Factor 1, 4, 9 | K-Factor 13, 20 | |
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Wiring Diagrams

2

Buck-Boost Transformers Wiring Diagrams

Diagram A

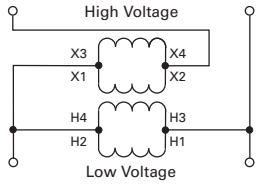


Diagram B

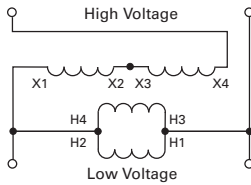


Diagram C

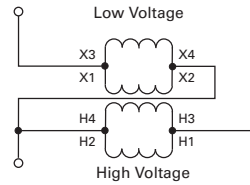


Diagram D

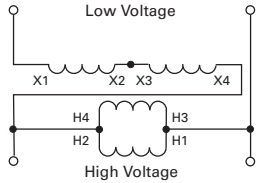


Diagram E

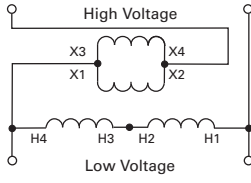


Diagram F

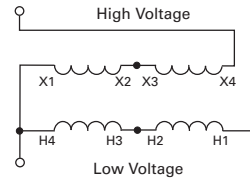


Diagram G

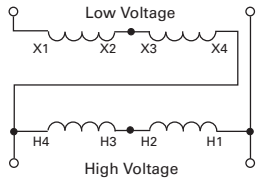


Diagram H

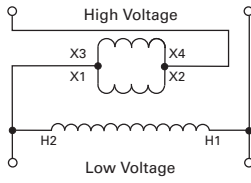


Diagram I

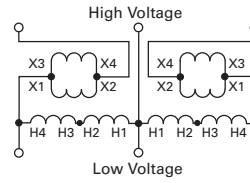


Diagram J

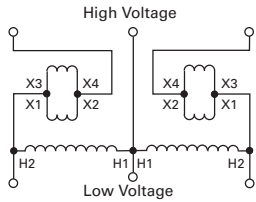


Diagram K

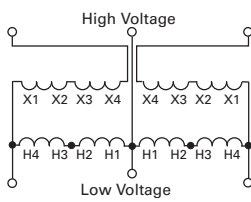


Diagram L

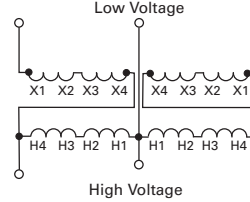


Diagram M ①

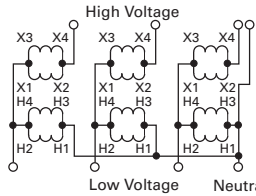


Diagram N ①

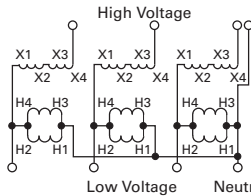


Diagram O ①

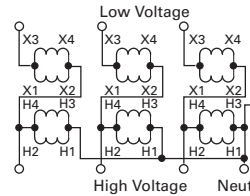


Diagram P ①

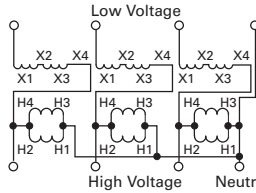


Diagram Q ①

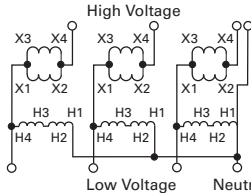


Diagram R ①

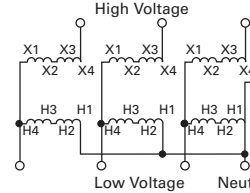


Diagram S ①

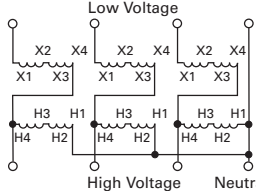


Diagram T

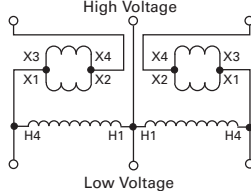
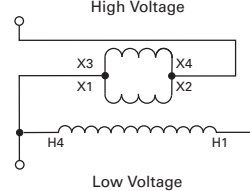


Diagram U



Note

① **WARNING!** If input is three-wire, "neutral" connection must be isolated and insulated! When used to supply a three-phase, four-wire load, the source must be three-phase, four-wire wye.

Medium-Voltage Dry-Type Distribution Transformers

Contents

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| Mini-Power Centers | V2-T2-105 |
| Totally Enclosed Non-Ventilated Transformers | V2-T2-109 |
| Class I, Division 2, Hazardous Location Transformers | V2-T2-112 |
| Marine Duty Transformers | V2-T2-115 |
| Buck-Boost and Low-Voltage Lighting Transformers | V2-T2-120 |
| Medium-Voltage Dry-Type Distribution Transformers | |
| Features, Benefits and Functions | V2-T2-149 |
| Standards and Certifications | V2-T2-149 |
| Product Selection | V2-T2-150 |

Medium-Voltage Dry-Type Distribution Transformers

Product Description

Note: The following pages provide listings for most standard transformer ratings and catalog numbers. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Single- and Three-Phase

- Ventilated, NEMA 3R enclosure standard
- Suitable for indoor or outdoor applications
- Upright mounting only
- 220°C insulation system
- 150°C rise standard; 115°C or 80°C rise optional
- Available in single-phase ratings 15–333 kVA
- Available in three-phase ratings 15–1500 kVA

Application Description

DOE 2016 compliant energy-efficient transformers are specifically designed to meet the energy efficiency standards set forth in CFR Title 10 Chapter II Part 431, Appendix A of Subpart K 2016. Compliant transformers are optimized to offer maximum efficiency at 50% of nameplate rating.

Transformers that are currently specifically excluded from the scope of DOE 10 CFR Part 431 include:

- Liquid-filled transformers below 10 kVA
- Dry-type transformers below 15 kVA
- AC and DC drives transformers
- Rectifier transformers designed for high harmonics
- Autotransformers
- Non-distribution transformers, such as UPS transformers
- Special impedance or regulation transformers
- Regulating transformers
- Sealed and non-ventilated transformers
- Machine tool transformers
- Welding transformers
- Transformers with tap ranges greater than 15%
- Transformers with a frequency other than 60 Hz
- Grounding transformers
- Testing transformers

DOE 2016 Efficiency Levels

Tables of Energy Efficiency Medium-Voltage Dry-Type Distribution Transformers—20–45 kV BIL

| Single-Phase | | Three-Phase | |
|--------------|------------|-------------|------------|
| kVA | Efficiency | kVA | Efficiency |
| 15 | 98.10 | 15 | 97.50 |
| 25 | 98.33 | 30 | 97.90 |
| 37.5 | 98.49 | 45 | 98.10 |
| 50 | 98.60 | 75 | 98.33 |
| 75 | 98.73 | 112.5 | 98.52 |
| 100 | 98.82 | 150 | 98.65 |
| 167 | 98.96 | 225 | 98.82 |
| 250 | 99.07 | 300 | 98.93 |
| 333 | 99.14 | 500 | 99.09 |
| — | — | 750 | 99.21 |
| — | — | 1000 | 99.28 |
| — | — | 1500 | 99.37 |

Features, Benefits and Functions

- 60 Hz operation (except as noted)
- Short-term overload capability as required by ANSI
- Meet NEMA ST-20 sound levels
- Meet CFR Title 10 Chapter II Part 431, Appendix A of Subpart K 2016 energy efficiency requirements for dry-type transformers effective as of January 1, 2016

Standards and Certifications

- UL listed



Industry Standards

All Eaton dry-type distribution and control transformers are built and tested in accordance with applicable NEMA, ANSI and IEEE Standards.

Seismically Qualified

Eaton manufactured dry-type distribution transformers are seismically qualified and exceed requirements of the International Building Code (IBC) and California Code Title 24.

Product Selection

2

Single-Phase—Medium-Voltage Distribution Transformers 60 Hz DOE 2016 Energy-Efficient—Aluminum Windings**2400 Volts to 120/240 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|-------|----------------|----------------|----------------|-------------------|----------------|
| 25 | 150 | | | | | | T42D11S2516 |
| 37.5 | | | | | | | T42D11S3716 |
| 50 | | | | | | | T42D11S5016 |
| 75 | | | | | | | T42D11S7516 |
| 100 | | | | | | | T42D11S9916 |
| 167 | | | | | | | T42D11S6716 |
| 25 | 115 | | | | | | T42D11F2516 |
| 37.5 | | | | | | | T42D11F3716 |
| 50 | | | | | | | T42D11F5016 |
| 75 | | | | | | | T42D11F7516 |
| 100 | | | | | | | T42D11F9916 |
| 167 | | | | | | | T42D11F6716 |
| 25 | 80 | | | | | | T42D11B2516 |
| 37.5 | | | | | | | T42D11B3716 |
| 50 | | | | | | | T42D11B5016 |
| 75 | | | | | | | T42D11B7516 |
| 100 | | | | | | | T42D11B9916 |
| 167 | | | | | | | T42D11B6716 |

4160 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|-------|----------------|----------------|----------------|-------------------|----------------|
| 25 | 150 | | | | | | T46D11S2516 |
| 37.5 | | | | | | | T46D11S3716 |
| 50 | | | | | | | T46D11S5016 |
| 75 | | | | | | | T46D11S7516 |
| 100 | | | | | | | T46D11S9916 |
| 167 | | | | | | | T46D11S6716 |
| 25 | 115 | | | | | | T46D11F2516 |
| 37.5 | | | | | | | T46D11F3716 |
| 50 | | | | | | | T46D11F5016 |
| 75 | | | | | | | T46D11F7516 |
| 100 | | | | | | | T46D11F9916 |
| 167 | | | | | | | T46D11F6716 |
| 25 | 80 | | | | | | T46D11B2516 |
| 37.5 | | | | | | | T46D11B3716 |
| 50 | | | | | | | T46D11B5016 |
| 75 | | | | | | | T46D11B7516 |
| 100 | | | | | | | T46D11B9916 |
| 167 | | | | | | | T46D11B6716 |

Note

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Single-Phase—Medium-Voltage Distribution Transformers 60 Hz DOE 2016 Energy-Efficient—Copper Windings

2400 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|-------|----------------|----------------|----------------|-------------------|----------------|
| 25 | 150 | | | | | | T42D11S2516CU |
| 37.5 | | | | | | | T42D11S3716CU |
| 50 | | | | | | | T42D11S5016CU |
| 75 | | | | | | | T42D11S7516CU |
| 100 | | | | | | | T42D11S9916CU |
| 167 | | | | | | | T42D11S6716CU |
| 25 | 115 | | | | | | T42D11F2516CU |
| 37.5 | | | | | | | T42D11F3716CU |
| 50 | | | | | | | T42D11F5016CU |
| 75 | | | | | | | T42D11F7516CU |
| 100 | | | | | | | T42D11F9916CU |
| 167 | | | | | | | T42D11F6716CU |
| 25 | 80 | | | | | | T42D11B2516CU |
| 37.5 | | | | | | | T42D11B3716CU |
| 50 | | | | | | | T42D11B5016CU |
| 75 | | | | | | | T42D11B7516CU |
| 100 | | | | | | | T42D11B9916CU |
| 167 | | | | | | | T42D11B6716CU |

4160 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|-------|----------------|----------------|----------------|-------------------|----------------|
| 25 | 150 | | | | | | T46D11S2516CU |
| 37.5 | | | | | | | T46D11S3716CU |
| 50 | | | | | | | T46D11S5016CU |
| 75 | | | | | | | T46D11S7516CU |
| 100 | | | | | | | T46D11S9916CU |
| 167 | | | | | | | T46D11S6716CU |
| 25 | 115 | | | | | | T46D11F2516CU |
| 37.5 | | | | | | | T46D11F3716CU |
| 50 | | | | | | | T46D11F5016CU |
| 75 | | | | | | | T46D11F7516CU |
| 100 | | | | | | | T46D11F9916CU |
| 167 | | | | | | | T46D11F6716CU |
| 25 | 80 | | | | | | T46D11B2516CU |
| 37.5 | | | | | | | T46D11B3716CU |
| 50 | | | | | | | T46D11B5016CU |
| 75 | | | | | | | T46D11B7516CU |
| 100 | | | | | | | T46D11B9916CU |
| 167 | | | | | | | T46D11B6716CU |

Note

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Three-Phase—Medium-Voltage Distribution Transformers 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

2400 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|-------|------------------------------------|----------------|----------------|-------------------|----------------|
| 45 | 150 | | Contact local Eaton representative | | | | V42D47T4516 |
| 75 | | | | | | | V42D47T7516 |
| 112.5 | | | | | | | V42D47T1216 |
| 150 | | | | | | | V42D47T4916 |
| 225 | | | | | | | V42D47T2216 |
| 300 | | | | | | | V42D47T3316 |
| 500 | | | | | | | V42D47T5516 |
| 750 | | | | | | | V42D47T7716 |
| 45 | 115 | | Contact local Eaton representative | | | | V42D47F4516 |
| 75 | | | | | | | V42D47F7516 |
| 112.5 | | | | | | | V42D47F1216 |
| 150 | | | | | | | V42D47F4916 |
| 225 | | | | | | | V42D47F2216 |
| 300 | | | | | | | V42D47F3316 |
| 500 | | | | | | | V42D47F5516 |
| 750 | | | | | | | V42D47F7716 |
| 45 | 80 | | Contact local Eaton representative | | | | V42D47B4516 |
| 75 | | | | | | | V42D47B7516 |
| 112.5 | | | | | | | V42D47B1216 |
| 150 | | | | | | | V42D47B4916 |
| 225 | | | | | | | V42D47B2216 |
| 300 | | | | | | | V42D47B3316 |
| 500 | | | | | | | V42D47B5516 |
| 750 | | | | | | | V42D47B7716 |

Note

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Three-Phase—Medium-Voltage Distribution Transformers 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

4160 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|-------|----------------|----------------|----------------|-------------------|----------------|
| 45 | 150 | | | | | | V46D47T4516 |
| 75 | | | | | | | V46D47T7516 |
| 112.5 | | | | | | | V46D47T1216 |
| 150 | | | | | | | V46D47T4916 |
| 225 | | | | | | | V46D47T2216 |
| 300 | | | | | | | V46D47T3316 |
| 500 | | | | | | | V46D47T5516 |
| 750 | | | | | | | V46D47T7716 |
| 45 | 115 | | | | | | V46D47F4516 |
| 75 | | | | | | | V46D47F7516 |
| 112.5 | | | | | | | V46D47F1216 |
| 150 | | | | | | | V46D47F4916 |
| 225 | | | | | | | V46D47F2216 |
| 300 | | | | | | | V46D47F3316 |
| 500 | | | | | | | V46D47F5516 |
| 750 | | | | | | | V46D47F7716 |
| 45 | 80 | | | | | | V46D47B4516 |
| 75 | | | | | | | V46D47B7516 |
| 112.5 | | | | | | | V46D47B1216 |
| 150 | | | | | | | V46D47B4916 |
| 225 | | | | | | | V46D47B2216 |
| 300 | | | | | | | V46D47B3316 |
| 500 | | | | | | | V46D47B5516 |
| 750 | | | | | | | V46D47B7716 |

Note

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Three-Phase—Medium-Voltage Distribution Transformers 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

2400 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|-------|----------------|----------------|----------------|-------------------|----------------|
| 45 | 150 | | | | | | V42D28T4516 |
| 75 | | | | | | | V42D28T7516 |
| 112.5 | | | | | | | V42D28T1216 |
| 150 | | | | | | | V42D28T4916 |
| 225 | | | | | | | V42D28T2216 |
| 300 | | | | | | | V42D28T3316 |
| 500 | | | | | | | V42D28T5516 |
| 750 | | | | | | | V42D28T7716 |
| 45 | 115 | | | | | | V42D28F4516 |
| 75 | | | | | | | V42D28F7516 |
| 112.5 | | | | | | | V42D28F1216 |
| 150 | | | | | | | V42D28F4916 |
| 225 | | | | | | | V42D28F2216 |
| 300 | | | | | | | V42D28F3316 |
| 500 | | | | | | | V42D28F5516 |
| 750 | | | | | | | V42D28F7716 |
| 45 | 80 | | | | | | V42D28B4516 |
| 75 | | | | | | | V42D28B7516 |
| 112.5 | | | | | | | V42D28B1216 |
| 150 | | | | | | | V42D28B4916 |
| 225 | | | | | | | V42D28B2216 |
| 300 | | | | | | | V42D28B3316 |
| 500 | | | | | | | V42D28B5516 |
| 750 | | | | | | | V42D28B7716 |

Note

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Three-Phase—Medium-Voltage Distribution Transformers 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

4160 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|-------|----------------|----------------|----------------|-------------------|----------------|
| 45 | 150 | | | | | | V46D28T4516 |
| 75 | | | | | | | V46D28T7516 |
| 112.5 | | | | | | | V46D28T1216 |
| 150 | | | | | | | V46D28T4916 |
| 225 | | | | | | | V46D28T2216 |
| 300 | | | | | | | V46D28T3316 |
| 500 | | | | | | | V46D28T5516 |
| 750 | | | | | | | V46D28T7716 |
| 45 | 115 | | | | | | V46D28F4516 |
| 75 | | | | | | | V46D28F7516 |
| 112.5 | | | | | | | V46D28F1216 |
| 150 | | | | | | | V46D28F4916 |
| 225 | | | | | | | V46D28F2216 |
| 300 | | | | | | | V46D28F3316 |
| 500 | | | | | | | V46D28F5516 |
| 750 | | | | | | | V46D28F7716 |
| 45 | 80 | | | | | | V46D28B4516 |
| 75 | | | | | | | V46D28B7516 |
| 112.5 | | | | | | | V46D28B1216 |
| 150 | | | | | | | V46D28B4916 |
| 225 | | | | | | | V46D28B2216 |
| 300 | | | | | | | V46D28B3316 |
| 500 | | | | | | | V46D28B5516 |
| 750 | | | | | | | V46D28B7716 |

Note

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Three-Phase—Medium-Voltage Distribution Transformers 60 Hz DOE 2016 Energy-Efficient—Copper Windings

2400 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|-------|------------------------------------|----------------|----------------|-------------------|----------------|
| 45 | 150 | | Contact local Eaton representative | | | | V42D47T4516CU |
| 75 | | | | | | | V42D47T7516CU |
| 112.5 | | | | | | | V42D47T1216CU |
| 150 | | | | | | | V42D47T4916CU |
| 225 | | | | | | | V42D47T2216CU |
| 300 | | | | | | | V42D47T3316CU |
| 500 | | | | | | | V42D47T5516CU |
| 750 | | | | | | | V42D47T7716CU |
| 45 | 115 | | Contact local Eaton representative | | | | V42D47F4516CU |
| 75 | | | | | | | V42D47F7516CU |
| 112.5 | | | | | | | V42D47F1216CU |
| 150 | | | | | | | V42D47F4916CU |
| 225 | | | | | | | V42D47F2216CU |
| 300 | | | | | | | V42D47F3316CU |
| 500 | | | | | | | V42D47F5516CU |
| 750 | | | | | | | V42D47F7716CU |
| 45 | 80 | | Contact local Eaton representative | | | | V42D47B4516CU |
| 75 | | | | | | | V42D47B7516CU |
| 112.5 | | | | | | | V42D47B1216CU |
| 150 | | | | | | | V42D47B4916CU |
| 225 | | | | | | | V42D47B2216CU |
| 300 | | | | | | | V42D47B3316CU |
| 500 | | | | | | | V42D47B5516CU |
| 750 | | | | | | | V42D47B7716CU |

Note

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Three-Phase—Medium-Voltage Distribution Transformers 60 Hz DOE 2016 Energy-Efficient—Copper Windings

4160 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|
| 45 | 150 | | | | | | V46D47T4516CU |
| 75 | | | | | | | V46D47T7516CU |
| 112.5 | | | | | | | V46D47T1216CU |
| 150 | | | | | | | V46D47T4916CU |
| 225 | | | | | | | V46D47T2216CU |
| 300 | | | | | | | V46D47T3316CU |
| 500 | | | | | | | V46D47T5516CU |
| 750 | | | | | | | V46D47T7716CU |
| 45 | 115 | Contact local Eaton representative | | | | | V46D47F4516CU |
| 75 | | | | | | | V46D47F7516CU |
| 112.5 | | | | | | | V46D47F1216CU |
| 150 | | | | | | | V46D47F4916CU |
| 225 | | | | | | | V46D47F2216CU |
| 300 | | | | | | | V46D47F3316CU |
| 500 | | | | | | | V46D47F5516CU |
| 750 | | | | | | | V46D47F7716CU |
| 45 | 80 | Contact local Eaton representative | | | | | V46D47B4516CU |
| 75 | | | | | | | V46D47B7516CU |
| 112.5 | | | | | | | V46D47B1216CU |
| 150 | | | | | | | V46D47B4916CU |
| 225 | | | | | | | V46D47B2216CU |
| 300 | | | | | | | V46D47B3316CU |
| 500 | | | | | | | V46D47B5516CU |
| 750 | | | | | | | V46D47B7716CU |

Note

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Three-Phase—Medium-Voltage Distribution Transformers 60 Hz DOE 2016 Energy-Efficient—Copper Windings

2400 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|-------|----------------|----------------|----------------|-------------------|----------------|
| 45 | 150 | | | | | | V42D28T4516CU |
| 75 | | | | | | | V42D28T7516CU |
| 112.5 | | | | | | | V42D28T1216CU |
| 150 | | | | | | | V42D28T4916CU |
| 225 | | | | | | | V42D28T2216CU |
| 300 | | | | | | | V42D28T3316CU |
| 500 | | | | | | | V42D28T5516CU |
| 750 | | | | | | | V42D28T7716CU |
| 45 | 115 | | | | | | V42D28F4516CU |
| 75 | | | | | | | V42D28F7516CU |
| 112.5 | | | | | | | V42D28F1216CU |
| 150 | | | | | | | V42D28F4916CU |
| 225 | | | | | | | V42D28F2216CU |
| 300 | | | | | | | V42D28F3316CU |
| 500 | | | | | | | V42D28F5516CU |
| 750 | | | | | | | V42D28F7716CU |
| 45 | 80 | | | | | | V42D28B4516CU |
| 75 | | | | | | | V42D28B7516CU |
| 112.5 | | | | | | | V42D28B1216CU |
| 150 | | | | | | | V42D28B4916CU |
| 225 | | | | | | | V42D28B2216CU |
| 300 | | | | | | | V42D28B3316CU |
| 500 | | | | | | | V42D28B5516CU |
| 750 | | | | | | | V42D28B7716CU |

Note

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Three-Phase—Medium-Voltage Distribution Transformers 60 Hz DOE 2016 Energy-Efficient— Copper Windings

4160 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|
| 45 | 150 | | | | | | V46D28T4516CU |
| 75 | | | | | | | V46D28T7516CU |
| 112.5 | | | | | | | V46D28T1216CU |
| 150 | | | | | | | V46D28T4916CU |
| 225 | | | | | | | V46D28T2216CU |
| 300 | | | | | | | V46D28T3316CU |
| 500 | | | | | | | V46D28T5516CU |
| 750 | | | | | | | V46D28T7716CU |
| 45 | 115 | Contact local Eaton representative | | | | | V46D28F4516CU |
| 75 | | | | | | | V46D28F7516CU |
| 112.5 | | | | | | | V46D28F1216CU |
| 150 | | | | | | | V46D28F4916CU |
| 225 | | | | | | | V46D28F2216CU |
| 300 | | | | | | | V46D28F3316CU |
| 500 | | | | | | | V46D28F5516CU |
| 750 | | | | | | | V46D28F7716CU |
| 45 | 80 | Contact local Eaton representative | | | | | V46D28B4516CU |
| 75 | | | | | | | V46D28B7516CU |
| 112.5 | | | | | | | V46D28B1216CU |
| 150 | | | | | | | V46D28B4916CU |
| 225 | | | | | | | V46D28B2216CU |
| 300 | | | | | | | V46D28B3316CU |
| 500 | | | | | | | V46D28B5516CU |
| 750 | | | | | | | V46D28B7716CU |

Note

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Dry-Type Distribution Transformers

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Contents

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| Options and Accessories | V2-T2-167 |
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Standards and Certifications

Eaton dry-type distribution transformers are approved, listed, recognized or may comply with the following standards.

Engineering Standards

| Catalog Product Name | UL Standard ① | UL/cUL File Number | UL Listed Control Number | cUL Energy Efficiency Verification File Number | CSA File Number | Insulation System Temp/°C | kVA Single-Phase | kVA Three-Phase | Applicable IEC Standard |
|---------------------------------------|---------------|--------------------|--------------------------|--|-----------------|---------------------------|------------------|-----------------|-------------------------|
| Industrial Control Transformer | | | | | | | | | |
| MTE | 5085 | E46323 | 702X | — | — | 105 | 0.025–1.5 | N/A | 61558 |
| MTK | 5085 | E46323 | 702X | — | — | 180 | 0.05–5 | N/A | 61558 |
| Encapsulated Transformer | | | | | | | | | |
| AP | 5085 | E10156 | 591H | — | — | 180 | 3–10 | N/A | 61558 |
| AP | 1561 | E78389 | 591H | — | — | 180 | 15 | N/A | 61558 |
| EP | 5085 | E10156 | 591H | — | LR60545 | 180 | 0.05–10 | N/A | 61558 |
| EP | 1561 | E78389 | 591H | — | LR60545 ③ | 180 | 15–37.5 | N/A | 61558 ④ / 726 ⑤ |
| EPT | 5085 | E10156 | 591H | — | LR60545 | 180 | N/A | 3–9 | 61558 ⑥ / 726 ⑦ |
| EPT | 1561 | E78389 | 591H | — | LR60545 ⑧ | 180 | N/A | 15–75 | 726 |
| MPC | 1062 | E53449 | 591H | — | LR60546 | 180 | 3–25 | 15–30 | — |
| Ventilated Transformer | | | | | | | | | |
| DS-3 | 1561 | E78389 | 591H | EV33871 ② | — | 220 | 7.5–167 | N/A | 60726 |
| DT-3 | 1561 | E78389 | 591H | EV33871 ⑥ | — | 220 | N/A | 7.5–750 | 60726 |
| KT | 1561 | E78389 | 591H | EV33871 ⑥ | — | 220 | N/A | 7.5–500 | N/A |

Notes

- ① UL 5085 replaces UL 506.
- ② Applies to 15–167 kVA.
- ③ Applies to 25 kVA.
- ④ Applies to 15–25 kVA.
- ⑤ Applies to 37.5 kVA.
- ⑥ Applies to 3 kVA.
- ⑦ Applies to 5–9 kVA.
- ⑧ Applies to 15–300 kVA.
- ⑨ Applies to 30 kVA.

In addition to the above standards, Eaton dry-type distribution transformers are also manufactured in compliance with the applicable standards listed below.

Not all of the following standards apply to every transformer.

NEC: National Electrical Code

NEMA ST-1: Specialty Transformers (C89.1) (control transformers).

NEMA ST-20: General-Purpose Transformers.

DOE 2016 Final Rule: CFR Title 10 Chapter II Part 431, Appendix A of Subpart K 2016.

NEMA 250: Enclosures for Electrical Equipment (1000 volts maximum).

IEEE C57.12.01: General Requirements for Dry-Type Distribution and Power Transformers (including those with solid-cast and/or resin-encapsulated windings).

ANSI C57.12.70: Terminal Markings and Connections for Distribution and Power Transformers.

ANSI C57.12.91: Standard Test Code for Dry-Type Distribution and Power Transformers.

CSA C22 No. 47-M90: Air-Cooled Transformers (Dry-Type).

CSA C9-M1981: Dry-Type Transformers.

CSA C22.2 No. 66: Specialty Transformers.

CSA 802-94: Maximum Losses for Distribution, Power and Dry-Type Transformers.

NEMA TP-1: Guide for Determining Energy Efficiency for Distribution Transformers (rescinded).

NEMA TP-2: Standard Test Method for Measuring the Energy Consumption of Distribution Transformers (rescinded).

NEMA TP-3: Standard for the Labeling of Distribution Transformer Efficiency (rescinded).



Energy Verified

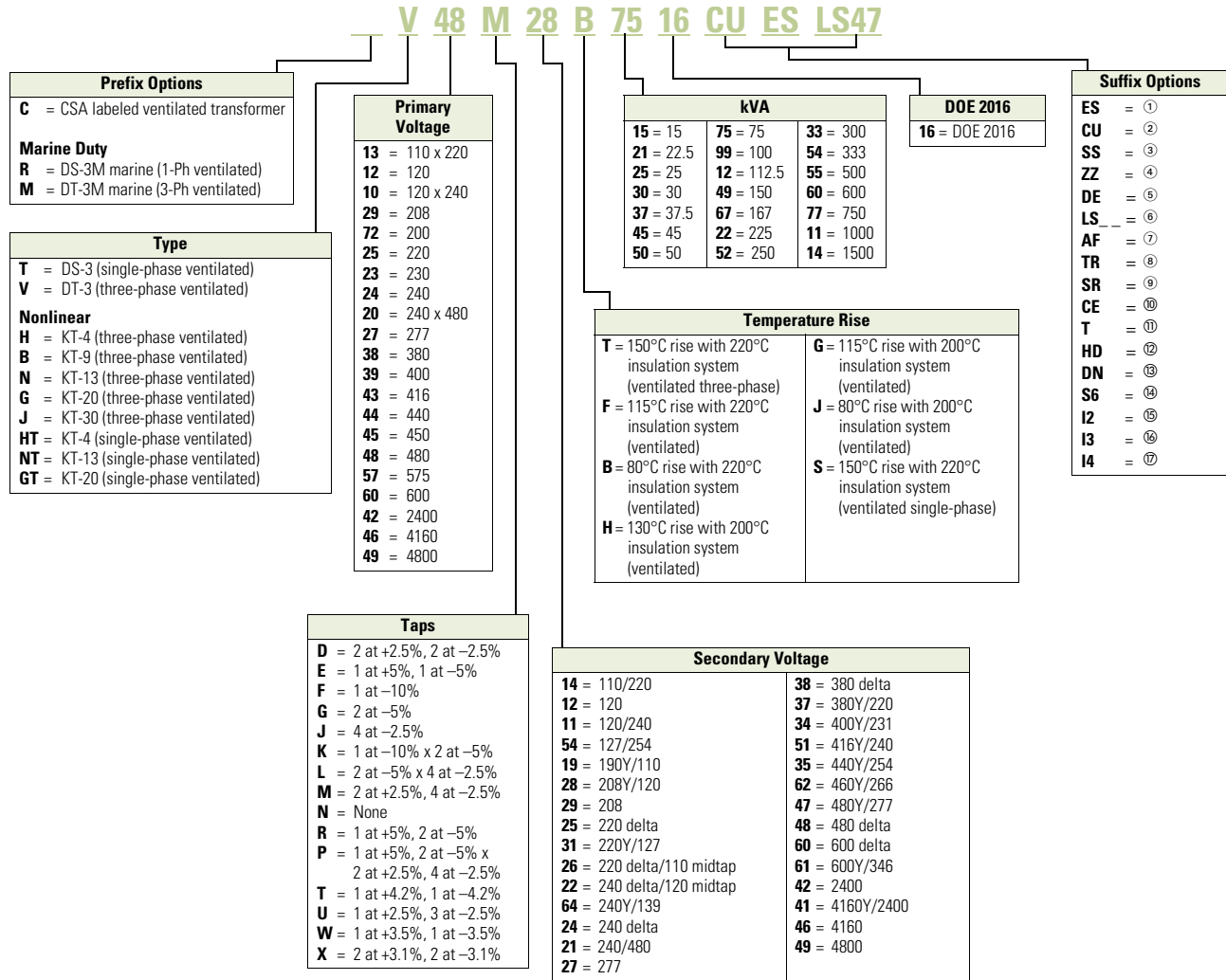
Catalog Number Selection

Use table for catalog number breakdown only.

Do not use to create catalog numbers because all combinations may not be valid.

DOE 2016 Efficient Transformers, Shielded Isolation, Nonlinear, Marine Duty Transformers— Example: V48M28B7516CUESLS47

2



Notes

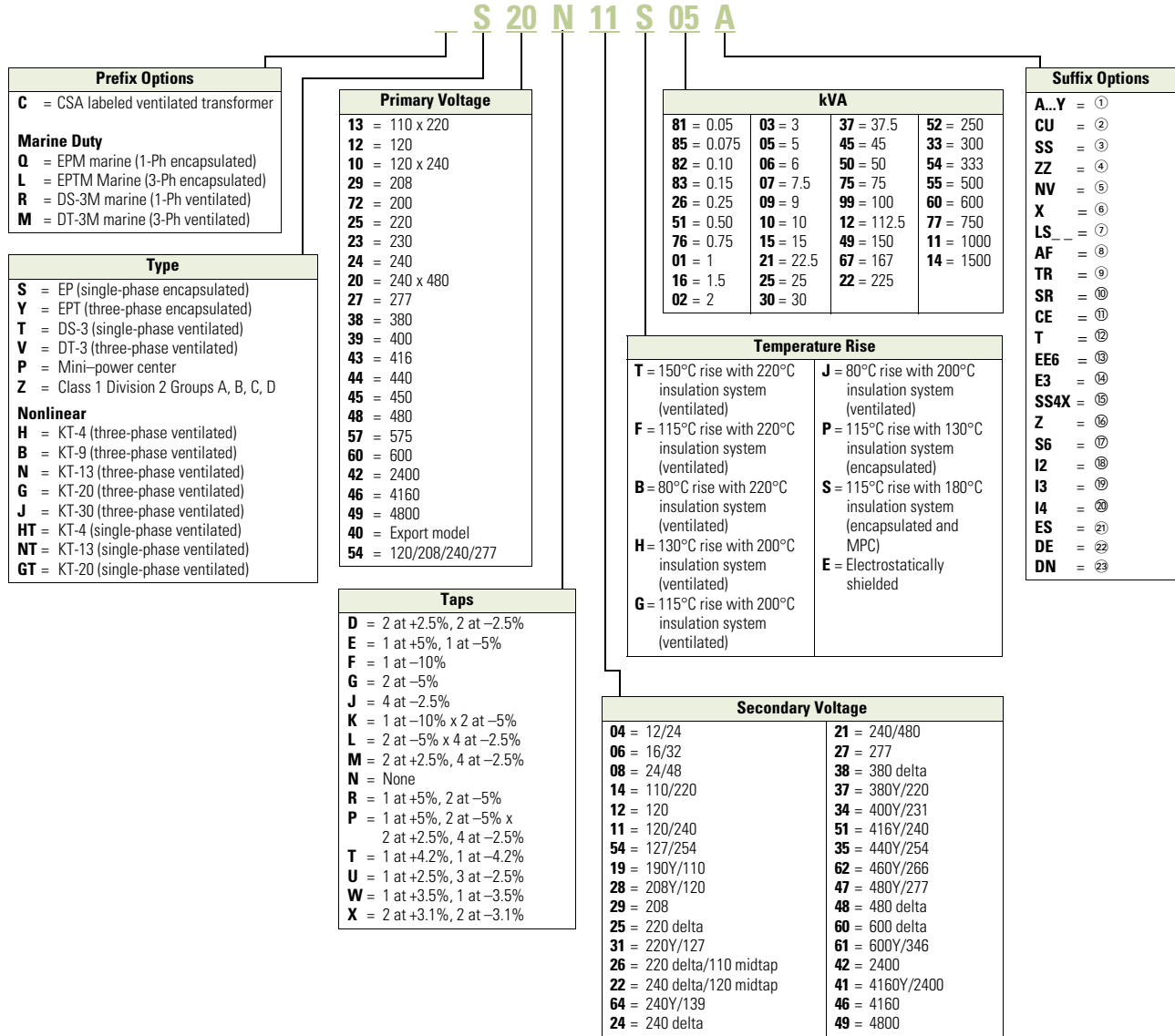
- ① Electrostatic shield.
- ② Copper windings.
- ③ Grade 304 stainless steel enclosure (does not imply a NEMA 4X rating).
- ④ Open type core and coil assembly.
- ⑤ Double aluminum electrostatic shield.
- ⑥ Low sound design. LS47 indicates low sound equal to 47 dB; LS42 indicates 42 dB.
- ⑦ Fungus proof.
- ⑧ Certified test report of standard production tests for the specific serial number to be shipped.
- ⑨ Certified sound level report.
- ⑩ CE Marked.
- ⑪ Thermal indicator embedded in center coil. Suffix "TT" indicates two thermal indicators of different temperature ratings, are installed.
- ⑫ Hinged front door.
- ⑬ Double neutral.
- ⑭ Grade 316 stainless steel enclosure (does not imply NEMA 4X rating).
- ⑮ Integral 2-inch infrared viewing window.
- ⑯ Integral 3-inch infrared viewing window.
- ⑰ Integral 4-inch infrared viewing window.

For Eaton's industrial control transformers catalog number selection, see Volume 7—Logic Control, Operator Interface and Connectivity Solutions, **CA08100008E**, Tab 7.

Contact your local Eaton sales office for voltage combinations not shown.

Use table for catalog number breakdown only.
Do not use to create catalog numbers because all combinations may not be valid.

General-Purpose, NEMA TP-1 Energy-Efficient, Mini-Power Center, Shielded Isolation, Nonlinear, Buck-Boost, Marine Duty Transformers—Example: S20N11S05A



Notes

- ① Model number is not used on newly designed/redesigned transformers.
 - ② Copper windings.
 - ③ Grade 304 stainless steel enclosure (does not imply a NEMA 4X rating).
 - ④ Open type core and coil assembly.
 - ⑤ Totally enclosed non-ventilated DS-3 or DT-3.
 - ⑥ 50/60 Hz.
 - ⑦ Low sound design. LS47 indicates low sound equal to 47 dB; LS42 indicates 42 dB.
 - ⑧ Fungus proof.
 - ⑨ Certified test report of standard production tests for the specific serial number to be shipped.
 - ⑩ Certified sound level report.
 - ⑪ CE Marked.
 - ⑫ Thermal indicator embedded in center coil. Suffix "TT" indicates two thermal indicators of different temperature ratings, are installed.
 - ⑬ With 2016 enclosure construction.
 - ⑭ CSL3 DOE 2007 energy-efficient.
 - ⑮ NEMA 4X Grade 304 stainless steel enclosure.
 - ⑯ Easy install base.
 - ⑰ Grade 316 stainless steel enclosure (does not imply NEMA 4X rating).
 - ⑱ Integral 2-inch infrared viewing window.
 - ⑲ Integral 3-inch infrared viewing window.
 - ⑳ Integral 4-inch infrared viewing window.
 - ㉑ Electrostatic shield.
 - ㉒ Double aluminum electrostatic shield.
 - ㉓ Double neutral.
- For Eaton's industrial control transformers catalog number selection, see Volume 7—Logic Control, Operator Interface and Connectivity Solutions, **CA08100008E**, Tab 7.
- Contact your local Eaton sales office for voltage combinations not shown.

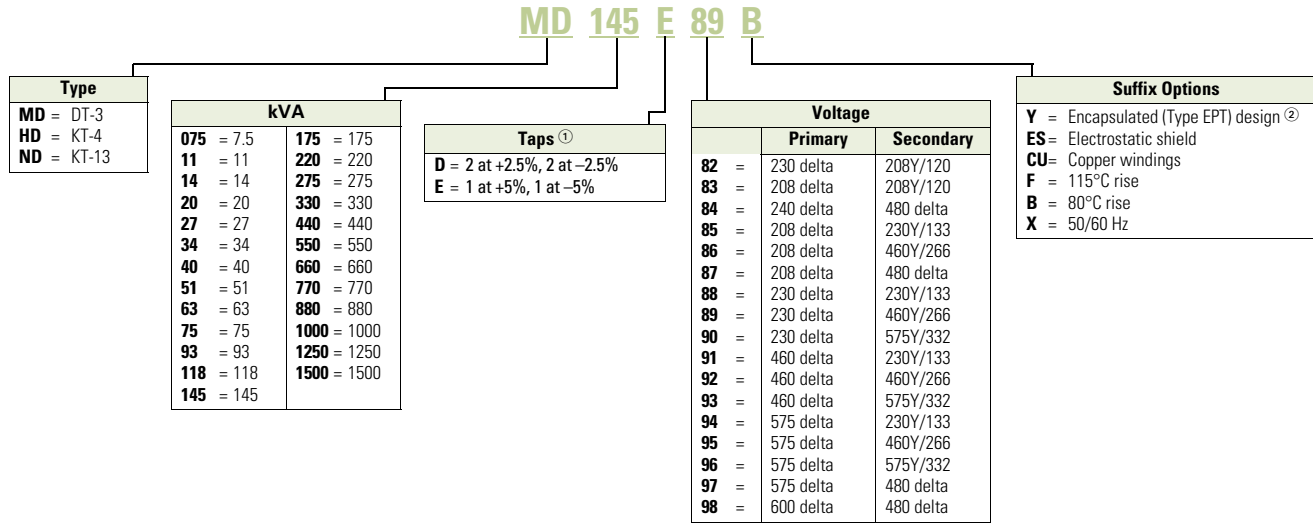
2.6

Transformers

Transformer Standards, Technical Data and Accessories

Use table for catalog number breakdown only.
Do not use to create catalog numbers because all combinations may not be valid.

2 Motor Drive Isolation Transformers—Example: MD145E89B



Notes

- ① For other tap combinations, contact your local Eaton sales office.
 - ② Available up to 34 kVA.
- Contact your local Eaton sales office for voltage combinations not shown.

Product Selection

Single-Phase Transformers

How to Select Single-Phase Units

1. Determine the primary (source) voltage—the voltage presently available.
2. Determine the secondary (load) voltage—the voltage needed at the load.
3. Determine the kVA load:
 - If the load is defined in kVA, a transformer can be selected from the tabulated data
 - If the load rating is given in amperes, determine the load kVA from the chart (below right). To determine kVA when volts and amperes are known, use the formula:

$$\text{kVA} = \frac{\text{Volts} \times \text{Amperes}}{1000}$$

- If the load is an AC motor, determine the minimum transformer kVA from the chart at the right
 - Select a transformer rating equal to or greater than the load kVA.
4. Define tap arrangements needed.
 5. Define temperature rise.

Using the above procedure, select the transformer from the listings in this catalog.

Single-Phase AC Motors

| Horsepower | Full Load Amperes | | | | Minimum Transformer kVA ^① |
|------------|-------------------|-----------|-----------|-----------|--------------------------------------|
| | 115 Volts | 208 Volts | 220 Volts | 230 Volts | |
| 1/6 | 4.4 | 2.4 | 2.3 | 2.2 | 0.53 |
| 1/4 | 5.8 | 3.2 | 3.0 | 2.9 | 0.70 |
| 1/3 | 7.2 | 4.0 | 3.8 | 3.6 | 0.87 |
| 1/2 | 9.8 | 5.4 | 5.1 | 4.9 | 1.18 |
| 3/4 | 13.8 | 7.6 | 7.2 | 6.9 | 1.66 |
| 1 | 16 | 8.8 | 8.4 | 8 | 1.92 |
| 1-1/2 | 20 | 11.0 | 10.4 | 10 | 2.40 |
| 2 | 24 | 13.2 | 12.5 | 12 | 2.88 |
| 3 | 34 | 18.7 | 17.8 | 17 | 4.10 |
| 5 | 56 | 30.8 | 29.3 | 28 | 6.72 |
| 7-1/2 | 80 | 44 | 42 | 40 | 9.6 |
| 10 | 100 | 55 | 52 | 50 | 12.0 |

Full Load Current in Amperes—Single-Phase Circuits

| kVA | Voltage | | | | | | | | | |
|------|---------|------|------|------|------|------|------|------|------|--|
| | 120 | 208 | 220 | 240 | 277 | 480 | 600 | 2400 | 4160 | |
| 0.25 | 2.0 | 1.2 | 1.1 | 1.0 | 0.9 | 0.5 | 0.4 | 0.10 | 0.06 | |
| 0.50 | 4.2 | 2.4 | 2.3 | 2.1 | 1.8 | 1.0 | 0.8 | 0.21 | 0.12 | |
| 0.75 | 6.3 | 3.6 | 3.4 | 3.1 | 2.7 | 1.6 | 1.3 | 0.31 | 0.18 | |
| 1 | 8.3 | 4.8 | 4.5 | 4.2 | 3.6 | 2.1 | 1.7 | 0.42 | 0.24 | |
| 1.5 | 12.5 | 7.2 | 6.8 | 6.2 | 5.4 | 3.1 | 2.5 | 0.63 | 0.36 | |
| 2 | 16.7 | 9.6 | 9.1 | 8.3 | 7.2 | 4.2 | 3.3 | 0.83 | 0.48 | |
| 3 | 25 | 14.4 | 13.6 | 12.5 | 10.8 | 6.2 | 5.0 | 1.2 | 0.72 | |
| 5 | 41 | 24.0 | 22.7 | 20.8 | 18.0 | 10.4 | 8.3 | 2.1 | 1.2 | |
| 7.5 | 62 | 36 | 34 | 31 | 27 | 15.6 | 12.5 | 3.1 | 1.8 | |
| 10 | 83 | 48 | 45 | 41 | 36 | 20.8 | 16.7 | 4.2 | 2.4 | |
| 15 | 125 | 72 | 68 | 62 | 54 | 31 | 25 | 6.2 | 3.6 | |
| 25 | 208 | 120 | 114 | 104 | 90 | 52 | 41 | 10.4 | 6.0 | |
| 37.5 | 312 | 180 | 170 | 156 | 135 | 78 | 62 | 15.6 | 9.0 | |
| 50 | 416 | 240 | 227 | 208 | 180 | 104 | 83 | 20.8 | 12.0 | |
| 75 | 625 | 360 | 341 | 312 | 270 | 156 | 125 | 31.3 | 18.0 | |
| 100 | 833 | 480 | 455 | 416 | 361 | 208 | 166 | 41.7 | 24.0 | |
| 167 | 1391 | 802 | 759 | 695 | 602 | 347 | 278 | 69.6 | 40.1 | |

Notes

^① If motors are started more than once per hour, increase minimum transformer kVA by 20%.

When motor service factor is greater than 1, increase full load amperes proportionally. Example: If service factor is 1.15, increase above ampere values by 15%.

Three-Phase Transformers

2

How to Select Three-Phase Units

1. Determine the primary (source) voltage—the voltage presently available.
2. Determine the secondary (load) voltage—the voltage needed at the load.
3. Determine the kVA load:
 - If the load is defined in kVA, a transformer can be selected from the tabulated data
 - If the load rating is given in amperes, determine the load kVA from the chart (below right). To determine kVA when volts and amperes are known, use the formula:

$$\text{kVA} = \frac{\text{Volts} \times \text{Amperes} \times 1.732}{1000}$$

- If the load is an AC motor, determine the minimum transformer kVA from the chart at the right
 - Select a transformer rating equal to or greater than the load kVA
4. Define tap arrangements needed.
 5. Define temperature rise.

Using the above procedure, select the transformer from the listings in this catalog.

Three-Phase AC Motors

| Horsepower | Full Load Amperes | | | | | Minimum Transformer kVA ^① |
|------------|-------------------|-----------|-----------|-----------|-----------|--------------------------------------|
| | 208 Volts | 230 Volts | 380 Volts | 460 Volts | 575 Volts | |
| 0.5 | 2.2 | 2.0 | 1.2 | 1.0 | 0.8 | 0.9 |
| 3/4 | 3.1 | 2.8 | 1.7 | 1.4 | 1.1 | 1.2 |
| 1 | 4.0 | 3.6 | 2.2 | 1.8 | 1.4 | 1.5 |
| 1.5 | 5.7 | 5.2 | 3.1 | 2.6 | 2.1 | 2.1 |
| 2 | 7.5 | 6.8 | 4.1 | 3.4 | 2.7 | 2.7 |
| 3 | 10.7 | 9.6 | 5.8 | 4.8 | 3.9 | 3.8 |
| 5 | 16.7 | 15.2 | 9.2 | 7.6 | 6.1 | 6.3 |
| 7.5 | 24 | 22 | 14 | 11 | 9 | 9.2 |
| 10 | 31 | 28 | 17 | 14 | 11 | 11.2 |
| 15 | 46 | 42 | 26 | 21 | 17 | 16.6 |
| 20 | 59 | 54 | 33 | 27 | 22 | 21.6 |
| 25 | 75 | 68 | 41 | 34 | 27 | 26.6 |
| 30 | 88 | 80 | 48 | 40 | 32 | 32.4 |
| 40 | 114 | 104 | 63 | 52 | 41 | 43.2 |
| 50 | 143 | 130 | 79 | 65 | 52 | 52 |
| 60 | 170 | 154 | 93 | 77 | 62 | 64 |
| 75 | 211 | 192 | 116 | 96 | 77 | 80 |
| 100 | 273 | 248 | 150 | 124 | 99 | 103 |
| 125 | 342 | 312 | 189 | 156 | 125 | 130 |
| 150 | 396 | 360 | 218 | 180 | 144 | 150 |
| 200 | 528 | 480 | 291 | 240 | 192 | 200 |

Full Load Current in Amperes—Three-Phase Circuits

| kVA | Voltage | | | | | | |
|-------|---------|------|------|------|------|------|------|
| | 208 | 240 | 380 | 480 | 600 | 2400 | 4160 |
| 3 | 8.3 | 7.2 | 4.6 | 3.6 | 2.9 | 0.72 | 0.42 |
| 6 | 16.6 | 14.4 | 9.1 | 7.2 | 5.8 | 1.4 | 0.83 |
| 9 | 25 | 21.6 | 13.7 | 10.8 | 8.6 | 2.2 | 1.2 |
| 15 | 41.7 | 36.1 | 22.8 | 18.0 | 14.4 | 3.6 | 2.1 |
| 22.5 | 62.4 | 54.1 | 34.2 | 27.1 | 21.6 | 5.4 | 3.1 |
| 30 | 83.4 | 72.3 | 45.6 | 36.1 | 28.9 | 7.2 | 4.2 |
| 37.5 | 104 | 90.3 | 57.0 | 45.2 | 36.1 | 9.0 | 5.2 |
| 45 | 124 | 108 | 68.4 | 54.2 | 43.4 | 10.8 | 6.3 |
| 50 | 139 | 120 | 76 | 60.1 | 48.1 | 12.0 | 6.9 |
| 75 | 208 | 180 | 114 | 90 | 72 | 18.0 | 10.4 |
| 112.5 | 312 | 270 | 171 | 135 | 108 | 27.1 | 15.6 |
| 150 | 416 | 360 | 228 | 180 | 144 | 36.1 | 20.8 |
| 225 | 624 | 541 | 342 | 270 | 216 | 54.2 | 31.3 |
| 300 | 832 | 721 | 456 | 360 | 288 | 72.2 | 41.6 |
| 500 | 1387 | 1202 | 760 | 601 | 481 | 120 | 69.4 |
| 750 | 2084 | 1806 | 1140 | 903 | 723 | 180 | 104 |
| 1000 | 2779 | 2408 | 1519 | 1204 | 963 | 241 | 139 |

Notes

- ① If motors are started more than once per hour, increase minimum transformer kVA by 20%.
- When motor service factor is greater than 1, increase full load amperes proportionally.
 Example: If service factor is 1.15, increase above ampere values by 15%.

Options and Accessories

(Order separately)

Weathershield Kit

A weathershield kit consisting of a front and rear cover shield must be installed on all ventilated dry-type distribution transformers when the unit is located outdoors. The shields protect the transformer top ventilation openings against rain but allow for proper

ventilation. Field installation hardware is not required. Refer to specific transformer listing for selection of weathershield kit. Proper installation provides a NEMA 3R rating.

Note: For 316 stainless steel, add the suffix 'S' to the catalog number.

Weathershield Kit



Weathershield Kit

| Fits Frame Size(s) ① | Catalog Number ② |
|---|------------------|
| 809, 810, 811, 816, 817, 818 | WS11 |
| 814, 814E | WS13 |
| 815 | WS15 |
| 819, 820 | WS16 |
| 808, 908, 909, 910, 911, 912, 910A, 911A, 912A | WS31 |
| 912B, 912Z, 912D | WS38 |
| 812, 813, 913A, 913B, 914A, 915A, 916, 914B, 915B | WS33 |
| 914D, 915D, 914F, 915F, 914Z, 915Z | WS39 |
| 916A, 916B, 912Z | WS19 |
| 917, 918, 918A | WS34 |
| 919, 920, 919E, 919EX, 920E, 920EX | WS35 |
| 922 | WS36 |
| 923 | WS37 |
| 842 | WS45 |
| 842A | WS45A |
| 843 | WS43 |
| 843A | WS43A |
| 844 | WS44 |
| 844A | WS44A |
| 939 | WS57 |
| 940 | WS58 |
| 942 | WS59 |
| 943 | WS60 |
| 944 | WS61 |
| 945 | WS62 |

Terminal Extension Kit

A terminal extension kit is used to allow front access to the rear terminals on most 500 and 750 kVA transformers (transformers on frames 919 and 920) when insufficient space is available at the rear of the transformer. Eaton recommends a minimum 6-inch clearance from the wall to maintain proper ventilation.

Terminal Extension Kit

| Fits Frame Size(s) ① | Bus Material | Catalog Number |
|----------------------|--------------|----------------|
| 919 | Aluminum | EXT55AL |
| 919 | Copper | EXT55CU |
| 920 | Aluminum | EXT77AL |
| 920 | Copper | EXT77CU |

Wall-Mounting Bracket

Wall-mounting brackets are used to wall-mount ventilated transformers. This bracket allows the transformer to be installed with the proper clearance, as recommended by Eaton.

Wall-mounting brackets are compatible with the following frames.

Wall-Mounting Bracket



Availability Guide Wall-Mounting Brackets

| Frame Sizes ① | Catalog Number |
|---|----------------|
| Type DS-3 (Single-Phase Compatible) | |
| 809, 810, 811, 812, 813, 815, 816, 817, 818, 835, 836, 837, 814A, 842 | WMB01 |
| Type DT-3, K-Factor, Drive Isolation (Three-Phase Compatible) | |
| 908, 909, 910, 911, 912, 910A, 911A, 912A, 912B, 912D, 913A, 913B, 914A, 914B, 914D, 915D, 915A, 915B, 914F, 915F, 912Z, 914Z, 915Z | WMB01 |
| 842A, 939, 940 | WMB05 |
| 843A, 844A, 942, 943 | WMB04 |

Notes

- ① Effective June 1, 2001, frame numbers will have a prefix of FR, e.g., **FR819**. Dimensions, accessories and so on are still applicable as if the FR did not exist.
- ② For Grade 316 stainless steel weathershields, add the suffix "S" to a catalog number, e.g., **WS31S**.

Terminal Lug Kits for Transformers ①

| Typical Sizing | Terminal Lugs Cable Range | Quantity | Hardware Bolt Size | Quantity | Catalog Number |
|--------------------------|------------------------------|----------|-----------------------|----------|----------------|
| 15–37.5 kVA single-phase | #14–#2 | 8 | 1/4-20 x 3/4 | 8 | LKS1 |
| 15–45 kVA three-phase | #6–250 kcmil | 4 | | | |
| 50–75 kVA single-phase | #6–250 kcmil | 12 | 1/4-20 x 3/4 | 8 | LKS2 |
| 75–112.5 kVA three-phase | | | 1/4-20 x 1-3/4 | 8 | |
| 100–167 kVA single-phase | #6–250 kcmil | 3 | 1/4-20 x 3/4 | 3 | LKS3 |
| 150–300 kVA three-phase | #2–600 kcmil | 22 | 3/8-16 x 2 | 16 | |
| 500 kVA three-phase | #2–600 kcmil | 29 | 3/8-16 x 2 | 18 | LKS4 |

Rodent Screens

| Description | Frame Size(s) ② | Catalog Number |
|---|------------------------------------|-------------------|
| Rodent screens are used to discourage birds or rodents from entering the enclosure through the ventilation openings. Stainless steel screens are not available. | 908, 909 | RS01 |
| | 910A, 911, 912 | RS02 |
| | 913B, 914B, 915B | RS03 |
| | 916 | RS04 |
| | 917, 918, 918A | RS05 |
| | 919, 920, 919E, 919EX, 920E, 920EX | RS06 |
| | 916A, 916B | RS07 |
| | 922 | RS08 |
| | 923 | RS09 |
| | 814, 821, 814E | RS11 |
| | 815 | RS12 |
| | 816 | RS13 |
| | 817, 818 | RS14 |
| | 819, 820 | RS15 |
| | 842 | RS45 |
| | 842A | RS45A |
| | 843 | RS43 |
| | 843A | RS43A |
| | 844 | RS44 |
| | 844A | RS44A |
| | 912B, 912Z, 912D | RS16 |
| | 914D, 915D, 914F, 915F, 914Z, 915Z | RS17 |
| | 916Z | RS07 |
| 939 | RS57 | |
| 940 | RS58 | |
| 942 | RS59 | |
| 943 | RS60 | |
| 944 | RS61 | |
| 945 | RS62 | |

Replacement Parts for Mini-Power Centers

| Frame | Deadfront Cover (Breaker Cover) | Front Cover |
|-------|------------------------------------|-------------|
| 283 | 47-37503 | 7074C98H04 |
| 284 | 47-37503-2 | 7074C98H01 |
| 285 | 47-37503-3 | 7074C98H02 |
| 286 | 47-37503-4 | 7074C98H02 |
| 287 | 47-37503-5 | 7074C98H03 |
| 289 | 47-37459 | 7074C44H01 |
| 290 | 47-37459-2 | 7074C44H02 |
| 291 | 47-37459-3 | 7074C44H03 |
| 289A | 47-42072-1 | 7074C44H01 |
| 290A | 47-42072-2 | 7074C44H02 |
| 291A | 47-42072-3 | 7074C44H03 |

Notes

- ① Lugs are rated Al/Cu and are suitable for use with either aluminum or copper conductors.
 ② Effective June 1, 2001, frame numbers will have a prefix of FR, e.g., **FR819**. Dimensions, accessories and so on are still applicable as if the FR did not exist.

Case Parts for Ventilated Units

| Frame(s) ① | Front Panel (Upper) | Front Panel (Lower) | Back Panel (Upper) | Back Panel (Lower) | Front or Back Panel (Cutout Cover Plate) | Top Cover | Side Panel (Two Required per Transformer) | Bottom |
|---------------------|---------------------|---------------------|--------------------|--------------------|--|------------|---|------------|
| Single-Phase | | | | | | | | |
| 809 | 7073C16P03 | — | 7073C16P03 | — | — | 7073C17P01 | 7073C18P04 | 7073C14P03 |
| 810 | 7073C16P01 | — | 7073C16P01 | — | — | 7073C17P01 | 7073C18P01 | 7073C14P01 |
| 811 | 7073C16P01 | — | 7073C16P01 | — | — | 7073C17P01 | 7073C18P01 | 7073C14P01 |
| 812 | 7073C16P02 | — | 7073C16P02 | — | — | 7073C17P02 | 7073C18P02 | 7073C14P02 |
| 813 | 7073C16P02 | — | 7073C16P02 | — | — | 7073C17P02 | 7073C18P02 | 7073C14P02 |
| 814, 814E | 7073C54P01 | — | 7073C54P01 | — | — | 7073C17P03 | 7073C18P05 | 7073C14P04 |
| 815 | 47-39433 | — | 47-39433 | — | — | 47-39431 | 47-39430 | 47-39429 |
| 816 | 47-40452 | — | 47-40452 | — | — | 47-40453 | 47-40451 | 47-40449 |
| 817 | 47-40457 | — | 47-40457 | — | — | 47-40458 | 47-40456 | 47-40454 |
| 818 | 47-40457 | — | 47-40457 | — | — | 47-40458 | 47-40456 | 47-40454 |
| 819 | 47-40574 | — | 47-40574 | — | — | 47-40575 | 47-40573 | 47-40459 |
| 820 | 47-40574 | — | 47-40574 | — | — | 47-40575 | 47-40573 | 47-40459 |
| 842 | 47-54828-2 | — | 47-54828-2 | — | — | 47-54829-2 | 47-54827-2 | 47-55335-2 |
| 842A | 73-5915-1 | — | 73-5915-1 | — | — | 73-5916-1 | 73-5913-1 | 73-5914-1 |
| 843 | 47-54828-4 | — | 47-54828-4 | — | — | 47-54829-4 | 47-54827-4 | 47-55335-3 |
| 843A | 73-5915-2 | — | 73-5915-2 | — | — | 73-5916-2 | 73-5913-2 | 73-5914-2 |
| 844 | 47-54828-5 | — | 47-54828-5 | — | — | 47-54829-5 | 47-54827-5 | 47-55335-5 |
| 844A | 73-5915-3 | — | 73-5915-3 | — | — | 73-5916-3 | 73-5913-3 | 73-5914-3 |

Notes

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Parts listed are for standard catalog listed transformers. Units with modifications may require different parts. (Frame number from transformer nameplate required.) Transformer nameplate and UL label are not field replaceable.

Case Parts for Ventilated Units, continued

2

| Frame(s) ① | Front Panel (Upper) | Front Panel (Lower) | Back Panel (Upper) | Back Panel (Lower) | Front or Back Panel (Cutout Cover Plate) | Top Cover | Side Panel (Two Required per Transformer) | Bottom |
|--------------------|---------------------|---------------------|--------------------|--------------------|--|------------|---|------------|
| Three-Phase | | | | | | | | |
| 908 | 7073C37P01 | — | 7073C37P01 | — | — | 1714C45P01 | 1714C44P03 | 7073C20P05 |
| 909 | 7073C37P01 | — | 7073C37P01 | — | — | 1714C45P01 | 1714C44P03 | 7073C20P05 |
| 910 | 1714C46P01 | — | 1714C46P01 | — | — | 1714C45P01 | 1714C44P01 | 7073C20P01 |
| 911 | 1714C46P01 | — | 1714C46P01 | — | — | 1714C45P01 | 1714C44P01 | 7073C20P01 |
| 912 | 1714C46P01 | — | 1714C46P01 | — | — | 1714C45P01 | 1714C44P01 | 7073C20P01 |
| 916 | 1714C60P01 | — | 1714C60P01 | — | — | 1714C58P01 | 1714C56P01 | 7073C20P03 |
| 917 | 47-44973-1 | — | 47-44973-1 | — | — | 1714C67P01 | 1714C64P01 | 7073C20P04 |
| 918 | 47-44973-1 | — | 47-44973-1 | — | — | 1714C67P01 | 1714C64P01 | 7073C20P04 |
| 919, 919E, 919EX | 2D46331P03 | 2D46331P04 | 2D46331P03 | 2D46331P04 | 2D46331P01 | 2D46331P02 | 2D46332P01 | 2D46331P04 |
| 920, 920E, 920EX | 2D46331P03 | 2D46331P04 | 2D46331P03 | 2D46331P04 | 2D46331P01 | 2D46331P02 | 2D46332P01 | 2D46331P04 |
| 922 | 2D46391H06 | 2D46391H08 | 2D46391H03 | 2D46391H08 | — | 2D46391H02 | 2D46392H01 | — |
| 923 | 47-45927-1 | — | 47-45927-1 | — | — | 47-45926-1 | 47-45925-1 | 47-45759-1 |
| 910A | 47-40592 | — | 47-40592 | — | — | 1714C45P01 | 47-40591 | 47-40589 |
| 911A | 47-40592 | — | 47-40592 | — | — | 1714C45P01 | 47-40591 | 47-40589 |
| 912A | 47-40592 | — | 47-40592 | — | — | 1714C45P01 | 47-40591 | 47-40589 |
| 912B | 47-49323-1 | — | 47-49323-1 | — | — | 47-49322-1 | 47-49321-1 | 47-49320-1 |
| 912D | 47-55332-2 | — | 47-55332-2 | — | — | 47-55331-2 | 47-55329-2 | 47-55330-1 |
| 912DN | 47-55332-4 | — | 47-55332-4 | — | — | 47-55331-2 | 47-55329-2 | 47-55330-3 |
| 913A | 1714C47P03 | — | 1714C47P03 | — | — | 1714C45P02 | 1714C44P07 | 7073C30P02 |
| 913B | 47-40580 | — | 47-40580 | — | — | 1714C45P02 | 47-40578 | 47-41792 |
| 914A | 1714C47P03 | — | 1714C47P03 | — | — | 1714C45P02 | 1714C44P07 | 7073C30P02 |
| 914B | 47-40580 | — | 47-40580 | — | — | 1714C45P02 | 47-40578 | 47-41792 |
| 914D | 47-49317-1 | — | 47-49317-1 | — | — | 47-49316-1 | 47-49315-1 | 47-49314-1 |
| 914F/915F | 47-56915-1 | — | 47-56915-1 | — | — | 47-56916-1 | 47-56917-1 | 47-56918-1 |
| 915A | 1714C47P03 | — | 1714C47P03 | — | — | 1714C45P02 | 1714C44P07 | 7073C30P02 |
| 915B | 47-40580 | — | 47-40580 | — | — | 1714C45P02 | 47-40578 | 47-41792 |
| 915D | 47-49317-1 | — | 47-49317-1 | — | — | 47-49316-1 | 47-49315-1 | 47-49314-1 |
| 916A | 47-41790 | — | 47-41790 | — | — | 47-41791 | 47-41789 | 47-41788 |
| 918A | 47-41801 | — | 47-41801 | — | — | 47-41802 | 47-41800 | 47-41802 |
| 912Z | 47-49323-1 | — | 47-49323-1 | — | — | 47-49322-1 | 47-49991-1 | 47-49989-1 |
| 915Z | 47-49317-1 | — | 47-49317-1 | — | — | 47-49316-1 | 47-49994-1 | 47-49995-1 |
| 916Z | 47-49992-1 | — | 47-49992-1 | — | — | 47-41791 | 47-49988-1 | 47-49987-1 |
| 939 | 73-5902-1 | — | 73-5902-1 | — | — | 73-5903-1 | 73-5900-1 | 73-5901-1 |
| 940 | 73-5902-2 | — | 73-5902-2 | — | — | 73-5903-2 | 73-5900-2 | 73-5901-2 |
| 942 | 73-5902-3 | — | 73-5902-3 | — | — | 73-5903-3 | 73-5900-3 | 73-5901-3 |
| 943 | 73-5902-4 | — | 73-5902-4 | — | — | 73-5903-4 | 73-5900-4 | 73-5901-4 |
| 944 | 73-5902-5 | — | 73-5902-5 | — | — | 73-5903-5 | 73-5900-5 | 73-5901-5 |
| 945 | 73-5902-6 | — | 73-5902-6 | — | — | 73-5903-6 | 73-5900-6 | 73-5901-6 |

Notes

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Parts listed are for standard catalog listed transformers. Units with modifications may require different parts. (Frame number from transformer nameplate required.) Transformer nameplate and UL label are not field replaceable.

Technical Data and Specifications

Customer-Furnished Connecting Cables

Eaton recommends that external cables be rated 90°C (sized at 75°C ampacity) for encapsulated designs and 75°C for ventilated designs.

Primary and secondary terminal lugs are not included. Lug kits are available separately.

Overload Capability

Short-term overload capacity is designed into transformers as required by ANSI. Dry-type distribution transformers will deliver 200% nameplate load for one-half hour, 150% load for one hour and 125% load for four hours without being damaged, provided that a constant 50% load precedes and follows the overload. See ANSI C57.96-01.250 for additional limitations.

Continuous overload capacity is not deliberately designed into a transformer because the design objective is to be within the allowed winding temperature rise with nameplate loading.

Seismically Qualified

Eaton manufactured dry-type distribution transformers are seismically qualified, and exceed requirements of the Uniform Building Code (UBC) and California Code Title 24.

Taps

Primary taps are available in most ratings to allow compensation for source voltage variations.

Series-Multiple Windings

Series-multiple windings consist of two similar coils in each winding that can be connected in series or parallel (multiple). Transformers with series-multiple windings are designated with a "x" or "/" between the voltage ratings, such as voltages of "120/240" or "240 x 480." If the series-multiple winding is designated by an "x," the winding can be connected only for a series or parallel. With the "/" designation, a midpoint also becomes

available in addition to the series or parallel connection. As an example, a 120 x 240 winding can be connected for either 120 (parallel) or 240 (series), but a 120/240 winding can be connected for 120 (parallel), 240 (series) or 240 with a 120 midpoint.

Enclosures

Eaton's ventilated transformers—Types DS-3, DT-3, MD and KT—use a NEMA 2 rated (drip-proof) enclosure as standard, and are rated NEMA 3R with the addition of weathershields. Eaton encapsulated—Types EP, EPT, EPZ and EPTZ—and totally enclosed, non-ventilated (Types DS-3E and DT-3E) transformers use a NEMA 3R rated enclosure.

Buck-Boost Transformers

An autotransformer has only one winding, and is therefore smaller and more economical than the conventional two-winding transformer. In an autotransformer, the primary and secondary are electrically and mechanically connected. The required secondary voltage is obtained by "tapping-off" from the single winding.

Buck-boost autotransformers are insulated units with 120 x 240 or 240 x 480 volt primaries and 12/24, 16/32 or 24/48 volt secondaries, and provide a very economical method for minor voltage adjustments where circuit isolation is not needed.

Autotransformers can be used only where local electrical codes permit, and isolation of the two circuits is not required.

Nonlinear Ratings

The transformers shall be specifically designed to supply circuits with a harmonic profile equal to or less than a K-factor of 4 or 13, as described in the following table, without exceeding specified temperature rise.

Nonlinear Ratings

| Harmonic | K-4 | K-13 |
|-------------|--------|--------|
| Fundamental | 100.0% | 100.0% |
| 3rd | 34.0% | 70.0% |
| 5th | 22.0% | 42.0% |
| 7th | 3.0% | 5.0% |
| 9th | 1.0% | 3.0% |
| 11th | 0.7% | 3.0% |
| 13th | 0.5% | 1.0% |
| 15th | 0.3% | 0.7% |
| 17th | 0.3% | 0.6% |

Sound Levels

All Eaton 600 volt class general-purpose dry-type distribution transformers are designed to meet NEMA ST-20 sound levels listed here. These are the sound levels measured in a soundproof environment. Actual sound levels measured at an installation will likely be higher (up to 15 dB greater) due to electrical connections and environmental conditions. Lower sound levels are available and should be specified when the transformer is going to be installed in an area where sound may be a concern.

All Eaton general-purpose dry-type distribution transformers are designed with sound levels lower than NEMA ST-20 maximum levels. However, consideration should be given to the specific location of the

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilated (up to 1.2 kV) | | Encapsulated (up to 1.2 kV) |
|---------------------------------|---------------------------------------|-----------------|--------------------------------|
| | K-Factor 1, 4, 9 | K-Factor 13, 20 | |
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

transformers and their installation to minimize the potential for sound transmission to surrounding structures and sound reflection. It is suggested that the following installation methods be included:

1. If possible, mount the transformer away from corners of walls or ceilings. For installation that must be near a corner, use sound-absorbing materials on the walls and ceilings if necessary to eliminate reflection.
2. Provide a solid foundation for mounting the transformer and then use vibration dampening mounts if not already provided in the transformer. (Eaton encapsulated EP/EPT designs use a special encapsulation system and ventilated DS/DT-3 designs contain a built-in vibration dampening system to minimize and isolate sound transmission.)
3. Provide flexible conduit to make the connections to the transformer.
4. Locate the transformer as far as possible from areas where high sound levels are undesirable.

Typical Data for General-Purpose Dry-Type Distribution Transformers, Aluminum Wound ^①

Type EP 115°C Rise

| kVA | Weight Lbs | | Losses in Watts | | Efficiency | | | | % Regulation | | % Impedance ^② | | Sound Level dB |
|-------|------------|-----|-----------------|-------|------------|----------|----------|-----------|--------------|----------|--------------------------|------|----------------|
| | Al | Cu | No Load | Total | 1/4 Load | 1/2 Load | 3/4 Load | Full Load | 100% P.F. | 80% P.F. | Min. | Max. | |
| 0.05 | — | 7 | 6 | 9 | 65.3 | 79.6 | 84.3 | 85.6 | 5.9 | 6.4 | 5.5 | 9.5 | 45 |
| 0.075 | — | 7 | 7 | 14 | 66.0 | 79.0 | 82.5 | 82.8 | 9.4 | 9.2 | 7.5 | 11.0 | 45 |
| 0.10 | — | 7 | 5 | 15 | 82.4 | 86.9 | 87.7 | 86.5 | 10.3 | 10.6 | 8.0 | 12.0 | 45 |
| 0.15 | — | 8 | 7 | 20 | 83.4 | 88.2 | 88.9 | 87.8 | 9.0 | 9.6 | 8.0 | 12.0 | 45 |
| 0.25 | — | 12 | 14 | 29 | 79.0 | 87.2 | 89.5 | 89.6 | 5.9 | 7.5 | 7.5 | 9.5 | 45 |
| 0.5 | — | 13 | 20 | 47 | 85.1 | 90.3 | 91.4 | 91.4 | 5.5 | 7.0 | 5.0 | 7.0 | 45 |
| 0.75 | — | 20 | 29 | 57 | 86.0 | 91.3 | 92.7 | 92.9 | 3.9 | 5.0 | 4.0 | 6.0 | 45 |
| 1 | — | 30 | 24 | 60 | 90.8 | 93.9 | 94.5 | 94.4 | 3.8 | 4.9 | 3.8 | 5.8 | 45 |
| 1.5 | 65 | 40 | 30 | 90 | 92.5 | 94.7 | 95.0 | 94.6 | 4.1 | 5.2 | 2.5 | 4.5 | 45 |
| 2 | 113 | 40 | 30 | 100 | 94.2 | 95.7 | 95.8 | 95.4 | 3.6 | 4.7 | 3.3 | 5.3 | 45 |
| 3 | — | 69 | 61 | 135 | 92.0 | 95.0 | 95.7 | 95.7 | 2.5 | 3.5 | 2.5 | 4.1 | 45 |
| 5 | — | 120 | 104 | 215 | 91.8 | 95.0 | 95.8 | 95.9 | 2.3 | 3.3 | 2.0 | 4.6 | 45 |
| 7.5 | 123 | 133 | 129 | 250 | 93.2 | 96.0 | 96.7 | 95.9 | 1.5 | 2.4 | 2.4 | 3.4 | 45 |
| 10 | 193 | 208 | 153 | 295 | 93.9 | 96.3 | 97.0 | 97.2 | 1.5 | 2.5 | 2.0 | 3.3 | 50 |
| 15 | 216 | 235 | 209 | 435 | 94.4 | 96.6 | 97.1 | 97.2 | 1.6 | 2.8 | 1.6 | 3.6 | 50 |
| 25 | 385 | 414 | 191 | 440 | 96.8 | 98.0 | 98.3 | 98.4 | 1.1 | 2.5 | 1.6 | 4.2 | 50 |
| 37.5 | 735 | 856 | 225 | 370 | 97.4 | 98.3 | 98.5 | 98.4 | 1.2 | 2.6 | 2.8 | 4.0 | 50 |

Type EPT 115°C Rise ^③

| kVA | Weight Lbs | | Losses in Watts | | Efficiency | | | | % Regulation | | % Impedance ^② | | Sound Level dB |
|-----|------------|------|-----------------|-------|------------|----------|----------|-----------|--------------|----------|--------------------------|------|----------------|
| | Al | Cu | No Load | Total | 1/4 Load | 1/2 Load | 3/4 Load | Full Load | 100% P.F. | 80% P.F. | Min. | Max. | |
| 3 | 116 | 123 | 110 | 165 | 87.3 | 92.6 | 94.3 | 94.9 | 2.1 | 6.1 | 2.4 | 8.0 | 45 |
| 6 | 143 | 153 | 145 | 275 | 90.9 | 94.5 | 95.5 | 95.7 | 2.2 | 3.1 | 2.9 | 4.9 | 45 |
| 9 | 166 | 178 | 195 | 375 | 91.6 | 95.0 | 95.9 | 96.1 | 2.0 | 2.8 | 2.0 | 3.6 | 45 |
| 15 | 275 | 300 | 265 | 545 | 93.0 | 95.7 | 96.5 | 96.6 | 1.9 | 3.1 | 1.9 | 3.9 | 50 |
| 30 | 422 | 504 | 250 | 665 | 96.5 | 97.7 | 98.0 | 97.9 | 1.5 | 2.5 | 1.8 | 3.8 | 50 |
| 45 | 660 | 745 | 300 | 740 | 97.2 | 98.2 | 98.4 | 98.5 | 1.0 | 2.1 | 1.8 | 4.0 | 50 |
| 75 | 1275 | 1450 | 400 | 945 | 97.7 | 98.6 | 98.8 | 98.8 | 0.8 | 1.6 | 1.7 | 3.4 | 55 |

Notes

^① Typical values for aluminum windings. Contact Eaton for values of copper windings. Up-to-date design data is available at www.eaton.com.

^② Actual impedance may be $\pm 7.5\%$.

^③ Type EPT transformers 3–15 kVA are T-T connected.

Performance data is based upon 480 volt Delta primary and a 208Y/120 volt secondary for three-phase transformers; 240 x 480 volt primary and a 120/240 volt secondary for single-phase transformers. All data is subject to future revision. Refer to Eaton for 5 kV class information. All data is subject to future revision.

Typical Data for DOE 2016 Energy-Efficient Low-Voltage Dry-Type Distribution Transformers, Aluminum Wound ^①

Type DS-3 150°C Rise DOE 2016 Single-Phase

| kVA | Frame | Weight | Losses in Watts | | Efficiency (T. Rise +20° C) | | | | % Regulation | | | % Impedance | | | Sound Level dB | DOE 2016 Efficiency | Practical Inrush |
|------|-------|--------|-----------------|----------------------|-----------------------------|----------|----------|-----------|--------------|----------|--------|-------------|------|----|----------------|---------------------|------------------|
| | | | No Load | Total at Rise +20° C | 1/4 Load | 1/2 Load | 3/4 Load | Full Load | 100% P.F. | 80% P.F. | % Imp. | % X | % R | | | | |
| 15 | 842A | 200 | 54 | 669 | 97.89 | 97.76 | 96.97 | 95.75 | 4.1 | 4.2 | 4.37 | 1.51 | 4.10 | 45 | 97.70 | 320 | |
| 25 | 842A | 275 | 74 | 1004 | 98.20 | 98.05 | 97.30 | 96.15 | 3.7 | 3.7 | 3.71 | 1.88 | 3.20 | 45 | 98.00 | 550 | |
| 37.5 | 843A | 310 | 78 | 1328 | 98.60 | 98.34 | 97.65 | 96.59 | 3.3 | 5.6 | 5.86 | 4.82 | 3.33 | 45 | 98.20 | 930 | |
| 50 | 843A | 390 | 105 | 2005 | 98.48 | 98.16 | 97.37 | 96.20 | 3.8 | 5.7 | 5.84 | 4.43 | 3.80 | 45 | 98.30 | 360 | |
| 75 | 844A | 650 | 180 | 2330 | 98.54 | 98.42 | 97.86 | 96.99 | 2.9 | 4.1 | 4.15 | 3.00 | 2.87 | 50 | 98.50 | 820 | |
| 100 | 844A | 690 | 208 | 3028 | 98.67 | 98.50 | 97.93 | 97.07 | 2.8 | 4.9 | 5.13 | 4.29 | 2.82 | 50 | 98.60 | 760 | |
| 167 | 814A | 1610 | 900 | 4887 | 98.60 | 98.70 | 98.40 | 98.00 | 1.40 | 6.80 | 9.70 | 9.50 | 1.80 | 55 | 98.70 | 416 | |

Type DS-3 115°C Rise DOE 2016 Single-Phase

| kVA | Frame | Weight | Losses in Watts | | Efficiency (T. Rise +20° C) | | | | % Regulation | | | % Impedance | | | Sound Level dB | DOE 2016 Efficiency | Practical Inrush |
|------|-------|--------|-----------------|----------------------|-----------------------------|----------|----------|-----------|--------------|----------|--------|-------------|------|----|----------------|---------------------|------------------|
| | | | No Load | Total at Rise +20° C | 1/4 Load | 1/2 Load | 3/4 Load | Full Load | 100% P.F. | 80% P.F. | % Imp. | % X | % R | | | | |
| 15 | 842A | 200 | 54 | 656 | 97.90 | 97.77 | 96.98 | 95.76 | 4.0 | 4.2 | 4.33 | 1.62 | 4.01 | 45 | 97.70 | 323 | |
| 25 | 842A | 275 | 74 | 984 | 98.21 | 98.06 | 97.31 | 96.16 | 3.6 | 3.2 | 3.67 | 0.50 | 3.64 | 45 | 98.00 | 556 | |
| 37.5 | 843A | 310 | 78 | 1301 | 98.61 | 98.35 | 97.66 | 96.60 | 3.3 | 5.5 | 5.80 | 4.80 | 3.26 | 45 | 98.20 | 939 | |
| 50 | 843A | 390 | 105 | 1965 | 98.49 | 98.17 | 97.38 | 96.21 | 3.7 | 5.7 | 5.78 | 4.43 | 3.72 | 45 | 98.30 | 364 | |
| 75 | 844A | 650 | 180 | 2283 | 98.55 | 98.43 | 97.87 | 97.00 | 2.8 | 4.1 | 4.11 | 3.00 | 2.80 | 50 | 98.50 | 828 | |

Type DS-3 80°C Rise DOE 2016 Single-Phase

| kVA | Frame | Weight | Losses in Watts | | Efficiency (T. Rise +20° C) | | | | % Regulation | | | % Impedance | | | Sound Level dB | DOE 2016 Efficiency | Practical Inrush |
|------|-------|--------|-----------------|----------------------|-----------------------------|----------|----------|-----------|--------------|----------|--------|-------------|------|----|----------------|---------------------|------------------|
| | | | No Load | Total at Rise +20° C | 1/4 Load | 1/2 Load | 3/4 Load | Full Load | 100% P.F. | 80% P.F. | % Imp. | % X | % R | | | | |
| 15 | 842A | 275 | 74 | 344 | 97.85 | 98.26 | 98.05 | 97.65 | 1.8 | 2.2 | 2.23 | 1.31 | 1.80 | 45 | 97.70 | 550 | |
| 25 | 843A | 310 | 78 | 678 | 98.40 | 98.58 | 98.34 | 97.96 | 2.4 | 3.8 | 3.91 | 3.08 | 2.40 | 45 | 98.00 | 930 | |
| 37.5 | 843A | 390 | 105 | 1010 | 98.28 | 98.44 | 98.16 | 97.73 | 2.4 | 4.1 | 4.38 | 3.66 | 2.41 | 45 | 98.20 | 360 | |
| 50 | 844A | 650 | 180 | 930 | 98.25 | 98.58 | 98.42 | 98.12 | 1.5 | 2.6 | 2.77 | 2.32 | 1.50 | 45 | 98.30 | 820 | |
| 75 | 844A | 690 | 208 | 1588 | 98.44 | 98.69 | 98.50 | 98.19 | 1.8 | 3.5 | 3.85 | 3.38 | 1.84 | 50 | 98.50 | 760 | |

Note

^① Typical values for aluminum windings. Contact Eaton for values of copper windings. Up-to-date design data is available at www.eaton.com.

Typical Data for DOE 2016 Energy-Efficient Low-Voltage Dry-Type Distribution Transformers—Aluminum Wound

Type DT-3 150°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 225 | 69 | 573 | 97.85 | 97.70 | 97.11 | 96.43 | 3.7 | 3.7 | 3.74 | 1.6 | 3.4 | 45 | 97.89 | 70 |
| 30 | 409 | 129 | 802 | 97.99 | 98.17 | 97.87 | 97.45 | 2.4 | 2.4 | 2.44 | 1.0 | 2.2 | 45 | 98.23 | 218 |
| 45 | 416 | 140 | 1287 | 98.37 | 98.25 | 97.80 | 97.27 | 3.3 | 3.5 | 3.51 | 2.4 | 2.5 | 45 | 98.40 | 165 |
| 75 | 570 | 210 | 1887 | 98.52 | 98.44 | 98.05 | 97.59 | 3.3 | 3.6 | 3.61 | 2.8 | 2.2 | 50 | 98.60 | 270 |
| 112.5 | 976 | 280 | 2516 | 98.70 | 98.63 | 98.28 | 97.86 | 3.9 | 4.3 | 4.37 | 3.9 | 2.0 | 50 | 98.74 | 302 |
| 150 | 1239 | 350 | 2983 | 98.77 | 98.74 | 98.44 | 98.08 | 3.1 | 3.4 | 3.46 | 3.0 | 1.8 | 50 | 98.83 | 516 |
| 225 | 1624 | 495 | 4118 | 98.86 | 98.84 | 98.57 | 98.24 | 3.8 | 4.2 | 4.29 | 4.0 | 1.6 | 55 | 98.94 | 721 |
| 300 | 2283 | 640 | 5236 | 98.98 | 98.92 | 98.65 | 98.33 | 3.9 | 4.3 | 4.45 | 4.2 | 1.5 | 55 | 99.02 | 731 |

Type DT-3 115°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 231 | 65 | 521 | 97.94 | 97.86 | 97.35 | 96.74 | 3.4 | 3.5 | 3.54 | 1.8 | 3.0 | 45 | 97.89 | 70 |
| 30 | 420 | 122 | 691 | 98.10 | 98.35 | 98.12 | 97.79 | 2.1 | 2.2 | 2.21 | 1.1 | 1.9 | 45 | 98.23 | 196 |
| 45 | 429 | 140 | 1217 | 98.40 | 98.32 | 97.91 | 97.42 | 3.5 | 3.8 | 3.81 | 3.0 | 2.4 | 45 | 98.40 | 146 |
| 75 | 605 | 210 | 1816 | 98.58 | 98.50 | 98.13 | 97.69 | 3.5 | 3.8 | 3.82 | 3.2 | 2.1 | 50 | 98.60 | 244 |
| 112.5 | 982 | 260 | 2436 | 98.73 | 98.66 | 98.32 | 97.91 | 4.0 | 4.4 | 4.53 | 4.1 | 1.9 | 50 | 98.74 | 265 |
| 150 | 1253 | 350 | 3014 | 98.76 | 98.72 | 98.42 | 98.06 | 3.5 | 3.9 | 3.97 | 3.6 | 1.8 | 50 | 98.83 | 447 |
| 225 | 1633 | 495 | 3757 | 98.90 | 98.91 | 98.68 | 98.39 | 4.7 | 5.1 | 5.3 | 5.1 | 1.4 | 55 | 98.94 | 610 |
| 300 | 2283 | 600 | 4668 | 98.99 | 98.99 | 98.77 | 98.50 | 3.9 | 4.4 | 4.52 | 4.3 | 1.4 | 55 | 99.02 | 675 |

Type DT-3 80°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 237 | 65 | 508 | 97.97 | 97.90 | 97.41 | 96.82 | 3.6 | 3.8 | 3.81 | 2.4 | 3.0 | 45 | 97.89 | 70 |
| 30 | 433 | 140 | 557 | 98.13 | 98.54 | 98.46 | 98.25 | 1.9 | 2.1 | 2.15 | 1.6 | 1.4 | 45 | 98.23 | 165 |
| 45 | 570 | 210 | 724 | 98.25 | 98.70 | 98.66 | 98.51 | 1.7 | 2.0 | 2.04 | 1.7 | 1.1 | 50 | 98.40 | 270 |
| 75 | 982 | 256 | 1104 | 98.58 | 98.87 | 98.78 | 98.60 | 2.3 | 2.7 | 2.75 | 2.5 | 1.1 | 50 | 98.60 | 302 |
| 112.5 | 1274 | 365 | 1701 | 98.66 | 98.90 | 98.78 | 98.57 | 2.2 | 2.5 | 2.62 | 2.3 | 1.2 | 50 | 98.74 | 516 |
| 150 | 1628 | 414 | 1781 | 98.74 | 99.03 | 98.98 | 98.85 | 2.4 | 2.8 | 2.9 | 2.8 | 0.9 | 55 | 98.83 | 721 |
| 225 | 2207 | 761 | 3337 | 98.84 | 98.99 | 98.86 | 98.65 | 2.7 | 3.1 | 3.17 | 3.0 | 1.1 | 55 | 98.94 | 731 |
| 300 | 2283 | 565 | 3642 | 99.00 | 99.12 | 98.99 | 98.80 | 3.8 | 4.3 | 4.51 | 4.4 | 1.0 | 60 | 99.02 | 694 |

Typical Data for DOE 2016 Energy-Efficient Low-Voltage Dry-Type Distribution Transformers—Aluminum Wound

Type KT-4 150°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Trise +20°C | X Trise +20°C | R Trise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|--------------------|---------------|---------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 407 | 91 | 324 | 97.51 | 98.18 | 98.15 | 97.96 | 1.7 | 1.8 | 1.77 | 0.9 | 1.6 | 45 | 97.89 | 70 |
| 30 | 437 | 122 | 755 | 98.08 | 98.26 | 97.98 | 97.59 | 2.5 | 2.7 | 2.66 | 1.6 | 2.1 | 45 | 98.23 | 196 |
| 45 | 439 | 140 | 1323 | 98.35 | 98.21 | 97.74 | 97.19 | 3.9 | 4.2 | 4.18 | 3.2 | 2.6 | 45 | 98.40 | 146 |
| 75 | 599 | 210 | 1971 | 98.53 | 98.40 | 97.98 | 97.49 | 3.7 | 4.0 | 4.05 | 3.3 | 2.3 | 50 | 98.60 | 244 |
| 112.5 | 987 | 365 | 1833 | 98.60 | 98.82 | 98.69 | 98.45 | 2.6 | 3.0 | 3.07 | 2.8 | 1.3 | 50 | 98.74 | 265 |
| 150 | 1637 | 495 | - | - | - | - | - | - | - | - | - | - | 55 | 98.83 | 447 |
| 225 | 1642 | 471 | 3944 | 98.88 | 98.87 | 98.61 | 98.30 | 4.8 | 5.3 | 5.43 | 5.2 | 1.5 | 55 | 98.94 | 610 |
| 300 | 2394 | 600 | 5069 | 98.99 | 98.94 | 98.68 | 98.38 | 4.4 | 4.8 | 4.99 | 4.8 | 1.5 | 55 | 99.02 | 675 |

Type KT-4 115°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Trise +20°C | X Trise +20°C | R Trise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|--------------------|---------------|---------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 402 | 91 | 294 | 97.48 | 98.24 | 98.27 | 98.13 | 1.6 | 1.7 | 1.7 | 1.0 | 1.4 | 45 | 97.89 | 136 |
| 30 | 415 | 122 | 695 | 98.12 | 98.35 | 98.12 | 97.78 | 2.2 | 2.4 | 2.38 | 1.4 | 1.9 | 45 | 98.23 | 196 |
| 45 | 619 | 193 | 784 | 98.18 | 98.60 | 98.53 | 98.34 | 2.0 | 2.3 | 2.34 | 1.9 | 1.3 | 50 | 98.40 | 244 |
| 75 | 984 | 260 | 1343 | 98.49 | 98.71 | 98.55 | 98.29 | 2.8 | 3.2 | 3.25 | 2.9 | 1.4 | 50 | 98.60 | 265 |
| 112.5 | 1236 | 365 | 1687 | 98.62 | 98.88 | 98.78 | 98.57 | 2.5 | 2.9 | 2.98 | 2.7 | 1.2 | 50 | 98.74 | 447 |
| 150 | 1662 | 495 | 1974 | 98.65 | 98.96 | 98.90 | 98.75 | 3.0 | 3.4 | 3.57 | 3.4 | 1.0 | 55 | 98.83 | 610 |
| 225 | 2353 | 542 | 3005 | 98.88 | 99.03 | 98.91 | 98.71 | 3.1 | 3.5 | 3.68 | 3.5 | 1.1 | 55 | 98.94 | 675 |
| 300 | 2198 | 582 | 4188 | 98.88 | 99.00 | 98.84 | 98.61 | 3.2 | 3.6 | 3.73 | 3.5 | 1.2 | 55 | 99.02 | 1027 |

Type KT-4 80°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Trise +20°C | X Trise +20°C | R Trise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|--------------------|---------------|---------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 254 | 65 | 543 | 97.71 | 97.69 | 97.17 | 96.55 | 3.6 | 3.7 | 3.67 | 1.8 | 3.2 | 45 | 97.89 | 58 |
| 30 | 437 | 140 | 591 | 98.12 | 98.50 | 98.38 | 98.15 | 2.2 | 2.5 | 2.52 | 2.0 | 1.5 | 45 | 98.23 | 146 |
| 45 | 619 | 180 | 730 | 98.32 | 98.71 | 98.64 | 98.45 | 2.0 | 2.3 | 2.36 | 2.0 | 1.2 | 50 | 98.40 | 244 |
| 75 | 1027 | 260 | 1159 | 98.49 | 98.80 | 98.70 | 98.51 | 2.7 | 3.1 | 3.18 | 2.9 | 1.2 | 50 | 98.60 | 265 |
| 112.5 | 1643 | 444 | 1213 | 98.50 | 99.00 | 99.06 | 98.99 | 2.1 | 2.5 | 2.64 | 2.5 | 0.7 | 55 | 98.74 | 610 |
| 150 | 1710 | 408 | 1853 | 98.86 | 99.07 | 98.98 | 98.82 | 2.9 | 3.4 | 3.52 | 3.4 | 1.0 | 55 | 98.83 | 611 |
| 225 | 2680 | 621 | 2405 | 98.78 | 99.09 | 99.07 | 98.96 | 3.0 | 3.5 | 3.67 | 3.6 | 0.8 | 60 | 98.94 | 757 |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Typical Data for DOE 2016 Energy-Efficient Low-Voltage Dry-Type Distribution Transformers—Aluminum Wound

Type KT-9 150°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 406 | 91 | 315 | 97.52 | 98.20 | 98.19 | 98.01 | 1.6 | 1.7 | 1.68 | 0.8 | 1.5 | 45 | 97.89 | 70 |
| 30 | 416 | 122 | 770 | 98.04 | 98.22 | 97.94 | 97.54 | 2.4 | 2.5 | 2.47 | 1.2 | 2.2 | 45 | 98.23 | 196 |
| 45 | 594 | 193 | 817 | 98.18 | 98.57 | 98.48 | 98.27 | 2.1 | 2.4 | 2.4 | 2.0 | 1.4 | 50 | 98.40 | 244 |
| 75 | 1012 | 256 | 1323 | 98.49 | 98.72 | 98.56 | 98.31 | 3.0 | 3.4 | 3.5 | 3.2 | 1.4 | 50 | 98.60 | 265 |
| 112.5 | 1297 | 365 | 1907 | 98.59 | 98.80 | 98.65 | 98.39 | 2.7 | 3.1 | 3.18 | 2.9 | 1.4 | 50 | 98.74 | 447 |
| 150 | 1652 | 385 | 1840 | 98.87 | 99.07 | 98.98 | 98.82 | 3.0 | 3.4 | 3.61 | 3.5 | 1.0 | 50 | 98.83 | — |
| 225 | 2379 | 617 | 3346 | 98.82 | 98.96 | 98.81 | 98.59 | 3.1 | 3.6 | 3.7 | 3.5 | 1.2 | 55 | 98.94 | 618.48 |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Type KT-9 115°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 412 | 91 | 290 | 97.58 | 98.29 | 98.32 | 98.17 | 1.5 | 1.6 | 1.61 | 0.9 | 1.3 | 45 | 97.89 | — |
| 30 | 437 | 140 | 636 | 98.04 | 98.40 | 98.26 | 97.99 | 2.6 | 2.9 | 2.98 | 2.5 | 1.7 | 45 | 98.23 | 196 |
| 45 | 619 | 193 | 772 | 98.20 | 98.62 | 98.55 | 98.36 | 2.0 | 2.3 | 2.29 | 1.9 | 1.3 | 50 | 98.40 | 244 |
| 75 | 977 | 260 | 1226 | 98.50 | 98.77 | 98.66 | 98.44 | 2.6 | 3.0 | 3.11 | 2.8 | 1.3 | 50 | 98.60 | 265 |
| 112.5 | 1760 | 495 | 1369 | 98.41 | 98.93 | 98.97 | 98.89 | 2.1 | 2.6 | 2.7 | 2.6 | 0.8 | 55 | 98.74 | — |
| 150 | 1800 | 489 | 1911 | 98.80 | 99.05 | 98.98 | 98.82 | 3.0 | 3.5 | 3.64 | 3.5 | 0.9 | 55 | 98.83 | 610 |
| 225 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Type KT-9 80°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 30 | 435 | 140 | 617 | 98.14 | 98.48 | 98.33 | 98.07 | 2.4 | 2.7 | 2.7 | 2.2 | 1.6 | 45 | 98.23 | — |
| 45 | 927 | 221 | 554 | 97.89 | 98.67 | 98.81 | 98.78 | 1.4 | 1.7 | 1.82 | 1.7 | 0.7 | 50 | 98.40 | 244 |
| 75 | 1098 | 288 | 883 | 98.42 | 98.91 | 98.95 | 98.87 | 1.6 | 1.9 | 2.01 | 1.8 | 0.8 | 50 | 98.60 | 447 |
| 112.5 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 150 | 2416 | 515 | 1537 | 98.70 | 99.10 | 99.12 | 99.04 | 1.8 | 2.2 | 2.3 | 2.2 | 0.7 | 55 | 98.83 | 675 |
| 225 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Typical Data for DOE 2016 Energy-Efficient Low-Voltage Dry-Type Distribution Transformers—Aluminum Wound

Type KT-13 150°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 406 | 91 | 315 | 97.52 | 98.20 | 98.19 | 98.01 | 1.6 | 1.7 | 1.68 | 0.8 | 1.5 | 45 | 97.89 | 70 |
| 30 | 416 | 122 | 770 | 98.04 | 98.22 | 97.94 | 97.54 | 2.4 | 2.5 | 2.47 | 1.2 | 2.2 | 45 | 98.23 | 196 |
| 45 | 594 | 193 | 817 | 98.18 | 98.57 | 98.48 | 98.27 | 2.1 | 2.4 | 2.4 | 2.0 | 1.4 | 53 | 98.40 | 244 |
| 75 | 1012 | 256 | 1323 | 98.49 | 98.72 | 98.56 | 98.31 | 3.0 | 3.4 | 3.5 | 3.2 | 1.4 | 53 | 98.60 | 265 |
| 112.5 | 1297 | 365 | 1907 | 98.59 | 98.80 | 98.65 | 98.39 | 2.7 | 3.1 | 3.18 | 2.9 | 1.4 | 53 | 98.74 | 447 |
| 150 | 1425 | 415 | 2050 | 98.72 | 98.96 | 98.86 | 98.68 | 3.1 | 3.5 | 3.64 | 3.5 | 1.1 | 53 | 98.83 | 610 |
| 225 | 2341 | 600 | 3072 | 98.86 | 99.02 | 98.89 | 98.70 | 3.2 | 3.6 | 3.75 | 3.6 | 1.1 | 58 | 98.94 | 675 |
| 300 | 2400 | 676 | 4090 | 98.91 | 99.03 | 98.89 | 98.68 | 4.1 | 4.6 | 4.78 | 4.6 | 1.1 | 63 | 99.02 | 526 |

Type KT-13 115°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 412 | 91 | 290 | 97.58 | 98.29 | 98.32 | 98.17 | 1.5 | 1.6 | 1.61 | 0.9 | 1.3 | 45 | 97.89 | 136 |
| 30 | 437 | 140 | 636 | 98.04 | 98.40 | 98.26 | 97.99 | 2.6 | 2.9 | 2.98 | 2.5 | 1.7 | 48 | 98.23 | 196 |
| 45 | 619 | 193 | 772 | 98.20 | 98.62 | 98.55 | 98.36 | 2.0 | 2.3 | 2.29 | 1.9 | 1.3 | 53 | 98.40 | 244 |
| 75 | 977 | 260 | 1226 | 98.50 | 98.77 | 98.66 | 98.44 | 2.6 | 3.0 | 3.11 | 2.8 | 1.3 | 53 | 98.60 | 265 |
| 112.5 | 1760 | 495 | 1369 | 98.41 | 98.93 | 98.97 | 98.89 | 2.1 | 2.6 | 2.7 | 2.6 | 0.8 | 58 | 98.74 | 610 |
| 150 | 1800 | 489 | 1911 | 98.80 | 99.05 | 98.98 | 98.82 | 3.0 | 3.5 | 3.64 | 3.5 | 0.9 | 58 | 98.83 | 610 |
| 225 | 1927 | 570 | - | - | - | - | - | - | - | - | - | - | 63 | 98.94 | - |
| 300 | 2894 | 620 | 4300 | 98.91 | 99.00 | 98.83 | 98.60 | 4.8 | 5.3 | 5.52 | 5.4 | 1.2 | 63 | 99.02 | 577.55 |

Type KT-13 80°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 30 | 435 | 140 | 617 | 98.14 | 98.48 | 98.33 | 98.07 | 2.4 | 2.7 | 2.7 | 2.2 | 1.6 | 48 | 98.23 | 244 |
| 45 | 927 | 221 | 554 | 97.89 | 98.67 | 98.81 | 98.78 | 1.4 | 1.7 | 1.82 | 1.7 | 0.7 | 53 | 98.40 | 344 |
| 75 | 1098 | 288 | 883 | 98.42 | 98.91 | 98.95 | 98.87 | 1.6 | 1.9 | 2.01 | 1.8 | 0.8 | 53 | 98.60 | 447 |
| 112.5 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 150 | 2416 | 515 | 1537 | 98.70 | 99.10 | 99.12 | 99.04 | 1.8 | 2.2 | 2.3 | 2.2 | 0.7 | 58 | 98.83 | 675 |
| 225 | 2816 | 757 | 2649 | 98.85 | 99.11 | 99.06 | 98.93 | 2.9 | 3.4 | 3.55 | 3.4 | 0.8 | 63 | 98.94 | 642 |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Typical Data for DOE 2016 Energy-Efficient Low-Voltage Dry-Type Distribution Transformers—Copper Wound

2

Type DS-3 150°C Rise DOE 2016 Single-Phase

| kVA | Frame | Weight | Losses in Watts | | Efficiency (T. Rise +20° C) | | | | % Regulation | | % Impedance | | | Sound Level dB | DOE 2016 Efficiency | Practical Inrush |
|------|-------|--------|-----------------|----------------------|-----------------------------|----------|----------|-----------|--------------|----------|-------------|------|------|----------------|---------------------|------------------|
| | | | No Load | Total at Rise +20° C | 1/4 Load | 1/2 Load | 3/4 Load | Full Load | 100% P.F. | 80% P.F. | % Imp. | % X | % R | | | |
| 15 | 842A | 216 | 54 | 480 | 98.06 | 98.16 | 97.68 | 96.92 | 2.7 | 3.2 | 3.26 | 1.60 | 2.84 | 45 | 97.70 | 335 |
| 25 | 842A | 295 | 74 | 961 | 98.32 | 98.32 | 97.80 | 96.98 | 2.6 | 2.9 | 2.98 | 1.22 | 2.72 | 45 | 98.00 | 267 |
| 37.5 | 843A | 440 | 78 | 1254 | 98.60 | 98.36 | 97.71 | 96.77 | 3.1 | 5.5 | 5.83 | 4.91 | 3.14 | 45 | 98.20 | 588 |
| 50 | 843A | 450 | 105 | 1544 | 98.60 | 98.41 | 97.78 | 96.83 | 2.8 | 4.1 | 4.13 | 2.96 | 2.88 | 45 | 98.30 | 472 |
| 75 | 844A | 890 | 180 | 2129 | 98.58 | 98.52 | 98.02 | 97.25 | 2.1 | 3.5 | 3.47 | 2.30 | 2.60 | 50 | 98.50 | 919 |
| 100 | 844A | 950 | 208 | 2843 | 98.78 | 98.73 | 98.33 | 97.71 | 1.8 | 4.2 | 4.32 | 3.42 | 2.64 | 50 | 98.60 | 828 |
| 167 | 814A | 1665 | 570 | 3094 | 98.70 | 98.80 | 98.60 | 98.30 | 1.50 | 6.30 | 9.00 | 8.80 | 1.50 | 55 | 98.70 | 955 |

Type DS-3 115°C Rise DOE 2016 Single-Phase

| kVA | Frame | Weight | Losses in Watts | | Efficiency (T. Rise +20° C) | | | | % Regulation | | % Impedance | | | Sound Level dB | DOE 2016 Efficiency | Practical Inrush |
|------|-------|--------|-----------------|----------------------|-----------------------------|----------|----------|-----------|--------------|----------|-------------|------|------|----------------|---------------------|------------------|
| | | | No Load | Total at Rise +20° C | 1/4 Load | 1/2 Load | 3/4 Load | Full Load | 100% P.F. | 80% P.F. | % Imp. | % X | % R | | | |
| 15 | 842A | 218 | 54 | 470 | 98.07 | 98.17 | 97.69 | 96.93 | 2.8 | 3.2 | 3.23 | 1.65 | 2.78 | 45 | 97.70 | 247 |
| 25 | 842A | 300 | 74 | 942 | 98.33 | 98.33 | 97.81 | 96.99 | 3.5 | 2.7 | 2.95 | 0.64 | 2.88 | 45 | 98.00 | 1162 |
| 37.5 | 843A | 450 | 78 | 1229 | 98.61 | 98.37 | 97.72 | 96.78 | 3.1 | 5.4 | 5.77 | 4.89 | 3.07 | 45 | 98.20 | 338 |
| 50 | 843A | 464 | 105 | 1513 | 98.61 | 98.42 | 97.79 | 96.84 | 2.8 | 4.1 | 4.09 | 2.96 | 2.82 | 45 | 98.30 | 780 |
| 75 | 844A | 900 | 180 | 2086 | 98.59 | 98.53 | 98.03 | 97.26 | 2.5 | 3.4 | 3.44 | 2.31 | 2.54 | 50 | 98.50 | 1041 |

Type DS-3 80°C Rise DOE 2016 Single-Phase

| kVA | Frame | Weight | Losses in Watts | | Efficiency (T. Rise +20° C) | | | | % Regulation | | % Impedance | | | Sound Level dB | DOE 2016 Efficiency | Practical Inrush |
|------|-------|--------|-----------------|----------------------|-----------------------------|----------|----------|-----------|--------------|----------|-------------|------|------|----------------|---------------------|------------------|
| | | | No Load | Total at Rise +20° C | 1/4 Load | 1/2 Load | 3/4 Load | Full Load | 100% P.F. | 80% P.F. | % Imp. | % X | % R | | | |
| 15 | 842A | 295 | 74 | 284 | 97.92 | 98.43 | 98.32 | 98.04 | 1.4 | 1.8 | 1.79 | 1.11 | 1.40 | 45 | 97.70 | 588 |
| 25 | 843A | 440 | 78 | 373 | 98.40 | 98.59 | 98.36 | 98.00 | 1.2 | 3.2 | 3.89 | 3.70 | 1.18 | 45 | 98.00 | 472 |
| 37.5 | 843A | 450 | 105 | 456 | 98.35 | 98.61 | 98.41 | 98.07 | 0.9 | 2.5 | 3.10 | 2.95 | 0.94 | 45 | 98.20 | 919 |
| 50 | 844A | 890 | 180 | 755 | 98.28 | 98.65 | 98.52 | 98.26 | 1.2 | 2.1 | 2.31 | 2.01 | 1.15 | 45 | 98.30 | 828 |
| 75 | 844A | 950 | 208 | 856 | 98.51 | 98.84 | 98.73 | 98.52 | 0.9 | 2.6 | 3.24 | 3.12 | 0.86 | 50 | 98.50 | 955 |

Typical Data for DOE 2016 Energy-Efficient Low-Voltage Dry-Type Distribution Transformers—Copper Wound

Type DT-3 150°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Trise +20°C | X Trise +20°C | R Trise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|--------------------|---------------|---------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 250 | 75 | 467 | 97.83 | 97.95 | 97.58 | 97.08 | 2.9 | 3.0 | 3.00 | 1.5 | 2.6 | 45 | 97.89 | 109 |
| 30 | 415 | 119 | 823 | 98.03 | 98.15 | 97.81 | 97.37 | 2.5 | 2.5 | 2.56 | 1.0 | 2.3 | 45 | 98.23 | 262 |
| 45 | 478 | 123 | 1288 | 98.44 | 98.27 | 97.80 | 97.26 | 3.2 | 3.4 | 3.44 | 2.3 | 2.6 | 45 | 98.40 | 181 |
| 75 | 676 | 210 | 1937 | 98.52 | 98.41 | 98.01 | 97.53 | 3.0 | 3.2 | 3.21 | 2.2 | 2.3 | 50 | 98.60 | 399 |
| 112.5 | 1263 | 270 | 2474 | 98.73 | 98.65 | 98.31 | 97.89 | 3.3 | 3.6 | 3.63 | 3.1 | 2.0 | 50 | 98.74 | 351 |
| 150 | 1410 | 360 | 2861 | 98.78 | 98.77 | 98.50 | 98.16 | 3.0 | 3.3 | 3.39 | 3.0 | 1.7 | 50 | 98.83 | 597 |
| 225 | 1883 | 420 | 4815 | 98.88 | 98.72 | 98.35 | 97.93 | 4.6 | 5.0 | 5.14 | 4.8 | 2.0 | 55 | 98.94 | 540 |
| 300 | 2485 | 515 | 5475 | 98.92 | 98.85 | 98.56 | 98.21 | 3.7 | 4.1 | 4.21 | 3.9 | 1.7 | 55 | 99.02 | 858 |

Type DT-3 115°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Trise +20°C | X Trise +20°C | R Trise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|--------------------|---------------|---------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 241 | 75 | 445 | 97.89 | 98.03 | 97.69 | 97.23 | 2.7 | 2.8 | 2.77 | 1.3 | 2.5 | 45 | 97.89 | 109 |
| 30 | 433 | 116 | 747 | 98.09 | 98.27 | 97.99 | 97.60 | 2.2 | 2.3 | 2.3 | 0.9 | 2.1 | 45 | 98.23 | 235 |
| 45 | 471 | 123 | 1208 | 98.48 | 98.35 | 97.92 | 97.42 | 3.2 | 3.5 | 3.46 | 2.5 | 2.4 | 45 | 98.40 | 170 |
| 75 | 665 | 214 | 1758 | 98.53 | 98.51 | 98.17 | 97.75 | 2.7 | 3.0 | 2.97 | 2.1 | 2.1 | 50 | 98.60 | 378 |
| 112.5 | 1271 | 270 | 2336 | 98.72 | 98.69 | 98.38 | 98.00 | 3.5 | 3.9 | 4 | 3.6 | 1.8 | 50 | 98.74 | 307 |
| 150 | 1422 | 360 | 2156 | 98.90 | 99.00 | 98.84 | 98.62 | 3.0 | 3.4 | 3.56 | 3.4 | 1.2 | 50 | 98.83 | 546 |
| 225 | 2082 | 420 | 4567 | 98.90 | 98.77 | 98.43 | 98.03 | 4.8 | 5.3 | 5.41 | 5.1 | 1.8 | 55 | 98.94 | 455 |
| 300 | 2568 | 570 | 5416 | 98.93 | 98.87 | 98.58 | 98.25 | 4.2 | 4.7 | 4.8 | 4.5 | 1.6 | 55 | 99.02 | 707 |

Type DT-3 80°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Trise +20°C | X Trise +20°C | R Trise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|--------------------|---------------|---------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 239 | 75 | 439 | 97.89 | 98.05 | 97.72 | 97.26 | 2.8 | 3.0 | 2.96 | 1.7 | 2.4 | 45 | 97.89 | 92 |
| 30 | 466 | 205 | 645 | 98.26 | 98.58 | 98.46 | 98.22 | 1.9 | 2.1 | 2.06 | 1.4 | 1.5 | 45 | 98.23 | 181 |
| 45 | 667 | 210 | 773 | 98.30 | 98.68 | 98.61 | 98.42 | 1.7 | 1.9 | 1.95 | 1.5 | 1.3 | 50 | 98.40 | 399 |
| 75 | 1147 | 270 | 1162 | 98.47 | 98.79 | 98.71 | 98.52 | 2.2 | 2.6 | 2.68 | 2.4 | 1.2 | 50 | 98.60 | 351 |
| 112.5 | 1385 | 360 | 1631 | 98.66 | 98.92 | 98.82 | 98.62 | 2.2 | 2.6 | 2.69 | 2.4 | 1.1 | 50 | 98.74 | 597 |
| 150 | 1895 | 420 | 2287 | 98.74 | 98.91 | 98.76 | 98.54 | 2.9 | 3.4 | 3.48 | 3.2 | 1.2 | 55 | 98.83 | 540 |
| 225 | 2385 | 513 | 2854 | 98.89 | 99.06 | 98.94 | 98.76 | 2.6 | 3.1 | 3.2 | 3.0 | 1.0 | 55 | 98.94 | 707 |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Typical Data for DOE 2016 Energy-Efficient Low-Voltage Dry-Type Distribution Transformers—Copper Wound

2

Type KT-4 150°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 418 | 86.17 | 351 | 97.62 | 98.15 | 98.05 | 97.79 | 1.9 | 1.9 | 1.9 | 0.7 | 1.8 | 45 | 97.89 | 154 |
| 30 | 458 | 123 | 644 | 98.13 | 98.42 | 98.24 | 97.94 | 2.2 | 2.4 | 2.38 | 1.6 | 1.7 | 45 | 98.23 | 170 |
| 45 | 480 | 123 | 757 | 98.17 | 98.56 | 98.47 | 98.25 | 3.0 | 3.4 | 3.52 | 3.2 | 1.4 | 45 | 98.40 | 168 |
| 75 | 1274 | 270 | 1063 | 98.58 | 98.90 | 98.83 | 98.67 | 1.7 | 2.0 | 2.05 | 1.8 | 1.1 | 50 | 98.60 | 307 |
| 112.5 | 1818 | 360 | 1667 | 98.63 | 98.88 | 98.78 | 98.58 | 2.1 | 2.5 | 2.56 | 2.3 | 1.2 | 50 | 98.74 | 546 |
| 150 | 2105 | 439 | 2394 | 98.71 | 98.87 | 98.71 | 98.48 | 3.4 | 3.8 | 3.98 | 3.8 | 1.3 | 55 | 98.83 | 455 |
| 225 | 2674 | 570 | 3032 | 98.89 | 99.04 | 98.91 | 98.71 | 3.2 | 3.6 | 3.76 | 3.6 | 1.1 | 55 | 98.94 | 707 |
| 300 | 2737 | 570 | 5057 | 98.99 | 98.94 | 98.68 | 98.37 | 4.6 | 5.0 | 5.2 | 5.0 | 1.5 | 55 | 99.02 | 720 |

Type KT-4 115°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 414 | 86 | 338 | 97.50 | 98.12 | 98.06 | 97.83 | 1.9 | 2.0 | 1.98 | 1.1 | 1.7 | 45 | 97.89 | 154.39 |
| 30 | 417 | 123 | 642 | 98.15 | 98.44 | 98.25 | 97.95 | 2.1 | 2.3 | 2.31 | 1.5 | 1.7 | 45 | 98.23 | 170 |
| 45 | 684 | 190 | 777 | 98.21 | 98.62 | 98.55 | 98.35 | 1.5 | 1.7 | 1.7 | 1.1 | 1.3 | 50 | 98.40 | 378 |
| 75 | 1083 | 270 | 1147 | 98.62 | 98.88 | 98.77 | 98.58 | 1.9 | 2.2 | 2.24 | 1.9 | 1.2 | 50 | 98.60 | 307 |
| 112.5 | 1394 | 350 | 1673 | 98.60 | 98.87 | 98.77 | 98.57 | 2.3 | 2.7 | 2.74 | 2.5 | 1.2 | 50 | 98.74 | 546 |
| 150 | 2103 | 420 | 2260 | 98.74 | 98.91 | 98.77 | 98.55 | 3.5 | 3.9 | 4.1 | 3.9 | 1.2 | 55 | 98.83 | 455 |
| 225 | 2150 | 570 | 2966 | 98.88 | 99.04 | 98.92 | 98.73 | 3.0 | 3.4 | 3.6 | 3.4 | 1.1 | 55 | 98.94 | 707 |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Type KT-4 80°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 30 | 482 | 110 | 556 | 98.24 | 98.57 | 98.44 | 98.19 | 1.9 | 2.1 | 2.12 | 1.5 | 1.5 | 45 | 98.23 | 170 |
| 45 | 669 | 195 | 704 | 98.21 | 98.69 | 98.66 | 98.51 | 1.4 | 1.6 | 1.57 | 1.1 | 1.1 | 50 | 98.40 | 378 |
| 75 | 1210 | 243 | 1124 | 98.49 | 98.81 | 98.72 | 98.54 | 2.4 | 2.7 | 2.83 | 2.6 | 1.2 | 50 | 98.60 | 307 |
| 112.5 | 1287 | 360 | 1653 | 98.65 | 98.91 | 98.80 | 98.60 | 2.3 | 2.7 | 2.76 | 2.5 | 1.1 | 50 | 98.74 | 546 |
| 150 | 2138 | 420 | 1610 | 98.85 | 99.13 | 99.09 | 98.98 | 2.8 | 3.3 | 3.47 | 3.4 | 0.8 | 55 | 98.83 | 455 |
| 225 | 2727 | 584 | 2996 | 98.88 | 99.04 | 98.92 | 98.73 | 3.1 | 3.5 | 3.7 | 3.5 | 1.1 | 55 | 98.94 | 693.89 |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Typical Data for DOE 2016 Energy-Efficient Low-Voltage Dry-Type Distribution Transformers—Copper Wound

Type KT-9 150°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Trise +20°C | X Trise +20°C | R Trise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|--------------------|---------------|---------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 430 | 116 | 306 | 97.53 | 98.29 | 98.34 | 98.21 | 1.4 | 1.5 | 1.51 | 0.8 | 1.3 | 45 | 97.89 | — |
| 30 | 505 | 118 | 667 | 98.19 | 98.42 | 98.20 | 97.87 | 2.3 | 2.5 | 2.48 | 1.7 | 1.8 | 45 | 98.23 | — |
| 45 | 699 | 190 | 837 | 98.12 | 98.52 | 98.43 | 98.21 | 1.8 | 2.0 | 1.96 | 1.3 | 1.4 | 50 | 98.40 | — |
| 75 | 1103 | 245 | 1284 | 98.51 | 98.74 | 98.59 | 98.35 | 2.5 | 2.8 | 2.88 | 2.5 | 1.4 | 50 | 98.60 | — |
| 112.5 | 1424 | 380 | 1566 | 98.68 | 98.96 | 98.88 | 98.70 | 1.9 | 2.2 | 2.28 | 2.0 | 1.1 | 50 | 98.74 | 546 |
| 150 | 2132 | 418 | 2337 | 98.80 | 98.93 | 98.76 | 98.52 | 3.1 | 3.5 | 3.65 | 3.4 | 1.3 | 55 | 98.83 | 455 |
| 225 | 2628 | 561 | 3130 | 98.83 | 98.99 | 98.86 | 98.65 | 3.1 | 3.5 | 3.64 | 3.5 | 1.1 | 55 | 98.94 | — |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Type KT-9 115°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Trise +20°C | X Trise +20°C | R Trise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|--------------------|---------------|---------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 398 | 116 | — | — | — | — | — | — | — | — | — | — | 45 | 97.89 | — |
| 30 | 478 | 123 | 612 | 98.28 | 98.54 | 98.36 | 98.07 | 1.9 | 2.1 | 2.1 | 1.3 | 1.6 | 45 | 98.23 | 170 |
| 45 | 658 | 190 | 773 | 98.17 | 98.61 | 98.54 | 98.35 | 1.6 | 1.8 | 1.82 | 1.3 | 1.3 | 50 | 98.40 | 378 |
| 75 | 1115 | 250 | 1245 | 98.48 | 98.74 | 98.62 | 98.40 | 2.4 | 2.7 | 2.8 | 2.5 | 1.3 | 50 | 98.60 | 307 |
| 112.5 | 2150 | 337 | 1589 | 98.64 | 98.91 | 98.82 | 98.63 | 3.1 | 3.5 | 3.65 | 3.5 | 1.1 | 55 | 98.74 | — |
| 150 | 2200 | 418 | 2488 | 98.72 | 98.85 | 98.67 | 98.41 | 3.4 | 3.8 | 3.9 | 3.6 | 1.4 | 55 | 98.83 | 455 |
| 225 | 3043 | 695 | 2226 | 98.78 | 99.14 | 99.15 | 99.07 | 2.9 | 3.4 | 3.56 | 3.5 | 0.7 | 55 | 98.94 | — |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Type KT-9 80°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Trise +20°C | X Trise +20°C | R Trise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|--------------------|---------------|---------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 434 | 116 | 263 | 97.66 | 98.46 | 98.57 | 98.51 | 1.1 | 1.2 | 1.17 | 0.6 | 1.0 | 45 | 97.89 | — |
| 30 | 507 | 110 | 546 | 98.24 | 98.58 | 98.46 | 98.22 | 1.9 | 2.1 | 2.1 | 1.5 | 1.5 | 45 | 98.23 | 170 |
| 45 | 703 | 146 | 850 | 98.43 | 98.63 | 98.45 | 98.17 | 2.2 | 2.4 | 2.45 | 1.9 | 1.6 | 50 | 98.40 | — |
| 75 | 1112 | 290 | 1004 | 98.46 | 98.87 | 98.86 | 98.73 | 2.2 | 2.6 | 2.68 | 2.5 | 1.0 | 50 | 98.60 | 307 |
| 112.5 | 1927 | 380 | — | — | — | — | — | — | — | — | — | — | 50 | 98.74 | — |
| 150 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 225 | 3345 | 695 | 2031 | 98.86 | 99.20 | 99.22 | 99.16 | 2.8 | 3.3 | 3.5 | 3.4 | 0.6 | — | 98.94 | — |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Typical Data for DOE 2016 Energy-Efficient Low-Voltage Dry-Type Distribution Transformers—Copper Wound

2

Type KT-13 150°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 430 | 116 | 306 | 97.53 | 98.29 | 98.34 | 98.21 | 1.4 | 1.5 | 1.51 | 0.8 | 1.3 | 45 | 97.89 | 235 |
| 30 | 480 | 118 | 652 | 98.19 | 98.44 | 98.23 | 97.91 | 2.3 | 2.5 | 2.49 | 1.7 | 1.8 | 48 | 98.23 | 170 |
| 45 | 658 | 190 | 821 | 98.17 | 98.56 | 98.47 | 98.25 | 1.7 | 1.8 | 1.83 | 1.2 | 1.4 | 53 | 98.40 | 378 |
| 75 | 1115 | 245 | 1280 | 98.58 | 98.78 | 98.62 | 98.37 | 2.4 | 2.7 | 2.8 | 2.4 | 1.4 | 53 | 98.60 | 307 |
| 112.5 | 1424 | 380 | 1566 | 98.68 | 98.96 | 98.88 | 98.70 | 1.9 | 2.2 | 2.28 | 2.0 | 1.1 | 53 | 98.74 | 546 |
| 150 | 2132 | 418 | 2337 | 98.80 | 98.93 | 98.76 | 98.52 | 3.1 | 3.5 | 3.65 | 3.4 | 1.3 | 58 | 98.83 | 455 |
| 225 | 2628 | 561 | 3130 | 98.83 | 98.99 | 98.86 | 98.65 | 3.1 | 3.5 | 3.64 | 3.5 | 1.1 | 58 | 98.94 | 707 |
| 300 | — | 658 | — | — | — | — | — | — | — | — | — | — | — | 99.02 | — |

Type KT-13 115°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 398 | 116 | 289 | 97.65 | 98.39 | 98.45 | 98.35 | 1.4 | 1.5 | 1.51 | 1.0 | 1.2 | 45 | 97.89 | 235 |
| 30 | 478 | 123 | 612 | 98.28 | 98.54 | 98.36 | 98.07 | 1.9 | 2.1 | 2.1 | 1.3 | 1.6 | 48 | 98.23 | 170 |
| 45 | 658 | 190 | 773 | 98.17 | 98.61 | 98.54 | 98.35 | 1.6 | 1.8 | 1.82 | 1.3 | 1.3 | 53 | 98.40 | 378 |
| 75 | 1115 | 250 | 1245 | 98.48 | 98.74 | 98.62 | 98.40 | 2.4 | 2.7 | 2.8 | 2.5 | 1.3 | 53 | 98.60 | 307 |
| 112.5 | 2150 | 337 | 1589 | 98.64 | 98.91 | 98.82 | 98.63 | 3.1 | 3.5 | 3.65 | 3.5 | 1.1 | 58 | 98.74 | 315 |
| 150 | 2013 | 418 | 2488 | 98.72 | 98.85 | 98.67 | 98.41 | 3.4 | 3.8 | 3.9 | 3.6 | 1.4 | 58 | 98.83 | 455 |
| 225 | 3043 | 695 | 2226 | 98.78 | 99.14 | 99.15 | 99.07 | 2.9 | 3.4 | 3.56 | 3.5 | 0.7 | 58 | 98.94 | — |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Type KT-13 80°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 434 | 116 | 263 | 97.66 | 98.46 | 98.57 | 98.51 | 1.1 | 1.2 | 1.17 | 0.6 | 1.0 | 45 | 97.89 | 235 |
| 30 | 507 | 110 | 546 | 98.24 | 98.58 | 98.46 | 98.22 | 1.9 | 2.1 | 2.1 | 1.5 | 1.5 | 48 | 98.23 | 170 |
| 45 | 703 | 146 | 850 | 98.43 | 98.63 | 98.45 | 98.17 | 2.2 | 2.4 | 2.45 | 1.9 | 1.6 | 53 | 98.40 | 195 |
| 75 | 1112 | 290 | 1004 | 98.46 | 98.87 | 98.86 | 98.73 | 2.2 | 2.6 | 2.68 | 2.5 | 1.0 | 53 | 98.60 | 307 |
| 112.5 | 1927 | 380 | — | — | — | — | — | — | — | — | — | — | 53 | 98.74 | 315 |
| 150 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 225 | 3345 | 695 | 2031 | 98.86 | 99.20 | 99.22 | 99.16 | 2.8 | 3.3 | 3.5 | 3.4 | 0.6 | — | 98.94 | — |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Typical Data for General-Purpose Dry-Type Distribution Transformers, Aluminum Wound

Type DS-3 150°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | % Imp. Trise +20 | X Trise +20 | R Trise +20 | Sound Level dB | TP1 Efficiency | Practical Max. |
|-----|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|------------------|-------------|-------------|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 196 | 80 | 518 | 97.5 | 97.7 | 97.3 | 96.7 | 2.0 | 2.5 | 3.46 | 1.9 | 2.9 | 45 | 97.70 | 303 |
| 25 | 261 | 110 | 736 | 98.2 | 98.2 | 97.8 | 97.3 | 1.6 | 2.1 | 2.97 | 1.6 | 2.5 | 45 | 98.00 | 492 |
| 38 | 304 | 132 | 1141 | 98.3 | 98.1 | 97.7 | 97.1 | 1.8 | 3.8 | 4.85 | 4.0 | 2.7 | 45 | 98.20 | 352 |
| 50 | 396 | 145 | 1699 | 98.4 | 98.1 | 97.5 | 96.8 | 2.1 | 4.2 | 5.32 | 4.3 | 3.1 | 45 | 98.30 | 359 |
| 75 | 688 | 260 | 1622 | 98.4 | 98.6 | 98.3 | 97.9 | 1.5 | 2.7 | 3.46 | 2.9 | 1.8 | 50 | 98.50 | 1143 |
| 100 | 699 | 300 | 2527 | 98.5 | 98.4 | 98.1 | 97.6 | 1.9 | 4.0 | 5.17 | 4.7 | 2.2 | 50 | 98.60 | 865 |
| 167 | 1610 | 900 | 3987 | 68.7 | 98.7 | 98.4 | 98.0 | 1.4 | 6.8 | 9.70 | 9.5 | 1.8 | 55 | 98.70 | 416 |

Type DS-3 115°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | % Imp. Trise +20 | X Trise +20 | R Trise +20 | Sound Level dB | TP1 Efficiency | Practical Max. |
|------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|------------------|-------------|-------------|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 246 | 80 | 519 | 97.8 | 97.8 | 97.3 | 96.8 | 2.1 | 3.1 | 3.9 | 2.6 | 2.9 | 45 | 97.70 | 244 |
| 25 | 373 | 300 | 766 | 97.7 | 98.1 | 98.0 | 97.7 | 1.4 | 2.8 | 3.3 | 2.8 | 1.9 | 45 | 98.00 | 367 |
| 37.5 | 380 | 125 | 1182 | 98.2 | 98.4 | 98.1 | 97.8 | 2.0 | 3.1 | 4.1 | 2.9 | 2.8 | 45 | 98.20 | 205 |
| 50 | 590 | 300 | 417 | 98.4 | 98.3 | 97.9 | 97.4 | 1.8 | 4.1 | 5.2 | 5.2 | 0.2 | 45 | 98.30 | 511 |
| 75 | 689 | 170 | 2356 | 98.5 | 98.2 | 97.6 | 97.0 | 2.7 | 5.6 | 6.9 | 6.3 | 2.9 | 50 | 98.50 | 572 |

Type DS-3 80°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | % Imp. Trise +20 | X Trise +20 | R Trise +20 | Sound Level dB | TP1 Efficiency | Practical Max. |
|------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|------------------|-------------|-------------|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 360 | 115 | 269 | 97.4 | 98.3 | 98.4 | 98.4 | 0.8 | 1.7 | 2.0 | 1.8 | 1.0 | 45 | 97.70 | 460 |
| 25 | 370 | 120 | 580 | 97.8 | 98.2 | 98.0 | 97.8 | 1.5 | 3.2 | 3.9 | 3.4 | 1.8 | 45 | 98.00 | 348 |
| 37.5 | 565 | 150 | 834 | 98.1 | 98.4 | 98.1 | 97.8 | 1.5 | 3.3 | 4.1 | 3.6 | 1.8 | 45 | 98.20 | 490 |
| 50 | 680 | 175 | 1014 | 98.4 | 98.5 | 98.4 | 98.1 | 1.5 | 3.4 | 4.2 | 3.9 | 1.7 | 45 | 98.30 | 577 |
| 75 | 900 | 260 | 1387 | 98.3 | 98.6 | 98.5 | 98.2 | 1.4 | 3.5 | 4.3 | 4.0 | 1.5 | 50 | 98.50 | 807 |

Type DT-3 150°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | % Imp. Trise +20 | X Trise +20 | R Trise +20 | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|------------------|-------------|-------------|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 204 | 95 | 778 | 96.6 | 96.7 | 96.0 | 95.1 | 4.8 | 4.0 | 4.8 | 1.4 | 4.6 | 45 | 97.00 | 127 |
| 30 | 291 | 165 | 1207 | 97.2 | 97.3 | 96.9 | 96.2 | 3.7 | 5.6 | 4.6 | 3.0 | 3.5 | 45 | 97.50 | 159 |
| 37.5 | 381 | 210 | 1428 | 97.5 | 97.5 | 97.0 | 96.4 | 3.5 | 5.5 | 4.5 | 3.1 | 3.2 | 45 | 97.70 | 161 |
| 45 | 351 | 210 | 1911 | 97.5 | 97.4 | 96.7 | 96.0 | 3.8 | 6.3 | 5.1 | 3.4 | 3.8 | 45 | 97.70 | 188 |
| 50 | 531 | 270 | 1316 | 97.7 | 98.1 | 97.9 | 97.5 | 2.2 | 4.0 | 3.2 | 2.4 | 2.1 | 45 | 98.00 | 333 |
| 75 | 553 | 300 | 2917 | 97.9 | 97.7 | 97.0 | 96.3 | 3.6 | 6.6 | 5.3 | 4.0 | 3.5 | 50 | 98.00 | 187 |
| 112.5 | 793 | 400 | 3693 | 98.0 | 98.0 | 97.5 | 96.9 | 3.2 | 7.5 | 6.0 | 5.2 | 2.9 | 50 | 98.20 | 350 |
| 150 | 913 | 490 | 4923 | 98.2 | 98.0 | 97.5 | 96.9 | 3.2 | 6.5 | 5.3 | 4.4 | 3.0 | 50 | 98.30 | 506 |
| 225 | 1343 | 650 | 6476 | 98.4 | 98.2 | 97.8 | 97.2 | 2.8 | 6.3 | 5.1 | 4.4 | 2.6 | 55 | 98.50 | 734 |
| 300 | 1597 | 750 | 8239 | 98.5 | 98.3 | 97.9 | 97.3 | 2.9 | 8.9 | 7.6 | 7.2 | 2.5 | 55 | 98.60 | 699 |
| 500 | 2590 | 1400 | 9782 | 98.6 | 98.7 | 98.5 | 98.1 | 1.9 | 8.2 | 7.2 | 7.0 | 1.7 | 60 | 98.70 | 1256 |
| 750 | 3340 | 1800 | 12,692 | 98.8 | 98.9 | 98.7 | 98.4 | 1.8 | 8.9 | 8.0 | 7.9 | 1.5 | 64 | 98.80 | 1507 |

Typical Data for General-Purpose Dry-Type Distribution Transformers, Aluminum Wound

Type DT-3 115°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | % Imp. Trise +20 | X Trise +20 | R Trise +20 | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|------------------|-------------|-------------|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 202 | 100 | 743 | 96.7 | 96.8 | 96.2 | 95.4 | 4.4 | 3.9 | 4.4 | 1.2 | 4.3 | 45 | 97.00 | 127 |
| 30 | 311 | 165 | 1492 | 97.3 | 97.1 | 96.3 | 95.5 | 4.5 | 4.8 | 4.8 | 1.8 | 4.4 | 45 | 97.50 | 137 |
| 45 | 418 | 220 | 1458 | 97.8 | 97.9 | 97.5 | 97.0 | 2.8 | 5.4 | 4.6 | 3.7 | 2.8 | 45 | 97.70 | 183 |
| 50 | 556 | 270 | 1211 | 97.6 | 98.1 | 98.0 | 97.7 | 1.9 | 3.7 | 3.2 | 2.6 | 1.9 | 45 | 98.00 | 297 |
| 75 | 581 | 300 | 2415 | 97.9 | 97.9 | 97.5 | 96.9 | 3.0 | 6.7 | 5.9 | 5.1 | 2.8 | 50 | 98.00 | 252 |
| 112.5 | 829 | 440 | 3209 | 98.0 | 98.1 | 97.8 | 97.3 | 2.6 | 3.6 | 3.1 | 1.9 | 2.5 | 50 | 98.20 | 433 |
| 150 | 996 | 530 | 3781 | 98.1 | 98.3 | 97.9 | 97.5 | 2.4 | 5.8 | 5.2 | 4.7 | 2.2 | 50 | 98.30 | 511 |
| 225 | 1569 | 720 | 5205 | 98.4 | 98.4 | 98.1 | 97.8 | 2.2 | 6.8 | 6.2 | 5.8 | 2.0 | 55 | 98.50 | 631 |
| 300 | 1908 | 830 | 6926 | 98.5 | 98.5 | 98.2 | 97.8 | 2.3 | 6.0 | 5.4 | 4.9 | 2.0 | 55 | 98.60 | 872 |
| 500 | 3117 | 1650 | 6968 | 98.5 | 98.9 | 98.8 | 98.7 | 1.2 | 6.6 | 6.6 | 6.5 | 1.1 | 60 | 98.70 | 1310 |
| 750 | 4884 | 2000 | 9335 | 98.9 | 99.1 | 99.0 | 98.8 | 1.3 | 8.7 | 9.0 | 8.9 | 1.0 | 64 | 98.80 | 1486 |

Type DT-3 80°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | % Imp. Trise +20 | X Trise +20 | R Trise +20 | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|------------------|-------------|-------------|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 276 | 165 | 551 | 96.7 | 97.4 | 97.2 | 96.8 | 3.4 | 3.9 | 3.5 | 2.3 | 2.6 | 45 | 97.00 | 119 |
| 30 | 350 | 180 | 904 | 97.3 | 97.8 | 97.6 | 97.2 | 2.5 | 3.9 | 3.4 | 2.5 | 2.4 | 45 | 97.50 | 112 |
| 45 | 540 | 290 | 1027 | 97.7 | 98.2 | 98.2 | 97.9 | 1.7 | 3.5 | 3.3 | 2.9 | 1.6 | 45 | 97.70 | 317 |
| 75 | 810 | 360 | 1782 | 97.8 | 98.2 | 98.0 | 97.7 | 0.3 | 3.5 | 4.3 | 3.9 | 1.9 | 50 | 98.00 | 355 |
| 112.5 | 944 | 470 | 2521 | 98.2 | 98.4 | 98.2 | 97.9 | 1.9 | 4.4 | 4.1 | 3.7 | 1.8 | 50 | 98.20 | 518 |
| 150 | 1438 | 650 | 2760 | 98.2 | 98.6 | 98.5 | 98.3 | 1.5 | 4.8 | 4.7 | 4.5 | 1.4 | 50 | 98.30 | 555 |
| 225 | 1746 | 830 | 4047 | 98.3 | 98.6 | 98.5 | 98.3 | 1.6 | 5.5 | 5.6 | 5.4 | 1.4 | 55 | 98.50 | 667 |
| 300 | 2400 | 1100 | 5338 | 98.6 | 99.0 | 99.0 | 98.9 | 1.6 | 5.9 | 6.1 | 5.9 | 1.4 | 55 | 98.60 | 885 |
| 500 | 3418 | 1800 | 5858 | 98.6 | 99.0 | 99.0 | 98.9 | 0.9 | 4.9 | 5.4 | 5.3 | 0.8 | 60 | 98.70 | 1487 |

Type KT-4 150°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | % Imp. Trise +20 | X Trise +20 | R Trise +20 | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|------------------|-------------|-------------|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 206 | 100 | 883 | 96.7 | 96.5 | 95.6 | 94.6 | 5.5 | 5.2 | 5.5 | 1.8 | 5.2 | 45 | 97.00 | 125 |
| 30 | 311 | 165 | 1263 | 97.2 | 97.3 | 96.7 | 96.0 | 3.9 | 7.4 | 6.0 | 4.8 | 3.7 | 45 | 97.50 | 151 |
| 45 | 400 | 220 | 1554 | 97.7 | 97.7 | 97.3 | 96.7 | 3.2 | 5.9 | 4.8 | 3.8 | 3.0 | 45 | 97.70 | 236 |
| 75 | 547 | 300 | 2622 | 97.9 | 97.8 | 97.2 | 96.6 | 3.3 | 6.7 | 5.3 | 4.4 | 3.1 | 50 | 98.00 | 331 |
| 112.5 | 800 | 440 | 3525 | 98.0 | 98.0 | 97.6 | 97.0 | 3.0 | 7.4 | 6.0 | 5.3 | 2.7 | 50 | 98.20 | 360 |
| 150 | 1010 | 530 | 4055 | 98.1 | 98.2 | 97.8 | 97.4 | 2.6 | 6.6 | 5.4 | 4.8 | 2.3 | 50 | 98.30 | 524 |
| 225 | 1680 | 700 | 5879 | 98.3 | 98.3 | 97.9 | 97.5 | 2.6 | 7.6 | 6.3 | 5.9 | 2.3 | 55 | 98.50 | 647 |
| 300 | 2122 | 1100 | 5895 | 98.4 | 98.6 | 98.4 | 98.1 | 1.9 | 6.8 | 5.9 | 5.7 | 1.6 | 55 | 98.60 | 954 |
| 500 | 3201 | 1800 | 7054 | 98.5 | 98.9 | 98.8 | 98.7 | 1.3 | 5.9 | 5.4 | 5.2 | 1.1 | 60 | 98.70 | 1529 |

Typical Data for General-Purpose Dry-Type Distribution Transformers, Aluminum Wound**Type KT-4 115°C Rise NEMA TP-1**

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | % Imp. Trise +20 | X Trise +20 | R Trise +20 | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|------------------|-------------|-------------|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 307 | 135 | 394 | 96.3 | 97.5 | 97.6 | 97.5 | 1.8 | 2.7 | 2.2 | 1.4 | 1.7 | 45 | 97.00 | 163 |
| 30 | 313 | 165 | 1344 | 97.4 | 97.3 | 96.6 | 95.9 | 4.1 | 5.1 | 4.6 | 2.4 | 3.9 | 45 | 97.50 | 194 |
| 45 | 400 | 220 | 1463 | 97.8 | 97.9 | 97.5 | 97.0 | 3.0 | 6.1 | 5.2 | 4.4 | 2.8 | 45 | 97.70 | 197 |
| 75 | 587 | 285 | 2355 | 97.9 | 97.9 | 97.5 | 97.0 | 2.9 | 6.7 | 5.9 | 5.2 | 2.8 | 50 | 98.00 | 274 |
| 112.5 | 947 | 470 | 2910 | 97.9 | 98.1 | 97.9 | 97.5 | 2.4 | 5.0 | 4.3 | 3.7 | 2.2 | 50 | 98.20 | 482 |
| 150 | 1243 | 560 | 4119 | 98.1 | 98.2 | 97.8 | 97.4 | 2.5 | 6.6 | 5.7 | 5.2 | 2.4 | 50 | 98.30 | 489 |
| 225 | 1680 | 700 | 5413 | 98.3 | 98.3 | 98.1 | 97.7 | 2.3 | 7.5 | 7.0 | 6.7 | 2.1 | 55 | 98.50 | 573 |
| 300 | 2480 | 1100 | 5735 | 98.4 | 98.7 | 98.5 | 98.2 | 1.8 | 6.7 | 6.3 | 6.1 | 1.5 | 55 | 98.60 | 849 |

Type KT-4 80°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | % Imp. Trise +20 | X Trise +20 | R Trise +20 | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|------------------|-------------|-------------|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 378 | 165 | 416 | 96.4 | 97.6 | 97.7 | 97.6 | 1.7 | 2.9 | 2.5 | 1.9 | 1.7 | 45 | 97.00 | 160 |
| 30 | 365 | 188 | 877 | 97.2 | 97.7 | 97.6 | 97.2 | 2.4 | 3.9 | 3.5 | 2.6 | 2.3 | 45 | 97.50 | 194 |
| 45 | 550 | 285 | 1055 | 97.4 | 98.1 | 98.0 | 97.8 | 1.8 | 3.7 | 3.4 | 2.9 | 1.7 | 45 | 97.70 | 236 |
| 75 | 774 | 360 | 1784 | 97.8 | 98.2 | 98.0 | 97.7 | 2.0 | 4.7 | 4.5 | 4.0 | 1.9 | 50 | 98.00 | 328 |
| 112.5 | 1380 | 550 | 1872 | 97.9 | 98.5 | 98.5 | 98.4 | 1.3 | 4.2 | 4.2 | 4.1 | 1.2 | 50 | 98.20 | 525 |
| 150 | 1604 | 700 | 2728 | 98.0 | 98.5 | 98.5 | 98.3 | 1.4 | 4.4 | 4.5 | 4.3 | 1.4 | 50 | 98.30 | 626 |
| 225 | 2336 | 850 | 3728 | 98.4 | 98.7 | 98.6 | 98.4 | 1.4 | 5.0 | 5.2 | 5.1 | 1.3 | 55 | 98.50 | 882 |
| 300 | 2689 | 1100 | 4589 | 98.4 | 98.8 | 98.7 | 98.5 | 1.4 | 5.5 | 5.8 | 5.6 | 1.2 | 55 | 98.60 | 870 |

Type KT-13 150°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | % Imp. Trise +20 | X Trise +20 | R Trise +20 | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|------------------|-------------|-------------|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 271 | 165 | 604 | 96.7 | 97.3 | 97.0 | 96.5 | 3.1 | 4.2 | 3.6 | 2.1 | 2.9 | 45 | 97.00 | 126 |
| 30 | 365 | 198 | 977 | 97.1 | 97.6 | 97.3 | 96.9 | 2.7 | 4.3 | 3.5 | 2.4 | 2.6 | 45 | 97.50 | 188 |
| 45 | 545 | 280 | 1215 | 97.5 | 98.0 | 97.8 | 97.4 | 2.2 | 4.2 | 3.3 | 2.6 | 2.1 | 45 | 97.70 | 277 |
| 75 | 812 | 360 | 2139 | 97.7 | 98.0 | 97.8 | 97.4 | 2.6 | 5.9 | 4.9 | 4.3 | 2.4 | 50 | 98.00 | 302 |
| 112.5 | 920 | 490 | 3059 | 98.0 | 98.2 | 97.8 | 97.4 | 2.4 | 5.0 | 4.1 | 3.4 | 2.3 | 50 | 98.20 | 504 |
| 150 | 1221 | 530 | 4297 | 98.1 | 98.1 | 97.7 | 97.2 | 2.7 | 6.5 | 5.3 | 4.6 | 2.5 | 50 | 98.30 | 597 |
| 225 | 1960 | 830 | 4461 | 98.3 | 98.6 | 98.3 | 98.0 | 1.9 | 6.6 | 6.1 | 5.9 | 1.6 | 55 | 98.50 | 590 |
| 300 | 2358 | 1100 | 5931 | 98.4 | 98.6 | 98.4 | 98.2 | 1.9 | 7.2 | 6.3 | 6.0 | 1.6 | 55 | 98.60 | 847 |

Typical Data for General-Purpose Dry-Type Distribution Transformers, Aluminum Wound

2

Type KT-13 115°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | % Imp. Trise +20 | X Trise +20 | R Trise +20 | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|------------------|-------------|-------------|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 332 | 165 | 432 | 96.6 | 97.6 | 97.6 | 97.4 | 1.9 | 3.2 | 2.8 | 2.2 | 1.8 | 45 | 97.00 | 136 |
| 30 | 390 | 200 | 903 | 97.3 | 97.8 | 97.6 | 97.2 | 2.5 | 4.4 | 3.6 | 2.8 | 2.3 | 45 | 97.50 | 120 |
| 45 | 548 | 280 | 1187 | 97.5 | 98.1 | 98.0 | 97.7 | 2.2 | — | 3.0 | 2.3 | 2.0 | 45 | 97.70 | 278 |
| 75 | 808 | 360 | 1850 | 97.8 | 98.1 | 97.8 | 97.5 | 2.4 | 5.6 | 4.8 | 4.3 | 2.2 | 50 | 98.00 | 268 |
| 112.5 | 990 | 540 | 2373 | 97.9 | 98.3 | 98.2 | 98.0 | 1.8 | 4.5 | 4.0 | 3.6 | 1.6 | 50 | 98.20 | 434 |
| 150 | 1600 | 650 | 2372 | 98.1 | 98.5 | 98.4 | 98.1 | 1.3 | 3.4 | 3.0 | 2.8 | 1.1 | 50 | 98.30 | 644 |
| 225 | 2306 | 850 | 4001 | 98.3 | 98.7 | 98.6 | 98.3 | 1.6 | 4.9 | 5.1 | 4.9 | 1.4 | 55 | 98.50 | 836 |
| 300 | 3291 | 1100 | 4583 | 98.4 | 98.8 | 98.7 | 98.5 | 1.3 | 6.2 | 6.3 | 6.2 | 1.2 | 55 | 98.60 | 950 |

Type KT-13 80°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | % Imp. Trise +20 | X Trise +20 | R Trise +20 | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|------------------|-------------|-------------|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 315 | 165 | 536 | 96.4 | 97.3 | 97.2 | 96.9 | 2.5 | 3.9 | 3.6 | 2.5 | 2.5 | 45 | 97.00 | 125 |
| 30 | 408 | 188 | 854 | 97.4 | 97.9 | 97.7 | 97.3 | 2.3 | 4.0 | 3.6 | 2.8 | 2.2 | 45 | 97.50 | 166 |
| 45 | 555 | 280 | 982 | 97.6 | 98.2 | 98.2 | 98.0 | 1.6 | 3.2 | 3.0 | 2.5 | 1.6 | 45 | 97.70 | 218 |
| 75 | 838 | 400 | 1289 | 97.8 | 98.4 | 98.5 | 98.4 | 1.3 | 3.0 | 2.9 | 2.6 | 1.2 | 50 | 98.00 | 541 |
| 112.5 | 1367 | 550 | 1905 | 97.9 | 98.5 | 98.5 | 98.4 | 1.3 | 4.2 | 4.4 | 4.2 | 1.2 | 50 | 98.20 | 390 |
| 150 | 1607 | 668 | 2474 | 98.2 | 98.6 | 98.6 | 98.4 | 1.4 | 4.6 | 4.7 | 4.5 | 1.2 | 50 | 98.30 | 520 |
| 225 | 2582 | 850 | 3471 | 98.3 | 98.7 | 98.7 | 98.5 | 1.3 | 5.1 | 6.3 | 6.2 | 1.2 | 55 | 98.50 | 719 |
| 300 | 3228 | 1100 | 3978 | 98.3 | 98.8 | 98.8 | 98.7 | 1.1 | 4.2 | 4.5 | 4.3 | 1.0 | 55 | 98.60 | 1085 |

Typical Data for General-Purpose Dry-Type Distribution Transformers, Copper Wound

Type DS-3 150°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 270 | 80 | 605 | 97.6 | 97.5 | 96.9 | 96.3 | 3.5 | 4.2 | 4.2 | 2.3 | 3.5 | 45 | 97.70 | 183 |
| 25 | 406 | 115 | 732 | 97.9 | 98.1 | 97.7 | 97.3 | — | — | 3.5 | 2.5 | 2.5 | 45 | 98.00 | 459 |
| 37.5 | 453 | 125 | 1154 | 98.2 | 98.1 | 97.6 | 97.0 | 2.7 | 3.7 | 4.8 | 4.0 | 2.7 | 45 | 98.20 | 440 |
| 50 | 657 | 160 | 1159 | 98.3 | 98.4 | 98.1 | 97.7 | 2.0 | 3.3 | 3.8 | 3.8 | 2.0 | 45 | 98.30 | 440 |
| 75 | 803 | 175 | 2259 | 98.5 | 98.3 | 97.7 | 97.1 | 2.8 | 4.8 | 6.5 | 5.8 | 2.8 | 50 | 98.50 | 711 |
| 100 | 960 | 250 | 2504 | 98.6 | 98.4 | 98.0 | 97.5 | 2.3 | 4.3 | 5.5 | 5.0 | 2.3 | 50 | 98.60 | 926 |
| 167 | 1665 | 570 | 3094 | 98.7 | 98.8 | 98.6 | 98.3 | 1.5 | 6.3 | 9.0 | 8.8 | 1.5 | 50 | 98.70 | 955 |

Type DS-3 115°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 264 | 80 | 437 | 97.8 | 98.1 | 97.8 | 97.3 | 2.4 | 2.2 | 3.3 | 2.2 | 2.4 | 45 | 97.70 | 239 |
| 25 | 420 | 110 | 603 | 97.9 | 98.2 | 98.0 | 97.7 | 2.0 | 2.9 | 3.2 | 2.6 | 2.0 | 45 | 98.00 | 287 |
| 37.5 | 450 | 125 | 1217 | 98.2 | 98.0 | 97.5 | 96.9 | 2.9 | 4.5 | 5.9 | 5.1 | 2.9 | 45 | 98.20 | 433 |
| 50 | 703 | 300 | 1409 | 98.4 | 98.4 | 98.0 | 97.6 | 2.2 | 3.8 | 4.7 | 4.1 | 2.2 | — | 98.30 | 499 |
| 75 | 793 | 175 | 2178 | 98.5 | 98.3 | 97.8 | 97.2 | 2.7 | 4.7 | 6.2 | 5.6 | 2.7 | 50 | 98.50 | 702 |

Type DS-3 80°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 407 | 115 | 293 | 97.3 | 98.2 | 98.3 | 98.2 | 1.2 | 1.7 | 1.8 | 1.4 | 1.2 | 45 | 97.70 | 125 |
| 25 | 430 | 300 | 679 | 97.9 | 98.4 | 98.3 | 98.1 | 1.5 | 2.6 | 3.0 | 2.6 | 1.5 | 45 | 98.00 | 164 |
| 37.5 | 685 | 300 | 729 | 98.1 | 98.6 | 98.6 | 98.5 | 1.1 | 2.2 | 2.6 | 2.3 | 1.1 | 45 | 98.20 | 205 |
| 50 | 799 | 180 | 1013 | 98.3 | 98.6 | 98.4 | 98.1 | 1.7 | 2.9 | 3.4 | 2.9 | 1.7 | 45 | 98.30 | 329 |
| 75 | 1042 | 250 | 1447 | 98.3 | 98.6 | 98.4 | 98.1 | 1.6 | 3.4 | 3.8 | 3.5 | 1.6 | 50 | 98.50 | 338 |

Type DT-3 150°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 250 | 150 | 755 | 98.9 | 97.0 | 96.4 | 95.7 | 4.2 | 5.3 | 4.8 | 2.6 | 4.0 | 45 | 97.00 | 107 |
| 30 | 350 | 165 | 1100 | 97.3 | 97.5 | 97.0 | 96.5 | 3.2 | 4.5 | 5.2 | 4.1 | 3.1 | 45 | 97.50 | 204 |
| 37.5 | 415 | 210 | 1382 | 97.5 | 97.6 | 97.1 | 96.5 | 3.2 | 4.8 | 4.0 | 2.5 | 3.1 | 45 | 97.70 | 213 |
| 45 | 416 | 215 | 1786 | 97.4 | 97.4 | 96.9 | 96.2 | 3.6 | 5.5 | 4.6 | 3.0 | 3.5 | 45 | 97.70 | 212 |
| 50 | 647 | 270 | 1220 | 97.7 | 98.2 | 98.0 | 97.7 | 2.0 | 3.5 | 2.8 | 2.0 | 1.9 | 45 | 98.00 | 357 |
| 75 | 643 | 320 | 2903 | 97.9 | 97.5 | 97.1 | 96.4 | 3.6 | 7.4 | 4.3 | 2.5 | 3.4 | 50 | 98.00 | 338 |
| 112.5 | 876 | 420 | 3699 | 97.9 | 97.9 | 97.4 | 96.8 | 3.0 | 6.7 | 5.1 | 4.2 | 2.9 | 50 | 98.20 | 395 |
| 150 | 1064 | 530 | 4269 | 98.1 | 98.2 | 97.8 | 97.3 | 2.7 | 5.3 | 4.3 | 3.5 | 2.5 | 50 | 98.30 | 584 |
| 225 | 1569 | 560 | 7124 | 98.4 | 98.1 | 97.5 | 97.0 | 3.2 | 8.7 | 7.4 | 6.8 | 2.9 | 55 | 98.50 | 832 |
| 300 | 2050 | 730 | 7959 | 98.4 | 98.3 | 97.9 | 97.4 | 2.6 | 6.7 | 5.5 | 4.9 | 2.4 | 55 | 98.60 | 964 |
| 500 | 3681 | 1400 | 8292 | 98.8 | 98.9 | 98.7 | 98.4 | 1.6 | 7.4 | 6.8 | 6.7 | 1.4 | 60 | 98.70 | 1279 |

Typical Data for General-Purpose Dry-Type Distribution Transformers, Copper Wound

Type DT-3 115°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 256 | 95 | 669 | 97.7 | 97.8 | 97.3 | 96.7 | 4.0 | 5.4 | 4.8 | 2.9 | 3.8 | 45 | 97.00 | 76 |
| 30 | 337 | 180 | 1077 | 97.7 | 97.8 | 97.3 | 96.8 | 3.0 | 6.2 | 4.6 | 3.5 | 3.0 | 45 | 97.50 | 144 |
| 45 | 446 | 215 | 1625 | 97.7 | 97.7 | 97.2 | 96.6 | 3.2 | 5.2 | 4.4 | 3.1 | 3.1 | 45 | 97.70 | 219 |
| 50 | 630 | 270 | 1213 | 97.8 | 98.2 | 98.0 | 97.7 | 2.0 | 3.5 | 3.0 | 2.3 | 1.9 | 45 | 98.00 | 320 |
| 75 | 662 | 320 | 2346 | 97.9 | 98.0 | 97.6 | 97.0 | 2.8 | 5.4 | 4.7 | 3.9 | 2.7 | 50 | 98.00 | 280 |
| 112.5 | 914 | 400 | 2953 | 98.1 | 98.2 | 97.9 | 97.4 | 2.5 | 5.7 | 5.0 | 4.5 | 2.3 | 50 | 98.20 | 345 |
| 150 | 1132 | 530 | 3364 | 98.3 | 98.5 | 98.2 | 97.8 | 2.0 | 4.8 | 4.4 | 4.0 | 1.9 | 50 | 98.30 | 535 |
| 225 | 2036 | 650 | 6445 | 98.4 | 98.3 | 97.8 | 97.3 | 2.9 | 8.8 | 8.1 | 7.7 | 2.6 | 55 | 98.50 | 524 |
| 300 | 2325 | 830 | 6038 | 98.6 | 98.7 | 98.4 | 98.1 | 2.0 | 5.7 | 5.2 | 4.9 | 1.7 | 55 | 98.60 | 620 |
| 500 | 3681 | 1400 | 7841 | 98.8 | 98.9 | 98.7 | 98.5 | 1.4 | 6.8 | 6.8 | 6.6 | 1.3 | 60 | 98.70 | 1344 |

Type DT-3 80°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 349 | 135 | 390 | 96.6 | 97.7 | 97.7 | 97.6 | 1.8 | 2.4 | 2.1 | 1.3 | 1.7 | 45 | 97.00 | 150 |
| 30 | 410 | 210 | 823 | 97.3 | 97.9 | 97.7 | 97.4 | 2.1 | 3.4 | 3.0 | 2.1 | 2.0 | 45 | 97.50 | 164 |
| 45 | 504 | 200 | 1308 | 97.9 | 98.0 | 97.7 | 97.2 | 2.5 | 4.5 | 3.9 | 3.1 | 2.5 | 45 | 97.70 | 158 |
| 75 | 818 | 370 | 1837 | 97.9 | 98.2 | 98.0 | 97.7 | 2.0 | 9.3 | 4.3 | 3.8 | 2.0 | 50 | 98.00 | 312 |
| 112.5 | 1065 | 440 | 2409 | 98.1 | 98.3 | 98.0 | 97.6 | 1.8 | 3.8 | 3.3 | 2.8 | 1.8 | 50 | 98.20 | 584 |
| 150 | 1410 | 650 | 3349 | 98.3 | 98.5 | 98.3 | 97.9 | 1.9 | 3.9 | 3.7 | 3.2 | 1.8 | 50 | 98.30 | 531 |
| 225 | 2030 | 830 | 4096 | 98.4 | 98.7 | 98.5 | 98.3 | 1.6 | 5.4 | 5.4 | 5.2 | 1.5 | 55 | 98.50 | 856 |
| 300 | 3041 | 1100 | 4646 | 98.5 | 98.8 | 98.7 | 98.5 | 1.4 | 5.6 | 6.1 | 6.0 | 1.2 | 55 | 98.60 | 1251 |

Type KT-4 80°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 251 | 100 | 635 | 96.8 | 97.1 | 96.6 | 96.0 | 3.7 | 5.0 | 4.2 | 2.1 | 3.6 | 45 | 97.00 | 88 |
| 30 | 326 | 165 | 1134 | 97.4 | 97.5 | 97.1 | 96.5 | 3.5 | 5.3 | 4.3 | 2.9 | 3.2 | 45 | 97.50 | 168 |
| 45 | 479 | 220 | 1505 | 97.6 | 97.8 | 97.3 | 96.8 | 3.0 | 5.6 | 5.0 | 4.1 | 2.9 | 45 | 97.70 | 223 |
| 75 | 463 | 300 | 2883 | 97.9 | 97.7 | 97.1 | 96.4 | 3.6 | 7.1 | 5.9 | 4.7 | 3.4 | 50 | 98.00 | 325 |
| 112.5 | 977 | 440 | 2952 | 98.1 | 98.2 | 97.9 | 97.5 | 2.6 | 6.6 | 5.6 | 5.1 | 2.2 | 50 | 98.20 | 344 |
| 150 | 1212 | 540 | 3716 | 98.3 | 98.4 | 98.0 | 97.6 | 2.4 | 6.0 | 5.1 | 4.6 | 2.1 | 50 | 98.30 | 524 |
| 225 | 1815 | 650 | 5420 | 98.4 | 98.5 | 98.1 | 97.7 | 2.4 | 7.6 | 6.5 | 6.2 | 2.1 | 55 | 98.50 | 565 |
| 300 | 2400 | 830 | 6259 | 98.6 | 98.6 | 98.4 | 98.0 | 2.2 | 6.3 | 5.2 | 4.9 | 1.8 | 55 | 98.60 | 864 |

Typical Data for General-Purpose Dry-Type Distribution Transformers, Copper Wound

Type KT-4 115°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 256 | 95 | 702 | 96.7 | 96.9 | 96.3 | 95.6 | 4.2 | 5.7 | 5.0 | 2.9 | 4.0 | 45 | 97.00 | 93 |
| 30 | 341 | 165 | 1007 | 97.4 | 97.6 | 97.3 | 96.8 | 3.0 | 4.8 | 4.2 | 3.1 | 2.8 | 45 | 97.50 | 155 |
| 45 | 526 | 220 | 1200 | 97.9 | 98.1 | 97.9 | 97.5 | 2.3 | 5.0 | 4.1 | 3.5 | 2.2 | 50 | 97.70 | 211 |
| 75 | 759 | 300 | 1715 | 98.1 | 98.3 | 98.1 | 97.8 | 1.9 | 5.0 | 4.5 | 4.1 | 1.9 | 50 | 98.00 | 309 |
| 112.5 | 1030 | 470 | 2735 | 98.0 | 98.3 | 98.0 | 97.7 | 2.2 | 4.4 | 3.8 | 3.2 | 2.0 | 50 | 98.20 | 390 |
| 150 | 1631 | 650 | 3076 | 98.2 | 98.5 | 98.3 | 98.1 | 1.7 | 4.9 | 4.5 | 4.2 | 1.6 | 50 | 98.30 | 416 |
| 225 | 1965 | 690 | 4434 | 98.5 | 98.6 | 98.4 | 98.1 | 1.9 | 5.6 | 5.3 | 5.0 | 1.7 | 55 | 98.50 | 659 |
| 300 | 2337 | 830 | 6127 | 98.6 | 98.7 | 98.4 | 98.0 | 2.0 | 5.2 | 4.7 | 4.3 | 1.8 | 55 | 98.60 | 729 |

Type KT-4 80°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 365 | 165 | 371 | 97.0 | 98.0 | 98.1 | 98.0 | 1.5 | 2.3 | 2.1 | 1.5 | 1.4 | 45 | 97.00 | 166 |
| 30 | 424 | 210 | 787 | 97.3 | 97.9 | 97.8 | 97.6 | 2.0 | 3.2 | 2.9 | 2.2 | 1.9 | 45 | 97.50 | 219 |
| 45 | 653 | 290 | 977 | 97.4 | 98.1 | 98.1 | 98.0 | 1.6 | 3.1 | 3.0 | 2.5 | 1.5 | 45 | 97.70 | 308 |
| 75 | 640 | 350 | 1951 | 97.8 | 98.1 | 97.8 | 97.5 | 2.2 | 5.2 | 4.9 | 4.4 | 2.1 | 50 | 98.00 | 284 |
| 112.5 | 1264 | 560 | 2009 | 98.2 | 98.7 | 98.6 | 98.4 | 1.4 | 4.3 | 4.2 | 4.0 | 1.3 | 50 | 98.20 | 483 |
| 150 | 1825 | 650 | 2873 | 98.5 | 98.7 | 98.5 | 98.2 | 1.6 | 6.1 | 6.4 | 6.3 | 1.5 | 50 | 98.30 | 429 |
| 225 | 2096 | 890 | 4449 | 98.3 | 98.6 | 98.4 | 98.1 | 1.8 | 6.5 | 6.6 | 6.4 | 1.6 | 55 | 98.50 | 764 |

Type KT-13 150°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 346 | 165 | 461 | 96.2 | 97.4 | 97.5 | 97.3 | 2.1 | 3.0 | 2.5 | 1.6 | 2.0 | 45 | 97.00 | 176 |
| 30 | 390 | 190 | 908 | 97.2 | 97.7 | 97.5 | 97.1 | 2.6 | 4.0 | 3.3 | 2.3 | 2.4 | 45 | 97.50 | 193 |
| 45 | 623 | 235 | 1328 | 97.6 | 97.9 | 97.6 | 97.2 | 2.5 | 3.2 | 2.8 | 1.4 | 2.4 | 45 | 97.70 | 285 |
| 75 | 848 | 370 | 2402 | 97.7 | 97.9 | 97.5 | 97.0 | 2.8 | 5.7 | 4.5 | 3.6 | 2.7 | 50 | 98.00 | 348 |
| 112.5 | 1080 | 455 | 2991 | 98.0 | 98.2 | 97.9 | 97.4 | 2.4 | 4.3 | 3.5 | 2.7 | 2.3 | 50 | 98.20 | 393 |
| 150 | 1431 | 600 | 3686 | 98.2 | 98.3 | 98.1 | 97.7 | 2.3 | 5.1 | 4.2 | 3.7 | 2.1 | 50 | 98.30 | 416 |
| 225 | 2129 | 830 | 4250 | 98.4 | 98.6 | 98.4 | 98.2 | 2.0 | 6.3 | 5.4 | 5.1 | 1.5 | 55 | 98.50 | 923 |

Type KT-13 115°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 341 | 165 | 378 | 96.6 | 97.8 | 97.9 | 97.9 | 1.5 | 2.4 | 2.1 | 1.6 | 1.4 | 45 | 97.00 | 157 |
| 30 | 444 | 188 | 824 | 97.1 | 97.8 | 97.6 | 97.3 | 2.2 | 3.6 | 3.1 | 2.2 | 2.1 | 45 | 97.50 | 206 |
| 45 | 598 | 250 | 1476 | 97.4 | 97.7 | 97.4 | 96.9 | 2.8 | 4.6 | 4.0 | 2.9 | 2.7 | 45 | 97.70 | 313 |
| 75 | 894 | 350 | 2128 | 97.9 | 98.1 | 97.9 | 97.5 | 1.9 | 5.1 | 4.6 | 4.0 | 2.4 | 50 | 98.00 | 282 |
| 112.5 | 1054 | 460 | 2612 | 98.1 | 98.3 | 98.1 | 97.8 | 2.0 | 4.3 | 3.3 | 2.6 | 1.9 | 50 | 98.20 | 458 |
| 150 | 1399 | 600 | 3185 | 98.2 | 98.5 | 98.3 | 98.0 | 2.0 | 5.9 | 5.4 | 5.1 | 1.7 | 50 | 98.30 | 460 |
| 225 | 2088 | 890 | 4382 | 98.3 | 98.6 | 98.4 | 98.2 | 1.8 | 6.1 | 5.7 | 5.5 | 1.6 | 55 | 98.50 | 830 |

Typical Data for General-Purpose Dry-Type Distribution Transformers, Copper Wound

Type KT-13 80°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 370 | 165 | 382 | 96.7 | 97.8 | 97.9 | 97.8 | 1.5 | 2.4 | 2.2 | 1.6 | 1.4 | 45 | 97.00 | 157 |
| 30 | 490 | 188 | 595 | 97.4 | 98.2 | 98.2 | 98.1 | 1.4 | 3.0 | 2.8 | 2.5 | 1.4 | 45 | 97.50 | 197 |
| 45 | 635 | 290 | 1189 | 97.4 | 97.9 | 97.8 | 97.5 | 2.1 | 3.9 | 3.5 | 2.8 | 2.0 | 45 | 97.70 | 245 |
| 75 | 987 | 410 | 1351 | 97.7 | 98.9 | 98.4 | 98.3 | 1.4 | 2.8 | 2.6 | 2.3 | 1.3 | 50 | 98.00 | 530 |
| 112.5 | 854 | 560 | 2039 | 98.1 | 98.6 | 98.5 | 98.3 | 1.4 | 4.2 | 4.3 | 4.1 | 1.3 | 50 | 98.20 | 458 |
| 150 | 1807 | 650 | 3053 | 98.0 | 98.4 | 98.3 | 98.0 | 1.7 | 4.3 | 4.0 | 3.7 | 1.6 | 50 | 98.30 | 490 |
| 225 | 4091 | 1200 | 2364 | 98.2 | 98.9 | 99.1 | 99.1 | 0.6 | 2.7 | 2.9 | 2.8 | 0.5 | 55 | 98.50 | 1440 |

Type KT-13 115°C Rise E3 Efficient

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 3.25 | 78 | 359 | 97.6 | 98.1 | 98.0 | 97.7 | 2.0 | 3.7 | 3.2 | 2.6 | 1.9 | 45 | 98.00 | 102 |
| 30 | 370 | 125 | 636 | 98.1 | 98.4 | 98.3 | 98.0 | 1.7 | 2.7 | 2.3 | 1.6 | 1.7 | 45 | 98.30 | 260 |
| 45 | 635 | 135 | 1076 | 98.5 | 98.5 | 98.1 | 97.7 | 2.2 | 4.1 | 3.5 | 2.8 | 2.1 | 45 | 98.50 | 206 |
| 75 | 870 | 225 | 1529 | 98.5 | 98.6 | 98.4 | 98.0 | 1.9 | 4.9 | 4.4 | 4.1 | 1.7 | 50 | 98.60 | 331 |
| 112.5 | 1526 | 350 | 1768 | 98.6 | 98.8 | 98.7 | 98.5 | 1.3 | 3.5 | 3.1 | 2.8 | 1.3 | 50 | 98.80 | 816 |
| 150 | 1665 | 350 | 2419 | 97.8 | 98.9 | 98.7 | 98.4 | 1.5 | 4.5 | 4.2 | 3.9 | 1.4 | 50 | 98.90 | 659 |
| 225 | 2094 | 650 | 3650 | 98.9 | 98.9 | 98.8 | 98.5 | 1.5 | 5.4 | 5.2 | 5.1 | 1.3 | 55 | 99.00 | 895 |
| 300 | 3900 | 750 | 3731 | 98.9 | 99.1 | 99.0 | 98.8 | 1.3 | 5.2 | 5.2 | 5.1 | 1.0 | 55 | 99.04 | 997 |

Type KT-9 115°C Rise E3 Efficient

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 335 | 78 | 353 | 97.4 | 98.0 | 98.0 | 97.7 | 2.0 | 3.7 | 3.2 | 2.6 | 1.8 | 45 | 98.00 | 96 |
| 30 | 406 | 125 | 670 | 98.0 | 98.3 | 98.1 | 97.8 | 1.9 | 2.7 | 2.4 | 1.5 | 1.8 | 45 | 98.30 | 260 |
| 45 | 635 | 135 | 1075 | 98.6 | 98.5 | 98.2 | 97.7 | 2.3 | 4.1 | 3.5 | 2.8 | 2.1 | 45 | 98.50 | 201 |
| 75 | 870 | 210 | 1551 | 98.5 | 98.6 | 98.3 | 98.0 | 1.9 | 4.0 | 3.6 | 3.1 | 1.8 | 50 | 98.60 | 319 |
| 112.5 | 1526 | 350 | 1583 | 98.6 | 98.9 | 98.8 | 98.6 | 1.2 | 3.0 | 2.7 | 2.5 | 1.1 | 50 | 98.80 | 827 |
| 150 | 1665 | 350 | 2463 | 98.8 | 98.9 | 98.7 | 98.4 | 1.6 | 4.5 | 4.2 | 4.0 | 1.4 | 50 | 98.90 | 643 |
| 225 | 2094 | 650 | 3766 | 98.8 | 98.9 | 98.7 | 98.4 | 1.7 | 5.5 | 5.2 | 5.0 | 1.4 | 55 | 99.00 | 926 |

Typical Data for General-Purpose Dry-Type Distribution Transformers, Copper Wound**Type NON HMT 115°C Rise NEMA TP-1**

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 362 | 80 | 527 | 97.6 | 97.7 | 97.3 | 96.7 | 3.2 | 5.9 | 5.1 | 4.2 | 3.0 | 45 | 97.00 | — |
| 30 | 430 | 100 | 1040 | 98.3 | 98.0 | 97.4 | 96.7 | 3.2 | 6.2 | 5.4 | 4.4 | 3.1 | 45 | 97.50 | — |
| 45 | 627 | 170 | 1368 | 98.3 | 98.2 | 97.7 | 97.2 | 2.8 | 6.0 | 5.2 | 4.4 | 2.7 | 45 | 97.70 | — |
| 75 | 926 | 250 | 2096 | 98.4 | 98.3 | 97.9 | 97.4 | 2.6 | 7.0 | 6.2 | 5.7 | 2.5 | 50 | 98.00 | — |
| 112.5 | 1628 | 400 | 2515 | 98.4 | 98.5 | 98.3 | 97.9 | 2.0 | 5.5 | 4.9 | 4.5 | 1.9 | 50 | 98.20 | — |
| 150 | 2001 | 500 | 2688 | 98.5 | 98.7 | 98.6 | 98.3 | 1.6 | 5.6 | 5.2 | 5.0 | 1.5 | 50 | 98.30 | — |
| 225 | 3596 | 590 | 3310 | 98.8 | 98.9 | 98.8 | 98.6 | 1.5 | 6.2 | 6.0 | 5.9 | 1.2 | 55 | 98.50 | — |
| 300 | 3891 | 800 | 4854 | 98.7 | 98.9 | 98.7 | 98.4 | 1.7 | 7.1 | 7.0 | 6.8 | 1.4 | 55 | 98.60 | — |

Type THR HMT 115°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | — | 80 | 708 | 97.1 | 97.0 | 96.4 | 95.5 | 4.3 | 7.4 | 6.3 | 4.7 | 4.2 | 45 | 97.00 | — |
| 30 | 450 | 100 | 1409 | 98.0 | 97.4 | 96.5 | 95.6 | 4.7 | 8.0 | 6.8 | 5.2 | 4.4 | 45 | 97.50 | — |
| 45 | 610 | 170 | 1374 | 98.2 | 98.1 | 97.7 | 97.1 | 2.8 | 4.8 | 4.2 | 3.2 | 2.7 | 45 | 97.70 | — |
| 75 | 868 | 250 | 2341 | 98.2 | 98.1 | 97.6 | 97.0 | 2.9 | 6.6 | 5.8 | 5.0 | 2.8 | 50 | 98.00 | — |
| 112.5 | 1643 | 400 | 2685 | 98.3 | 98.4 | 98.1 | 97.7 | 2.2 | 5.5 | 5.0 | 4.6 | 2.0 | 50 | 98.20 | — |
| 150 | — | 500 | 3304 | 98.5 | 98.6 | 98.3 | 97.9 | 2.0 | 6.7 | 6.3 | 6.0 | 1.9 | 50 | 98.30 | — |
| 225 | 3370 | 590 | 3712 | 98.7 | 98.8 | 98.7 | 98.4 | 1.7 | 6.6 | 6.4 | 6.2 | 1.4 | 55 | 98.50 | — |
| 300 | 3894 | 800 | 4688 | 98.9 | 99.0 | 98.8 | 98.5 | 1.7 | 7.4 | 7.2 | 7.1 | 1.3 | 55 | 98.60 | — |

Typical Specifications— General-Purpose (1000 kVA and Below)

2

General

Furnish and install, single-phase and three-phase general-purpose individually mounted dry-type transformers of the two-winding type, self-cooled, with ratings and voltages as indicated on the drawings. Transformers shall be manufactured by Eaton.

Transformers shall be designed, manufactured and tested in accordance with all the latest applicable ANSI, NEMA and IEEE Standards. All 600-volt class transformers through 1000 kVA shall be UL listed and bear the UL label.

Transformers shall be designed for continuous operation at rated kVA, for operation 24 hours a day, 365 days a year, with normal life expectancy as defined in ANSI C57.96.

Insulation Systems

Transformers shall be insulated as follows:

- **Type EP or EPT:**
0.050 through 75 kVA:
180°C insulation system
- **Type DS-3 or DT-3:**
15 kVA and above: 220°C insulation system

Required performance shall be obtained without exceeding the above indicated temperature rise in a 40°C maximum ambient, with a 30°C average over 24 hours.

All insulation materials shall be flame-retardant and shall not support combustion as defined in ASTM Standard Test Method D635.

Core and Coil Assemblies

Transformer core shall be constructed with high-grade, non-aging, silicon steel with high magnetic permeability, and low hysteresis and eddy current losses. Maximum magnetic flux densities shall be substantially below the saturation point. The transformer core volume shall allow efficient transformer operation at 10% above the nominal tap voltage. The core laminations shall be tightly clamped and compressed. Coils shall be wound of electrical-grade [aluminum] [copper] and continuous wound construction. BIL (basic impulse level) for all 600-volt class windings shall be 10 kV.

On encapsulated units rated [75 kVA and below] [15 kVA and below] [9 kVA and below], the core and coil assembly shall be completely encapsulated in a proportioned mixture of resin or epoxy and aggregate to provide a moisture-proof, shock-resistant seal. The core and coil encapsulation system shall minimize the sound level.

On ventilated units rated [15 kVA and above] [30 kVA and above] [112.5 kVA and above], the core and coil assembly shall be installed on neoprene vibration-absorbing pads.

Enclosures

The enclosure shall be made of heavy-gauge steel and shall be finished using a continuous process of degreasing, cleaning and phosphatizing, followed by electrostatic deposition of a thermosetting polyester powder coating and subsequent baking. The coating color shall be ANSI 61 and shall be UL recognized for outdoor use. The maximum temperature on top of the enclosure shall not exceed 90°C.

On units rated [75 kVA and below] [15 kVA and below] [9 kVA and below] encapsulated, the enclosure construction shall be totally enclosed, non-ventilated, NEMA 3R, with lifting provisions.

On units rated [15 kVA and above] [30 kVA and above] [112.5 kVA and above], the enclosure construction shall be ventilated, NEMA 2, drip-proof, with lifting provisions. All ventilation openings shall be protected against falling dirt. On outdoor units, provide suitable weathershields over ventilation openings.

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilated (up to 1.2 kV) K-Factor 1, 4, 9 | Self-Cooled Ventilated (up to 1.2 kV) K-Factor 13, 20 | Encapsulated (up to 1.2 kV) |
|---------------------------------|---|--|--------------------------------|
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Tests

The following tests shall be performed as standard on all transformers:

1. Ratio tests at the rated voltage connection and at all tap connections.
2. Polarity and phase relation tests on the rated voltage connection.
3. Applied potential tests.
4. Induced potential test.
5. No-load and excitation current at rated voltage on the rated voltage connection.

Sound Levels

Transformer average sound levels shall not exceed the following ANSI and NEMA levels for self-cooled ratings measured in accordance with NEMA ST-20.

Typical Specification— DOE 2016 Energy-Efficient Transformers

General

Furnish and install, single- and three-phase energy-efficient dry-type transformers that comply with CFR Title 10 Chapter II Part 431, Appendix A of Subpart K 2016. Transformers shall be of the two-winding type, self-cooled, with ratings (kVA) as indicated on the drawings. Transformer's losses shall conform to 10 CFR Part 431 requirements. Transformers shall be manufactured by Eaton.

Transformers shall be designed, manufactured and tested in accordance with all the latest applicable ANSI, NEMA and IEEE Standards, and shall be listed by Underwriters Laboratories and bear the UL label.

Transformers shall be designed for continuous operation at rated kVA, for 24 hours a day, 365 days a year, with normal life expectancy as defined in ANSI C57.96.

Insulation System and Temperature Rise

Transformers shall be insulated with a 220°C insulation system. Transformers shall be 150°C rise and shall be capable of carrying a 15% continuous overload without exceeding a 150°C rise. Required performance shall be obtained without exceeding the above rise in a 40°C maximum, 30°C average ambient temperature.

All insulation materials shall be flame-retardant and shall not support combustion as defined in ASTM Standard Test Method D635.

Core and Coil Assemblies

Transformer core shall be constructed with high-grade, non-aging, silicon steel with high magnetic permeability, and low hysteresis and eddy current losses. Maximum magnetic flux densities shall be substantially below the saturation point.

The transformer core volume shall allow efficient transformer operation at 10% above the nominal tap voltage. The core laminations shall be tightly clamped and compressed. Coils shall be wound of electrical grade [aluminum] [copper] and continuous wound construction. BIL (basic impulse level) for all 600-volt class windings shall be 10 kV.

The core and coil assembly shall be installed on neoprene vibration-absorbing pads.

Enclosures

The enclosure shall be made of heavy gauge steel and shall be finished utilizing a continuous process of degreasing, cleaning and phosphatizing, followed by electrostatic deposition of a thermosetting polyester powder coating and subsequent baking. The coating color shall be ANSI 61 and shall be UL recognized for outdoor use.

The enclosure construction shall be ventilated, NEMA 2, drip-proof, with lifting provisions. All ventilation openings shall be protected against falling dirt.

All transformers shall be equipped with a wiring compartment suitable for conduit entry and large enough to allow convenient wiring. The maximum temperature on top of the enclosure shall not exceed 90°C.

Tests

The following tests shall be performed as standard on all transformers:

1. Ratio tests at the rated voltage connection and at all tap connections.
2. Polarity and phase relation tests on the rated voltage connection.
3. Applied potential tests.
4. Induced potential test.
5. No-load and excitation current at rated voltage on the rated voltage connection.

Efficiency

Transformers shall be energy-efficient with minimum efficiencies as set forth per NEMA TP-1-2002 and U.S. DOE 10 CFR Parts 430 and 431 when operated at 35% of full load capacity. Transformer must bear the UL Energy Efficiency Verification Mark to confirm that the unit meets the requirements of 10 CFR Part 431.

DOE 2016 Efficiency Levels

Dry-Type Distribution Transformers—Low-Voltage (600 V and below)

| Single-Phase kVA | Efficiency | Three-Phase kVA | Efficiency |
|---------------------|------------|--------------------|------------|
| | | | |
| 25 | 98.00 | 30 | 98.23 |
| 37.5 | 98.20 | 45 | 98.40 |
| 50 | 98.30 | 75 | 98.60 |
| 75 | 98.50 | 112.5 | 98.74 |
| 100 | 98.60 | 150 | 98.83 |
| 167 | 98.70 | 225 | 98.94 |
| 250 | 98.80 | 300 | 99.02 |
| 333 | 98.90 | 500 | 99.14 |
| — | — | 750 | 99.23 |
| — | — | 1000 | 99.28 |

Sound Levels

Transformer average sound levels shall not exceed the following ANSI and NEMA levels for self-cooled ratings.

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilated (up to 1.2 kV) | | Encapsulated (up to 1.2 kV) |
|---------------------------------|---------------------------------------|-----------------|--------------------------------|
| | K-Factor 1, 4, 9 | K-Factor 13, 20 | |
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Typical Specifications— Dry-Type Transformers for Nonlinear Loads

2

General

Furnish and install, individually mounted dry-type transformers of the two-winding type, self-cooled, with ratings and voltages as indicated on the drawings.

Transformers shall be manufactured by Eaton.

Transformers shall be designed, manufactured and tested in accordance with all the latest applicable ANSI, NEMA and IEEE Standards. All 600-volt class transformers through 500 kVA shall be UL listed as suitable for non-sinusoidal current loads with K factor not to exceed [4] [13] [20].

Insulation Systems

Transformers shall be insulated with a UL recognized 220°C insulation system. Winding temperature rise shall be [80°C] [115°C] [150°C].

Required performance shall be obtained without exceeding the above indicated temperature rise in a 40°C maximum ambient, with a 30°C average.

All insulation materials shall be flame-retardant and shall not support combustion as defined in ASTM Standard Test Method D635.

Core and Coil Assemblies

Transformer core shall be constructed with high-grade, non-aging, silicon steel with high magnetic permeability, and low hysteresis and eddy current losses. Maximum magnetic flux densities shall be substantially below the saturation point. The transformer core volume shall allow efficient transformer operation at 10% above the nominal tap voltage. The core laminations shall be tightly clamped and compressed.

Transformer coils shall be wound of electrical-grade [aluminum] [copper] conductor with continuous wound construction. An electrostatic shield consisting of a single turn of aluminum shall be placed between the primary and secondary winding and grounded to the transformer core. BIL (basic impulse level) for all 600-volt class windings shall be 10 kV.

The core and coil assembly shall be installed on neoprene vibration-absorbing pads.

The neutral conductor shall be rated to carry 200% of normal phase current.

Enclosures

The enclosure shall be made of heavy gauge steel and shall be finished utilizing a continuous process of degreasing, cleaning and phosphatizing, followed by electrostatic deposition of a polymer polyester powder coating and baking. The coating color shall be ANSI 61 and shall be UL recognized for outdoor use. The maximum temperature on top of the enclosure shall not exceed 90°C.

The enclosure construction shall be ventilated, NEMA 2, drip-proof, with lifting provisions. All ventilation openings shall be protected against falling dirt. On outdoor units, provide suitable weathershields over ventilation openings. **To ensure proper ventilation, locate the unit at least 6 inches (152.4 mm) from the adjacent wall or structure.**

Nonlinear Ratings

The transformers shall be specifically designed to supply circuits with a harmonic profile equal to or less than a K-factor of 4 or 13 as described below without exceeding [80°C] [115°C] [150°C] temperature rise.

Nonlinear Ratings

| Harmonic | K-4 | K-13 |
|-------------|--------|--------|
| Fundamental | 100.0% | 100.0% |
| 3rd | 34.0% | 70.0% |
| 5th | 22.0% | 42.0% |
| 7th | 3.0% | 5.0% |
| 9th | 1.0% | 3.0% |
| 11th | 0.7% | 3.0% |
| 13th | 0.5% | 1.0% |
| 15th | 0.3% | 0.7% |
| 17th | 0.3% | 0.6% |

Tests

The following tests shall be performed as standard on all transformers:

1. Ratio tests at the rated voltage connection and at all tap connections.
2. Polarity and phase relation tests on the rated voltage connection.
3. Applied potential tests.
4. Induced potential test.
5. No-load and excitation current at rated voltage on the rated voltage connection.

Sound Levels

Transformer average sound levels shall not exceed the following ANSI and NEMA levels for self-cooled ratings measured in accordance with NEMA ST-20.

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilated (up to 1.2 kV) | | Encapsulated (up to 1.2 kV) |
|---------------------------------|---------------------------------------|-----------------|--------------------------------|
| | K-Factor 1, 4, 9 | K-Factor 13, 20 | |
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Typical Specification— AC Adjustable Frequency Drive Isolation Transformers

General

Furnish and install, single-phase and three-phase general-purpose individually mounted dry-type transformers of the two-winding type, self-cooled, with ratings and voltages for input application as indicated on the drawings. Transformers shall be manufactured by Eaton.

Transformers shall be designed, manufactured and tested in accordance with all the latest applicable ANSI, NEMA and IEEE Standards. All 600-volt class transformers through 550 kVA shall be UL listed and bear the UL label.

Transformers shall be designed for continuous operation at rated kVA, for operation 24 hours a day, 365 days a year, with normal life expectancy as defined in ANSI C57.96.

Insulation Systems

Transformers shall be insulated with a UL recognized 220°C insulation system.

Required performance shall be obtained without exceeding the above indicated temperature rise in a 40°C maximum ambient, with a 30°C average over 24 hours.

All insulation materials shall be flame-retardant and shall not support combustion as defined in ASTM Standard Test Method D635.

Core and Coil Assemblies

Transformer core shall be constructed with high-grade, non-aging, silicon steel with high magnetic permeability, and low hysteresis and eddy current losses. Maximum magnetic flux densities shall be substantially below the saturation point. The transformer core volume shall allow efficient transformer operation at 10% above the nominal tap voltage. The core laminations shall be tightly clamped and compressed. Coils shall be wound of electrical-grade [aluminum] [copper] and continuous wound construction. BIL (basic impulse level) for all 600-volt class windings shall be 10 kV.

A temperature sensing device shall be imbedded in the center coil.

The core and coil assembly shall be installed on neoprene vibration-absorbing pads.

Enclosures

The enclosure shall be made of heavy-gauge steel and shall be finished using a continuous process of degreasing, cleaning, and phosphatizing, followed by electrostatic deposition of a thermosetting polyester powder coating and subsequent baking. The coating color shall be ANSI 61 and shall be UL recognized for outdoor use. The maximum temperature on top of the enclosure shall not exceed 90°C.

The enclosure construction shall be ventilated, NEMA 2, drip-proof, with lifting provisions. All ventilation openings shall be protected against falling dirt. **To ensure proper ventilation, locate the unit at least 6 inches (152.4 mm) from the adjacent wall or structure. On outdoor units, provide suitable weathershields over ventilation openings.**

Sound Levels

Transformer average sound levels shall not exceed the following ANSI and NEMA levels for self-cooled ratings measured in accordance with NEMA ST-20.

The following table lists the recommended kVA size of the drive isolation transformer for a specific horsepower requirement.

Three-Phase

| Horsepower AC Motor | kVA Minimum |
|------------------------|----------------|
| 5 | 7.5 |
| 7.5 | 11 |
| 10 | 14 |
| 15 | 20 |
| 20 | 27 |
| 25 | 34 |
| 30 | 40 |
| 40 | 51 |
| 50 | 63 |
| 60 | 75 |
| 75 | 93 |
| 100 | 118 |
| 125 | 145 |
| 150 | 175 |
| 200 | 220 |
| 250 | 275 |
| 300 | 330 |
| 400 | 440 |
| 500 | 550 |
| 600 | 660 |
| 700 | 770 |

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilated (up to 1.2 kV) | | Encapsulated (up to 1.2 kV) |
|---------------------------------|---------------------------------------|-----------------|--------------------------------|
| | K-Factor 1, 4, 9 | K-Factor 13, 20 | |
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Typical Specifications— Mini-Power Centers (3–30 kVA)

2

General

Furnish and install, single-phase and three-phase general-purpose individually mounted mini-power centers of the two-winding type, self-cooled, with ratings and voltages as indicated on the drawings. Mini-power centers shall be manufactured by Eaton.

Units shall be designed, manufactured and tested in accordance with all the latest applicable ANSI, NEMA, IEEE, CSA and UL standards, and shall be UL listed and CSA certified and bear the UL and CSA labels.

Units shall be designed for continuous operation at rated kVA, 24 hours a day, 365 days a year, with normal life expectancy as defined in ANSI C57.96.

Each mini-power center shall include a main primary breaker with an interrupting rating of 14 kA at 277/480 volts; an encapsulated dry-type transformer and a secondary panelboard with main breaker rated 10 kA interrupting rating at 120/240 volts.

1. All interconnecting wiring between the primary breaker and transformer, secondary main breaker and transformer, and distribution section shall be factory installed. Main primary, secondary and branch breakers shall be enclosed with a padlockable hinged door.
2. The secondary distribution section shall accommodate one-inch, plug-in breakers with 10 kA interrupting capacity.
3. On the all-copper, bolt-on designs, the secondary distribution section shall accommodate bolt-on breakers with 10 kA interrupting capacity.

Insulation System

Transformers shall be insulated with a 180°C insulation system.

Required performance shall be obtained without exceeding the above indicated temperature rise in a 40°C maximum ambient, with a 30°C average over 24 hours.

All insulation materials shall be flame-retardant and shall not support combustion as defined in ASTM Standard Test Method D635.

Core and Coil Assemblies

Transformer core shall be constructed with high-grade, non-aging, silicon steel with high magnetic permeability, and low hysteresis and eddy current losses. Maximum magnetic flux densities shall be substantially below the saturation point.

The transformer core volume shall allow efficient transformer operation at 10% above the nominal tap voltage. The core laminations shall be tightly clamped and compressed. Coils shall be wound of electrical-grade aluminum (copper) with continuous wound construction. BIL (basic impulse level) for all 600-volt class windings shall be 10 kV.

The core and coil assembly shall be completely encapsulated in a proportioned mixture of resin or epoxy and aggregate to provide a moisture-proof, shock-resistant seal. The core and coil encapsulation system shall minimize the sound level.

Enclosures

The enclosure shall be made of heavy-gauge steel and shall be finished using a continuous process of degreasing, cleaning, and phosphatizing, followed by electrostatic deposition of a thermosetting polymer polyester powder coating and subsequent baking. The coating color shall be ANSI 61 and shall be UL recognized for outdoor use. Mini-power centers shall be equipped with a wiring compartment suitable for conduit entry and large enough to allow convenient wiring. The maximum temperature on top of the enclosure shall not exceed 90°C. The core of the transformer shall be grounded to the enclosure. The enclosure shall be totally enclosed, non-ventilated, NEMA 3R, with lifting eyes.

Tests

The following tests shall be performed as standard on all transformers:

1. Ratio tests at the rated voltage connection and at all tap connections.
2. Polarity and phase relation tests on the rated voltage connection.
3. Applied potential tests.
4. Induced potential test.
5. No-load and excitation current at rated voltage on the rated voltage connection.

Sound Levels

Transformer average sound levels shall not exceed the following ANSI/NEMA levels for self-cooled ratings measured in accordance with NEMA ST-20.

Average Sound Levels

| kVA | NEMA Average Sound Level in dB |
|-------|--------------------------------|
| 0–9 | 45 |
| 10–30 | 50 |

Typical Specification— NEMA TP-1-2002 Compliant Energy-Efficient Transformers

General

Furnish and install, three-phase energy-efficient dry-type transformers that comply with NEMA Standard TP-1-2002 and U.S. DOE 10 CFR Parts 430 and 431. Transformers shall be of the two-winding type, self-cooled, with ratings (kVA) as indicated on the drawings. Transformer's losses shall conform to NEMA TP-1 requirements. Transformers shall be manufactured by Eaton.

Transformers shall be designed, manufactured and tested in accordance with all the latest applicable ANSI, NEMA and IEEE Standards, and shall be listed by Underwriters Laboratories and bear the UL label.

Transformers shall be designed for continuous operation at rated kVA, for 24 hours a day, 365 days a year, with normal life expectancy as defined in ANSI C57.96.

Insulation System and Temperature Rise

Transformers shall be insulated with a 220°C insulation system. Transformers shall be 150°C rise and shall be capable of carrying a 15% continuous overload without exceeding a 150°C rise. Required performance shall be obtained without exceeding the above rise in a 40°C maximum, 30°C average ambient temperature.

All insulation materials shall be flame-retardant and shall not support combustion as defined in ASTM Standard Test Method D635.

Core and Coil Assemblies

Transformer core shall be constructed with high-grade, non-aging, silicon steel with high magnetic permeability, and low hysteresis and eddy current losses. Maximum magnetic flux densities shall be substantially below the saturation point.

The transformer core volume shall allow efficient transformer operation at 10% above the nominal tap voltage. The core laminations shall be tightly clamped and compressed. Coils shall be wound of electrical grade [aluminum] [copper] and continuous wound construction. BIL (basic impulse level) for all 600-volt class windings shall be 10 kV.

The core and coil assembly shall be installed on neoprene vibration-absorbing pads.

Enclosures

The enclosure shall be made of heavy gauge steel and shall be finished utilizing a continuous process of degreasing, cleaning and phosphatizing, followed by electrostatic deposition of a thermosetting polyester powder coating and subsequent baking. The coating color shall be ANSI 61 and shall be UL recognized for outdoor use.

The enclosure construction shall be ventilated, NEMA 2, drip-proof, with lifting provisions. All ventilation openings shall be protected against falling dirt. **To ensure proper ventilation, locate the unit at least 6 inches (152.4 mm) from the adjacent wall or structure.**

All transformers shall be equipped with a wiring compartment suitable for conduit entry and large enough to allow convenient wiring. The maximum temperature on top of the enclosure shall not exceed 90°C.

Tests

The following tests shall be performed as standard on all transformers:

1. Ratio tests at the rated voltage connection and at all tap connections.
2. Polarity and phase relation tests on the rated voltage connection.
3. Applied potential tests.
4. Induced potential test.

5. No-load and excitation current at rated voltage on the rated voltage connection.

Efficiency

Transformers shall be energy-efficient with minimum efficiencies as set forth per NEMA TP-1-2002 and U.S. DOE 10 CFR Parts 430 and 431 when operated at 35% of full load capacity.

NEMA TP-1-2002 Efficiency Levels

NEMA Class 1 Efficiency Levels Dry-Type Distribution Transformers—Low-Voltage (600 V and below)

| Single-Phase | | Three-Phase | |
|--------------|------------|-------------|------------|
| kVA | Efficiency | kVA | Efficiency |
| 15 | 97.7 | 15 | 97.0 |
| 25 | 98.0 | 30 | 97.5 |
| 37.5 | 98.2 | 45 | 97.7 |
| 50 | 98.3 | 75 | 98.0 |
| 75 | 98.5 | 112.5 | 98.2 |
| 100 | 98.6 | 150 | 98.3 |
| 167 | 98.7 | 225 | 98.5 |
| 250 | 98.8 | 300 | 98.6 |
| 333 | 98.9 | 500 | 98.7 |
| — | — | 750 | 98.8 |
| — | — | 1000 | 98.9 |

Sound Levels

Transformer average sound levels shall not exceed the following ANSI and NEMA levels for self-cooled ratings.

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilated (up to 1.2 kV) K-Factor 1, 4, 9 | Self-Cooled Ventilated (up to 1.2 kV) K-Factor 13, 20 | Encapsulated (up to 1.2 kV) |
|------------------------------|--|---|-----------------------------|
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Glossary of Transformer Terms

Air cooled: A transformer that is cooled by the natural circulation of air around, or through, the core and coils.

Ambient noise level: The existing or inherent sound level of the area surrounding the transformer, prior to energizing the transformer. Measured in decibels.

Ambient temperature: The temperature of the air surrounding the transformer into which the heat of the transformer is dissipated.

Ampacity: The current-carrying capacity of an electrical conductor under stated thermal conditions. Expressed in amperes.

Ampere: The practical unit of electric current.

Attenuation: A decrease in signal power or voltage. Unit of measure is dB.

Autotransformer: A transformer in which part of the winding is common to both the primary and the secondary circuits.

Banked: Two or more single-phase transformers wired together to supply a three-phase load. Three single-phase transformers can be “banked” together to support a three-phase load. For example, three 10 kVA single-phase transformers “banked” together will have a 30 kVA three-phase capacity.

BIL: Basic impulse level. The ability of a transformer’s insulation system to withstand high voltage surges. All Eaton 600V-class transformers have a 10 kV BIL rating.

BTU: British thermal unit. In North America, the term “BTU” is used to describe the heat value (energy content) of fuels, and also to describe the power of heating and cooling systems, such as furnaces, stoves, barbecue grills and air conditioners. When used as a unit of power, BTU “per hour” (BTU/h) is understood, though this is often abbreviated to just “BTU.”

Buck-boost: The name of a standard, single-phase, two-winding transformer application with the low-voltage secondary windings connected as an autotransformer for boosting (increasing) or bucking (decreasing) voltages in small amounts. Applications can either be single-phase or three-phase.

CE: Mark to indicate third-party approved or self-certification to specific requirements of the European community.

Celsius (centigrade): Metric temperature measure.

$$^{\circ}\text{F} = (1.8 \times ^{\circ}\text{C}) + 32$$

$$^{\circ}\text{C} = (^{\circ}\text{F} - 32) / 1.8$$

Center tap: A tap at the mid-point of a winding. The center tap on three-phase delta-delta transformers is called a lighting tap. It provides 5% of the transformer’s kVA for single-phase loads.

Certified tests: Actual values taken during production tests and certified as applying to a given unit shipped on a specific order. Certified tests are serial number-specific.

Common mode: Electrical noise or voltage fluctuation that occurs between all of the line leads and the common ground, or between ground and line or neutral.

Compensated transformer: A transformer with a turns ratio that provides a higher than nameplate output (secondary) voltage at no load, and nameplate output (secondary) voltage at rated load. It is common for small transformers (2 kVA and less) to be compensated.

Conductor losses: Losses (expressed in watts) in a transformer that are incidental to carrying a load: coil resistance, stray loss due to stray fluxes in the

windings, core clamps, and the like, as well as circulating currents (if any) in parallel windings. Also called load losses.

Continuous rating: The load that a transformer can handle indefinitely without exceeding its specified temperature rise.

Core losses: Losses (expressed in watts) caused by magnetization of the core and its resistance to magnetic flux. Also called no-load losses or excitation losses. Core losses are always present when the transformer is energized.

CSA: Canadian Standards Association. The Canadian equivalent of Underwriters Laboratories (UL).

cUL: Mark to indicate UL Certification to specific CSA Standards.

Decibel (dB): Unit of measure used to express the magnitude of a change in signal or sound level.

Delta connection: A standard three-phase connection with the ends of each phase winding connected in series to form a closed loop with each phase 120 degrees from the other. Sometimes referred to as three-wire.

Dielectric tests: Tests that consist of the application of a voltage higher than the rated voltage for a specified time for the purpose of determining the adequacy against breakdowns of insulating materials and spacings under normal conditions.

DOE 2016 efficient: A revision to federal law 10 CFR Part 431 (2007) that mandates higher efficiency for distribution transformers manufactured for sale in the U.S. and U.S. Territories effective January 1, 2016. “TP-1” efficient transformers can no longer legally be manufactured for use in the U.S. as of this date.

Dry-type transformer: A transformer in which the core and coils are in a gaseous or dry compound insulating medium. A transformer that is cooled by a medium other than a liquid, normally by the circulation of air.

Eddy currents: The currents that are induced in the body of a conducting mass by the time variation of magnetic flux or varying magnetic field.

Efficiency: The ratio of the power output from a transformer to the total power input. Typically expressed as a %.

Electrostatic shield: Copper or other conducting sheet placed between primary and secondary windings, and grounded to reduce electrical interference and to provide additional protection from line-to-line or line-to-ground noise. Commonly referred to as “Faraday shield.”

There are no industry standards for electrostatic shield performance. Eaton-manufactured transformers have been tested by an independent laboratory to meet the following attenuation levels.

When tested per MIL-Std-220A, Method of Insertion Loss Measurement, with matched impedance no load technique:

1. Common mode noise attenuation: –80 dBA minimum at 0.1 kHz to 1.5 kHz; –55 dBA minimum at 1.51 kHz to 100 kHz.
2. Normal mode (Transverse mode) noise attenuation: –35 dBA minimum at 1.5 kHz to 10 kHz.

Primary to Secondary Capacitance of 24.74–18.06 picofarads on the range 100–20 kHz.

Encapsulated transformer: A transformer with its core coils either dipped or cast in an epoxy resin or other encapsulating substance.

Enclosure: A surrounding case or housing used to protect the contained equipment against external conditions and prevent personnel from accidentally contacting live parts.

Environmentally preferable product: A product that has a lesser or reduced negative effect on human health and the environment when compared to competing products that serve the same purpose. This comparison may consider raw materials acquisition, production, manufacturing, packaging, distribution, reuse, operation, maintenance and disposal of the product. This term includes recyclable products, recycled products and reusable products.

EPACT: The Energy Policy Act of 1992 (EPACT) is an important piece of legislation for efficiency because it established minimum efficiency levels for dry-type distribution transformers manufactured or imported after December 2006. EPACT, which was based on NEMA standards, defined a number of terms, including what constitutes an energy-efficient transformer. The DOE issued a rule that defines these transformers and how manufacturers must comply. DOE EPACT rule (PDF): Energy Efficiency Program for Certain Commercial and Industrial Equipment: Test Procedures, Labeling, and the Certification Requirements for Electric Motors. Final Rule. 10-CFR Part 431.

Excitation current: No load current. The current that flows in any winding used to excite the transformer when all other windings are open-circuited. It is usually expressed in percent of the rated current of a winding in which it is measured. Also called magnetizing current.

FCAN: “Full Capacity Above Nominal” taps. Designates the transformer will deliver its rated kVA when connected to a voltage source which is higher than the rated primary voltage.

FCBN: “Full Capacity Below Nominal” taps. Designates the transformer will deliver its rated kVA when connected to a voltage source which is lower than the rated primary voltage.

Frequency: On AC circuits, designates the number of times that polarity alternates from positive to negative and back again per second, such as 60 cycles per second. Typically measured in Hertz (Hz).

Ground: Connecting one side of a circuit to the earth through low resistance or low impedance paths to help prevent transmitting electrical shock to personnel.

Harmonic: A sinusoidal waveform with a frequency that is an integral multiple of the fundamental frequency (60 Hz).

60 H₃ fundamental
120 H₃ 2nd harmonic
180 H₃ 3rd harmonic
240 H₃ 4th harmonic

Harmonic distortion: Nonlinear distortion of a system characterized by the appearance of harmonic (non-sinusoidal) currents in the output, when the input is sinusoidal.

Harmonic distortion, total (THD): The square root of the sum of the squares of all harmonic currents present in a load, excluding the fundamental 60 Hz current. Usually expressed as a percent of the fundamental.

High voltage windings: In a two-winding transformer, the winding intended to have the greater voltage. Usually marked with “H” designations.

HMT: Harmonic Mitigating Transformer (HMT) is better able to handle the harmonic currents present in today’s electrical power system. thereby increasing system capacity, reducing distortion throughout a facility, help to minimize downtime and “mysterious” maintenance on equipment, and return the longevity of equipment life through reduced operational energy losses, thereby running cooler.

Hp: Horsepower. The energy required to raise 33,000 pounds a distance of one foot in one minute. 1 hp is equal to 746 watts, or 0.746 kW.

Hi pot: A standard test on dry-type transformers consisting of extra-high potentials (voltages) connected to the windings. Used to check the integrity of insulation materials and clearances.

Hottest-spot temperature: The highest temperature inside the transformer winding. Is greater than the measured average temperature of the coil conductors, when using the resistance change method.

Hysteresis: The tendency of a magnetic substance to persist in any state of magnetization.

Impedance: The retarding forces of current in an AC circuit; the current-limiting characteristics of a transformer. Symbol = Z

Inductance: In electrical circuits, the opposition to a change in the flow of electrical current. Symbol = L

Inducted potential test: A standard dielectric test of transformer insulation. Verifies the integrity of insulating materials and electrical clearances.

Inrush current: The initial high peak of current that occurs in the first few cycles of energization, which can be 30 to 40 times the rated current.

Insulating transformer: Another term for an isolating transformer.

Insulation: Material with a high electrical resistance.

Insulation materials: Those materials used to insulate the transformer’s electrical windings from each other and ground.

Integral TVSS or SPD: Major Standard Change for Surge Protective Devices (formerly known as Transient Voltage Surge Suppressors). The primary safety standard for transient voltage surge suppressors (TVSS) has undergone major revisions in the past three years with mandatory compliance by manufacturers required by September 29, 2009. Even the name of the standard has changed from UL Standard for Safety for Transient Voltage Surge Suppressors, UL 1449 to UL Standard for Safety for Surge Protective Devices, UL 1449. This means that TVSS listed to the UL 1449 2nd Edition standard will no longer be able to be manufactured after September 29, 2009. All Surge Protective Devices must be designed, tested, manufactured and listed to the UL 1449 3rd Edition standard after this date.

Isolating transformer:

A transformer where the input (primary) windings are not connected to the output (secondary) windings (i.e., electrically isolated).

K-factor: A common industry term for the amount of harmonics produced by a given load. The larger the K-factor, the more harmonics that are present. Also used to define a transformer's ability to withstand the additional heating generated by harmonic currents.

kVA: Kilovolt-ampere. Designates the output that a transformer can deliver for a specified time at a rated secondary voltage and rated frequency without exceeding the specified temperature rise. When multiplied by the power factor, will give kilowatts or kW.

$$1000 \text{ VA} = 1 \text{ kVA}$$

Lamination: Thin sheets of electrical steel used to construct the core of a transformer.

Limiting temperature:

The maximum temperature at which a component or material may be operated continuously with no sacrifice in normal life expectancy.

Linear load: A load where the current waveform conforms to that of the applied voltage, or a load where a change in current is directly proportional to a change in applied voltage.

Live part: Any component consisting of an electrically conductive material that can be energized under conditions of normal use.

Load losses: I^2R losses in windings. Also see conductor losses.

Low-voltage winding: In a two-winding transformer, the winding intended to have the lesser voltage. Usually marked with "X" designations.

Mid-tap: See center tap.

Noise level: The relative intensity of sound, measured in decibels (dB). NEMA Standard ST-20 outlines the maximum allowable noise level for dry-type transformers.

Nonlinear load: A load where the current waveform does not conform to that of the applied voltage, or where a change in current is not proportional to a change in applied voltage.

Non-ventilated transformer: A transformer where the core and coil assembly is mounted inside an enclosure with no openings for ventilation. Also referred to as totally enclosed non-ventilated (TENV).

No load losses: Losses in a transformer that is excited at rated voltage and frequency but that is not supplying a load. No load losses include core losses, dielectric losses and conductor losses in the winding due to the exciting current. Also referred to as excitation losses.

Overload capability: Short-term overload capacity is designed into transformers as required by ANSI. Continuous overload capacity is not deliberately designed into a transformer because the design objective is to be within the allowed winding temperature rise with nameplate loading.

Percent IR (% resistance): Voltage drop due to resistance at rated current in percent of rated voltage.

Percent IX (% reactance): Voltage drop due to reactance at rated current in percent of rated voltage.

Percent IZ (% impedance): Voltage drop due to impedance at rated current in percent of rated voltage.

Phase: Type of AC electrical circuit; usually single-phase two- or three-wire, or three-phase three- or four-wire.

Polarity test: A standard test on transformers to determine instantaneous direction of the voltages in the primary compared to the secondary.

Primary taps: Taps added to the primary (input) winding. See Tap.

Primary voltage: The input circuit voltage.

Power factor: The cosine of the phase angle between a voltage and a current.

Ratio test: A standard test of transformers to determine the ratio of the input (primary) voltage to the output (secondary) voltage.

Reactance: The effect of inductive and capacitive components of a circuit producing other than unity power factor.

Reactor: A single winding device with an air or iron core that produces a specific amount of inductive reactance into a circuit. Normally used to reduce of control current.

Regulation: Usually expressed as the percent change in output voltage when the load goes from full load to no load.

Scott T connection: Connection for three-phase transformers. Instead of using three sets of coils for a three-phase load, the transformer uses only two sets of coils.

Series/multiple winding: A winding consisting of two or more sections that can be connected for series operation or multiple (parallel) operation. Also called series-parallel winding.

Short circuit: A low resistance connection, usually accidental, across part of a circuit, resulting in excessive current flow.

Sound levels: All transformers make some sound mainly due to the vibration generated in its core by alternating flux. All Eaton general-purpose dry-type distribution transformers are designed with sound levels lower than NEMA ST-20 maximum levels.

Star connection: Same as a wye connection.

Step-down transformer: A transformer where the input voltage is greater than the output voltage.

Step-up transformer: A transformer where the input voltage is less than the output voltage.

T-T connection: See Scott T connection.

Tap: A connection brought out of a winding at some point between its extremities, usually to permit changing the voltage or current ratio. Taps are typically used to compensate for above or below rated input voltage, in order to provide the rated output voltage. See FCAN and FCBN.

Temperature class: The maximum temperature that the insulation system of a transformer can continuously withstand. The common insulation classes are 105, 150, 180 (also 185) and 220.

Temperature rise: The increase over ambient temperature of the windings due to energizing and loading the transformer.

Total losses: The sum of the no-load losses and load losses.

Totally enclosed non-ventilated enclosure: The core and coil assembly is installed inside an enclosure that has no ventilation to cool the transformer. The transformer relies on heat to radiate from the enclosure for cooling.

Transformer tests:

Per NEMA ST-20, routine transformer production tests are performed on each transformer prior to shipment. These tests are: *Ratio tests* on the rated voltage connection; *Polarity and Phase Relation tests* on the rated connection; *No-Load and Excitation Current tests* at rated voltage on the rated voltage connection and *Applied Potential and Induced Potential tests*. Special tests include sound level testing.

Transverse mode: Electrical noise or voltage disturbance that occurs between phase and neutral, or from spurious signals across metallic hot line and the neutral conductor.

Turns ratio: The ratio of the number of turns in the high voltage winding to that in the low-voltage winding.

Typical test data: Tests that were performed on similar units that were previously manufactured and tested.

UL (Underwriters Laboratories): An independent safety testing organization.

Universal taps:

A combination of six primary voltage taps consisting of 2 at +2-1/2% FCAN and 4 at -2-1/2% FCBN.

Watt: A unit of electrical power when the current in a circuit is one ampere and the voltage is one volt.

Wye connection: A standard three-wire transformer connection with similar ends of single-phase coils connected together. The common point forms the electrical neutral point and may be grounded. Also referred to as three-phase four-wire. To obtain the line-to-neutral voltage, divide the line voltage by $\sqrt{3}$ (1.732).

Frequently Asked Questions About Transformers

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Can 60 Hz transformers be used at other frequencies?

Transformers rated for 60 Hz can be applied to circuits with a higher frequency, as long as the nameplate voltages are not exceeded. The higher the frequency that you apply to a 60 Hz transformer, the less voltage regulation you will have. 60 Hz transformers may be used at lower frequencies but only at reduced voltages corresponding to the reduction in frequency. For example, a 480 to 120 volt 60 Hz transformer can carry rated kVA at 50 Hz but ONLY when applied as a 400 to 100 volt transformer (50/60 x 480 = 400).

Can single-phase transformers be used on a three-phase source?

Yes. Any single-phase transformer can be used on a three-phase source by connecting the primary terminals of the single-phase transformer to any two wires of a three-phase system. It does not matter whether the three-phase source is three-phase three-wire or three-phase four-wire. The output of the transformer will be single-phase.

Can transformers be used to create three-phase power from a single-phase system?

No. Single-phase transformers alone cannot be used to create the phase-shifts required for a three-phase system. Phase shifting devices (reactors or capacitors) or phase converters in conjunction with transformers are required to change single-phase power to three-phase.

What considerations need to be taken into account when operating transformers where high altitudes?

At altitudes greater than 3300 feet (1000 meters), the density of the air is less than at lower elevations. This reduces the ability of the air surrounding a transformer to cool it, so the temperature rise of the transformer is increased. Therefore, when a transformer is being installed at altitudes greater than 3300 feet above sea level, it is necessary to derate the usable capacity of the transformer. The table below lists the derating factors. As an example, a 75 kVA 480V–208Y/120V transformer installed at 10,000 feet needs to be derated by 4%. Instead of 208A output, the usable current is only 199A.

| Altitude | | Current Rating Factor |
|----------|--------|-----------------------|
| Feet | Meters | |
| 3300 | 1000 | 1.00 |
| 4000 | 1200 | 0.995 |
| 5000 | 1500 | 0.99 |
| 6000 | 1800 | 0.985 |
| 7000 | 2100 | 0.98 |
| 8000 | 2400 | 0.97 |
| 9000 | 2700 | 0.965 |
| 10,000 | 3000 | 0.96 |
| 12,000 | 3600 | 0.95 |
| 14,000 | 4200 | 0.935 |
| 15,000 | 4500 | 0.93 |

What considerations need to be taken into account when operating transformers where the ambient temperature is high?

Eaton’s dry-type transformers are designed in accordance with ANSI standards to operate in areas where the average maximum ambient temperature is 40°C. For operation in ambient temperatures above 40°C, there are two options:

1. Order a custom designed transformer made for the specific application.
2. Derate the nameplate kVA of a standard transformer by 8% for each 10°C of ambient above 40°C.

What is the normal life expectancy of a transformer?

When a transformer is operated under ANSI/IEEE basic loading conditions (ANSI C57.96), its normal life expectancy is 20 years. The ANSI/IEEE basic loading conditions are:

- A. The transformer is continuously loaded at rated kVA and rated voltages.
- B. The average temperature of the ambient air during any 24-hour period is equal to 30°C and at no time exceeds 40°C.
- C. The altitude where the transformer is installed does not exceed 3300 feet (1000 meters).

What are insulation classes?

Insulation classes were originally used to distinguish insulating materials operating at different temperatures. In the past, letters were used for the different designations. Recently, insulation system temperatures (°C) have replaced the letters’ designations.

Insulation Classes

| Previous Designation | Insulation System Rating (°C) |
|----------------------|-------------------------------|
| Class A | 105 |
| Class B | 150 |
| Class F | 180 |
| Class H | 220 |
| Class R | 220 |

How do you know if the enclosure temperature is too hot?

UL and CSA standards strictly regulate the highest temperature that an enclosure can reach. For ventilated transformers, the temperature of the enclosure should not increase by more than 50°C in a 40°C ambient at full rated current. For encapsulated transformers, the temperature of the enclosure should not increase by more than 65°C in a 25°C ambient at full rated current. This means that it is permissible for the temperature of the enclosure to reach 90°C (194°F). Although this temperature is very warm to the touch, it is within the allowed standards. A thermometer should be used to measure enclosure temperatures, not your hand.

Can transformers be reverse-connected (reverse-fed)?

Yes, with limitations. Eaton single-phase transformers rated 3 kVA and larger can be reverse-connected without any loss of kVA capacity or any adverse effects. Transformers rated 2 kVA and below, because there is a turns ratio compensation on the low-voltage winding that adjusts voltage between no load and full load conditions, should not be reverse-fed.

Three-phase transformers with either delta-delta or delta-wye configurations can also be reverse-connected for step-up operation. When reverse-feeding a delta-wye connected transformer, there are two important considerations to take into account: (1) The neutral is not connected, only the three-phase wires of the wye system are connected, and (2) the ground strap between X0 and the enclosure must be removed. Due to high inrush currents that may be created in these applications, it is recommended that you do not reverse-feed transformers rated more than 75 kVA. The preferred solution is to purchase an Eaton step-up transformer designed specifically for your application.

Can transformers be connected in parallel?

Yes, with certain restrictions. For single-phase transformers being connected in parallel, the voltages and impedances of the transformers must be equal (impedances must be within 7.5% of each other). For three-phase transformers, the same restrictions apply as for single-phase transformers, plus the phase shift of the transformers must be the same. For example, a delta-wye-connected transformer (30° phase shift) must be connected in parallel with another delta-wye-connected transformer, not a delta-delta connected-transformer (0° phase shift).

Why is the impedance of a transformer important?

The impedance of a transformer is important because it is used to determine the interrupting rating and trip rating of the circuit protection devices on the load or line side of the transformer. To calculate the maximum short circuit current on the load side of a transformer, use the following formula:

$$\text{Maximum Short Circuit} = \frac{\text{Full Load Current (Amps)}}{\text{Transformer Impedance}}$$

$$\frac{\text{Full Load Current (Amps)}}{\text{Transformer Impedance}}$$

Full load current for single-phase circuits is:

$$\frac{\text{Nameplate Volt-Amps}}{\text{Load (output) Voltage}}$$

and for three-phase circuits, the full load current is:

$$\frac{\text{Nameplate Volts-Amps}}{\text{Load (output) Volts} \times \sqrt{3}}$$

Example: For a standard three-phase, 75 kVA transformer, rated 480 volt delta primary and 208Y/120 volt secondary (catalog number V48M28T7516) and impedance equal to 5.1%, the full load current is:

$$\frac{75,000 \text{ VA}}{208 \text{ V} \times 1.732} = 208.2 \text{ A}$$

The maximum short circuit load current is:

$$\frac{208.2 \text{ A}}{0.051} = 4,082.4 \text{ A}$$

The circuit breaker or fuse on the secondary side of this transformer would have to have a minimum interrupting capacity of 4083 amperes at 208 volts. NEMA ST-20.

A similar transformer with lower impedance would require a primary circuit breaker or fuse with a higher interrupting capacity.

What clearances are required around transformers when they are installed?

All dry-type transformers depend upon the circulation of air for cooling; therefore, it is important that the flow of air around a transformer not be impeded. UL 1561 requires that there be no less than 6 inches (152.4 mm) clearance between any side transformer with ventilation openings and any wall or obstruction.

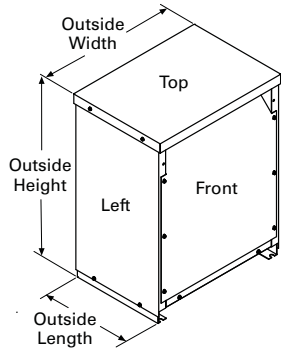
In compliance with NEC 450.9, Eaton's ventilated transformers have a note on their nameplates requiring a minimum of 6 inches (152.4 mm) clearance from the ventilation openings and walls or other obstructions. This clearance only addresses the ventilation needs of the transformer. There may be additional local codes and standards that affect installation clearances.

Transformers should not be mounted in such a manner that one unit will contribute to the additional heating of another unit, beyond allowable temperature limits, for example, where two units are mounted on a wall one above the other.

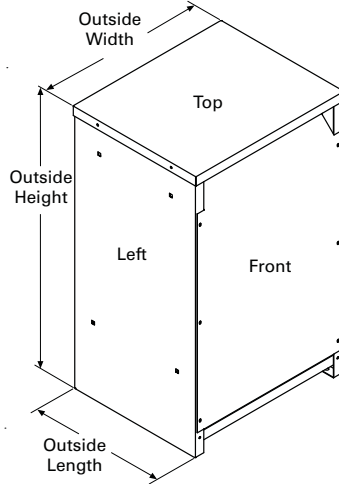
Dimensions

Approximate Dimensions in Inches (mm)

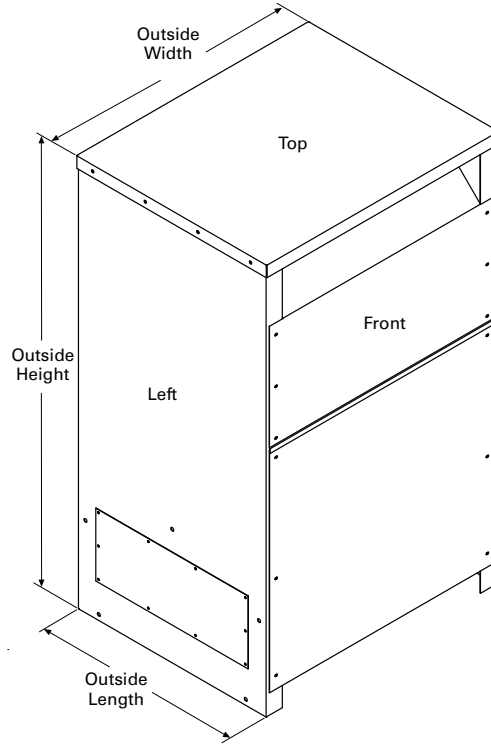
2 Enclosure Dimensional Drawings—Ventilated Transformers



Drawing 1



Drawing 2

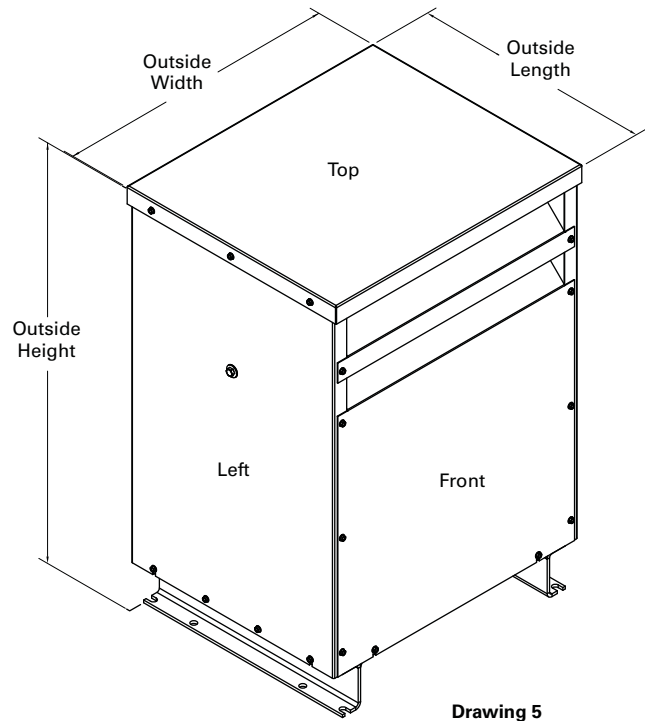
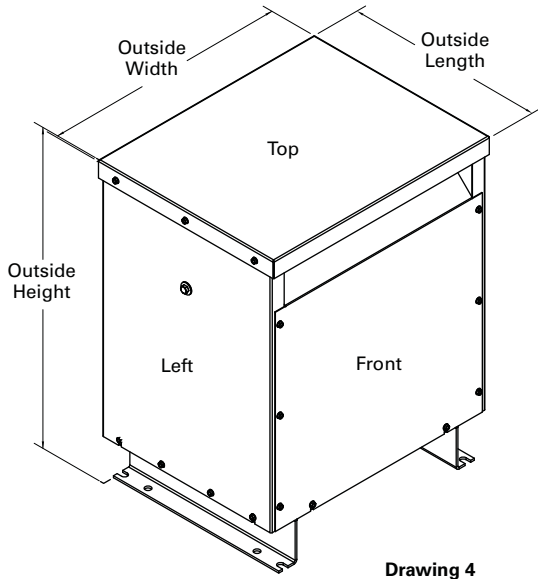


Drawing 3

| Frame | Drawing Number | Dimensions | | |
|---------------|----------------|----------------|----------------|----------------|
| | | Height | Width | Length |
| FR816 | 1 | 31.30 (795.0) | 22.89 (581.4) | 18.39 (467.2) |
| FR818 | 1 | 37.59 (954.8) | 22.89 (581.4) | 20.36 (517.1) |
| FR819 | 2 | 42.03 (1067.6) | 24.22 (615.2) | 23.84 (605.5) |
| FR820 | 2 | 42.03 (1067.6) | 24.22 (615.2) | 23.84 (605.5) |
| FR814 | 2 | 62.91 (1597.9) | 29.97 (761.2) | 33.97 (862.8) |
| FR842, 842A | 1 | 33.75 (857.3) | 22.45 (570.2) | 17.40 (442.0) |
| FR843, 843A | 1 | 38.70 (983.0) | 23.51 (597.2) | 24.38 (619.3) |
| FR844, 844A | 2 | 44.92 (1141.0) | 26.27 (667.3) | 27.12 (688.8) |
| FR821 | 2 | 62.91 (1597.9) | 29.97 (761.2) | 33.97 (862.8) |
| FR912D | 1 | 30.00 (762.0) | 23.00 (584.2) | 16.50 (419.1) |
| FR914D/FR914F | 1 | 39.00 (990.6) | 29.00 (736.6) | 22.00 (558.8) |
| FR915D/FR915F | 1 | 39.00 (990.6) | 29.00 (736.6) | 22.00 (558.8) |
| FR916A | 2 | 48.56 (1233.4) | 28.22 (716.8) | 23.42 (594.9) |
| FR917 | 2 | 56.17 (1426.7) | 31.44 (798.6) | 24.67 (626.6) |
| FR918A | 2 | 62.18 (1579.4) | 31.44 (798.6) | 30.68 (779.3) |
| FR923 | 2 | 57.54 (1461.5) | 36.69 (931.9) | 32.65 (829.3) |
| FR924 | 2 | 68.37 (1736.6) | 44.46 (1129.3) | 36.44 (925.6) |
| FR928 | 2 | 56.16 (1426.5) | 32.93 (836.4) | 27.97 (710.4) |
| FR929 | 2 | 59.56 (1512.8) | 36.72 (932.7) | 32.50 (825.5) |
| FR919E | 3 | 75.00 (1905.0) | 44.20 (1122.7) | 36.23 (920.2) |
| FR920E | 3 | 75.00 (1905.0) | 44.20 (1122.7) | 36.23 (920.2) |
| FR922 | 3 | 90.00 (2286.0) | 69.26 (1759.2) | 42.65 (1083.3) |

Approximate Dimensions in Inches (mm)

Enclosure Dimensional Drawings—Ventilated Transformers, continued



| Frame | Drawing Number | Dimensions | | |
|-------|----------------|--------------|--------------|-------------|
| | | Height | Width | Length |
| FR939 | 4 | 28.00 (711) | 21.88 (556) | 17.75 (451) |
| FR940 | 5 | 36.88 (937) | 24.88 (632) | 21.13 (537) |
| FR942 | 5 | 43.00 (1092) | 30.50 (775) | 24.00 (610) |
| FR943 | 5 | 51.00 (1295) | 34.50 (876) | 31.50 (800) |
| FR944 | 5 | 60.00 (1524) | 38.00 (965) | 33.50 (851) |
| FR945 | 5 | 66.18 (1681) | 42.18 (1071) | 33.50 (851) |

2.7

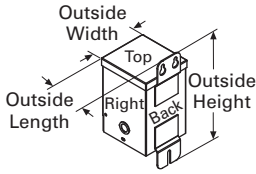
Transformers

Dimensions

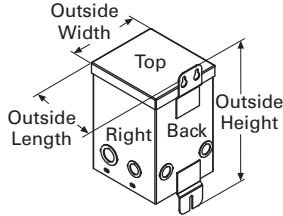
Approximate Dimensions in Inches (mm)

2

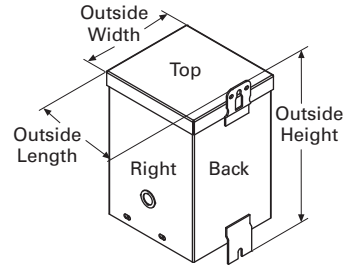
Enclosure Dimensional Drawings—Encapsulated Transformers (Type EP)



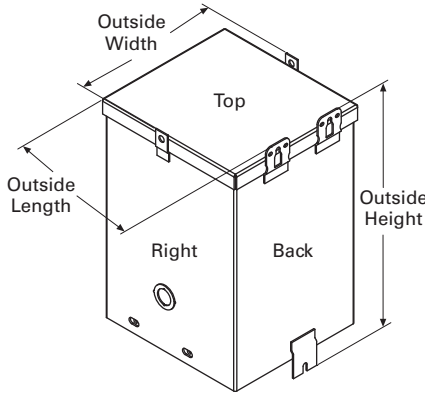
Drawing 6



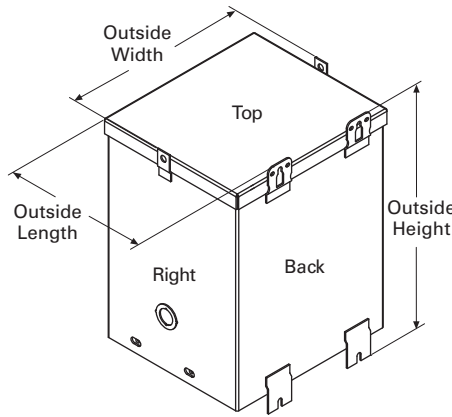
Drawing 7



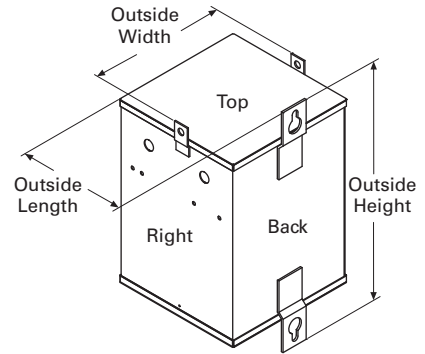
Drawing 8



Drawing 9



Drawing 10

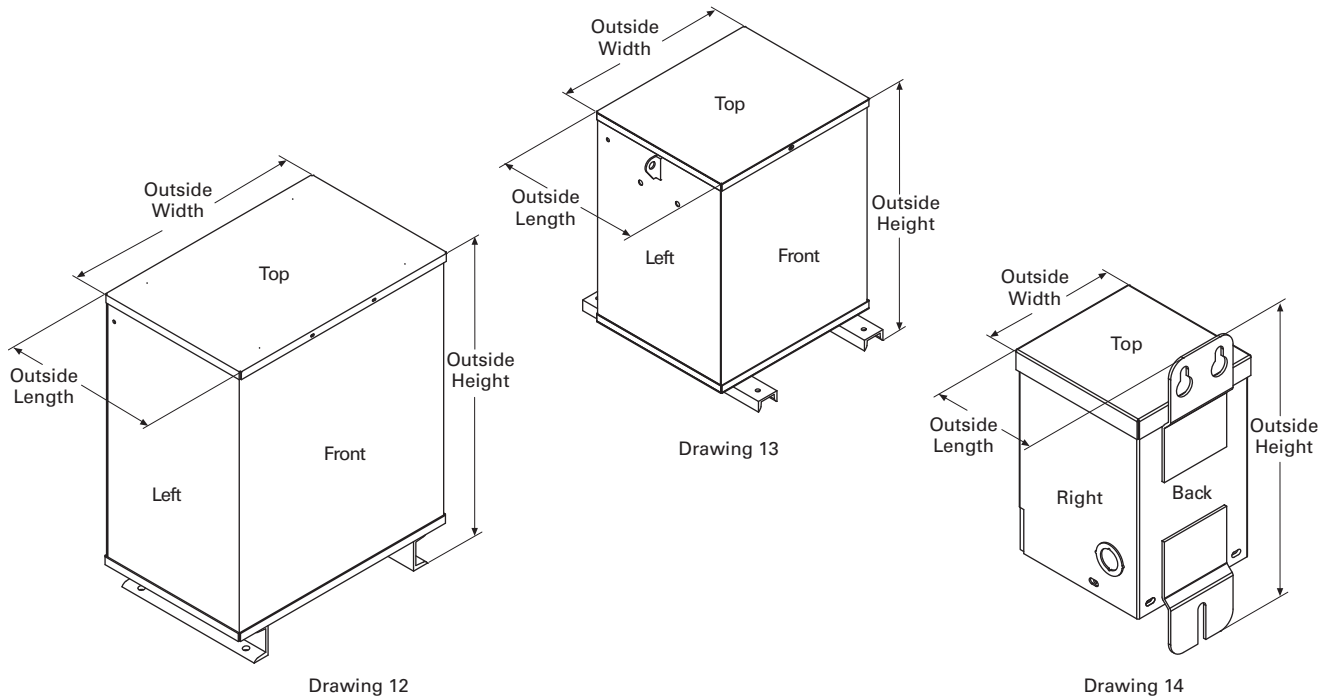


Drawing 11

| Frame | Drawing Number | Dimensions | | |
|-------|----------------|---------------|---------------|---------------|
| | | Height | Width | Length |
| FR52 | 6 | 8.91 (226.3) | 4.11 (104.4) | 4.00 (101.6) |
| FR54 | 6 | 8.91 (226.3) | 4.11 (104.4) | 4.00 (101.6) |
| FR55 | 6 | 8.91 (226.3) | 4.11 (104.4) | 4.00 (101.6) |
| FR56 | 7 | 8.97 (227.8) | 4.87 (123.7) | 4.06 (103.1) |
| FR57 | 7 | 8.97 (227.8) | 4.87 (123.7) | 4.91 (124.7) |
| FR58A | 7 | 11.28 (286.5) | 5.99 (152.1) | 5.75 (146.1) |
| FR59A | 7 | 11.28 (286.5) | 5.99 (152.1) | 5.75 (146.1) |
| FR67 | 7 | 13.41 (340.6) | 6.37 (161.8) | 6.52 (165.6) |
| FR68 | 7 | 13.41 (340.6) | 6.37 (161.8) | 6.52 (165.6) |
| FR176 | 8 | 14.25 (361.9) | 7.69 (195.3) | 8.00 (203.2) |
| FR177 | 9 | 16.00 (406.4) | 10.38 (263.7) | 9.89 (251.2) |
| FR301 | 11 | 22.26 (565.4) | 12.71 (322.8) | 12.79 (324.9) |
| FR178 | 9 | 16.00 (406.4) | 10.38 (263.7) | 9.89 (251.2) |
| FR302 | 11 | 25.26 (641.6) | 12.71 (322.8) | 12.79 (324.9) |
| FR304 | 11 | 25.26 (641.6) | 14.72 (373.9) | 14.82 (376.4) |
| FR179 | 9 | 19.00 (482.6) | 13.38 (339.9) | 10.52 (267.2) |
| FR180 | 9 | 19.00 (482.6) | 13.38 (339.9) | 10.52 (267.2) |
| FR182 | 10 | 23.31 (592.1) | 16.35 (415.3) | 14.12 (358.6) |
| FR190 | 10 | 26.31 (668.3) | 16.35 (415.3) | 14.12 (358.6) |

Approximate Dimensions in Inches (mm)

Enclosure Dimensional Drawings—Encapsulated Transformers Type EP (Single-Phase), continued



| Frame | Drawing Number | Dimensions | | |
|--------|----------------|---------------|---------------|---------------|
| | | Height | Width | Length |
| FR132 | 13 | 20.67 (525.0) | 19.02 (483.1) | 13.59 (345.2) |
| FR300A | 12 | 28.24 (717.3) | 22.42 (569.5) | 14.06 (357.1) |
| FR57P | 14 | 9.34 (237.2) | 4.45 (113.0) | 5.18 (131.6) |
| FR58AP | 14 | 11.68 (296.7) | 4.99 (126.7) | 5.99 (152.1) |
| FR567P | 14 | 13.03 (330.9) | 5.74 (145.8) | 6.56 (166.6) |
| FR568P | 14 | 13.78 (350.0) | 6.22 (158.0) | 6.32 (160.5) |

2.7

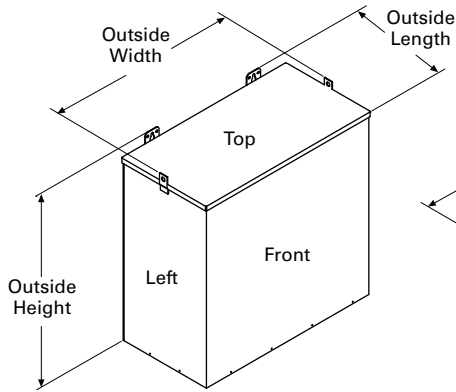
Transformers

Dimensions

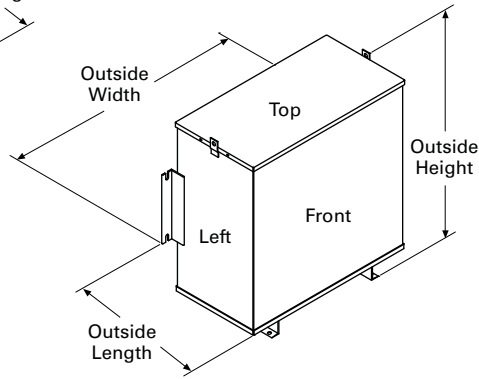
Approximate Dimensions in Inches (mm)

2

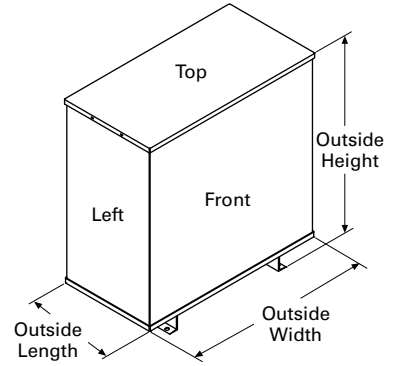
Enclosure Dimensional Drawings—Encapsulated Transformers (Type EPT)



Drawing 15



Drawing 16

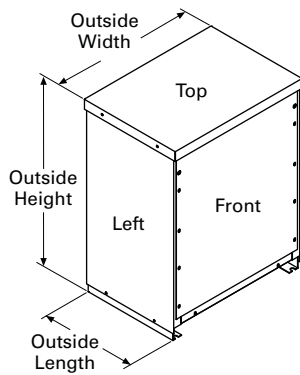


Drawing 17

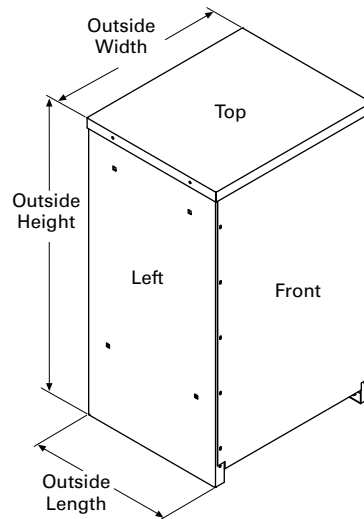
| Frame | Drawing Number | Dimensions | | |
|-------|----------------|---------------|---------------|---------------|
| | | Height | Width | Length |
| FR201 | 15 | 13.40 (340.4) | 15.93 (404.6) | 8.26 (209.8) |
| FR102 | 15 | 13.12 (333.2) | 19.59 (497.6) | 7.09 (180.1) |
| FR103 | 15 | 15.90 (403.9) | 16.93 (430.0) | 10.01 (254.3) |
| FR200 | 15 | 15.90 (403.9) | 16.93 (430.0) | 10.01 (254.3) |
| FR97 | 15 | 15.19 (385.8) | 25.68 (652.3) | 8.38 (212.9) |
| FR95 | 15 | 17.38 (441.5) | 20.00 (508.0) | 10.52 (267.2) |
| FR243 | 16 | 17.38 (441.5) | 20.00 (508.0) | 10.52 (267.2) |
| FR96 | 15 | 16.19 (411.2) | 29.68 (753.9) | 9.42 (239.3) |
| FR244 | 16 | 28.15 (715.0) | 26.58 (675.1) | 14.66 (372.4) |
| FR245 | 17 | 32.06 (814.3) | 30.29 (769.4) | 15.68 (398.3) |

Approximate Dimensions in Inches (mm)

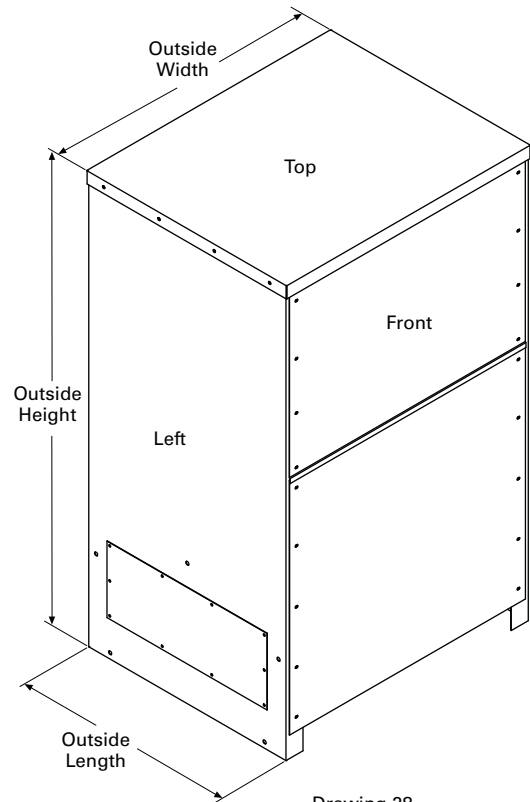
Enclosure Dimensional Drawings—Totally Enclosed Nonventilated Transformers



Drawing 26



Drawing 27



Drawing 28

| Frame | Drawing Number | Dimensions | | |
|-----------------|----------------|----------------|----------------|---------------|
| | | Height | Width | Length |
| FR818N | 26 | 37.59 (954.8) | 22.89 (581.4) | 20.36 (517.1) |
| FR819EN | 27 | 42.03 (1067.6) | 24.22 (615.2) | 23.84 (605.5) |
| FR820EN | 27 | 42.03 (1067.6) | 24.22 (615.2) | 23.84 (605.5) |
| FR814N | 27 | 62.91 (1597.9) | 29.97 (761.2) | 33.97 (862.8) |
| FR912DN | 26 | 30.00 (762.0) | 23.00 (584.2) | 16.50 (419.1) |
| FR914DN/FR914FN | 26 | 39.18 (995.2) | 29.00 (736.6) | 22.00 (558.8) |
| FR915DN/FR915FN | 26 | 39.18 (995.2) | 29.00 (736.6) | 22.00 (558.8) |
| FR916AN | 27 | 46.58 (1183.1) | 28.22 (716.8) | 23.42 (594.9) |
| FR917N | 27 | 56.18 (1427.0) | 31.44 (798.6) | 24.67 (626.8) |
| FR918AN | 27 | 62.18 (1579.4) | 31.44 (798.6) | 30.68 (779.3) |
| FR923N | 27 | 57.50 (1460.5) | 36.69 (931.9) | 32.65 (829.3) |
| FR919N | 28 | 75.00 (1905.0) | 44.21 (1122.9) | 36.23 (920.2) |
| FR920N | 28 | 75.00 (1905.0) | 44.21 (1122.9) | 36.23 (920.2) |

2.7

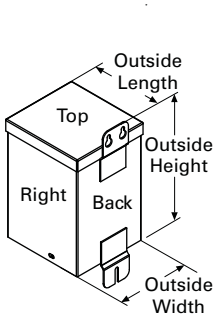
Transformers

Dimensions

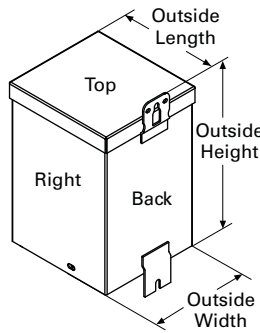
Approximate Dimensions in Inches (mm)

2

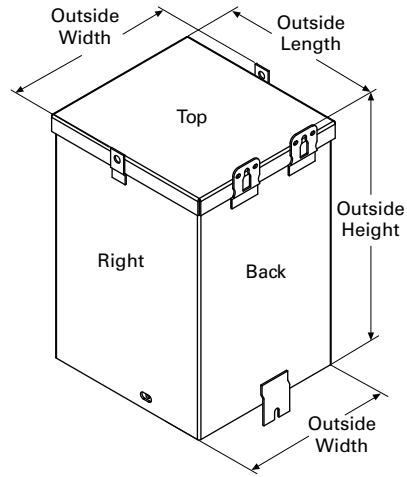
Enclosure Dimensional Drawings—Hazardous Location Transformers (Type EPZ)



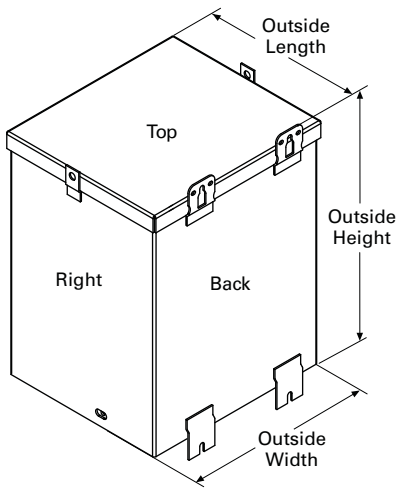
Drawing 21



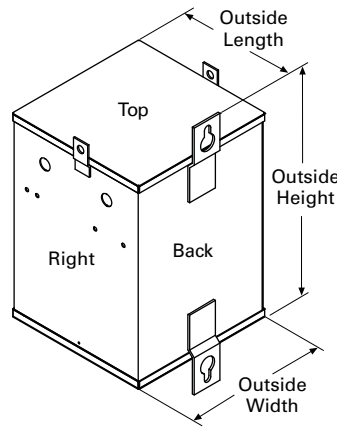
Drawing 22



Drawing 23



Drawing 24

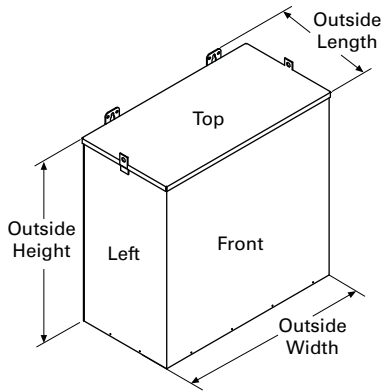


Drawing 25

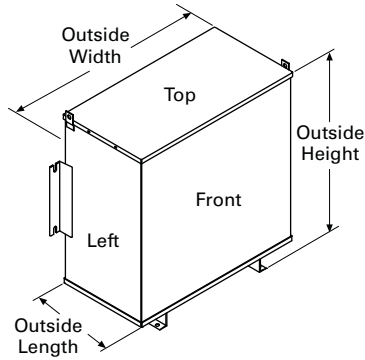
| Frame | Drawing Number | Dimensions Height | Width | Length |
|--------|----------------|-------------------|---------------|---------------|
| FR57H | 21 | 8.97 (227.8) | 4.87 (123.7) | 4.91 (124.7) |
| FR58H | 22 | 11.28 (286.5) | 5.99 (152.1) | 5.75 (146.1) |
| FR59H | 22 | 11.28 (286.5) | 5.99 (152.1) | 5.75 (146.1) |
| FR67H | 22 | 13.41 (340.6) | 6.37 (161.8) | 6.52 (165.6) |
| FR68H | 22 | 13.41 (340.6) | 6.37 (161.8) | 6.52 (165.6) |
| FR176H | 23 | 14.25 (361.9) | 7.69 (195.3) | 8.00 (203.2) |
| FR177H | 24 | 16.00 (406.4) | 10.38 (263.7) | 9.89 (251.2) |
| FR178H | 24 | 16.00 (406.4) | 10.38 (263.7) | 9.89 (251.2) |
| FR179H | 24 | 19.00 (482.6) | 13.38 (339.9) | 10.52 (267.2) |
| FR180H | 24 | 19.00 (482.6) | 13.38 (339.9) | 10.52 (267.2) |
| FR182H | 25 | 23.31 (592.1) | 16.35 (415.3) | 14.12 (358.6) |

Approximate Dimensions in Inches (mm)

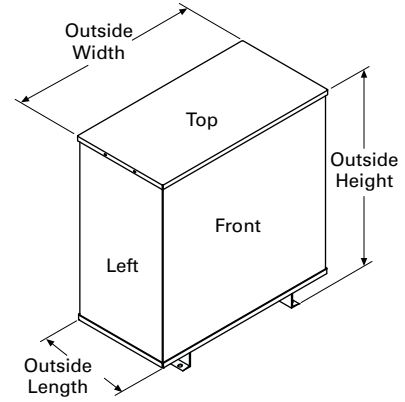
Enclosure Dimensional Drawings—Hazardous Location Transformers (Type EPTZ)



Drawing 18



Drawing 19



Drawing 20

| Frame | Drawing Number | Dimensions | | |
|--------|----------------|---------------|---------------|---------------|
| | | Height | Width | Length |
| FR201H | 18 | 13.40 (340.4) | 15.93 (404.6) | 8.26 (209.8) |
| FR200H | 18 | 15.90 (403.9) | 16.93 (430.0) | 10.01 (254.3) |
| FR103H | 18 | 15.90 (403.9) | 16.93 (430.0) | 10.01 (254.3) |
| FR95H | 18 | 17.38 (441.5) | 20.00 (508.0) | 10.52 (267.2) |
| FR243H | 19 | 17.38 (441.5) | 20.00 (508.0) | 10.52 (267.2) |
| FR244H | 19 | 28.15 (715.0) | 26.58 (675.1) | 14.66 (372.4) |
| FR245H | 20 | 32.06 (814.3) | 30.29 (769.4) | 15.68 (398.3) |

Dry-Type Transformer Family



| | | |
|------------|---|-----------|
| 2.1 | DOE 2016 Energy-Efficient Transformers | |
| | Product Description | V2-T2-2 |
| | Catalog Number Selection | V2-T2-4 |
| | Product Selection | V2-T2-4 |
| | Accessories | V2-T2-28 |
| | Technical Data and Specifications | V2-T2-28 |
| 2.2 | DOE 2016 Energy-Efficient K-Factor Rated Transformers | |
| | Product Description | V2-T2-29 |
| | Product Selection | V2-T2-31 |
| | Accessories | V2-T2-63 |
| | Technical Data and Specifications | V2-T2-63 |
| 2.3 | DOE 2016 Energy-Efficient Harmonic Mitigating Transformers | |
| | Product Description | V2-T2-64 |
| | Catalog Number Selection | V2-T2-66 |
| | Product Selection | V2-T2-67 |
| | Accessories | V2-T2-75 |
| | Technical Data and Specifications | V2-T2-75 |
| 2.4 | General-Purpose Encapsulated Transformers | |
| | Product Description | V2-T2-79 |
| | Catalog Number Selection | V2-T2-80 |
| | Product Selection | V2-T2-80 |
| | Accessories | V2-T2-95 |
| | Technical Data and Specifications | V2-T2-95 |
| 2.5 | Distribution Transformers | |
| | Motor Drive Isolation Transformers | V2-T2-97 |
| | Mini-Power Centers | V2-T2-105 |
| | Totally Enclosed Non-Ventilated Transformers | V2-T2-109 |
| | Class I, Division 2, Hazardous Location Transformers | V2-T2-112 |
| | Marine Duty Transformers | V2-T2-115 |
| | Buck-Boost and Low-Voltage Lighting Transformers | V2-T2-120 |
| | Medium-Voltage Dry-Type Distribution Transformers | V2-T2-149 |
| 2.6 | Transformer Standards, Technical Data and Accessories | |
| | Standards and Certifications | V2-T2-161 |
| | Catalog Number Selection | V2-T2-162 |
| | Product Selection | V2-T2-165 |
| | Options and Accessories | V2-T2-167 |
| | Technical Data and Specifications | V2-T2-171 |
| | Glossary of Transformer Terms | V2-T2-198 |
| | Frequently Asked Questions About Transformers | V2-T2-202 |
| 2.7 | Dimensions | |
| | Dimensions | V2-T2-204 |

Revision notes

Volume 2—Commercial Distribution, CA08100003E

Tab 2—Transformers

| Revision date | Section | Change page(s) | Description |
|---------------|---------|----------------------|---------------|
| 08/24/2017 | 2.1 | V2-T2-2–V2-T2-4 | Content edits |
| 08/24/2017 | 2.1 | V2-T2-6–V2-T2-11 | Content edits |
| 08/24/2017 | 2.1 | V2-T2-13 | Content edits |
| 08/24/2017 | 2.1 | V2-T2-19 | Content edits |
| 08/24/2017 | 2.1 | V2-T2-26–V2-T2-28 | Content edits |
| 08/24/2017 | 2.2 | V2-T2-31 | Content edits |
| 08/24/2017 | 2.2 | V2-T2-63 | Content edits |
| 08/24/2017 | 2.3 | V2-T2-66, V2-T2-67 | Content edits |
| 08/24/2017 | 2.3 | V2-T2-75 | Content edits |
| 08/24/2017 | 2.3 | V2-T2-79–V2-T2-82 | Content edits |
| 08/24/2017 | 2.3 | V2-T2-86–V2-T2-91 | Content edits |
| 08/24/2017 | 2.4 | V2-T2-94 | Content edits |
| 08/24/2017 | 2.5 | V2-T2-97, V2-T2-98 | Content edits |
| 08/24/2017 | 2.5 | V2-T2-104–V2-T2-114 | Content edits |
| 08/24/2017 | 2.5 | V2-T2-116, V2-T2-117 | Content edits |
| 08/24/2017 | 2.5 | V2-T2-119, V2-T2-120 | Content edits |
| 08/24/2017 | 2.5 | V2-T2-134 | Content edits |
| 08/24/2017 | 2.5 | V2-T2-147 | Content edits |
| 08/24/2017 | 2.5 | V2-T2-149, V2-T2-150 | Content edits |
| 08/24/2017 | 2.6 | V2-T2-161–V2-T2-164 | Content edits |
| 08/24/2017 | 2.6 | V2-T2-167–V2-T2-169 | Content edits |
| 08/24/2017 | 2.6 | V2-T2-173, V2-T2-174 | Content edits |
| 08/24/2017 | 2.6 | V2-T2-177 | Content edits |
| 08/24/2017 | 2.6 | V2-T2-190–V2-T2-195 | Content edits |
| 08/24/2017 | 2.6 | V2-T2-202 | Content edits |



Powering Business Worldwide

Type DT-3

2



Product Description

Note: The following pages provide listings for most standard transformer ratings and catalog numbers. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Types DS-3, DT-3

- Ventilated, NEMA 2 enclosure standard
- Suitable for indoor applications, outdoors when weathershields are also installed
- Upright mounting only
- 220°C insulation system
- 150°C rise standard; 115°C or 80°C rise optional
- Available in single-phase ratings 15–167 kVA, 600 volts primary (DS-3)
- Available in three-phase ratings 15–1500 kVA and up to 600 volts primary (DT-3)

Application Description

DOE 2016 compliant energy-efficient transformers are specifically designed to meet the energy efficiency standards set forth in “CFR Title 10 Chapter II Part 431, Appendix A of Subpart K 2016”. Surveys have shown that the average loading of low-voltage dry-type distribution transformers, over a 24-hour period, is approximately 35%. DOE 2016 compliant transformers are optimized to offer maximum efficiency at 35% of nameplate rating.

The range of products covered by DOE 2016 is:

DOE 2016 Product Range

| Rating | Voltage Class | Voltage |
|------------------------------------|-------------------|-------------------|
| | Primary voltage | 34.5 kV and below |
| | Secondary voltage | 600V and below |
| Low-Voltage Dry-Type Rating | Single-phase | 10–833 kVA |
| | Three-phase | 15–2500 kVA |
| Liquid Rating | Single-phase | 10–833 kVA |
| | Three-phase | 15–2500 kVA |

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Transformers that are currently specifically excluded from the scope of CFR Title 10 Chapter II Part 431, Appendix A of Subpart K 2016 include:

- Liquid-filled transformers below 10 kVA
- Low-voltage dry-type transformers below 15 kVA
- AC and DC drives transformers
- Rectifier transformers designed for high harmonics
- Autotransformers
- Non-distribution transformers, such as UPS transformers
- Special impedance or regulation transformers
- Regulating transformers
- Sealed and non-ventilated transformers
- Machine tool transformers
- Welding transformers
- Transformers with tap ranges greater than 15%
- Transformers with a frequency other than 60 Hz
- Grounding transformers
- Testing transformers

Efficiency levels set forth in DOE 2016.

DOE 2016 Efficiency Levels

Low-Voltage Dry-Type Distribution Transformers (600V and below)

| Single-Phase | | Three-Phase | |
|--------------|------------|-------------|------------|
| kVA | Efficiency | kVA | Efficiency |
| 15 | 97.70 | 15 | 97.89 |
| 25 | 98.00 | 30 | 98.23 |
| 37.5 | 98.20 | 45 | 98.40 |
| 50 | 98.30 | 75 | 98.60 |
| 75 | 98.50 | 112.5 | 98.74 |
| 100 | 98.60 | 150 | 98.83 |
| 167 | 98.70 | 225 | 98.94 |
| 250 | 98.80 | 300 | 99.02 |
| 333 | 98.90 | 500 | 99.14 |
| — | — | 750 | 99.23 |
| — | — | 1000 | 99.28 |

Features, Benefits and Functions

- 60 Hz operation (except as noted)
- Short-term overload capability as required by ANSI
- Meet NEMA ST-20 sound levels
- Transformer core and coil covered with a fungus-resistant varnish to seal out moisture and other contaminants, and prevent the growth of fungus
- The core and coil assembly is grounded to the transformer enclosure by means of a visible flexible copper ground strap. The copper ground strap is sized per the NEC to be a grounding conductor. Three-phase DOE 2016 efficient transformers are provided with a bonding ground bar attached to the bottom panel for compliance with NEC 450.10(A)
- Transformers manufactured in enclosures 939, 940, 942, 943, 944 and 945 are UL Listed to be installed indoors (without weathershields) with just 2 inches of clearance on the sides and behind the transformer
- Double neutral
- Meet federal energy efficiency requirements for low-voltage dry-type distribution transformers effective as of January 1, 2016
- cUL Energy Verified in accordance with energy standards: CFR Title 10 Chapter II Part 431, Appendix A of Subpart K and CSA C802.2-12 Update No. 1 May 2013 by Underwriters Laboratories Inc.

Standards and Certifications

- UL® listed



Industry Standards

All Eaton low-voltage dry-type distribution transformers are built and tested in accordance with applicable NEMA, ANSI and IEEE Standards. All 600 volt class transformers are UL listed unless otherwise noted.

Seismically Qualified

Eaton manufactured low-voltage dry-type distribution transformers are seismically qualified and exceed requirements of the Uniform Building Code (UBC), International Building Code (IBC) and California Code Title 24.

Catalog Number Selection

Please refer to Section 2.7 **Page V2-T2-162**.

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Product Selection

Additional Product Selection information begins on **Page V2-T2-165**.

Single-Phase—Type DS-3 60 Hz DOE 2016 Energy-Efficient—Aluminum Windings

208 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ^① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|--------|----------------|-----------------------------|----------------|-------------------|--------------------|
| 15 | 150 | FR842A | E0260A | 200 (91) | WS45A | WMB05 | T29M11S1516 |
| 25 | | FR842A | | 275 (125) | WS45A | WMB05 | T29M11S2516 |
| 37.5 | | FR843A | | 310 (141) | WS43A | WMB04 | T29M11S3716 |
| 50 | | FR843A | | 390 (177) | WS43A | WMB04 | T29M11S5016 |
| 75 | | FR844A | E0551A | 650 (295) | WS44A | WMB04 | T29R11S7516 |
| 100 | | FR844A | EA29R11 | 690 (313) | WS44A | WMB04 | T29R11S9916 |

277 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ^① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|--------|----------------|-----------------------------|----------------|-------------------|--------------------|
| 15 | 150 | FR842A | 262C | 210 (95) | WS45A | WMB05 | T27M11S1516 |
| 25 | | FR842A | | 289 (131) | WS45A | WMB05 | T27M11S2516 |
| 37.5 | | FR843A | | 326 (148) | WS43A | WMB04 | T27M11S3716 |
| 50 | | FR843A | | 410 (186) | WS43A | WMB04 | T27M11S5016 |
| 75 | | FR844A | | 683 (310) | WS44A | WMB04 | T27M11S7516 |
| 100 | | FR844A | | 725 (329) | WS44A | WMB04 | T27M11S9916 |

600 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ^① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|--------|----------------|-----------------------------|----------------|-------------------|--------------------|
| 15 | 150 | FR842A | 262B | 212 (96) | WS45A | WMB05 | T60M11S1516 |
| 25 | | FR842A | | 292 (133) | WS45A | WMB05 | T60M11S2516 |
| 37.5 | | FR843A | | 329 (149) | WS43A | WMB04 | T60M11S3716 |
| 50 | | FR843A | | 413 (188) | WS43A | WMB04 | T60M11S5016 |
| 75 | | FR844A | | 689 (313) | WS44A | WMB04 | T60M11S7516 |
| 100 | | FR844A | | 731 (332) | WS44A | WMB04 | T60M11S9916 |

Notes

^① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase—Type DS-3 60 Hz DOE 2016 Energy-Efficient—Aluminum Windings**208 x 416 Volts to 120/240 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ^① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|--------|----------------|-----------------------------|----------------|-------------------|--------------------|
| 15 | 150 | FR842A | E03XF | 204 (93) | WS45A | WMB05 | T18P11S1516 |
| 25 | | FR842A | | 281 (128) | WS45A | WMB05 | T18P11S2516 |
| 37.5 | | FR843A | | 316 (143) | WS43A | WMB04 | T18P11S3716 |
| 50 | | FR843A | | 398 (181) | WS43A | WMB04 | T18P11S5016 |
| 75 | | FR844A | | 663 (301) | WS44A | WMB04 | T18P11S7516 |
| 100 | | FR844A | | 704 (320) | WS44A | WMB04 | T18P11S9916 |

240 x 480 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ^① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|--------|----------------|-----------------------------|----------------|-------------------|--------------------|
| 15 | 150 | FR842A | 3XA | 210 (95) | WS45A | WMB05 | T20P11S1516 |
| 25 | | FR842A | | 289 (131) | WS45A | WMB05 | T20P11S2516 |
| 37.5 | | FR843A | | 326 (148) | WS43A | WMB04 | T20P11S3716 |
| 50 | | FR843A | | 410 (186) | WS43A | WMB04 | T20P11S5016 |
| 75 | | FR844A | | 683 (310) | WS44A | WMB04 | T20P11S7516 |
| 100 | | FR844A | | 725 (329) | WS44A | WMB04 | T20P11S9916 |
| 167 | | FR814E | 288A | 1665 (756) | WS13 | — | T48M11S6716 |
| 15 | 115 | FR842A | 3XA | 212 (96) | WS45A | WMB05 | T20P11F1516 |
| 25 | | FR842A | | 292 (133) | WS45A | WMB05 | T20P11F2516 |
| 37.5 | | FR843A | | 329 (149) | WS43A | WMB04 | T20P11F3716 |
| 50 | | FR843A | | 414 (188) | WS43A | WMB04 | T20P11F5016 |
| 75 | | FR844A | | 689 (313) | WS44A | WMB04 | T20P11F7516 |
| 100 | | FR844A | | 732 (332) | WS44A | WMB04 | T20P11F9916 |
| 15 | 80 | FR842A | 3XA | 289 (131) | WS45A | WMB05 | T20P11B1516 |
| 25 | | FR843A | | 326 (148) | WS43A | WMB04 | T20P11B2516 |
| 37.5 | | FR843A | | 410 (186) | WS43A | WMB04 | T20P11B3716 |
| 50 | | FR844A | | 683 (310) | WS44A | WMB04 | T20P11B5016 |
| 75 | | FR844A | | 725 (329) | WS44A | WMB04 | T20P11B7516 |

Notes

^① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase—Type DS-3 60 Hz DOE 2016 Energy-Efficient—Copper Windings

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208 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|--------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR842A | E0260A | 216 (98) | WS45A | WMB05 | T29M11S1516CU |
| 25 | | FR842A | | 295 (134) | WS45A | WMB05 | T29M11S2516CU |
| 37.5 | | FR843A | | 440 (200) | WS43A | WMB04 | T29M11S3716CU |
| 50 | | FR843A | | 450 (204) | WS43A | WMB04 | T29M11S5016CU |
| 75 | | FR844A | E0551A | 890 (404) | WS44A | WMB04 | T29R11S7516CU |
| 100 | | FR844A | | 950 (431) | WS44A | WMB04 | T29R11S9916CU |

277 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|--------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR842A | 262C | 238 (108) | WS45A | WMB05 | T27M11S1516CU |
| 25 | | FR842A | | 326 (148) | WS45A | WMB05 | T27M11S2516CU |
| 37.5 | | FR843A | | 485 (220) | WS43A | WMB04 | T27M11S3716CU |
| 50 | | FR843A | | 497 (225) | WS43A | WMB04 | T27M11S5016CU |
| 75 | | FR844A | | 982 (446) | WS44A | WMB04 | T27M11S7516CU |
| 100 | | FR844A | | 1048 (476) | WS44A | WMB04 | T27M11S9916CU |

600 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|--------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR842A | 262B | 241 (109) | WS45A | WMB05 | T60M11S1516CU |
| 25 | | FR842A | | 329 (149) | WS45A | WMB05 | T60M11S2516CU |
| 37.5 | | FR843A | | 490 (222) | WS43A | WMB04 | T60M11S3716CU |
| 50 | | FR843A | | 501 (227) | WS43A | WMB04 | T60M11S5016CU |
| 75 | | FR844A | | 991 (450) | WS44A | WMB04 | T60M11S7516CU |
| 100 | | FR844A | | 1058 (480) | WS44A | WMB04 | T60M11S9916CU |

Notes

① Frames (dimensions and weights) subject to revision.

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Single-Phase—Type DS-3 60 Hz DOE 2016 Energy-Efficient—Copper Windings

208 x 416 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ^① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|--------|----------------|-----------------------------|----------------|-------------------|----------------|
| 15 | 150 | FR842A | E03XF | 246 (112) | WS45A | WMB05 | T18P11S1516CU |
| 25 | | FR842A | | 336 (153) | WS45A | WMB05 | T18P11S2516CU |
| 37.5 | | FR843A | | 500 (227) | WS43A | WMB04 | T18P11S3716CU |
| 50 | | FR843A | | 511 (232) | WS43A | WMB04 | T18P11S5016CU |
| 75 | | FR844A | | 1011 (459) | WS44A | WMB04 | T18P11S7516CU |
| 100 | | FR844A | | 1079 (490) | WS44A | WMB04 | T18P11S9916CU |

240 x 480 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ^① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|--------|----------------|-----------------------------|----------------|-------------------|----------------|
| 15 | 150 | FR842A | 3XA | 258 (117) | WS45A | WMB05 | T20P11S1516CU |
| 25 | | FR842A | | 353 (160) | WS45A | WMB05 | T20P11S2516CU |
| 37.5 | | FR843A | | 525 (238) | WS43A | WMB04 | T20P11S3716CU |
| 50 | | FR843A | | 537 (244) | WS43A | WMB04 | T20P11S5016CU |
| 75 | | FR844A | | 1062 (482) | WS44A | WMB04 | T20P11S7516CU |
| 100 | | FR844A | | 1133 (514) | WS44A | WMB04 | T20P11S9916CU |
| 167 | | FR814E | 288A | 1748 (794) | WS13 | — | T48M11S6716CU |
| 15 | 115 | FR842A | 3XA | 218 (99) | WS45A | WMB05 | T20P11F1516CU |
| 25 | | FR842A | | 298 (135) | WS45A | WMB05 | T20P11F2516CU |
| 37.5 | | FR843A | | 444 (202) | WS43A | WMB04 | T20P11F3716CU |
| 50 | | FR843A | | 455 (207) | WS43A | WMB04 | T20P11F5016CU |
| 75 | | FR844A | | 899 (408) | WS44A | WMB04 | T20P11F7516CU |
| 100 | | FR844A | | 960 (436) | WS44A | WMB04 | T20P11F9916CU |
| 15 | 80 | FR842A | 3XA | 353 (160) | WS45A | WMB05 | T20P11B1516CU |
| 25 | | FR843A | | 525 (238) | WS43A | WMB04 | T20P11B2516CU |
| 37.5 | | FR843A | | 537 (244) | WS43A | WMB04 | T20P11B3716CU |
| 50 | | FR844A | | 1062 (482) | WS44A | WMB04 | T20P11B5016CU |
| 75 | | FR844A | | 1133 (514) | WS44A | WMB04 | T20P11B7516CU |

Notes

^① Frames (dimensions and weights) subject to revision.

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Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

208 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|-------------|
| 15 | 150 | FR939 | 280E | 233 (106) | WS57 | WMB05 | V29M28T1516 | |
| 30 | | FR940 | | 400 (182) | WS58 | WMB05 | V29M28T3016 | |
| 45 | | FR940 | | 442 (201) | WS58 | WMB05 | V29M28T4516 | |
| 75 | | FR942 | | 602 (273) | WS59 | WMB04 | V29M28T7516 | |
| 112.5 | | FR943 | 324A | 976 (443) | WS60 | WMB04 | V29R28T1216 | |
| 150 | | FR943 | | 1254 (569) | WS60 | WMB04 | V29R28T4916 | |
| 225 | | FR944 | | 1624 (737) | WS61 | — | V29R28T2216 | |
| 300 | | Contact local Eaton representative | | | | | | V29E28T3316 |
| 500 | | | | | | | | V29E28T5516 |
| 15 | 115 | FR939 | 280E | 243 (110) | WS57 | WMB05 | V29M28F1516 | |
| 30 | | FR940 | | 419 (190) | WS58 | WMB05 | V29M28F3016 | |
| 45 | | FR940 | | 450 (205) | WS58 | WMB05 | V29M28F4516 | |
| 75 | | FR942 | | 635 (288) | WS59 | WMB04 | V29M28F7516 | |
| 112.5 | | FR943 | 324A | 1031 (468) | WS60 | WMB04 | V29R28F1216 | |
| 150 | | FR943 | | 1316 (597) | WS60 | WMB04 | V29R28F4916 | |
| 225 | | FR944 | | 1715 (778) | WS61 | — | V29R28F2216 | |
| 300 | | Contact local Eaton representative | | | | | | V29R28F3316 |
| 500 | | | | | | | | V29E28F5516 |
| 15 | 80 | FR939 | 280E | 249 (113) | WS57 | WMB05 | V29M28B1516 | |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V29M28B3016 | |
| 45 | | FR942 | | 599 (272) | WS59 | WMB04 | V29M28B4516 | |
| 75 | | FR943 | | 1031 (468) | WS60 | WMB04 | V29M28B7516 | |
| 112.5 | | FR943 | 324A | 1338 (607) | WS60 | WMB04 | V29R28B1216 | |
| 150 | | FR944 | | 1709 (776) | WS61 | — | V29R28B4916 | |
| 225 | | Contact local Eaton representative | | | | | | V29R28B2216 |
| 300 | | | | | | | | V29R28B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings**208 Delta Volts to 480Y/277 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|------------------------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR939 | E0342B | 225 (102) | WS57 | WMB05 | V29M47T1516 |
| 30 | | FR940 | | 402 (183) | WS58 | WMB05 | V29M47T3016 |
| 45 | | FR940 | 436 (198) | WS58 | WMB05 | V29M47T4516 | |
| 75 | | FR942 | 623 (283) | WS59 | WMB04 | V29M47T7516 | |
| 112.5 | | FR943 | E0351A | 987 (448) | WS60 | WMB04 | V29R47T1216 |
| 150 | | FR943 | | 1253 (569) | WS60 | WMB04 | V29R47T4916 |
| 225 | | FR944 | | 2257 (1025) | WS61 | — | V29R47T2216 |
| 300 | Contact local Eaton representative | | | | | | V29E47T3316 |
| 500 | | | | | | | V29E47T5516 |
| 15 | 115 | FR939 | E0342B | 250 (114) | WS57 | WMB05 | V29M47F1516 |
| 30 | | FR940 | | 442 (201) | WS58 | WMB05 | V29M47F3016 |
| 45 | | FR940 | 598 (271) | WS58 | WMB05 | V29M47F4516 | |
| 75 | | FR942 | 617 (280) | WS59 | WMB04 | V29M47F7516 | |
| 112.5 | | FR943 | E0351A | 977 (444) | WS60 | WMB04 | V29R47F1216 |
| 150 | | FR943 | | 2257 (1025) | WS60 | WMB04 | V29R47F4916 |
| 225 | | FR944 | | 2450 (1112) | WS61 | — | V29R47F2216 |
| 300 | Contact local Eaton representative | | | | | | V29E47F3316 |
| 500 | | | | | | | V29E47F5516 |
| 15 | 80 | FR939 | E0342B | 249 (113) | WS57 | WMB05 | V29M47B1516 |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V29M47B3016 |
| 45 | | FR942 | 599 (272) | WS59 | WMB04 | V29M47B4516 | |
| 75 | | FR943 | 1031 (468) | WS60 | WMB04 | V29M47B7516 | |
| 112.5 | | FR943 | E0351A | 1338 (607) | WS60 | WMB04 | V29R47B1216 |
| 150 | | FR944 | | 1709 (776) | WS61 | — | V29R47B4916 |
| 225 | | Contact local Eaton representative | | | | | |
| 300 | | | | | | | V29E47B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

240 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR939 | 280C | 236 (107) | WS57 | WMB05 | V24M28T1516 |
| 30 | | FR940 | | 402 (183) | WS58 | WMB05 | V24M28T3016 |
| 45 | | FR940 | | 448 (203) | WS58 | WMB05 | V24M28T4516 |
| 75 | | FR942 | | 622 (282) | WS59 | WMB04 | V24M28T7516 |
| 112.5 | | FR943 | 324B | 1022 (464) | WS60 | WMB04 | V24R28T1216 |
| 150 | | FR943 | | 1191 (541) | WS60 | WMB04 | V24R28T4916 |
| 225 | | FR944 | | 1678 (762) | WS61 | — | V24R28T2216 |
| 300 | | FR945 | | 2415 (1096) | WS62 | — | V24R28T3316 |
| 500 | | Contact local Eaton representative | | | | | V24E28T5516 |
| 15 | 115 | FR939 | 280C | 243 (110) | WS57 | WMB05 | V24M28F1516 |
| 30 | | FR940 | | 419 (190) | WS58 | WMB05 | V24M28F3016 |
| 45 | | FR940 | | 450 (205) | WS58 | WMB05 | V24M28F4516 |
| 75 | | FR942 | | 635 (288) | WS59 | WMB04 | V24M28F7516 |
| 112.5 | | FR943 | 324B | 1031 (468) | WS60 | WMB04 | V24R28F1216 |
| 150 | | FR943 | | 1316 (597) | WS60 | WMB04 | V24R28F4916 |
| 225 | | Contact local Eaton representative | | | | | V24E47F2216 |
| 300 | | | | | | | V24R28F3316 |
| 500 | | | | | | | V24E28F5516 |
| 15 | 80 | FR939 | 280C | 249 (113) | WS57 | WMB05 | V24M28B1516 |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V24M28B3016 |
| 45 | | FR942 | | 599 (272) | WS59 | WMB04 | V24M28B4516 |
| 75 | | FR943 | | 1031 (468) | WS60 | WMB04 | V24M28B7516 |
| 112.5 | | FR943 | 324B | 1338 (607) | WS60 | WMB04 | V24R28B1216 |
| 150 | | FR944 | | 1709 (776) | WS61 | — | V24R28B4916 |
| 225 | | Contact local Eaton representative | | | | | V24E28B2216 |
| 300 | | | | | | | V24E28B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings**240 Delta Volts to 480Y/277 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|-------------|
| 15 | 150 | FR939 | E0317A | 224 (102) | WS57 | WMB05 | V24M47T1516 | |
| 30 | | FR940 | | 422 (192) | WS58 | WMB05 | V24M47T3016 | |
| 45 | | FR940 | | 444 (202) | WS58 | WMB05 | V24M47T4516 | |
| 75 | | FR942 | | 635 (288) | WS59 | WMB04 | V24M47T7516 | |
| 112.5 | | FR943 | E0351C | 1017 (462) | WS60 | WMB04 | V24R47T1216 | |
| 150 | | FR943 | | 1275 (579) | WS60 | WMB04 | V24R47T4916 | |
| 225 | | FR944 | | 2274 (1032) | WS61 | — | V24R47T2216 | |
| 300 | | Contact local Eaton representative | | | | | | V24E47T3316 |
| 500 | | | | | | | | V24E47T5516 |
| 15 | 115 | FR939 | E0317A | 243 (110) | WS57 | WMB05 | V24M47F1516 | |
| 30 | | FR940 | | 419 (190) | WS58 | WMB05 | V24M47F3016 | |
| 45 | | FR940 | | 450 (205) | WS58 | WMB05 | V24M47F4516 | |
| 75 | | FR942 | | 635 (288) | WS59 | WMB04 | V24M47F7516 | |
| 112.5 | | FR943 | E0351C | 1031 (468) | WS60 | WMB04 | V24R47F1216 | |
| 150 | | FR943 | | 1316 (597) | WS60 | WMB04 | V24R47F4916 | |
| 225 | | Contact local Eaton representative | | | | | | V24E47F2216 |
| 300 | | | | | | | | V24E47F3316 |
| 500 | | | | | | | | V24E47F5516 |
| 15 | 80 | FR939 | E0317A | 249 (113) | WS57 | WMB05 | V24M47B1516 | |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V24M47B3016 | |
| 45 | | FR942 | | 599 (272) | WS59 | WMB04 | V24M47B4516 | |
| 75 | | FR943 | | 1031 (468) | WS60 | WMB04 | V24M47B7516 | |
| 112.5 | | FR943 | E0351C | 1338 (607) | WS60 | WMB04 | V24R47B1216 | |
| 150 | | FR944 | | 1709 (776) | WS61 | — | V24R47B4916 | |
| 225 | | Contact local Eaton representative | | | | | | V24E47B2216 |
| 300 | | | | | | | | V24E47B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

480 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR939 | 280B | 225 (102) | WS57 | WMB05 | V48M28T1516 |
| 30 | | FR940 | | 409 (186) | WS58 | WMB05 | V48M28T3016 |
| 45 | | FR940 | | 416 (189) | WS58 | WMB05 | V48M28T4516 |
| 75 | | FR942 | | 570 (259) | WS59 | WMB04 | V48M28T7516 |
| 112.5 | | FR943 | | 976 (443) | WS60 | WMB04 | V48M28T1216 |
| 150 | | FR943 | | 1239 (563) | WS60 | WMB04 | V48M28T4916 |
| 225 | | FR944 | | 1624 (737) | WS61 | — | V48M28T2216 |
| 300 | | FR945 | | 2283 (1036) | WS62 | — | V48M28T3316 |
| 500 | | Contact local Eaton representative | | | | | V48M28T5516 |
| 750 | | | | | | | V48D28T7716 |
| 1000 | | | | | | | V48D28T1116 |
| 15 | 115 | FR939 | 280B | 231 (105) | WS57 | WMB05 | V48M28F1516 |
| 30 | | FR940 | | 399 (181) | WS58 | WMB05 | V48M28F3016 |
| 45 | | FR940 | | 429 (195) | WS58 | WMB05 | V48M28F4516 |
| 75 | | FR942 | | 605 (275) | WS59 | WMB04 | V48M28F7516 |
| 112.5 | | FR943 | | 982 (446) | WS60 | WMB04 | V48M28F1216 |
| 150 | | FR943 | | 1253 (569) | WS60 | WMB04 | V48M28F4916 |
| 225 | | FR944 | | 1633 (741) | WS61 | — | V48M28F2216 |
| 300 | | FR945 | | 2104 (955) | WS62 | — | V48M28F3316 |
| 500 | | Contact local Eaton representative | | | | | V48M28F5516 |
| 15 | 80 | FR939 | 280B | 237 (108) | WS57 | WMB05 | V48M28B1516 |
| 30 | | FR940 | | 433 (197) | WS58 | WMB05 | V48M28B3016 |
| 45 | | FR942 | | 570 (259) | WS58 | WMB05 | V48M28B4516 |
| 75 | | FR943 | | 982 (446) | WS59 | WMB04 | V48M28B7516 |
| 112.5 | | FR943 | | 1274 (578) | WS60 | WMB04 | V48M28B1216 |
| 150 | | FR944 | | 1628 (739) | WS60 | WMB04 | V48M28B4916 |
| 225 | | FR945 | | 2207 (1002) | WS61 | — | V48M28B2216 |
| 300 | | FR924 | | 2877 (1306) | WS40 | — | V48M28B3316 |
| 500 | | Contact local Eaton representative | | | | | V48M28B5516 |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings**480 Delta Volts to 240 Delta Volts with 120 Volt Lighting Tap on Phase B ^①**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ^② | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|-----------------------------|----------------|-------------------|----------------|
| 15 | 150 | FR939 | 282B | 231 (105) | WS57 | WMB05 | V48M22T1516 |
| 30 | | FR940 | | 399 (181) | WS58 | WMB05 | V48M22T3016 |
| 45 | | FR940 | | 426 (193) | WS58 | WMB05 | V48M22T4516 |
| 75 | | FR942 | | 581 (264) | WS59 | WMB04 | V48M22T7516 |
| 112.5 | | FR943 | | 964 (438) | WS60 | WMB04 | V48M22T1216 |
| 150 | | FR943 | | 1275 (579) | WS60 | WMB04 | V48M22T4916 |
| 225 | | FR944 | | 1618 (735) | WS61 | — | V48M22T2216 |
| 300 | | FR945 | | 2437 (1106) | WS62 | — | V48M22T3316 |
| 500 | | Contact local Eaton representative | | | | | V48M22T5516 |
| 750 | | | | | | | V48D22T7716 |
| 1000 | | | | | | | V48D22T1116 |
| 15 | 115 | FR939 | 282B | 250 (114) | WS57 | WMB05 | V48M22F1516 |
| 30 | | FR940 | | 405 (184) | WS58 | WMB05 | V48M22F3016 |
| 45 | | FR940 | | 428 (194) | WS58 | WMB05 | V48M22F4516 |
| 75 | | FR942 | | 612 (278) | WS59 | WMB04 | V48M22F7516 |
| 112.5 | | FR943 | | 975 (443) | WS60 | WMB04 | V48M22F1216 |
| 150 | | FR943 | | 1300 (590) | WS60 | WMB04 | V48M22F4916 |
| 225 | | FR944 | | 1732 (786) | WS61 | — | V48M22F2216 |
| 300 | | FR945 | | 1732 (786) | WS62 | — | V48M22F3316 |
| 500 | | Contact local Eaton representative | | | | | V48M22F5516 |
| 15 | 80 | FR939 | 282B | 249 (113) | WS57 | WMB05 | V48M22B1516 |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V48M22B3016 |
| 45 | | FR942 | | 599 (272) | WS59 | WMB04 | V48M22B4516 |
| 75 | | FR943 | | 1031 (468) | WS60 | WMB04 | V48M22B7516 |
| 112.5 | | FR943 | | 1338 (607) | WS60 | WMB04 | V48M22B1216 |
| 150 | | FR944 | | 1709 (776) | WS61 | — | V48M22B4916 |
| 225 | | FR945 | | 2317 (1052) | WS62 | — | V48M22B2216 |
| 300 | | Contact local Eaton representative | | | | | V48M22B3316 |
| 500 | | | | | | | V48M22B5516 |

Notes

① Lighting tap limited to 5% of nameplate full load capacity.

② Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

480 Delta Volts to 400Y/231 Volts

2

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR939 | 280B | 233 (106) | WS57 | WMB05 | V48M34T1516 |
| 30 | | FR940 | | 399 (181) | WS58 | WMB05 | V48M34T3016 |
| 45 | | FR940 | | 416 (189) | WS58 | WMB05 | V48M34T4516 |
| 75 | | FR942 | | 614 (279) | WS59 | WMB04 | V48M34T7516 |
| 112.5 | | FR943 | | 984 (447) | WS60 | WMB04 | V48M34T1216 |
| 150 | | FR943 | | 1240 (563) | WS60 | WMB04 | V48M34T4916 |
| 225 | | FR944 | | 1723 (782) | WS61 | — | V48M34T2216 |
| 300 | | FR945 | | 2347 (1066) | WS62 | — | V48M34T3316 |
| 500 | | Contact local Eaton representative | | | | | V48M34T5516 |
| 15 | 115 | FR939 | 280B | 243 (110) | WS57 | WMB05 | V48M34F1516 |
| 30 | | FR940 | | 419 (190) | WS58 | WMB05 | V48M34F3016 |
| 45 | | FR940 | | 450 (205) | WS58 | WMB05 | V48M34F4516 |
| 75 | | FR942 | | 635 (288) | WS59 | WMB04 | V48M34F7516 |
| 112.5 | | FR943 | | 1031 (468) | WS60 | WMB04 | V48M34F1216 |
| 150 | | FR943 | | 1316 (597) | WS60 | WMB04 | V48M34F4916 |
| 225 | | FR944 | | 1715 (778) | WS61 | — | V48M34F2216 |
| 300 | | FR945 | | 2209 (1003) | WS62 | — | V48M34F3316 |
| 500 | | Contact local Eaton representative | | | | | V48M34F5516 |
| 15 | 80 | FR939 | 280B | 249 (113) | WS57 | WMB05 | V48M34B1516 |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V48M34B3016 |
| 45 | | FR942 | | 599 (272) | WS59 | WMB04 | V48M34B4516 |
| 75 | | FR943 | | 1031 (468) | WS60 | WMB04 | V48M34B7516 |
| 112.5 | | FR943 | | 1338 (607) | WS60 | WMB04 | V48M34B1216 |
| 150 | | FR944 | | 1709 (776) | WS61 | — | V48M34B4916 |
| 225 | | FR945 | | 2317 (1052) | WS62 | — | V48M34B2216 |
| 300 | | FR924 | | 1971 (895) | WS40 | — | V48M34B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

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Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings**480 Delta Volts to 480Y/277 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR939 | 280B | 227 (103) | WS57 | WMB05 | V48M47T1516 |
| 30 | | FR940 | | 395 (179) | WS58 | WMB05 | V48M47T3016 |
| 45 | | FR940 | | 433 (197) | WS58 | WMB05 | V48M47T4516 |
| 75 | | FR942 | | 576 (262) | WS59 | WMB04 | V48M47T7516 |
| 112.5 | | FR943 | | 970 (440) | WS60 | WMB04 | V48M47T1216 |
| 150 | | FR943 | | 1253 (569) | WS60 | WMB04 | V48M47T4916 |
| 225 | | FR944 | | 1912 (868) | WS61 | — | V48M47T2216 |
| 300 | | FR945 | | 2294 (1041) | WS62 | — | V48M47T3316 |
| 500 | | Contact local Eaton representative | | | | | V48M47T5516 |
| 15 | 115 | FR939 | 280B | 243 (110) | WS57 | WMB05 | V48M47F1516 |
| 30 | | FR940 | | 419 (190) | WS58 | WMB05 | V48M47F3016 |
| 45 | | FR940 | | 450 (205) | WS58 | WMB05 | V48M47F4516 |
| 75 | | FR942 | | 635 (288) | WS59 | WMB04 | V48M47F7516 |
| 112.5 | | FR943 | | 1031 (468) | WS60 | WMB04 | V48M47F1216 |
| 150 | | FR943 | | 1316 (597) | WS60 | WMB04 | V48M47F4916 |
| 225 | | FR944 | | 1715 (778) | WS61 | — | V48M47F2216 |
| 300 | | FR945 | | 2209 (1003) | WS62 | — | V48M47F3316 |
| 500 | | Contact local Eaton representative | | | | | V48M47F5516 |
| 15 | 80 | FR939 | 280B | 249 (113) | WS57 | WMB05 | V48M47B1516 |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V48M47B3016 |
| 45 | | FR942 | | 599 (272) | WS59 | WMB04 | V48M47B4516 |
| 75 | | FR943 | | 1031 (468) | WS60 | WMB04 | V48M47B7516 |
| 112.5 | | FR943 | | 1338 (607) | WS60 | WMB04 | V48M47B1216 |
| 150 | | FR944 | | 1709 (776) | WS61 | — | V48M47B4916 |
| 225 | | FR945 | | 2317 (1052) | WS62 | — | V48M47B2216 |
| 300 | | FR924 | | 1971 (895) | WS40 | — | V48M47B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

600 Delta Volts to 208Y/120 Volts

2

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR939 | 280A | 226 (103) | WS57 | WMB05 | V60M28T1516 |
| 30 | | FR940 | | 396 (180) | WS58 | WMB05 | V60M28T3016 |
| 45 | | FR940 | | 433 (197) | WS58 | WMB05 | V60M28T4516 |
| 75 | | FR942 | | 610 (277) | WS59 | WMB04 | V60M28T7516 |
| 112.5 | | FR943 | | 1000 (454) | WS60 | WMB04 | V60M28T1216 |
| 150 | | FR943 | | 1250 (568) | WS60 | WMB04 | V60M28T4916 |
| 225 | | FR944 | | 1650 (749) | WS61 | — | V60M28T2216 |
| 300 | | FR945 | | 2300 (1044) | WS62 | — | V60M28T3316 |
| 500 | | Contact local Eaton representative | | | | | V60M28T5516 |
| 15 | 115 | FR939 | 280A | 243 (110) | WS57 | WMB05 | V60M28F1516 |
| 30 | | FR940 | | 419 (190) | WS58 | WMB05 | V60M28F3016 |
| 45 | | FR940 | | 450 (205) | WS58 | WMB05 | V60M28F4516 |
| 75 | | FR942 | | 635 (288) | WS59 | WMB04 | V60M28F7516 |
| 112.5 | | FR943 | | 1031 (468) | WS60 | WMB04 | V60M28F1216 |
| 150 | | FR943 | | 1316 (597) | WS60 | WMB04 | V60M28F4916 |
| 225 | | FR944 | | 1715 (778) | WS61 | — | V60M28F2216 |
| 300 | | FR945 | | 2209 (1003) | WS62 | — | V60M28F3316 |
| 500 | | Contact local Eaton representative | | | | | V60M28F5516 |
| 15 | 80 | FR939 | 280A | 249 (113) | WS57 | WMB05 | V60M28B1516 |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V60M28B3016 |
| 45 | | FR942 | | 599 (272) | WS59 | WMB04 | V60M28B4516 |
| 75 | | FR943 | | 1031 (468) | WS60 | WMB04 | V60M28B7516 |
| 112.5 | | FR943 | | 1338 (607) | WS60 | WMB04 | V60M28B1216 |
| 150 | | FR944 | | 1709 (776) | WS61 | — | V60M28B4916 |
| 225 | | FR945 | | 2317 (1052) | WS62 | — | V60M28B2216 |
| 300 | | FR924 | | 1971 (895) | WS40 | — | V60M28B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings**600 Delta Volts to 480Y/277 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|--------------------|
| 15 | 150 | FR939 | 280A | 250 (114) | WS57 | WMB05 | V60M47T1516 |
| 30 | | FR940 | | 435 (197) | WS58 | WMB05 | V60M47T3016 |
| 45 | | FR940 | | 476 (216) | WS58 | WMB05 | V60M47T4516 |
| 75 | | FR942 | | 634 (288) | WS59 | WMB04 | V60M47T7516 |
| 112.5 | | FR943 | | 1067 (484) | WS60 | WMB04 | V60M47T1216 |
| 150 | | FR943 | | 1378 (626) | WS60 | WMB04 | V60M47T4916 |
| 225 | | FR944 | | 2103 (955) | WS61 | — | V60M47T2216 |
| 300 | | FR945 | | 2523 (1145) | WS62 | — | V60M47T3316 |
| 500 | | Contact local Eaton representative | | | | | V60M47T5516 |
| 15 | 115 | FR939 | 280A | 243 (110) | WS57 | WMB05 | V60M47F1516 |
| 30 | | FR940 | | 419 (190) | WS58 | WMB05 | V60M47F3016 |
| 45 | | FR940 | | 450 (205) | WS58 | WMB05 | V60M47F4516 |
| 75 | | FR942 | | 635 (288) | WS59 | WMB04 | V60M47F7516 |
| 112.5 | | FR943 | | 1031 (468) | WS60 | WMB04 | V60M47F1216 |
| 150 | | FR943 | | 1316 (597) | WS60 | WMB04 | V60M47F4916 |
| 225 | | FR944 | | 1715 (778) | WS61 | — | V60M47F2216 |
| 300 | | FR945 | | 2209 (1003) | WS62 | — | V60M47F3316 |
| 500 | | Contact local Eaton representative | | | | | V60M47F5516 |
| 15 | 80 | FR939 | 280A | 249 (113) | WS57 | WMB05 | V60M47B1516 |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V60M47B3016 |
| 45 | | FR942 | | 599 (272) | WS59 | WMB04 | V60M47B4516 |
| 75 | | FR943 | | 1031 (468) | WS60 | WMB04 | V60M47B7516 |
| 112.5 | | FR943 | | 1338 (607) | WS60 | WMB04 | V60M47B1216 |
| 150 | | FR944 | | 1709 (776) | WS61 | — | V60M47B4916 |
| 225 | | FR945 | | 2317 (1052) | WS62 | — | V60M47B2216 |
| 300 | | FR924 | | 1971 (895) | WS40 | — | V60M47B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient—Copper Windings

208 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR939 | 280E | 237 (108) | WS57 | WMB05 | V29M28T1516CU |
| 30 | | FR940 | | 424 (192) | WS58 | WMB05 | V29M28T3016CU |
| 45 | | FR940 | | 499 (227) | WS58 | WMB05 | V29M28T4516CU |
| 75 | | FR942 | | 678 (308) | WS59 | WMB04 | V29M28T7516CU |
| 112.5 | | FR943 | 324A | 1292 (587) | WS60 | WMB04 | V29R28T1216CU |
| 150 | | FR943 | | 1410 (640) | WS60 | WMB04 | V29R28T4916CU |
| 225 | | FR944 | | 1760 (799) | WS61 | — | V29R28T2216CU |
| 300 | | FR945 | | 2361 (1072) | WS62 | — | V29R28T3316CU |
| 500 | | Contact local Eaton representative | | | | | V29E28T5516CU |
| 15 | 115 | FR939 | 280E | 253 (115) | WS57 | WMB05 | V29M28F1516CU |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V29M28F3016CU |
| 45 | | FR940 | | 495 (225) | WS58 | WMB05 | V29M28F4516CU |
| 75 | | FR942 | | 698 (317) | WS59 | WMB04 | V29M28F7516CU |
| 112.5 | | FR943 | 324A | 1335 (606) | WS60 | WMB04 | V29R28F1216CU |
| 150 | | FR943 | | 1493 (678) | WS60 | WMB04 | V29R28F4916CU |
| 225 | | FR944 | | 2186 (992) | WS61 | — | V29R28F2216CU |
| 300 | | FR945 | | 2696 (1224) | WS62 | — | V29R28F3316CU |
| 500 | | Contact local Eaton representative | | | | | V29E28F5516CU |
| 15 | 80 | FR939 | 280E | 251 (114) | WS57 | WMB05 | V29M28B1516CU |
| 30 | | FR940 | | 489 (222) | WS58 | WMB05 | V29M28B3016CU |
| 45 | | FR942 | | 700 (318) | WS59 | WMB04 | V29M28B4516CU |
| 75 | | FR943 | | 1204 (547) | WS60 | WMB04 | V29M28B7516CU |
| 112.5 | | FR943 | 324A | 1454 (660) | WS60 | WMB04 | V29R28B1216CU |
| 150 | | FR944 | | 1990 (903) | WS61 | — | V29R28B4916CU |
| 225 | | FR945 | | 2504 (1137) | WS62 | — | V29R28B2216CU |
| 300 | | Contact local Eaton representative | | | | | V29R28B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient—Copper Windings**208 Delta Volts to 480Y/277 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|---------------|
| 15 | 150 | FR939 | E0342B | 245 (111) | WS57 | WMB05 | V29M47T1516CU | |
| 30 | | FR940 | | 428 (194) | WS58 | WMB05 | V29M47T3016CU | |
| 45 | | FR940 | | 503 (228) | WS58 | WMB05 | V29M47T4516CU | |
| 75 | | FR942 | | 676 (307) | WS59 | WMB04 | V29M47T7516CU | |
| 112.5 | | FR943 | E0351A | 1283 (582) | WS60 | WMB04 | V29R47T1216CU | |
| 150 | | FR943 | | 1432 (650) | WS60 | WMB04 | V29R47T4916CU | |
| 225 | | Contact local Eaton representative | | | | | | V29E47T2216CU |
| 300 | | | | | | | | V29E47T3316CU |
| 500 | | | | | | | | V29E47T5516CU |
| 15 | 115 | FR939 | E0342B | 247 (112) | WS57 | WMB05 | V29M47F1516CU | |
| 30 | | FR940 | | 434 (197) | WS58 | WMB05 | V29M47F3016CU | |
| 45 | | FR940 | | 600 (272) | WS58 | WMB05 | V29M47F4516CU | |
| 75 | | FR942 | | 682 (310) | WS59 | WMB04 | V29M47F7516CU | |
| 112.5 | | FR943 | E0351A | 1154 (524) | WS60 | WMB04 | V29R47F1216CU | |
| 150 | | FR943 | | 1500 (681) | WS60 | WMB04 | V29R47F4916CU | |
| 225 | | Contact local Eaton representative | | | | | | V29E47F2216CU |
| 300 | | | | | | | | V29E47F3316CU |
| 500 | | | | | | | | V29E47F5516CU |
| 15 | 80 | FR939 | E0342B | 251 (114) | WS57 | WMB05 | V29M47B1516CU | |
| 30 | | FR940 | | 489 (222) | WS58 | WMB05 | V29M47B3016CU | |
| 45 | | FR942 | | 700 (318) | WS59 | WMB04 | V29M47B4516CU | |
| 75 | | FR943 | | 1204 (547) | WS60 | WMB04 | V29M47B7516CU | |
| 112.5 | | FR943 | E0351A | 1454 (660) | WS60 | WMB04 | V29R47B1216CU | |
| 150 | | FR944 | | 1990 (903) | WS61 | — | V29R47B4916CU | |
| 225 | | Contact local Eaton representative | | | | | | V29E47B2216CU |
| 300 | | | | | | | | V29E47B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient—Copper Windings

240 Delta Volts to 208Y/120 Volts

2

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|---------------|
| 15 | 150 | FR939 | 280C | 238 (108) | WS57 | WMB05 | V24M28T1516CU | |
| 30 | | FR940 | | 458 (208) | WS58 | WMB05 | V24M28T3016CU | |
| 45 | | FR940 | | 478 (217) | WS58 | WMB05 | V24M28T4516CU | |
| 75 | | FR942 | | 697 (316) | WS59 | WMB04 | V24M28T7516CU | |
| 112.5 | | FR943 | 324B | 1103 (501) | WS60 | WMB04 | V24R28T1216CU | |
| 150 | | FR943 | | 1283 (582) | WS60 | WMB04 | V24R28T4916CU | |
| 225 | | FR944 | | 1500 (681) | WS61 | — | V24R28T2216CU | |
| 300 | | FR945 | | 2700 (1226) | WS62 | — | V24R28T3316CU | |
| 500 | | Contact local Eaton representative | | | | | | V24E28T5516CU |
| 15 | 115 | FR939 | 280C | 253 (115) | WS57 | WMB05 | V24M28F1516CU | |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V24M28F3016CU | |
| 45 | | FR940 | | 495 (225) | WS58 | WMB05 | V24M28F4516CU | |
| 75 | | FR942 | | 698 (317) | WS59 | WMB04 | V24M28F7516CU | |
| 112.5 | | FR943 | 324B | 1335 (606) | WS60 | WMB04 | V24R28F1216CU | |
| 150 | | FR943 | | 1493 (678) | WS60 | WMB04 | V24R28F4916CU | |
| 225 | | FR944 | | 2186 (992) | WS61 | — | V24R28F2216CU | |
| 300 | | FR945 | | 2696 (1224) | WS62 | — | V24R28F3316CU | |
| 500 | | Contact local Eaton representative | | | | | | V24E28F5516CU |
| 15 | 80 | FR939 | 280C | 251 (114) | WS57 | WMB05 | V24M28B1516CU | |
| 30 | | FR940 | | 489 (222) | WS58 | WMB05 | V24M28B3016CU | |
| 45 | | FR942 | | 700 (318) | WS59 | WMB04 | V24M28B4516CU | |
| 75 | | FR943 | | 1204 (547) | WS60 | WMB04 | V24M28B7516CU | |
| 112.5 | | FR943 | 324B | 1454 (660) | WS60 | WMB04 | V24R28B1216CU | |
| 150 | | FR944 | | 1990 (903) | WS61 | — | V24R28B4916CU | |
| 225 | | FR945 | | 2504 (1137) | WS62 | — | V24R28B2216CU | |
| 300 | | Contact local Eaton representative | | | | | | V24R28B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient—Copper Windings**240 Delta Volts to 480Y/277 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR939 | E0317A | 250 (114) | WS57 | WMB05 | V24M47T1516CU |
| 30 | | FR940 | | 432 (196) | WS58 | WMB05 | V24M47T3016CU |
| 45 | | FR940 | | 482 (219) | WS58 | WMB05 | V24M47T4516CU |
| 75 | | FR942 | | 700 (318) | WS59 | WMB04 | V24M47T7516CU |
| 112.5 | | FR943 | | 1170 (531) | WS60 | WMB04 | V24M47T1216CU |
| 150 | | FR943 | | 1350 (613) | WS60 | WMB04 | V24M47T4916CU |
| 225 | | Contact local Eaton representative | | | | | V24R47T2216CU |
| 300 | | | | | | | V24E47T3316CU |
| 500 | | | | | | | V24E47T5516CU |
| 15 | 115 | FR939 | E0317A | 253 (115) | WS57 | WMB05 | V24M47F1516CU |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V24M47F3016CU |
| 45 | | FR940 | | 495 (225) | WS58 | WMB05 | V24M47F4516CU |
| 75 | | FR942 | | 698 (317) | WS59 | WMB04 | V24M47F7516CU |
| 112.5 | | FR943 | E0351C | 1335 (606) | WS60 | WMB04 | V24R47F1216CU |
| 150 | | FR943 | | 1493 (678) | WS60 | WMB04 | V24R47F4916CU |
| 225 | | FR944 | | 2186 (992) | WS61 | — | V24R47F2216CU |
| 300 | | Contact local Eaton representative | | | | | V24R47F3316CU |
| 500 | | | | | | | V24E47F5516CU |
| 15 | 80 | FR939 | E0317A | 251 (114) | WS57 | WMB05 | V24M47B1516CU |
| 30 | | FR940 | | 489 (222) | WS58 | WMB05 | V24M47B3016CU |
| 45 | | FR942 | | 700 (318) | WS59 | WMB04 | V24M47B4516CU |
| 75 | | FR943 | | 1204 (547) | WS60 | WMB04 | V24M47B7516CU |
| 112.5 | | FR943 | E0351C | 1454 (660) | WS60 | WMB04 | V24R47B1216CU |
| 150 | | FR944 | | 1990 (903) | WS61 | — | V24R47B4916CU |
| 225 | | Contact local Eaton representative | | | | | V24R47B2216CU |
| 300 | | | | | | | V24R47B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient—Copper Windings

480 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|------------------------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|-------|
| 15 | 150 | FR939 | 280B | 250 (114) | WS57 | WMB05 | V48M28T1516CU | |
| 30 | | FR940 | | 415 (188) | WS58 | WMB05 | V48M28T3016CU | |
| 45 | | FR940 | | 478 (217) | WS58 | WMB05 | V48M28T4516CU | |
| 75 | | FR942 | | 676 (307) | WS59 | WMB04 | V48M28T7516CU | |
| 112.5 | | FR943 | | 1263 (573) | WS60 | WMB04 | V48M28T1216CU | |
| 150 | | FR943 | | 1410 (640) | WS60 | WMB04 | V48M28T4916CU | |
| 225 | | FR944 | | 1883 (855) | WS61 | — | V48M28T2216CU | |
| 300 | | FR945 | | 2485 (1128) | WS62 | — | V48M28T3316CU | |
| 500 | | Contact local Eaton representative | | | | | V48M28T5516CU | |
| 750 | | | | | | | V48D28T7716CU | |
| 1000 | | | | | | V48D28T1116CU | | |
| 15 | 115 | FR939 | 280B | 241 (109) | WS57 | WMB05 | V48M28F1516CU | |
| 30 | | FR940 | | 433 (197) | WS58 | WMB05 | V48M28F3016CU | |
| 45 | | FR940 | | 471 (214) | WS58 | WMB05 | V48M28F4516CU | |
| 75 | | FR942 | | 665 (302) | WS59 | WMB04 | V48M28F7516CU | |
| 112.5 | | FR943 | | 1271 (577) | WS60 | WMB04 | V48M28F1216CU | |
| 150 | | FR943 | | 1422 (646) | WS60 | WMB04 | V48M28F4916CU | |
| 225 | | FR944 | | 2082 (945) | WS61 | — | V48M28F2216CU | |
| 300 | | FR945 | | 2568 (1166) | WS62 | — | V48M28F3316CU | |
| 500 | | Contact local Eaton representative | | | | | V48M28F5516CU | |
| 15 | | 80 | | FR939 | 280B | 239 (109) | WS57 | WMB05 |
| 30 | FR940 | | 466 (212) | WS58 | | WMB05 | V48M28B3016CU | |
| 45 | FR942 | | 667 (303) | WS58 | | WMB05 | V48M28B4516CU | |
| 75 | FR943 | | 1147 (521) | WS59 | | WMB04 | V48M28B7516CU | |
| 112.5 | FR943 | | 1385 (629) | WS60 | | WMB04 | V48M28B1216CU | |
| 150 | FR944 | | 1895 (860) | WS60 | | WMB04 | V48M28B4916CU | |
| 225 | FR945 | | 2385 (1083) | WS61 | | — | V48M28B2216CU | |
| 300 | Contact local Eaton representative | | | | | V48M28B3316CU | | |
| 500 | | | | | | V48M28B5516CU | | |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient—Copper Windings**480 Delta Volts to 240 Delta Volts with 120 Volt Lighting Tap on Phase B ^①**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ^② | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|------------------------------------|------------------------------------|----------------|-----------------------------|----------------|-------------------|----------------|-------|
| 15 | 150 | FR939 | 282B | 253 (115) | WS57 | WMB05 | V48M22T1516CU | |
| 30 | | FR940 | | 485 (220) | WS58 | WMB05 | V48M22T3016CU | |
| 45 | | FR940 | | 475 (216) | WS58 | WMB05 | V48M22T4516CU | |
| 75 | | FR942 | | 691 (314) | WS59 | WMB04 | V48M22T7516CU | |
| 112.5 | | FR943 | | 1215 (552) | WS60 | WMB04 | V48M22T1216CU | |
| 150 | | FR943 | | 1366 (620) | WS60 | WMB04 | V48M22T4916CU | |
| 225 | | FR944 | | 2000 (908) | WS61 | — | V48M22T2216CU | |
| 300 | | FR945 | | 2624 (1191) | WS62 | — | V48M22T3316CU | |
| 500 | | Contact local Eaton representative | | | | | V48M22T5516CU | |
| 750 | | | | | | | V48D22T7716CU | |
| 1000 | | | | | | V48D22T1116CU | | |
| 15 | 115 | FR939 | 282B | 300 (136) | WS57 | WMB05 | V48M22F1516CU | |
| 30 | | FR940 | | 485 (220) | WS58 | WMB05 | V48M22F3016CU | |
| 45 | | FR940 | | 467 (212) | WS58 | WMB05 | V48M22F4516CU | |
| 75 | | FR942 | | 665 (302) | WS59 | WMB04 | V48M22F7516CU | |
| 112.5 | | FR943 | | 1200 (545) | WS60 | WMB04 | V48M22F1216CU | |
| 150 | | FR943 | | 1366 (620) | WS60 | WMB04 | V48M22F4916CU | |
| 225 | | FR944 | | 2400 (1090) | WS61 | — | V48M22F2216CU | |
| 300 | | FR945 | | 3000 (1362) | WS62 | — | V48M22F3316CU | |
| 500 | | Contact local Eaton representative | | | | | V48M22F5516CU | |
| 15 | | 80 | | FR939 | 282B | 251 (114) | WS57 | WMB05 |
| 30 | FR940 | | 489 (222) | WS58 | | WMB05 | V48M22B3016CU | |
| 45 | FR942 | | 700 (318) | WS59 | | WMB04 | V48M22B4516CU | |
| 75 | FR943 | | 1204 (547) | WS60 | | WMB04 | V48M22B7516CU | |
| 112.5 | FR943 | | 1454 (660) | WS60 | | WMB04 | V48M22B1216CU | |
| 150 | FR944 | | 1990 (903) | WS61 | | — | V48M22B4916CU | |
| 225 | FR945 | | 2504 (1137) | WS62 | | — | V48M22B2216CU | |
| 300 | Contact local Eaton representative | | | | | V48M22B3316CU | | |
| 500 | | | | | | V48M22B5516CU | | |

Notes

^① Lighting tap limited to 5% of nameplate full load capacity.

^② Frames (dimensions and weights) subject to revision.

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Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient—Copper Windings

480 Delta Volts to 400Y/231 Volts

2

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR939 | 280B | 260 (118) | WS57 | WMB05 | V48M34T1516CU |
| 30 | | FR940 | | 490 (222) | WS58 | WMB05 | V48M34T3016CU |
| 45 | | FR940 | | 495 (225) | WS58 | WMB05 | V48M34T4516CU |
| 75 | | FR942 | | 683 (310) | WS59 | WMB04 | V48M34T7516CU |
| 112.5 | | FR943 | | 1250 (568) | WS60 | WMB04 | V48M34T1216CU |
| 150 | | FR943 | | 1370 (622) | WS60 | WMB04 | V48M34T4916CU |
| 225 | | FR944 | | 2100 (953) | WS61 | — | V48M34T2216CU |
| 300 | | FR945 | | 2650 (1203) | WS62 | — | V48M34T3316CU |
| 500 | | Contact local Eaton representative | | | | | V48M34T5516CU |
| 15 | 115 | FR939 | 280B | 253 (115) | WS57 | WMB05 | V48M34F1516CU |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V48M34F3016CU |
| 45 | | FR940 | | 495 (225) | WS58 | WMB05 | V48M34F4516CU |
| 75 | | FR942 | | 698 (317) | WS59 | WMB04 | V48M34F7516CU |
| 112.5 | | FR943 | | 1335 (606) | WS60 | WMB04 | V48M34F1216CU |
| 150 | | FR943 | | 1493 (678) | WS60 | WMB04 | V48M34F4916CU |
| 225 | | FR944 | | 2186 (992) | WS61 | — | V48M34F2216CU |
| 300 | | FR945 | | 2696 (1224) | WS62 | — | V48M34F3316CU |
| 500 | | Contact local Eaton representative | | | | | V48M34F5516CU |
| 15 | 80 | FR939 | 280B | 251 (114) | WS57 | WMB05 | V48M34B1516CU |
| 30 | | FR940 | | 489 (222) | WS58 | WMB05 | V48M34B3016CU |
| 45 | | FR942 | | 700 (318) | WS59 | WMB04 | V48M34B4516CU |
| 75 | | FR943 | | 1204 (547) | WS60 | WMB04 | V48M34B7516CU |
| 112.5 | | FR943 | | 1454 (660) | WS60 | WMB04 | V48M34B1216CU |
| 150 | | FR944 | | 1990 (903) | WS61 | — | V48M34B4916CU |
| 225 | | FR945 | | 2504 (1137) | WS62 | — | V48M34B2216CU |
| 300 | | Contact local Eaton representative | | | | | V48M34B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient—Copper Windings**480 Delta Volts to 480Y/277 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|
| 15 | 150 | FR939 | 280B | 260 (118) | WS57 | WMB05 | V48M47T1516CU |
| 30 | | FR940 | | 431 (196) | WS58 | WMB05 | V48M47T3016CU |
| 45 | | FR940 | | 457 (207) | WS58 | WMB05 | V48M47T4516CU |
| 75 | | FR942 | | 673 (306) | WS59 | WMB04 | V48M47T7516CU |
| 112.5 | | FR943 | | 1110 (504) | WS60 | WMB04 | V48M47T1216CU |
| 150 | | FR943 | | 1432 (650) | WS60 | WMB04 | V48M47T4916CU |
| 225 | | FR944 | | 2100 (953) | WS61 | — | V48M47T2216CU |
| 300 | | FR945 | | 2650 (1203) | WS62 | — | V48M47T3316CU |
| 500 | | Contact local Eaton representative | | | | | V48M47T5516CU |
| 15 | 115 | FR939 | 280B | 271 (123) | WS57 | WMB05 | V48M47F1516CU |
| 30 | | FR940 | | 431 (196) | WS58 | WMB05 | V48M47F3016CU |
| 45 | | FR940 | | 485 (220) | WS58 | WMB05 | V48M47F4516CU |
| 75 | | FR942 | | 730 (331) | WS59 | WMB04 | V48M47F7516CU |
| 112.5 | | FR943 | | 1146 (520) | WS60 | WMB04 | V48M47F1216CU |
| 150 | | FR943 | | 1432 (650) | WS60 | WMB04 | V48M47F4916CU |
| 225 | | FR944 | | 2150 (976) | WS61 | — | V48M47F2216CU |
| 300 | | FR945 | | 2700 (1226) | WS62 | — | V48M47F3316CU |
| 500 | | Contact local Eaton representative | | | | | V48M47F5516CU |
| 15 | 80 | FR939 | 280B | 254 (115) | WS57 | WMB05 | V48M47B1516CU |
| 30 | | FR940 | | 476 (216) | WS58 | WMB05 | V48M47B3016CU |
| 45 | | FR942 | | 670 (304) | WS58 | WMB05 | V48M47B4516CU |
| 75 | | FR943 | | 1110 (504) | WS59 | WMB04 | V48M47B7516CU |
| 112.5 | | FR943 | | 1385 (629) | WS60 | WMB04 | V48M47B1216CU |
| 150 | | FR944 | | 2100 (953) | WS60 | WMB04 | V48M47B4916CU |
| 225 | | FR945 | | 2650 (1203) | WS61 | — | V48M47B2216CU |
| 300 | | Contact local Eaton representative | | | | | V48M47B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

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Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient—Copper Windings

600 Delta Volts to 208Y/120 Volts

2

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR939 | 280A | 250 (114) | WS57 | WMB05 | V60M28T1516CU |
| 30 | | FR940 | | 441 (200) | WS58 | WMB05 | V60M28T3016CU |
| 45 | | FR940 | | 460 (209) | WS58 | WMB05 | V60M28T4516CU |
| 75 | | FR942 | | 712 (323) | WS59 | WMB04 | V60M28T7516CU |
| 112.5 | | FR943 | | 1260 (572) | WS60 | WMB04 | V60M28T1216CU |
| 150 | | FR943 | | 1420 (645) | WS60 | WMB04 | V60M28T4916CU |
| 225 | | FR944 | | 1890 (858) | WS61 | — | V60M28T2216CU |
| 300 | | FR945 | | 2450 (1112) | WS62 | — | V60M28T3316CU |
| 500 | | Contact local Eaton representative | | | | | V60M28T5516CU |
| 15 | 115 | FR939 | 280A | 253 (115) | WS57 | WMB05 | V60M28F1516CU |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V60M28F3016CU |
| 45 | | FR940 | | 495 (225) | WS58 | WMB05 | V60M28F4516CU |
| 75 | | FR942 | | 698 (317) | WS59 | WMB04 | V60M28F7516CU |
| 112.5 | | FR943 | | 1335 (606) | WS60 | WMB04 | V60M28F1216CU |
| 150 | | FR943 | | 1493 (678) | WS60 | WMB04 | V60M28F4916CU |
| 225 | | FR944 | | 2186 (992) | WS61 | — | V60M28F2216CU |
| 300 | | FR945 | | 2696 (1224) | WS62 | — | V60M28F3316CU |
| 500 | | Contact local Eaton representative | | | | | V60M28F5516CU |
| 15 | 80 | FR939 | 280A | 251 (114) | WS57 | WMB05 | V60M28B1516CU |
| 30 | | FR940 | | 489 (222) | WS58 | WMB05 | V60M28B3016CU |
| 45 | | FR942 | | 700 (318) | WS59 | WMB04 | V60M28B4516CU |
| 75 | | FR943 | | 1204 (547) | WS60 | WMB04 | V60M28B7516CU |
| 112.5 | | FR943 | | 1454 (660) | WS60 | WMB04 | V60M28B1216CU |
| 150 | | FR944 | | 1990 (903) | WS61 | — | V60M28B4916CU |
| 225 | | FR945 | | 2504 (1137) | WS62 | — | V60M28B2216CU |
| 300 | | Contact local Eaton representative | | | | | V60M28B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3 60 Hz DOE 2016 Energy-Efficient—Copper Windings**600 Delta Volts to 480Y/277 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|---------------|
| 15 | 150 | FR939 | 280A | 233 (106) | WS57 | WMB05 | V60M47T1516CU | |
| 30 | | FR940 | | 431 (196) | WS58 | WMB05 | V60M47T3016CU | |
| 45 | | FR940 | | 472 (214) | WS58 | WMB05 | V60M47T4516CU | |
| 75 | | FR942 | | 673 (306) | WS59 | WMB04 | V60M47T7516CU | |
| 112.5 | | FR943 | | 1110 (504) | WS60 | WMB04 | V60M47T1216CU | |
| 150 | | FR943 | | 1450 (658) | WS60 | WMB04 | V60M47T4916CU | |
| 225 | | FR944 | | 1913 (869) | WS61 | — | V60M47T2216CU | |
| 300 | | FR945 | | 2600 (1180) | WS62 | — | V60M47T3316CU | |
| 500 | | Contact local Eaton representative | | | | | | V60M47T5516CU |
| 15 | 115 | FR939 | 280A | 253 (115) | WS57 | WMB05 | V60M47F1516CU | |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | V60M47F3016CU | |
| 45 | | FR940 | | 495 (225) | WS58 | WMB05 | V60M47F4516CU | |
| 75 | | FR942 | | 698 (317) | WS59 | WMB04 | V60M47F7516CU | |
| 112.5 | | FR943 | | 1335 (606) | WS60 | WMB04 | V60M47F1216CU | |
| 150 | | FR943 | | 1493 (678) | WS60 | WMB04 | V60M47F4916CU | |
| 225 | | FR944 | | 2186 (992) | WS61 | — | V60M47F2216CU | |
| 300 | | FR945 | | 2696 (1224) | WS62 | — | V60M47F3316CU | |
| 500 | | Contact local Eaton representative | | | | | | V60M47F5516CU |
| 15 | 80 | FR939 | 280A | 251 (114) | WS57 | WMB05 | V60M47B1516CU | |
| 30 | | FR940 | | 489 (222) | WS58 | WMB05 | V60M47B3016CU | |
| 45 | | FR942 | | 700 (318) | WS59 | WMB04 | V60M47B4516CU | |
| 75 | | FR943 | | 1204 (547) | WS60 | WMB04 | V60M47B7516CU | |
| 112.5 | | FR943 | | 1454 (660) | WS60 | WMB04 | V60M47B1216CU | |
| 150 | | FR944 | | 1990 (903) | WS61 | — | V60M47B4916CU | |
| 225 | | FR945 | | 2504 (1137) | WS62 | — | V60M47B2216CU | |
| 300 | | Contact local Eaton representative | | | | | | V60M47B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Accessories

Please refer to Section 2.7 **Page V2-T2-167**.

2

Technical Data and Specifications

Frequency

Eaton standard low-voltage dry-type distribution transformers are designed for 60 Hz operation. Transformers required for other frequencies are available and must be specifically designed.

Overload Capability

Short-term overload is designed into transformers as required by ANSI. Low-voltage dry-type distribution transformers will deliver 200% nameplate load for one-half hour, 150% load for one hour and 125% load for four hours without being damaged, provided that a constant 50% load precedes and follows the overload. See ANSI C57.96-01.250 for additional limitations.

Continuous overload capacity is not deliberately designed into a transformer because the design objective is to be within the allowed winding temperature rise with nameplate loading.

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Insulation System Classification

| Ambient | + Winding Rise | + Hot Spot | = Temp. Class |
|---------|----------------|------------|---------------|
| 40°C | 55°C | 10°C | 105°C |
| 40°C | 80°C | 30°C | 150°C |
| 25°C | 135°C | 20°C | 180°C |
| 40°C | 115°C | 30°C | 185°C |
| 40°C | 150°C | 30°C | 220°C |

The design life of transformers having different insulation systems is the same—the lower-temperature systems are designed for the same life as the higher-temperature systems.

Enclosures

Eaton’s ventilated transformers, Types DS-3 and DT-3, use a NEMA 2 rated (drip-proof) enclosure as standard, and are rated NEMA 3R with the addition of weathershields. Transformers manufactured in enclosures 939, 940, 942, 943, 944 and 945 are UL Listed to be installed indoors (without weathershields) with just 2 inches clearance on the sides and rear of the transformer.

Winding Terminations

Primary and secondary windings are terminated in the wiring compartment. Ventilating transformers have leads brought out to terminals that are pre-drilled to accept Cu/Al lugs. Aluminum-wound transformers have aluminum terminals; copper-wound models have copper terminals; aluminum and copper transformers include double neutral. **Lugs are not supplied with these transformers.** Eaton recommends external cables be rated 75°C for ventilated designs.

Series-Multiple Windings

Series-multiple windings consist of two similar coils in each winding that can be connected in series or parallel (multiple). Transformers with series-multiple windings are designated with an “x” or “/” between the voltage ratings, such as voltages of “120/240” or “240 x 480.” If the series-multiple winding is designated by an “x,” the winding can be connected only for a series or parallel.

With the “/” designation, a mid-point also becomes available in addition to the series or parallel connection. As an example, a 120 x 240 winding can be connected for either 120 (parallel) or 240 (series), but a 120/240 winding can be connected for 120 (parallel), or 240 (series), or 240 with a 120 mid-point.

For additional information, please refer to Section 2.7 **Page V2-T2-167**.

Sound Levels

All Eaton 600 volt class DOE 2016 low-voltage general-purpose dry-type distribution transformers are designed to meet NEMA ST-20 sound levels listed here. These are the sound levels measured in a soundproof environment. Actual sound levels measured at an installation will likely be higher (as much as 15 dB greater) due to electrical connections and environmental conditions. Lower sound levels are available and should be specified when the transformer is going to be installed in an area where sound may be a concern.

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilating (up to 1.2 kV) | | Encapsulated (up to 1.2 kV) |
|------------------------------|--|-----------------|-----------------------------|
| | K-Factor 1, 4, 9 | K-Factor 13, 20 | |
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Note

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

DOE 2016 Energy-Efficient K-Factor Rated Transformers



Product Description

A common industry term for the amount of harmonics produced by a given load is the K-factor. The larger the K-factor, the more harmonics are present. Linear loads, for example, have a K-factor of 1. Transformers may carry a K-factor rating to define the transformer's ability to withstand the additional heating generated by harmonic currents.

Applications

Eaton K-Factor transformers are specifically designed to withstand the harmful overheating effects caused by harmonics generated by nonlinear (non-sinusoidal) loads. These loads include computers, laser printers, copiers and other office equipment, as well as video monitors and other electronic equipment. Eaton K-Factor transformers are not simply over-sized transformers. The core and coils of our K-Factor transformers are specially designed to have reduced induction levels, which results in a reduction in stray losses. Oversized (200% rated) neutrals and electrostatic shielding are typical features found in our K-Factor transformers. Eaton K-Factor transformers are manufactured with the same high-quality construction features as our other ventilated transformer products, including NEMA 2 enclosures as standard.

Contents

| <i>Description</i> | <i>Page</i> |
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| DOE 2016 Energy-Efficient K-Factor Rated Transformers | |
| Features, Benefits and Functions | V2-T2-30 |
| Standards and Certifications | V2-T2-30 |
| Product Selection | V2-T2-31 |
| Accessories | V2-T2-63 |
| Technical Data and Specifications | V2-T2-63 |

Calculating the K-Factor

All nonlinear waveforms can be broken down mathematically into a fundamental frequency and its harmonics. IEEE C57.110 establishes a direct relationship between these harmonics and transformer heating. Underwriters Laboratories has established a similar relationship, the K-factor, which is derived by summing the square of the percentage current at a given harmonic level multiplied by the square of the harmonic order.

$$K = \sum (I_h)^2 (h)^2$$

I_h = Percent Current at Harmonic h

h = Harmonic Order, i.e., 3rd, 5th, 7th

For example, a load that is 90% of the fundamental, 30% of the third harmonic, and 20% of the fifth harmonic would yield $(.9)^2(1)^2 + (.3)^2(3)^2 + (.2)^2(5)^2$ or a K-factor of 2.62. This load would require an Eaton KT-4 transformer with a K-factor rating of 4.

Transformers that carry a K-factor rating define the transformer's ability to withstand a given harmonic load while operating within the transformer's insulation class.

An analysis of harmonic loads and a calculation of the K-factor must be made to properly apply transformers in any building or facility. Note that the calculated K-factor is not constant because nonlinear loads change throughout the day as equipment and lighting is turned off and on. These harmonic loads also change over the life of the building or facility as equipment is added or removed.

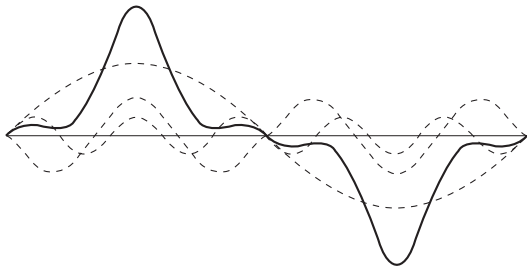
Harmonic Currents

Harmonic currents are found in nonlinear loads. These currents are generated by various types of equipment including switching mode power supplies that abruptly switch current on and off during each line cycle. Switching mode power supplies or diode-capacitor power supplies convert AC line voltage to low voltage DC. This process is accomplished by charging capacitors during each line cycle with narrow pluses

of current that are time-coincident with line voltage peaks. Examples of this equipment include electronic ballasts for fluorescent lighting, personal computers, printers, fax machines, electronic and medical test equipment, uninterruptible power supplies, and solid-state motor drives.

Note: Nonlinear is synonymous with the term non-sinusoidal.

Harmonic Currents Found in Nonlinear Loads Cause Wave Shape Distortion and Create Added Stresses on Transformers

**Features, Benefits and Functions**

- 600 volt class standard
- Three-phase, 480 delta–208Y/120 volt standard
- Single-phase, 240 x 480 volt–120/240 volt standard
- 150°C rise standard, 80°C and 115°C available
- Three-phase neutrals sized for 200% of rated current
- The core and coil assembly is grounded to the transformer enclosure by means of a visible flexible copper ground strap. The copper ground strap is sized per the NEC to be a grounding conductor. Three-phase DOE 2016 efficient transformers are provided with a bonding ground bar attached to the bottom panel for compliance with NEC 450.10(A)
- Electrostatic shield

Note: Electrostatic shields do not reduce harmonic levels. However, because of the nature of switching mode loads, these shields do reduce transient noise in the system, which may affect sensitive computer loads.

- Aluminum windings (copper optional)
 - Class 220°C insulation
 - Reduced core flux density
- Note:** Reduced core flux prevents the core from saturation and overheating due to voltage distortions caused by harmonic currents.
- Indoor enclosures (weathershields optional, for outdoor applications)
 - Coils designed to minimize stray losses
 - K4, K13 standard
 - K9, K20, K30 optional
 - Low sound level (–3 dB, –5 dB) available as options

Standards and Certifications

- UL listed

**Industry Standards**

All Eaton low-voltage dry-type distribution transformers are built and tested in accordance with applicable NEMA, ANSI and IEEE Standards. All 600 volt class transformers are UL listed unless otherwise noted.

Seismically Qualified

Eaton manufactured low-voltage dry-type distribution transformers are seismically qualified and exceed requirements of the Uniform Building Code (UBC), International Building Code (IBC) and California Code Title 24.

Catalog Number Selection

Please refer to Section 2.7 **Page V2-T2-162.**

Product Selection

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

K-4 480 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|--|
| 15 | 150 | FR940 | 283B | 407 (185) | WS58 | WMB05 | H48M28T1516 | |
| 30 | | FR940 | | 437 (198) | WS58 | WMB05 | H48M28T3016 | |
| 45 | | FR940 | | 439 (199) | WS58 | WMB05 | H48M28T4516 | |
| 75 | | FR942 | | 599 (272) | WS59 | WMB04 | H48M28T7516 | |
| 112.5 | | FR943 | | 987 (448) | WS60 | WMB04 | H48M28T1216 | |
| 150 | | FR944 | | 1637 (743) | WS61 | — | H48M28T4916 | |
| 225 | | FR944 | | 1642 (745) | WS61 | — | H48M28T2216 | |
| 300 | | FR945 | | 2394 (1087) | WS62 | — | H48M28T3316 | |
| 500 | | Contact local Eaton representative | | | | | H48M28T5516 | |
| 15 | 115 | FR940 | 283B | 402 (183) | WS58 | WMB05 | H48M28F1516 | |
| 30 | | FR940 | | 415 (188) | WS58 | WMB05 | H48M28F3016 | |
| 45 | | FR942 | | 619 (281) | WS59 | WMB04 | H48M28F4516 | |
| 75 | | FR943 | | 984 (447) | WS60 | WMB04 | H48M28F7516 | |
| 112.5 | | FR943 | | 1236 (561) | WS60 | WMB04 | H48M28F1216 | |
| 150 | | FR944 | | 1662 (755) | WS61 | — | H48M28F4916 | |
| 225 | | FR945 | | 2353 (1068) | WS62 | — | H48M28F2216 | |
| 300 | | FR945 | | 2198 (998) | WS62 | — | H48M28F3316 | |
| 500 | | Contact local Eaton representative | | | | | H48M28F5516 | |
| 15 | 80 | FR940 | 283B | 415 (188) | WS58 | WMB05 | H48M28B1516 | |
| 30 | | FR940 | | 437 (198) | WS58 | WMB05 | H48M28B3016 | |
| 45 | | FR942 | | 619 (281) | WS58 | WMB05 | H48M28B4516 | |
| 75 | | FR943 | | 1027 (466) | WS59 | WMB04 | H48M28B7516 | |
| 112.5 | | FR944 | | 1643 (746) | WS60 | WMB04 | H48M28B1216 | |
| 150 | | FR944 | | 1710 (776) | WS60 | — | H48M28B4916 | |
| 225 | | FR924 | | 2680 (1217) | WS40 | — | H48M28B2216 | |
| 300 | | Contact local Eaton representative | | | | | H48M28B3316 | |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

2

K-4 480 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR940 | 283B | 427 (194) | WS58 | WMB05 | H48M47T1516 |
| 30 | | FR940 | | 459 (208) | WS58 | WMB05 | H48M47T3016 |
| 45 | | FR940 | | 461 (209) | WS58 | WMB05 | H48M47T4516 |
| 75 | | FR942 | | 629 (286) | WS59 | WMB04 | H48M47T7516 |
| 112.5 | | FR943 | | 1036 (471) | WS60 | WMB04 | H48M47T1216 |
| 150 | | FR944 | | 1719 (780) | WS61 | — | H48M47T4916 |
| 225 | | FR944 | | 1724 (783) | WS61 | — | H48M47T2216 |
| 300 | | FR945 | | 2514 (1141) | WS62 | — | H48M47T3316 |
| 500 | | Contact local Eaton representative | | | | | H48M47T5516 |
| 15 | 115 | FR940 | 283B | 422 (192) | WS58 | WMB05 | H48M47F1516 |
| 30 | | FR940 | | 436 (198) | WS58 | WMB05 | H48M47F3016 |
| 45 | | FR942 | | 650 (295) | WS59 | WMB04 | H48M47F4516 |
| 75 | | FR943 | | 1033 (469) | WS60 | WMB04 | H48M47F7516 |
| 112.5 | | FR943 | | 1298 (589) | WS60 | WMB04 | H48M47F1216 |
| 150 | | FR944 | | 1745 (792) | WS61 | — | H48M47F4916 |
| 225 | | FR945 | | 2471 (1122) | WS62 | — | H48M47F2216 |
| 300 | | FR945 | | 2308 (1048) | WS62 | — | H48M47F3316 |
| 500 | | Contact local Eaton representative | | | | | H48M47F5516 |
| 15 | 80 | FR939 | 283B | 267 (121) | WS57 | WMB05 | H48M47B1516 |
| 30 | | FR940 | | 459 (208) | WS58 | WMB05 | H48M47B3016 |
| 45 | | FR942 | | 650 (295) | WS59 | WMB04 | H48M47B4516 |
| 75 | | FR943 | | 1078 (490) | WS60 | WMB04 | H48M47B7516 |
| 112.5 | | FR944 | | 1725 (783) | WS61 | — | H48M47B1216 |
| 150 | | FR944 | | 1796 (815) | WS61 | — | H48M47B4916 |
| 225 | | FR924 | | 2814 (1278) | WS40 | — | H48M47B2216 |
| 300 | | Contact local Eaton representative | | | | | H48M47B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

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DOE 2016 Energy-Efficient K-Factor Rated Transformers

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

K-4 600 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lbs (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|-------------------|----------------|-------------------|----------------|
| 15 | 150 | FR940 | 283E | 427 (194) | WS58 | WMB05 | H60M28T1516 |
| 30 | | FR940 | | 459 (208) | WS58 | WMB05 | H60M28T3016 |
| 45 | | FR940 | | 461 (209) | WS58 | WMB05 | H60M28T4516 |
| 75 | | FR942 | | 629 (286) | WS59 | WMB04 | H60M28T7516 |
| 112.5 | | FR943 | | 1036 (471) | WS60 | WMB04 | H60M28T1216 |
| 150 | | FR944 | | 1719 (780) | WS61 | — | H60M28T4916 |
| 225 | | FR944 | | 1724 (783) | WS61 | — | H60M28T2216 |
| 300 | | FR945 | | 2514 (1141) | WS62 | — | H60M28T3316 |
| 500 | | Contact local Eaton representative | | | | | H60M28T5516 |
| 15 | 115 | FR940 | 283E | 422 (192) | WS58 | WMB05 | H60M28F1516 |
| 30 | | FR940 | | 436 (198) | WS58 | WMB05 | H60M28F3016 |
| 45 | | FR942 | | 650 (295) | WS59 | WMB04 | H60M28F4516 |
| 75 | | FR943 | | 1033 (469) | WS60 | WMB04 | H60M28F7516 |
| 112.5 | | FR943 | | 1298 (589) | WS60 | WMB04 | H60M28F1216 |
| 150 | | FR944 | | 1745 (792) | WS61 | — | H60M28F4916 |
| 225 | | FR945 | | 2471 (1122) | WS62 | — | H60M28F2216 |
| 300 | | FR945 | | 2308 (1048) | WS62 | — | H60M28F3316 |
| 500 | | Contact local Eaton representative | | | | | H60M28F5516 |
| 15 | 80 | FR939 | 283E | 267 (121) | WS57 | WMB05 | H60M28B1516 |
| 30 | | FR940 | | 459 (208) | WS58 | WMB05 | H60M28B3016 |
| 45 | | FR942 | | 650 (295) | WS59 | WMB04 | H60M28B4516 |
| 75 | | FR943 | | 1078 (490) | WS60 | WMB04 | H60M28B7516 |
| 112.5 | | FR944 | | 1725 (783) | WS61 | — | H60M28B1216 |
| 150 | | FR944 | | 1796 (815) | WS61 | — | H60M28B4916 |
| 225 | | FR924 | | 2814 (1278) | WS40 | — | H60M28B2216 |
| 300 | | Contact local Eaton representative | | | | | H60M28B3316 |

Notes

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

K-4 600 Delta Volts to 480Y/277 Volts

2

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR940 | 283E | 427 (194) | WS58 | WMB05 | H60M47T1516 |
| 30 | | FR940 | | 459 (208) | WS58 | WMB05 | H60M47T3016 |
| 45 | | FR940 | | 461 (209) | WS58 | WMB05 | H60M47T4516 |
| 75 | | FR942 | | 629 (286) | WS59 | WMB04 | H60M47T7516 |
| 112.5 | | FR943 | | 1036 (471) | WS60 | WMB04 | H60M47T1216 |
| 150 | | FR944 | | 1719 (780) | WS61 | — | H60M47T4916 |
| 225 | | FR944 | | 1724 (783) | WS61 | — | H60M47T2216 |
| 300 | | FR945 | | 2514 (1141) | WS62 | — | H60M47T3316 |
| 500 | | Contact local Eaton representative | | | | | H60M47T5516 |
| 15 | 115 | FR940 | 283E | 422 (192) | WS58 | WMB05 | H60M47F1516 |
| 30 | | FR940 | | 436 (198) | WS58 | WMB05 | H60M47F3016 |
| 45 | | FR942 | | 650 (295) | WS59 | WMB04 | H60M47F4516 |
| 75 | | FR943 | | 1033 (469) | WS60 | WMB04 | H60M47F7516 |
| 112.5 | | FR943 | | 1298 (589) | WS60 | WMB04 | H60M47F1216 |
| 150 | | FR944 | | 1745 (792) | WS61 | — | H60M47F4916 |
| 225 | | FR945 | | 2471 (1122) | WS62 | — | H60M47F2216 |
| 300 | | FR945 | | 2308 (1048) | WS62 | — | H60M47F3316 |
| 500 | | Contact local Eaton representative | | | | | H60M47F5516 |
| 15 | 80 | FR939 | 283E | 267 (121) | WS57 | WMB05 | H60M47B1516 |
| 30 | | FR940 | | 459 (208) | WS58 | WMB05 | H60M47B3016 |
| 45 | | FR942 | | 650 (295) | WS59 | WMB04 | H60M47B4516 |
| 75 | | FR943 | | 1078 (490) | WS60 | WMB04 | H60M47B7516 |
| 112.5 | | FR944 | | 1725 (783) | WS61 | — | H60M47B1216 |
| 150 | | FR944 | | 1796 (815) | WS61 | — | H60M47B4916 |
| 225 | | FR924 | | 2814 (1278) | WS40 | — | H60M47B2216 |
| 300 | | Contact local Eaton representative | | | | | H60M47B3316 |

Notes

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DOE 2016 Energy-Efficient K-Factor Rated Transformers

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

K-4 480 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR940 | 283B | 418 (190) | WS58 | WMB05 | H48M28T1516CU |
| 30 | | FR940 | | 458 (208) | WS58 | WMB05 | H48M28T3016CU |
| 45 | | FR940 | | 480 (218) | WS58 | WMB05 | H48M28T4516CU |
| 75 | | FR943 | | 1274 (578) | WS60 | WMB04 | H48M28T7516CU |
| 112.5 | | FR943 | | 1818 (825) | WS60 | WMB04 | H48M28T1216CU |
| 150 | | FR944 | | 2105 (956) | WS61 | — | H48M28T4916CU |
| 225 | | FR945 | | 2674 (1214) | WS62 | — | H48M28T2216CU |
| 300 | | FR945 | | 2737 (1243) | WS62 | — | H48M28T3316CU |
| 500 | | Contact local Eaton representative | | | | | H48M28T5516CU |
| 15 | 115 | FR940 | 283B | 414 (188) | WS58 | WMB05 | H48M28F1516CU |
| 30 | | FR940 | | 417 (189) | — | — | H48M28F3016CU |
| 45 | | FR942 | | 684 (311) | WS59 | WMB04 | H48M28F4516CU |
| 75 | | FR943 | | 1083 (492) | WS60 | WMB04 | H48M28F7516CU |
| 112.5 | | FR943 | | 1394 (633) | WS60 | WMB04 | H48M28F1216CU |
| 150 | | FR944 | | 2103 (955) | WS61 | — | H48M28F4916CU |
| 225 | | FR945 | | 2150 (976) | — | — | H48M28F2216CU |
| 300 | | Contact local Eaton representative | | | | | H48M28F3316CU |
| 500 | | | | | | | H48M28F5516CU |
| 15 | 80 | FR940 | 283B | 440 (200) | WS58 | WMB05 | H48M28B1516CU |
| 30 | | FR940 | | 482 (219) | WS58 | WMB05 | H48M28B3016CU |
| 45 | | FR942 | | 669 (304) | WS59 | WMB04 | H48M28B4516CU |
| 75 | | FR943 | | 1210 (549) | WS60 | WMB04 | H48M28B7516CU |
| 112.5 | | FR943 | | 1287 (584) | WS60 | WMB04 | H48M28B1216CU |
| 150 | | FR944 | | 2138 (971) | WS61 | — | H48M28B4916CU |
| 225 | | FR945 | | 2727 (1238) | — | — | H48M28B2216CU |
| 300 | | Contact local Eaton representative | | | | | H48M28B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

2

K-4 480 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|---------------|
| 15 | 150 | FR940 | 283B | 439 (199) | WS58 | WMB05 | H48M47T1516CU | |
| 30 | | FR940 | | 481 (218) | WS58 | WMB05 | H48M47T3016CU | |
| 45 | | FR940 | | 504 (229) | WS58 | WMB05 | H48M47T4516CU | |
| 75 | | FR943 | | 1338 (607) | WS60 | WMB04 | H48M47T7516CU | |
| 112.5 | | FR943 | | 1909 (867) | WS60 | WMB04 | H48M47T1216CU | |
| 150 | | FR944 | | 2210 (1003) | WS61 | — | H48M47T4916CU | |
| 225 | | FR945 | | 2808 (1275) | WS62 | — | H48M47T2216CU | |
| 300 | | FR945 | | 2874 (1305) | WS62 | — | H48M47T3316CU | |
| 500 | | Contact local Eaton representative | | | | | | H48M47T5516CU |
| 15 | 115 | FR940 | 283B | 435 (197) | WS58 | WMB05 | H48M47F1516CU | |
| 30 | | FR940 | | 438 (199) | WS58 | WMB05 | H48M47F3016CU | |
| 45 | | FR942 | | 718 (326) | WS59 | WMB04 | H48M47F4516CU | |
| 75 | | FR943 | | 1137 (516) | WS60 | WMB04 | H48M47F7516CU | |
| 112.5 | | FR943 | | 1464 (665) | WS60 | WMB04 | H48M47F1216CU | |
| 150 | | FR944 | | 2208 (1003) | WS61 | — | H48M47F4916CU | |
| 225 | | FR945 | | 1764 (801) | WS62 | — | H48M47F2216CU | |
| 300 | | Contact local Eaton representative | | | | | | H48M47F3316CU |
| 500 | | | | | | | | H48M47F5516CU |
| 15 | 80 | FR940 | 283B | 462 (208) | WS58 | WMB05 | H48M47B1516CU | |
| 30 | | FR940 | | 506 (230) | WS58 | WMB05 | H48M47B3016CU | |
| 45 | | FR942 | | 702 (319) | WS59 | WMB04 | H48M47B4516CU | |
| 75 | | FR943 | | 1271 (577) | WS60 | WMB04 | H48M47B7516CU | |
| 112.5 | | FR943 | | 1351 (614) | WS60 | WMB04 | H48M47B1216CU | |
| 150 | | FR944 | | 2245 (1019) | WS61 | — | H48M47B4916CU | |
| 225 | | FR945 | | 2863 (1300) | WS62 | — | H48M47B2216CU | |
| 300 | | Contact local Eaton representative | | | | | | H48M47B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

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DOE 2016 Energy-Efficient K-Factor Rated Transformers

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

K-4 600 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|---------------|
| 15 | 150 | FR940 | 283E | 439 (199) | WS58 | WMB05 | H60M28T1516CU | |
| 30 | | FR940 | | 481 (218) | WS58 | WMB05 | H60M28T3016CU | |
| 45 | | FR940 | | 504 (229) | WS58 | WMB05 | H60M28T4516CU | |
| 75 | | FR943 | | 1338 (607) | WS60 | WMB04 | H60M28T7516CU | |
| 112.5 | | FR943 | | 1909 (867) | WS60 | WMB04 | H60M28T1216CU | |
| 150 | | FR944 | | 2210 (1003) | WS61 | — | H60M28T4916CU | |
| 225 | | FR945 | | 2808 (1275) | WS62 | — | H60M28T2216CU | |
| 300 | | FR945 | | 2874 (1305) | WS62 | — | H60M28T3316CU | |
| 500 | | Contact local Eaton representative | | | | | | H60M28T5516CU |
| 15 | 115 | FR940 | 283E | 435 (197) | WS58 | WMB05 | H60M28F1516CU | |
| 30 | | FR940 | | 438 (199) | WS58 | WMB05 | H60M28F3016CU | |
| 45 | | FR942 | | 718 (326) | WS59 | WMB04 | H60M28F4516CU | |
| 75 | | FR943 | | 1137 (516) | WS60 | WMB04 | H60M28F7516CU | |
| 112.5 | | FR943 | | 1464 (665) | WS60 | WMB04 | H60M28F1216CU | |
| 150 | | FR944 | | 2208 (1003) | WS61 | — | H60M28F4916CU | |
| 225 | | FR945 | | 1764 (801) | WS62 | — | H60M28F2216CU | |
| 300 | | Contact local Eaton representative | | | | | | H60M28F3316CU |
| 500 | | | | | | | | H60M28F5516CU |
| 15 | 80 | FR940 | 283E | 462 (208) | WS58 | WMB05 | H60M28B1516CU | |
| 30 | | FR940 | | 506 (230) | WS58 | WMB05 | H60M28B3016CU | |
| 45 | | FR942 | | 702 (319) | WS59 | WMB04 | H60M28B4516CU | |
| 75 | | FR943 | | 1271 (577) | WS60 | WMB04 | H60M28B7516CU | |
| 112.5 | | FR943 | | 1351 (614) | WS60 | WMB04 | H60M28B1216CU | |
| 150 | | FR944 | | 2245 (1019) | WS61 | — | H60M28B4916CU | |
| 225 | | FR945 | | 2863 (1300) | WS62 | — | H60M28B2216CU | |
| 300 | | Contact local Eaton representative | | | | | | H60M28B3316CU |

Notes

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

K-4 600 Delta Volts to 480Y/277 Volts

2

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR940 | 283E | 439 (199) | WS58 | WMB05 | H60M47T1516CU |
| 30 | | FR940 | | 481 (218) | WS58 | WMB05 | H60M47T3016CU |
| 45 | | FR940 | | 504 (229) | WS58 | WMB05 | H60M47T4516CU |
| 75 | | FR943 | | 1338 (607) | WS60 | WMB04 | H60M47T7516CU |
| 112.5 | | FR943 | | 1909 (867) | WS60 | WMB04 | H60M47T1216CU |
| 150 | | FR944 | | 2210 (1003) | WS61 | — | H60M47T4916CU |
| 225 | | FR945 | | 2808 (1275) | WS62 | — | H60M47T2216CU |
| 300 | | FR945 | | 2874 (1305) | WS62 | — | H60M47T3316CU |
| 500 | | Contact local Eaton representative | | | | | H60M47T5516CU |
| 15 | 115 | FR940 | 283E | 435 (197) | WS58 | WMB05 | H60M47F1516CU |
| 30 | | FR940 | | 438 (199) | WS58 | WMB05 | H60M47F3016CU |
| 45 | | FR942 | | 718 (326) | WS59 | WMB04 | H60M47F4516CU |
| 75 | | FR943 | | 1137 (516) | WS60 | WMB04 | H60M47F7516CU |
| 112.5 | | FR943 | | 1464 (665) | WS60 | WMB04 | H60M47F1216CU |
| 150 | | FR944 | | 2208 (1003) | WS61 | — | H60M47F4916CU |
| 225 | | FR945 | | 1764 (801) | WS62 | — | H60M47F2216CU |
| 300 | | Contact local Eaton representative | | | | | H60M47F3316CU |
| 500 | | | | | | | H60M47F5516CU |
| 15 | 80 | FR940 | 283E | 462 (208) | WS58 | WMB05 | H60M47B1516CU |
| 30 | | FR940 | | 506 (230) | WS58 | WMB05 | H60M47B3016CU |
| 45 | | FR942 | | 702 (319) | WS59 | WMB04 | H60M47B4516CU |
| 75 | | FR943 | | 1271 (577) | WS60 | WMB04 | H60M47B7516CU |
| 112.5 | | FR943 | | 1351 (614) | WS60 | WMB04 | H60M47B1216CU |
| 150 | | FR944 | | 2245 (1019) | WS61 | — | H60M47B4916CU |
| 225 | | FR945 | | 2863 (1300) | WS62 | — | H60M47B2216CU |
| 300 | | Contact local Eaton representative | | | | | H60M47B3316CU |

Notes

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings**K-9 480 Delta Volts to 208Y/120 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|------------------------------------|------------------------------------|----------------|------------------|----------------|--------------------|--------------------|-------|
| 15 | 150 | FR940 | 283B | 406 (184) | WS58 | WMB05 | B48M28T1516 | |
| 30 | | FR940 | | 416 (189) | WS58 | WMB05 | B48M28T3016 | |
| 45 | | FR942 | | 594 (270) | WS59 | WMB04 | B48M28T4516 | |
| 75 | | FR943 | | 1012 (459) | WS60 | WMB04 | B48M28T7516 | |
| 112.5 | | FR943 | | 1297 (589) | WS60 | WMB04 | B48M28T1216 | |
| 150 | | FR944 | | 1652 (750) | WS61 | — | B48M28T4916 | |
| 225 | | FR945 | | 2379 (1080) | WS62 | — | B48M28T2216 | |
| 300 | | FR924 | | 1910 (867) | WS40 | — | B48M28T3316 | |
| 500 | | Contact local Eaton representative | | | | | B48M28T5516 | |
| 15 | | 115 | | FR940 | 283B | 412 (187) | WS58 | WMB05 |
| 30 | FR940 | | 437 (198) | WS58 | | WMB05 | B48M28F3016 | |
| 45 | FR942 | | 619 (281) | WS59 | | WMB04 | B48M28F4516 | |
| 75 | FR943 | | 977 (444) | WS60 | | WMB04 | B48M28F7516 | |
| 112.5 | FR944 | | 1760 (799) | WS61 | | — | B48M28F1216 | |
| 150 | FR944 | | 1682 (764) | WS61 | | — | B48M28F4916 | |
| 225 | FR924 | | 1927 (875) | WS40 | | — | B48M28F2216 | |
| 300 | FR924 | | 2894 (1314) | WS40 | | — | B48M28F3316 | |
| 500 | Contact local Eaton representative | | | | | B48M28F5516 | | |
| 15 | 80 | | FR940 | 283B | | 420 (191) | WS58 | WMB05 |
| 30 | | FR940 | 438 (199) | | WS58 | WMB05 | B48M28B3016 | |
| 45 | | FR943 | 927 (421) | | WS60 | WMB04 | B48M28B4516 | |
| 75 | | FR943 | 1098 (498) | | WS60 | WMB04 | B48M28B7516 | |
| 112.5 | | FR944 | 1939 (880) | | WS61 | — | B48M28B1216 | |
| 150 | | FR945 | 2400 (1090) | | WS62 | — | B48M28B4916 | |
| 225 | | FR924 | 2816 (1278) | | WS40 | — | B48M28B2216 | |
| 300 | | Contact local Eaton representative | | | | | B48M28B3316 | |

Notes

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

K-9 480 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|------------------------------------|------------------------------------|----------------|------------------|----------------|--------------------|--------------------|-------|
| 15 | 150 | FR940 | 283B | 426 (194) | WS58 | WMB05 | B48M47T1516 | |
| 30 | | FR940 | | 437 (198) | WS58 | WMB05 | B48M47T3016 | |
| 45 | | FR942 | | 624 (283) | WS59 | WMB04 | B48M47T4516 | |
| 75 | | FR943 | | 1063 (482) | WS60 | WMB04 | B48M47T7516 | |
| 112.5 | | FR943 | | 1362 (618) | WS60 | WMB04 | B48M47T1216 | |
| 150 | | FR944 | | 1496 (679) | WS61 | — | B48M47T4916 | |
| 225 | | FR945 | | 2458 (1116) | WS62 | — | B48M47T2216 | |
| 300 | | FR924 | | 2014 (914) | WS40 | — | B48M47T3316 | |
| 500 | | Contact local Eaton representative | | | | | B48M47T5516 | |
| 15 | | 115 | | FR940 | 283B | 433 (196) | WS58 | WMB05 |
| 30 | FR940 | | 459 (208) | WS58 | | WMB05 | B48M47F3016 | |
| 45 | FR942 | | 650 (295) | WS59 | | WMB04 | B48M47F4516 | |
| 75 | FR943 | | 1026 (466) | WS60 | | WMB04 | B48M47F7516 | |
| 112.5 | FR944 | | 1848 (839) | WS61 | | — | B48M47F1216 | |
| 150 | FR944 | | 1766 (802) | WS61 | | — | B48M47F4916 | |
| 225 | FR924 | | 2023 (919) | WS40 | | — | B48M47F2216 | |
| 300 | FR924 | | 3039 (1380) | WS40 | | — | B48M47F3316 | |
| 500 | Contact local Eaton representative | | | | | B48M47F5516 | | |
| 15 | 80 | | FR940 | 283B | | 420 (191) | WS58 | WMB05 |
| 30 | | FR940 | 457 (207) | | WS58 | WMB05 | B48M47B3016 | |
| 45 | | FR943 | 973 (442) | | WS60 | WMB04 | B48M47B4516 | |
| 75 | | FR943 | 1153 (523) | | WS60 | WMB04 | B48M47B7516 | |
| 112.5 | | FR944 | 1939 (880) | | WS61 | — | B48M47B1216 | |
| 150 | | FR945 | 2537 (1152) | | WS62 | — | B48M47B4916 | |
| 225 | | FR924 | 2957 (1342) | | WS40 | — | B48M47B2216 | |
| 300 | | Contact local Eaton representative | | | | | B48M47B3316 | |

Notes

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings**K-9 600 Delta Volts to 208Y/120 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|--------------------|--------------------|
| 15 | 150 | FR940 | 283E | 426 (194) | WS58 | WMB05 | B60M28T1516 | |
| 30 | | FR940 | | 437 (198) | WS58 | WMB05 | B60M28T3016 | |
| 45 | | FR942 | | 624 (283) | WS59 | WMB04 | B60M28T4516 | |
| 75 | | FR943 | | 1063 (482) | WS60 | WMB04 | B60M28T7516 | |
| 112.5 | | FR943 | | 1362 (618) | WS60 | WMB04 | B60M28T1216 | |
| 150 | | FR944 | | 1496 (679) | WS61 | — | B60M28T4916 | |
| 225 | | FR945 | | 2458 (1116) | WS62 | — | B60M28T2216 | |
| 300 | | FR924 | | 2014 (914) | WS40 | — | B60M28T3316 | |
| 500 | | Contact local Eaton representative | | | | | | B60M28T5516 |
| 15 | 115 | FR940 | 283E | 433 (196) | WS58 | WMB05 | B60M28F1516 | |
| 30 | | FR940 | | 459 (208) | WS58 | WMB05 | B60M28F3016 | |
| 45 | | FR942 | | 650 (295) | WS59 | WMB04 | B60M28F4516 | |
| 75 | | FR943 | | 1026 (466) | WS60 | WMB04 | B60M28F7516 | |
| 112.5 | | FR944 | | 1848 (839) | WS61 | — | B60M28F1216 | |
| 150 | | FR944 | | 1766 (802) | WS61 | — | B60M28F4916 | |
| 225 | | FR924 | | 2023 (919) | WS40 | — | B60M28F2216 | |
| 300 | | FR924 | | 3039 (1380) | WS40 | — | B60M28F3316 | |
| 500 | | Contact local Eaton representative | | | | | | B60M28F5516 |
| 15 | 80 | FR940 | 283E | 420 (191) | WS58 | WMB05 | B60M28B1516 | |
| 30 | | FR940 | | 457 (207) | WS58 | WMB05 | B60M28B3016 | |
| 45 | | FR943 | | 973 (442) | WS60 | WMB04 | B60M28B4516 | |
| 75 | | FR943 | | 1153 (523) | WS60 | WMB04 | B60M28B7516 | |
| 112.5 | | FR944 | | 1939 (880) | WS61 | — | B60M28B1216 | |
| 150 | | FR945 | | 2537 (1152) | WS62 | — | B60M28B4916 | |
| 225 | | FR924 | | 2957 (1342) | WS40 | — | B60M28B2216 | |
| 300 | | Contact local Eaton representative | | | | | | B60M28B3316 |

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

K-9 600 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|------------------------------------|------------------------------------|----------------|------------------|----------------|--------------------|--------------------|-------|
| 15 | 150 | FR940 | 283E | 426 (194) | WS58 | WMB05 | B60M47T1516 | |
| 30 | | FR940 | | 437 (198) | WS58 | WMB05 | B60M47T3016 | |
| 45 | | FR942 | | 624 (283) | WS59 | WMB04 | B60M47T4516 | |
| 75 | | FR943 | | 1063 (482) | WS60 | WMB04 | B60M47T7516 | |
| 112.5 | | FR943 | | 1362 (618) | WS60 | WMB04 | B60M47T1216 | |
| 150 | | FR944 | | 1496 (679) | WS61 | — | B60M47T4916 | |
| 225 | | FR945 | | 2458 (1116) | WS62 | — | B60M47T2216 | |
| 300 | | FR924 | | 2014 (914) | WS40 | — | B60M47T3316 | |
| 500 | | Contact local Eaton representative | | | | | B60M47T5516 | |
| 15 | | 115 | | FR940 | 283E | 433 (196) | WS58 | WMB05 |
| 30 | FR940 | | 459 (208) | WS58 | | WMB05 | B60M47F3016 | |
| 45 | FR942 | | 650 (295) | WS59 | | WMB04 | B60M47F4516 | |
| 75 | FR943 | | 1026 (466) | WS60 | | WMB04 | B60M47F7516 | |
| 112.5 | FR944 | | 1848 (839) | WS61 | | — | B60M47F1216 | |
| 150 | FR944 | | 1766 (802) | WS61 | | — | B60M47F4916 | |
| 225 | FR924 | | 2023 (919) | WS40 | | — | B60M47F2216 | |
| 300 | FR924 | | 3039 (1380) | WS40 | | — | B60M47F3316 | |
| 500 | Contact local Eaton representative | | | | | B60M47F5516 | | |
| 15 | 80 | | FR940 | 283E | | 420 (191) | WS58 | WMB05 |
| 30 | | FR940 | 457 (207) | | WS58 | WMB05 | B60M47B3016 | |
| 45 | | FR943 | 973 (442) | | WS60 | WMB04 | B60M47B4516 | |
| 75 | | FR943 | 1153 (523) | | WS60 | WMB04 | B60M47B7516 | |
| 112.5 | | FR944 | 1939 (880) | | WS61 | — | B60M47B1216 | |
| 150 | | FR945 | 2537 (1152) | | WS62 | — | B60M47B4916 | |
| 225 | | FR924 | 2957 (1342) | | WS40 | — | B60M47B2216 | |
| 300 | | Contact local Eaton representative | | | | | B60M47B3316 | |

Notes

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DOE 2016 Energy-Efficient K-Factor Rated Transformers

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

K-9 480 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR940 | 283B | 430 (195) | WS58 | WMB05 | B48M28T1516CU |
| 30 | | FR940 | | 505 (229) | WS58 | WMB05 | B48M28T3016CU |
| 45 | | FR942 | | 699 (317) | WS59 | WMB04 | B48M28T4516CU |
| 75 | | FR943 | | 1103 (501) | WS60 | WMB04 | B48M28T7516CU |
| 112.5 | | FR943 | | 1424 (646) | WS60 | WMB04 | B48M28T1216CU |
| 150 | | FR944 | | 2132 (968) | WS61 | — | B48M28T4916CU |
| 225 | | FR945 | | 2628 (1193) | WS62 | — | B48M28T2216CU |
| 300 | | FR924 | | 3400 (1544) | WS40 | — | B48M28T3316CU |
| 500 | | Contact local Eaton representative | | | | | B48M28T5516CU |
| 15 | 115 | FR940 | 283B | 398 (181) | WS58 | WMB05 | B48M28F1516CU |
| 30 | | FR940 | | 478 (217) | WS58 | WMB05 | B48M28F3016CU |
| 45 | | FR942 | | 658 (299) | WS59 | WMB04 | B48M28F4516CU |
| 75 | | FR943 | | 1115 (506) | WS60 | WMB04 | B48M28F7516CU |
| 112.5 | | FR944 | | 2150 (976) | WS61 | — | B48M28F1216CU |
| 150 | | FR944 | | 2013 (914) | WS61 | — | B48M28F4916CU |
| 225 | | FR945 | | 3043 (1382) | WS62 | — | B48M28F2216CU |
| 300 | | Contact local Eaton representative | | | | | B48M28F3316CU |
| 500 | | | | | | | B48M28F5516CU |
| 15 | 80 | FR940 | 283B | 434 (197) | WS58 | WMB05 | B48M28B1516CU |
| 30 | | FR940 | | 507 (230) | WS58 | WMB05 | B48M28B3016CU |
| 45 | | FR942 | | 703 (319) | WS59 | WMB04 | B48M28B4516CU |
| 75 | | FR943 | | 1112 (505) | WS60 | WMB04 | B48M28B7516CU |
| 112.5 | | FR944 | | 1927 (875) | WS61 | — | B48M28B1216CU |
| 150 | | FR945 | | 2013 (914) | WS61 | — | B48M28B4916CU |
| 225 | | FR945 | | 3345 (1519) | WS62 | — | B48M28B2216CU |
| 300 | | Contact local Eaton representative | | | | | B48M28B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

2

K-9 480 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR940 | 283B | 452 (205) | WS58 | WMB05 | B48M47T1516CU |
| 30 | | FR940 | | 504 (229) | WS58 | WMB05 | B48M47T3016CU |
| 45 | | FR942 | | 691 (314) | WS59 | WMB04 | B48M47T4516CU |
| 75 | | FR943 | | 1171 (532) | WS60 | WMB04 | B48M47T7516CU |
| 112.5 | | FR943 | | 1495 (679) | WS60 | WMB04 | B48M47T1216CU |
| 150 | | FR944 | | 2239 (1016) | WS61 | — | B48M47T4916CU |
| 225 | | FR945 | | 2759 (1253) | WS62 | — | B48M47T2216CU |
| 300 | | FR924 | | 3400 (1544) | WS40 | — | B48M47T3316CU |
| 500 | | Contact local Eaton representative | | | | | B48M47T5516CU |
| 15 | 115 | FR940 | 283B | 418 (190) | WS58 | WMB05 | B48M47F1516CU |
| 30 | | FR940 | | 502 (228) | WS58 | WMB05 | B48M47F3016CU |
| 45 | | FR942 | | 691 (314) | WS59 | WMB04 | B48M47F4516CU |
| 75 | | FR943 | | 1171 (532) | WS60 | WMB04 | B48M47F7516CU |
| 112.5 | | FR944 | | 2258 (1025) | WS61 | — | B48M47F1216CU |
| 150 | | FR944 | | 2114 (960) | WS61 | — | B48M47F4916CU |
| 225 | | FR945 | | 3195 (1451) | WS62 | — | B48M47F2216CU |
| 300 | | Contact local Eaton representative | | | | | B48M28F3316CU |
| 500 | | | | | | | B48M28F5516CU |
| 15 | 80 | FR940 | 283B | 456 (207) | WS58 | WMB05 | B48M47B1516CU |
| 30 | | FR940 | | 532 (242) | WS58 | WMB05 | B48M47B3016CU |
| 45 | | FR942 | | 738 (335) | WS59 | WMB04 | B48M47B4516CU |
| 75 | | FR943 | | 1168 (530) | WS60 | WMB04 | B48M47B7516CU |
| 112.5 | | FR944 | | 2023 (919) | WS61 | — | B48M47B1216CU |
| 150 | | FR945 | | 3195 (1451) | WS61 | — | B48M47B4916CU |
| 225 | | FR945 | | 3512 (1595) | WS62 | — | B48M47B2216CU |
| 300 | | Contact local Eaton representative | | | | | B48M28B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

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DOE 2016 Energy-Efficient K-Factor Rated Transformers

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

K-9 600 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------------|----------------------|
| 15 | 150 | FR940 | 283E | 452 (205) | WS58 | WMB05 | B60M28T1516CU | |
| 30 | | FR940 | | 504 (229) | WS58 | WMB05 | B60M28T3016CU | |
| 45 | | FR942 | | 691 (314) | WS59 | WMB04 | B60M28T4516CU | |
| 75 | | FR943 | | 1171 (532) | WS60 | WMB04 | B60M28T7516CU | |
| 112.5 | | FR943 | | 1495 (679) | WS60 | WMB04 | B60M28T1216CU | |
| 150 | | FR944 | | 2239 (1016) | WS61 | — | B60M28T4916CU | |
| 225 | | FR945 | | 2759 (1253) | WS62 | — | B60M28T2216CU | |
| 300 | | FR924 | | 3400 (1544) | WS40 | — | B60M28T3316CU | |
| 500 | | Contact local Eaton representative | | | | | | B60M28T5516CU |
| 15 | 115 | FR940 | 283E | 418 (190) | WS58 | WMB05 | B60M28F1516CU | |
| 30 | | FR940 | | 502 (228) | WS58 | WMB05 | B60M28F3016CU | |
| 45 | | FR942 | | 691 (314) | WS59 | WMB04 | B60M28F4516CU | |
| 75 | | FR943 | | 1171 (532) | WS60 | WMB04 | B60M28F7516CU | |
| 112.5 | | FR944 | | 2258 (1025) | WS61 | — | B60M28F1216CU | |
| 150 | | FR944 | | 2114 (960) | WS61 | — | B60M28F4916CU | |
| 225 | | FR945 | | 3195 (1451) | WS62 | — | B60M28F2216CU | |
| 300 | | Contact local Eaton representative | | | | | | B60M28F3316CU |
| 500 | | | | | | | | B60M28F5516CU |
| 15 | 80 | FR940 | 283E | 456 (207) | WS58 | WMB05 | B60M28B1516CU | |
| 30 | | FR940 | | 532 (242) | WS58 | WMB05 | B60M28B3016CU | |
| 45 | | FR942 | | 738 (335) | WS59 | WMB04 | B60M28B4516CU | |
| 75 | | FR943 | | 1168 (530) | WS60 | WMB04 | B60M28B7516CU | |
| 112.5 | | FR944 | | 2023 (919) | WS61 | — | B60M28B1216CU | |
| 150 | | FR945 | | 3195 (1451) | WS61 | — | B60M28B4916CU | |
| 225 | | FR945 | | 3512 (1595) | WS62 | — | B60M28B2216CU | |
| 300 | | Contact local Eaton representative | | | | | | B60M28B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

K-9 600 Delta Volts to 480Y/277 Volts

2

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | FR940 | 283E | 452 (205) | WS58 | WMB05 | B60M47T1516CU |
| 30 | | FR940 | | 504 (229) | WS58 | WMB05 | B60M47T3016CU |
| 45 | | FR942 | | 691 (314) | WS59 | WMB04 | B60M47T4516CU |
| 75 | | FR943 | | 1171 (532) | WS60 | WMB04 | B60M47T7516CU |
| 112.5 | | FR943 | | 1495 (679) | WS60 | WMB04 | B60M47T1216CU |
| 150 | | FR944 | | 2239 (1016) | WS61 | — | B60M47T4916CU |
| 225 | | FR945 | | 2759 (1253) | WS62 | — | B60M47T2216CU |
| 300 | | FR924 | | 3400 (1544) | WS40 | — | B60M47T3316CU |
| 500 | | Contact local Eaton representative | | | | | B60M47T5516CU |
| 15 | 115 | FR940 | 283E | 418 (190) | WS58 | WMB05 | B60M47F1516CU |
| 30 | | FR940 | | 502 (228) | WS58 | WMB05 | B60M47F3016CU |
| 45 | | FR942 | | 691 (314) | WS59 | WMB04 | B60M47F4516CU |
| 75 | | FR943 | | 1171 (532) | WS60 | WMB04 | B60M47F7516CU |
| 112.5 | | FR944 | | 2258 (1025) | WS61 | — | B60M47F1216CU |
| 150 | | FR944 | | 2114 (960) | WS61 | — | B60M47F4916CU |
| 225 | | FR945 | | 3195 (1451) | WS62 | — | B60M47F2216CU |
| 300 | | Contact local Eaton representative | | | | | B60M47F3316CU |
| 500 | | | | | | | B60M47F5516CU |
| 15 | 80 | FR940 | 283E | 456 (207) | WS58 | WMB05 | B60M47B1516CU |
| 30 | | FR940 | | 532 (242) | WS58 | WMB05 | B60M47B3016CU |
| 45 | | FR942 | | 738 (335) | WS59 | WMB04 | B60M47B4516CU |
| 75 | | FR943 | | 1168 (530) | WS60 | WMB04 | B60M47B7516CU |
| 112.5 | | FR944 | | 2023 (919) | WS61 | — | B60M47B1216CU |
| 150 | | FR945 | | 3195 (1451) | WS61 | — | B60M47B4916CU |
| 225 | | FR945 | | 3512 (1595) | WS62 | — | B60M47B2216CU |
| 300 | | Contact local Eaton representative | | | | | B60M47B5516CU |

Notes

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings**K-13 480 Delta Volts to 208Y/120 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|--------------------|--------------------|
| 15 | 150 | FR940 | 283B | 406 (184) | WS58 | WMB05 | N48M28T1516 | |
| 30 | | FR940 | | 416 (189) | WS58 | WMB05 | N48M28T3016 | |
| 45 | | FR942 | | 594 (270) | WS59 | WMB04 | N48M28T4516 | |
| 75 | | FR943 | | 1012 (459) | WS60 | WMB04 | N48M28T7516 | |
| 112.5 | | FR943 | | 1297 (589) | WS60 | WMB04 | N48M28T1216 | |
| 150 | | FR944 | | 1425 (647) | WS61 | — | N48M28T4916 | |
| 225 | | FR945 | | 2341 (1063) | WS62 | — | N48M28T2216 | |
| 300 | | Contact local Eaton representative | | | | | | N48M28T3316 |
| 500 | | | | | | | | N48M28T5516 |
| 15 | 115 | FR940 | 283B | 412 (187) | WS58 | WMB05 | N48M28F1516 | |
| 30 | | FR940 | | 437 (198) | WS58 | WMB05 | N48M28F3016 | |
| 45 | | FR942 | | 619 (281) | WS59 | WMB04 | N48M28F4516 | |
| 75 | | FR943 | | 977 (444) | WS60 | WMB04 | N48M28F7516 | |
| 112.5 | | FR944 | | 1760 (799) | WS61 | — | N48M28F1216 | |
| 150 | | FR944 | | 1682 (764) | WS61 | — | N48M28F4916 | |
| 225 | | FR924 | | 1927 (875) | WS40 | — | N48M28F2216 | |
| 300 | | Contact local Eaton representative | | | | | | N48M28F3316 |
| 500 | | | | | | | | N48M28F5516 |
| 15 | 80 | FR940 | 283B | 420 (191) | WS58 | WMB05 | N48M28B1516 | |
| 30 | | FR940 | | 438 (199) | WS58 | WMB05 | N48M28B3016 | |
| 45 | | FR943 | | 927 (421) | WS60 | WMB04 | N48M28B4516 | |
| 75 | | FR943 | | 1098 (498) | WS60 | WMB04 | N48M28B7516 | |
| 112.5 | | FR944 | | 1939 (880) | WS61 | — | N48M28B1216 | |
| 150 | | FR945 | | 2400 (1090) | WS62 | — | N48M28B4916 | |
| 225 | | Contact local Eaton representative | | | | | | N48M28B2216 |
| 300 | | | | | | | | N48M28B3316 |

Notes

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

K-13 480 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|-------------|
| 15 | 150 | FR940 | 283B | 426 (194) | WS58 | WMB05 | N48M47T1516 | |
| 30 | | FR940 | | 437 (198) | WS58 | WMB05 | N48M47T3016 | |
| 45 | | FR942 | | 624 (283) | WS59 | WMB04 | N48M47T4516 | |
| 75 | | FR943 | | 1063 (482) | WS60 | WMB04 | N48M47T7516 | |
| 112.5 | | FR943 | | 1362 (618) | WS60 | WMB04 | N48M47T1216 | |
| 150 | | FR944 | | 1496 (679) | WS61 | — | N48M47T4916 | |
| 225 | | FR945 | | 2458 (1116) | WS62 | — | N48M47T2216 | |
| 300 | | Contact local Eaton representative | | | | | | N48M47T3316 |
| 500 | | | | | | | | N48M47T5516 |
| 15 | 115 | FR940 | 283B | 433 (196) | WS58 | WMB05 | N48M47F1516 | |
| 30 | | FR940 | | 459 (208) | WS58 | WMB05 | N48M47F3016 | |
| 45 | | FR942 | | 650 (295) | WS59 | WMB04 | N48M47F4516 | |
| 75 | | FR943 | | 1026 (466) | WS60 | WMB04 | N48M47F7516 | |
| 112.5 | | FR944 | | 1848 (839) | WS61 | — | N48M47F1216 | |
| 150 | | FR944 | | 1766 (802) | WS61 | — | N48M47F4916 | |
| 225 | | FR924 | | 2023 (919) | WS40 | — | N48M47F2216 | |
| 300 | | Contact local Eaton representative | | | | | | N48M47F3316 |
| 500 | | | | | | | | N48M47F5516 |
| 15 | 80 | FR940 | 283B | 420 (191) | WS58 | WMB05 | N48M47B1516 | |
| 30 | | FR940 | | 457 (207) | WS58 | WMB05 | N48M47B3016 | |
| 45 | | FR943 | | 973 (442) | WS60 | WMB04 | N48M47B4516 | |
| 75 | | FR943 | | 1153 (523) | WS60 | WMB04 | N48M47B7516 | |
| 112.5 | | FR944 | | 1939 (880) | WS61 | — | N48M47B1216 | |
| 150 | | FR945 | | 2537 (1152) | WS62 | — | N48M47B4916 | |
| 225 | | Contact local Eaton representative | | | | | | N48M47B2216 |
| 300 | | | | | | | | N48M47B3316 |

Notes

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DOE 2016 Energy-Efficient K-Factor Rated Transformers

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings**K-13 600 Delta Volts to 208Y/120 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|--------------------|--------------------|
| 15 | 150 | FR940 | 283E | 426 (194) | WS58 | WMB05 | N60M28T1516 | |
| 30 | | FR940 | | 437 (198) | WS58 | WMB05 | N60M28T3016 | |
| 45 | | FR942 | | 624 (283) | WS59 | WMB04 | N60M28T4516 | |
| 75 | | FR943 | | 1063 (482) | WS60 | WMB04 | N60M28T7516 | |
| 112.5 | | FR943 | | 1362 (618) | WS60 | WMB04 | N60M28T1216 | |
| 150 | | FR944 | | 1496 (679) | WS61 | — | N60M28T4916 | |
| 225 | | FR945 | | 2458 (1116) | WS62 | — | N60M28T2216 | |
| 300 | | Contact local Eaton representative | | | | | | N60M28T3316 |
| 500 | | | | | | | | N60M28T5516 |
| 15 | 115 | FR940 | 283E | 433 (196) | WS58 | WMB05 | N60M28F1516 | |
| 30 | | FR940 | | 459 (208) | WS58 | WMB05 | N60M28F3016 | |
| 45 | | FR942 | | 650 (295) | WS59 | WMB04 | N60M28F4516 | |
| 75 | | FR943 | | 1026 (466) | WS60 | WMB04 | N60M28F7516 | |
| 112.5 | | FR944 | | 1848 (839) | WS61 | — | N60M28F1216 | |
| 150 | | FR944 | | 1766 (802) | WS61 | — | N60M28F4916 | |
| 225 | | FR924 | | 2023 (919) | WS40 | — | N60M28F2216 | |
| 300 | | Contact local Eaton representative | | | | | | N60M28F3316 |
| 500 | | | | | | | | N60M28F5516 |
| 15 | 80 | FR940 | 283E | 420 (191) | WS58 | WMB05 | N60M28B1516 | |
| 30 | | FR940 | | 457 (207) | WS58 | WMB05 | N60M28B3016 | |
| 45 | | FR943 | | 973 (442) | WS60 | WMB04 | N60M28B4516 | |
| 75 | | FR943 | | 1153 (523) | WS60 | WMB04 | N60M28B7516 | |
| 112.5 | | FR944 | | 1939 (880) | WS61 | — | N60M28B1216 | |
| 150 | | FR945 | | 2537 (1152) | WS62 | — | N60M28B4916 | |
| 225 | | Contact local Eaton representative | | | | | | N60M28B2216 |
| 300 | | | | | | | | N60M28B3316 |

Notes

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

2

K-13 600 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|-------------|
| 15 | 150 | FR940 | 283E | 426 (194) | WS58 | WMB05 | N60M47T1516 | |
| 30 | | FR940 | | 437 (198) | WS58 | WMB05 | N60M47T3016 | |
| 45 | | FR942 | | 624 (283) | WS59 | WMB04 | N60M47T4516 | |
| 75 | | FR943 | | 1063 (482) | WS60 | WMB04 | N60M47T7516 | |
| 112.5 | | FR943 | | 1362 (618) | WS60 | WMB04 | N60M47T1216 | |
| 150 | | FR944 | | 1496 (679) | WS61 | — | N60M47T4916 | |
| 225 | | FR945 | | 2458 (1116) | WS62 | — | N60M47T2216 | |
| 300 | | Contact local Eaton representative | | | | | | N60M47T3316 |
| 500 | | | | | | | | N60M47T5516 |
| 15 | 115 | FR940 | 283E | 433 (196) | WS58 | WMB05 | N60M47F1516 | |
| 30 | | FR940 | | 459 (208) | WS58 | WMB05 | N60M47F3016 | |
| 45 | | FR942 | | 650 (295) | WS59 | WMB04 | N60M47F4516 | |
| 75 | | FR943 | | 1026 (466) | WS60 | WMB04 | N60M47F7516 | |
| 112.5 | | FR944 | | 1848 (839) | WS61 | — | N60M47F1216 | |
| 150 | | FR944 | | 1766 (802) | WS61 | — | N60M47F4916 | |
| 225 | | Contact local Eaton representative | | | | | | N60M47F2216 |
| 300 | | | | | | | | N60M47F3316 |
| 500 | | | | | | | | N60M47F5516 |
| 15 | 80 | FR940 | 283E | 420 (191) | WS58 | WMB05 | N60M47B1516 | |
| 30 | | FR940 | | 457 (207) | WS58 | WMB05 | N60M47B3016 | |
| 45 | | FR943 | | 973 (442) | WS60 | WMB04 | N60M47B4516 | |
| 75 | | FR943 | | 1153 (523) | WS60 | WMB04 | N60M47B7516 | |
| 112.5 | | FR944 | | 1939 (880) | WS61 | — | N60M47B1216 | |
| 150 | | FR945 | | 2537 (1152) | WS62 | — | N60M47B4916 | |
| 225 | | Contact local Eaton representative | | | | | | N60M47B2216 |
| 300 | | | | | | | | N60M47B3316 |

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings**K-13 480 Delta Volts to 208Y/120 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|---------------|
| 15 | 150 | FR940 | 283B | 430 (195) | WS58 | WMB05 | N48M28T1516CU | |
| 30 | | FR940 | | 480 (218) | WS58 | WMB05 | N48M28T3016CU | |
| 45 | | FR942 | | 658 (299) | WS59 | WMB04 | N48M28T4516CU | |
| 75 | | FR943 | | 1115 (506) | WS60 | WMB04 | N48M28T7516CU | |
| 112.5 | | FR943 | | 1424 (646) | WS60 | WMB04 | N48M28T1216CU | |
| 150 | | FR944 | | 2132 (968) | WS61 | — | N48M28T4916CU | |
| 225 | | FR945 | | 2628 (1193) | WS62 | — | N48M28T2216CU | |
| 300 | | Contact local Eaton representative | | | | | | N48M28T3316CU |
| 500 | | | | | | | | N48M28T5516CU |
| 15 | 115 | FR940 | 283B | 398 (181) | WS58 | WMB05 | N48M28F1516CU | |
| 30 | | FR940 | | 478 (217) | WS58 | WMB05 | N48M28F3016CU | |
| 45 | | FR942 | | 658 (299) | WS59 | WMB04 | N48M28F4516CU | |
| 75 | | FR943 | | 1115 (506) | WS60 | WMB04 | N48M28F7516CU | |
| 112.5 | | FR944 | | 2150 (976) | WS61 | — | N48M28F1216CU | |
| 150 | | FR944 | | 2013 (914) | WS61 | — | N48M28F4916CU | |
| 225 | | FR945 | | 3043 (1382) | WS62 | — | N48M28F2216CU | |
| 300 | | Contact local Eaton representative | | | | | | N48M28F3316CU |
| 500 | | | | | | | | N48M28F5516CU |
| 15 | 80 | FR940 | 283B | 434 (197) | WS58 | WMB05 | N48M28B1516CU | |
| 30 | | FR940 | | 507 (230) | WS58 | WMB05 | N48M28B3016CU | |
| 45 | | FR942 | | 703 (319) | WS59 | WMB04 | N48M28B4516CU | |
| 75 | | FR943 | | 1112 (505) | WS60 | WMB04 | N48M28B7516CU | |
| 112.5 | | FR944 | | 1927 (875) | WS61 | — | N48M28B1216CU | |
| 150 | | FR945 | | 3043 (1382) | | — | N48M28B4916CU | |
| 225 | | Contact local Eaton representative | | | | | | N48M28B2216CU |
| 300 | | | | | | | | N48M28B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

K-13 480 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|--|
| 15 | 150 | FR940 | 283B | 452 (205) | WS58 | WMB05 | N48M47T1516CU | |
| 30 | | FR940 | | 504 (229) | WS58 | WMB05 | N48M47T3016CU | |
| 45 | | FR942 | | 691 (314) | WS59 | WMB04 | N48M47T4516CU | |
| 75 | | FR943 | | 1171 (532) | WS60 | WMB04 | N48M47T7516CU | |
| 112.5 | | FR943 | | 1495 (679) | WS60 | WMB04 | N48M47T1216CU | |
| 150 | | FR944 | | 2239 (1016) | WS61 | — | N48M47T4916CU | |
| 225 | | FR945 | | 2759 (1253) | WS62 | — | N48M47T2216CU | |
| 300 | | Contact local Eaton representative | | | | | N48M47T3316CU | |
| 500 | | | | | | N48M47T5516CU | | |
| 15 | 115 | FR940 | 283B | 418 (190) | WS58 | WMB05 | N48M47F1516CU | |
| 30 | | FR940 | | 502 (228) | WS58 | WMB05 | N48M47F3016CU | |
| 45 | | FR942 | | 691 (314) | WS59 | WMB04 | N48M47F4516CU | |
| 75 | | FR943 | | 1171 (532) | WS60 | WMB04 | N48M47F7516CU | |
| 112.5 | | FR944 | | 2258 (1025) | WS61 | — | N48M47F1216CU | |
| 150 | | FR944 | | 2114 (960) | WS61 | — | N48M47F4916CU | |
| 225 | | Contact local Eaton representative | | | | | N48M47F2216CU | |
| 300 | | | | | | | N48M47F3316CU | |
| 500 | | | | | | N48M47F5516CU | | |
| 15 | 80 | FR940 | 283B | 456 (207) | WS58 | WMB05 | N48M47B1516CU | |
| 30 | | FR940 | | 532 (242) | WS58 | WMB05 | N48M47B3016CU | |
| 45 | | FR942 | | 738 (335) | WS59 | WMB04 | N48M47B4516CU | |
| 75 | | FR943 | | 1168 (530) | WS60 | WMB04 | N48M47B7516CU | |
| 112.5 | | FR944 | | 2023 (919) | WS61 | — | N48M47B1216CU | |
| 150 | | FR945 | | 3195 (1451) | WS61 | — | N48M47B4916CU | |
| 225 | | Contact local Eaton representative | | | | | N48M47B2216CU | |
| 300 | | | | | | | N48M47B3316CU | |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

DOE 2016 Energy-Efficient K-Factor Rated Transformers

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

K-13 600 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|---------------|
| 15 | 150 | FR940 | 283E | 452 (205) | WS58 | WMB05 | N60M28T1516CU | |
| 30 | | FR940 | | 504 (229) | WS58 | WMB05 | N60M28T3016CU | |
| 45 | | FR942 | | 691 (314) | WS59 | WMB04 | N60M28T4516CU | |
| 75 | | FR943 | | 1171 (532) | WS60 | WMB04 | N60M28T7516CU | |
| 112.5 | | FR943 | | 1495 (679) | WS60 | WMB04 | N60M28T1216CU | |
| 150 | | FR945 | | 2239 (1016) | WS61 | — | N60M28T4916CU | |
| 225 | | FR945 | | 2759 (1253) | WS62 | — | N60M28T2216CU | |
| 300 | | FR924 | | 3400 (1544) | WS40 | — | N60M28T3316CU | |
| 500 | | Contact local Eaton representative | | | | | | N60M28T5516CU |
| 15 | 115 | FR940 | 283E | 418 (190) | WS58 | WMB05 | N60M28F1516CU | |
| 30 | | FR940 | | 502 (228) | WS58 | WMB05 | N60M28F3016CU | |
| 45 | | FR942 | | 691 (314) | WS59 | WMB04 | N60M28F4516CU | |
| 75 | | FR943 | | 1171 (532) | WS60 | WMB04 | N60M28F7516CU | |
| 112.5 | | FR944 | | 2258 (1025) | WS61 | — | N60M28F1216CU | |
| 150 | | FR944 | | 2114 (960) | WS61 | — | N60M28F4916CU | |
| 225 | | FR945 | | 3195 (1451) | WS62 | — | N60M28F2216CU | |
| 300 | | Contact local Eaton representative | | | | | | N60M28F3316CU |
| 500 | | | | | | | | N60M28F5516CU |
| 15 | 80 | FR940 | 283E | 456 (207) | WS58 | WMB05 | N60M28B1516CU | |
| 30 | | FR940 | | 532 (242) | WS58 | WMB05 | N60M28B3016CU | |
| 45 | | FR942 | | 738 (335) | WS59 | WMB04 | N60M28B4516CU | |
| 75 | | FR943 | | 1168 (530) | WS60 | WMB04 | N60M28B7516CU | |
| 112.5 | | FR944 | | 2023 (919) | WS61 | — | N60M28B1216CU | |
| 150 | | FR945 | | 3195 (1451) | WS61 | — | N60M28B4916CU | |
| 225 | | FR945 | | 3512 (1595) | WS62 | — | N60M28B2216CU | |
| 300 | | Contact local Eaton representative | | | | | | N60M28B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

2

K-13 600 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|---------------|
| 15 | 150 | FR940 | 283E | 452 (205) | WS58 | WMB05 | N60M47T1516CU | |
| 30 | | FR940 | | 504 (229) | WS58 | WMB05 | N60M47T3016CU | |
| 45 | | FR942 | | 691 (314) | WS59 | WMB04 | N60M47T4516CU | |
| 75 | | FR943 | | 1171 (532) | WS60 | WMB04 | N60M47T7516CU | |
| 112.5 | | FR943 | | 1495 (679) | WS60 | WMB04 | N60M47T1216CU | |
| 150 | | FR945 | | 2239 (1016) | WS61 | — | N60M47T4916CU | |
| 225 | | FR945 | | 2759 (1253) | WS62 | — | N60M47T2216CU | |
| 300 | | Contact local Eaton representative | | | | | | N60M47T3316CU |
| 500 | | | | | | | | N60M47T5516CU |
| 15 | 115 | FR940 | 283E | 418 (190) | WS58 | WMB05 | N60M47F1516CU | |
| 30 | | FR940 | | 502 (228) | WS58 | WMB05 | N60M47F3016CU | |
| 45 | | FR942 | | 691 (314) | WS59 | WMB04 | N60M47F4516CU | |
| 75 | | FR943 | | 1171 (532) | WS60 | WMB04 | N60M47F7516CU | |
| 112.5 | | FR944 | | 2258 (1025) | WS61 | — | N60M47F1216CU | |
| 150 | | FR944 | | 2114 (960) | WS61 | — | N60M47F4916CU | |
| 225 | | FR945 | | 3195 (1451) | WS62 | — | N60M47F2216CU | |
| 300 | | Contact local Eaton representative | | | | | | N60M47F3316CU |
| 500 | | | | | | | | N60M47F5516CU |
| 15 | 80 | FR940 | 283E | 456 (207) | WS58 | WMB05 | N60M47B1516CU | |
| 30 | | FR940 | | 532 (242) | WS58 | WMB05 | N60M47B3016CU | |
| 45 | | FR942 | | 738 (335) | WS59 | WMB04 | N60M47B4516CU | |
| 75 | | FR943 | | 1168 (530) | WS60 | WMB04 | N60M47B7516CU | |
| 112.5 | | FR944 | | 2023 (919) | WS61 | — | N60M47B1216CU | |
| 150 | | FR945 | | 3195 (1451) | WS61 | — | N60M47B4916CU | |
| 225 | | FR945 | | 3512 (1595) | WS62 | — | N60M47B2216CU | |
| 300 | | Contact local Eaton representative | | | | | | N60M47B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings**K-20 480 Delta Volts to 208Y/120 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | Contact local Eaton representative | | | | | G48M28T1516 |
| 30 | | | | | | | G48M28T3016 |
| 45 | | | | | | | G48M28T4516 |
| 75 | | | | | | | G48M28T7516 |
| 112.5 | | | | | | | G48M28T1216 |
| 150 | | | | | | | G48M28T4916 |
| 225 | | | | | | | G48M28T2216 |
| 300 | | | | | | | G48M28T3316 |
| 500 | | | | | | | G48M28T5516 |
| 15 | | | | | | | 115 |
| 30 | G48M28F3016 | | | | | | |
| 45 | G48M28F4516 | | | | | | |
| 75 | G48M28F7516 | | | | | | |
| 112.5 | G48M28F1216 | | | | | | |
| 150 | G48M28F4916 | | | | | | |
| 225 | G48M28F2216 | | | | | | |
| 300 | G48M28F3316 | | | | | | |
| 500 | G48M28F5516 | | | | | | |
| 15 | 80 | Contact local Eaton representative | | | | | |
| 30 | | | | | | | G48M28B3016 |
| 45 | | | | | | | G48M28B4516 |
| 75 | | | | | | | G48M28B7516 |
| 112.5 | | | | | | | G48M28B1216 |
| 150 | | | | | | | G48M28B4916 |
| 225 | | | | | | | G48M28B2216 |
| 300 | | | | | | | G48M28B3316 |

Notes

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

2

K-20 480 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | Contact local Eaton representative | | | | | G48M47T1516 |
| 30 | | | | | | | G48M47T3016 |
| 45 | | | | | | | G48M47T4516 |
| 75 | | | | | | | G48M47T7516 |
| 112.5 | | | | | | | G48M47T1216 |
| 150 | | | | | | | G48M47T4916 |
| 225 | | | | | | | G48M47T2216 |
| 300 | | | | | | | G48M47T3316 |
| 500 | | | | | | | G48M47T5516 |
| 15 | 115 | Contact local Eaton representative | | | | | G48M47F1516 |
| 30 | | | | | | | G48M47F3016 |
| 45 | | | | | | | G48M47F4516 |
| 75 | | | | | | | G48M47F7516 |
| 112.5 | | | | | | | G48M47F1216 |
| 150 | | | | | | | G48M47F4916 |
| 225 | | | | | | | G48M47F2216 |
| 300 | | | | | | | G48M47F3316 |
| 500 | | | | | | | G48M47F5516 |
| 15 | 80 | Contact local Eaton representative | | | | | G48M47B1516 |
| 30 | | | | | | | G48M47B3016 |
| 45 | | | | | | | G48M47B4516 |
| 75 | | | | | | | G48M47B7516 |
| 112.5 | | | | | | | G48M47B1216 |
| 150 | | | | | | | G48M47B4916 |
| 225 | | | | | | | G48M47B2216 |
| 300 | | | | | | | G48M47B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings**K-20 600 Delta Volts to 208Y/120 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | Contact local Eaton representative | | | | | G60M28T1516 |
| 30 | | | | | | | G60M28T3016 |
| 45 | | | | | | | G60M28T4516 |
| 75 | | | | | | | G60M28T7516 |
| 112.5 | | | | | | | G60M28T1216 |
| 150 | | | | | | | G60M28T4916 |
| 225 | | | | | | | G60M28T2216 |
| 300 | | | | | | | G60M28T3316 |
| 500 | | | | | | | G60M28T5516 |
| 15 | | | | | | | 115 |
| 30 | G60M28F3016 | | | | | | |
| 45 | G60M28F4516 | | | | | | |
| 75 | G60M28F7516 | | | | | | |
| 112.5 | G60M28F1216 | | | | | | |
| 150 | G60M28F4916 | | | | | | |
| 225 | G60M28F2216 | | | | | | |
| 300 | G60M28F3316 | | | | | | |
| 500 | G60M28F5516 | | | | | | |
| 15 | 80 | Contact local Eaton representative | | | | | |
| 30 | | | | | | | G60M28B3016 |
| 45 | | | | | | | G60M28B4516 |
| 75 | | | | | | | G60M28B7516 |
| 112.5 | | | | | | | G60M28B1216 |
| 150 | | | | | | | G60M28B4916 |
| 225 | | | | | | | G60M28B2216 |
| 300 | | | | | | | G60M28B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

K-20 600 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | Contact local Eaton representative | | | | | G60M47T1516 |
| 30 | | | | | | | G60M47T3016 |
| 45 | | | | | | | G60M47T4516 |
| 75 | | | | | | | G60M47T7516 |
| 112.5 | | | | | | | G60M47T1216 |
| 150 | | | | | | | G60M47T4916 |
| 225 | | | | | | | G60M47T2216 |
| 300 | | | | | | | G60M47T3316 |
| 500 | | | | | | | G60M47T5516 |
| 15 | 115 | Contact local Eaton representative | | | | | G60M47F1516 |
| 30 | | | | | | | G60M47F3016 |
| 45 | | | | | | | G60M47F4516 |
| 75 | | | | | | | G60M47F7516 |
| 112.5 | | | | | | | G60M47F1216 |
| 150 | | | | | | | G60M47F4916 |
| 225 | | | | | | | G60M47F2216 |
| 300 | | | | | | | G60M47F3316 |
| 500 | | | | | | | G60M47F5516 |
| 15 | 80 | Contact local Eaton representative | | | | | G60M47B1516 |
| 30 | | | | | | | G60M47B3016 |
| 45 | | | | | | | G60M47B4516 |
| 75 | | | | | | | G60M47B7516 |
| 112.5 | | | | | | | G60M47B1216 |
| 150 | | | | | | | G60M47B4916 |
| 225 | | | | | | | G60M47B2216 |
| 300 | | | | | | | G60M47B3316 |

Notes

① Frames (dimensions and weights) subject to revision.

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings**K-20 480 Delta Volts to 208Y/120 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | Contact local Eaton representative | | | | | G48M28T1516CU |
| 30 | | | | | | | G48M28T3016CU |
| 45 | | | | | | | G48M28T4516CU |
| 75 | | | | | | | G48M28T7516CU |
| 112.5 | | | | | | | G48M28T1216CU |
| 150 | | | | | | | G48M28T4916CU |
| 225 | | | | | | | G48M28T2216CU |
| 300 | | | | | | | G48M28T3316CU |
| 500 | | | | | | | G48M28T5516CU |
| 15 | | | | | | | 115 |
| 30 | G48M28F3016CU | | | | | | |
| 45 | G48M28F4516CU | | | | | | |
| 75 | G48M28F7516CU | | | | | | |
| 112.5 | G48M28F1216CU | | | | | | |
| 150 | G48M28F4916CU | | | | | | |
| 225 | G48M28F2216CU | | | | | | |
| 300 | G48M28F3316CU | | | | | | |
| 500 | G48M28F5516CU | | | | | | |
| 15 | 80 | Contact local Eaton representative | | | | | |
| 30 | | | | | | | G48M28B3016CU |
| 45 | | | | | | | G48M28B4516CU |
| 75 | | | | | | | G48M28B7516CU |
| 112.5 | | | | | | | G48M28B1216CU |
| 150 | | | | | | | G48M28B4916CU |
| 225 | | | | | | | G48M28B2216CU |
| 300 | | | | | | | G48M28B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

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Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

K-20 480 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | Contact local Eaton representative | | | | | G48M47T1516CU |
| 30 | | | | | | | G48M47T3016CU |
| 45 | | | | | | | G48M47T4516CU |
| 75 | | | | | | | G48M47T7516CU |
| 112.5 | | | | | | | G48M47T1216CU |
| 150 | | | | | | | G48M47T4916CU |
| 225 | | | | | | | G48M47T2216CU |
| 300 | | | | | | | G48M47T3316CU |
| 500 | | | | | | | G48M47T5516CU |
| 15 | | | | | | | 115 |
| 30 | G48M47F3016CU | | | | | | |
| 45 | G48M47F4516CU | | | | | | |
| 75 | G48M47F7516CU | | | | | | |
| 112.5 | G48M47F1216CU | | | | | | |
| 150 | G48M47F4916CU | | | | | | |
| 225 | G48M47F2216CU | | | | | | |
| 300 | G48M47F3316CU | | | | | | |
| 500 | G48M47F5516CU | | | | | | |
| 15 | 80 | Contact local Eaton representative | | | | | |
| 30 | | | | | | | G48M47B3016CU |
| 45 | | | | | | | G48M47B4516CU |
| 75 | | | | | | | G48M47B7516CU |
| 112.5 | | | | | | | G48M47B1216CU |
| 150 | | | | | | | G48M47B4916CU |
| 225 | | | | | | | G48M47B2216CU |
| 300 | | | | | | | G48M47B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings**K-20 600 Delta Volts to 208Y/120 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | Contact local Eaton representative | | | | | G60M28T1516CU |
| 30 | | | | | | | G60M28T3016CU |
| 45 | | | | | | | G60M28T4516CU |
| 75 | | | | | | | G60M28T7516CU |
| 112.5 | | | | | | | G60M28T1216CU |
| 150 | | | | | | | G60M28T4916CU |
| 225 | | | | | | | G60M28T2216CU |
| 300 | | | | | | | G60M28T3316CU |
| 500 | | | | | | | G60M28T5516CU |
| 15 | | | | | | | 115 |
| 30 | G60M28F3016CU | | | | | | |
| 45 | G60M28F4516CU | | | | | | |
| 75 | G60M28F7516CU | | | | | | |
| 112.5 | G60M28F1216CU | | | | | | |
| 150 | G60M28F4916CU | | | | | | |
| 225 | G60M28F2216CU | | | | | | |
| 300 | G60M28F3316CU | | | | | | |
| 500 | G60M28F5516CU | | | | | | |
| 15 | 80 | Contact local Eaton representative | | | | | |
| 30 | | | | | | | G60M28B3016CU |
| 45 | | | | | | | G60M28B4516CU |
| 75 | | | | | | | G60M28B7516CU |
| 112.5 | | | | | | | G60M28B1216CU |
| 150 | | | | | | | G60M28B4916CU |
| 225 | | | | | | | G60M28B2216CU |
| 300 | | | | | | | G60M28B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase— K-Factor Rated 60 Hz DOE 2016 Energy-Efficient— Copper Windings

K-20 600 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) ① | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|------------------|----------------|-------------------|----------------|
| 15 | 150 | Contact local Eaton representative | | | | | G60M47T1516CU |
| 30 | | | | | | | G60M47T3016CU |
| 45 | | | | | | | G60M47T4516CU |
| 75 | | | | | | | G60M47T7516CU |
| 112.5 | | | | | | | G60M47T1216CU |
| 150 | | | | | | | G60M47T4916CU |
| 225 | | | | | | | G60M47T2216CU |
| 300 | | | | | | | G60M47T3316CU |
| 500 | | | | | | | G60M47T5516CU |
| 15 | | | | | | | 115 |
| 30 | G60M47F3016CU | | | | | | |
| 45 | G60M47F4516CU | | | | | | |
| 75 | G60M47F7516CU | | | | | | |
| 112.5 | G60M47F1216CU | | | | | | |
| 150 | G60M47F4916CU | | | | | | |
| 225 | G60M47F2216CU | | | | | | |
| 300 | G60M47F3316CU | | | | | | |
| 500 | G60M47F5516CU | | | | | | |
| 15 | 80 | Contact local Eaton representative | | | | | |
| 30 | | | | | | | G60M47B3016CU |
| 45 | | | | | | | G60M47B4516CU |
| 75 | | | | | | | G60M47B7516CU |
| 112.5 | | | | | | | G60M47B1216CU |
| 150 | | | | | | | G60M47B4916CU |
| 225 | | | | | | | G60M47B2216CU |
| 300 | | | | | | | G60M47B3316CU |

Notes

① Frames (dimensions and weights) subject to revision.

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Accessories

Please refer to Section 2.7 **Page V2-T2-167**.

Technical Data and Specifications

Frequency

Eaton standard low-voltage dry-type distribution transformers are designed for 60 Hz operation. Transformers required for other frequencies are available and must be specifically designed.

Overload Capability

Short-term overload is designed into transformers as required by ANSI. Low-voltage dry-type distribution transformers will deliver 200% nameplate load for one-half hour, 150% load for one hour, and 125% load for four hours without being damaged, provided that a constant 50% load precedes and follows the overload. See ANSI C57.96-01.250 for additional limitations.

Continuous overload capacity is not deliberately designed into a transformer because the design objective is to be within the allowed winding temperature rise with nameplate loading.

Electrostatic Shielding

There are no industry standards for electrostatic shield performance. Eaton-manufactured transformers have been tested by an independent laboratory to meet the following attenuation levels:

- When tested per MIL-Std-220A, Method of Insertion Loss Measurement, with matched impedance no load technique:
 - Common mode noise attenuation:
 - Minus 80 dBA minimum at 0.1 kHz to 1.5 kHz; minus 55 dBA minimum at 1.51 kHz to 100 kHz
 - Normal mode (Transverse mode) noise attenuation:
 - Minus 35 dBA minimum at 1.5 kHz to 10 kHz

- Primary to Secondary Capacitance of 24.74–18.06 picofarads on the range 100–20 kHz

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Insulation System Classification

| Ambient | + Winding Rise | + Hot Spot | = Temp. Class |
|---------|----------------|------------|---------------|
| 40°C | 55°C | 10°C | 105°C |
| 40°C | 80°C | 30°C | 150°C |
| 25°C | 135°C | 20°C | 180°C |
| 40°C | 115°C | 30°C | 185°C |
| 40°C | 150°C | 30°C | 220°C |

The design life of transformers having different insulation systems is the same—the lower-temperature systems are designed for the same life as the higher-temperature systems.

Enclosures

Eaton ventilated transformers, Type KT, use a NEMA 2 rated (drip-proof) enclosure as standard, and are rated NEMA 3R with the addition of weathershields. Transformers manufactured in enclosures 939, 940, 942, 943, 944 and 945 are UL Listed to be installed indoors (without weathershields) with just 2 inches clearance on the sides and behind the transformer.

Winding Terminations

Primary and secondary windings are terminated in the wiring compartment. Ventilating transformers have leads brought out to aluminum pads that are pre-drilled to accept Cu/Al lugs.

Lugs are not supplied with these transformers. Eaton recommends that external cables be rated 75°C for ventilated designs.

Sound Levels

All Eaton 600 volt class general-purpose low-voltage dry-type distribution transformers are designed to meet NEMA ST-20 sound levels listed here. These are the sound levels measured in a soundproof environment. Actual sound levels measured at an installation will likely be higher due to electrical connections and environmental conditions.

Lower sound levels are available and should be specified when the transformer is going to be installed in an area where sound may be a concern.

For additional information, please refer to Section 2.7 **Page V2-T2-171**.

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilated (up to 1.2 kV) | | Encapsulated (up to 1.2 kV) |
|------------------------------|---------------------------------------|-----------------|-----------------------------|
| | K-Factor 1, 4, 9 | K-Factor 13, 20 | |
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Note

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Harmonic Mitigating Transformer

2



Product Description

Note: The following pages provide listings for most standard transformer ratings and catalog numbers. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

The electrical transformer has been a staple of electrical power systems for the past 100+ years. While the types of electrical loads that are being added to our systems today have radically changed, the transformer has stayed relatively the same in design during this time frame. Eaton’s harmonic mitigating transformer (HMT) represents the evolution of the transformer into something that will best provide clean, energy-efficient electricity to power the loads of today and tomorrow. The recent shift of our electrical loads from predominately AC consumers (resistive heating elements, incandescent lighting, three-phase motor load) to DC consumers (such as computers, fax machines,

printers, down to the “wall-wart” that recharges the cell phone) requires that our electrical infrastructure changes as well. These new loads now introduce other currents and frequencies into our electrical power systems—commonly known as “harmonics.” Harmonic currents can cause additional heating, which may cause transformers, generators and conductors to become overloaded. Excessive heat is one of the major reasons that standard transformers and conductors fail prematurely. These harmonic currents have various other effects (such as “loss of ride-through capability,” reduced lifespan and mysterious misoperation of equipment) on the components and loads of an electrical distribution system. Eaton’s HMTs, when used properly within an electrical system, will help keep the loads operating the way the manufacturer designed them and keep the facility’s electrical system free from voltage distortion.

Contents

Description

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| Standards and Certifications | V2-T2-65 |
| Catalog Number Selection | V2-T2-66 |
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| Technical Data and Specifications | V2-T2-75 |

Three-Phase, Type DT-3 HMT, 60 Hz

- Harmonic mitigating (cancellation) transformers are a cost-effective means of treating harmful harmonics in an electrical distribution system
- Reducing harmonic content in electrical systems can result in a more reliable electrical system, lower maintenance costs, less downtime, fewer equipment malfunctions, and lower cooling system capacity
- Available in a variety of phase-shift configurations that allow flexibility to target specific families of harmonics
- Harmonic treatment via electromagnetic flux cancellation
- May be installed as a stand-alone transformer, or included in IFS™
- Available in three-phase ratings, 15–500 kVA, up to 600 volts primary

Features and Benefits

- 480 volt to 208/120 volt standard. Additional voltage combinations available
- 150°C, 115°C or 80°C temperature rise available
- Aluminum windings and terminals standard; copper available
- 200% rated neutral
- Single electrostatic shield for attenuation of common mode and transverse mode noise
- Approximately 98% efficient when operated in systems with 100% nonlinear load profiles
- 220°C insulation system
- Third-party tested for harmonic performance and energy efficiency
- Meet NEMA ST-20 sound standards
- Eliminate circulating harmonic currents in primary windings of transformers
- Enclosures are NEMA 2 drip-proof. The addition of optional weather-shields makes the enclosure NEMA 3R rainproof
- Harmonic cancellation via electromagnetic flux cancellation. Filters, capacitors or other such devices are not used
- Help meet IEEE 519 harmonic limits

Standards and Certifications

- UL listed



Industry Standards

All Eaton low-voltage dry-type transformers are built and tested in accordance with applicable NEMA, ANSI and IEEE standards. Harmonic mitigating transformers are UL listed.

IEEE 519-1992

Proper use of Eaton's harmonic mitigating transformers within your electrical system will help you to meet the harmonic distortion limits as proposed by IEEE 519-1992, "IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems."

Seismic Qualified

Eaton low-voltage dry-type distribution transformers are seismically qualified and exceed the requirements of the Uniform Building Code (UBC), International Building Code (IBC) and California Code Title 24.

2.3

Transformers

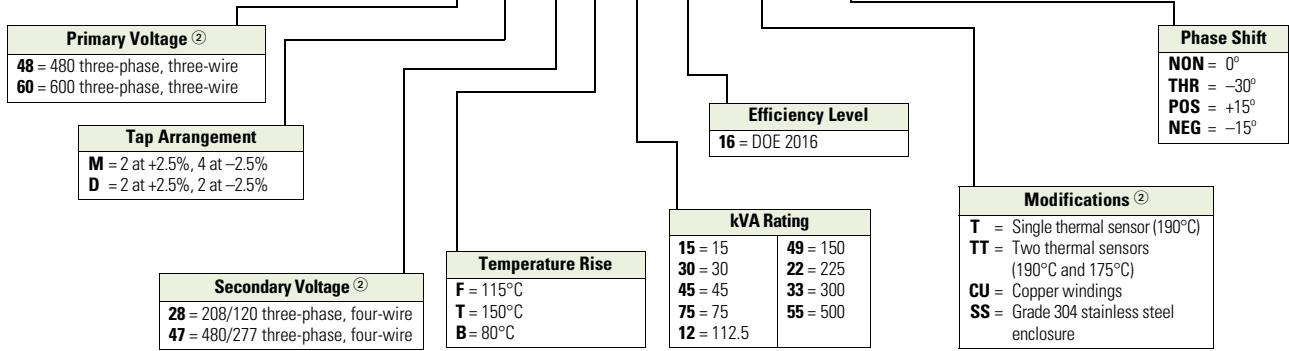
DOE 2016 Energy-Efficient Harmonic Mitigating Transformers

Catalog Number Selection ^①

DOE 2016 Energy-Efficient Harmonic Mitigating Transformers

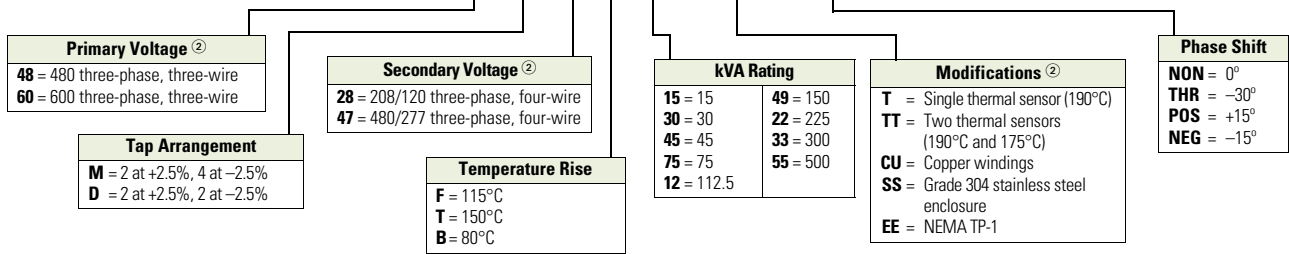
2

X 48 M 28 F 30 16 CUTT NEG



Harmonic Mitigating Transformers

X 48 M 28 F 30 TCUEE NEG



DOE 2016 Efficiency Levels

Dry-Type Distribution Transformers—Low-Voltage (600V and below)

Three-Phase

| kVA | Efficiency |
|-------|------------|
| 15 | 97.89 |
| 30 | 98.23 |
| 45 | 98.40 |
| 75 | 98.60 |
| 112.5 | 98.74 |
| 150 | 98.83 |
| 225 | 98.94 |
| 300 | 99.02 |
| 500 | 99.14 |
| 750 | 99.23 |
| 1000 | 99.28 |

Notes

- ① Do not use to create catalog numbers because all combinations may not be valid.
- ② The most common ratings are shown. Contact Eaton for availability of additional ratings.

Product Selection

Three-Phase—Harmonic Mitigating Transformers 60 Hz DOE 2016 Energy-Efficient—Aluminum Windings

480 Delta Volts to 208/120 Volts—Type NON 0° Phase Shift

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|
| 15 | 150 | Contact local Eaton representative | | | | | X48M28T1516NON |
| 30 | | | | | | | X48M28T3016NON |
| 45 | | | | | | | X48M28T4516NON |
| 75 | | | | | | | X48M28T7516NON |
| 112.5 | | | | | | | X48M28T1216NON |
| 150 | | | | | | | X48M28T4916NON |
| 225 | | | | | | | X48M28T2216NON |
| 300 | | | | | | | X48M28T3316NON |
| 500 | | | | | | | X48M28T5516NON |
| 15 | | | | | | | 115 |
| 30 | X48M28F3016NON | | | | | | |
| 45 | X48M28F4516NON | | | | | | |
| 75 | X48M28F7516NON | | | | | | |
| 112.5 | X48M28F1216NON | | | | | | |
| 150 | X48M28F4916NON | | | | | | |
| 225 | X48M28F2216NON | | | | | | |
| 300 | X48M28F3316NON | | | | | | |
| 500 | X48M28F5516NON | | | | | | |
| 15 | 80 | Contact local Eaton representative | | | | | |
| 30 | | | | | | | X48M28B3016NON |
| 45 | | | | | | | X48M28B4516NON |
| 75 | | | | | | | X48M28B7516NON |
| 112.5 | | | | | | | X48M28B1216NON |
| 150 | | | | | | | X48M28B4916NON |
| 225 | | | | | | | X48M28B2216NON |
| 300 | | | | | | | X48M28B3316NON |

Note

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Harmonic Mitigating Transformers 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

600 Delta Volts to 208/120 Volts—Type NON 0° Phase Shift

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|
| 15 | 150 | Contact local Eaton representative | | | | | X60M28T1516NON |
| 30 | | | | | | | X60M28T3016NON |
| 45 | | | | | | | X60M28T4516NON |
| 75 | | | | | | | X60M28T7516NON |
| 112.5 | | | | | | | X60M28T1216NON |
| 150 | | | | | | | X60M28T4916NON |
| 225 | | | | | | | X60M28T2216NON |
| 300 | | | | | | | X60M28T3316NON |
| 500 | | | | | | | X60M28T5516NON |
| 15 | 115 | Contact local Eaton representative | | | | | X60M28F1516NON |
| 30 | | | | | | | X60M28F3016NON |
| 45 | | | | | | | X60M28F4516NON |
| 75 | | | | | | | X60M28F7516NON |
| 112.5 | | | | | | | X60M28F1216NON |
| 150 | | | | | | | X60M28F4916NON |
| 225 | | | | | | | X60M28F2216NON |
| 300 | | | | | | | X60M28F3316NON |
| 500 | | | | | | | X60M28F5516NON |
| 15 | 80 | Contact local Eaton representative | | | | | X60M28B1516NON |
| 30 | | | | | | | X60M28B3016NON |
| 45 | | | | | | | X60M28B4516NON |
| 75 | | | | | | | X60M28B7516NON |
| 112.5 | | | | | | | X60M28B1216NON |
| 150 | | | | | | | X60M28B4916NON |
| 225 | | | | | | | X60M28B2216NON |
| 300 | | | | | | | X60M28B3316NON |

Note

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Harmonic Mitigating Transformers 60 Hz DOE 2016 Energy-Efficient— Copper Windings**480 Delta Volts to 208/120 Volts—Type NON 0° Phase Shift**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|------------------|
| 15 | 150 | Contact local Eaton representative | | | | | X48M28T1516CUNON |
| 30 | | | | | | | X48M28T3016CUNON |
| 45 | | | | | | | X48M28T4516CUNON |
| 75 | | | | | | | X48M28T7516CUNON |
| 112.5 | | | | | | | X48M28T1216CUNON |
| 150 | | | | | | | X48M28T4916CUNON |
| 225 | | | | | | | X48M28T2216CUNON |
| 300 | | | | | | | X48M28T3316CUNON |
| 500 | | | | | | | X48M28T5516CUNON |
| 15 | | | | | | | 115 |
| 30 | X48M28F3016CUNON | | | | | | |
| 45 | X48M28F4516CUNON | | | | | | |
| 75 | X48M28F7516CUNON | | | | | | |
| 112.5 | X48M28F1216CUNON | | | | | | |
| 150 | X48M28F4916CUNON | | | | | | |
| 225 | X48M28F2216CUNON | | | | | | |
| 300 | X48M28F3316CUNON | | | | | | |
| 500 | X48M28F5516CUNON | | | | | | |
| 15 | 80 | Contact local Eaton representative | | | | | |
| 30 | | | | | | | X48M28B3016CUNON |
| 45 | | | | | | | X48M28B4516CUNON |
| 75 | | | | | | | X48M28B7516CUNON |
| 112.5 | | | | | | | X48M28B1216CUNON |
| 150 | | | | | | | X48M28B4916CUNON |
| 225 | | | | | | | X48M28B2216CUNON |
| 300 | | | | | | | X48M28B3316CUNON |

Note

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Harmonic Mitigating Transformers 60 Hz DOE 2016 Energy-Efficient— Copper Windings

2

600 Delta Volts to 208/120 Volts—Type NON 0° Phase Shift

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|------------------|
| 15 | 150 | Contact local Eaton representative | | | | | X60M28T1516CUNON |
| 30 | | | | | | | X60M28T3016CUNON |
| 45 | | | | | | | X60M28T4516CUNON |
| 75 | | | | | | | X60M28T7516CUNON |
| 112.5 | | | | | | | X60M28T1216CUNON |
| 150 | | | | | | | X60M28T4916CUNON |
| 225 | | | | | | | X60M28T2216CUNON |
| 300 | | | | | | | X60M28T3316CUNON |
| 500 | | | | | | | X60M28T5516CUNON |
| 15 | 115 | Contact local Eaton representative | | | | | X60M28F1516CUNON |
| 30 | | | | | | | X60M28F3016CUNON |
| 45 | | | | | | | X60M28F4516CUNON |
| 75 | | | | | | | X60M28F7516CUNON |
| 112.5 | | | | | | | X60M28F1216CUNON |
| 150 | | | | | | | X60M28F4916CUNON |
| 225 | | | | | | | X60M28F2216CUNON |
| 300 | | | | | | | X60M28F3316CUNON |
| 500 | | | | | | | X60M28F5516CUNON |
| 15 | 80 | Contact local Eaton representative | | | | | X60M28B1516CUNON |
| 30 | | | | | | | X60M28B3016CUNON |
| 45 | | | | | | | X60M28B4516CUNON |
| 75 | | | | | | | X60M28B7516CUNON |
| 112.5 | | | | | | | X60M28B1216CUNON |
| 150 | | | | | | | X60M28B4916CUNON |
| 225 | | | | | | | X60M28B2216CUNON |
| 300 | | | | | | | X60M28B3316CUNON |

Note

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Harmonic Mitigating Transformers 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings**480 Delta Volts to 208/120 Volts— Type THR 30° Phase Shift**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|
| 15 | 150 | Contact local Eaton representative | | | | | X48M28T1516THR |
| 30 | | | | | | | X48M28T3016THR |
| 45 | | | | | | | X48M28T4516THR |
| 75 | | | | | | | X48M28T7516THR |
| 112.5 | | | | | | | X48M28T1216THR |
| 150 | | | | | | | X48M28T4916THR |
| 225 | | | | | | | X48M28T2216THR |
| 300 | | | | | | | X48M28T3316THR |
| 500 | | | | | | | X48M28T5516THR |
| 15 | | | | | | | 115 |
| 30 | X48M28F3016THR | | | | | | |
| 45 | X48M28F4516THR | | | | | | |
| 75 | X48M28F7516THR | | | | | | |
| 112.5 | X48M28F1216THR | | | | | | |
| 150 | X48M28F4916THR | | | | | | |
| 225 | X48M28F2216THR | | | | | | |
| 300 | X48M28F3316THR | | | | | | |
| 500 | X48M28F5516THR | | | | | | |
| 15 | 80 | Contact local Eaton representative | | | | | |
| 30 | | | | | | | X48M28B3016THR |
| 45 | | | | | | | X48M28B4516THR |
| 75 | | | | | | | X48M28B7516THR |
| 112.5 | | | | | | | X48M28B1216THR |
| 150 | | | | | | | X48M28B4916THR |
| 225 | | | | | | | X48M28B2216THR |
| 300 | | | | | | | X48M28B3316THR |

Note

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Harmonic Mitigating Transformers 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

600 Delta Volts to 208/120 Volts—Type THR 30° Phase Shift

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|
| 15 | 150 | Contact local Eaton representative | | | | | X60M28T1516THR |
| 30 | | | | | | | X60M28T3016THR |
| 45 | | | | | | | X60M28T4516THR |
| 75 | | | | | | | X60M28T7516THR |
| 112.5 | | | | | | | X60M28T1216THR |
| 150 | | | | | | | X60M28T4916THR |
| 225 | | | | | | | X60M28T2216THR |
| 300 | | | | | | | X60M28T3316THR |
| 500 | | | | | | | X60M28T5516THR |
| 15 | 115 | Contact local Eaton representative | | | | | X60M28F1516THR |
| 30 | | | | | | | X60M28F3016THR |
| 45 | | | | | | | X60M28F4516THR |
| 75 | | | | | | | X60M28F7516THR |
| 112.5 | | | | | | | X60M28F1216THR |
| 150 | | | | | | | X60M28F4916THR |
| 225 | | | | | | | X60M28F2216THR |
| 300 | | | | | | | X60M28F3316THR |
| 500 | | | | | | | X60M28F5516THR |
| 15 | 80 | Contact local Eaton representative | | | | | X60M28B1516THR |
| 30 | | | | | | | X60M28B3016THR |
| 45 | | | | | | | X60M28B4516THR |
| 75 | | | | | | | X60M28B7516THR |
| 112.5 | | | | | | | X60M28B1216THR |
| 150 | | | | | | | X60M28B4916THR |
| 225 | | | | | | | X60M28B2216THR |
| 300 | | | | | | | X60M28B3316THR |

Note

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Harmonic Mitigating Transformers 60 Hz DOE 2016 Energy-Efficient— Copper Windings**480 Delta Volts to 208/120 Volts— Type THR 30° Phase Shift**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|------------------|
| 15 | 150 | Contact local Eaton representative | | | | | X48M28T1516CUTHR |
| 30 | | | | | | | X48M28T3016CUTHR |
| 45 | | | | | | | X48M28T4516CUTHR |
| 75 | | | | | | | X48M28T7516CUTHR |
| 112.5 | | | | | | | X48M28T1216CUTHR |
| 150 | | | | | | | X48M28T4916CUTHR |
| 225 | | | | | | | X48M28T2216CUTHR |
| 300 | | | | | | | X48M28T3316CUTHR |
| 500 | | | | | | | X48M28T5516CUTHR |
| 15 | | | | | | | 115 |
| 30 | X48M28F3016CUTHR | | | | | | |
| 45 | X48M28F4516CUTHR | | | | | | |
| 75 | X48M28F7516CUTHR | | | | | | |
| 112.5 | X48M28F1216CUTHR | | | | | | |
| 150 | X48M28F4916CUTHR | | | | | | |
| 225 | X48M28F2216CUTHR | | | | | | |
| 300 | X48M28F3316CUTHR | | | | | | |
| 500 | X48M28F5516CUTHR | | | | | | |
| 15 | 80 | Contact local Eaton representative | | | | | |
| 30 | | | | | | | X48M28B3016CUTHR |
| 45 | | | | | | | X48M28B4516CUTHR |
| 75 | | | | | | | X48M28B7516CUTHR |
| 112.5 | | | | | | | X48M28B1216CUTHR |
| 150 | | | | | | | X48M28B4916CUTHR |
| 225 | | | | | | | X48M28B2216CUTHR |
| 300 | | | | | | | X48M28B3316CUTHR |

Note

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Harmonic Mitigating Transformers 60 Hz DOE 2016 Energy-Efficient— Copper Windings

600 Delta Volts to 208/120 Volts—Type THR 30° Phase Shift

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|------------------|
| 15 | 150 | Contact local Eaton representative | | | | | X60M28T1516CUTHR |
| 30 | | | | | | | X60M28T3016CUTHR |
| 45 | | | | | | | X60M28T4516CUTHR |
| 75 | | | | | | | X60M28T7516CUTHR |
| 112.5 | | | | | | | X60M28T1216CUTHR |
| 150 | | | | | | | X60M28T4916CUTHR |
| 225 | | | | | | | X60M28T2216CUTHR |
| 300 | | | | | | | X60M28T3316CUTHR |
| 500 | | | | | | | X60M28T5516CUTHR |
| 15 | 115 | Contact local Eaton representative | | | | | X60M28F1516CUTHR |
| 30 | | | | | | | X60M28F3016CUTHR |
| 45 | | | | | | | X60M28F4516CUTHR |
| 75 | | | | | | | X60M28F7516CUTHR |
| 112.5 | | | | | | | X60M28F1216CUTHR |
| 150 | | | | | | | X60M28F4916CUTHR |
| 225 | | | | | | | X60M28F2216CUTHR |
| 300 | | | | | | | X60M28F3316CUTHR |
| 500 | | | | | | | X60M28F5516CUTHR |
| 15 | 80 | Contact local Eaton representative | | | | | X60M28B1516CUTHR |
| 30 | | | | | | | X60M28B3016CUTHR |
| 45 | | | | | | | X60M28B4516CUTHR |
| 75 | | | | | | | X60M28B7516CUTHR |
| 112.5 | | | | | | | X60M28B1216CUTHR |
| 150 | | | | | | | X60M28B4916CUTHR |
| 225 | | | | | | | X60M28B2216CUTHR |
| 300 | | | | | | | X60M28B3316CUTHR |

Note

Additional voltage combinations are available. Contact your local Eaton sales office for assistance if the voltage you require is not included in this catalog. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Accessories

Harmonic mitigating transformers are available with the same options and accessories as general-purpose ventilated transformers. Please refer to Section 2.7 **Page V2-T2-167**.

Technical Data and Specifications

Frequency

Eaton standard low-voltage dry-type distribution transformers are designed for 60 Hz operation. Transformers required for other frequencies are available and must be specifically designed.

Overload Capacity

Short-term overload is designed into transformers as required by ANSI. Dry-type distribution transformers will deliver 200% nameplate load for one-half hour; 150% load for one hour and 125% load for four hours without being damaged, provided that a constant 50% load precedes and follows the overload. See ANSI C57.96-01.250 for additional limitations.

Continuous overload capacity is not deliberately designed into a transformer because the design objective is to be within the allowed winding temperature rise with nameplate loading.

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Insulation System Classification

| Ambient | + Winding Rise | + Hot Spot | = Temp. Class |
|---------|----------------|------------|---------------|
| 40°C | 55°C | 10°C | 105°C |
| 40°C | 80°C | 30°C | 150°C |
| 25°C | 135°C | 20°C | 180°C |
| 40°C | 115°C | 30°C | 185°C |
| 40°C | 150°C | 30°C | 220°C |

The design life of transformers having different insulation systems is the same—the lower-temperature systems are designed for the same life as the higher-temperature systems.

Enclosures

Eaton ventilated transformers use a NEMA 2 rated (drip-proof) enclosure as a standard, and are rated NEMA 3R with the addition of weathershields. Transformers manufactured in enclosures 939, 940, 942, 943, 944 and 945 are UL Listed to be installed indoors (without weathershields) with just 2 inches clearance on the sides and behind the transformer.

Sound Levels

All Eaton 600 volt class general-purpose low-voltage dry-type distribution transformers are designed to meet NEMA ST-20 levels listed here.

Lower sound levels are available and must be designed specially.

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilated (up to 1.2 kV) | | Encapsulated (up to 1.2 kV) |
|------------------------------|---------------------------------------|-----------------|-----------------------------|
| | K-Factor 1, 4, 9 | K-Factor 13, 20 | |
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Note

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Demystifying Harmonic Mitigating Transformer Myths

2

Aren't "power factor corrected" computer power supplies fixing all harmonics?

The use of power factor corrected computer power supplies is a great first start to reducing harmonic currents in your facility. These are becoming prevalent in server applications, but have not "crossed-over" into the laptop computer/business computer. Remember also that, once the computer power supply harmonics are addressed, you will still need to address the harmonic currents coming from the variety of other equipment in your facility.

Don't K-rated transformers fix harmonics?

The K-rated transformer was created to address the additional heat being produced by standard delta-wye transformers when feeding nonlinear loads. The goal of the K-rated transformer is to dissipate the heat produced over a larger area, thus providing the illusion of correction. The K-rated transformer does nothing to reduce the root issue of harmonic currents or correct power quality issues. Because of their larger size, they also consume additional energy to "do the same work" and are counter-productive to an energy-efficient electrical distribution design.

Don't you need two HMTs for any correction to occur?

The design of HMTs allows them to address different families of harmonic currents in different ways. A single HMT will treat the triplen (3rd, 9th, 15th and so on) harmonic currents in its secondary winding. The 5th, 7th, 17th and 19th harmonic family is treated on a system basis through a technique known as "phase shifting."

This phase shift does occur between the Type NON and Type THR, and the Type POS and Type NEG harmonic mitigating transformers—and this can also occur between a Type NON and a standard delta-wye transformer (that is probably already existing within your facility). See our Sample HMT Applications area for additional information.

The cost of HMTs is too high!

While the initial cost of HMTs is typically 1.5 to 4 times the cost of a standard transformer (due to the additional design, materials and labor involved in creating the magnetics necessary to reduce harmonic impact)—to not use an HMT in a harmonic environment will actually cost you 250% more energy loss in the transformer. Due to the relatively long life of a transformer (20–30 years), these additional energy costs easily overshadow the initial one-time first cost increment.

If I use one HMT, don't I need to change all my transformers?

Most facilities have only a percentage (typically 20–25%) of their electrical system that really requires the use of an HMT. This means in a typical building that only a few areas are either critical (meaning high requirements for "clean" power) or have high concentrations of electronic, nonlinear loads—requiring the use of the HMT in those specific areas. The harmonic mitigating transformer is a weapon in your arsenal in providing a complete, properly designed electrical system for today and tomorrow.

Transformer Technology Table Explanation

In understanding the product placement of the HMT, it becomes useful to have some "rule of thumb" understanding to compare products. Looking at one of the aspects of an HMT—price—you can see that, if a standard delta-wye transformer had a cost of one unit, a K-13 transformer would cost about double and an HMT would cost 1.5 to 4 times the unit cost. What's impressive to compare is the next column of information—"Energy Savings." If the amount of energy used to power today's loads is compared against a standard delta-wye transformer (that was never designed to feed today's types of loads), you can easily see that the HMT is designed to meet the issue head-on! Referring to the table's information, you can see that it would take 30% more energy to power the same computer loads with a K-13 transformer, whereas an HMT would take 25% less energy to feed those same

computer loads. (This is due to the fact that the HMT has a different design than a standard delta-wye transformer and addresses the root issue of harmonic currents.) A good analogy is to look at the incandescent light bulb versus a compact fluorescent lamp—you might pay a bit more up front, but because of the large energy savings (because of the harmonic loading), you soon realize that the upfront cost pales in comparison to the potential of energy saved. Eaton would be happy to provide you with an estimation calculator to help you determine the amount of payback and return on investment (ROI) based on the incremental cost of the HMT. It's very typical to return the price differential between the HMT and a standard transformer with a few years—thus using the additional 20 to 30 years of energy savings to add to your bottom line.

Transformer Technology Comparison ^①

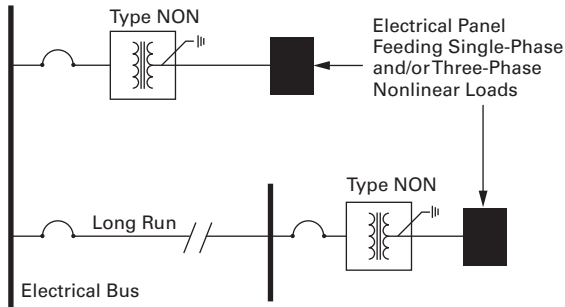
| Transformer Type | Cost | Energy Savings | Power Quality |
|--------------------|--------|----------------|----------------------------|
| Standard delta-wye | if 1X | if 1X | Not designed for harmonics |
| K-13 | 1.5–2X | –0.3X | Bulked up—doesn't help |
| HMT | 2.5X | 2.5X | Corrects root issue |

Note

^① Comparing cost, energy savings and power quality performance between the "commonly used" transformer types.

Sample HMT Applications

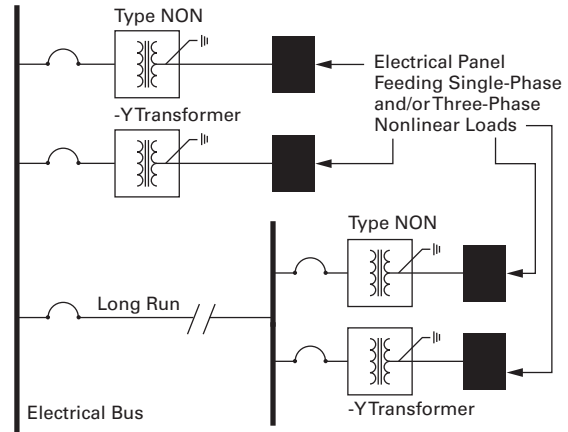
Typical Application of Type NON Transformer



Installation of a Type NON transformer provides an effective treatment of triplen (3rd, 9th, 15th and so on) harmonic currents that are generated by loads connected to the transformer. Triplen harmonic currents are treated in the secondary windings of the transformer due to the transformer's low zero sequence impedance. Type NON transformers do not need to be used in combination with other transformers to treat triplen harmonic currents. A single Type NON transformer may be installed, or multiple units can be applied.

Type NON transformers are an ideal solution for treating triplen harmonics generated by personal computers, printers, fax machines and other office equipment, as well as by single-phase electronic ballasts, and single-phase electronic testing or monitoring devices.

Typical Application of Type NON Transformer with a Standard Delta-Wye Transformer

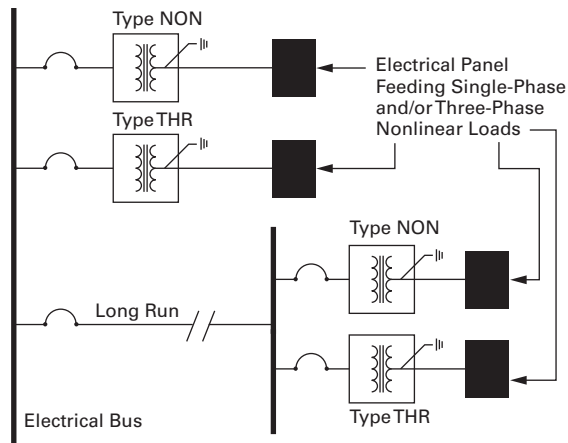


When a delta-wye transformer exists in an electrical distribution system, the addition of a Type NON transformer offers an economical solution for treating harmonic currents. The 30° phase-shift created between a Type NON harmonic mitigating transformer and a delta-wye transformer (standard transformer or K-Factor transformer) provides treatment of 5th, 7th, 17th and 19th harmonic currents. These harmonic currents are canceled in the common electrical bus that feeds the transformers. Additionally,

triplen (3rd, 9th, 15th and so on) harmonic currents generated by the loads connected to the Type NON transformer will be treated in the secondary windings of the Type NON transformer due to its low zero sequence impedance. When using two or more transformers to treat harmonics, it is better that the load be split equally between the transformers to receive the maximum benefit.

Note: Triplen currents will still circulate in the delta-wye transformer for additional waste. See figure on **Page V2-T2-78** to correct.

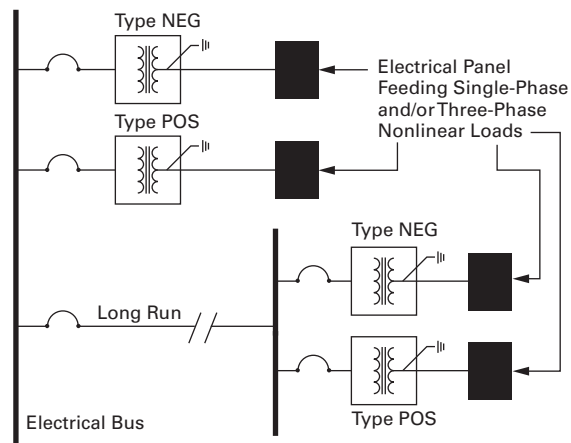
Optimum Application of Type NON and Type THR Transformers



When you're searching for an optimum harmonic correction solution in an electrical distribution system, the combination of a Type NON and Type THR transformer offers a great solution. The 30° phase shift created between Type NON and type THR harmonic mitigating transformers provides treatment of 5th, 7th, 17th and 19th harmonic currents. These harmonic currents are canceled in the common electrical bus that feeds the transformers. Additionally,

triplen (3rd, 9th, 15th and so on) harmonic currents generated by the loads will be treated in the secondary windings of HMTs. This will ensure that these currents will not circulate in the primary of the transformer creating additional heat, voltage distortion and wasted energy loss. When using two or more transformers to treat harmonics, it is better that the load be split equally between the transformers to receive the maximum benefit.

Typical Application of Type NEG and Type POS Transformers



The combination of a Type POS (+15° phase-shift) transformer and a Type NEG (-15° phase-shift) transformer effectively treats 5th, 7th, 17th and 19th harmonic currents. These harmonic currents are canceled in the common electrical bus that feeds the transformers. Additionally, triplen (3rd, 9th, 15th and so on) harmonic

currents generated by the loads connected to these transformers will be treated in their secondary windings due to their low zero sequence impedance. When using two or more transformers to treat harmonics, it is better that the load be split equally between the transformers to receive the maximum benefit.

Type EP and EPT**Contents**

| Description | Page |
|---|-----------------|
| General-Purpose Encapsulated Transformers | |
| Catalog Number Selection | V2-T2-80 |
| Product Selection | V2-T2-80 |
| Single-Phase | V2-T2-80 |
| Three-Phase | V2-T2-86 |
| Accessories | V2-T2-95 |
| Technical Data and Specifications | V2-T2-95 |

Product Description

Note: The following pages provide listings for most standard transformer ratings and catalog numbers. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Type EP and EPT

- Encapsulated design
- Suitable for indoor or outdoor applications
- Totally enclosed, non-ventilated enclosures
- Enclosures are NEMA 3R rated
- Mountable in any position indoors and upright-only outdoors
- 180°C insulation system
- 115°C rise standard; 80°C optional
- Available in ratings through 37.5 kVA single-phase; 75 kVA three-phase
- Types EP and EPT encapsulated transformers are specifically excluded from the scope of U.S. DOE energy efficiency requirements

Application Description

The basic purpose of a transformer is voltage transformation as near as practically possible to the load for economy and distribution of power. Typical loads for dry-type distribution transformers include lighting, heating, air conditioners, fans and machine tools. Such loads are found in commercial, institutional, industrial and residential structures.

Features, Benefits and Functions

- 60 Hz operation (50/60 Hz optional)
- Short-term overload capability as required by ANSI
- Meet NEMA ST-20 sound levels

Standards and Certifications

- UL listed
- CSA certified

**Industry Standards**

All Eaton dry-type distribution and control transformers are built and tested in accordance with applicable NEMA, ANSI and IEEE Standards. All 600 volt class transformers are UL listed unless otherwise noted.

Seismically Qualified

Eaton manufactured dry-type distribution transformers are seismically qualified and exceed requirements of the Uniform Building Code (UBC), International Building Code (IBC), and California Code Title 24.

Catalog Number Selection

Please refer to Section 2.7 **Page V2-T2-162**.

2

Product Selection

Additional Product Selection information begins on **Page V2-T2-165**.

Single-Phase Encapsulated—Type EP, 60 Hz

Type EP 0.05–37.5 kVA

120 x 240 Volts to 120/240 Volts ①



| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|------|--------------------|------|------|---------------|-------|-----------------------|----------------|----------------|-------------------|
| | FCAN | FCBN | | | | | | | |
| 0.25 | — | — | EP | 115 | FR57P | 3E | 13 (6) | Indoor–Outdoor | S10N11P26P |
| 0.5 | — | — | | | FR57P | | 16 (7) | | S10N11P51P |
| 0.75 | — | — | | | FR67P | | 29 (13) | | S10N11P76P |
| 1 | — | — | | | FR67P | | 31 (14) | | S10N11P01P |
| 1.5 | — | — | | | FR67P | | 42 (19) | | S10N11P16P |
| 2 | — | — | | | FR68P | | 42 (19) | | S10N11P02P |
| 3 | — | — | | | FR176 | | 55 (25) | | S10N11S03N |
| 5 | — | — | | | FR177 | | 113 (51) | | S10N11S05N |
| 7.5 | — | — | | | FR178 | | 123 (56) | | S10N11S07N |
| 10 | — | — | | | FR179 | | 193 (88) | | S10N11S10N |
| 15 | — | — | | | FR180 | | 216 (98) | | S10N11S15N |
| 25 | — | — | | | FR182 | | 375 (170) | | S10N11S25N |

208 Volts to 120/240 Volts ①

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|------|--------------------|------|------|---------------|-------|-----------------------|----------------|----------------|-------------------|
| | FCAN | FCBN | | | | | | | |
| 0.25 | — | — | EP | 115 | FR57P | 26A | 13 (6) | Indoor–Outdoor | S29N11P26P |
| 0.5 | — | — | | | FR57P | | 16 (7) | | S29N11P51P |
| 0.75 | — | — | | | FR67P | | 29 (13) | | S29N11P76P |
| 1 | — | — | | | FR67P | | 31 (14) | | S29N11P01P |
| 1.5 | — | — | | | FR67P | | 42 (19) | | S29N11P16P |
| 2 | — | — | | | FR68P | | 42 (19) | | S29N11P02P |
| 3 | — | — | | | FR176 | | 65 (30) | | S29N11S03N |
| 5 | — | — | | | FR177 | | 113 (51) | | S29N11S05N |
| 7.5 | — | — | | | FR178 | | 123 (56) | | S29N11S07N |
| 10 | — | — | | | FR179 | | 193 (88) | | S29N11S10N |
| 15 | — | — | | | FR180 | | 216 (98) | | S29N11S15N |
| 25 | — | — | | | FR182 | | 395 (179) | | S29N11S25N |

Notes

① Contact Eaton for availability of 0.05–0.25 kVA designs.

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase Encapsulated—Type EP, 60 Hz

277 Volts to 120/240 Volts ①

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|------|--------------------|------|------|---------------|--------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 0.25 | — | — | EP | 115 | FR57P | 524A | 13 (6) | Indoor–Outdoor | S27N11P26P |
| 0.5 | — | — | | | FR58AP | | 26 (12) | | S27N11P51P |
| 0.75 | — | — | | | FR58AP | | 29 (13) | | S27N11P76P |
| 1 | — | — | | | FR59AP | | 31 (14) | | S27N11P01P |
| 1.5 | — | — | | | FR67P | | 42 (19) | | S27N11P16P |
| 2 | — | — | | | FR176P | | 65 (30) | | S27N11P02P |
| 3 | — | — | | | FR176 | | 55 (25) | | S27N11S03N |
| 5 | — | — | | | FR177 | | 113 (51) | | S27N11S05N |
| 7.5 | — | — | | | FR178 | | 123 (56) | | S27N11S07N |
| 10 | — | — | | | FR179 | | 193 (88) | | S27N11S10N |
| 15 | — | — | | | FR180 | | 180 (82) | | S27N11S15N |
| 25 | — | — | | | FR182 | | 375 (170) | | S27N11S25N |

240 x 480 Volts to 120/240 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-------|--------------------|------|------|---------------|--------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 0.050 | — | — | EP | 115 | FR52 | 3A | 7 (3) | Indoor–Outdoor | S20N11S81N |
| 0.075 | — | — | | | FR54 | | 7 (3) | | S20N11S85N |
| 0.100 | — | — | | | FR54 | | 7 (3) | | S20N11S82N |
| 0.150 | — | — | | | FR55 | | 8 (4) | | S20N11S83N |
| 0.25 | — | — | | | FR57P | | 12 (5) | | S20N11P26P |
| 0.5 | — | — | | | FR57P | | 16 (7) | | S20N11P51P |
| 0.75 | — | — | | | FR58AP | | 26 (12) | | S20N11P76P |
| 1 | — | — | | | FR67P | | 31 (14) | | S20N11P01P |
| 1.5 | — | — | | | FR67P | | 42 (19) | | S20N11P16P |
| 2 | — | — | | | FR68P | | 42 (19) | | S20N11P02P |
| 3 | — | — | | | FR176 | | 65 (30) | | S20N11S03N |
| 3 | ② | ② | | | FR176 | | 65 (30) | | S20K11S03N |
| 5 | — | — | | | FR177 | | 113 (51) | | S20N11S05N |
| 5 | ② | ② | | | FR177 | 9A | 105 (48) | | S20K11S05N |
| 7.5 | — | — | | | FR178 | 3A | 105 (48) | | S20N11S07N |
| 7.5 | ② | ② | | | FR178 | 9A | 123 (56) | | S20K11S07N |
| 10 | — | — | | | FR179 | 3A | 193 (88) | | S20N11S10N |
| 10 | ② | ② | | | FR179 | 9A | 193 (88) | | S20K11S10N |
| 15 | — | — | | | FR180 | 3A | 216 (98) | | S20N11S15N |
| 15 | ③ | ③ | | | FR180 | 23A | 216 (98) | | S20L11S15N |
| 25 | — | — | | | FR182 | 3A | 385 (175) | | S20N11S25N |
| 25 | ③ | ③ | | | FR182 | 23A | 375 (170) | | S20L11S25N |
| 37.5 | ③ | ③ | | | FR300A | 248A | 735 (334) | | S20L11S37 ④ |

Notes

- ① Contact Eaton for availability of 0.05–0.25 kVA designs.
 ② 1 at +10% FCBN at 240 volts; 2 at –5% FCBN at 480 volts.
 ③ 2 at +5% FCBN at 240 volts; 4 at –2.5% FCBN at 480 volts.
 ④ Floor-mount only.

Contact your local Eaton sales office for CE Mark transformer requirements.
 For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.
 Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase Encapsulated—Type EP, 60 Hz

2

190/200/208/220 x 380/400/416/440 Volts to 110/220 Volts 50/60 Hz—Export Model IP 22 Rated

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 0.5 | — | — | EP | 115 | FR67 | 538A | 34 (15) | Indoor–Outdoor | S40N14S51CE |
| 1 | — | — | | | FR67 | | 42 (19) | | S40N14S01CE |
| 1.5 | — | — | | | FR176 | | 46 (21) | | S40N14S16CE |
| 2 | — | — | | | FR176 | | 65 (30) | | S40N14S02CE |
| 3 | — | — | | | FR177 | | 113 (51) | | S40N14S03CE |
| 5 | — | — | | | FR178 | | 140 (64) | | S40N14S05CE |
| 7.5 | — | — | | | FR179 | | 193 (88) | | S40N14S07CE |
| 10 | — | — | | | FR180 | | 216 (98) | | S40N14S10CE |
| 15 | — | — | | | FR182 | | 375 (170) | | S40N14S15CE |

120/208/240/277 Volts to 120/240 Volts 60 Hz

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------|------|---------------|--------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 1 | — | — | EP | 115 | FR67P | ① | 42 (19) | Indoor–Outdoor | S54N11P01 |
| 1.5 | — | — | | | FR176P | | 65 (30) | | S54N11P16 |
| 2 | — | — | | | FR176P | | 65 (30) | | S54N11P02 |
| 3 | — | — | | | FR177 | | 113 (51) | | S54N11S03 |
| 5 | — | — | | | FR178 | | 140 (64) | | S54N11S05 |
| 7.5 | — | — | | | FR179 | | 193 (88) | | S54N11S07 |
| 10 | — | — | | | FR180 | | 216 (98) | | S54N11S10 |

240 x 480 Volts to 120/240 Volts Stainless Steel ②

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 1 | — | — | EP | 115 | FR67P | 3A | 34 (15) | Indoor–Outdoor | S20N11P01PSS |
| 2 | — | — | | | FR68P | | 46 (21) | | S20N11P02PSS |
| 3 | — | — | | | FR176 | | 65 (30) | | S20N11S03SS |
| 5 | — | — | | | FR177 | | 113 (51) | | S20N11S05SS |
| 7.5 | — | — | | | FR178 | | 123 (56) | | S20N11S07SS |
| 10 | — | — | | | FR179 | | 193 (88) | | S20N11S10SS |
| 15 | — | — | | | FR180 | | 205 (93) | | S20N11S15SS |
| 25 | — | — | | | FR182 | | 375 (170) | | S20N11S25SS |

Notes

① Refer to your local Eaton sales office.

② NEMA 3R, 304 stainless steel enclosure; 316 stainless steel enclosure available as an option.

Contact your local Eaton sales office for CE Mark transformer requirements.

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase Encapsulated—Type EP, 60 Hz

480 Volts to 120/240 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|-------------------|
| | FCAN | FCBN | | | | | | | |
| 1 | — | 2 at -5% | EP | 115 | FR67P | 2D | 31 (14) | Indoor—Outdoor | S48G11P01P |
| 1.5 | — | 2 at -5% | | | FR67P | | 42 (19) | | S48G11P16P |
| 2 | — | 2 at -5% | | | FR68P | | 42 (19) | | S48G11P02P |
| 3 | — | 2 at -5% | | | FR176 | | 65 (30) | | S48G11S03N |
| 3 | 2 at +2.5% | 2 at -2.5% | | | FR176 | 16A | 65 (30) | | S48D11S03N |
| 5 | — | 2 at -5% | | | FR177 | 2D | 113 (51) | | S48G11S05N |
| 5 | 2 at +2.5% | 2 at -2.5% | | | FR177 | 16A | 113 (51) | | S48D11S05N |
| 7.5 | — | 2 at -5% | | | FR178 | 2D | 123 (56) | | S48G11S07N |
| 7.5 | 2 at +2.5% | 2 at -2.5% | | | FR178 | 16A | 123 (56) | | S48D11S07N |
| 10 | — | 2 at -5% | | | FR179 | 2D | 193 (88) | | S48G11S10N |
| 10 | 2 at +2.5% | 2 at -2.5% | | | FR179 | 16A | 193 (88) | | S48D11S10N |
| 15 | — | 2 at -5% | | | FR180 | 2D | 216 (98) | | S48G11S15N |
| 15 | 2 at +2.5% | 2 at -2.5% | | | FR180 | 16A | 216 (98) | | S48D11S15N |
| 25 | — | 2 at -5% | | | FR182 | 2D | 385 (175) | | S48G11S25N |
| 25 | 2 at +2.5% | 4 at -2.5% | | | FR132 | 83A | 410 (186) | | S48M11S25N |

480 Volts to 120/240 Volts Stainless Steel, Copper Windings ^①

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------------|
| | FCAN | FCBN | | | | | | | |
| 10 | 2 at +2.5% | 2 at -2.5% | EP | 115 | FR179 | 16A | 210 (95) | Indoor—Outdoor | S48D11S10CUSS |
| 15 | 2 at +2.5% | 2 at -2.5% | | | FR180 | | 235 (107) | | S48D11S15SSCU |
| 25 | 2 at +2.5% | 4 at -2.5% | | | FR182 | 83A | 415 (188) | | S48M11S25SSCU |

600 Volts to 120/240 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|------|--------------------|------------|------|---------------|--------|-----------------------|----------------|----------------|-------------------|
| | FCAN | FCBN | | | | | | | |
| 0.5 | — | 2 at -5% | EP | 115 | FR57P | 2I | 16 (7) | Indoor—Outdoor | S60G11P51P |
| 0.75 | — | 2 at -5% | | | FR58AP | | 26 (12) | | S60G11P76P |
| 1 | — | 2 at -5% | | | FR67P | | 31 (14) | | S60G11P01P |
| 1.5 | — | 2 at -5% | | | FR67P | | 42 (19) | | S60G11P16P |
| 2 | — | 2 at -5% | | | FR68P | | 42 (19) | | S60G11P02P |
| 3 | — | 2 at -5% | | | FR176 | | 65 (30) | | S60G11S03N |
| 5 | — | 2 at -5% | | | FR177 | | 105 (48) | | S60G11S05N |
| 7.5 | — | 2 at -5% | | | FR178 | | 123 (56) | | S60G11S07N |
| 10 | — | 2 at -5% | | | FR179 | | 193 (88) | | S60G11S10N |
| 15 | — | 4 at -2.5% | | | FR180 | 527A | 216 (98) | | S60J11S15N |
| 25 | — | 4 at -2.5% | | | FR182 | | 385 (175) | | S60J11S25N |
| 25 | 2 at +2.5% | 4 at -2.5% | | | FR132 | 83B | 395 (180) | | S60M11S25N |

Notes

^① NEMA 3R, 304 stainless steel enclosure; 316 stainless steel enclosure available as an option.

Contact your local Eaton sales office for CE Mark transformer requirements.

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase Shielded—Type EP, 60 Hz

2

120 x 240 Volts to 120/240 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------|------|---------------|-------|-----------------------|----------------|----------------|-------------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | — | EP | 115 | FR176 | 90B | 50 (23) | Indoor–Outdoor | S10N11E03N |
| 5 | — | — | | | FR177 | | 90 (41) | | S10N11E05N |
| 7.5 | — | — | | | FR178 | | 123 (56) | | S10N11E07N |
| 10 | — | — | | | FR179 | | 210 (95) | | S10N11E10N |
| 15 | — | — | | | FR180 | | 205 (93) | | S10N11E15N |
| 25 | — | — | | | FR182 | | 375 (170) | | S10N11E25N |

120 Volts to 120 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------|------|---------------|-------|-----------------------|----------------|----------------|-------------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | — | EP | 115 | FR176 | 77A | 60 (27) | Indoor–Outdoor | S12N12E03N |
| 5 | — | — | | | FR177 | | 100 (45) | | S12N12E05N |
| 7.5 | — | — | | | FR178 | | 123 (56) | | S12N12E07N |
| 10 | — | — | | | FR179 | | 180 (82) | | S12N12E10N |
| 15 | — | — | | | FR180 | | 216 (98) | | S12N12E15N |
| 25 | — | — | | | FR182 | | 375 (170) | | S12N12E25N |

208 Volts to 120/240 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------|------|---------------|-------|-----------------------|----------------|----------------|-------------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | — | EP | 115 | FR176 | 578A | 60 (27) | Indoor–Outdoor | S29N11E03N |
| 5 | — | — | | | FR177 | | 135 (61) | | S29N11E05N |
| 7.5 | — | — | | | FR178 | | 95 (43) | | S29N11E07N |
| 10 | — | — | | | FR179 | | 165 (75) | | S29N11E10N |
| 15 | — | — | | | FR180 | | 185 (94) | | S29N11E15N |
| 25 | — | — | | | FR182 | | 375 (170) | | S29N11E25N |

208 Volts to 208 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------|------|---------------|-------|-----------------------|----------------|----------------|-------------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | — | EP | 115 | FR176 | 77B | 65 (30) | Indoor–Outdoor | S29N29E03N |
| 5 | — | — | | | FR177 | | 113 (51) | | S29N29E05N |
| 7.5 | — | — | | | FR178 | | 123 (56) | | S29N29E07N |
| 10 | — | — | | | FR179 | | 195 (89) | | S29N29E10N |
| 15 | — | — | | | FR180 | | 216 (98) | | S29N29E15N |
| 25 | — | — | | | FR182 | | 375 (170) | | S29N29E25N |

Note

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase Shielded—Type EP, 60 Hz

240 Volts to 240 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | — | EP | 115 | FR176 | 77C | 65 (30) | Indoor—Outdoor | S24N24E03N |
| 5 | — | — | | | FR177 | | 113 (51) | | S24N24E05N |
| 7.5 | — | — | | | FR178 | | 123 (56) | | S24N24E07N |
| 10 | — | — | | | FR179 | | 193 (88) | | S24N24E10N |
| 15 | — | — | | | FR180 | | 216 (98) | | S24N24E15N |
| 25 | — | — | | | FR182 | | 375 (170) | | S24N24E25N |

277 Volts to 120/240 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | — | EP | 115 | FR176 | 513B | 65 (30) | Indoor—Outdoor | S27N11E03N |
| 5 | — | — | | | FR177 | | 113 (51) | | S27N11E05N |
| 7.5 | — | — | | | FR178 | | 75 (34) | | S27N11E07N |
| 10 | — | — | | | FR179 | | 162 (74) | | S27N11E10N |
| 15 | — | — | | | FR180 | | 216 (98) | | S27N11E15N |
| 25 | — | — | | | FR182 | | 375 (170) | | S27N11E25N |

240 x 480 Volts to 120/240 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|------|--------------------|------|------|---------------|--------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 0.25 | — | — | EP | 115 | FR57P | 90A | 12 (5) | Indoor—Outdoor | S20N11E26P |
| 0.50 | — | — | | | FR57P | | 16 (7) | | S20N11E51P |
| 0.75 | — | — | | | FR58AP | | 26 (12) | | S20N11E76P |
| 1 | — | — | | | FR67P | | 31 (14) | | S20N11E01P |
| 1.5 | — | — | | | FR67P | | 42 (19) | | S20N11E16P |
| 2 | — | — | | | FR68P | | 42 (19) | | S20N11E02P |
| 3 | — | — | | | FR176 | | 65 (30) | | S20N11E03A |
| 5 | — | — | | | FR177 | | 113 (51) | | S20N11E05A |
| 7.5 | — | — | | | FR178 | | 123 (56) | | S20N11E07A |
| 10 | — | — | | | FR179 | | 166 (75) | | S20N11E10A |
| 15 | — | — | | | FR180 | | 216 (98) | | S20N11E15A |
| 25 | ① | ① | | | FR182 | 526A | 375 (170) | | S20L11E25A |

Notes

① 2 at +5% FCBN at 240 volts; 4 at -2.5% FCBN at 480 volts.

Contact your local Eaton sales office for CE Mark transformer requirements.

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Encapsulated—Type EPT, 60 Hz

2

Type EPT 3–75 kVA



240 Delta Volts to 208Y/120 Volts

| Full Capacity Taps | | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|--------------------|------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| kVA | FCAN | FCBN | | | | | | | |
| 9 | — | 2 at -5% | EPT | 115 | FR103 | 70C | 190 (86) | Indoor–Outdoor | Y24G28T09N ① |
| 15 | — | 2 at -5% | | | FR95 | | | | 275 (125) |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84C | 422 (191) | | Y24M28T30N |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | | | 660 (299) |

380 Delta Volts to 190Y/110 Volts

| Full Capacity Taps | | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|--------------------|------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| kVA | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 70F | 116 (53) | Indoor–Outdoor | Y38G19T03A ① |
| 6 | — | 2 at -5% | | | FR200 | | | | 165 (75) |
| 9 | — | 2 at -5% | | | FR95 | 72R | 275 (125) | | Y38G19T09A ① |
| 15 | — | 2 at -5% | | | FR95 | | | | 275 (125) |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84AC | 422 (191) | | Y38M19T30A |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | | | 660 (299) |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1275 (580) | | Y38M19T75A ② |

380 Delta Volts to 208Y/120 Volts

| Full Capacity Taps | | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|--------------------|------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| kVA | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 70D | 116 (53) | Indoor–Outdoor | Y38G28T03A ① |
| 6 | — | 2 at -5% | | | FR200 | | | | 70F |
| 9 | — | 2 at -5% | | | FR103 | 70D | 185 (84) | | Y38G28T09A ① |
| 15 | — | 2 at -5% | | | FR95 | | | | 275 (125) |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84H | 422 (191) | | Y38M28T30A |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | | | 84R |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1275 (580) | | Y38M28T75A ② |

Notes

- ① T-T (Scott T) connected.
- ② Floor-mount only.

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Encapsulated—Type EPT, 60 Hz

380 Delta Volts to 220Y/127 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 70F | 116 (53) | Indoor—Outdoor | Y38G31T03A ① |
| 6 | — | 2 at -5% | | | FR200 | | 165 (75) | | Y38G31T06A ① |
| 9 | — | 2 at -5% | | | FR103 | 70M | 195 (89) | | Y38G31T09A ① |
| 15 | — | 2 at -5% | | | FR95 | 70F | 275 (125) | | Y38G31T15A ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84R | 422 (191) | | Y38M31T30A |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y38M31T45A |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1275 (580) | | Y38M31T75A ② |

380 Delta Volts to 220 Delta Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 74K | 116 (53) | Indoor—Outdoor | Y38G25T03A ① |
| 6 | — | 2 at -5% | | | FR200 | | 180 (82) | | Y38G25T06A ① |
| 9 | — | 2 at -5% | | | FR103 | | 195 (89) | | Y38G25T09A ① |
| 15 | — | 2 at -5% | | | FR95 | | 275 (125) | | Y38G25T15A ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | ③ | 422 (191) | | Y38M25T30A |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y38M25T45A |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | 85L | 1275 (580) | | Y38M25T75 ② |

380 Delta Volts to 380Y/220 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 70D | 116 (53) | Indoor—Outdoor | Y38G37T03A ① |
| 6 | — | 2 at -5% | | | FR200 | | 165 (75) | | Y38G37T06A ① |
| 9 | — | 2 at -5% | | | FR103 | | 180 (82) | | Y38G37T09A ① |
| 15 | — | 2 at -5% | | | FR95 | | 275 (125) | | Y38G37T15A ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84H | 422 (191) | | Y38M37T30A |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y38M37T45A |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1275 (580) | | Y38M37T75A ② |

380 Delta Volts to 480Y/277 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 70F | 116 (53) | Indoor—Outdoor | Y38G47T03A ① |
| 6 | — | 2 at -5% | | | FR200 | | 180 (82) | | Y38G47T06A ① |
| 9 | — | 2 at -5% | | | FR103 | | 166 (75) | | Y38G47T09A ① |
| 15 | — | 2 at -5% | | | FR95 | | 275 (125) | | Y38G47T15A ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84AB | 422 (191) | | Y38M47T30A |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y38M47T45A |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1275 (580) | | Y38M47T75A ② |

Notes

- ① T-T (Scott T) connected.
- ② Floor-mount only.
- ③ Refer to your Eaton sales office.

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Encapsulated—Type EPT, 60 Hz

2

416 Delta Volts to 208Y/120 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 70V | 116 (53) | Indoor-Outdoor | Y43G28T03A ① |
| 6 | — | 2 at -5% | | | FR200 | | 175 (79) | | Y43G28T06A ① |
| 9 | — | 2 at -5% | | | FR103 | | 190 (86) | | Y43G28T09A ① |
| 15 | — | 2 at -5% | | | FR95 | | 275 (125) | | Y43G28T15A ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84I | 422 (191) | | Y43M28T30A |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y43M28T45A |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1275 (580) | | Y43M28T75A ② |

440 Delta Volts to 220Y/127 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 70G | 116 (53) | Indoor-Outdoor | Y44G31T03A ① |
| 6 | — | 2 at -5% | | | FR200 | | 165 (75) | | Y44G31T06A ① |
| 9 | — | 2 at -5% | | | FR103 | | 166 (75) | | Y44G31T09A ① |
| 15 | — | 2 at -5% | | | FR95 | | 275 (125) | | Y44G31T15A ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84O | 422 (191) | | Y44M31T30A ② |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y44M31T45A |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1275 (580) | | Y44M31T75A ② |

480 Delta Volts to 208Y/120 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 70A | 116 (52) | Indoor-Outdoor | Y48G28T03N ① |
| 6 | — | 2 at -5% | | | FR200 | | 165 (75) | | Y48G28T06N ① |
| 6 | 2 at +2.5% | 2 at -2.5% | | | FR200 | 72B | 165 (75) | | Y48D28T06N ① |
| 9 | — | 2 at -5% | | | FR103 | 70A | 166 (75) | | Y48G28T09N ① |
| 9 | — | 4 at -2.5% | | | FR103 | 503A | 185 (84) | | Y48J28T09N ① |
| 9 | 2 at +2.5% | 2 at -2.5% | | | FR103 | 72B | 185 (84) | | Y48D28T09N ① |
| 15 | — | 2 at -5% | | | FR95 | 70A | 275 (125) | | Y48G28T15N ① |
| 15 | — | 4 at -2.5% | | | FR95 | 503A | 275 (125) | | Y48J28T15N ① |
| 15 | 2 at +2.5% | 2 at -2.5% | | | FR95 | 72B | 275 (125) | | Y48D28T15N ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84A | 422 (191) | | Y48M28T30N |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 720 (327) | | Y48M28T45N |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1275 (580) | | Y48M28T75N ② |

480 Delta Volts to 208Y/120 Volts—Copper Windings

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 15 | 2 at +2.5% | 2 at -2.5% | EPT | 115 | FR95 | 72B | 300 (136) | Indoor-Outdoor | Y48D28T15CU ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84A | 505 (230) | | Y48M28T30CU |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 810 (368) | | Y48M28T45CU |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1450 (659) | | Y48M28T75CU ②③ |

Notes

- ① T-T (Scott T) connected.
- ② Floor-mount only.
- ③ Not CSA certified.

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Encapsulated—Type EPT, 60 Hz

480 Delta Volts to 208Y/120 Volts Stainless Steel ①

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 70A | 116 (53) | Indoor–Outdoor | Y48G28T03SS ② |
| 6 | 2 at +2.5% | 2 at -2.5% | | | FR200 | 72B | 175 (79) | | Y48D28T06SS ② |
| 9 | 2 at +2.5% | 2 at -2.5% | | | FR103 | | 185 (84) | | Y48D28T09SS ② |
| 15 | 2 at +2.5% | 2 at -2.5% | | | FR95 | | 275 (125) | | Y48D28T15SS ② |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84A | 422 (191) | | Y48M28T30SS |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y48M28T45SS |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1275 (580) | | Y48M28T75SS ③ |

480 Delta Volts to 208Y/120 Volts Stainless Steel—Copper Windings ①

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|-----------------|
| | FCAN | FCBN | | | | | | | |
| 15 | 2 at +2.5% | 2 at -2.5% | EPT | 115 | FR95 | 72B | 275 (125) | Indoor–Outdoor | Y48D28T15CUSS ② |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84A | 504 (229) | | Y48M28T30CUSS |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 810 (368) | | Y48M28T45CUSS |

480 Delta Volts to 220Y/127 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 70K | 116 (53) | Indoor–Outdoor | Y48G31T03A ② |
| 6 | — | 2 at -5% | | | FR200 | | 175 (79) | | Y48G31T06A ② |
| 9 | — | 2 at -5% | | | FR103 | 70A | 185 (84) | | Y48G31T09A ② |
| 15 | — | 2 at -5% | | | FR95 | | 275 (125) | | Y48G31T15A ② |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84A | 422 (191) | | Y48M31T30A |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y48M31T45A |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | 84K | 1275 (580) | | Y48M31T75A ③ |

480 Delta Volts to 240 Delta Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 74A | 116 (52) | Indoor–Outdoor | Y48G24T03N ②④ |
| 6 | — | 2 at -5% | | | FR200 | | 165 (75) | | Y48G24T06N ②④ |
| 9 | — | 4 at -2.5% | | | FR103 | 73A | 185 (84) | | Y48J24T09N ②④ |
| 15 | — | 4 at -2.5% | | | FR95 | | 275 (125) | | Y48J24T15N ②④ |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 85A | 422 (191) | | Y48M24T30N ④ |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y48M24T45N ④ |

Notes

- ① NEMA 3R, 304 stainless steel enclosure; 316 stainless steel enclosure available.
- ② T-T (Scott T) connected.
- ③ Floor-mount only.
- ④ Do not include 120 volt lighting tap.

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Encapsulated—Type EPT, 60 Hz

2

480 Delta Volts to 380Y/220 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 70A | 116 (53) | Indoor-Outdoor | Y48G37T03A ① |
| 6 | — | 2 at -5% | | | FR200 | 70R | 165 (75) | | Y48G37T06A ① |
| 9 | — | 2 at -5% | | | FR103 | | 185 (84) | | Y48G37T09A ① |
| 15 | — | 2 at -5% | | | FR95 | | 275 (125) | | Y48G37T15A ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84A | 422 (191) | | Y48M37T30A |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y48M37T45A |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1275 (580) | | Y48M37T75A ② |

480 Delta Volts to 380 Delta Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 74B | 116 (53) | Indoor-Outdoor | Y48G38T03A ① |
| 6 | — | 2 at -5% | | | FR200 | | 165 (75) | | Y48G38T06A ① |
| 9 | — | 2 at -5% | | | FR103 | | 185 (84) | | Y48G38T09A ① |
| 15 | — | 2 at -5% | | | FR95 | 74A | 275 (125) | | Y48G38T15A ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 85A | 422 (191) | | Y48M38T30A |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y48M38T45A |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1297 (593) | | Y48M38T75 ② |

480 Delta Volts to 416Y/240 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR200 | 70A | 165 (75) | Indoor-Outdoor | Y48G51T03A ① |
| 6 | — | 2 at -5% | | | FR200 | | 185 (84) | | Y48G51T06A ① |
| 9 | — | 2 at -5% | | | FR103 | 70S | 185 (84) | | Y48G51T09A ① |
| 15 | — | 2 at -5% | | | FR95 | | 275 (125) | | Y48G51T15A ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84A | 422 (191) | | Y48M51T30A |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y48M51T45A |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1275 (580) | | Y48M51T75A ② |

480 Delta Volts to 440Y/254 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 70A | 116 (53) | Indoor-Outdoor | Y48G35T03A ① |
| 6 | — | 2 at -5% | | | FR200 | | 185 (84) | | Y48G35T06A ① |
| 9 | — | 2 at -5% | | | FR103 | | 185 (84) | | Y48G35T09A ① |
| 15 | — | 2 at -5% | | | FR95 | | 275 (125) | | Y48G35T15A ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84A | 422 (191) | | Y48M35T30A |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y48M35T45A |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR245 | | 1275 (580) | | Y48M35T75A ② |

Notes

① T-T (Scott T) connected.

② Floor-mount only.

Contact your local Eaton sales office for CE Mark transformer requirements.
 For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.
 Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Encapsulated—Type EPT, 60 Hz**480 Delta Volts to 480Y/277 Volts**

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|---------------------|
| | FCAN | FCBN | | | | | | | |
| 9 | 2 at +2.5% | 2 at -2.5% | EPT | 115 | FR103 | 72C | 190 (86) | Indoor-Outdoor | Y48D47T09N ① |
| 15 | 2 at +2.5% | 2 at -2.5% | | | FR95 | | 275 (125) | | Y48D47T15N ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84A | 422 (191) | | Y48M47T30N |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y48M47T45N |

600 Delta Volts to 208Y/120 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|---------------------|
| | FCAN | FCBN | | | | | | | |
| 9 | — | 2 at -5% | EPT | 115 | FR103 | 70B | 185 (84) | Indoor-Outdoor | Y60G28T09N ① |
| 15 | — | 2 at -5% | | | FR95 | | 275 (125) | | Y60G28T15N ① |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR243 | 84B | 422 (191) | | Y60M28T30N |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR244 | | 660 (299) | | Y60M28T45N |

Three-Phase Shielded—Type EPT, 60 Hz**480 Delta Volts to 208Y/120 Volts**

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|---------------------|
| | FCAN | FCBN | | | | | | | |
| 3 | 2 at +2.5% | 2 at -2.5% | EPT | 115 | FR201 | 86B | 116 (52) | Indoor-Outdoor | Y48D28E03A ① |
| 6 | 2 at +2.5% | 2 at -2.5% | | | FR200 | | 165 (75) | | Y48D28E06A ① |
| 9 | 2 at +2.5% | 2 at -2.5% | | | FR103 | | 190 (86) | | Y48D28E09N ① |
| 15 | 2 at +2.5% | 2 at -2.5% | | | FR95 | | 275 (125) | | Y48D28E15B ① |

480 Delta Volts to 240 Delta Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|-------|-----------------------|----------------|----------------|---------------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR201 | 88A | 116 (52) | Indoor-Outdoor | Y48G24E03A ① |
| 6 | — | 2 at -5% | | | FR200 | | 165 (75) | | Y48G24E06A ① |
| 9 | — | 4 at -2.5% | | | FR103 | 505B | 195 (89) | | Y48J24E09A ① |
| 15 | — | 4 at -2.5% | | | FR95 | | 275 (125) | | Y48J24E15A ① |

Notes

① T-T (Scott T) connected.

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

NEMA Type 4X Single-Phase Encapsulated—Type EP, 60 Hz, Grade 304 Stainless Steel ①

2

240 x 480 Volts to 120/240 Volts—Aluminum Windings

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|---------|--------------------|------|------|------------------|----------|--------------------------|-------------------|----------------|-----------------|
| | FCAN | FCBN | | | | | | | |
| 0.100 ② | — | — | EP | 115 | FR544X | 3A | 7 (3) | Indoor–Outdoor | S20N11S82SS4X |
| 0.015 ② | — | — | | | FR554X | | 9 (4) | | S20N11S83SS4X |
| 0.250 ② | — | — | | | FR57P4X | | 15 (7) | | S20N11P26SS4X |
| 0.500 ② | — | — | | | FR57P4X | | 14 (6) | | S20N11P51SS4X |
| 0.750 ② | — | — | | | FR58AP4X | | 22 (10) | | S20N11P76SS4X |
| 1 ② | — | — | | | FR67P4X | | 30 (14) | | S20N11P01SS4X |
| 1.5 ② | — | — | | | FR67P4X | | 41 (19) | | S20N11P16SS4X |
| 2 ② | — | — | | | FR68P4X | | 75 (34) | | S20N11P02SS4X |
| 3 | — | — | | | FR1764X | | 68 (31) | | S20N11S03SS4X |
| 3 | ③ | ③ | | | FR1764X | 9A | 67 (30) | | S20K11S03SS4X |
| 5 | — | — | | | FR1774X | 3A | 107 (49) | | S20N11S05SS4X |
| 5 | ③ | ③ | | | FR1774X | 9A | 105 (48) | | S20K11S05SS4X |
| 7.5 | — | — | | | FR1784X | 3A | 129 (58) | | S20N11S07SS4X |
| 7.5 | ③ | ③ | | | FR1784X | 9A | 130 (59) | | S20K11S07SS4X |
| 10 | — | — | | | FR1794X | 3A | 196 (89) | | S20N11S10SS4X |
| 10 | ③ | ③ | | | FR1794X | 9A | 198 (90) | | S20K11S10SS4X |
| 15 | — | — | | | FR1804X | 3A | 215 (98) | | S20N11S15SS4X |
| 15 | ③ | ③ | | | FR1804X | 23A | 215 (98) | | S20L11S15SS4X |
| 25 | — | — | | | FR1824X | 3A | 393 (178) | | S20N11S25SS4X |
| 25 | ④ | ④ | | | FR1824X | 23A | 453 (206) | | S20L11S25SS4X |
| 37.5 | ④ | ④ | | | FR300A4X | 248A | 735 (334) | | S20L11S37SS4X ⑤ |

Notes

- ① Grade 304 stainless steel standard. Grade 316 stainless steel available as an option. Replace suffix "SS" with suffix "S6."
 ② Copper windings provided as standard.
 ③ 1 at +10% FCBN at 240 volts; 2 at –5% FCBN at 480 volts.
 ④ 2 at +5% FCBN at 240 volts; 4 at –2.5% FCBN at 480 volts.
 ⑤ Floor-mount only.

Contact your local Eaton sales office for voltage combinations not shown in the above table. Other voltages and custom features are available upon request.

NEMA Type 4X Single-Phase Encapsulated—Type EP, 60 Hz, Grade 304 Stainless Steel ①**240 x 480 Volts to 120/240 Volts—Copper Windings**

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|---------|--------------------|------|------|------------------|----------|--------------------------|-------------------|----------------|-------------------|
| | FCAN | FCBN | | | | | | | |
| 0.100 ② | — | — | EP | 115 | FR544X | 3A | 7 (3) | Indoor—Outdoor | S20N11S82SS4X |
| 0.015 ② | — | — | | | FR554X | | 9 (4) | | S20N11S83SS4X |
| 0.250 ② | — | — | | | FR57P4X | | 15 (7) | | S20N11P26SS4X |
| 0.500 ② | — | — | | | FR57P4X | | 14 (6) | | S20N11P51SS4X |
| 0.750 ② | — | — | | | FR58AP4X | | 22 (10) | | S20N11P76SS4X |
| 1 ② | — | — | | | FR67P4X | | 30 (14) | | S20N11P01SS4X |
| 1.5 ② | — | — | | | FR67P4X | | 36 (16) | | S20N11P16SS4X |
| 2 ② | — | — | | | FR68P4X | | 41 (19) | | S20N11P02SS4X |
| 3 | — | — | | | FR1764X | | 76 (34) | | S20N11S03CUSS4X |
| 3 | ③ | ③ | | | FR1764X | 9A | 77 (35) | | S20K11S03CUSS4X |
| 5 | — | — | | | FR1774X | 3A | 135 (61) | | S20N11S05CUSS4X |
| 5 | ④ | ④ | | | FR1774X | 9A | 121 (55) | | S20K11S05CUSS4X |
| 7.5 | — | — | | | FR1784X | 3A | 144 (65) | | S20N11S07CUSS4X |
| 7.5 | ④ | ④ | | | FR1784X | 9A | 146 (66) | | S20K11S07CUSS4X |
| 10 | — | — | | | FR1794X | 3A | 229 (104) | | S20N11S10CUSS4X |
| 10 | ④ | ④ | | | FR1794X | 9A | 219 (99) | | S20K11S10CUSS4X |
| 15 | — | — | | | FR1804X | 3A | 236 (107) | | S20N11S15CUSS4X |
| 15 | ④ | ④ | | | FR1804X | 23A | 236 (107) | | S20L11S15CUSS4X |
| 25 | — | — | | | FR300A4X | 3A | 388 (176) | | S20N11S25CUSS4X |
| 25 | ④ | ④ | | | FR300A4X | 23A | 388 (176) | | S20L11S25CUSS4X |
| 37.5 | ④ | ④ | | | FR300A4X | 248A | 775 (352) | | S20L11S37CUSS4X ⑤ |

Notes

- ① Grade 304 stainless steel standard. Grade 316 stainless steel available as an option. Replace suffix "SS" with suffix "S6."
 ② Copper windings provided as standard.
 ③ 1 at +10% FCBN at 240 volts; 2 at -5% FCBN at 480 volts.
 ④ 2 at +5% FCBN at 240 volts; 4 at -2.5% FCBN at 480 volts.
 ⑤ Floor-mount only.

Contact your local Eaton sales office for voltage combinations not shown in the above table. Other voltages and custom features are available upon request.

NEMA Type 4X Three-Phase Encapsulated—Type EPT, 60 Hz, Grade 304 Stainless Steel ①

2 480 Delta Volts to 208Y/120 Volts—Aluminum Windings

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|---------|-----------------------|----------------|----------------|-----------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR2014X | 70A | 125 (57) | Indoor-Outdoor | Y48G28T03SS4X ② |
| 6 | — | 2 at -5% | | | FR2004X | | 165 (75) | | Y48G28T06SS4X ② |
| 6 | 2 at +2.5% | 2 at -2.5% | | | FR2004X | 72B | 171 (78) | | Y48D28T06SS4X ② |
| 9 | — | 2 at -5% | | | FR1034X | 70A | 180 (82) | | Y48G28T09SS4X ② |
| 9 | — | 4 at -2.5% | | | FR1034X | 503A | 192 (87) | | Y48J28T09SS4X ② |
| 9 | 2 at +2.5% | 2 at -2.5% | | | FR1034X | 72B | 196 (89) | | Y48D28T09SS4X ② |
| 15 | 2 at +2.5% | 2 at -2.5% | | | FR954X | | 281 (127) | | Y48D28T15SS4X ② |
| 15 | — | 2 at -5% | | | FR954X | 70A | 269 (122) | | Y48G28T15SS4X ② |
| 15 | — | 4 at -2.5% | | | FR954X | 503A | 268 (121) | | Y48J28T15SS4X ② |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR2434X | 84A | 539 (245) | | Y48M28T30SS4X |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR2444X | | 723 (328) | | Y48M28T45SS4X |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR2454X | | 1277 (580) | | Y48M28T75SS4X ③ |

480 Delta Volts to 208Y/120 Volts—Copper Windings

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|--------------------|------------|------|---------------|---------|-----------------------|----------------|----------------|-------------------|
| | FCAN | FCBN | | | | | | | |
| 3 | — | 2 at -5% | EPT | 115 | FR2014X | 70A | 139 (63) | Indoor-Outdoor | Y48G28T03CUSS4X ② |
| 6 | — | 2 at -5% | | | FR2004X | | 187 (84) | | Y48G28T06CUSS4X ② |
| 6 | 2 at +2.5% | 2 at -2.5% | | | FR2004X | 72B | 188 (85) | | Y48D28T06CUSS4X ② |
| 9 | — | 2 at -5% | | | FR1034X | 70A | 226 (103) | | Y48G28T09CUSS4X ② |
| 9 | — | 4 at -2.5% | | | FR1034X | 503A | 226 (103) | | Y48J28T09CUSS4X ② |
| 9 | 2 at +2.5% | 2 at -2.5% | | | FR1034X | 72B | 231 (105) | | Y48D28T09CUSS4X ② |
| 15 | 2 at +2.5% | 2 at -2.5% | | | FR954X | | 276 (125) | | Y48D28T15CUSS4X ② |
| 15 | — | 2 at -5% | | | FR954X | 70A | 283 (128) | | Y48G28T15CUSS4X ② |
| 15 | — | 4 at -2.5% | | | FR954X | 503A | 299 (136) | | Y48J28T15CUSS4X ② |
| 30 | 2 at +2.5% | 4 at -2.5% | | | FR2434X | 84A | 602 (273) | | Y48M28T30CUSS4X |
| 45 | 2 at +2.5% | 4 at -2.5% | | | FR2444X | | 829 (376) | | Y48M28T45CUSS4X |
| 75 | 2 at +2.5% | 4 at -2.5% | | | FR2454X | | 1452 (659) | | Y48M28T75CUSS4X ③ |

Notes

① Grade 304 stainless steel standard. Grade 316 stainless steel available as an option. Replace suffix "SS" with suffix "S6."

② T-T (Scott T) connected.

③ Floor-mount only.

Contact your local Eaton sales office for voltage combinations not shown in the above table. Other voltages and custom features are available upon request.

Accessories

Please refer to Section 2.7 **Page V2-T2-167**.

Technical Data and Specifications

Frequency

Eaton standard dry-type distribution transformers are designed for 60 Hz operation. Transformers required for other frequencies are available and must be specifically designed.

Overload Capability

Short-term overload is designed into transformers as required by ANSI. Dry-type distribution transformers will deliver 200% nameplate load for one-half hour, 150% load for one hour and 125% load for four hours without being damaged, provided that a constant 50% load precedes and follows the overload. See ANSI C57.96-01.250 for additional limitations.

Continuous overload capacity is not deliberately designed into a transformer because the design objective is to be within the allowed winding temperature rise with nameplate loading.

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Insulation System Classification

| Ambient | + Winding Rise | + Hot Spot | = Temp. Class |
|---------|----------------|------------|---------------|
| 40°C | 55°C | 10°C | 105°C |
| 40°C | 80°C | 30°C | 150°C |
| 25°C | 135°C | 20°C | 180°C |
| 40°C | 115°C | 30°C | 185°C |
| 40°C | 150°C | 30°C | 220°C |

The design life of transformers having different insulation systems is the same—the lower-temperature systems are designed for the same life as the higher-temperature systems.

Enclosures

Eaton encapsulated transformers, Types EP and EPT, use a NEMA 3R rated enclosure as standard. NEMA 4X enclosures (grade 304 or 316 stainless steel) are available as an option.

Winding Terminations

Primary and secondary windings are terminated in the wiring compartment. Encapsulated units have copper leads or stabs brought out for connections. Eaton recommends that external cables be rated 90°C (sized at 75°C ampacity) for encapsulated designs.

Series-Multiple Windings

Series-multiple windings consist of two similar coils in each winding that can be connected in series or parallel (multiple). Transformers with series-multiple windings are designated with an "x" or "/" between the voltage ratings, such as voltages of "120/240" or "240 x 480." If the series-multiple winding is designated by an "x," the winding can be connected only for a series or parallel. With the "/" designation, a mid-point also becomes available in addition to the series or parallel connection. As an example, a 120 x 240 winding can be connected for either 120 (parallel) or 240 (series), but a 120/240 winding can be connected for 120 (parallel), 240 (series) or 240 with a 120 mid-point.

Sound Levels

All Eaton 600 volt class general-purpose dry-type distribution transformers are designed to meet NEMA ST-20 sound levels listed here. These are the sound levels measured in a soundproof environment. Actual sound levels measured at an installation will likely be higher due to electrical connections and environmental conditions.

Lower sound levels are available and should be specified when the transformer is going to be installed in an area where sound may be a concern.

For additional information, please refer to Section 2.7 **Page V2-T2-171**.

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilated (up to 1.2 kV) | | Encapsulated (up to 1.2 kV) |
|---------------------------------|---------------------------------------|-----------------|--------------------------------|
| | K-Factor 1, 4, 9 | K-Factor 13, 20 | |
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Note

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Distribution Transformers

2



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Type MD



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| Buck-Boost and Low-Voltage Lighting Transformers | V2-T2-120 |
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Motor Drive Isolation Transformers

Product Description

Note: The following pages provide listings for most standard transformer ratings and catalog numbers. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

- Suitable for indoor or outdoor applications (with weathershield)
- Ventilated enclosures
- 220°C insulation system
- 150°C rise standard (self extinguishing), 115°C or 80°C rise optional
- Available in ratings from 7.5 through 1500 kVA
- Motor drive isolation transformers are specifically excluded from the scope of U.S. DOE energy efficiency requirements

Application Description

Drive isolation transformers are specifically designed for use with AC and DC adjustable speed drives. Two winding drive isolation transformers provide:

- Electrical isolation between the incoming line and the drive circuitry
- Voltage conversion of input line to standard drive input voltages
- Minimized line disturbances caused by SCR (silicon controlled rectifiers) firing
- Reduced short-circuit currents and voltage line transients

Drive isolation transformers are specifically sized to the drive kVA requirements and are braced to withstand the mechanical stresses of current reversals and short circuits associated with SCR drives.

Features, Benefits and Functions

- 60 Hz operation (50/60 Hz operation available)
- Short-term overload capability as required by ANSI
- Primary and secondary terminals are front accessible for fast and easy connection
- Slotted screw mounting holes in enclosure and cover reduce installation time
- Sound dampening pads, which isolate the core and coil from the case, reduce noise levels to meet NEMA ST-20
- Core laminations of precision sheared silicon steel are hand stacked to ensure quiet operation
- Terminations are clearly marked for easy identification
- Three-phase transformers have one 5% full capacity tap above and below nominal voltage for incoming source adjustment
- Units are suitable for continuous operation in a 40°C ambient maximum
- Full current neutral
- Thermoguard protection embedded in coils of three-phase models to indicate that high temperatures (approximately 190°C) are present. Thermoguards consist of a set of NC dry contacts
- Three coil delta-wye configurations are used throughout the product line

Standards and Certifications

- ANSI C89.2
- NEMA ST-20
- UL 506
- UL 1561



Seismic Qualified

All Eaton manufactured dry-type distribution transformers are seismically qualified and exceed requirements of the International Building Code (IBC) and California Code Title 24.

Catalog Number SelectionPlease refer to Section 2.7 **Page V2-T2-162**.**2****Product Selection**Additional Product Selection information begins on **Page V2-T2-165**.**Three-Phase Drive Isolation****208 Delta Volts to 460Y/266 Volts**

| hp | kVA | Full Capacity Taps | | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|-----|--------------------|----------|------------------|--------|--------------------------|-------------------|---------------|-----------------|
| | | FCAN | FCBN | | | | | | |
| 5 | 7.5 | 1 at +5% | 1 at -5% | 150 | FR912D | 347B | 158 (72) | WS38 | MD075E86 |
| 7.5 | 11 | | | | FR912D | | 176 (80) | WS38 | MD11E86 |
| 10 | 14 | | | | FR912D | | 149 (68) | WS38 | MD14E86 |
| 15 | 20 | | | | FR912D | | 240 (19) | WS38 | MD20E86 |
| 20 | 27 | | | | FR912D | | 231 (15) | WS38 | MD27E86 |
| 25 | 34 | | | | FR912D | | 310 (141) | WS38 | MD34E86 |
| 30 | 40 | | | | FR912D | | 307 (139) | WS38 | MD40E86 |
| 40 | 51 | | | | FR914D | | 480 (218) | WS39 | MD51E86 |
| 50 | 63 | | | | FR914D | | 485 (220) | WS39 | MD63E86 |
| 60 | 75 | | | | FR914D | | 482 (219) | WS39 | MD75E86 |
| 75 | 93 | | | | FR915D | | 600 (272) | WS39 | MD93E86 |
| 100 | 118 | | | | FR916A | | 658 (299) | WS19 | MD118E86 |
| 125 | 145 | | | | FR916A | | 770 (350) | WS19 | MD145E86 |
| 150 | 175 | | | | FR918A | 321B | 1320 (599) | WS34 | MD175E86 |
| 200 | 220 | | | | FR918A | | 1436 (652) | WS34 | MD220E86 |
| 250 | 275 | | | | FR918A | | ① | WS34 | MD275E86 |
| 300 | 330 | | | | FR919E | | ① | WS35 | MD330E86 |
| 400 | 440 | | | | FR920E | | ① | WS35 | MD440E86 |

Notes

① Contact Eaton.

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Drive Isolation

230 Delta Volts to 230Y/133 Volts

| hp | kVA | Full Capacity Taps | | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|-----|--------------------|----------|---------------|--------|-----------------------|----------------|---------------|----------------|
| | | FCAN | FCBN | | | | | | |
| 5 | 7.5 | 1 at +5% | 1 at -5% | 150 | FR912D | 286A | 158 (72) | WS38 | MD075E88 |
| 7.5 | 11 | | | | FR912D | | 156 (71) | WS38 | MD11E88 |
| 10 | 14 | | | | FR912D | | 158 (72) | WS38 | MD14E88 |
| 15 | 20 | | | | FR912D | | 216 (98) | WS38 | MD20E88 |
| 20 | 27 | | | | FR912D | | 231 (105) | WS38 | MD27E88 |
| 25 | 34 | | | | FR912D | | 310 (141) | WS38 | MD34E88 |
| 30 | 40 | | | | FR912D | | 310 (141) | WS38 | MD40E88 |
| 40 | 51 | | | | FR914D | | 480 (218) | WS39 | MD51E88 |
| 50 | 63 | | | | FR914D | | 500 (227) | WS39 | MD63E88 |
| 60 | 75 | | | | FR914D | | 538 (244) | WS39 | MD75E88 |
| 75 | 93 | | | | FR915D | | 600 (272) | WS39 | MD93E88 |
| 100 | 118 | | | | FR915D | | 600 (272) | WS39 | MD118E88 |
| 125 | 145 | | | | FR916A | | 868 (394) | WS19 | MD145E88 |
| 150 | 175 | | | | FR918A | 318D | 1320 (599) | WS34 | MD175E88 |
| 200 | 220 | | | | FR918A | | 1332 (605) | WS34 | MD220E88 |
| 250 | 275 | | | | FR918A | | 1350 (613) | WS34 | MD275E88 |
| 300 | 330 | | | | FR919E | | 2336 (1061) | WS35 | MD330E88 |
| 400 | 440 | | | | FR920E | | ① | WS35 | MD440E88 |

230 Delta Volts to 460Y/266 Volts

| hp | kVA | Full Capacity Taps | | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|-----|--------------------|----------|---------------|--------|-----------------------|----------------|---------------|----------------|
| | | FCAN | FCBN | | | | | | |
| 5 | 7.5 | 1 at +5% | 1 at -5% | 150 | FR912D | 347A | 158 (72) | WS38 | MD075E89 |
| 7.5 | 11 | | | | FR912D | | 158 (72) | WS38 | MD11E89 |
| 10 | 14 | | | | FR912D | | 158 (72) | WS38 | MD14E89 |
| 15 | 20 | | | | FR912D | | 254 (115) | WS38 | MD20E89 |
| 20 | 27 | | | | FR912D | | 231 (105) | WS38 | MD27E89 |
| 25 | 34 | | | | FR912D | | 310 (141) | WS38 | MD34E89 |
| 30 | 40 | | | | FR912D | | 344 (156) | WS38 | MD40E89 |
| 40 | 51 | | | | FR914D | | 480 (218) | WS39 | MD51E89 |
| 50 | 63 | | | | FR914D | | 457 (207) | WS39 | MD63E89 |
| 60 | 75 | | | | FR914D | | 480 (218) | WS39 | MD75E89 |
| 75 | 93 | | | | FR915D | | 600 (272) | WS39 | MD93E89 |
| 100 | 118 | | | | FR916A | | 941 (427) | WS19 | MD118E89 |
| 125 | 145 | | | | FR916A | | 770 (350) | WS19 | MD145E89 |
| 150 | 175 | | | | FR918A | 321A | 1326 (602) | WS34 | MD175E89 |
| 200 | 220 | | | | FR918A | | 1332 (605) | WS34 | MD220E89 |
| 250 | 275 | | | | FR918A | | 1350 (613) | WS34 | MD275E89 |
| 300 | 330 | | | | FR919E | | 2400 (1090) | WS35 | MD330E89 |
| 400 | 440 | | | | FR920E | | ① | WS35 | MD440E89 |

Notes

① Contact Eaton.

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Drive Isolation**460 Delta Volts to 230Y/133 Volts**

| hp | kVA | Full Capacity Taps | | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|-----|--------------------|----------|---------------|--------|-----------------------|----------------|---------------|----------------|
| | | FCAN | FCBN | | | | | | |
| 5 | 7.5 | 1 at +5% | 1 at -5% | 150 | FR912D | 286D | 193 (88) | WS38 | MD075E91 |
| 7.5 | 11 | | | | FR912D | | 158 (72) | WS38 | MD11E91 |
| 10 | 14 | | | | FR912D | | 158 (72) | WS38 | MD14E91 |
| 15 | 20 | | | | FR912D | | 216 (98) | WS38 | MD20E91 |
| 20 | 27 | | | | FR912D | | 231 (105) | WS38 | MD27E91 |
| 25 | 34 | | | | FR912D | | 340 (154) | WS38 | MD34E91 |
| 30 | 40 | | | | FR912D | | 339 (154) | WS38 | MD40E91 |
| 40 | 51 | | | | FR914D | | 535 (243) | WS39 | MD51E91 |
| 50 | 63 | | | | FR914D | | 480 (218) | WS39 | MD63E91 |
| 60 | 75 | | | | FR914D | | 469 (213) | WS39 | MD75E91 |
| 75 | 93 | | | | FR915D | | 727 (330) | WS39 | MD93E91 |
| 100 | 118 | | | | FR916A | | 770 (350) | WS19 | MD118E91 |
| 125 | 145 | | | | FR916A | | 770 (350) | WS19 | MD145E91 |
| 150 | 175 | | | | FR917 | | 1100 (499) | WS34 | MD175E91 |
| 200 | 220 | | | | FR918A | | 1299 (590) | WS34 | MD220E91 |
| 250 | 275 | | | | FR918A | | 1596 (725) | WS34 | MD275E91 |
| 300 | 330 | | | | FR919E | 318E | 2234 (1014) | WS35 | MD330E91 |
| 400 | 440 | | | | FR919E | | 2400 (1090) | WS35 | MD440E91 |

460 Delta Volts to 400Y/231 Volts

| hp | kVA | Full Capacity Taps | | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|-----|--------------------|----------|---------------|--------|-----------------------|----------------|---------------|----------------|
| | | FCAN | FCBN | | | | | | |
| 5 | 7.5 | 1 at +5% | 1 at -5% | 150 | FR912D | 286D | 193 (88) | WS38 | MD075E75 |
| 7.5 | 11 | | | | FR912D | | 158 (72) | WS38 | MD11E75 |
| 10 | 14 | | | | FR912D | | 158 (72) | WS38 | MD14E75 |
| 15 | 20 | | | | FR912D | | 216 (98) | WS38 | MD20E75 |
| 20 | 27 | | | | FR912D | | 231 (105) | WS38 | MD27E75 |
| 25 | 34 | | | | FR912D | | 340 (154) | WS38 | MD34E75 |
| 30 | 40 | | | | FR912D | | 339 (154) | WS38 | MD40E75 |
| 40 | 51 | | | | FR914D | | 535 (243) | WS39 | MD51E75 |
| 50 | 63 | | | | FR914D | | 480 (218) | WS39 | MD63E75 |
| 60 | 75 | | | | FR914D | | 469 (213) | WS39 | MD75E75 |
| 75 | 93 | | | | FR915D | | 727 (330) | WS39 | MD93E75 |
| 100 | 118 | | | | FR916A | | 770 (350) | WS19 | MD118E75 |
| 125 | 145 | | | | FR916A | | 770 (350) | WS19 | MD145E75 |
| 150 | 175 | | | | FR917 | | 1100 (499) | WS34 | MD175E75 |
| 200 | 220 | | | | FR918A | | 1299 (590) | WS34 | MD220E75 |
| 250 | 275 | | | | FR918A | | 1596 (725) | WS34 | MD275E75 |
| 300 | 330 | | | | FR919E | 318E | 2234 (1014) | WS35 | MD330E75 |
| 400 | 440 | | | | FR919E | | 2400 (1090) | WS35 | MD440E75 |

Note

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Drive Isolation

460 Delta Volts to 460Y/266 Volts

| hp | kVA | Full Capacity Taps | | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|-----|--------------------|----------|---------------|--------|-----------------------|----------------|---------------|-----------------|
| | | FCAN | FCBN | | | | | | |
| 5 | 7.5 | 1 at +5% | 1 at -5% | 150 | FR912D | 286D | 164 (74) | WS38 | MD075E92 |
| 7.5 | 11 | | | | FR912D | | 161 (73) | WS38 | MD11E92 |
| 10 | 14 | | | | FR912D | | 173 (79) | WS38 | MD14E92 |
| 15 | 20 | | | | FR912D | | 231 (105) | WS38 | MD20E92 |
| 20 | 27 | | | | FR912D | | 250 (114) | WS38 | MD27E92 |
| 25 | 34 | | | | FR912D | | 310 (141) | WS38 | MD34E92 |
| 30 | 40 | | | | FR912D | | 310 (141) | WS38 | MD40E92 |
| 40 | 51 | | | | FR914D | | 503 (228) | WS39 | MD51E92 |
| 50 | 63 | | | | FR914D | | 535 (243) | WS39 | MD63E92 |
| 60 | 75 | | | | FR914D | | 535 (243) | WS39 | MD75E92 |
| 75 | 93 | | | | FR916A | | 710 (322) | WS19 | MD93E92 |
| 100 | 118 | | | | FR916A | | 770 (350) | WS19 | MD118E92 |
| 125 | 145 | | | | FR916A | | 866 (393) | WS19 | MD145E92 |
| 150 | 175 | | | | FR917 | | 1100 (499) | WS34 | MD175E92 |
| 200 | 220 | | | | FR918A | | 1100 (499) | WS34 | MD220E92 |
| 250 | 275 | | | | FR918A | | 1469 (667) | WS34 | MD275E92 |
| 300 | 330 | | | | FR919E | 318E | 2587 (1174) | WS35 | MD330E92 |
| 400 | 440 | | | | FR919E | | 2500 (1135) | WS35 | MD440E92 |

Note

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Drive Isolation

480 Delta Volts to 240 Delta Volts

| hp | kVA | Full Capacity Taps | | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|-----|--------------------|----------|---------------|--------|-----------------------|----------------|---------------|----------------|
| | | FCAN | FCBN | | | | | | |
| 5 | 7.5 | 1 at +5% | 1 at -5% | 150 | FR912D | 300A | 193 (88) | WS38 | MD075E77 |
| 7.5 | 11 | | | | FR912D | | 158 (72) | WS38 | MD11E77 |
| 10 | 14 | | | | FR912D | | 158 (72) | WS38 | MD14E77 |
| 15 | 20 | | | | FR912D | | 185 (84) | WS38 | MD20E77 |
| 20 | 27 | | | | FR912D | | 231 (105) | WS38 | MD27E77 |
| 25 | 34 | | | | FR912D | | 329 (149) | WS38 | MD34E77 |
| 30 | 40 | | | | FR912D | | 339 (154) | WS38 | MD40E77 |
| 40 | 51 | | | | FR914D | | 535 (243) | WS39 | MD51E77 |
| 50 | 63 | | | | FR914D | | 480 (218) | WS39 | MD63E77 |
| 60 | 75 | | | | FR914D | | 469 (213) | WS39 | MD75E77 |
| 75 | 93 | | | | FR915D | | 727 (330) | WS39 | MD93E77 |
| 100 | 118 | | | | FR916A | | 770 (350) | WS19 | MD118E77 |
| 125 | 145 | | | | FR916A | | 770 (350) | WS19 | MD145E77 |
| 150 | 175 | | | | FR917 | | 1100 (499) | WS34 | MD175E77 |
| 200 | 220 | | | | FR918A | | 1299 (590) | WS34 | MD220E77 |
| 250 | 275 | | | | FR918A | | 1596 (725) | WS34 | MD275E77 |
| 300 | 330 | | | | FR919E | 348D | 2234 (1014) | WS35 | MD330E77 |
| 400 | 440 | | | | FR919E | | 2400 (1090) | WS35 | MD440E77 |

480 Delta Volts to 480 Delta Volts

| hp | kVA | Full Capacity Taps | | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|-----|--------------------|----------|---------------|--------|-----------------------|----------------|---------------|----------------|
| | | FCAN | FCBN | | | | | | |
| 5 | 7.5 | 1 at +5% | 1 at -5% | 150 | FR912D | 300A | 193 (88) | WS38 | MD075E99 |
| 7.5 | 11 | | | | FR912D | | 158 (72) | WS38 | MD11E99 |
| 10 | 14 | | | | FR912D | | 158 (72) | WS38 | MD14E99 |
| 15 | 20 | | | | FR912D | | 185 (84) | WS38 | MD20E99 |
| 20 | 27 | | | | FR912D | | 231 (105) | WS38 | MD27E99 |
| 25 | 34 | | | | FR912D | | 329 (149) | WS38 | MD34E99 |
| 30 | 40 | | | | FR912D | | 339 (154) | WS38 | MD40E99 |
| 40 | 51 | | | | FR914D | | 535 (243) | WS39 | MD51E99 |
| 50 | 63 | | | | FR914D | | 480 (218) | WS39 | MD63E99 |
| 60 | 75 | | | | FR914D | | 469 (213) | WS39 | MD75E99 |
| 75 | 93 | | | | FR915D | | 727 (330) | WS39 | MD93E99 |
| 100 | 118 | | | | FR916A | | 770 (350) | WS19 | MD118E99 |
| 125 | 145 | | | | FR916A | | 770 (350) | WS19 | MD145E99 |
| 150 | 175 | | | | FR917 | | 1100 (499) | WS34 | MD175E99 |
| 200 | 220 | | | | FR918A | | 1299 (590) | WS34 | MD220E99 |
| 250 | 275 | | | | FR918A | | 1596 (725) | WS34 | MD275E99 |
| 300 | 330 | | | | FR919E | 348D | 2234 (1014) | WS35 | MD330E99 |
| 400 | 440 | | | | FR919E | | 2400 (1090) | WS35 | MD440E99 |

Note

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on [Page V2-T2-204](#).

Three-Phase Drive Isolation

575 Delta Volts to 460Y/266 Volts

| hp | kVA | Full Capacity Taps | | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|-----|--------------------|----------|---------------|--------|-----------------------|----------------|---------------|----------------|
| | | FCAN | FCBN | | | | | | |
| 5 | 7.5 | 1 at +5% | 1 at -5% | 150 | FR912D | 286H | 158 (72) | WS38 | MD075E95 |
| 7.5 | 11 | | | | FR912D | | 158 (72) | WS38 | MD11E95 |
| 10 | 14 | | | | FR912D | | 158 (72) | WS38 | MD14E95 |
| 15 | 20 | | | | FR912D | | 272 (123) | WS38 | MD20E95 |
| 20 | 27 | | | | FR912D | | 266 (121) | WS38 | MD27E95 |
| 25 | 34 | | | | FR912D | | 360 (163) | WS38 | MD34E95 |
| 30 | 40 | | | | FR912D | | 310 (141) | WS38 | MD40E95 |
| 40 | 51 | | | | FR914D | | 504 (229) | WS39 | MD51E95 |
| 50 | 63 | | | | FR914D | | 506 (230) | WS39 | MD63E95 |
| 60 | 75 | | | | FR914D | | 524 (238) | WS39 | MD75E95 |
| 75 | 93 | | | | FR916A | | 730 (331) | WS19 | MD93E95 |
| 100 | 118 | | | | FR916A | | 770 (350) | WS19 | MD118E95 |
| 125 | 145 | | | | FR916A | | 770 (350) | WS19 | MD145E95 |
| 150 | 175 | | | | FR917 | | 1282 (582) | WS34 | MD175E95 |
| 200 | 220 | | | | FR917 | | 1201 (545) | WS34 | MD220E95 |
| 250 | 275 | | | | FR923 | 318F | 702 (319) | WS37 | MD275E95 |
| 300 | 330 | | | | FR919E | | 2263 (1027) | WS35 | MD330E95 |
| 400 | 440 | | | | FR919E | | 2400 (1090) | WS35 | MD440E95 |

575 Delta Volts to 575Y/332 Volts

| hp | kVA | Full Capacity Taps | | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Weathershield | Catalog Number |
|-----|-----|--------------------|----------|---------------|--------|-----------------------|----------------|---------------|----------------|
| | | FCAN | FCBN | | | | | | |
| 5 | 7.5 | 1 at +5% | 1 at -5% | 150 | FR912D | 286H | 158 (72) | WS38 | MD075E96 |
| 7.5 | 11 | | | | FR912D | | 158 (72) | WS38 | MD11E96 |
| 10 | 14 | | | | FR912D | | 231 (105) | WS38 | MD14E96 |
| 15 | 20 | | | | FR912D | | 231 (105) | WS38 | MD20E96 |
| 20 | 27 | | | | FR912D | | 231 (105) | WS38 | MD27E96 |
| 25 | 34 | | | | FR912D | | 261 (118) | WS38 | MD34E96 |
| 30 | 40 | | | | FR912D | | 310 (141) | WS38 | MD40E96 |
| 40 | 51 | | | | FR914D | | 480 (218) | WS39 | MD51E96 |
| 50 | 63 | | | | FR914D | | 500 (227) | WS39 | MD63E96 |
| 60 | 75 | | | | FR914D | | 538 (244) | WS39 | MD75E96 |
| 75 | 93 | | | | FR916A | | 600 (272) | WS19 | MD93E96 |
| 100 | 118 | | | | FR916A | | 948 (430) | WS19 | MD118E96 |
| 125 | 145 | | | | FR916A | | 868 (394) | WS19 | MD145E96 |
| 150 | 175 | | | | FR917 | | 1320 (599) | WS34 | MD175E96 |
| 200 | 220 | | | | FR917 | | 1332 (605) | WS34 | MD220E96 |
| 250 | 275 | | | | FR918A | 318F | 1350 (613) | WS34 | MD275E96 |
| 300 | 330 | | | | FR919E | | 2336 (1061) | WS35 | MD330E96 |
| 400 | 440 | | | | FR919E | | 2500 (1137) | WS35 | MD440E96 |

Note

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Motor Drive Isolation Transformers

Accessories

- Copper windings
- Non-standard voltages
- 50/60 Hz designs
- Delta-delta configuration
- 80°C or 115°C rise designs
- Encapsulated designs (up to 34 kVA). Thermoguards are not available on encapsulated designs

- Totally enclosed non-ventilated
- Electrostatic shields

Please refer to Section 2.7
Page V2-T2-167.

Technical Data and Specifications

Frequency

Eaton standard dry-type distribution transformers are designed for 60 Hz operation. Transformers required for other frequencies are available and must be specifically designed.

Overload Capability

Short-term overload is designed into transformers as required by ANSI. Dry-type distribution transformers will deliver 200% nameplate load for one-half hour, 150% load for one hour and 125% load for four hours without being damaged, provided that a constant 50% load precedes and follows the overload. See ANSI C57.96-01.250 for additional limitations.

Continuous overload capacity is not deliberately designed into a transformer because the design objective is to be within the allowed winding temperature rise with nameplate loading.

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Insulation System Classification

| Ambient | + Winding Rise | + Hot Spot | = Temp. Class |
|---------|----------------|------------|---------------|
| 40°C | 55°C | 10°C | 105°C |
| 40°C | 80°C | 30°C | 150°C |
| 25°C | 135°C | 20°C | 180°C |
| 40°C | 115°C | 30°C | 185°C |
| 40°C | 150°C | 30°C | 220°C |

The design life of transformers having different insulation systems is the same—the lower-temperature systems are designed for the same life as the higher-temperature systems.

Enclosures

Eaton ventilated transformers, Type MD, use a NEMA 2 rated (drip-proof) enclosure as standard, and are rated NEMA 3R with the addition of weathershields.

Winding Terminations

Primary and secondary windings are terminated in the wiring compartment. Ventilating transformers have leads brought out to aluminum pads that are pre-drilled to accept Cu/Al lugs. **Lugs are not supplied with these transformers.** Eaton recommends that external cables be rated 75°C for ventilated designs.

Sound Levels

All Eaton 600 volt class general-purpose dry-type distribution transformers are designed to meet NEMA ST-20 sound levels listed here. These are the sound levels measured in a soundproof environment. Actual sound levels measured at an installation will likely be higher due to electrical connections and environmental conditions. Lower sound levels are available and should be specified when the transformer is going to be installed in an area where sound may be a concern.

For additional information, please refer to Section 2.7
Page V2-T2-171.

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilating (up to 1.2 kV) | | Encapsulated (up to 1.2 kV) |
|------------------------------|--|-----------------|-----------------------------|
| | K-Factor 1, 4, 9 | K-Factor 13, 20 | |
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Note

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Mini-Power Centers



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Mini-Power Centers

Product Description

Note: The following pages provide listings for most standard transformer ratings and catalog numbers. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

- Encapsulated design
- Suitable for indoor or outdoor applications
- 180°C insulation system
- 115°C rise standard; 80°C rise optional

Application Description

A mini-power center combines three individual components into one NEMA Type 3R enclosure: a main breaker, an encapsulated single-phase (Type EP) or three-phase (EPT) dry-type transformer, and a secondary distribution loadcenter with main breaker. Interconnecting wiring is completed at the factory. Mini-power centers are used wherever there is a 480 volt or 600 volt distribution system and loads requiring 208Y/120 volt, three-phase or 120/240 volt single-phase. Typical installations include:

- Industrial plant assembly lines
- Plant expansions
- Test equipment
- Temporary construction site power
- Sewage disposal plants
- Warehouses
- Car washes
- Parking lots
- Commercial buildings
- Mini-power centers are encapsulated transformers and are outside the scope of U.S. DOE energy efficiency requirements

Features, Benefits and Functions

- 60 Hz operation
- Indoor/outdoor, NEMA 3R
- Primary main breaker
- Secondary main breaker (Type BR plug-in and Type BAB bolt-on branch breakers not included)
- All live parts enclosed for personnel safety
- Cover is hinged to prevent removal and can be padlocked
- Cores are grounded with a copper lead
- Ground bar is supplied to permit grounding of individual secondary circuits
- Neutral bar is grounded to case
- Branch circuits can be easily added or changed using Type BR plug-in breakers and Type BR plug-in and Type BAB bolt-on
- Suitable for service entrance
- Wide range of configurations available:
 - Aluminum windings and plug-in loadcenter chassis standard
 - Copper windings and plug-in loadcenter chassis also available
 - Copper windings and bolt-on loadcenter chassis available

- Short-term overload capability as required by ANSI
- Meet NEMA ST-20 sound levels

Standards and Certifications

- UL listed
- CSA® certified



Industry Standards

All Eaton dry-type distribution and control transformers are built and tested in accordance with applicable NEMA, ANSI and IEEE Standards. All 600 volt class transformers are UL listed unless otherwise noted.

Seismically Qualified

Eaton manufactured dry-type distribution transformers are seismically qualified and exceed requirements of the International Building Code (IBC) and California Code Title 24.

Catalog Number SelectionPlease refer to Section 2.7 **Page V2-T2-162**.**Product Selection**Additional Product Selection information begins on **Page V2-T2-165**.**Single-Phase****480 Volts to 120/240 Volts**

| kVA | Full Capacity Taps FCBN | Frame | Wiring Diagram Number | Weight Lb (kg) | Main Circuit Breaker | | Branch Breakers Max. Number ⁽²⁾⁽³⁾ | | | Max. Amp | Catalog Number |
|-----|-------------------------|-------|-----------------------|----------------|------------------------|-----------|---|----------|--|----------|----------------|
| | | | | | Primary ⁽¹⁾ | Secondary | Single-Pole | Two-Pole | | | |
| 3 | 2 at -5% | FR283 | 97A3K | 105 (47) | EHD2015 | BR215 | 8 | 4 | | 12 | P48G11S03P |
| 5 | 2 at -5% | FR284 | 110A5K | 110 (50) | EHD2020 | BR225 | 12 | 6 | | 20 | P48G11S05P |
| 7.5 | 2 at -5% | FR284 | 109A7K | 125 (56) | EHD2030 | BR230 | 12 | 6 | | 30 | P48G11S07P |
| 10 | 2 at -5% | FR285 | 108A10K | 180 (82) | EHD2040 | BR250 | 12 | 6 | | 40 | P48G11S10P |
| 15 | 2 at -5% | FR286 | 107A15K | 215 (98) | EHD2060 | BR270 | 20 | 10 | | 60 | P48G11S15P |
| 25 | 2 at -5% | FR287 | 106A25K | 373 (169) | EHD2100 | BR2125 | 26 | 13 | | 100 | P48G11S25P |

600 Volts to 120/240 Volts

| kVA | Full Capacity Taps FCBN | Frame | Wiring Diagram Number | Weight Lb (kg) | Main Circuit Breaker | | Branch Breakers Max. Number ⁽²⁾⁽³⁾ | | | Max. Amp | Catalog Number |
|-----|-------------------------|-------|-----------------------|----------------|------------------------|-----------|---|----------|--|----------|----------------|
| | | | | | Primary ⁽¹⁾ | Secondary | Single-Pole | Two-Pole | | | |
| 5 | 2 at -5% | FR284 | 110B5K | 110 (50) | FDB2015 | BR225 | 12 | 6 | | 20 | P60G11S05P |
| 7.5 | 2 at -5% | FR284 | 109B7K | 125 (56) | FDB2030 | BR230 | 12 | 6 | | 30 | P60G11S07P |
| 10 | 2 at -5% | FR285 | 108B10K | 180 (82) | FDB2040 | BR250 | 12 | 6 | | 40 | P60G11S10P |
| 15 | 2 at -5% | FR286 | 107B15K | 215 (98) | FDB2060 | BR270 | 20 | 10 | | 60 | P60G11S15P |
| 25 | 2 at -5% | FR287 | 106B25K | 373 (169) | FDB2100 | BR2125 | 26 | 13 | | 100 | P60G11S25P |

Three-Phase**480 Delta Volts to 208Y/120 Volts**

| kVA | Full Capacity Taps FCBN | Frame | Wiring Diagram Number | Weight Lb (kg) | Main Circuit Breaker | | Branch Breakers Max. Number ⁽²⁾⁽³⁾ | | | Max. Amp | Catalog Number |
|------|-------------------------|--------|-----------------------|----------------|----------------------|-----------|---|----------|------------|----------|----------------|
| | | | | | Primary | Secondary | Single-Pole | Two-Pole | Three-Pole | | |
| 15 | 2 at -5% | FR289A | 105A15K | 320 (145) | EHD3040 | BR350 | 18 | 9 | 6 | 40 | P48G28T15P |
| 22.5 | 2 at -5% | FR290A | 103A21K | 565 (256) | EHD3070 | BR370 | 18 | 9 | 6 | 60 | P48G28T21P |
| 30 | 2 at -5% | FR291A | 104A30K | 635 (288) | EHD3090 | BR3100 | 24 | 12 | 8 | 80 | P48G28T30P |

600 Delta Volts to 208Y/120 Volts

| kVA | Full Capacity Taps FCBN | Frame | Wiring Diagram Number | Weight Lb (kg) | Main Circuit Breaker | | Branch Breakers Max. Number ⁽²⁾⁽³⁾ | | | Max. Amp | Catalog Number |
|------|-------------------------|--------|-----------------------|----------------|----------------------|-----------|---|----------|------------|----------|----------------|
| | | | | | Primary | Secondary | Single-Pole | Two-Pole | Three-Pole | | |
| 15 | 2 at -5% | FR289A | 105D15K | 320 (145) | FDB3030 | BR350 | 18 | 9 | 6 | 40 | P60G28T15P |
| 22.5 | 2 at -5% | FR290A | 103B21K | 565 (256) | FDB3050 | BR370 | 18 | 9 | 6 | 60 | P60G28T21P |
| 30 | 2 at -5% | FR291A | 104B30K | 635 (288) | FDB3070 | BR3100 | 24 | 12 | 8 | 80 | P60G28T30P |

Notes

- ⁽¹⁾ Primary breakers with higher interrupting capacity available. For HFD breaker, add suffix "H." For FD breaker, add suffix "F." For FDC breaker, add suffix "C."
Main breakers are fixed only.
- ⁽²⁾ Combinations can be selected.
- ⁽³⁾ Branch breakers not included. Use Eaton's Type BR.

For 304 grade stainless steel enclosure, replace 10th character of catalog number with an "SS" suffix, e.g., P48G11S03SS, or add "SS" suffix before the addition of "CUB."
For 316 grade stainless steel enclosure, replace 10th character of catalog number with an "S6" suffix, e.g., P48G11S03S6, or add "S6" suffix before the addition of "CUB."
For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

All Copper, Bolt-On Breaker Designs—Single-Phase

480 Volts to 120/240 Volts

| kVA | Full Capacity Taps FCBN | Frame | Wiring Diagram Number | Weight Lb (kg) | Main Circuit Breaker | | Branch Breakers Max. Number ^{②③} | | | Max. Amp | Catalog Number |
|-----|-------------------------|-------|-----------------------|----------------|----------------------|-----------|---|----------|------------|----------|----------------|
| | | | | | Primary ^① | Secondary | Single-Pole | Two-Pole | Three-Pole | | |
| 3 | 2 at -5% | FR306 | 97A3K | 105 (47) | EHD2015L | BAB2015 | 8 | 4 | | 12 | P48G11S03CUB |
| 5 | 2 at -5% | FR307 | 110A5K | 110 (50) | EHD2020L | BAB2025 | 12 | 6 | | 20 | P48G11S05CUB |
| 7.5 | 2 at -5% | FR307 | 109A7K | 110 (50) | EHD2030L | BAB2030 | 12 | 6 | | 30 | P48G11S07CUB |
| 10 | 2 at -5% | FR308 | 108A10K | 180 (82) | EHD2040L | BAB2050 | 12 | 6 | | 40 | P48G11S10CUB |
| 15 | 2 at -5% | FR309 | 108A15K | 215 (98) | EHD2060L | BAB2070 | 24 | 12 | | 60 | P48G11S15CUB |
| 25 | 2 at -5% | FR310 | 106A25K | 385 (175) | EHD2100L | BAB2125 | 26 | 13 | | 100 | P48G11S25CUB |

600 Volts to 120/240 Volts

| kVA | Full Capacity Taps FCBN | Frame | Wiring Diagram Number | Weight Lb (kg) | Main Circuit Breaker | | Branch Breakers Max. Number ^{②③} | | | Max. Amp | Catalog Number |
|-----|-------------------------|-------|-----------------------|----------------|----------------------|-----------|---|----------|------------|----------|----------------|
| | | | | | Primary ^① | Secondary | Single-Pole | Two-Pole | Three-Pole | | |
| 3 | 2 at -5% | FR306 | 97B3K | 105 (47) | FDB2015L | BAB2015 | 8 | 4 | | 12 | P60G11S03CUB |
| 5 | 2 at -5% | FR307 | 110B5K | 110 (50) | FDB2020L | BAB2025 | 12 | 6 | | 20 | P60G11S05CUB |
| 7.5 | 2 at -5% | FR307 | 109B7K | 110 (50) | FDB2030L | BAB2030 | 12 | 6 | | 30 | P60G11S07CUB |
| 10 | 2 at -5% | FR308 | 108B10K | 180 (82) | FDB2040L | BAB2050 | 12 | 6 | | 40 | P60G11S10CUB |
| 15 | 2 at -5% | FR309 | 108B15K | 215 (98) | FDB2060L | BAB2070 | 24 | 12 | | 60 | P60G11S15CUB |
| 25 | 2 at -5% | FR310 | 106B25K | 385 (175) | FDB2100L | BAB2125 | 26 | 13 | | 100 | P60G11S25CUB |

Three-Phase

480 Volts to 208Y/120 Volts

| kVA | Full Capacity Taps FCBN | Frame | Wiring Diagram Number | Weight Lb (kg) | Main Circuit Breaker | | Branch Breakers Max. Number ^{②③} | | | Max. Amp | Catalog Number |
|------|-------------------------|--------|-----------------------|----------------|----------------------|-----------|---|----------|------------|----------|----------------|
| | | | | | Primary | Secondary | Single-Pole | Two-Pole | Three-Pole | | |
| 15 | 2 at -5% | FR289A | 105A15K | 320 (145) | EHD3040L | BAB3050H | 18 | 9 | 6 | 40 | P48G28T15CUB |
| 22.5 | 2 at -5% | FR290A | 103A21K | 565 (257) | EHD3070L | BAB3070H | 18 | 9 | 6 | 60 | P48G28T21CUB |
| 30 | 2 at -5% | FR291A | 104A30K | 635 (288) | EHD3090L | BAB3100H | 24 | 12 | 8 | 80 | P48G28T30CUB |

600 Volts to 208Y/120 Volts

| kVA | Full Capacity Taps FCBN | Frame | Wiring Diagram Number | Weight Lb (kg) | Main Circuit Breaker | | Branch Breakers Max. Number ^{②③} | | | Max. Amp | Catalog Number |
|------|-------------------------|--------|-----------------------|----------------|----------------------|-----------|---|----------|------------|----------|----------------|
| | | | | | Primary | Secondary | Single-Pole | Two-Pole | Three-Pole | | |
| 15 | 2 at -5% | FR289A | 105D15K | 320 (145) | FDB3030L | BAB3050H | 18 | 9 | 6 | 40 | P60G28T15CUB |
| 22.5 | 2 at -5% | FR290A | 103B21K | 565 (257) | FDB3050L | BAB3070H | 18 | 9 | 6 | 60 | P60G28T21CUB |
| 30 | 2 at -5% | FR291A | 104B30K | 635 (288) | FDB3070L | BAB3100H | 24 | 12 | 8 | 80 | P60G28T30CUB |

Notes

① Primary breakers with higher interrupting capacity available. For HFD breaker, add suffix "H." For FD breaker, add suffix "F." For FDC breaker, add suffix "C."
Main breakers are fixed only. UL Listed only, not CSA.

② Combinations can be selected.

③ Branch breakers not included. Use Eaton's Type BAB.

For 304 grade stainless steel enclosure, replace 10th character of catalog number with an "SS" suffix, e.g., P48G11S03SS, or add "SS" suffix before the addition of "CUB."

For 316 grade stainless steel enclosure, replace 10th character of catalog number with an "S6" suffix, e.g., P48G11S03S6, or add "S6" suffix before the addition of "CUB."

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Mini-Power Centers

Accessories

Please refer to Section 2.7
Page V2-T2-167.

Technical Data and Specifications

Frequency

Eaton standard dry-type distribution transformers are designed for 60 Hz operation. Transformers required for other frequencies must be specifically designed.

Overload Capability

Short-term overload is designed into transformers as required by ANSI. Dry-type distribution transformers will deliver 200% nameplate load for one-half hour, 150% load for one hour and 125% load for four hours without being damaged, provided that a constant 50% load precedes and follows the overload. See ANSI C57.96-01.250 for additional limitations.

Continuous overload capacity is not deliberately designed into a transformer because the design objective is to be within the allowed winding temperature rise with nameplate loading.

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Insulation System Classification

| Ambient | + Winding Rise | + Hot Spot | = Temp. Class |
|---------|----------------|------------|---------------|
| 40°C | 55°C | 10°C | 105°C |
| 40°C | 80°C | 30°C | 150°C |
| 25°C | 135°C | 20°C | 180°C |
| 40°C | 115°C | 30°C | 185°C |
| 40°C | 150°C | 30°C | 220°C |

The design life of transformers having different insulation systems is the same—the lower-temperature systems are designed for the same life as the higher-temperature systems.

Winding Terminations

Eaton recommends that external cables be rated 90°C (sized at 75°C ampacity) for encapsulated designs and 75°C for ventilated designs.

Sound Levels

All Eaton 600 volt class general-purpose dry-type distribution transformers are designed to meet NEMA ST-20 sound levels listed here. These are the sound levels measured in a soundproof environment. Actual sound levels measured at an installation will likely be higher due to electrical connections and environmental conditions. Lower sound levels are available and should be specified when the transformer is going to be installed in an area where sound may be a concern.

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilated (up to 1.2 kV) | | Encapsulated (up to 1.2 kV) |
|------------------------------|---------------------------------------|-----------------|-----------------------------|
| | K-Factor 1, 4, 9 | K-Factor 13, 20 | |
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Note

For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. The following pages provide listings for most standard transformer ratings and styles. For all-copper and bolt-on-breaker designs, contact Eaton.

Three-Phase Type DT-3E Totally Enclosed Non-Ventilated



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Totally Enclosed Non-Ventilated Transformers

Product Description

Note: The following pages provide listings for most standard transformer ratings and catalog numbers. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

- Suitable for indoor or outdoor applications
- Totally enclosed, non-ventilated enclosures rated NEMA 3R
- 220°C insulation system
- 150°C rise standard; 115°C or 80°C rise optional
- Totally enclosed non-ventilated transformers are specifically excluded from the scope of U.S. DOE energy efficiency requirements

Application Description

Totally enclosed non-ventilated dry-type transformers are for special applications, where because of adverse atmospheric conditions it is desirable to use a dry-type non-ventilated transformer vs. the ventilated standard unit, which has openings in its enclosure to allow air to flow directly over the core and coil.

In applications where the atmosphere contains conductive, corrosive, or combustible materials, which might damage a transformer, or lint and dust flyings that might block the ventilation passages, the non-ventilated transformer is highly suited. It has no openings in the enclosure. Heat is dissipated by radiating from the surface area of the enclosure. Consequently, the enclosures are larger than those of the standard ventilated type. Non-ventilated transformers are suited for application in the textile, chemical, automotive, petrochemical, foundry, cement, food, paper and other industries.

Features, Benefits and Functions

- 60 Hz operation (50/60 Hz operation available)
- Short-term overload capability as required by ANSI
- Meet NEMA ST-20 sound levels

Standards and Certifications

- UL listed



Industry Standards

All Eaton dry-type distribution and control transformers are built and tested in accordance with applicable NEMA, ANSI and IEEE Standards.

Seismically Qualified

Eaton manufactured dry-type distribution transformers are seismically qualified and exceed requirements of the International Building Code (IBC) and California Code Title 24.

Catalog Number Selection

Please refer to Section 2.7 **Page V2-T2-162**.

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Product Selection

Additional Product Selection information begins on **Page V2-T2-165**.

Single-Phase—Type DS-3E, 60 Hz ^①**240 x 480 Volts to 120/240 Volts +1–5%, –2–5% at 240 Volts Primary; +2–2.5%, –4–2.5% at 480 Volts Primary**

| kVA | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Catalog Number |
|------|-------|---------------|--------|-----------------------|----------------|--------------------|
| 15 | DS-3E | 150 | FR817N | 3XA | 350 (159) | T20P11S15NV |
| 25 | DS-3E | 150 | FR818N | 3XA | 350 (159) | T20P11S25NV |
| 37.5 | DS-3E | 150 | FR820N | 3XA | 600 (274) | T20P11S37NV |
| 50 | DS-3E | 150 | FR820N | 3XA | 720 (329) | T20P11S50NV |

Three-Phase—Type DT-3E, 60 Hz ^①**480 Delta Volts to 208Y/120 Volts +2–2.5% FCAN, 4–2.5% FCBN Taps**

| kVA | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Catalog Number |
|-------|-------|---------------|---------|-----------------------|----------------|--------------------|
| 15 | DT-3E | 150 | FR912DN | 280B | 480 (217) | V48M28T15NV |
| 30 | DT-3E | 150 | FR912DN | 280B | 480 (217) | V48M28T30NV |
| 45 | DT-3E | 150 | FR915DN | 280B | 600 (272) | V48M28T45NV |
| 75 | DT-3E | 150 | FR916AN | 280B | 760 (344) | V48M28T75NV |
| 112.5 | DT-3E | 150 | FR917N | 280B | 1100 (499) | V48M28T12NV |
| 150 | DT-3E | 150 | FR918AN | 280B | 1300 (589) | V48M28T49NV |
| 225 | DT-3E | 150 | FR919EN | 275A | 2400 (1088) | V48M28T22NV |
| 300 | DT-3E | 150 | FR920EN | 275A | 2900 (1315) | V48M28T33NV |

Notes

^① Transformers Type EPT 75 kVA and smaller three-phase, and Type EP 37.5 kVA and smaller single-phase, are furnished in place of non-ventilated transformers as standard. See general-purpose transformers.

Contact your local Eaton sales office for availability of additional totally enclosed non-ventilated transformers. Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Totally Enclosed Non-Ventilated Transformers

Accessories

Please refer to Section 2.7 **Page V2-T2-167**.

Technical Data and Specifications

Frequency

Eaton standard dry-type distribution transformers are designed for 60 Hz operation. Transformers required for other frequencies are available and must be specifically designed.

Overload Capability

Short-term overload is designed into transformers as required by ANSI. Dry-type distribution transformers will deliver 200% nameplate load for one-half hour, 150% load for one hour and 125% load for four hours without being damaged, provided that a constant 50% load precedes and follows the overload. See ANSI C57.96-01.250 for additional limitations.

Continuous overload capacity is not deliberately designed into a transformer because the design objective is to be within the allowed winding temperature rise with nameplate loading.

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Insulation System Classification

| Ambient | + Winding Rise | + Hot Spot | = Temp. Class |
|---------|----------------|------------|---------------|
| 40°C | 55°C | 10°C | 105°C |
| 40°C | 80°C | 30°C | 150°C |
| 25°C | 135°C | 20°C | 180°C |
| 40°C | 115°C | 30°C | 185°C |
| 40°C | 150°C | 30°C | 220°C |

The design life of transformers having different insulation systems is the same—the lower-temperature systems are designed for the same life as the higher-temperature systems.

Enclosures

Eaton totally enclosed, non-ventilated transformers, Types DS-3E and DT-3E, use a NEMA 3R rated enclosure as standard.

Winding Terminations

Primary and secondary windings are terminated in the wiring compartment. Totally enclosed non-ventilated transformers have leads brought out to aluminum pads that are pre-drilled to accept Cu/Al lugs. **Lugs are not supplied with these transformers.** Eaton recommends external cables be rated 75°C for ventilated designs.

Series-Multiple Windings

Series-multiple windings consist of two similar coils in each winding that can be connected in series or parallel (multiple). Transformers with series-multiple windings are designated with an “x” or “/” between the voltage ratings, such as voltages of “120/240” or “240 x 480.” If the series-multiple winding is designated by an “x,” the winding can be connected only for a series or parallel. With the “/” designation, a mid-point also becomes available in addition to the series or parallel connection. As an example, a 120 x 240 winding can be connected for either 120 (parallel) or 240 (series), but a 120/240 winding can be connected for 120 (parallel), or 240 (series), or 240 with a 120 mid-point.

Note: The preceding pages provide listings for most standard transformer ratings and catalog numbers. For all-copper and bolt-on-breaker designs, contact Eaton. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Three-Phase Type EPTZ Encapsulated

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Class I, Division 2, Hazardous Location Transformers

Product Description

Note: The following pages provide listings for most standard transformer ratings and catalog numbers. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

- Encapsulated design
- Suitable for indoor or outdoor applications
- Totally enclosed, non-ventilated enclosures
- 180°C insulation system
- 115°C rise standard; 80°C rise optional
- Mountable in any position indoors. Upright only outdoors
- Available in ratings up to 600 volts primary, 25 kVA single-phase, 75 kVA three-phase
- Available in NEMA Type 4X enclosure
- Encapsulated transformers, such as Class I, Division 2 transformers, are specifically excluded from the scope of U.S. DOE energy efficiency requirements

Application Description

Type EPZ and EPTZ transformers are labeled as “Suitable for use in Class I, Division 2, Groups A, B, C and D locations, as defined by NEC Article 501, with NEC-recommended installation procedures for dry-type transformers rated under 600 volts nominal operation.”

A Class I, Division 2 location per Section 500 of the NEC is defined as:

1. A location in which volatile flammable liquids or gases are handled, processed or used, but that normally will be confined within closed containers or systems from which they can escape only in case of accidental rupture or breakdown of the container or system.
2. Or, a location where ignitable concentrations of gases or vapors are normally prevented by positive mechanical ventilation and that might become hazardous through failure of the ventilation equipment.
3. Or, a location that is adjacent to a Class I, Division 1 location and ignitable concentrations of gases or vapors might occasionally enter.

Atmospheres classified by NEC Section 500 as Group A includes acetylene. Group B includes gases such as hydrogen and formaldehyde. Group C may contain gases or vapors such as ethyl ether, ethylene, or the equivalent. Atmospheres classified as Group D may contain gases or vapors such as acetone, ammonia, benzene, butane, cyclopropane, ethanol, gasoline, hexane, methanol, methane, natural gas, naphtha, propane or the equivalent.

Features, Benefits and Functions

- NEMA 3R enclosure
- 60 Hz operation
- Aluminum windings (copper optional)
- Short-term overload capability as required by ANSI
- Meet NEMA ST-20 sound levels

Standards and Certifications

- UL listed



Industry Standards

All Eaton dry-type distribution and control transformers are built and tested in accordance with applicable NEMA, ANSI and IEEE Standards.

Seismically Qualified

Eaton manufactured dry-type distribution transformers are seismically qualified and exceed requirements of the International Building Code (IBC) and California Code Title 24.

Catalog Number Selection

Please refer to Section 2.7 **Page V2-T2-162**.

Product Selection

Additional Product Selection information begins on **Page V2-T2-165**.

Single-Phase—Type EPZ, 60 Hz

480 Volts to 120/240 Volts

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Catalog Number |
|------|--------------------|------|------|---------------|--------|-----------------------|----------------|----------------|
| | FCAN | FCBN | | | | | | |
| 0.05 | — | — | EPZ | 115 | FR57H | 524H | 13 (6) | Z48N11S51A |
| 0.75 | — | — | | | FR58H | | 21 (10) | Z48N11S76A |
| 1 | — | — | | | FR59H | | 31 (14) | Z48N11S01A |
| 1.5 | — | — | | | FR67H | | 40 (18) | Z48N11S16A |
| 2 | — | — | | | FR68H | | 40 (18) | Z48N11S02A |
| 3 | — | — | | | FR176H | | 65 (30) | Z48N11S03A |
| 5 | — | — | | | FR177H | | 113 (51) | Z48N11S05A |
| 7.5 | — | — | | | FR178H | | 123 (56) | Z48N11S07A |
| 10 | — | — | | | FR179H | | 193 (88) | Z48N11S10A |
| 15 | — | — | | | FR180H | | 234 (107) | Z48N11S15 |
| 25 | — | — | | | FR182H | | 375 (170) | Z48N11S25A |

Three-Phase—Type EPTZ, 60 Hz

480 Delta Volts to 208Y/120 Volts Three-Phase

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Catalog Number |
|-----|--------------------|----------|------|---------------|--------|-----------------------|----------------|----------------|
| | FCAN | FCBN | | | | | | |
| 3 | — | 2 at -5% | EPTZ | 115 | FR201H | 70A | 116 (53) | Z48G28T03A |
| 6 | — | 2 at -5% | | | FR200H | | 143 (65) | Z48G28T06A |
| 9 | — | 2 at -5% | | | FR103H | | 166 (75) | Z48G28T09A |
| 15 | — | 2 at -5% | | | FR95H | | 275 (125) | Z48G28T15A |
| 30 | — | 2 at -5% | | | FR243H | 66A | 523 (239) | Z48G28T30 |
| 45 | — | 2 at -5% | | | FR244H | | 660 (299) | Z48G28T45A |
| 75 | — | 2 at -5% | | | FR245H | | 1275 (580) | Z48G28T75A ① |

480 Delta Volts to 240 Delta Volts with 120 Volt Lighting Tap on B Phase ②

| kVA | Full Capacity Taps | | Type | °C Temp. Rise | Frame | Wiring Diagram Number | Weight Lb (kg) | Catalog Number |
|-----|--------------------|----------|------|---------------|--------|-----------------------|----------------|----------------|
| | FCAN | FCBN | | | | | | |
| 6 | — | 2 at -5% | EPTZ | 115 | FR102H | 95A | 115 (52) | Z48G22T06A |
| 9 | — | 2 at -5% | | | FR97H | | 160 (73) | Z48G22T09A |
| 15 | — | 2 at -5% | | | FR195H | | 340 (155) | Z48G22T15A |
| 30 | — | 2 at -5% | | | FR243H | 62A | 422 (191) | Z48G22T30A |
| 45 | — | 2 at -5% | | | FR244H | | 660 (299) | Z48G22T45A |

Notes

- ① Floor-mount only.
- ② Center Tap capacity limited to 5% of rated kVA.

For 316 grade stainless steel enclosure, replace 10th character of catalog number with an "SS" suffix. Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton. Frame drawings/dimensions information begins on **Page V2-T2-204**.

Class I, Division 2, Hazardous Location Transformers**Accessories**

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Please refer to Section 2.7 **Page V2-T2-167**.**Technical Data and Specifications****Frequency**

Eaton standard dry-type distribution transformers are designed for 60 Hz operation. Transformers required for other frequencies are available and must be specifically designed.

Overload Capability

Short-term overload is designed into transformers as required by ANSI. Dry-type distribution transformers will deliver 200% nameplate load for one-half hour, 150% load for one hour, and 125% load for four hours without being damaged, provided that a constant 50% load precedes and follows the overload. See ANSI C57.96-01.250 for additional limitations.

Continuous overload capacity is not deliberately designed into a transformer because the design objective is to be within the allowed winding temperature rise with nameplate loading.

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Insulation System Classification

| Ambient | + Winding Rise | + Hot Spot | = Temp. Class |
|---------|----------------|------------|---------------|
| 40°C | 55°C | 10°C | 105°C |
| 40°C | 80°C | 30°C | 150°C |
| 25°C | 135°C | 20°C | 180°C |
| 40°C | 115°C | 30°C | 185°C |
| 40°C | 150°C | 30°C | 220°C |

The design life of transformers having different insulation systems is the same—the lower-temperature systems are designed for the same life as the higher-temperature systems.

Enclosures

Eaton encapsulated transformers, Types EPZ and EPTZ, use a NEMA 3R rated enclosure.

Sound Levels

All Eaton 600 volt class general-purpose dry-type distribution transformers are designed to meet NEMA ST-20 sound levels listed here. These are the sound levels measured in a soundproof environment. Actual sound levels measured at an installation will likely be higher due to electrical connections and environmental conditions. Lower sound levels are available and should be specified when the transformer is going to be installed in an area where sound may be a concern.

Winding Terminations

Lugs are not supplied with these transformers. Eaton recommends that external cables be rated 90°C (sized at 75°C ampacity) for encapsulated designs and 75°C for ventilated designs.

Unused tap leads must be properly insulated prior to energization. EPZ and EPTZ transformers are UL and cUL listed.

Series-Multiple Windings

Series-multiple windings consist of two similar coils in each winding that can be connected in series or parallel (multiple). Transformers with series-multiple windings are designated with an "x" or "/" between the voltage ratings, such as voltages of "120/240" or "240 x 480." If the series-multiple winding is designated by an "x," the winding can be connected only for a series or parallel. With the "/" designation, a mid-point also becomes available in addition to the series or parallel connection. As an example, a 120 x 240 winding can be connected for either 120 (parallel) or 240 (series), but a 120/240 winding can be connected for 120 (parallel), 240 (series) or 240 with a 120 mid-point.

Marine Duty Transformers



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Marine Duty Transformers

Product Description

Note: The following pages provide listings for most standard transformer ratings and catalog numbers. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Types EP, EPT

- Encapsulated design
- Suitable for indoor or outdoor applications
- Totally enclosed, non-ventilated enclosures
- Enclosures are NEMA 3R rated
- Mountable in any position indoors and upright-only outdoors
- 180°C insulation system
- 115°C rise standard; 80°C rise optional
- Copper windings standard
- Available in single-phase ratings through 375 kVA (EP)
- Available in three-phase ratings through 75 kVA (EPT)

Types DS-3, DT-3

- Ventilated, NEMA 2 enclosure standard
- Suitable for indoor applications; outdoors when weathershields are also installed
- Upright mounting only
- 220°C insulation system
- 115°C rise standard; 150°C or 80°C rise optional
- Copper windings standard
- Available in single-phase ratings 15–167 kVA and up to 4160 volts primary (DS-3)
- Available in three-phase ratings 15–1500 kVA and up to 4160 volts primary (DT-3)
- cUL Energy Verified in accordance with energy standards: CFR Title 10 Chapter II Part 431, Appendix A of Subpart K and CSA C802.2-12 Update No. 1 May 2013 by Underwriters Laboratories Inc.

Application Description

The basic purpose of a transformer is voltage transformation as near as practically possible to the load for economy and distribution of power. Typical loads for low-voltage dry-type distribution transformers include lighting, heating, air conditioners, fans and machine tools. Such loads are found in commercial, institutional, industrial and residential structures.

Features, Benefits and Functions

- Meets ABS (American Bureau of Shipping) specification
- ABS Type Approval Certificate Number 04-TP517621-X
- 60 Hz operation
- 115°C temperature rise standard
- Copper windings standard
- Short-term overload capability as required by ANSI
- Meet NEMA ST-20 sound levels

Standards and Certifications

- UL listed



Industry Standards

All Eaton low-voltage dry-type distribution and control transformers are built and tested in accordance with applicable NEMA, ANSI and IEEE Standards. All 600 volt class transformers are UL listed unless otherwise noted.

Catalog Number SelectionPlease refer to Section 2.7 **Page V2-T2-162**.

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Product SelectionAdditional Product Selection information begins on **Page V2-T2-165**.**Single-Phase—Type DS-3M Marine Duty 60 Hz DOE 2016 Energy-Efficient****240 x 480 Volts to 120/240 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|
| 15 | 115 | Contact local Eaton representative | | | | | RT20P11F1516CU |
| 25 | | | | | | | RT20P11F2516CU |
| 37.5 | | | | | | | RT20P11F3716CU |
| 50 | | | | | | | RT20P11F5016CU |
| 75 | | | | | | | RT20P11F7516CU |
| 100 | | | | | | | RT20P11F9916CU |

600 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|
| 15 | 115 | Contact local Eaton representative | | | | | RT60M11F1516CU |
| 25 | | | | | | | RT60M11F2516CU |
| 37.5 | | | | | | | RT60M11F3716CU |
| 50 | | | | | | | RT60M11F5016CU |
| 75 | | | | | | | RT60M11F7516CU |
| 100 | | | | | | | RT60M11F9916CU |

NoteFrame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3M Marine Duty 60 Hz DOE 2016 Energy-Efficient

208 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|----------------|
| 15 | 115 | FR939 | 280E | 253 (115) | WS57 | WMB05 | MV29M28F1516CU | |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | MV29M28F3016CU | |
| 45 | | FR940 | | 495 (225) | WS58 | WMB05 | MV29M28F4516CU | |
| 75 | | FR942 | | 698 (317) | WS59 | WMB04 | MV29M28F7516CU | |
| 112.5 | | FR943 | 324A | 1335 (606) | WS60 | WMB04 | MV29R28F1216CU | |
| 150 | | FR943 | | 1493 (678) | WS60 | WMB04 | MV29R28F4916CU | |
| 225 | | FR944 | | 2186 (992) | WS61 | — | MV29R28F2216CU | |
| 300 | | FR945 | | 2696 (1224) | WS62 | — | MV29R28F3316CU | |
| 500 | | Contact local Eaton representative | | | | | | MV29R28F5516CU |

208 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|----------------|
| 15 | 115 | FR939 | E0342B | 247 (112) | WS57 | WMB05 | MV29M47F1516CU | |
| 30 | | FR940 | | 434 (197) | WS58 | WMB05 | MV29M47F3016CU | |
| 45 | | FR940 | | 600 (272) | WS58 | WMB05 | MV29M47F4516CU | |
| 75 | | FR942 | | 682 (310) | WS59 | WMB04 | MV29M47F7516CU | |
| 112.5 | | FR943 | E0351A | 1154 (524) | WS60 | WMB04 | MV29R47F1216CU | |
| 150 | | FR943 | | 1500 (681) | WS60 | WMB04 | MV29R47F4916CU | |
| 225 | | FR944 | | 1918 (871) | WS61 | — | MV29R47F2216CU | |
| 300 | | Contact local Eaton representative | | | | | | MV29R47F3316CU |
| 500 | | | | | | | | MV29R47F5516CU |

240 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|----------------|
| 15 | 115 | FR939 | 280C | 253 (115) | WS57 | WMB05 | MV24M28F1516CU | |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | MV24M28F3016CU | |
| 45 | | FR940 | | 495 (225) | WS58 | WMB05 | MV24M28F4516CU | |
| 75 | | FR942 | | 698 (317) | WS59 | WMB04 | MV24M28F7516CU | |
| 112.5 | | FR943 | 324B | 1335 (606) | WS60 | WMB04 | MV24R28F1216CU | |
| 150 | | FR943 | | 1493 (678) | WS60 | WMB04 | MV24R28F4916CU | |
| 225 | | FR944 | | 2186 (992) | WS61 | — | MV24R28F2216CU | |
| 300 | | FR945 | | 2696 (1224) | WS62 | — | MV24R28F3316CU | |
| 500 | | Contact local Eaton representative | | | | | | MV24R28F5516CU |

240 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|----------------|
| 15 | 115 | FR939 | E0317A | 253 (115) | WS57 | WMB05 | MV24M47F1516CU | |
| 30 | | FR940 | | 455 (206) | WS58 | WMB05 | MV24M47F3016CU | |
| 45 | | FR940 | | 495 (225) | WS58 | WMB05 | MV24M47F4516CU | |
| 75 | | FR942 | | 698 (317) | WS59 | WMB04 | MV24M47F7516CU | |
| 112.5 | | FR943 | E0351C | 1335 (606) | WS60 | WMB04 | MV24R47F1216CU | |
| 150 | | FR943 | | 1493 (678) | WS60 | WMB04 | MV24R47F4916CU | |
| 225 | | FR944 | | 2186 (992) | WS61 | — | MV24R47F2216CU | |
| 300 | | Contact local Eaton representative | | | | | | MV24R47F3316CU |
| 500 | | | | | | | | MV24R47F5516CU |

Note

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase—Type DT-3M Marine Duty 60 Hz DOE 2016 Energy-Efficient

440 Delta Volts to 220Y/127 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|
| 15 | 115 | Contact local Eaton representative | | | | | MV44M31F1516CU |
| 30 | | | | | | | MV44M31F3016CU |
| 45 | | | | | | | MV44M31F4516CU |
| 75 | | | | | | | MV44M31F7516CU |
| 112.5 | | | | | | | MV44M31F1216CU |
| 150 | | | | | | | MV44M31F4916CU |
| 225 | | | | | | | MV44M31F2216CU |
| 300 | | | | | | | MV44M31F3316CU |
| 500 | | | | | | | MV44M31F5516CU |

480 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|
| 15 | 115 | FR939 | 280B | 241 (109) | WS57 | WMB05 | MV48M28F1516CU |
| 30 | | FR940 | | 433 (197) | WS58 | WMB05 | MV48M28F3016CU |
| 45 | | FR940 | | 471 (214) | WS58 | WMB05 | MV48M28F4516CU |
| 75 | | FR942 | | 665 (302) | WS59 | WMB04 | MV48M28F7516CU |
| 112.5 | | FR943 | | 1271 (577) | WS60 | WMB04 | MV48M28F1216CU |
| 150 | | FR943 | | 1422 (646) | WS60 | WMB04 | MV48M28F4916CU |
| 225 | | FR944 | | 2082 (945) | WS61 | — | MV48M28F2216CU |
| 300 | | FR945 | | 2568 (1166) | WS62 | — | MV48M28F3316CU |
| 500 | | Contact local Eaton representative | | | | | MV48M28F5516CU |

480 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|
| 15 | 115 | FR939 | 280B | 271 (123) | WS57 | WMB05 | MV48M47F1516CU |
| 30 | | FR940 | | 431 (196) | WS58 | WMB05 | MV48M47F3016CU |
| 45 | | FR940 | | 485 (220) | WS58 | WMB05 | MV48M47F4516CU |
| 75 | | FR942 | | 730 (331) | WS59 | WMB04 | MV48M47F7516CU |
| 112.5 | | FR943 | | 1146 (520) | WS60 | WMB04 | MV48M47F1216CU |
| 150 | | FR943 | | 1432 (650) | WS60 | WMB04 | MV48M47F4916CU |
| 225 | | FR944 | | 2150 (976) | WS61 | — | MV48M47F2216CU |
| 300 | | FR945 | | 2700 (1226) | WS62 | — | MV48M47F3316CU |
| 500 | | Contact local Eaton representative | | | | | MV48M47F5516CU |

Note

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Marine Duty Transformers

Accessories

Please refer to Section 2.7 **Page V2-T2-167.**

Technical Data and Specifications

Frequency

Eaton standard low-voltage dry-type distribution transformers are designed for 60 Hz operation. Transformers required for other frequencies are available and must be specifically designed.

Overload Capability

Short-term overload is designed into transformers as required by ANSI. Dry-type distribution transformers will deliver 200% nameplate load for one-half hour, 150% load for one hour, and 125% load for four hours without being damaged, provided that a constant 50% load precedes and follows the overload. See ANSI C57.96-01.250 for additional limitations.

Continuous overload capacity is not deliberately designed into a transformer because the design objective is to be within the allowed winding temperature rise with nameplate loading.

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Insulation System Classification

| Ambient | + Winding Rise | + Hot Spot | = Temp. Class |
|---------|----------------|------------|---------------|
| 40°C | 55°C | 10°C | 105°C |
| 40°C | 80°C | 30°C | 150°C |
| 25°C | 135°C | 20°C | 180°C |
| 40°C | 115°C | 30°C | 185°C |
| 40°C | 150°C | 30°C | 220°C |

The design life of transformers having different insulation systems is the same—the lower-temperature systems are designed for the same life as the higher-temperature systems.

Enclosures

Eaton ventilated transformers Types DS-3M and DT-3M use a NEMA 2 rated (drip-proof) enclosure as standard, and are rated NEMA 3R with the addition of weathershields. Eaton encapsulated transformers Types EPM and EPTM use a NEMA 3R rated enclosure. Type DT-3M transformers manufactured in enclosures 939, 940, 942, 943, 944 and 945 are UL Listed to be installed with just 2 inches clearance on the sides and rear of the transformer.

Winding Terminations

Primary and secondary windings are terminated in the wiring compartment. Encapsulated units have copper leads or stabs brought out for connections. Ventilating transformers have leads brought out to aluminum pads that are pre-drilled to accept Cu/Al lugs.

Lugs are not supplied with these transformers. Eaton recommends that external cables be rated 90°C (sized at 75°C ampacity) for encapsulated designs and 75°C for ventilated designs.

Series-Multiple Windings

Series-multiple windings consist of two similar coils in each winding that can be connected in series or parallel (multiple). Transformers with series-multiple windings are designated with an “x” or “/” between the voltage ratings, such as voltages of “120/240” or “240 x 480.” If the series-multiple winding is designated by an “x,” the winding can be connected only for a series or parallel. With the “/” designation, a mid-point also becomes available in addition to the series or parallel connection. As an example, a 120 x 240 winding can be connected for either 120 (parallel) or 240 (series), but a 120/240 winding can be connected for 120 (parallel), 240 (series) or 240 with a 120 mid-point.

Sound Levels

All Eaton 600 volt class general-purpose low-voltage dry-type distribution transformers are designed to meet NEMA ST-20 sound levels listed here. These are the sound levels measured in a soundproof environment. Actual sound levels measured at an installation will likely be higher due to electrical connections and environmental conditions. Lower sound levels are available and should be specified when the transformer is going to be installed in an area where sound may be a concern.

For additional information, please refer to Section 2.7 **Page V2-T2-171.**

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilated (up to 1.2 kV) K-Factor 1, 4, 9 | Self-Cooled Ventilated (up to 1.2 kV) K-Factor 13, 20 | Encapsulated (up to 1.2 kV) |
|------------------------------|--|---|-----------------------------|
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Type EP Buck-Boost Transformer

2



Buck-Boost and Low-Voltage Lighting Transformers

Product Description

Note: The following pages provide listings for most standard transformer ratings and catalog numbers. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Types EP, EPT

- Encapsulated design
- Suitable for indoor or outdoor applications
- Totally enclosed, non-ventilated enclosures
- Enclosures are NEMA 3R rated
- Mountable in any position indoors and upright-only outdoors
- 180°C insulation system
- 115°C rise standard; 80°C rise optional
- Available in single-phase ratings through 7.5 kVA
- Encapsulated transformers, such as buck-boost and low-voltage lighting transformers, are specifically excluded from the scope of U.S. DOE energy efficiency requirements

Application Description

A buck-boost transformer is used to provide an economical method of correcting a lower or higher voltage rating more suitable for efficient operation of electrical equipment.

Type EP buck-boost transformers are small kVA, single-phase transformers with dual primary and dual secondary windings, and are usually connected as autotransformers by using one unit for single-phase applications and either two or three units banked for three-phase operation. They are primarily used for motor operation and should not be used for motor control circuits, to correct fluctuating line voltage or to obtain a neutral on a delta system. Buck-boost transformers are ideally suited for use with low-voltage lighting systems, such as outdoor lighting.

Contents

| Description | Page |
|--|------------------|
| Motor Drive Isolation Transformers | V2-T2-97 |
| Mini-Power Centers | V2-T2-105 |
| Totally Enclosed Non-Ventilated Transformers | V2-T2-109 |
| Class I, Division 2, Hazardous Location Transformers | V2-T2-112 |
| Marine Duty Transformers | V2-T2-115 |
| Buck-Boost and Low-Voltage Lighting Transformers | |
| Product Selection | V2-T2-121 |
| Accessories | V2-T2-147 |
| Technical Data and Specifications | V2-T2-147 |
| Wiring Diagrams | V2-T2-148 |
| Medium-Voltage Dry-Type Distribution Transformers | V2-T2-149 |

Features, Benefits and Functions

- 60 Hz operation
- 600 volt class insulation
- Short-term overload capability as required by ANSI
- Meet NEMA ST-20 sound levels

Standards and Certifications

- UL listed
- CSA certified

**Industry Standards**

All Eaton dry-type distribution and control transformers are built and tested in accordance with applicable NEMA, ANSI and IEEE Standards. All 600 volt class transformers are UL listed unless otherwise noted.

Seismically Qualified

Eaton-manufactured dry-type distribution transformers are seismically qualified, and exceed requirements of the International Building Code (IBC) and California Code Title 24.

Catalog Number Selection

Please refer to Section 2.7 **Page V2-T2-162.**

Product Selection

For quick selection data, refer to the tables on this and the following pages.

Selection Requirements

You should have the following information before selecting a buck-boost transformer:

Line Voltage

The voltage that you want to buck (decrease) or boost (increase). This can be found by measuring the supply line voltage with a voltmeter.

Load Voltage

The voltage at which your equipment is designed to operate. This is listed on the nameplate of the load equipment.

Load Amperes or Load kVA

You do not need to know both—one or the other is sufficient for selection purposes. This information usually can be found on the nameplate of the equipment that you want to operate.

Frequency

The supply line frequency must be the same as the frequency of the equipment to be operated—Eaton’s buck-boost transformers operate at 60 Hz only.

Phase

The supply line should be the same as the equipment to be operated—either single- or three-phase.

Transformer Interconnection

For three-phase applications, interconnections of transformers should be made in a junction box. Two or three transformers may be used depending on an open delta (2) or wye (3) connection.

5-Step Selector

The tables that follow will simplify the selection of the buck-boost transformers. There are no calculations needed; simply follow these five steps:

1. Refer to the table having the same output voltage as the equipment you want to operate. For example, if you are installing a 240 volt 6 kVA single-phase load use selection table on the page.
2. Select the available line voltage across the top of the chart that is closest to the actual supply voltage. Therefore, for example, if the available line voltage is 213 volts, use the 212 volt column.
3. Read down the column until you reach an output kVA or amps rating equal to or greater than the load requirements. Since 6 kVA, in the example, is not listed, use the next higher rating, or 7.5 kVA.
4. Read across to the far left columns for the catalog number and quantity of transformers for your application. In this case, you will need one (1) catalog number S10N06P01P.
5. Connect the buck-boost transformer(s) you have selected in accordance with the connection diagram specified at the bottom of the available line voltage column. In this example, Diagram “F” would be used.

Note: For single-phase connections and three-phase open delta connections, inputs and outputs may be reversed. kVA capacity remains constant.

Additional Product Selection information begins on **Page V2-T2-165.**

120 x 240 Volts to 12/24 Volts

| kVA | °C Temp. Rise | Frame | Weight Lb (kg) | Catalog Number |
|------|---------------|--------|----------------|----------------|
| 0.05 | 115 | FR52 | 7 (3) | S10N04A81N |
| 0.10 | 115 | FR54 | 7 (3) | S10N04A82N |
| 0.15 | 115 | FR55 | 8 (4) | S10N04A83N |
| 0.25 | 115 | FR57P | 12 (5) | S10N04P26P |
| 0.50 | 115 | FR57P | 13 (5) | S10N04P51P |
| 0.75 | 115 | FR58AP | 21 (10) | S10N04P76P |
| 1 | 115 | FR67P | 31 (14) | S10N04P01P |
| 1.5 | 115 | FR67P | 40 (18) | S10N04P16P |
| 2 | 115 | FR68P | 40 (18) | S10N04P02P |
| 3 | 115 | FR176 | 65 (29) | S10N04A03N |
| 5 | 115 | FR177 | 113 (51) | S10N04A05N |
| 7.5 | 115 | FR178 | 123 (55) | S10N04A07N |

120 x 240 Volts to 16/32 Volts

| kVA | °C Temp. Rise | Frame | Weight Lb (kg) | Catalog Number |
|------|---------------|--------|----------------|----------------|
| 0.05 | 115 | FR52 | 7 (3) | S10N06A81N |
| 0.10 | 115 | FR54 | 7 (3) | S10N06A82N |
| 0.15 | 115 | FR55 | 8 (4) | S10N06A83N |
| 0.25 | 115 | FR57P | 12 (5) | S10N06P26P |
| 0.50 | 115 | FR57P | 13 (5) | S10N06P51P |
| 0.75 | 115 | FR58AP | 21 (10) | S10N06P76P |
| 1 | 115 | FR67P | 31 (14) | S10N06P01P |
| 1.5 | 115 | FR67P | 40 (18) | S10N06P16P |
| 2 | 115 | FR68P | 40 (18) | S10N06P02P |
| 3 | 115 | FR176 | 65 (29) | S10N06A03N |
| 5 | 115 | FR177 | 113 (51) | S10N06A05N |
| 7.5 | 115 | FR178 | 123 (55) | S10N06A07N |

240 x 480 Volts to 24/48 Volts

| kVA | °C Temp. Rise | Frame | Weight Lb (kg) | Catalog Number |
|------|---------------|--------|----------------|----------------|
| 0.05 | 115 | FR52 | 7 (3) | S20N08A81N |
| 0.10 | 115 | FR54 | 7 (3) | S20N08A82N |
| 0.15 | 115 | FR55 | 8 (4) | S20N08A83N |
| 0.25 | 115 | FR57P | 12 (5) | S20N08P26P |
| 0.50 | 115 | FR57P | 13 (5) | S20N08P51P |
| 0.75 | 115 | FR58AP | 21 (10) | S20N08P76P |
| 1 | 115 | FR67P | 31 (14) | S20N08P01P |
| 1.5 | 115 | FR67P | 40 (18) | S20N08P16P |
| 2 | 115 | FR68P | 40 (18) | S20N08P02P |
| 3 | 115 | FR176 | 65 (29) | S20N08A03N |
| 5 | 115 | FR177 | 113 (51) | S20N08A05N |
| 7.5 | 115 | FR178 | 123 (55) | S20N08A07N |

Note

Frame drawings/dimensions information begins on **Page V2-T2-204.**

Single-Phase 115 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | 96 | | 100 | | 102 | | Catalog Number | | |
|----------------------|----------|-------------------------|---------|---------------|---------|------------|-------|------------|-------|----------------|------------|------------|
| | | 84 Output kVA | 84 Amps | 91 Output kVA | 91 Amps | Output kVA | Amps | Output kVA | Amps | | Output kVA | Amps |
| 1 | 0.05 | — | — | — | — | 0.24 | 2.09 | — | — | — | — | S10N04A81N |
| 1 | 0.05 | 0.13 | 1.14 | 0.18 | 1.56 | — | — | 0.31 | 2.70 | 0.36 | 3.13 | S10N06A81N |
| 1 | 0.10 | — | — | — | — | 0.48 | 4.17 | — | — | — | — | S10N04A82N |
| 1 | 0.10 | 0.26 | 2.29 | 0.36 | 3.12 | — | — | 0.62 | 5.41 | 0.72 | 6.25 | S10N06A82N |
| 1 | 0.15 | — | — | — | — | 0.72 | 6.25 | — | — | — | — | S10N04A83N |
| 1 | 0.15 | 0.39 | 3.44 | 0.54 | 4.69 | — | — | 0.93 | 8.12 | 1.08 | 9.37 | S10N06A83N |
| 1 | 0.25 | — | — | — | — | 1.2 | 10.4 | — | — | — | — | S10N04P26P |
| 1 | 0.25 | 0.659 | 5.73 | 0.899 | 7.81 | — | — | 1.56 | 13.5 | 1.8 | 15.6 | S10N06P26P |
| 1 | 0.50 | — | — | — | — | 2.4 | 20.8 | — | — | — | — | S10N04P51P |
| 1 | 0.50 | 1.32 | 11.5 | 1.8 | 15.6 | — | — | 3.11 | 27.1 | 3.59 | 31.2 | S10N06P51P |
| 1 | 0.75 | — | — | — | — | 3.6 | 31.2 | — | — | — | — | S10N04P76P |
| 1 | 0.75 | 1.98 | 17.2 | 2.7 | 23.4 | — | — | 4.67 | 40.6 | 5.39 | 46.8 | S10N06P76P |
| 1 | 1 | — | — | — | — | 4.79 | 41.7 | — | — | — | — | S10N04P01P |
| 1 | 1 | 2.64 | 22.9 | 3.59 | 31.2 | — | — | 6.23 | 54.1 | 7.19 | 62.5 | S10N06P01P |
| 1 | 1.5 | — | — | — | — | 7.2 | 62.5 | — | — | — | — | S10N04P16P |
| 1 | 1.5 | 3.95 | 34.4 | 5.39 | 46.9 | — | — | 9.34 | 81.2 | 10.8 | 93.7 | S10N06P16P |
| 1 | 2 | — | — | — | — | 9.58 | 83.3 | — | — | — | — | S10N04P02P |
| 1 | 2 | 5.27 | 45.8 | 7.19 | 62.5 | — | — | 12.5 | 108 | 14.4 | 125 | S10N06P02P |
| 1 | 3 | — | — | — | — | 14.37 | 125.1 | — | — | — | — | S10N04A03N |
| 1 | 3 | 7.92 | 68.7 | 10.77 | 93.6 | — | — | 18.69 | 162.3 | 21.57 | 187.5 | S10N06A03N |
| 1 | 5 | — | — | — | — | 23.95 | 208.5 | — | — | — | — | S10N04A05N |
| 1 | 5 | 13.2 | 115 | 18 | 156 | — | — | 31.15 | 270.5 | 35.95 | 312.5 | S10N06A05N |
| 1 | 7.5 | — | — | — | — | 36 | 312 | — | — | — | — | S10N04A07N |
| 1 | 7.5 | 19.8 | 172 | 27 | 234 | — | — | 46.7 | 406 | 53.9 | 468 | S10N06A07N |
| Connection Diagram ② | | D | | B | | B | | C | | A | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase 115 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | | | | | | | | | Catalog Number |
|----------------------|----------|-------------------------|-------|------------|-------|------------|-------|------------|------|------------|-------|----------------|
| | | 105 Output | | 127 Output | | 130 Output | | 138 Output | | 146 Output | | |
| | | kVA | Amps | kVA | Amps | kVA | Amps | kVA | Amps | kVA | Amps | |
| 1 | 0.05 | 0.48 | 4.17 | 0.54 | 4.58 | — | — | 0.29 | 2.5 | — | — | S10N04A81N |
| 1 | 0.05 | — | — | — | — | 0.41 | 3.54 | — | — | 0.23 | 1.98 | S10N06A81N |
| 1 | 0.10 | 0.96 | 8.33 | 1.1 | 9.17 | — | — | 0.58 | 5.0 | — | — | S10N04A82N |
| 1 | 0.10 | — | — | — | — | 0.82 | 7.08 | — | — | 0.46 | 3.95 | S10N06A82N |
| 1 | 0.15 | 1.44 | 12.5 | 1.6 | 13.7 | — | — | 0.87 | 7.5 | — | — | S10N04A83N |
| 1 | 0.15 | — | — | — | — | 1.3 | 10.6 | — | — | 0.69 | 5.93 | S10N06A83N |
| 1 | 0.25 | 2.39 | 20.8 | 2.63 | 22.9 | — | — | 1.44 | 12.5 | — | — | S10N04P26P |
| 1 | 0.25 | — | — | — | — | 2.03 | 17.7 | — | — | 1.14 | 9.88 | S10N06P26P |
| 1 | 0.50 | 4.79 | 41.6 | 5.27 | 45.8 | — | — | 2.87 | 25 | — | — | S10N04P51P |
| 1 | 0.50 | — | — | — | — | 4.07 | 35.4 | — | — | 2.27 | 19.8 | S10N06P51P |
| 1 | 0.75 | 7.19 | 62.4 | 7.9 | 68.7 | — | — | 4.31 | 37.5 | — | — | S10N04P76P |
| 1 | 0.75 | — | — | — | — | 6.1 | 53.1 | — | — | 3.41 | 29.6 | S10N06P76P |
| 1 | 1 | 9.58 | 83.3 | 10.5 | 91.7 | — | — | 5.75 | 50 | — | — | S10N04P01P |
| 1 | 1 | — | — | — | — | 8.14 | 70.8 | — | — | 4.55 | 39.5 | S10N06P01P |
| 1 | 1.5 | 14.4 | 125 | 15.8 | 137 | — | — | 8.62 | 75 | — | — | S10N04P16P |
| 1 | 1.5 | — | — | — | — | 12.2 | 106 | — | — | 6.82 | 59.3 | S10N06P16P |
| 1 | 2 | 19.2 | 16.7 | 21.1 | 183 | — | — | 11.5 | 100 | — | — | S10N04P02P |
| 1 | 2 | — | — | — | — | 16.3 | 142 | — | — | 9.10 | 79.2 | S10N06P02P |
| 1 | 3 | 28.7 | 249.9 | 31.5 | 275.1 | — | — | 17.3 | 150 | — | — | S10N04A03N |
| 1 | 3 | — | — | — | — | 24.4 | 212.4 | — | — | 13.6 | 118.5 | S10N06A03N |
| 1 | 5 | 47.9 | 416.5 | 52.5 | 458.5 | — | — | 28.7 | 250 | — | — | S10N04A05N |
| 1 | 5 | — | — | — | — | 40.7 | 354 | — | — | 22.7 | 197.5 | S10N06A05N |
| 1 | 7.5 | 71.9 | 624 | 79 | 687 | — | — | 43.1 | 357 | — | — | S10N04A07N |
| 1 | 7.5 | — | — | — | — | 61 | 531 | — | — | 34.1 | 296 | S10N06A07N |
| Connection Diagram ② | | A | | A | | A | | B | | B | | |

Notes

① Additional wiring trough may be required.

② Refer to Page V2-T2-148 for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on Page V2-T2-204.

Single-Phase 120 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | | | 100 | | 104 | | 106 | | Catalog Number |
|----------------------|----------|-------------------------|---------|---------------|---------|------------|-------|------------|-------|------------|-------|----------------|
| | | 88 Output kVA | 88 Amps | 95 Output kVA | 95 Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 1 | 0.05 | — | — | — | — | 0.25 | 2.09 | — | — | — | — | S10N04A81N |
| 1 | 0.05 | 0.14 | 1.15 | 0.19 | 1.56 | — | — | 0.33 | 2.70 | 0.38 | 3.13 | S10N06A81N |
| 1 | 0.10 | — | — | — | — | 0.50 | 4.17 | — | — | — | — | S10N04A82N |
| 1 | 0.10 | 0.28 | 2.29 | 0.38 | 3.12 | — | — | 0.65 | 5.41 | 0.75 | 6.25 | S10N06A82N |
| 1 | 0.15 | — | — | — | — | 0.75 | 6.25 | — | — | — | — | S10N04A83N |
| 1 | 0.15 | 0.41 | 3.44 | 0.56 | 4.69 | — | — | 0.98 | 8.12 | 1.12 | 9.37 | S10N06A83N |
| 1 | 0.25 | — | — | — | — | 1.25 | 10.4 | — | — | — | — | S10N04P26P |
| 1 | 0.25 | 0.687 | 5.73 | 0.937 | 7.81 | — | — | 1.62 | 13.5 | 1.87 | 15.6 | S10N06P26P |
| 1 | 0.50 | — | — | — | — | 2.5 | 20.8 | — | — | — | — | S10N04P51P |
| 1 | 0.50 | 1.37 | 11.5 | 1.87 | 15.6 | — | — | 3.25 | 27.1 | 3.75 | 31.2 | S10N06P51P |
| 1 | 0.75 | — | — | — | — | 3.75 | 31.2 | — | — | — | — | S10N04P76P |
| 1 | 0.75 | 2.06 | 17.2 | 2.82 | 23.4 | — | — | 4.87 | 40.6 | 5.62 | 46.8 | S10N06P76P |
| 1 | 1 | — | — | — | — | 5 | 41.7 | — | — | — | — | S10N04P01P |
| 1 | 1 | 2.75 | 22.9 | 3.75 | 31.2 | — | — | 6.5 | 54.1 | 7.5 | 62.5 | S10N06P01P |
| 1 | 1.5 | — | — | — | — | 7.5 | 62.5 | — | — | — | — | S10N04P16P |
| 1 | 1.5 | 4.12 | 34.4 | 5.62 | 46.9 | — | — | 9.75 | 81.2 | 11.2 | 93.7 | S10N06P16P |
| 1 | 2 | — | — | — | — | 10 | 83.3 | — | — | — | — | S10N04P02P |
| 1 | 2 | 5.5 | 45.8 | 7.5 | 62.5 | — | — | 13 | 108 | 15 | 125 | S10N06P02P |
| 1 | 3 | — | — | — | — | 15 | 125.1 | — | — | — | — | S10N04A03N |
| 1 | 3 | 8.25 | 68.7 | 11.25 | 93.6 | — | — | 19.5 | 162.3 | 22.5 | 187.5 | S10N06A03N |
| 1 | 5 | — | — | — | — | 25 | 208.5 | — | — | — | — | S10N04A05N |
| 1 | 5 | 13.75 | 114.5 | 18.75 | 156 | — | — | 32.5 | 270.5 | 37.5 | 312.5 | S10N06A05N |
| 1 | 7.5 | — | — | — | — | 37.5 | 312 | — | — | — | — | S10N04A07N |
| 1 | 7.5 | 20.6 | 172 | 28.2 | 234 | — | — | 48.7 | 406 | 56.2 | 468 | S10N06A07N |
| Connection Diagram ② | | D | | B | | B | | C | | A | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase 120 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | | | | | | | | | Catalog Number |
|----------------------|----------|-------------------------|-------|------------|-------|------------|-------|------------|------|------------|-------|----------------|
| | | 109 Output | | 132 Output | | 136 Output | | 144 Output | | 152 Output | | |
| | | kVA | Amps | kVA | Amps | kVA | Amps | kVA | Amps | kVA | Amps | |
| 1 | 0.05 | 0.5 | 4.17 | 0.55 | 4.58 | — | — | 0.3 | 2.5 | — | — | S10N04A81N |
| 1 | 0.05 | — | — | — | — | 0.43 | 3.54 | — | — | 0.24 | 1.98 | S10N06A81N |
| 1 | 0.10 | 1.0 | 8.33 | 1.1 | 9.17 | — | — | 0.6 | 5.0 | — | — | S10N04A82N |
| 1 | 0.10 | — | — | — | — | 0.85 | 7.08 | — | — | 0.48 | 3.95 | S10N06A82N |
| 1 | 0.15 | 1.5 | 12.5 | 1.6 | 13.7 | — | — | 0.9 | 7.5 | — | — | S10N04A83N |
| 1 | 0.15 | — | — | — | — | 1.27 | 10.6 | — | — | 0.71 | 5.93 | S10N06A83N |
| 1 | 0.25 | 2.5 | 20.8 | 2.75 | 22.9 | — | — | 1.5 | 12.5 | — | — | S10N04P26P |
| 1 | 0.25 | — | — | — | — | 2.12 | 17.7 | — | — | 1.19 | 9.88 | S10N06P26P |
| 1 | 0.50 | 5 | 41.6 | 5.5 | 45.8 | — | — | 3 | 25 | — | — | S10N04P51P |
| 1 | 0.50 | — | — | — | — | 4.25 | 35.4 | — | — | 2.37 | 19.8 | S10N06P51P |
| 1 | 0.75 | 7.5 | 62.4 | 8.25 | 68.7 | — | — | 4.5 | 37.5 | — | — | S10N04P76P |
| 1 | 0.75 | — | — | — | — | 6.37 | 53.1 | — | — | 3.56 | 29.6 | S10N06P76P |
| 1 | 1 | 10 | 83.3 | 11 | 91.7 | — | — | 6 | 50 | — | — | S10N04P01P |
| 1 | 1 | — | — | — | — | 8.5 | 70.8 | — | — | 4.75 | 39.5 | S10N06P01P |
| 1 | 1.5 | 15 | 125 | 16.5 | 137 | — | — | 9 | 75 | — | — | S10N04P16P |
| 1 | 1.5 | — | — | — | — | 12.7 | 106 | — | — | 7.12 | 59.3 | S10N06P16P |
| 1 | 2 | 20 | 167 | 22 | 183 | — | — | 12 | 100 | — | — | S10N04P02P |
| 1 | 2 | — | — | — | — | 17 | 142 | — | — | 9.5 | 79.2 | S10N06P02P |
| 1 | 3 | 30 | 249.9 | 33 | 275.1 | — | — | 18 | 150 | — | — | S10N04A03N |
| 1 | 3 | — | — | — | — | 25.5 | 212.4 | — | — | 14.25 | 118.5 | S10N06A03N |
| 1 | 5 | 50 | 416.5 | 55 | 458.5 | — | — | 30 | 250 | — | — | S10N04A05N |
| 1 | 5 | — | — | — | — | 42.5 | 354 | — | — | 23.7 | 197.5 | S10N06A05N |
| 1 | 7.5 | 75 | 624 | 82.5 | 687 | — | — | 45 | 375 | — | — | S10N04A07N |
| 1 | 7.5 | — | — | — | — | 63.7 | 531 | — | — | 35.6 | 296 | S10N06A07N |
| Connection Diagram ② | | A | | A | | A | | B | | B | | |

Notes

① Additional wiring trough may be required.

② Refer to Page V2-T2-148 for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on Page V2-T2-204.

Single-Phase 230 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | 199 | | 203 | | 207 | | 209 | | 216 | | Catalog Number |
|----------------------|----------|-------------------------|-------|------------|------|------------|-------|------------|-------|------------|------|------------|-------|----------------|
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 1 | 0.05 | — | — | — | — | 0.43 | 1.88 | 0.48 | 2.08 | — | — | — | — | S10N04A81N |
| 1 | 0.05 | 0.31 | 1.36 | 0.36 | 1.56 | — | — | — | — | — | — | 0.72 | 3.12 | S10N06A81N |
| 1 | 0.10 | — | — | — | — | 0.86 | 3.75 | 0.96 | 4.17 | — | — | — | — | S10N04A82N |
| 1 | 0.10 | 0.62 | 2.71 | 0.72 | 3.12 | — | — | — | — | — | — | 1.44 | 6.25 | S10N06A82N |
| 1 | 0.15 | — | — | — | — | 1.29 | 5.62 | 1.44 | 6.25 | — | — | — | — | S10N04A83N |
| 1 | 0.15 | 0.93 | 4.06 | 1.08 | 4.69 | — | — | — | — | — | — | 2.16 | 9.37 | S10N06A83N |
| 1 | 0.25 | — | — | — | — | 2.15 | 9.37 | 2.39 | 10.4 | — | — | — | — | S10N04P26P |
| 1 | 0.25 | 1.55 | 6.77 | 1.8 | 7.81 | — | — | — | — | — | — | 3.59 | 15.6 | S10N06P26P |
| 1 | 0.50 | — | — | — | — | 4.31 | 18.7 | 4.79 | 20.8 | — | — | — | — | S10N04P51P |
| 1 | 0.50 | 3.11 | 13.5 | 3.6 | 15.6 | — | — | — | — | — | — | 7.19 | 31.2 | S10N06P51P |
| 1 | 0.75 | — | — | — | — | 6.46 | 28.2 | 7.19 | 31.2 | — | — | — | — | S10N04P76P |
| 1 | 0.75 | 4.66 | 20.3 | 5.4 | 23.4 | — | — | — | — | — | — | 10.8 | 46.8 | S10N06P76P |
| 1 | 1 | — | — | — | — | 8.62 | 37.5 | 9.58 | 41.7 | — | — | — | — | S10N04P01P |
| 1 | 1 | 6.23 | 27.1 | 7.2 | 31.2 | — | — | — | — | — | — | 14.4 | 62.5 | S10N06P01P |
| 1 | 1.5 | — | — | — | — | 12.9 | 56.2 | 14.4 | 62.5 | — | — | — | — | S10N04P16P |
| 1 | 1.5 | 9.34 | 40.6 | 10.8 | 46.9 | — | — | — | — | — | — | 21.6 | 93.7 | S10N06P16P |
| 1 | 2 | — | — | — | — | 17.2 | 75 | 19.2 | 83.3 | — | — | — | — | S10N04P02P |
| 1 | 2 | 12.5 | 54.2 | 14.4 | 62.5 | — | — | — | — | — | — | 28.7 | 125 | S10N06P02P |
| 1 | 3 | — | — | — | — | 25.8 | 112.5 | 28.7 | 125.1 | — | — | — | — | S10N04A03N |
| 1 | 3 | 18.6 | 81.3 | 21.6 | 93.6 | — | — | — | — | — | — | 43.2 | 187.5 | S10N06A03N |
| 1 | 5 | — | — | — | — | 43.1 | 187.5 | 47.9 | 208.5 | — | — | — | — | S10N04A05N |
| 1 | 5 | 31.1 | 135.5 | 36 | 156 | — | — | — | — | — | — | 72 | 312.5 | S10N06A05N |
| 1 | 7.5 | — | — | — | — | 64.6 | 282 | 71.9 | 312 | — | — | — | — | S10N04A07N |
| 1 | 7.5 | 46.6 | 203 | 54 | 234 | — | — | — | — | — | — | 108 | 468 | S10N06A07N |
| Connection Diagram ② | | G | | F | | G | | F | | E | | | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase 230 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | 219 | | 242 | | 246 | | 253 | | 260 | | Catalog Number |
|----------------------|----------|-------------------------|-------|------------|-------|------------|-------|------------|-------|------------|-------|------------|------|----------------|
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 1 | 0.05 | 0.96 | 4.16 | 1.0 | 4.38 | — | — | 0.53 | 2.29 | — | — | — | — | S10N04A81N |
| 1 | 0.05 | — | — | — | — | 0.77 | 3.34 | — | — | 0.41 | 1.77 | — | — | S10N06A81N |
| 1 | 0.10 | 1.92 | 8.33 | 2.01 | 8.75 | — | — | 1.05 | 4.58 | — | — | — | — | S10N04A82N |
| 1 | 0.10 | — | — | — | — | 1.53 | 6.67 | — | — | 0.82 | 3.54 | — | — | S10N06A82N |
| 1 | 0.15 | 2.87 | 12.5 | 3.02 | 13.1 | — | — | 1.58 | 6.87 | — | — | — | — | S10N04A83N |
| 1 | 0.15 | — | — | — | — | 2.3 | 10.0 | — | — | 1.22 | 5.31 | — | — | S10N06A83N |
| 1 | 0.25 | 4.79 | 20.8 | 5.03 | 21.9 | — | — | 2.63 | 11.5 | — | — | — | — | S10N04P26P |
| 1 | 0.25 | — | — | — | — | 3.83 | 16.7 | — | — | 2.04 | 8.85 | — | — | S10N06P26P |
| 1 | 0.50 | 9.58 | 41.6 | 10.1 | 43.7 | — | — | 5.27 | 22.9 | — | — | — | — | S10N04P51P |
| 1 | 0.50 | — | — | — | — | 7.67 | 33.3 | — | — | 4.07 | 17.7 | — | — | S10N06P51P |
| 1 | 0.75 | 14.4 | 62.4 | 15.1 | 65.6 | — | — | 7.9 | 34.4 | — | — | — | — | S10N04P76P |
| 1 | 0.75 | — | — | — | — | 11.5 | 50 | — | — | 6.11 | 26.6 | — | — | S10N06P76P |
| 1 | 1 | 19.2 | 83.3 | 20.1 | 87.5 | — | — | 10.5 | 45.8 | — | — | — | — | S10N04P01P |
| 1 | 1 | — | — | — | — | 15.3 | 66.7 | — | — | 8.15 | 35.4 | — | — | S10N06P01P |
| 1 | 1.5 | 28.7 | 125 | 30.2 | 131 | — | — | 15.8 | 68.7 | — | — | — | — | S10N04P16P |
| 1 | 1.5 | — | — | — | — | 23 | 100 | — | — | 12.2 | 53.1 | — | — | S10N06P16P |
| 1 | 2 | 38.3 | 167 | 40.2 | 175 | — | — | 21.1 | 91.7 | — | — | — | — | S10N04P02P |
| 1 | 2 | — | — | — | — | 30.7 | 133 | — | — | 16.3 | 70.8 | — | — | S10N06P02P |
| 1 | 3 | 57.6 | 249.9 | 60.3 | 262.5 | — | — | 31.5 | 137.4 | — | — | — | — | S10N04A03N |
| 1 | 3 | — | — | — | — | 45.9 | 200.1 | — | — | 24.4 | 106.2 | — | — | S10N06A03N |
| 1 | 5 | 96 | 416.5 | 100.5 | 437.5 | — | — | 52.5 | 229 | — | — | — | — | S10N04A05N |
| 1 | 5 | — | — | — | — | 76.5 | 333.5 | — | — | 40.7 | 177 | — | — | S10N06A05N |
| 1 | 7.5 | 144 | 624 | 151 | 656 | — | — | 79 | 344 | — | — | — | — | S10N04A07N |
| 1 | 7.5 | — | — | — | — | 115 | 500 | — | — | 61.1 | 266 | — | — | S10N06A07N |
| Connection Diagram ② | | E | | E | | E | | F | | F | | | | |

Notes

① Additional wiring trough may be required.

② Refer to Page V2-T2-148 for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on Page V2-T2-204.

Single-Phase 240 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | 216 | | 218 | | 225 | | Catalog Number | | |
|----------------------|----------|-------------------------|------|----------------|------|------------|-------|------------|-------|----------------|------------|------------|
| | | 208 Output kVA | Amps | 212 Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | | Output kVA | Amps |
| 1 | 0.05 | — | — | — | — | 0.45 | 1.88 | 0.5 | 2.08 | — | — | S10N04A81N |
| 1 | 0.05 | 0.32 | 1.35 | 0.38 | 1.56 | — | — | — | — | 0.75 | 3.12 | S10N06A81N |
| 1 | 0.10 | — | — | — | — | 0.9 | 3.75 | 1.0 | 4.17 | — | — | S10N04A82N |
| 1 | 0.10 | 0.65 | 2.71 | 0.75 | 3.12 | — | — | — | — | 1.5 | 6.25 | S10N06A82N |
| 1 | 0.15 | — | — | — | — | 1.35 | 5.62 | 1.5 | 6.25 | — | — | S10N04A83N |
| 1 | 0.15 | 0.98 | 4.06 | 1.12 | 4.69 | — | — | — | — | 2.25 | 9.37 | S10N06A83N |
| 1 | 0.25 | — | — | — | — | 2.25 | 9.37 | 2.5 | 10.4 | — | — | S10N04P26P |
| 1 | 0.25 | 1.62 | 6.77 | 1.87 | 7.81 | — | — | — | — | 3.75 | 15.6 | S10N06P26P |
| 1 | 0.50 | — | — | — | — | 4.5 | 18.7 | 5 | 20.8 | — | — | S10N04P51P |
| 1 | 0.50 | 3.25 | 13.5 | 3.75 | 15.6 | — | — | — | — | 7.5 | 31.2 | S10N06P51P |
| 1 | 0.75 | — | — | — | — | 6.75 | 28.2 | 7.5 | 31.2 | — | — | S10N04P76P |
| 1 | 0.75 | 4.87 | 20.3 | 5.62 | 23.4 | — | — | — | — | 11.2 | 46.8 | S10N06P76P |
| 1 | 1 | — | — | — | — | 9 | 37.5 | 10 | 41.7 | — | — | S10N04P01P |
| 1 | 1 | 6.5 | 27.1 | 7.5 | 31.2 | — | — | — | — | 15 | 62.5 | S10N06A01 |
| 1 | 1.5 | — | — | — | — | 13.5 | 56.2 | 15 | 62.5 | — | — | S10N04P16P |
| 1 | 1.5 | 9.75 | 40.6 | 11.2 | 46.9 | — | — | — | — | 22.5 | 93.7 | S10N06P16P |
| 1 | 2 | — | — | — | — | 18 | 75 | 20 | 83.3 | — | — | S10N04P02P |
| 1 | 2 | 13 | 54.2 | 15 | 62.5 | — | — | — | — | 30 | 125 | S10N06P02P |
| 1 | 3 | — | — | — | — | 27 | 112.5 | 30 | 125.1 | — | — | S10N04A03N |
| 1 | 3 | 19.5 | 81.3 | 22.5 | 93.6 | — | — | — | — | 45 | 187.5 | S10N06A03N |
| 1 | 5 | — | — | — | — | 45 | 187 | 50 | 208 | — | — | S10N04A05N |
| 1 | 5 | 32.5 | 135 | 37.5 | 156 | — | — | — | — | 75 | 312 | S10N06A05N |
| 1 | 7.5 | — | — | — | — | 67.5 | 282 | 75 | 312 | — | — | S10N04A07N |
| 1 | 7.5 | 48.7 | 203 | 56.2 | 234 | — | — | — | — | 112 | 468 | S10N06A07N |
| Connection Diagram ② | | G | | F | | G | | F | | E | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase 240 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | | | | | | | | | Catalog Number |
|----------------------|----------|-------------------------|-------|------------|-------|------------|-------|------------|-------|------------|-------|----------------|
| | | 229 | | 252 | | 256 | | 264 | | 272 | | |
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 1 | 0.05 | 1.0 | 4.16 | 1.05 | 4.38 | — | — | 0.55 | 2.29 | — | — | S10N04A81N |
| 1 | 0.05 | — | — | — | — | 0.8 | 3.33 | — | — | 0.42 | 1.77 | S10N06A81N |
| 1 | 0.10 | 2.0 | 8.33 | 2.1 | 8.75 | — | — | 1.1 | 4.58 | — | — | S10N04A82N |
| 1 | 0.10 | — | — | — | — | 1.6 | 6.67 | — | — | 0.85 | 3.54 | S10N06A82N |
| 1 | 0.15 | 3.0 | 12.5 | 3.15 | 13.1 | — | — | 1.65 | 6.87 | — | — | S10N04A83N |
| 1 | 0.15 | — | — | — | — | 2.4 | 10.0 | — | — | 1.27 | 5.31 | S10N06A83N |
| 1 | 0.25 | 5 | 20.8 | 5.25 | 21.9 | — | — | 2.75 | 11.5 | — | — | S10N04P26P |
| 1 | 0.25 | — | — | — | — | 4 | 16.7 | — | — | 2.12 | 8.85 | S10N06P26P |
| 1 | 0.50 | 10 | 41.6 | 10.5 | 43.7 | — | — | 5.5 | 22.9 | — | — | S10N04P51P |
| 1 | 0.50 | — | — | — | — | 8 | 33.3 | — | — | 4.25 | 17.7 | S10N06P51P |
| 1 | 0.75 | 15 | 62.4 | 15.7 | 65.6 | — | — | 8.25 | 34.4 | — | — | S10N04P76P |
| 1 | 0.75 | — | — | — | — | 12 | 50 | — | — | 6.37 | 26.6 | S10N06P76P |
| 1 | 1 | 20 | 83.3 | 21 | 87.5 | — | — | 11 | 45.8 | — | — | S10N04P01P |
| 1 | 1 | — | — | — | — | 16 | 66.7 | — | — | 8.5 | 35.4 | S10N06P01P |
| 1 | 1.5 | 30 | 125 | 31.5 | 131 | — | — | 16.5 | 68.7 | — | — | S10N04P16P |
| 1 | 1.5 | — | — | — | — | 24 | 100 | — | — | 12.7 | 53.1 | S10N06P16P |
| 1 | 2 | 40 | 167 | 42 | 175 | — | — | 22 | 91.7 | — | — | S10N04P02P |
| 1 | 2 | — | — | — | — | 32 | 133 | — | — | 17 | 70.8 | S10N06P02P |
| 1 | 3 | 60 | 249.9 | 63 | 262.5 | — | — | 33 | 137.4 | — | — | S10N04A03N |
| 1 | 3 | — | — | — | — | 48 | 200.1 | — | — | 25.5 | 106.2 | S10N06A03N |
| 1 | 5 | 100 | 416.5 | 105 | 437.5 | — | — | 55 | 229 | — | — | S10N04A05N |
| 1 | 5 | — | — | — | — | 80 | 333 | — | — | 42.5 | 177 | S10N06A05N |
| 1 | 7.5 | 150 | 624 | 157 | 656 | — | — | 82.5 | 344 | — | — | S10N04A07N |
| 1 | 7.5 | — | — | — | — | 120 | 500 | — | — | 63.7 | 266 | S10N06A07N |
| Connection Diagram ② | | E | | E | | E | | F | | F | | |

Notes

① Additional wiring trough may be required.

② Refer to Page V2-T2-148 for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on Page V2-T2-204.

Three-Phase Open Delta Connection 230 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | | | | | | | | | Catalog Number |
|----------------------|----------|-------------------------|------|------------|------|------------|-------|------------|-------|------------|-------|----------------|
| | | 199 | | 203 | | 207 | | 209 | | 216 | | |
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 2 | 0.05 | — | — | — | — | 0.75 | 1.87 | 0.83 | 2.08 | — | — | S10N04A81N |
| 2 | 0.05 | 0.54 | 1.35 | 0.62 | 1.56 | — | — | — | — | 1.24 | 3.12 | S10N06A81N |
| 2 | 0.10 | — | — | — | — | 1.49 | 3.75 | 1.66 | 4.17 | — | — | S10N04A82N |
| 2 | 0.10 | 1.08 | 2.71 | 1.24 | 3.12 | — | — | — | — | 2.49 | 6.25 | S10N06A82N |
| 2 | 0.15 | — | — | — | — | 2.24 | 5.62 | 2.49 | 6.25 | — | — | S10N04A83N |
| 2 | 0.15 | 1.62 | 4.06 | 1.87 | 4.69 | — | — | — | — | 3.73 | 9.37 | S10N06A83N |
| 2 | 0.25 | — | — | — | — | 3.3 | 9.37 | 4.15 | 10.4 | — | — | S10N04P26P |
| 2 | 0.25 | 2.7 | 6.77 | 3.11 | 7.81 | — | — | — | — | 6.22 | 15.6 | S10N06P26P |
| 2 | 0.50 | — | — | — | — | 7.47 | 18.7 | 8.3 | 20.8 | — | — | S10N04P51P |
| 2 | 0.50 | 5.39 | 13.5 | 6.22 | 15.6 | — | — | — | — | 12.4 | 31.2 | S10N06P51P |
| 2 | 0.75 | — | — | — | — | 11.2 | 28.2 | 12.4 | 31.2 | — | — | S10N04P76P |
| 2 | 0.75 | 8.09 | 20.3 | 9.33 | 23.4 | — | — | — | — | 18.7 | 46.8 | S10N06P76P |
| 2 | 1 | — | — | — | — | 14.9 | 37.5 | 16.6 | 41.7 | — | — | S10N04P01P |
| 2 | 1 | 10.8 | 27.1 | 12.4 | 31.2 | — | — | — | — | 24.9 | 62.5 | S10N06P01P |
| 2 | 1.5 | — | — | — | — | 22.4 | 56.2 | 24.9 | 62.5 | — | — | S10N04P16P |
| 2 | 1.5 | 16.2 | 40.6 | 18.7 | 46.9 | — | — | — | — | 37.3 | 93.7 | S10N06P16P |
| 2 | 2 | — | — | — | — | 29.9 | 75 | 33.2 | 83.3 | — | — | S10N04P02P |
| 2 | 2 | 21.6 | 54.2 | 24.9 | 62.5 | — | — | — | — | 49.8 | 125 | S10N06P02P |
| 2 | 3 | — | — | — | — | 44.7 | 112.5 | 49.8 | 125.1 | — | — | S10N04A03N |
| 2 | 3 | 32.4 | 81.3 | 32.7 | 93.6 | — | — | — | — | 74.7 | 187.5 | S10N06A03N |
| 2 | 5 | — | — | — | — | 74.7 | 187 | 83 | 208 | — | — | S10N04A05N |
| 2 | 5 | 53.9 | 135 | 62.2 | 156 | — | — | — | — | 124 | 312.5 | S10N06A05N |
| 2 | 7.5 | — | — | — | — | 112 | 282 | 124 | 312 | — | — | S10N04A07N |
| 2 | 7.5 | 80.9 | 203 | 93.3 | 234 | — | — | — | — | 187 | 468 | S10N06A07N |
| Connection Diagram ② | | L | | K | | L | | K | | I | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Open Delta Connection 230 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | | | | | | | | | Catalog Number |
|----------------------|----------|-------------------------|-------|------------|-------|------------|------|------------|-------|------------|-------|----------------|
| | | 219 | | 242 | | 246 | | 253 | | 260 | | |
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 2 | 0.05 | 1.66 | 4.17 | 1.74 | 4.37 | — | — | 0.91 | 2.29 | — | — | S10N04A81N |
| 2 | 0.05 | — | — | — | — | 1.33 | 3.33 | — | — | 0.70 | 1.77 | S10N06A81N |
| 2 | 0.10 | 3.32 | 8.33 | 3.48 | 8.75 | — | — | 1.83 | 4.58 | — | — | S10N04A82N |
| 2 | 0.10 | — | — | — | — | 2.65 | 6.67 | — | — | 1.41 | 3.54 | S10N06A82N |
| 2 | 0.15 | 4.98 | 12.5 | 5.23 | 13.1 | — | — | 2.74 | 6.87 | — | — | S10N04A83N |
| 2 | 0.15 | — | — | — | — | 3.98 | 10.0 | — | — | 2.12 | 5.13 | S10N06A83N |
| 2 | 0.25 | 8.3 | 20.8 | 8.71 | 21.9 | — | — | 4.56 | 11.5 | — | — | S10N04P26P |
| 2 | 0.25 | — | — | — | — | 6.64 | 16.7 | — | — | 3.52 | 8.85 | S10N06P26P |
| 2 | 0.50 | 16.6 | 41.7 | 17.4 | 43.7 | — | — | 9.73 | 22.9 | — | — | S10N04P51P |
| 2 | 0.50 | — | — | — | — | 13.3 | 33.3 | — | — | 7.05 | 17.7 | S10N06P51P |
| 2 | 0.75 | 24.9 | 62.4 | 26.1 | 65.6 | — | — | 13.7 | 34.4 | — | — | S10N04P76P |
| 2 | 0.75 | — | — | — | — | 19.9 | 50 | — | — | 10.6 | 26.6 | S10N06P76P |
| 2 | 1 | 33.2 | 83.3 | 34.8 | 87.5 | — | — | 18.3 | 45.8 | — | — | S10N04P01P |
| 2 | 1 | — | — | — | — | 26.5 | 66.7 | — | — | 14.1 | 35.4 | S10N06P01P |
| 2 | 1.5 | 49.8 | 125 | 52.3 | 131 | — | — | 27.4 | 68.7 | — | — | S10N04P16P |
| 2 | 1.5 | — | — | — | — | 39.8 | 100 | — | — | 21.2 | 53.1 | S10N06P16P |
| 2 | 2 | 66.4 | 167 | 69.7 | 175 | — | — | 36.5 | 91.7 | — | — | S10N04P02P |
| 2 | 2 | — | — | — | — | 53.1 | 133 | — | — | 28.2 | 70.8 | S10N06P02P |
| 2 | 3 | 99.6 | 249.9 | 104.4 | 262.5 | — | — | 54.9 | 137.4 | — | — | S10N04A03N |
| 2 | 3 | — | — | — | — | 79.5 | 200 | — | — | 42.3 | 106.2 | S10N06A03N |
| 2 | 5 | 166 | 417 | 174 | 437 | — | — | 91.3 | 229 | — | — | S10N04A05N |
| 2 | 5 | — | — | — | — | 133 | 333 | — | — | 70.5 | 177 | S10N06A05N |
| 2 | 7.5 | 249 | 624 | 261 | 656 | — | — | 137 | 344 | — | — | S10N04A07N |
| 2 | 7.5 | — | — | — | — | 199 | 500 | — | — | 106 | 266 | S10N06A07N |
| Connection Diagram ② | I | | | I | | I | | K | | K | | |

Notes

① Additional wiring trough may be required.

② Refer to Page V2-T2-148 for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on Page V2-T2-204.

Three-Phase Open Delta Connection 240 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | 208 | | 212 | | 216 | | 218 | | 225 | | Catalog Number |
|----------------------|----------|-------------------------|------|------------|------|------------|-------|------------|-------|------------|-------|------------|------|----------------|
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 2 | 0.05 | — | — | — | — | 0.73 | 1.87 | 0.87 | 2.08 | — | — | — | — | S10N04A81N |
| 2 | 0.05 | 0.56 | 1.35 | 0.65 | 1.56 | — | — | — | — | 1.3 | 3.12 | — | — | S10N06A81N |
| 2 | 0.10 | — | — | — | — | 1.56 | 3.75 | 1.73 | 4.17 | — | — | — | — | S10N04A82N |
| 2 | 0.10 | 1.13 | 2.71 | 1.3 | 3.12 | — | — | — | — | 2.6 | 6.25 | — | — | S10N06A82N |
| 2 | 0.15 | — | — | — | — | 2.34 | 5.62 | 2.6 | 6.25 | — | — | — | — | S10N04A83N |
| 2 | 0.15 | 1.69 | 4.06 | 1.95 | 4.69 | — | — | — | — | 3.9 | 9.37 | — | — | S10N06A83N |
| 2 | 0.25 | — | — | — | — | 3.9 | 9.37 | 4.33 | 10.4 | — | — | — | — | S10N04P26P |
| 2 | 0.25 | 2.81 | 6.77 | 3.25 | 7.81 | — | — | — | — | 6.49 | 15.6 | — | — | S10N06P26P |
| 2 | 0.50 | — | — | — | — | 7.79 | 18.7 | 8.66 | 20.8 | — | — | — | — | S10N04P51P |
| 2 | 0.50 | 5.63 | 13.5 | 6.5 | 15.6 | — | — | — | — | 13 | 31.2 | — | — | S10N06P51P |
| 2 | 0.75 | — | — | — | — | 11.7 | 28.2 | 13 | 31.2 | — | — | — | — | S10N04P76P |
| 2 | 0.75 | 8.44 | 20.3 | 9.75 | 23.4 | — | — | — | — | 19.5 | 46.8 | — | — | S10N06P76P |
| 2 | 1 | — | — | — | — | 15.6 | 37.5 | 17.3 | 41.7 | — | — | — | — | S10N04P01P |
| 2 | 1 | 11.3 | 27.1 | 13 | 31.2 | — | — | — | — | 26 | 62.5 | — | — | S10N06P01P |
| 2 | 1.5 | — | — | — | — | 23.4 | 56.2 | 26 | 62.5 | — | — | — | — | S10N04P16P |
| 2 | 1.5 | 16.9 | 40.6 | 19.5 | 46.9 | — | — | — | — | 39 | 93.7 | — | — | S10N06P16P |
| 2 | 2 | — | — | — | — | 31.2 | 75 | 34.6 | 83.3 | — | — | — | — | S10N04P02P |
| 2 | 2 | 22.5 | 54.2 | 26 | 62.5 | — | — | — | — | 52 | 125 | — | — | S10N06P02P |
| 2 | 3 | — | — | — | — | 46.8 | 112.5 | 51.9 | 125.1 | — | — | — | — | S10N04A03N |
| 2 | 3 | 33.9 | 81.3 | 39 | 93.6 | — | — | — | — | 78 | 187.5 | — | — | S10N06A03N |
| 2 | 5 | — | — | — | — | 77.9 | 187 | 86.6 | 208 | — | — | — | — | S10N04A05N |
| 2 | 5 | 56.3 | 135 | 65 | 156 | — | — | — | — | 130 | 312 | — | — | S10N06A05N |
| 2 | 7.5 | — | — | — | — | 117 | 282 | 130 | 312 | — | — | — | — | S10N04A07N |
| 2 | 7.5 | 84.4 | 203 | 97.5 | 234 | — | — | — | — | 195 | 468 | — | — | S10N06A07N |
| Connection Diagram ② | | L | | K | | L | | K | | L | | K | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Open Delta Connection 240 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | | | | | | | | | Catalog Number |
|----------------------|----------|-------------------------|-------|------------|-------|------------|------|------------|-------|------------|-------|----------------|
| | | 229 | | 252 | | 256 | | 264 | | 272 | | |
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 2 | 0.05 | 1.73 | 4.16 | 1.82 | 4.37 | — | — | 0.95 | 2.29 | — | — | S10N04A81N |
| 2 | 0.05 | — | — | — | — | 1.38 | 3.33 | — | — | 0.74 | 1.77 | S10N06A81N |
| 2 | 0.10 | 3.46 | 8.33 | 3.64 | 8.75 | — | — | 1.91 | 4.58 | — | — | S10N04A82N |
| 2 | 0.10 | — | — | — | — | 2.77 | 6.67 | — | — | 1.47 | 3.54 | S10N06A82N |
| 2 | 0.15 | 5.19 | 12.5 | 5.45 | 13.1 | — | — | 2.86 | 6.87 | — | — | S10N04A83N |
| 2 | 0.15 | — | — | — | — | 4.15 | 10.0 | — | — | 2.21 | 5.31 | S10N06A83N |
| 2 | 0.25 | 8.66 | 20.8 | 9.09 | 21.9 | — | — | 4.76 | 11.5 | — | — | S10N04P26P |
| 2 | 0.25 | — | — | — | — | 6.92 | 16.7 | — | — | 3.68 | 8.85 | S10N06P26P |
| 2 | 0.50 | 17.3 | 41.6 | 18.2 | 43.7 | — | — | 9.53 | 22.9 | — | — | S10N04P51P |
| 2 | 0.50 | — | — | — | — | 13.8 | 33.3 | — | — | 7.36 | 17.7 | S10N06P51P |
| 2 | 0.75 | 26 | 62.4 | 27.3 | 65.6 | — | — | 14.3 | 34.4 | — | — | S10N04P76P |
| 2 | 0.75 | — | — | — | — | 20.8 | 50 | — | — | 11 | 26.6 | S10N06P76P |
| 2 | 1 | 34.6 | 83.3 | 36.4 | 87.5 | — | — | 19.1 | 45.8 | — | — | S10N04P01P |
| 2 | 1 | — | — | — | — | 27.7 | 66.7 | — | — | 14.7 | 35.4 | S10N06P01P |
| 2 | 1.5 | 51.9 | 125 | 54.5 | 131 | — | — | 28.6 | 68.7 | — | — | S10N04P16P |
| 2 | 1.5 | — | — | — | — | 41.5 | 100 | — | — | 22.1 | 53.1 | S10N06P16P |
| 2 | 2 | 69.3 | 167 | 72.7 | 175 | — | — | 38.1 | 91.7 | — | — | S10N04P02P |
| 2 | 2 | — | — | — | — | 55.4 | 133 | — | — | 29.4 | 70.8 | S10N06P02P |
| 2 | 3 | 103.8 | 249.9 | 109.2 | 262.5 | — | — | 57.3 | 137.4 | — | — | S10N04A03N |
| 2 | 3 | — | — | — | — | 83.1 | 200 | — | — | 44.1 | 106.2 | S10N06A03N |
| 2 | 5 | 173 | 416 | 182 | 437 | — | — | 95.3 | 229 | — | — | S10N04A05N |
| 2 | 5 | — | — | — | — | 138 | 333 | — | — | 73.6 | 177 | S10N06A05N |
| 2 | 7.5 | 260 | 624 | 273 | 656 | — | — | 143 | 344 | — | — | S10N04A07N |
| 2 | 7.5 | — | — | — | — | 208 | 500 | — | — | 110 | 266 | S10N06A07N |
| Connection Diagram ② | | I | | I | | I | | K | | K | | |

Notes

① Additional wiring trough may be required.

② Refer to Page V2-T2-148 for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on Page V2-T2-204.

WARNING! Three-phase autotransformers should never be used to obtain four-wire output with three-wire input. Four-wire output requires four-wire wye input.

2

On all wye connections, the source neutral must be present and connected to the transformer bank. If source neutral is not present, do not use a wye connection.

Three-Phase Wye Connection 208 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | | | | | | | | | Catalog Number |
|----------------------|----------|-------------------------|------|------------|------|------------|------|------------|-------|------------|-------|----------------|
| | | 152 | | 164 | | 173 | | 180 | | 184 | | |
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 3 | 0.05 | — | — | — | — | 0.75 | 2.08 | — | — | — | — | S10N04A81N |
| 3 | 0.05 | 0.41 | 1.15 | 0.56 | 1.56 | — | — | 0.98 | 2.71 | 1.12 | 3.12 | S10N06A81N |
| 3 | 0.10 | — | — | — | — | 1.50 | 4.17 | — | — | — | — | S10N04A82N |
| 3 | 0.10 | 0.82 | 2.29 | 1.12 | 3.12 | — | — | 1.95 | 5.41 | 2.25 | 6.25 | S10N06A82N |
| 3 | 0.15 | — | — | — | — | 2.25 | 6.25 | — | — | — | — | S10N04A83N |
| 3 | 0.15 | 1.24 | 3.44 | 1.69 | 4.69 | — | — | 2.92 | 8.12 | 3.73 | 9.37 | S10N06A83N |
| 3 | 0.25 | — | — | — | — | 3.75 | 10.4 | — | — | — | — | S10N04P26P |
| 3 | 0.25 | 2.06 | 5.73 | 2.81 | 7.81 | — | — | 4.87 | 13.5 | 5.62 | 15.6 | S10N06P26P |
| 3 | 0.50 | — | — | — | — | 7.5 | 20.8 | — | — | — | — | S10N04P51P |
| 3 | 0.50 | 4.12 | 11.5 | 5.62 | 15.6 | — | — | 9.75 | 27.1 | 11.2 | 31.2 | S10N06P51P |
| 3 | 0.75 | — | — | — | — | 11.2 | 31.2 | — | — | — | — | S10N04P76P |
| 3 | 0.75 | 6.19 | 17.2 | 8.44 | 23.4 | — | — | 14.6 | 40.6 | 16.8 | 46.8 | S10N06P76P |
| 3 | 1 | — | — | — | — | 15 | 41.7 | — | — | — | — | S10N04P01P |
| 3 | 1 | 8.25 | 22.9 | 11.2 | 31.2 | — | — | 19.5 | 54.1 | 22.5 | 62.5 | S10N06P01P |
| 3 | 1.5 | — | — | — | — | 22.5 | 62.5 | — | — | — | — | S10N04P16P |
| 3 | 1.5 | 12.4 | 34.4 | 16.9 | 46.9 | — | — | 29.2 | 81.2 | 33.7 | 93.7 | S10N06P16P |
| 3 | 2 | — | — | — | — | 30 | 83.3 | — | — | — | — | S10N04P02P |
| 3 | 2 | 16.5 | 45.8 | 22.5 | 62.5 | — | — | 39 | 108 | 45 | 125 | S10N06P02P |
| 3 | 3 | — | — | — | — | 45 | 125 | — | — | — | — | S10N04A03N |
| 3 | 3 | 24.7 | 68.7 | 33.6 | 93.6 | — | — | 58.5 | 162.3 | 67.5 | 187.5 | S10N06A03N |
| 3 | 5 | — | — | — | — | 75 | 208 | — | — | — | — | S10N04A05N |
| 3 | 5 | 41.2 | 115 | 56.2 | 156 | — | — | 97.5 | 271 | 112 | 312 | S10N06A05N |
| 3 | 7.5 | — | — | — | — | 112 | 312 | — | — | — | — | S10N04A07N |
| 3 | 7.5 | 61.9 | 172 | 84.4 | 234 | — | — | 146 | 406 | 168 | 468 | S10N06A07N |
| Connection Diagram ② | | P | | N | | N | | O | | M | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

WARNING! Three-phase autotransformers should never be used to obtain four-wire output with three-wire input. Four-wire output requires four-wire wye input.

On all wye connections, the source neutral must be present and connected to the transformer bank. If source neutral is not present, do not use a wye connection.

Three-Phase Wye Connection 208 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | 229 | | 236 | | 250 | | 264 | | Catalog Number |
|----------------------|----------|-------------------------|-------|------------|-------|------------|-------|------------|------|------------|-------|----------------|
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 3 | 0.05 | 1.5 | 4.16 | 1.65 | 4.58 | — | — | 0.9 | 2.5 | — | — | S10N04A81N |
| 3 | 0.05 | — | — | — | — | 1.27 | 3.54 | — | — | 0.71 | 1.98 | S10N06A81N |
| 3 | 0.10 | 3.0 | 8.33 | 3.3 | 9.17 | — | — | 1.8 | 5.0 | — | — | S10N04A82N |
| 3 | 0.10 | — | — | — | — | 2.55 | 7.08 | — | — | 1.42 | 3.95 | S10N06A82N |
| 3 | 0.15 | 4.5 | 12.5 | 4.95 | 13.7 | — | — | 2.7 | 7.5 | — | — | S10N04A83N |
| 3 | 0.15 | — | — | — | — | 3.82 | 10.6 | — | — | 2.14 | 5.93 | S10N06A83N |
| 3 | 0.25 | 7.5 | 20.8 | 8.25 | 22.9 | — | — | 4.5 | 12.5 | — | — | S10N04P26P |
| 3 | 0.25 | — | — | — | — | 6.35 | 17.7 | — | — | 3.56 | 9.88 | S10N06P26P |
| 3 | 0.50 | 15 | 41.6 | 16.5 | 45.8 | — | — | 9 | 25 | — | — | S10N04P51P |
| 3 | 0.50 | — | — | — | — | 12.7 | 35.4 | — | — | 7.12 | 19.3 | S10N06P51P |
| 3 | 0.75 | 22.5 | 62.4 | 24.7 | 68.7 | — | — | 13.5 | 37.5 | — | — | S10N04P76P |
| 3 | 0.75 | — | — | — | — | 19 | 53.1 | — | — | 10.7 | 29.3 | S10N06P76P |
| 3 | 1 | 30 | 83.3 | 33 | 91.7 | — | — | 18 | 50 | — | — | S10N04P01P |
| 3 | 1 | — | — | — | — | 25.5 | 70.8 | — | — | 14.2 | 39.5 | S10N06P01P |
| 3 | 1.5 | 45 | 125 | 49.5 | 137 | — | — | 27 | 75 | — | — | S10N04P16P |
| 3 | 1.5 | — | — | — | — | 38.2 | 106 | — | — | 21.4 | 59.3 | S10N06P16P |
| 3 | 2 | 60 | 167 | 66 | 183 | — | — | 361 | 100 | — | — | S10N04P02P |
| 3 | 2 | — | — | — | — | 51 | 142 | — | — | 28.5 | 79.2 | S10N06P02P |
| 3 | 3 | 90 | 249.9 | 99 | 275.1 | — | — | 54 | 150 | — | — | S10N04A03N |
| 3 | 3 | — | — | — | — | 76.5 | 212.4 | — | — | 46.2 | 118.5 | S10N06A03N |
| 3 | 5 | 150 | 416 | 165 | 458 | — | — | 90 | 250 | — | — | S10N04A05N |
| 3 | 5 | — | — | — | — | 127 | 354 | — | — | 71.2 | 198 | S10N06A05N |
| 3 | 7.5 | 225 | 624 | 274 | 687 | — | — | 135 | 375 | — | — | S10N04A07N |
| 3 | 7.5 | — | — | — | — | 190 | 531 | — | — | 107 | 293 | S10N06A07N |
| Connection Diagram ② | | M | | M | | M | | N | | N | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

WARNING! Three-phase autotransformers should never be used to obtain four-wire output with three-wire input. Four-wire output requires four-wire wye input.

2

On all wye connections, the source neutral must be present and connected to the transformer bank. If source neutral is not present, do not use a wye connection.

Three-Phase Wye Connection 230 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | | | | | | | | | Catalog Number |
|----------------------|----------|-------------------------|------|------------|-------|------------|------|------------|------|------------|-------|----------------|
| | | 183 | | 192 | | 199 | | 208 | | 218 | | |
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 3 | 0.05 | — | — | 0.83 | 2.08 | — | — | 1.65 | 4.58 | 1.66 | 4.17 | S10N04A81N |
| 3 | 0.05 | 0.62 | 1.56 | — | — | 0.54 | 1.35 | — | — | — | — | S10N06A81N |
| 3 | 0.10 | — | — | 1.66 | 4.17 | — | — | 3.3 | 9.17 | 3.32 | 8.35 | S10N04A82N |
| 3 | 0.10 | 1.25 | 3.12 | — | — | 1.08 | 2.71 | — | — | — | — | S10N06A82N |
| 3 | 0.15 | — | — | 2.49 | 6.25 | — | — | 4.95 | 13.7 | 4.98 | 12.5 | S10N04A83N |
| 3 | 0.15 | 1.87 | 4.69 | — | — | 1.62 | 4.06 | — | — | — | — | S10N06A83N |
| 3 | 0.25 | — | — | 4.15 | 10.4 | — | — | 8.2 | 22.9 | 8.3 | 20.9 | S10N04P26P |
| 3 | 0.25 | 3.11 | 7.81 | — | — | 2.70 | 6.77 | — | — | — | — | S10N06P26P |
| 3 | 0.50 | — | — | 8.3 | 20.8 | — | — | 16.5 | 45.8 | 16.6 | 41.7 | S10N04P51P |
| 3 | 0.50 | 6.22 | 15.6 | — | — | 5.39 | 13.5 | — | — | — | — | S10N06P51P |
| 3 | 0.75 | — | — | 12.4 | 31.2 | — | — | 24.7 | 68.8 | 24.9 | 62.6 | S10N04P76P |
| 3 | 0.75 | 9.33 | 23.4 | — | — | 8.09 | 20.3 | — | — | — | — | S10N06P76P |
| 3 | 1 | — | — | 16.6 | 41.7 | — | — | 33 | 91.7 | 33.2 | 83.5 | S10N04P01P |
| 3 | 1 | 12.5 | 31.2 | — | — | 10.8 | 27.1 | — | — | — | — | S10N06P01P |
| 3 | 1.5 | — | — | 24.9 | 62.5 | — | — | 49.5 | 137 | 49.8 | 125 | S10N04P16P |
| 3 | 1.5 | 18.7 | 46.9 | — | — | 16.2 | 40.6 | — | — | — | — | S10N06P16P |
| 3 | 2 | — | — | 33.2 | 83.3 | — | — | 66 | 183 | 66.4 | 167 | S10N04P02P |
| 3 | 2 | 24.9 | 62.5 | — | — | 21.6 | 54.2 | — | — | — | — | S10N06P02P |
| 3 | 3 | — | — | 49.8 | 125.1 | — | — | 99 | 275 | 99.6 | 250.5 | S10N04A03N |
| 3 | 3 | 37.5 | 93.6 | — | — | 32.4 | 81.3 | — | — | — | — | S10N06A03N |
| 3 | 5 | — | — | 83 | 208 | — | — | 165 | 458 | 166 | 417 | S10N04A05N |
| 3 | 5 | 62.2 | 156 | — | — | 53.9 | 135 | — | — | — | — | S10N06A05N |
| 3 | 7.5 | — | — | 124 | 312 | — | — | 247 | 688 | 249 | 626 | S10N04A07N |
| 3 | 7.5 | 93.3 | 234 | — | — | 80.9 | 203 | — | — | — | — | S10N06A07N |
| Connection Diagram ② | | N | | N | | S | | M | | Q | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

WARNING! Three-phase autotransformers should never be used to obtain four-wire output with three-wire input. Four-wire output requires four-wire wye input.

On all wye connections, the source neutral must be present and connected to the transformer bank. If source neutral is not present, do not use a wye connection.

Three-Phase Wye Connection 230 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | 242 | | 245 | | 253 | | 260 | | 265 | | Catalog Number |
|----------------------|----------|-------------------------|-------|------------|------|------------|-------|------------|-------|------------|------|------------|------|----------------|
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 3 | 0.05 | 1.74 | 4.37 | — | — | 0.91 | 2.29 | — | — | — | — | — | — | S10N04A81N |
| 3 | 0.05 | — | — | 1.33 | 3.33 | — | — | 0.70 | 1.77 | 0.62 | 1.56 | — | — | S10N06A81N |
| 3 | 0.10 | 3.48 | 8.75 | — | — | 1.83 | 4.58 | — | — | — | — | — | — | S10N04A82N |
| 3 | 0.10 | — | — | 2.65 | 6.67 | — | — | 1.41 | 3.54 | 1.25 | 3.12 | — | — | S10N06A82N |
| 3 | 0.15 | 5.23 | 13.1 | — | — | 2.74 | 6.87 | — | — | — | — | — | — | S10N04A83N |
| 3 | 0.15 | — | — | 3.98 | 10.0 | — | — | 2.12 | 5.31 | 1.87 | 4.69 | — | — | S10N06A83N |
| 3 | 0.25 | 8.71 | 21.9 | — | — | 4.56 | 11.5 | — | — | — | — | — | — | S10N04P26P |
| 3 | 0.25 | — | — | 6.63 | 16.7 | — | — | 3.52 | 8.85 | 3.11 | 7.81 | — | — | S10N06P26P |
| 3 | 0.50 | 17.4 | 43.7 | — | — | 9.31 | 22.9 | — | — | — | — | — | — | S10N04P51P |
| 3 | 0.50 | — | — | 13.3 | 33.3 | — | — | 7.05 | 17.7 | 6.22 | 15.6 | — | — | S10N06P51P |
| 3 | 0.75 | 26.1 | 65.6 | — | — | 13.7 | 34.4 | — | — | — | — | — | — | S10N04P76P |
| 3 | 0.75 | — | — | 19.9 | 50 | — | — | 10.6 | 26.6 | 9.33 | 23.4 | — | — | S10N06P76P |
| 3 | 1 | 34.8 | 87.5 | — | — | 18.3 | 45.8 | — | — | — | — | — | — | S10N04P01P |
| 3 | 1 | — | — | 26.5 | 66.7 | — | — | 14.1 | 35.4 | 12.5 | 31.2 | — | — | S10N06P01P |
| 3 | 1.5 | 52.3 | 131 | — | — | 27.4 | 68.7 | — | — | — | — | — | — | S10N04P16P |
| 3 | 1.5 | — | — | 39.8 | 100 | — | — | 21.2 | 53.1 | 18.7 | 46.9 | — | — | S10N06P16P |
| 3 | 2 | 69.7 | 175 | — | — | 36.6 | 91.6 | — | — | — | — | — | — | S10N04P02P |
| 3 | 2 | — | — | 53.1 | 133 | — | — | 28.2 | 70.8 | 24.9 | 62.5 | — | — | S10N06P02P |
| 3 | 3 | 104.4 | 262.5 | — | — | 54.9 | 137.4 | — | — | — | — | — | — | S10N04A03N |
| 3 | 3 | — | — | 79.5 | 200 | — | — | 42.3 | 106.2 | 37.5 | 93.6 | — | — | S10N06A03N |
| 3 | 5 | 174 | 437 | — | — | 91.3 | 229 | — | — | — | — | — | — | S10N04A05N |
| 3 | 5 | — | — | 133 | 333 | — | — | 70.5 | 177 | 62.2 | 156 | — | — | S10N06A05N |
| 3 | 7.5 | 261 | 656 | — | — | 137 | 344 | — | — | — | — | — | — | S10N04A07N |
| 3 | 7.5 | — | — | 199 | 500 | — | — | 106 | 266 | 93.3 | 234 | — | — | S10N06A07N |
| Connection Diagram ② | | Q | | Q | | R | | R | | S | | | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

WARNING! Three-phase autotransformers should never be used to obtain four-wire output with three-wire input. Four-wire output requires four-wire wye input.

2

On all wye connections, the source neutral must be present and connected to the transformer bank. If source neutral is not present, do not use a wye connection.

Three-Phase Wye Connection 240 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | | | | | | | | | Catalog Number |
|----------------------|----------|-------------------------|------|------------|-------|------------|-------|------------|-------|------------|-------|----------------|
| | | 190 | | 200 | | 208 | | 218 | | 228 | | |
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 3 | 0.05 | — | — | 0.86 | 2.08 | — | — | 0.86 | 2.08 | 1.73 | 4.17 | S10N04A81N |
| 3 | 0.05 | 0.65 | 1.65 | — | — | 1.27 | 3.05 | — | — | — | — | S10N06A81N |
| 3 | 0.10 | — | — | 1.73 | 4.17 | — | — | 1.73 | 4.17 | 3.46 | 8.34 | S10N04A82N |
| 3 | 0.10 | 1.3 | 3.12 | — | — | 2.55 | 6.12 | — | — | — | — | S10N06A82N |
| 3 | 0.15 | — | — | 2.59 | 6.25 | — | — | 2.59 | 6.25 | 5.20 | 12.5 | S10N04A83N |
| 3 | 0.15 | 1.95 | 4.69 | — | — | 3.82 | 9.16 | — | — | — | — | S10N06A83N |
| 3 | 0.25 | — | — | 4.32 | 10.4 | — | — | 4.32 | 10.4 | 8.66 | 20.9 | S10N04P26P |
| 3 | 0.25 | 3.25 | 7.81 | — | — | 6.3 | 15.1 | — | — | — | — | S10N06P26P |
| 3 | 0.50 | — | — | 8.65 | 20.8 | — | — | 8.65 | 20.8 | 17.3 | 41.7 | S10N04P51P |
| 3 | 0.50 | 6.5 | 15.6 | — | — | 12.7 | 30.4 | — | — | — | — | S10N06P51P |
| 3 | 0.75 | — | — | 13 | 31.2 | — | — | 13 | 31.2 | 26 | 62.6 | S10N04P76P |
| 3 | 0.75 | 9.75 | 23.4 | — | — | 19.2 | 46 | — | — | — | — | S10N06P76P |
| 3 | 1 | — | — | 17.3 | 41.7 | — | — | 17.3 | 41.7 | 34.6 | 83.4 | S10N04P01P |
| 3 | 1 | 13 | 31.2 | — | — | 25.5 | 61.2 | — | — | — | — | S10N06P01P |
| 3 | 1.5 | — | — | 25.9 | 62.5 | — | — | 25.9 | 62.5 | 52 | 125 | S10N04P16P |
| 3 | 1.5 | 19.5 | 46.9 | — | — | 38.2 | 91.6 | — | — | — | — | S10N06P16P |
| 3 | 2 | — | — | 34.6 | 83.3 | — | — | 34.6 | 83.3 | 69.3 | 167 | S10N04P02P |
| 3 | 2 | 26 | 62.5 | — | — | 51 | 122.4 | — | — | — | — | S10N06P02P |
| 3 | 3 | — | — | 51.9 | 125.1 | — | — | 51.9 | 125.1 | 103.8 | 250.2 | S10N04A03N |
| 3 | 3 | 39 | 93.6 | — | — | 76.5 | 183.6 | — | — | — | — | S10N06A03N |
| 3 | 5 | — | — | 86.5 | 208 | — | — | 86.5 | 208 | 173 | 417 | S10N04A05N |
| 3 | 5 | 65 | 156 | — | — | 127.2 | 305.2 | — | — | — | — | S10N06A05N |
| 3 | 7.5 | — | — | 130 | 312 | — | — | 130 | 312 | 260 | 626 | S10N04A07N |
| 3 | 7.5 | 97.5 | 234 | — | — | 192 | 460 | — | — | — | — | S10N06A07N |
| Connection Diagram ② | | N | | N | | M | | R | | Q | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

WARNING! Three-phase autotransformers should never be used to obtain four-wire output with three-wire input. Four-wire output requires four-wire wye input.

On all wye connections, the source neutral must be present and connected to the transformer bank. If source neutral is not present, do not use a wye connection.

Three-Phase Wye Connection 240 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | | | | | | | | | Catalog Number |
|----------------------|----------|-------------------------|-------|------------|------|------------|-------|------------|-------|------------|------|----------------|
| | | 252 | | 256 | | 264 | | 272 | | 277 | | |
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 3 | 0.05 | 1.85 | 4.37 | — | — | 0.95 | 2.29 | — | — | — | — | S10N04A81N |
| 3 | 0.05 | — | — | 1.39 | 3.33 | — | — | 0.74 | 1.77 | 0.65 | 1.56 | S10N06A81N |
| 3 | 0.10 | 3.64 | 8.75 | — | — | 1.91 | 4.58 | — | — | — | — | S10N04A82N |
| 3 | 0.10 | — | — | 2.77 | 6.67 | — | — | 1.47 | 3.54 | 1.3 | 3.12 | S10N06A82N |
| 3 | 0.15 | 5.46 | 13.1 | — | — | 2.86 | 6.87 | — | — | — | — | S10N04A83N |
| 3 | 0.15 | — | — | 4.16 | 10.0 | — | — | 2.21 | 5.31 | 1.95 | 4.69 | S10N06A83N |
| 3 | 0.25 | 9.09 | 21.9 | — | — | 4.76 | 11.5 | — | — | — | — | S10N04P26P |
| 3 | 0.25 | — | — | 6.93 | 16.7 | — | — | 3.68 | 8.85 | 3.25 | 7.81 | S10N06P26P |
| 3 | 0.50 | 18.2 | 43.7 | — | — | 9.53 | 22.9 | — | — | — | — | S10N04P51P |
| 3 | 0.50 | — | — | 13.9 | 33.3 | — | — | 7.36 | 17.7 | 6.5 | 15.6 | S10N06P51P |
| 3 | 0.75 | 27.3 | 65.6 | — | — | 14.3 | 34.4 | — | — | — | — | S10N04P76P |
| 3 | 0.75 | — | — | 20.8 | 50 | — | — | 11 | 26.6 | 9.75 | 23.4 | S10N06P76P |
| 3 | 1 | 36.4 | 87.5 | — | — | 19.1 | 45.8 | — | — | — | — | S10N04P01P |
| 3 | 1 | — | — | 27.7 | 66.7 | — | — | 14.7 | 35.4 | 13 | 31.2 | S10N06P01P |
| 3 | 1.5 | 54.6 | 131 | — | — | 28.6 | 68.7 | — | — | — | — | S10N04P16P |
| 3 | 1.5 | — | — | 41.6 | 100 | — | — | 22.1 | 53.1 | 19.5 | 46.9 | S10N06P16P |
| 3 | 2 | 72.8 | 175 | — | — | 38.1 | 91.7 | — | — | — | — | S10N04P02P |
| 3 | 2 | — | — | 55.4 | 133 | — | — | 29.5 | 70.8 | 26 | 62.5 | S10N06P02P |
| 3 | 3 | 109.2 | 262.5 | — | — | 57.3 | 137.4 | — | — | — | — | S10N04A03N |
| 3 | 3 | — | — | 83.1 | 200 | — | — | 44.1 | 106.2 | 39 | 93.6 | S10N06A03N |
| 3 | 5 | 182 | 437 | — | — | 95.3 | 229 | — | — | — | — | S10N04A05N |
| 3 | 5 | — | — | 139 | 333 | — | — | 73.6 | 177 | 65 | 156 | S10N06A05N |
| 3 | 7.5 | 273 | 656 | — | — | 143 | 344 | — | — | — | — | S10N04A07N |
| 3 | 7.5 | — | — | 208 | 500 | — | — | 110 | 266 | 97.5 | 234 | S10N06A07N |
| Connection Diagram ② | | Q | | Q | | R | | R | | S | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

WARNING! Three-phase autotransformers should never be used to obtain four-wire output with three-wire input. Four-wire output requires four-wire wye input.

2

On all wye connections, the source neutral must be present and connected to the transformer bank. If source neutral is not present, do not use a wye connection.

Three-Phase Wye Connection 460 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | | | | | | | Catalog Number |
|----------------------|----------|-------------------------|--------|------------|--------|------------|--------|------------|--------|----------------|
| | | 406 | | 418 | | 432 | | 438 | | |
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 3 | 0.05 | — | — | 1.66 | 2.08 | — | — | 3.22 | 4.04 | S10N04A81N |
| 3 | 0.05 | 1.25 | 1.57 | — | — | 2.49 | 3.12 | — | — | S10N06A81N |
| 3 | 0.10 | — | — | 3.31 | 4.15 | — | — | 6.62 | 8.31 | S10N04A82N |
| 3 | 0.10 | 2.49 | 3.12 | — | — | 4.97 | 6.24 | — | — | S10N06A82N |
| 3 | 0.15 | — | — | 4.97 | 6.24 | — | — | 9.94 | 12.48 | S10N04A83N |
| 3 | 0.15 | 3.73 | 4.68 | — | — | 7.46 | 9.36 | — | — | S10N06A83N |
| 3 | 0.25 | — | — | 8.28 | 10.39 | — | — | 16.6 | 20.84 | S10N04P26P |
| 3 | 0.25 | 6.22 | 7.81 | — | — | 12.4 | 15.56 | — | — | S10N06P26P |
| 3 | 0.50 | — | — | 16.6 | 20.84 | — | — | 33.2 | 41.67 | S10N04P51P |
| 3 | 0.50 | 12.5 | 15.69 | — | — | 24.69 | 31.25 | — | — | S10N06P51P |
| 3 | 0.75 | — | — | 24.8 | 31.12 | — | — | 49.6 | 62.25 | S10N04P76P |
| 3 | 0.75 | 18.7 | 23.47 | — | — | 37.3 | 46.82 | — | — | S10N06P76P |
| 3 | 1 | — | — | 33.1 | 41.54 | — | — | 66.2 | 83.09 | S10N04P01P |
| 3 | 1 | 24.9 | 31.25 | — | — | 49.7 | 62.38 | — | — | S10N06P01P |
| 3 | 1.5 | — | — | 49.7 | 62.38 | — | — | 99.4 | 124.75 | S10N04P16P |
| 3 | 1.5 | 37.3 | 46.94 | — | — | 74.6 | 93.63 | — | — | S10N06P16P |
| 3 | 2 | — | — | 66.3 | 83.22 | — | — | 133 | 166.93 | S10N04P02P |
| 3 | 2 | 49.7 | 62.38 | — | — | 99.5 | 124.88 | — | — | S10N06P02P |
| 3 | 3 | — | — | 99.3 | 124.64 | — | — | 198.6 | 249.27 | S10N04A03N |
| 3 | 3 | 74.6 | 93.63 | — | — | 149 | 187.01 | — | — | S10N06A03N |
| 3 | 5 | — | — | 166 | 208.35 | — | — | 322 | 404.16 | S10N04A05N |
| 3 | 5 | 125 | 156.89 | — | — | 249 | 312.53 | — | — | S10N06A05N |
| 3 | 7.5 | — | — | 248 | 311 | — | — | 496 | 622 | S10N04A07N |
| 3 | 7.5 | 187 | 235 | — | — | 373 | 468 | — | — | S10N06A07N |
| Connection Diagram ② | | R | | R | | Q | | Q | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

WARNING! Three-phase autotransformers should never be used to obtain four-wire output with three-wire input. Four-wire output requires four-wire wye input.

On all wye connections, the source neutral must be present and connected to the transformer bank. If source neutral is not present, do not use a wye connection.

Three-Phase Wye Connection 460 Volt Output Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage | | 436 | | 450 | | Catalog Number |
|----------------------|----------|-------------------------|-------|------------|-------|------------|-------|----------------|
| | | 424 Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 3 | 0.05 | — | 1.7 | 2.1 | — | — | — | S10N04A81N |
| 3 | 0.05 | 1.3 | 1.56 | — | — | 2.6 | 3.13 | S10N06A81N |
| 3 | 0.10 | — | — | 3.5 | 4.2 | — | — | S10N04A82N |
| 3 | 0.10 | 2.6 | 3.12 | — | — | 5.2 | 6.25 | S10N06A82N |
| 3 | 0.15 | — | — | 5.2 | 6.25 | — | — | S10N04A83N |
| 3 | 0.15 | 3.9 | 4.68 | — | — | 7.8 | 9.38 | S10N06A83N |
| 3 | 0.25 | — | — | 8.7 | 10.4 | — | — | S10N04P26P |
| 3 | 0.25 | 6.5 | 7.82 | — | — | 13 | 15.6 | S10N06P26P |
| 3 | 0.50 | — | — | 17.4 | 20.9 | — | — | S10N04P51P |
| 3 | 0.50 | 13 | 15.6 | — | — | 26 | 31.2 | S10N06P51P |
| 3 | 0.75 | — | — | 26 | 31.2 | — | — | S10N04P76P |
| 3 | 0.75 | 19.5 | 23.4 | — | — | 39 | 46.9 | S10N06P76P |
| 3 | 1 | — | — | 35 | 42 | — | — | S10N04P01P |
| 3 | 1 | 26 | 31.2 | — | — | 52 | 62.5 | S10N06P01P |
| 3 | 1.5 | — | — | 52 | 62.5 | — | — | S10N04P16P |
| 3 | 1.5 | 39 | 46.8 | — | — | 78 | 93.8 | S10N06P16P |
| 3 | 2 | — | — | 69 | 82.9 | — | — | S10N04P02P |
| 3 | 2 | 52 | 62.5 | — | — | 104 | 125 | S10N06P02P |
| 3 | 3 | — | — | 104 | 125 | — | — | S10N04A03N |
| 3 | 3 | 78 | 93.8 | — | — | 156 | 187.6 | S10N06A03N |
| 3 | 5 | — | — | 174 | 209.2 | — | — | S10N04A05N |
| 3 | 5 | 130 | 156.3 | — | — | 260 | 312.7 | S10N06A05N |
| 3 | 7.5 | — | — | 260 | 312 | — | — | S10N04A07N |
| 3 | 7.5 | 195 | 234 | — | — | 390 | 469 | S10N06A07N |
| Connection Diagram ② | | R | | R | | Q | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage/Output Voltage | | | | 346/380 | | 362/380 | | Catalog Number |
|----------------------|----------|--|-------|--------------------------|-------|---------------|-------|---------------|-------|----------------|
| | | 200/240 Output kVA | Amps | 230/277 Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 1 | 0.25 | 1.25 | 5.2 | 1.44 | 5.2 | 1.98 | 5.2 | 3.95 | 10.4 | S20N08P26P |
| 1 | 0.50 | 2.50 | 10.4 | 2.88 | 10.4 | 3.95 | 10.4 | 7.90 | 20.8 | S20N08P51P |
| 1 | 0.75 | 3.75 | 15.6 | 4.32 | 15.6 | 5.93 | 15.6 | 11.9 | 31.2 | S20N08P76P |
| 1 | 1 | 5.00 | 20.8 | 5.76 | 20.8 | 7.90 | 20.8 | 15.8 | 41.6 | S20N08P01P |
| 1 | 1.5 | 7.50 | 31.2 | 8.64 | 31.2 | 11.9 | 31.2 | 23.8 | 62.5 | S20N08P16P |
| 1 | 2 | 10.0 | 41.6 | 11.5 | 41.6 | 15.8 | 41.6 | 31.6 | 83.3 | S20N08P02P |
| 1 | 3 | 15.0 | 62.5 | 17.3 | 62.5 | 23.8 | 62.5 | 47.5 | 125.0 | S20N08A03N |
| 1 | 5 | 25.0 | 104.0 | 28.8 | 104.0 | 39.5 | 104.0 | 79.0 | 208.0 | S20N08A05N |
| 1 | 7.5 | 37.5 | 156.0 | 43.2 | 156.0 | 59.3 | 156.0 | 118.6 | 312.0 | S20N08A07N |
| Connection Diagram ② | | B | | B | | F | | E | | |

Single-Phase Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage/Output Voltage | | | | 436/480 | | 458/480 | | Catalog Number |
|----------------------|----------|--|-------|--------------------------|-------|---------------|-------|---------------|-------|----------------|
| | | 378/416 Output kVA | Amps | 416/457 Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 1 | 0.25 | 2.16 | 5.2 | 2.38 | 5.2 | 2.50 | 5.2 | 4.99 | 10.4 | S20N08P26P |
| 1 | 0.50 | 4.33 | 10.4 | 4.76 | 10.4 | 4.99 | 10.4 | 9.98 | 20.8 | S20N08P51P |
| 1 | 0.75 | 6.49 | 15.6 | 7.14 | 15.6 | 7.49 | 15.6 | 15.0 | 31.2 | S20N08P76P |
| 1 | 1 | 8.65 | 20.8 | 9.52 | 20.8 | 9.98 | 20.8 | 20.0 | 41.6 | S20N08P01P |
| 1 | 1.5 | 13.0 | 31.2 | 14.3 | 31.2 | 15.0 | 31.2 | 30.0 | 62.5 | S20N08P16P |
| 1 | 2 | 17.3 | 41.6 | 19.0 | 41.6 | 20.0 | 41.6 | 40.0 | 83.3 | S20N08P02P |
| 1 | 3 | 26.0 | 62.5 | 28.6 | 62.5 | 30.0 | 62.5 | 60.0 | 125.0 | S20N08A03N |
| 1 | 5 | 43.3 | 104.0 | 47.6 | 104.0 | 49.9 | 104.0 | 99.8 | 208.0 | S20N08A05N |
| 1 | 7.5 | 64.9 | 156.0 | 71.4 | 156.0 | 74.9 | 156.0 | 149.8 | 312.0 | S20N08A07N |
| Connection Diagram ② | | F | | F | | F | | E | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase Required, 60 Hz

| Units Required ① | Unit kVA | Input Available Voltage/Output Voltage | | 277/230 | | 480/456 | | 504/480 | | 528/480 | | Catalog Number |
|----------------------|----------|--|-------|------------|-------|------------|-------|------------|-------|------------|--|----------------|
| | | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | | | |
| 1 | 0.25 | 1.44 | 6.26 | 5.23 | 11.4 | 5.47 | 11.4 | 2.75 | 5.72 | S20N08P26P | | |
| 1 | 0.50 | 2.88 | 12.5 | 10.4 | 22.8 | 10.9 | 22.8 | 5.49 | 11.4 | S20N08P51P | | |
| 1 | 0.75 | 4.33 | 18.8 | 15.7 | 34.2 | 16.4 | 34.2 | 8.24 | 17.2 | S20N08P76P | | |
| 1 | 1 | 5.76 | 25.0 | 20.9 | 45.6 | 21.8 | 45.6 | 11.0 | 22.9 | S20N08P01P | | |
| 1 | 1.5 | 8.64 | 37.6 | 31.3 | 68.4 | 32.8 | 68.4 | 16.5 | 34.3 | S20N08P16P | | |
| 1 | 2 | 11.5 | 50.1 | 41.8 | 91.2 | 43.7 | 91.2 | 22.0 | 45.8 | S20N08P02P | | |
| 1 | 3 | 17.3 | 75.3 | 62.7 | 136.0 | 65.2 | 136.0 | 33.0 | 68.8 | S20N08A03N | | |
| 1 | 5 | 28.8 | 125.3 | 104.5 | 227.0 | 108.0 | 227.0 | 54.9 | 114.4 | S20N08A05N | | |
| 1 | 7.5 | 43.2 | 187.9 | 156.8 | 341.0 | 163.0 | 341.0 | 82.4 | 171.6 | S20N08A07N | | |
| Connection Diagram ② | | B | | E | | E | | F | | | | |

Notes

① Additional wiring trough may be required.

② Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Required, 60 Hz

| Unit kVA | Input Available Voltage/Output Voltage | | | | | | | | | | Catalog Number |
|---------------------------------|--|-------|---------------|-------|---------------|-------|---------------|-------|---------------|-------|----------------|
| | 362/380 | | 346/416 | | 430/473 | | 400/480 | | 436/480 | | |
| | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 0.25 | 6.52 | 10.4 | 3.75 | 5.2 | 4.26 | 5.2 | 4.33 | 5.2 | 4.33 | 5.2 | S20N08P26P |
| 0.50 | 13.0 | 20.8 | 7.50 | 10.4 | 8.52 | 10.4 | 8.65 | 10.4 | 8.65 | 10.4 | S20N08P51P |
| 0.75 | 19.6 | 31.2 | 11.2 | 15.6 | 12.8 | 15.6 | 13.0 | 15.6 | 13.0 | 15.6 | S20N08P76P |
| 1 | 26.1 | 41.6 | 15.0 | 20.8 | 17.0 | 20.8 | 17.3 | 20.8 | 17.3 | 20.8 | S20N08P01P |
| 1.5 | 39.1 | 62.4 | 22.5 | 31.2 | 25.5 | 31.2 | 26.0 | 31.2 | 26.0 | 31.2 | S20N08P16P |
| 2 | 52.2 | 83.2 | 30.0 | 41.6 | 34.1 | 41.6 | 34.6 | 41.6 | 34.6 | 41.6 | S20N08P02P |
| 3 | 78.4 | 125.0 | 45.0 | 62.5 | 51.2 | 62.5 | 52.0 | 62.5 | 52.0 | 62.5 | S20N08A03N |
| 5 | 130.4 | 208.0 | 75.1 | 104.0 | 85.2 | 104.0 | 86.6 | 104.0 | 86.6 | 104.0 | S20N08A05N |
| 7.5 | 195.6 | 312.0 | 112.6 | 156.0 | 127.8 | 156.0 | 129.9 | 156.0 | 129.9 | 156.0 | S20N08A07N |
| Connection Diagram ^① | I | | N | | K | | N | | K | | |
| Units Required ^② | 2 | | 3 | | 2 | | 3 | | 2 | | |

Three-Phase Required, 60 Hz

| Unit kVA | Input Available Voltage/Output Voltage | | | | | | | | Catalog Number |
|---------------------------------|--|-------|---------------|-------|---------------|-------|---------------|-------|----------------|
| | 460/483 | | 457/380 | | 504/480 | | 528/480 | | |
| | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 0.25 | 8.7 | 10.4 | 4.12 | 6.25 | 9.08 | 10.9 | 4.76 | 5.72 | S20N08P26P |
| 0.50 | 17.4 | 20.8 | 8.23 | 12.5 | 18.2 | 21.8 | 9.51 | 11.4 | S20N08P51P |
| 0.75 | 26.1 | 31.2 | 12.3 | 18.8 | 27.2 | 32.8 | 14.3 | 17.2 | S20N08P76P |
| 1 | 34.8 | 41.6 | 16.5 | 25.0 | 36.3 | 43.7 | 19.0 | 22.9 | S20N08P01P |
| 1.5 | 52.2 | 62.4 | 24.7 | 37.5 | 54.5 | 65.5 | 28.5 | 34.3 | S20N08P16P |
| 2 | 69.6 | 83.2 | 32.9 | 50.0 | 72.6 | 87.4 | 38.0 | 45.8 | S20N08P02P |
| 3 | 104.6 | 125.0 | 49.5 | 75.2 | 109.7 | 131.3 | 57.2 | 68.8 | S20N08A03N |
| 5 | 174.0 | 208.0 | 82.3 | 125.1 | 181.6 | 218.4 | 95.1 | 114.4 | S20N08A05N |
| 7.5 | 261.0 | 312.0 | 123.5 | 187.6 | 272.4 | 327.6 | 142.7 | 171.6 | S20N08A07N |
| Connection Diagram ^① | I | | N | | I | | K | | |
| Units Required ^② | 2 | | 3 | | 2 | | 2 | | |

Notes

^① Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

^② Additional wiring trough may be required.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Three-Phase Open Delta Connection 480 Volt Output Required, 60 Hz

| Units Required ^① | Input Available Voltage | | 575 | | 575 | | Catalog Number ^② |
|---------------------------------|-------------------------|-------|---------------|-------|---------------|------|-----------------------------|
| | 600 Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 2 | 4.3 | 5.1 | — | — | — | — | S20N11P51P |
| 2 | — | — | — | — | 4.1 | 4.9 | S60G11P51P |
| 2 | 6.5 | 7.8 | — | — | — | — | S20N11P76P |
| 2 | — | — | — | — | 6.2 | 7.4 | S60G11P76P |
| 2 | 8.6 | 10.3 | — | — | — | — | S20N11P01P |
| 2 | — | — | — | — | 8.3 | 9.9 | S60G11P01P |
| 2 | 13.0 | 15.6 | — | — | — | — | S20N11P16P |
| 2 | — | — | — | — | 12.4 | 14.9 | S60G11P16P |
| 2 | 17.2 | 20.6 | — | — | — | — | S20N11P02P |
| 2 | — | — | — | — | 16.5 | 19.8 | S60G11P02P |
| 2 | 25.8 | 31 | — | — | — | — | S20N11S03N |
| 2 | — | — | — | — | 24.8 | 29.8 | S60G11P03P |
| 2 | 43.2 | 51.9 | — | — | — | — | S20N11S05N |
| 2 | — | — | — | — | 41 | 49.3 | S60G11S05N |
| 2 | 65 | 78.1 | — | — | — | — | S20N11S07N |
| 2 | — | — | — | — | 62 | 74.5 | S60G11S07N |
| 2 | 86 | 103.4 | — | — | — | — | S20N11S10N |
| 2 | — | — | 83 | 99.8 | — | — | S60G11S10N |
| 2 | 130 | 156.3 | — | — | — | — | S20N11S15N |
| 2 | — | — | 124 | 149.1 | — | — | S60N11S15N |
| 2 | 216 | 259.8 | — | — | — | — | T20P11S2516 |
| 2 | — | — | 207 | 248.9 | — | — | S60J11S25N |
| 2 | 324 | 389.7 | — | — | — | — | T20P11S3716 |
| 2 | 432 | 519.6 | — | — | — | — | T20P11S5016 |
| Connection Diagram ^③ | I | | J | | T | | |

Notes

- ① Additional wiring trough may be required.
 - ② On transformers supplied with standard taps, taps must be placed at nominal settings.
 - ③ Refer to **Page V2-T2-148** for buck-boost wiring diagrams.
- Autotransformers can be used only where local electric codes permit and isolation of the two circuits is not required.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Single-Phase 480 Volt Output Required, 60 Hz

| Units Required ① | Input Available Voltage | | 575 | | 575 | | Catalog Number ② |
|----------------------|-------------------------|-------|---------------|------|---------------|------|------------------|
| | 600 Output kVA | Amps | Output kVA | Amps | Output kVA | Amps | |
| 1 | 2.5 | 5.2 | — | — | — | — | S20N11P51P |
| 1 | — | — | — | — | 2.4 | 5 | S60G11P51P |
| 1 | 3.7 | 7.7 | — | — | — | — | S20N11P76P |
| 1 | — | — | — | — | 3.6 | 7.5 | S60G11P76P |
| 1 | 5.0 | 10.4 | — | — | — | — | S20N11P01P |
| 1 | — | — | — | — | 4.8 | 10 | S60G11P01P |
| 1 | 7.5 | 15.6 | — | — | — | — | S20N11P16P |
| 1 | — | — | — | — | 7.2 | 15 | S60G11P16P |
| 1 | 10 | 20.8 | — | — | — | — | S20N11P02P |
| 1 | — | — | — | — | 9.6 | 20 | S60G11P02P |
| 1 | 15 | 31.2 | — | — | — | — | S20N11S03N |
| 1 | — | — | — | — | 14.3 | 29.7 | S60G11P03P |
| 1 | 25 | 52 | — | — | — | — | S20N11S05N |
| 1 | — | — | — | — | 24 | 50 | S60G11S05N |
| 1 | 37.5 | 78.1 | — | — | — | — | S20N11S07N |
| 1 | — | — | — | — | 36 | 75 | S60G11S07N |
| 1 | 50 | 104.1 | — | — | — | — | S20N11S10N |
| 1 | — | — | 43 | 100 | — | — | S60G11S10N |
| 1 | 75 | 156.2 | — | — | — | — | S20N11S15N |
| 1 | — | — | 72 | 150 | — | — | S60N11S15N |
| 1 | 125 | 260.4 | — | — | — | — | T20P11S2516 |
| 1 | — | — | 120 | 250 | — | — | S60J11S25N |
| 1 | 187 | 389.6 | — | — | — | — | T20P11S3716 |
| 1 | 250 | 520.8 | — | — | — | — | T20P11S5016 |
| Connection Diagram ③ | E | | H | | U | | |

Notes

① Additional wiring trough may be required.

② On transformers supplied with standard taps, taps must be placed at nominal settings.

③ Refer to **Page V2-T2-148** for buck-boost wiring diagrams.

Autotransformers can be used only where local electric codes permit and isolation of the two circuits is not required.

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Output kVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}} \times \text{Output kVA} = \text{New kVA Rating}$.

Frame drawings/dimensions information begins on **Page V2-T2-204**.

Buck-Boost and Low-Voltage Lighting Transformers

Accessories

Please refer to Section 2.7 Page V2-T2-167.

Technical Data and Specifications

Frequency

Eaton buck-boost transformers are designed for 60 Hz operation.

Overload Capability

Short-term overload is designed into transformers as required by ANSI. Dry-type distribution transformers will deliver 200% nameplate load for one-half hour, 150% load for one hour, and 125% load for four hours without being damaged, provided that a constant 50% load precedes and follows the overload. See ANSI C57.96-01.250 for additional limitations.

Continuous overload capacity is not deliberately designed into a transformer because the design objective is to be within the allowed winding temperature rise with nameplate loading.

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Insulation System Classification

| Ambient | + Winding Rise | + Hot Spot | = Temp. Class |
|---------|----------------|------------|---------------|
| 40°C | 55°C | 10°C | 105°C |
| 40°C | 80°C | 30°C | 150°C |
| 25°C | 135°C | 20°C | 180°C |
| 40°C | 115°C | 30°C | 185°C |
| 40°C | 150°C | 30°C | 220°C |

The design life of transformers having different insulation systems is the same—the lower-temperature systems are designed for the same life as the higher-temperature systems.

Enclosures

Eaton encapsulated buck-boost transformers use a NEMA 3R rated enclosure.

Winding Terminations

Primary and secondary windings are terminated in the wiring compartment. Encapsulated units have copper leads or stabs brought out for connections. **Lugs are not supplied with these transformers.** Eaton recommends that external cables be rated 90°C (sized at 75°C ampacity) for encapsulated designs.

Series-Multiple Windings

Series-multiple windings consist of two similar coils in each winding that can be connected in series or parallel (multiple). Transformers with series-multiple windings are designated with an “x” or “/” between the voltage ratings, such as voltages of “120/240” or “240 x 480.” If the series-multiple winding is designated by an “x,” the winding can be connected only for a series or parallel. With the “/” designation, a mid-point also becomes available in addition to the series or parallel connection. As an example, a 120 x 240 winding can be connected for either 120 (parallel) or 240 (series), but a 120/240 winding can be connected for 120 (parallel), 240 (series) or 240 with a 120 mid-point.

Sound Levels

All Eaton 600 volt class general-purpose dry-type distribution transformers are designed to meet NEMA ST-20 sound levels listed here. These are the sound levels measured in a soundproof environment. Actual sound levels measured at an installation will likely be higher due to electrical connections and environmental conditions. Lower sound levels are available and should be specified when the transformer is going to be installed in an area where sound may be a concern.

For additional information, please refer to Section 2.7 Page V2-T2-171.

Note: When installation is to be made on a grounded system, consideration must be given to the resulting voltage. Thus, on a 208 grounded wye/120 system, the voltage can be boosted to 240 volts but the voltage to ground will be 139 volts. If 240/120 volts with a mid-point ground is needed, a standard two-winding transformer must be used.

The following formulas can be used to calculate specific requirements.

For single-phase:

$$\text{LOAD kVA} = \frac{\text{Load Voltage} \times \text{Full Line Amperes}}{1000}$$

For three-phase:

$$\text{LOAD kVA} = \frac{\text{Line Load Voltage} \times 1.73 \times \text{Full Load Amperes}}{1000}$$

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilated (up to 1.2 kV) | | Encapsulated (up to 1.2 kV) |
|---------------------------------|---------------------------------------|-----------------|--------------------------------|
| | K-Factor 1, 4, 9 | K-Factor 13, 20 | |
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Wiring Diagrams

2

Buck-Boost Transformers Wiring Diagrams

Diagram A

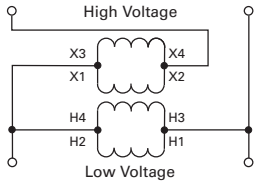


Diagram B

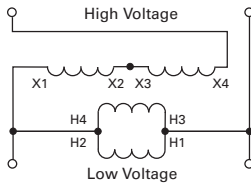


Diagram C

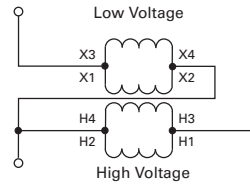


Diagram D

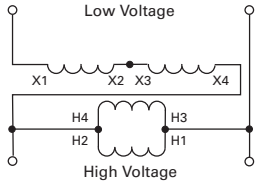


Diagram E

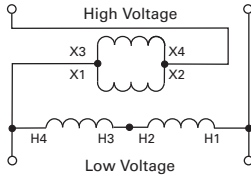


Diagram F

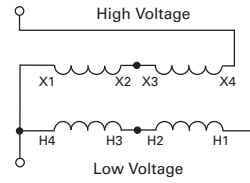


Diagram G

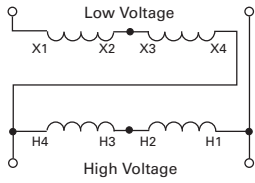


Diagram H

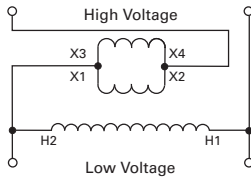


Diagram I

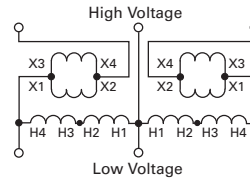


Diagram J

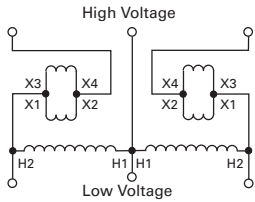


Diagram K

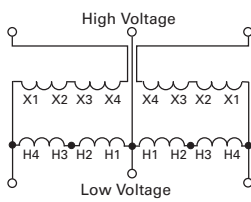


Diagram L

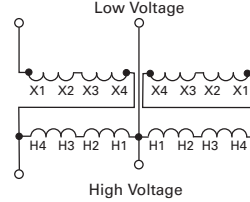


Diagram M ①

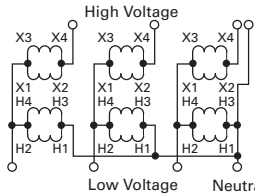


Diagram N ①

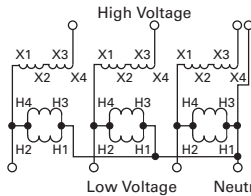


Diagram O ①

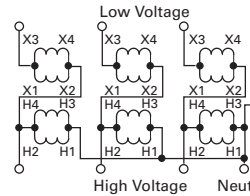


Diagram P ①

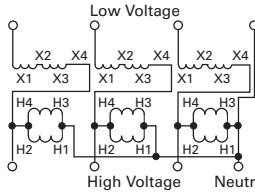


Diagram Q ①

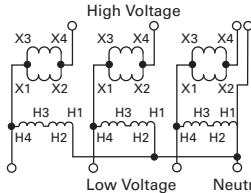


Diagram R ①

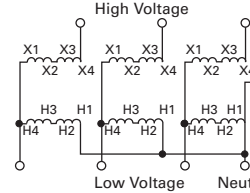


Diagram S ①

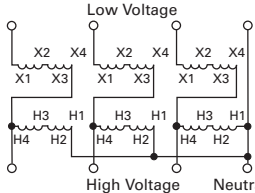


Diagram T

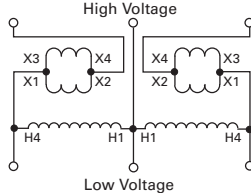
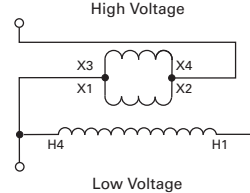


Diagram U



Note

① **WARNING!** If input is three-wire, "neutral" connection must be isolated and insulated! When used to supply a three-phase, four-wire load, the source must be three-phase, four-wire wye.

Medium-Voltage Dry-Type Distribution Transformers

Contents

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| Medium-Voltage Dry-Type Distribution Transformers | |
| Features, Benefits and Functions | V2-T2-149 |
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| Product Selection | V2-T2-150 |

Medium-Voltage Dry-Type Distribution Transformers

Product Description

Note: The following pages provide listings for most standard transformer ratings and catalog numbers. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Single- and Three-Phase

- Ventilated, NEMA 3R enclosure standard
- Suitable for indoor or outdoor applications
- Upright mounting only
- 220°C insulation system
- 150°C rise standard; 115°C or 80°C rise optional
- Available in single-phase ratings 15–333 kVA
- Available in three-phase ratings 15–1500 kVA

Application Description

DOE 2016 compliant energy-efficient transformers are specifically designed to meet the energy efficiency standards set forth in CFR Title 10 Chapter II Part 431, Appendix A of Subpart K 2016. Compliant transformers are optimized to offer maximum efficiency at 50% of nameplate rating.

Transformers that are currently specifically excluded from the scope of DOE 10 CFR Part 431 include:

- Liquid-filled transformers below 10 kVA
- Dry-type transformers below 15 kVA
- AC and DC drives transformers
- Rectifier transformers designed for high harmonics
- Autotransformers
- Non-distribution transformers, such as UPS transformers
- Special impedance or regulation transformers
- Regulating transformers
- Sealed and non-ventilated transformers
- Machine tool transformers
- Welding transformers
- Transformers with tap ranges greater than 15%
- Transformers with a frequency other than 60 Hz
- Grounding transformers
- Testing transformers

DOE 2016 Efficiency Levels

Tables of Energy Efficiency Medium-Voltage Dry-Type Distribution Transformers—20–45 kV BIL

| Single-Phase | | Three-Phase | |
|--------------|------------|-------------|------------|
| kVA | Efficiency | kVA | Efficiency |
| 15 | 98.10 | 15 | 97.50 |
| 25 | 98.33 | 30 | 97.90 |
| 37.5 | 98.49 | 45 | 98.10 |
| 50 | 98.60 | 75 | 98.33 |
| 75 | 98.73 | 112.5 | 98.52 |
| 100 | 98.82 | 150 | 98.65 |
| 167 | 98.96 | 225 | 98.82 |
| 250 | 99.07 | 300 | 98.93 |
| 333 | 99.14 | 500 | 99.09 |
| — | — | 750 | 99.21 |
| — | — | 1000 | 99.28 |
| — | — | 1500 | 99.37 |

Features, Benefits and Functions

- 60 Hz operation (except as noted)
- Short-term overload capability as required by ANSI
- Meet NEMA ST-20 sound levels
- Meet CFR Title 10 Chapter II Part 431, Appendix A of Subpart K 2016 energy efficiency requirements for dry-type transformers effective as of January 1, 2016

Standards and Certifications

- UL listed



Industry Standards

All Eaton dry-type distribution and control transformers are built and tested in accordance with applicable NEMA, ANSI and IEEE Standards.

Seismically Qualified

Eaton manufactured dry-type distribution transformers are seismically qualified and exceed requirements of the International Building Code (IBC) and California Code Title 24.

Product Selection

2

Single-Phase—Medium-Voltage Distribution Transformers 60 Hz DOE 2016 Energy-Efficient—Aluminum Windings**2400 Volts to 120/240 Volts**

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|-------|----------------|----------------|----------------|-------------------|----------------|
| 25 | 150 | | | | | | T42D11S2516 |
| 37.5 | | | | | | | T42D11S3716 |
| 50 | | | | | | | T42D11S5016 |
| 75 | | | | | | | T42D11S7516 |
| 100 | | | | | | | T42D11S9916 |
| 167 | | | | | | | T42D11S6716 |
| 25 | 115 | | | | | | T42D11F2516 |
| 37.5 | | | | | | | T42D11F3716 |
| 50 | | | | | | | T42D11F5016 |
| 75 | | | | | | | T42D11F7516 |
| 100 | | | | | | | T42D11F9916 |
| 167 | | | | | | | T42D11F6716 |
| 25 | 80 | | | | | | T42D11B2516 |
| 37.5 | | | | | | | T42D11B3716 |
| 50 | | | | | | | T42D11B5016 |
| 75 | | | | | | | T42D11B7516 |
| 100 | | | | | | | T42D11B9916 |
| 167 | | | | | | | T42D11B6716 |

4160 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|-------|----------------|----------------|----------------|-------------------|----------------|
| 25 | 150 | | | | | | T46D11S2516 |
| 37.5 | | | | | | | T46D11S3716 |
| 50 | | | | | | | T46D11S5016 |
| 75 | | | | | | | T46D11S7516 |
| 100 | | | | | | | T46D11S9916 |
| 167 | | | | | | | T46D11S6716 |
| 25 | 115 | | | | | | T46D11F2516 |
| 37.5 | | | | | | | T46D11F3716 |
| 50 | | | | | | | T46D11F5016 |
| 75 | | | | | | | T46D11F7516 |
| 100 | | | | | | | T46D11F9916 |
| 167 | | | | | | | T46D11F6716 |
| 25 | 80 | | | | | | T46D11B2516 |
| 37.5 | | | | | | | T46D11B3716 |
| 50 | | | | | | | T46D11B5016 |
| 75 | | | | | | | T46D11B7516 |
| 100 | | | | | | | T46D11B9916 |
| 167 | | | | | | | T46D11B6716 |

Note

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Single-Phase—Medium-Voltage Distribution Transformers 60 Hz DOE 2016 Energy-Efficient— Copper Windings

2400 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|
| 25 | 150 | | | | | | T42D11S2516CU |
| 37.5 | | | | | | | T42D11S3716CU |
| 50 | | | | | | | T42D11S5016CU |
| 75 | | | | | | | T42D11S7516CU |
| 100 | | | | | | | T42D11S9916CU |
| 167 | | | | | | | T42D11S6716CU |
| 25 | 115 | Contact local Eaton representative | | | | | T42D11F2516CU |
| 37.5 | | | | | | | T42D11F3716CU |
| 50 | | | | | | | T42D11F5016CU |
| 75 | | | | | | | T42D11F7516CU |
| 100 | | | | | | | T42D11F9916CU |
| 167 | | | | | | | T42D11F6716CU |
| 25 | 80 | Contact local Eaton representative | | | | | T42D11B2516CU |
| 37.5 | | | | | | | T42D11B3716CU |
| 50 | | | | | | | T42D11B5016CU |
| 75 | | | | | | | T42D11B7516CU |
| 100 | | | | | | | T42D11B9916CU |
| 167 | | | | | | | T42D11B6716CU |

4160 Volts to 120/240 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|
| 25 | 150 | | | | | | T46D11S2516CU |
| 37.5 | | | | | | | T46D11S3716CU |
| 50 | | | | | | | T46D11S5016CU |
| 75 | | | | | | | T46D11S7516CU |
| 100 | | | | | | | T46D11S9916CU |
| 167 | | | | | | | T46D11S6716CU |
| 25 | 115 | Contact local Eaton representative | | | | | T46D11F2516CU |
| 37.5 | | | | | | | T46D11F3716CU |
| 50 | | | | | | | T46D11F5016CU |
| 75 | | | | | | | T46D11F7516CU |
| 100 | | | | | | | T46D11F9916CU |
| 167 | | | | | | | T46D11F6716CU |
| 25 | 80 | Contact local Eaton representative | | | | | T46D11B2516CU |
| 37.5 | | | | | | | T46D11B3716CU |
| 50 | | | | | | | T46D11B5016CU |
| 75 | | | | | | | T46D11B7516CU |
| 100 | | | | | | | T46D11B9916CU |
| 167 | | | | | | | T46D11B6716CU |

Note

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Three-Phase—Medium-Voltage Distribution Transformers 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

2400 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|-------|------------------------------------|----------------|----------------|-------------------|----------------|
| 45 | 150 | | Contact local Eaton representative | | | | V42D47T4516 |
| 75 | | | | | | | V42D47T7516 |
| 112.5 | | | | | | | V42D47T1216 |
| 150 | | | | | | | V42D47T4916 |
| 225 | | | | | | | V42D47T2216 |
| 300 | | | | | | | V42D47T3316 |
| 500 | | | | | | | V42D47T5516 |
| 750 | | | | | | | V42D47T7716 |
| 45 | 115 | | Contact local Eaton representative | | | | V42D47F4516 |
| 75 | | | | | | | V42D47F7516 |
| 112.5 | | | | | | | V42D47F1216 |
| 150 | | | | | | | V42D47F4916 |
| 225 | | | | | | | V42D47F2216 |
| 300 | | | | | | | V42D47F3316 |
| 500 | | | | | | | V42D47F5516 |
| 750 | | | | | | | V42D47F7716 |
| 45 | 80 | | Contact local Eaton representative | | | | V42D47B4516 |
| 75 | | | | | | | V42D47B7516 |
| 112.5 | | | | | | | V42D47B1216 |
| 150 | | | | | | | V42D47B4916 |
| 225 | | | | | | | V42D47B2216 |
| 300 | | | | | | | V42D47B3316 |
| 500 | | | | | | | V42D47B5516 |
| 750 | | | | | | | V42D47B7716 |

Note

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Three-Phase—Medium-Voltage Distribution Transformers 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

4160 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number | |
|-------|---------------------|-------|----------------|----------------|----------------|-------------------|------------------------------------|-------------|
| 45 | 150 | | | | | | Contact local Eaton representative | V46D47T4516 |
| 75 | | | | | | | V46D47T7516 | |
| 112.5 | | | | | | | V46D47T1216 | |
| 150 | | | | | | | V46D47T4916 | |
| 225 | | | | | | | V46D47T2216 | |
| 300 | | | | | | | V46D47T3316 | |
| 500 | | | | | | | V46D47T5516 | |
| 750 | | | | | | | V46D47T7716 | |
| 45 | 115 | | | | | | Contact local Eaton representative | V46D47F4516 |
| 75 | | | | | | | V46D47F7516 | |
| 112.5 | | | | | | | V46D47F1216 | |
| 150 | | | | | | | V46D47F4916 | |
| 225 | | | | | | | V46D47F2216 | |
| 300 | | | | | | | V46D47F3316 | |
| 500 | | | | | | | V46D47F5516 | |
| 750 | | | | | | | V46D47F7716 | |
| 45 | 80 | | | | | | Contact local Eaton representative | V46D47B4516 |
| 75 | | | | | | | V46D47B7516 | |
| 112.5 | | | | | | | V46D47B1216 | |
| 150 | | | | | | | V46D47B4916 | |
| 225 | | | | | | | V46D47B2216 | |
| 300 | | | | | | | V46D47B3316 | |
| 500 | | | | | | | V46D47B5516 | |
| 750 | | | | | | | V46D47B7716 | |

Note

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Three-Phase—Medium-Voltage Distribution Transformers 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

2400 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|-------|----------------|----------------|----------------|-------------------|----------------|
| 45 | 150 | | | | | | V42D28T4516 |
| 75 | | | | | | | V42D28T7516 |
| 112.5 | | | | | | | V42D28T1216 |
| 150 | | | | | | | V42D28T4916 |
| 225 | | | | | | | V42D28T2216 |
| 300 | | | | | | | V42D28T3316 |
| 500 | | | | | | | V42D28T5516 |
| 750 | | | | | | | V42D28T7716 |
| 45 | 115 | | | | | | V42D28F4516 |
| 75 | | | | | | | V42D28F7516 |
| 112.5 | | | | | | | V42D28F1216 |
| 150 | | | | | | | V42D28F4916 |
| 225 | | | | | | | V42D28F2216 |
| 300 | | | | | | | V42D28F3316 |
| 500 | | | | | | | V42D28F5516 |
| 750 | | | | | | | V42D28F7716 |
| 45 | 80 | | | | | | V42D28B4516 |
| 75 | | | | | | | V42D28B7516 |
| 112.5 | | | | | | | V42D28B1216 |
| 150 | | | | | | | V42D28B4916 |
| 225 | | | | | | | V42D28B2216 |
| 300 | | | | | | | V42D28B3316 |
| 500 | | | | | | | V42D28B5516 |
| 750 | | | | | | | V42D28B7716 |

Note

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Three-Phase—Medium-Voltage Distribution Transformers 60 Hz DOE 2016 Energy-Efficient— Aluminum Windings

4160 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|-------|----------------|----------------|----------------|-------------------|------------------------------------|
| 45 | 150 | | | | | | Contact local Eaton representative |
| 75 | | | | | | | V46D28T4516 |
| 112.5 | | | | | | | V46D28T7516 |
| 150 | | | | | | | V46D28T1216 |
| 225 | | | | | | | V46D28T4916 |
| 300 | | | | | | | V46D28T2216 |
| 500 | | | | | | | V46D28T3316 |
| 750 | | | | | | | V46D28T5516 |
| 45 | 115 | | | | | | Contact local Eaton representative |
| 75 | | | | | | | V46D28T7716 |
| 112.5 | | | | | | | V46D28F4516 |
| 150 | | | | | | | V46D28F7516 |
| 225 | | | | | | | V46D28F1216 |
| 300 | | | | | | | V46D28F4916 |
| 500 | | | | | | | V46D28F2216 |
| 750 | | | | | | | V46D28F3316 |
| 45 | 80 | | | | | | Contact local Eaton representative |
| 75 | | | | | | | V46D28F5516 |
| 112.5 | | | | | | | V46D28B4516 |
| 150 | | | | | | | V46D28B7516 |
| 225 | | | | | | | V46D28B1216 |
| 300 | | | | | | | V46D28B4916 |
| 500 | | | | | | | V46D28B2216 |
| 750 | | | | | | | V46D28B3316 |
| 45 | 80 | | | | | | Contact local Eaton representative |
| 75 | | | | | | | V46D28B5516 |
| 112.5 | | | | | | | V46D28B7716 |
| 150 | | | | | | | V46D28B4516 |
| 225 | | | | | | | V46D28B7516 |
| 300 | | | | | | | V46D28B1216 |
| 500 | | | | | | | V46D28B4916 |
| 750 | | | | | | | V46D28B2216 |

Note

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Three-Phase—Medium-Voltage Distribution Transformers 60 Hz DOE 2016 Energy-Efficient—Copper Windings

2400 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|-------|------------------------------------|----------------|----------------|-------------------|----------------|
| 45 | 150 | | Contact local Eaton representative | | | | V42D47T4516CU |
| 75 | | | | | | | V42D47T7516CU |
| 112.5 | | | | | | | V42D47T1216CU |
| 150 | | | | | | | V42D47T4916CU |
| 225 | | | | | | | V42D47T2216CU |
| 300 | | | | | | | V42D47T3316CU |
| 500 | | | | | | | V42D47T5516CU |
| 750 | | | | | | | V42D47T7716CU |
| 45 | 115 | | Contact local Eaton representative | | | | V42D47F4516CU |
| 75 | | | | | | | V42D47F7516CU |
| 112.5 | | | | | | | V42D47F1216CU |
| 150 | | | | | | | V42D47F4916CU |
| 225 | | | | | | | V42D47F2216CU |
| 300 | | | | | | | V42D47F3316CU |
| 500 | | | | | | | V42D47F5516CU |
| 750 | | | | | | | V42D47F7716CU |
| 45 | 80 | | Contact local Eaton representative | | | | V42D47B4516CU |
| 75 | | | | | | | V42D47B7516CU |
| 112.5 | | | | | | | V42D47B1216CU |
| 150 | | | | | | | V42D47B4916CU |
| 225 | | | | | | | V42D47B2216CU |
| 300 | | | | | | | V42D47B3316CU |
| 500 | | | | | | | V42D47B5516CU |
| 750 | | | | | | | V42D47B7716CU |

Note

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Three-Phase—Medium-Voltage Distribution Transformers 60 Hz DOE 2016 Energy-Efficient—Copper Windings

4160 Delta Volts to 480Y/277 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|------------------------------------|----------------|----------------|----------------|-------------------|----------------|
| 45 | 150 | | | | | | V46D47T4516CU |
| 75 | | | | | | | V46D47T7516CU |
| 112.5 | | | | | | | V46D47T1216CU |
| 150 | | | | | | | V46D47T4916CU |
| 225 | | | | | | | V46D47T2216CU |
| 300 | | | | | | | V46D47T3316CU |
| 500 | | | | | | | V46D47T5516CU |
| 750 | | | | | | | V46D47T7716CU |
| 45 | 115 | Contact local Eaton representative | | | | | V46D47F4516CU |
| 75 | | | | | | | V46D47F7516CU |
| 112.5 | | | | | | | V46D47F1216CU |
| 150 | | | | | | | V46D47F4916CU |
| 225 | | | | | | | V46D47F2216CU |
| 300 | | | | | | | V46D47F3316CU |
| 500 | | | | | | | V46D47F5516CU |
| 750 | | | | | | | V46D47F7716CU |
| 45 | 80 | Contact local Eaton representative | | | | | V46D47B4516CU |
| 75 | | | | | | | V46D47B7516CU |
| 112.5 | | | | | | | V46D47B1216CU |
| 150 | | | | | | | V46D47B4916CU |
| 225 | | | | | | | V46D47B2216CU |
| 300 | | | | | | | V46D47B3316CU |
| 500 | | | | | | | V46D47B5516CU |
| 750 | | | | | | | V46D47B7716CU |

Note

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Three-Phase—Medium-Voltage Distribution Transformers 60 Hz DOE 2016 Energy-Efficient—Copper Windings

2400 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|-------|------------------------------------|----------------|----------------|-------------------|----------------|
| 45 | 150 | | Contact local Eaton representative | | | | V42D28T4516CU |
| 75 | | | | | | | V42D28T7516CU |
| 112.5 | | | | | | | V42D28T1216CU |
| 150 | | | | | | | V42D28T4916CU |
| 225 | | | | | | | V42D28T2216CU |
| 300 | | | | | | | V42D28T3316CU |
| 500 | | | | | | | V42D28T5516CU |
| 750 | | | | | | | V42D28T7716CU |
| 45 | 115 | | Contact local Eaton representative | | | | V42D28F4516CU |
| 75 | | | | | | | V42D28F7516CU |
| 112.5 | | | | | | | V42D28F1216CU |
| 150 | | | | | | | V42D28F4916CU |
| 225 | | | | | | | V42D28F2216CU |
| 300 | | | | | | | V42D28F3316CU |
| 500 | | | | | | | V42D28F5516CU |
| 750 | | | | | | | V42D28F7716CU |
| 45 | 80 | | Contact local Eaton representative | | | | V42D28B4516CU |
| 75 | | | | | | | V42D28B7516CU |
| 112.5 | | | | | | | V42D28B1216CU |
| 150 | | | | | | | V42D28B4916CU |
| 225 | | | | | | | V42D28B2216CU |
| 300 | | | | | | | V42D28B3316CU |
| 500 | | | | | | | V42D28B5516CU |
| 750 | | | | | | | V42D28B7716CU |

Note

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Three-Phase—Medium-Voltage Distribution Transformers 60 Hz DOE 2016 Energy-Efficient— Copper Windings

4160 Delta Volts to 208Y/120 Volts

| kVA | Temperature Rise °C | Frame | Wiring Diagram | Weight Lb (kg) | Type 3R WS Kit | Wallmount Bracket | Catalog Number |
|-------|---------------------|-------|----------------|----------------|----------------|-------------------|----------------|
| 45 | 150 | | | | | | V46D28T4516CU |
| 75 | | | | | | | V46D28T7516CU |
| 112.5 | | | | | | | V46D28T1216CU |
| 150 | | | | | | | V46D28T4916CU |
| 225 | | | | | | | V46D28T2216CU |
| 300 | | | | | | | V46D28T3316CU |
| 500 | | | | | | | V46D28T5516CU |
| 750 | | | | | | | V46D28T7716CU |
| 45 | 115 | | | | | | V46D28F4516CU |
| 75 | | | | | | | V46D28F7516CU |
| 112.5 | | | | | | | V46D28F1216CU |
| 150 | | | | | | | V46D28F4916CU |
| 225 | | | | | | | V46D28F2216CU |
| 300 | | | | | | | V46D28F3316CU |
| 500 | | | | | | | V46D28F5516CU |
| 750 | | | | | | | V46D28F7716CU |
| 45 | 80 | | | | | | V46D28B4516CU |
| 75 | | | | | | | V46D28B7516CU |
| 112.5 | | | | | | | V46D28B1216CU |
| 150 | | | | | | | V46D28B4916CU |
| 225 | | | | | | | V46D28B2216CU |
| 300 | | | | | | | V46D28B3316CU |
| 500 | | | | | | | V46D28B5516CU |
| 750 | | | | | | | V46D28B7716CU |

Note

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Dry-Type Distribution Transformers

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Standards and Certifications

Eaton dry-type distribution transformers are approved, listed, recognized or may comply with the following standards.

Engineering Standards

| Catalog Product Name | UL Standard ① | UL/cUL File Number | UL Listed Control Number | cUL Energy Efficiency Verification File Number | CSA File Number | Insulation System Temp/°C | kVA Single-Phase | kVA Three-Phase | Applicable IEC Standard |
|---------------------------------------|---------------|--------------------|--------------------------|--|-----------------|---------------------------|------------------|-----------------|-------------------------|
| Industrial Control Transformer | | | | | | | | | |
| MTE | 5085 | E46323 | 702X | — | — | 105 | 0.025–1.5 | N/A | 61558 |
| MTK | 5085 | E46323 | 702X | — | — | 180 | 0.05–5 | N/A | 61558 |
| Encapsulated Transformer | | | | | | | | | |
| AP | 5085 | E10156 | 591H | — | — | 180 | 3–10 | N/A | 61558 |
| AP | 1561 | E78389 | 591H | — | — | 180 | 15 | N/A | 61558 |
| EP | 5085 | E10156 | 591H | — | LR60545 | 180 | 0.05–10 | N/A | 61558 |
| EP | 1561 | E78389 | 591H | — | LR60545 ③ | 180 | 15–37.5 | N/A | 61558 ④ / 726 ⑤ |
| EPT | 5085 | E10156 | 591H | — | LR60545 | 180 | N/A | 3–9 | 61558 ⑥ / 726 ⑦ |
| EPT | 1561 | E78389 | 591H | — | LR60545 ⑧ | 180 | N/A | 15–75 | 726 |
| MPC | 1062 | E53449 | 591H | — | LR60546 | 180 | 3–25 | 15–30 | — |
| Ventilated Transformer | | | | | | | | | |
| DS-3 | 1561 | E78389 | 591H | EV33871 ② | — | 220 | 7.5–167 | N/A | 60726 |
| DT-3 | 1561 | E78389 | 591H | EV33871 ⑥ | — | 220 | N/A | 7.5–750 | 60726 |
| KT | 1561 | E78389 | 591H | EV33871 ⑥ | — | 220 | N/A | 7.5–500 | N/A |

Notes

- ① UL 5085 replaces UL 506.
- ② Applies to 15–167 kVA.
- ③ Applies to 25 kVA.
- ④ Applies to 15–25 kVA.
- ⑤ Applies to 37.5 kVA.
- ⑥ Applies to 3 kVA.
- ⑦ Applies to 5–9 kVA.
- ⑧ Applies to 15–300 kVA.
- ⑨ Applies to 30 kVA.

In addition to the above standards, Eaton dry-type distribution transformers are also manufactured in compliance with the applicable standards listed below.

Not all of the following standards apply to every transformer.

NEC: National Electrical Code

NEMA ST-1: Specialty Transformers (C89.1) (control transformers).

NEMA ST-20: General-Purpose Transformers.

DOE 2016 Final Rule: CFR Title 10 Chapter II Part 431, Appendix A of Subpart K 2016.

NEMA 250: Enclosures for Electrical Equipment (1000 volts maximum).

IEEE C57.12.01: General Requirements for Dry-Type Distribution and Power Transformers (including those with solid-cast and/or resin-encapsulated windings).

ANSI C57.12.70: Terminal Markings and Connections for Distribution and Power Transformers.

ANSI C57.12.91: Standard Test Code for Dry-Type Distribution and Power Transformers.

CSA C22 No. 47-M90: Air-Cooled Transformers (Dry-Type).

CSA C9-M1981: Dry-Type Transformers.

CSA C22.2 No. 66: Specialty Transformers.

CSA 802-94: Maximum Losses for Distribution, Power and Dry-Type Transformers.

NEMA TP-1: Guide for Determining Energy Efficiency for Distribution Transformers (rescinded).

NEMA TP-2: Standard Test Method for Measuring the Energy Consumption of Distribution Transformers (rescinded).

NEMA TP-3: Standard for the Labeling of Distribution Transformer Efficiency (rescinded).



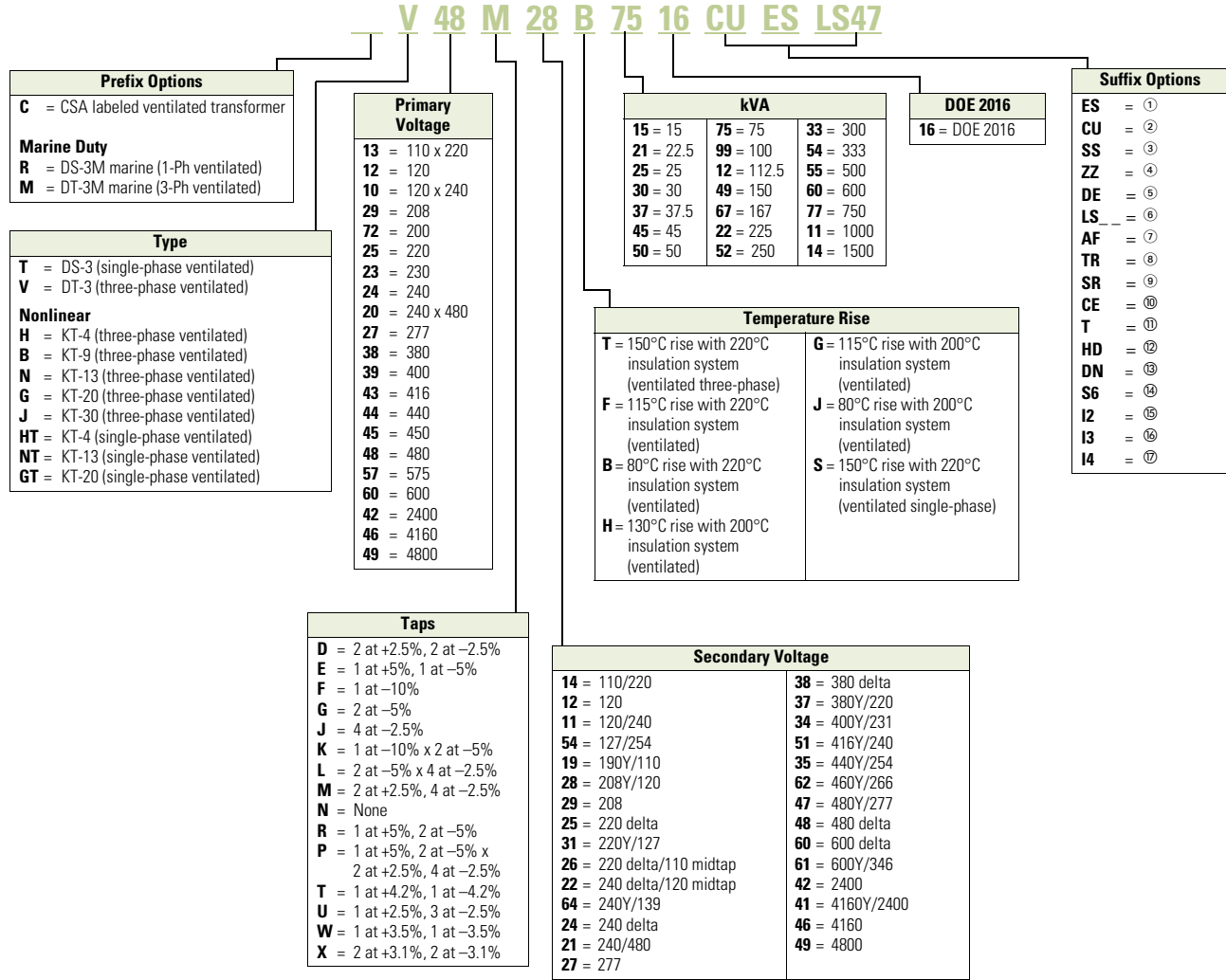
Catalog Number Selection

Use table for catalog number breakdown only.

Do not use to create catalog numbers because all combinations may not be valid.

DOE 2016 Efficient Transformers, Shielded Isolation, Nonlinear, Marine Duty Transformers— Example: V48M28B7516CUESLS47

2



Notes

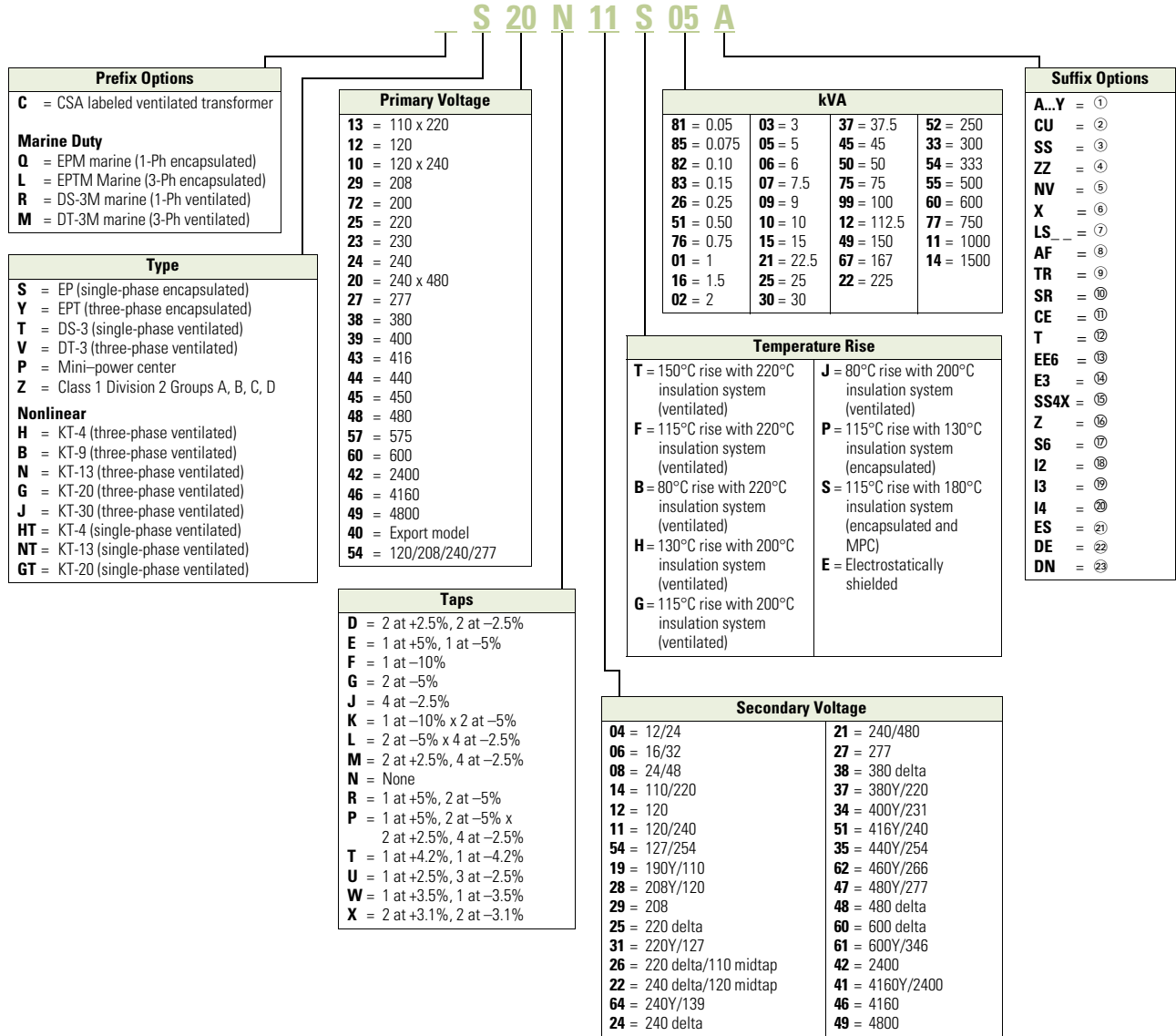
- ① Electrostatic shield.
- ② Copper windings.
- ③ Grade 304 stainless steel enclosure (does not imply a NEMA 4X rating).
- ④ Open type core and coil assembly.
- ⑤ Double aluminum electrostatic shield.
- ⑥ Low sound design. LS47 indicates low sound equal to 47 dB; LS42 indicates 42 dB.
- ⑦ Fungus proof.
- ⑧ Certified test report of standard production tests for the specific serial number to be shipped.
- ⑨ Certified sound level report.
- ⑩ CE Marked.
- ⑪ Thermal indicator embedded in center coil. Suffix "TT" indicates two thermal indicators of different temperature ratings, are installed.
- ⑫ Hinged front door.
- ⑬ Double neutral.
- ⑭ Grade 316 stainless steel enclosure (does not imply NEMA 4X rating).
- ⑮ Integral 2-inch infrared viewing window.
- ⑯ Integral 3-inch infrared viewing window.
- ⑰ Integral 4-inch infrared viewing window.

For Eaton's industrial control transformers catalog number selection, see Volume 7—Logic Control, Operator Interface and Connectivity Solutions, **CA08100008E**, Tab 7.

Contact your local Eaton sales office for voltage combinations not shown.

Use table for catalog number breakdown only.
Do not use to create catalog numbers because all combinations may not be valid.

General-Purpose, NEMA TP-1 Energy-Efficient, Mini-Power Center, Shielded Isolation, Nonlinear, Buck-Boost, Marine Duty Transformers—Example: S20N11S05A



Notes

- ① Model number is not used on newly designed/redesigned transformers.
 - ② Copper windings.
 - ③ Grade 304 stainless steel enclosure (does not imply a NEMA 4X rating).
 - ④ Open type core and coil assembly.
 - ⑤ Totally enclosed non-ventilated DS-3 or DT-3.
 - ⑥ 50/60 Hz.
 - ⑦ Low sound design. LS47 indicates low sound equal to 47 dB; LS42 indicates 42 dB.
 - ⑧ Fungus proof.
 - ⑨ Certified test report of standard production tests for the specific serial number to be shipped.
 - ⑩ Certified sound level report.
 - ⑪ CE Marked.
 - ⑫ Thermal indicator embedded in center coil. Suffix "TT" indicates two thermal indicators of different temperature ratings, are installed.
 - ⑬ With 2016 enclosure construction.
 - ⑭ CSL3 DOE 2007 energy-efficient.
 - ⑮ NEMA 4X Grade 304 stainless steel enclosure.
 - ⑯ Easy install base.
 - ⑰ Grade 316 stainless steel enclosure (does not imply NEMA 4X rating).
 - ⑱ Integral 2-inch infrared viewing window.
 - ⑲ Integral 3-inch infrared viewing window.
 - ⑳ Integral 4-inch infrared viewing window.
 - ㉑ Electrostatic shield.
 - ㉒ Double aluminum electrostatic shield.
 - ㉓ Double neutral.
- For Eaton's industrial control transformers catalog number selection, see Volume 7—Logic Control, Operator Interface and Connectivity Solutions, **CA08100008E**, Tab 7.
- Contact your local Eaton sales office for voltage combinations not shown.

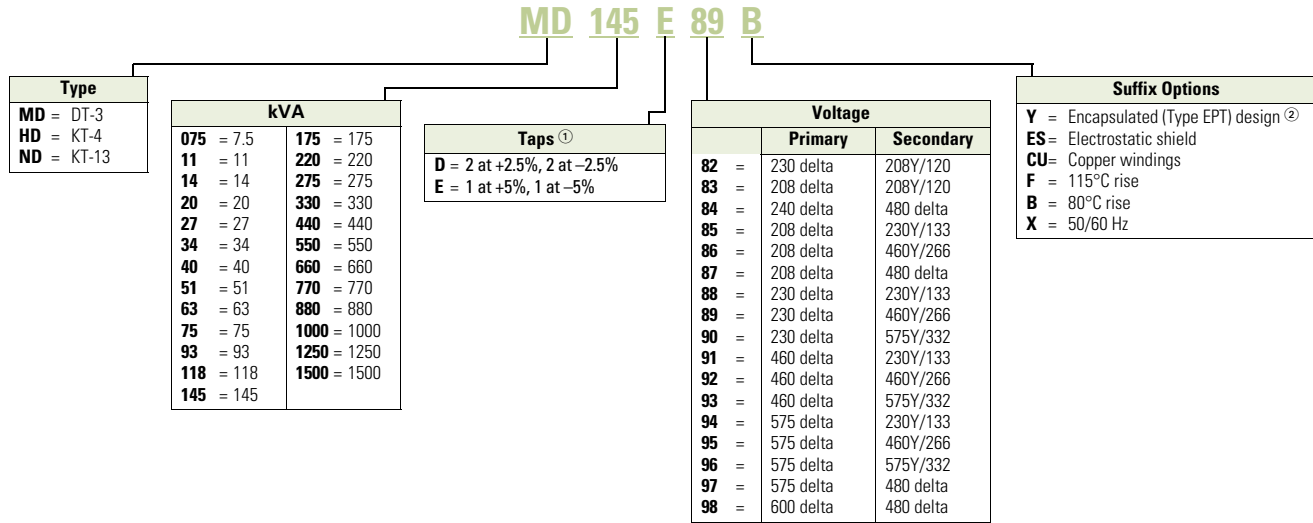
2.6

Transformers

Transformer Standards, Technical Data and Accessories

Use table for catalog number breakdown only.
Do not use to create catalog numbers because all combinations may not be valid.

2 Motor Drive Isolation Transformers—Example: MD145E89B



Notes

- ① For other tap combinations, contact your local Eaton sales office.
 - ② Available up to 34 kVA.
- Contact your local Eaton sales office for voltage combinations not shown.

Product Selection

Single-Phase Transformers

How to Select Single-Phase Units

1. Determine the primary (source) voltage—the voltage presently available.
2. Determine the secondary (load) voltage—the voltage needed at the load.
3. Determine the kVA load:
 - If the load is defined in kVA, a transformer can be selected from the tabulated data
 - If the load rating is given in amperes, determine the load kVA from the chart (below right). To determine kVA when volts and amperes are known, use the formula:

$$\text{kVA} = \frac{\text{Volts} \times \text{Amperes}}{1000}$$

- If the load is an AC motor, determine the minimum transformer kVA from the chart at the right
 - Select a transformer rating equal to or greater than the load kVA.
4. Define tap arrangements needed.
 5. Define temperature rise.

Using the above procedure, select the transformer from the listings in this catalog.

Single-Phase AC Motors

| Horsepower | Full Load Amperes | | | | Minimum Transformer kVA ^① |
|------------|-------------------|-----------|-----------|-----------|--------------------------------------|
| | 115 Volts | 208 Volts | 220 Volts | 230 Volts | |
| 1/6 | 4.4 | 2.4 | 2.3 | 2.2 | 0.53 |
| 1/4 | 5.8 | 3.2 | 3.0 | 2.9 | 0.70 |
| 1/3 | 7.2 | 4.0 | 3.8 | 3.6 | 0.87 |
| 1/2 | 9.8 | 5.4 | 5.1 | 4.9 | 1.18 |
| 3/4 | 13.8 | 7.6 | 7.2 | 6.9 | 1.66 |
| 1 | 16 | 8.8 | 8.4 | 8 | 1.92 |
| 1-1/2 | 20 | 11.0 | 10.4 | 10 | 2.40 |
| 2 | 24 | 13.2 | 12.5 | 12 | 2.88 |
| 3 | 34 | 18.7 | 17.8 | 17 | 4.10 |
| 5 | 56 | 30.8 | 29.3 | 28 | 6.72 |
| 7-1/2 | 80 | 44 | 42 | 40 | 9.6 |
| 10 | 100 | 55 | 52 | 50 | 12.0 |

Full Load Current in Amperes—Single-Phase Circuits

| kVA | Voltage | | | | | | | | | |
|------|---------|------|------|------|------|------|------|------|------|--|
| | 120 | 208 | 220 | 240 | 277 | 480 | 600 | 2400 | 4160 | |
| 0.25 | 2.0 | 1.2 | 1.1 | 1.0 | 0.9 | 0.5 | 0.4 | 0.10 | 0.06 | |
| 0.50 | 4.2 | 2.4 | 2.3 | 2.1 | 1.8 | 1.0 | 0.8 | 0.21 | 0.12 | |
| 0.75 | 6.3 | 3.6 | 3.4 | 3.1 | 2.7 | 1.6 | 1.3 | 0.31 | 0.18 | |
| 1 | 8.3 | 4.8 | 4.5 | 4.2 | 3.6 | 2.1 | 1.7 | 0.42 | 0.24 | |
| 1.5 | 12.5 | 7.2 | 6.8 | 6.2 | 5.4 | 3.1 | 2.5 | 0.63 | 0.36 | |
| 2 | 16.7 | 9.6 | 9.1 | 8.3 | 7.2 | 4.2 | 3.3 | 0.83 | 0.48 | |
| 3 | 25 | 14.4 | 13.6 | 12.5 | 10.8 | 6.2 | 5.0 | 1.2 | 0.72 | |
| 5 | 41 | 24.0 | 22.7 | 20.8 | 18.0 | 10.4 | 8.3 | 2.1 | 1.2 | |
| 7.5 | 62 | 36 | 34 | 31 | 27 | 15.6 | 12.5 | 3.1 | 1.8 | |
| 10 | 83 | 48 | 45 | 41 | 36 | 20.8 | 16.7 | 4.2 | 2.4 | |
| 15 | 125 | 72 | 68 | 62 | 54 | 31 | 25 | 6.2 | 3.6 | |
| 25 | 208 | 120 | 114 | 104 | 90 | 52 | 41 | 10.4 | 6.0 | |
| 37.5 | 312 | 180 | 170 | 156 | 135 | 78 | 62 | 15.6 | 9.0 | |
| 50 | 416 | 240 | 227 | 208 | 180 | 104 | 83 | 20.8 | 12.0 | |
| 75 | 625 | 360 | 341 | 312 | 270 | 156 | 125 | 31.3 | 18.0 | |
| 100 | 833 | 480 | 455 | 416 | 361 | 208 | 166 | 41.7 | 24.0 | |
| 167 | 1391 | 802 | 759 | 695 | 602 | 347 | 278 | 69.6 | 40.1 | |

Notes

① If motors are started more than once per hour, increase minimum transformer kVA by 20%.

When motor service factor is greater than 1, increase full load amperes proportionally. Example: If service factor is 1.15, increase above ampere values by 15%.

Three-Phase Transformers

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How to Select Three-Phase Units

1. Determine the primary (source) voltage—the voltage presently available.
2. Determine the secondary (load) voltage—the voltage needed at the load.
3. Determine the kVA load:
 - If the load is defined in kVA, a transformer can be selected from the tabulated data
 - If the load rating is given in amperes, determine the load kVA from the chart (below right). To determine kVA when volts and amperes are known, use the formula:

$$\text{kVA} = \frac{\text{Volts} \times \text{Amperes} \times 1.732}{1000}$$

- If the load is an AC motor, determine the minimum transformer kVA from the chart at the right
 - Select a transformer rating equal to or greater than the load kVA
4. Define tap arrangements needed.
 5. Define temperature rise.

Using the above procedure, select the transformer from the listings in this catalog.

Three-Phase AC Motors

| Horsepower | Full Load Amperes | | | | | Minimum Transformer kVA ^① |
|------------|-------------------|-----------|-----------|-----------|-----------|--------------------------------------|
| | 208 Volts | 230 Volts | 380 Volts | 460 Volts | 575 Volts | |
| 0.5 | 2.2 | 2.0 | 1.2 | 1.0 | 0.8 | 0.9 |
| 3/4 | 3.1 | 2.8 | 1.7 | 1.4 | 1.1 | 1.2 |
| 1 | 4.0 | 3.6 | 2.2 | 1.8 | 1.4 | 1.5 |
| 1.5 | 5.7 | 5.2 | 3.1 | 2.6 | 2.1 | 2.1 |
| 2 | 7.5 | 6.8 | 4.1 | 3.4 | 2.7 | 2.7 |
| 3 | 10.7 | 9.6 | 5.8 | 4.8 | 3.9 | 3.8 |
| 5 | 16.7 | 15.2 | 9.2 | 7.6 | 6.1 | 6.3 |
| 7.5 | 24 | 22 | 14 | 11 | 9 | 9.2 |
| 10 | 31 | 28 | 17 | 14 | 11 | 11.2 |
| 15 | 46 | 42 | 26 | 21 | 17 | 16.6 |
| 20 | 59 | 54 | 33 | 27 | 22 | 21.6 |
| 25 | 75 | 68 | 41 | 34 | 27 | 26.6 |
| 30 | 88 | 80 | 48 | 40 | 32 | 32.4 |
| 40 | 114 | 104 | 63 | 52 | 41 | 43.2 |
| 50 | 143 | 130 | 79 | 65 | 52 | 52 |
| 60 | 170 | 154 | 93 | 77 | 62 | 64 |
| 75 | 211 | 192 | 116 | 96 | 77 | 80 |
| 100 | 273 | 248 | 150 | 124 | 99 | 103 |
| 125 | 342 | 312 | 189 | 156 | 125 | 130 |
| 150 | 396 | 360 | 218 | 180 | 144 | 150 |
| 200 | 528 | 480 | 291 | 240 | 192 | 200 |

Full Load Current in Amperes—Three-Phase Circuits

| kVA | Voltage | | | | | | |
|-------|---------|------|------|------|------|------|------|
| | 208 | 240 | 380 | 480 | 600 | 2400 | 4160 |
| 3 | 8.3 | 7.2 | 4.6 | 3.6 | 2.9 | 0.72 | 0.42 |
| 6 | 16.6 | 14.4 | 9.1 | 7.2 | 5.8 | 1.4 | 0.83 |
| 9 | 25 | 21.6 | 13.7 | 10.8 | 8.6 | 2.2 | 1.2 |
| 15 | 41.7 | 36.1 | 22.8 | 18.0 | 14.4 | 3.6 | 2.1 |
| 22.5 | 62.4 | 54.1 | 34.2 | 27.1 | 21.6 | 5.4 | 3.1 |
| 30 | 83.4 | 72.3 | 45.6 | 36.1 | 28.9 | 7.2 | 4.2 |
| 37.5 | 104 | 90.3 | 57.0 | 45.2 | 36.1 | 9.0 | 5.2 |
| 45 | 124 | 108 | 68.4 | 54.2 | 43.4 | 10.8 | 6.3 |
| 50 | 139 | 120 | 76 | 60.1 | 48.1 | 12.0 | 6.9 |
| 75 | 208 | 180 | 114 | 90 | 72 | 18.0 | 10.4 |
| 112.5 | 312 | 270 | 171 | 135 | 108 | 27.1 | 15.6 |
| 150 | 416 | 360 | 228 | 180 | 144 | 36.1 | 20.8 |
| 225 | 624 | 541 | 342 | 270 | 216 | 54.2 | 31.3 |
| 300 | 832 | 721 | 456 | 360 | 288 | 72.2 | 41.6 |
| 500 | 1387 | 1202 | 760 | 601 | 481 | 120 | 69.4 |
| 750 | 2084 | 1806 | 1140 | 903 | 723 | 180 | 104 |
| 1000 | 2779 | 2408 | 1519 | 1204 | 963 | 241 | 139 |

Notes

① If motors are started more than once per hour, increase minimum transformer kVA by 20%.

When motor service factor is greater than 1, increase full load amperes proportionally. Example: If service factor is 1.15, increase above ampere values by 15%.

Options and Accessories

(Order separately)

Weathershield Kit

A weathershield kit consisting of a front and rear cover shield must be installed on all ventilated dry-type distribution transformers when the unit is located outdoors. The shields protect the transformer top ventilation openings against rain but allow for proper

ventilation. Field installation hardware is not required. Refer to specific transformer listing for selection of weathershield kit. Proper installation provides a NEMA 3R rating.

Note: For 316 stainless steel, add the suffix 'S' to the catalog number.

Weathershield Kit



Weathershield Kit

| Fits Frame Size(s) ① | Catalog Number ② |
|---|------------------|
| 809, 810, 811, 816, 817, 818 | WS11 |
| 814, 814E | WS13 |
| 815 | WS15 |
| 819, 820 | WS16 |
| 808, 908, 909, 910, 911, 912, 910A, 911A, 912A | WS31 |
| 912B, 912Z, 912D | WS38 |
| 812, 813, 913A, 913B, 914A, 915A, 916, 914B, 915B | WS33 |
| 914D, 915D, 914F, 915F, 914Z, 915Z | WS39 |
| 916A, 916B, 912Z | WS19 |
| 917, 918, 918A | WS34 |
| 919, 920, 919E, 919EX, 920E, 920EX | WS35 |
| 922 | WS36 |
| 923 | WS37 |
| 842 | WS45 |
| 842A | WS45A |
| 843 | WS43 |
| 843A | WS43A |
| 844 | WS44 |
| 844A | WS44A |
| 939 | WS57 |
| 940 | WS58 |
| 942 | WS59 |
| 943 | WS60 |
| 944 | WS61 |
| 945 | WS62 |

Terminal Extension Kit

A terminal extension kit is used to allow front access to the rear terminals on most 500 and 750 kVA transformers (transformers on frames 919 and 920) when insufficient space is available at the rear of the transformer. Eaton recommends a minimum 6-inch clearance from the wall to maintain proper ventilation.

Terminal Extension Kit

| Fits Frame Size(s) ① | Bus Material | Catalog Number |
|----------------------|--------------|----------------|
| 919 | Aluminum | EXT55AL |
| 919 | Copper | EXT55CU |
| 920 | Aluminum | EXT77AL |
| 920 | Copper | EXT77CU |

Wall-Mounting Bracket

Wall-mounting brackets are used to wall-mount ventilated transformers. This bracket allows the transformer to be installed with the proper clearance, as recommended by Eaton.

Wall-mounting brackets are compatible with the following frames.

Wall-Mounting Bracket



Availability Guide Wall-Mounting Brackets

| Frame Sizes ① | Catalog Number |
|---|----------------|
| Type DS-3 (Single-Phase Compatible) | |
| 809, 810, 811, 812, 813, 815, 816, 817, 818, 835, 836, 837, 814A, 842 | WMB01 |
| Type DT-3, K-Factor, Drive Isolation (Three-Phase Compatible) | |
| 908, 909, 910, 911, 912, 910A, 911A, 912A, 912B, 912D, 913A, 913B, 914A, 914B, 914D, 915D, 915A, 915B, 914F, 915F, 912Z, 914Z, 915Z | WMB01 |
| 842A, 939, 940 | WMB05 |
| 843A, 844A, 942, 943 | WMB04 |

Notes

- ① Effective June 1, 2001, frame numbers will have a prefix of FR, e.g., **FR819**. Dimensions, accessories and so on are still applicable as if the FR did not exist.
- ② For Grade 316 stainless steel weathershields, add the suffix "S" to a catalog number, e.g., **WS31S**.

Terminal Lug Kits for Transformers ①

| Typical Sizing | Terminal Lugs Cable Range | Quantity | Hardware Bolt Size | Quantity | Catalog Number |
|--------------------------|------------------------------|----------|-----------------------|----------|----------------|
| 15–37.5 kVA single-phase | #14–#2 | 8 | 1/4-20 x 3/4 | 8 | LKS1 |
| 15–45 kVA three-phase | #6–250 kcmil | 4 | | | |
| 50–75 kVA single-phase | #6–250 kcmil | 12 | 1/4-20 x 3/4 | 8 | LKS2 |
| 75–112.5 kVA three-phase | | | 1/4-20 x 1-3/4 | 8 | |
| 100–167 kVA single-phase | #6–250 kcmil | 3 | 1/4-20 x 3/4 | 3 | LKS3 |
| 150–300 kVA three-phase | #2–600 kcmil | 22 | 3/8-16 x 2 | 16 | |
| 500 kVA three-phase | #2–600 kcmil | 29 | 3/8-16 x 2 | 18 | LKS4 |

Rodent Screens

| Description | Frame Size(s) ② | Catalog Number |
|---|------------------------------------|-------------------|
| Rodent screens are used to discourage birds or rodents from entering the enclosure through the ventilation openings. Stainless steel screens are not available. | 908, 909 | RS01 |
| | 910A, 911, 912 | RS02 |
| | 913B, 914B, 915B | RS03 |
| | 916 | RS04 |
| | 917, 918, 918A | RS05 |
| | 919, 920, 919E, 919EX, 920E, 920EX | RS06 |
| | 916A, 916B | RS07 |
| | 922 | RS08 |
| | 923 | RS09 |
| | 814, 821, 814E | RS11 |
| | 815 | RS12 |
| | 816 | RS13 |
| | 817, 818 | RS14 |
| | 819, 820 | RS15 |
| | 842 | RS45 |
| | 842A | RS45A |
| | 843 | RS43 |
| | 843A | RS43A |
| | 844 | RS44 |
| | 844A | RS44A |
| | 912B, 912Z, 912D | RS16 |
| | 914D, 915D, 914F, 915F, 914Z, 915Z | RS17 |
| | 916Z | RS07 |
| | 939 | RS57 |
| | 940 | RS58 |
| | 942 | RS59 |
| 943 | RS60 | |
| 944 | RS61 | |
| 945 | RS62 | |

Replacement Parts for Mini-Power Centers

| Frame | Deadfront Cover (Breaker Cover) | Front Cover |
|-------|------------------------------------|-------------|
| 283 | 47-37503 | 7074C98H04 |
| 284 | 47-37503-2 | 7074C98H01 |
| 285 | 47-37503-3 | 7074C98H02 |
| 286 | 47-37503-4 | 7074C98H02 |
| 287 | 47-37503-5 | 7074C98H03 |
| 289 | 47-37459 | 7074C44H01 |
| 290 | 47-37459-2 | 7074C44H02 |
| 291 | 47-37459-3 | 7074C44H03 |
| 289A | 47-42072-1 | 7074C44H01 |
| 290A | 47-42072-2 | 7074C44H02 |
| 291A | 47-42072-3 | 7074C44H03 |

Notes

- ① Lugs are rated Al/Cu and are suitable for use with either aluminum or copper conductors.
 ② Effective June 1, 2001, frame numbers will have a prefix of FR, e.g., **FR819**. Dimensions, accessories and so on are still applicable as if the FR did not exist.

Case Parts for Ventilated Units

| Frame(s) ① | Front Panel (Upper) | Front Panel (Lower) | Back Panel (Upper) | Back Panel (Lower) | Front or Back Panel (Cutout Cover Plate) | Top Cover | Side Panel (Two Required per Transformer) | Bottom |
|---------------------|---------------------|---------------------|--------------------|--------------------|--|------------|---|------------|
| Single-Phase | | | | | | | | |
| 809 | 7073C16P03 | — | 7073C16P03 | — | — | 7073C17P01 | 7073C18P04 | 7073C14P03 |
| 810 | 7073C16P01 | — | 7073C16P01 | — | — | 7073C17P01 | 7073C18P01 | 7073C14P01 |
| 811 | 7073C16P01 | — | 7073C16P01 | — | — | 7073C17P01 | 7073C18P01 | 7073C14P01 |
| 812 | 7073C16P02 | — | 7073C16P02 | — | — | 7073C17P02 | 7073C18P02 | 7073C14P02 |
| 813 | 7073C16P02 | — | 7073C16P02 | — | — | 7073C17P02 | 7073C18P02 | 7073C14P02 |
| 814, 814E | 7073C54P01 | — | 7073C54P01 | — | — | 7073C17P03 | 7073C18P05 | 7073C14P04 |
| 815 | 47-39433 | — | 47-39433 | — | — | 47-39431 | 47-39430 | 47-39429 |
| 816 | 47-40452 | — | 47-40452 | — | — | 47-40453 | 47-40451 | 47-40449 |
| 817 | 47-40457 | — | 47-40457 | — | — | 47-40458 | 47-40456 | 47-40454 |
| 818 | 47-40457 | — | 47-40457 | — | — | 47-40458 | 47-40456 | 47-40454 |
| 819 | 47-40574 | — | 47-40574 | — | — | 47-40575 | 47-40573 | 47-40459 |
| 820 | 47-40574 | — | 47-40574 | — | — | 47-40575 | 47-40573 | 47-40459 |
| 842 | 47-54828-2 | — | 47-54828-2 | — | — | 47-54829-2 | 47-54827-2 | 47-55335-2 |
| 842A | 73-5915-1 | — | 73-5915-1 | — | — | 73-5916-1 | 73-5913-1 | 73-5914-1 |
| 843 | 47-54828-4 | — | 47-54828-4 | — | — | 47-54829-4 | 47-54827-4 | 47-55335-3 |
| 843A | 73-5915-2 | — | 73-5915-2 | — | — | 73-5916-2 | 73-5913-2 | 73-5914-2 |
| 844 | 47-54828-5 | — | 47-54828-5 | — | — | 47-54829-5 | 47-54827-5 | 47-55335-5 |
| 844A | 73-5915-3 | — | 73-5915-3 | — | — | 73-5916-3 | 73-5913-3 | 73-5914-3 |

Notes

① Effective June 1, 2001, frame numbers will have a prefix of FR, e.g., **FR819**. Dimensions, accessories and so on are still applicable as if the FR did not exist.

Parts listed are for standard catalog listed transformers. Units with modifications may require different parts. (Frame number from transformer nameplate required.) Transformer nameplate and UL label are not field replaceable.

Case Parts for Ventilated Units, continued

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| Frame(s) ① | Front Panel (Upper) | Front Panel (Lower) | Back Panel (Upper) | Back Panel (Lower) | Front or Back Panel (Cutout Cover Plate) | Top Cover | Side Panel (Two Required per Transformer) | Bottom |
|--------------------|---------------------|---------------------|--------------------|--------------------|--|------------|---|------------|
| Three-Phase | | | | | | | | |
| 908 | 7073C37P01 | — | 7073C37P01 | — | — | 1714C45P01 | 1714C44P03 | 7073C20P05 |
| 909 | 7073C37P01 | — | 7073C37P01 | — | — | 1714C45P01 | 1714C44P03 | 7073C20P05 |
| 910 | 1714C46P01 | — | 1714C46P01 | — | — | 1714C45P01 | 1714C44P01 | 7073C20P01 |
| 911 | 1714C46P01 | — | 1714C46P01 | — | — | 1714C45P01 | 1714C44P01 | 7073C20P01 |
| 912 | 1714C46P01 | — | 1714C46P01 | — | — | 1714C45P01 | 1714C44P01 | 7073C20P01 |
| 916 | 1714C60P01 | — | 1714C60P01 | — | — | 1714C58P01 | 1714C56P01 | 7073C20P03 |
| 917 | 47-44973-1 | — | 47-44973-1 | — | — | 1714C67P01 | 1714C64P01 | 7073C20P04 |
| 918 | 47-44973-1 | — | 47-44973-1 | — | — | 1714C67P01 | 1714C64P01 | 7073C20P04 |
| 919, 919E, 919EX | 2D46331P03 | 2D46331P04 | 2D46331P03 | 2D46331P04 | 2D46331P01 | 2D46331P02 | 2D46332P01 | 2D46331P04 |
| 920, 920E, 920EX | 2D46331P03 | 2D46331P04 | 2D46331P03 | 2D46331P04 | 2D46331P01 | 2D46331P02 | 2D46332P01 | 2D46331P04 |
| 922 | 2D46391H06 | 2D46391H08 | 2D46391H03 | 2D46391H08 | — | 2D46391H02 | 2D46392H01 | — |
| 923 | 47-45927-1 | — | 47-45927-1 | — | — | 47-45926-1 | 47-45925-1 | 47-45759-1 |
| 910A | 47-40592 | — | 47-40592 | — | — | 1714C45P01 | 47-40591 | 47-40589 |
| 911A | 47-40592 | — | 47-40592 | — | — | 1714C45P01 | 47-40591 | 47-40589 |
| 912A | 47-40592 | — | 47-40592 | — | — | 1714C45P01 | 47-40591 | 47-40589 |
| 912B | 47-49323-1 | — | 47-49323-1 | — | — | 47-49322-1 | 47-49321-1 | 47-49320-1 |
| 912D | 47-55332-2 | — | 47-55332-2 | — | — | 47-55331-2 | 47-55329-2 | 47-55330-1 |
| 912DN | 47-55332-4 | — | 47-55332-4 | — | — | 47-55331-2 | 47-55329-2 | 47-55330-3 |
| 913A | 1714C47P03 | — | 1714C47P03 | — | — | 1714C45P02 | 1714C44P07 | 7073C30P02 |
| 913B | 47-40580 | — | 47-40580 | — | — | 1714C45P02 | 47-40578 | 47-41792 |
| 914A | 1714C47P03 | — | 1714C47P03 | — | — | 1714C45P02 | 1714C44P07 | 7073C30P02 |
| 914B | 47-40580 | — | 47-40580 | — | — | 1714C45P02 | 47-40578 | 47-41792 |
| 914D | 47-49317-1 | — | 47-49317-1 | — | — | 47-49316-1 | 47-49315-1 | 47-49314-1 |
| 914F/915F | 47-56915-1 | — | 47-56915-1 | — | — | 47-56916-1 | 47-56917-1 | 47-56918-1 |
| 915A | 1714C47P03 | — | 1714C47P03 | — | — | 1714C45P02 | 1714C44P07 | 7073C30P02 |
| 915B | 47-40580 | — | 47-40580 | — | — | 1714C45P02 | 47-40578 | 47-41792 |
| 915D | 47-49317-1 | — | 47-49317-1 | — | — | 47-49316-1 | 47-49315-1 | 47-49314-1 |
| 916A | 47-41790 | — | 47-41790 | — | — | 47-41791 | 47-41789 | 47-41788 |
| 918A | 47-41801 | — | 47-41801 | — | — | 47-41802 | 47-41800 | 47-41802 |
| 912Z | 47-49323-1 | — | 47-49323-1 | — | — | 47-49322-1 | 47-49991-1 | 47-49989-1 |
| 915Z | 47-49317-1 | — | 47-49317-1 | — | — | 47-49316-1 | 47-49994-1 | 47-49995-1 |
| 916Z | 47-49992-1 | — | 47-49992-1 | — | — | 47-41791 | 47-49988-1 | 47-49987-1 |
| 939 | 73-5902-1 | — | 73-5902-1 | — | — | 73-5903-1 | 73-5900-1 | 73-5901-1 |
| 940 | 73-5902-2 | — | 73-5902-2 | — | — | 73-5903-2 | 73-5900-2 | 73-5901-2 |
| 942 | 73-5902-3 | — | 73-5902-3 | — | — | 73-5903-3 | 73-5900-3 | 73-5901-3 |
| 943 | 73-5902-4 | — | 73-5902-4 | — | — | 73-5903-4 | 73-5900-4 | 73-5901-4 |
| 944 | 73-5902-5 | — | 73-5902-5 | — | — | 73-5903-5 | 73-5900-5 | 73-5901-5 |
| 945 | 73-5902-6 | — | 73-5902-6 | — | — | 73-5903-6 | 73-5900-6 | 73-5901-6 |

Notes

① Effective June 1, 2001, frame numbers will have a prefix of FR, e.g., **FR819**. Dimensions, accessories and so on are still applicable as if the FR did not exist.

Parts listed are for standard catalog listed transformers. Units with modifications may require different parts. (Frame number from transformer nameplate required.) Transformer nameplate and UL label are not field replaceable.

Technical Data and Specifications

Customer-Furnished Connecting Cables

Eaton recommends that external cables be rated 90°C (sized at 75°C ampacity) for encapsulated designs and 75°C for ventilated designs.

Primary and secondary terminal lugs are not included. Lug kits are available separately.

Overload Capability

Short-term overload capacity is designed into transformers as required by ANSI. Dry-type distribution transformers will deliver 200% nameplate load for one-half hour, 150% load for one hour and 125% load for four hours without being damaged, provided that a constant 50% load precedes and follows the overload. See ANSI C57.96-01.250 for additional limitations.

Continuous overload capacity is not deliberately designed into a transformer because the design objective is to be within the allowed winding temperature rise with nameplate loading.

Seismically Qualified

Eaton manufactured dry-type distribution transformers are seismically qualified, and exceed requirements of the Uniform Building Code (UBC) and California Code Title 24.

Taps

Primary taps are available in most ratings to allow compensation for source voltage variations.

Series-Multiple Windings

Series-multiple windings consist of two similar coils in each winding that can be connected in series or parallel (multiple). Transformers with series-multiple windings are designated with a "x" or "/" between the voltage ratings, such as voltages of "120/240" or "240 x 480." If the series-multiple winding is designated by an "x," the winding can be connected only for a series or parallel. With the "/" designation, a midpoint also becomes

available in addition to the series or parallel connection. As an example, a 120 x 240 winding can be connected for either 120 (parallel) or 240 (series), but a 120/240 winding can be connected for 120 (parallel), 240 (series) or 240 with a 120 midpoint.

Enclosures

Eaton's ventilated transformers—Types DS-3, DT-3, MD and KT—use a NEMA 2 rated (drip-proof) enclosure as standard, and are rated NEMA 3R with the addition of weathershields. Eaton encapsulated—Types EP, EPT, EPZ and EPTZ—and totally enclosed, non-ventilated (Types DS-3E and DT-3E) transformers use a NEMA 3R rated enclosure.

Buck-Boost Transformers

An autotransformer has only one winding, and is therefore smaller and more economical than the conventional two-winding transformer. In an autotransformer, the primary and secondary are electrically and mechanically connected. The required secondary voltage is obtained by "tapping-off" from the single winding.

Buck-boost autotransformers are insulated units with 120 x 240 or 240 x 480 volt primaries and 12/24, 16/32 or 24/48 volt secondaries, and provide a very economical method for minor voltage adjustments where circuit isolation is not needed.

Autotransformers can be used only where local electrical codes permit, and isolation of the two circuits is not required.

Nonlinear Ratings

The transformers shall be specifically designed to supply circuits with a harmonic profile equal to or less than a K-factor of 4 or 13, as described in the following table, without exceeding specified temperature rise.

Nonlinear Ratings

| Harmonic | K-4 | K-13 |
|-------------|--------|--------|
| Fundamental | 100.0% | 100.0% |
| 3rd | 34.0% | 70.0% |
| 5th | 22.0% | 42.0% |
| 7th | 3.0% | 5.0% |
| 9th | 1.0% | 3.0% |
| 11th | 0.7% | 3.0% |
| 13th | 0.5% | 1.0% |
| 15th | 0.3% | 0.7% |
| 17th | 0.3% | 0.6% |

Sound Levels

All Eaton 600 volt class general-purpose dry-type distribution transformers are designed to meet NEMA ST-20 sound levels listed here. These are the sound levels measured in a soundproof environment. Actual sound levels measured at an installation will likely be higher (up to 15 dB greater) due to electrical connections and environmental conditions. Lower sound levels are available and should be specified when the transformer is going to be installed in an area where sound may be a concern.

All Eaton general-purpose dry-type distribution transformers are designed with sound levels lower than NEMA ST-20 maximum levels. However, consideration should be given to the specific location of the

transformers and their installation to minimize the potential for sound transmission to surrounding structures and sound reflection. It is suggested that the following installation methods be included:

1. If possible, mount the transformer away from corners of walls or ceilings. For installation that must be near a corner, use sound-absorbing materials on the walls and ceilings if necessary to eliminate reflection.
2. Provide a solid foundation for mounting the transformer and then use vibration dampening mounts if not already provided in the transformer. (Eaton encapsulated EP/EPT designs use a special encapsulation system and ventilated DS/DT-3 designs contain a built-in vibration dampening system to minimize and isolate sound transmission.)
3. Provide flexible conduit to make the connections to the transformer.
4. Locate the transformer as far as possible from areas where high sound levels are undesirable.

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilated (up to 1.2 kV) | | Encapsulated (up to 1.2 kV) |
|---------------------------------|---------------------------------------|-----------------|--------------------------------|
| | K-Factor 1, 4, 9 | K-Factor 13, 20 | |
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Typical Data for General-Purpose Dry-Type Distribution Transformers, Aluminum Wound ^①

Type EP 115°C Rise

| kVA | Weight Lbs | | Losses in Watts | | Efficiency | | | | % Regulation | | % Impedance ^② | | Sound Level dB |
|-------|------------|-----|-----------------|-------|------------|----------|----------|-----------|--------------|----------|--------------------------|------|----------------|
| | Al | Cu | No Load | Total | 1/4 Load | 1/2 Load | 3/4 Load | Full Load | 100% P.F. | 80% P.F. | Min. | Max. | |
| 0.05 | — | 7 | 6 | 9 | 65.3 | 79.6 | 84.3 | 85.6 | 5.9 | 6.4 | 5.5 | 9.5 | 45 |
| 0.075 | — | 7 | 7 | 14 | 66.0 | 79.0 | 82.5 | 82.8 | 9.4 | 9.2 | 7.5 | 11.0 | 45 |
| 0.10 | — | 7 | 5 | 15 | 82.4 | 86.9 | 87.7 | 86.5 | 10.3 | 10.6 | 8.0 | 12.0 | 45 |
| 0.15 | — | 8 | 7 | 20 | 83.4 | 88.2 | 88.9 | 87.8 | 9.0 | 9.6 | 8.0 | 12.0 | 45 |
| 0.25 | — | 12 | 14 | 29 | 79.0 | 87.2 | 89.5 | 89.6 | 5.9 | 7.5 | 7.5 | 9.5 | 45 |
| 0.5 | — | 13 | 20 | 47 | 85.1 | 90.3 | 91.4 | 91.4 | 5.5 | 7.0 | 5.0 | 7.0 | 45 |
| 0.75 | — | 20 | 29 | 57 | 86.0 | 91.3 | 92.7 | 92.9 | 3.9 | 5.0 | 4.0 | 6.0 | 45 |
| 1 | — | 30 | 24 | 60 | 90.8 | 93.9 | 94.5 | 94.4 | 3.8 | 4.9 | 3.8 | 5.8 | 45 |
| 1.5 | 65 | 40 | 30 | 90 | 92.5 | 94.7 | 95.0 | 94.6 | 4.1 | 5.2 | 2.5 | 4.5 | 45 |
| 2 | 113 | 40 | 30 | 100 | 94.2 | 95.7 | 95.8 | 95.4 | 3.6 | 4.7 | 3.3 | 5.3 | 45 |
| 3 | — | 69 | 61 | 135 | 92.0 | 95.0 | 95.7 | 95.7 | 2.5 | 3.5 | 2.5 | 4.1 | 45 |
| 5 | — | 120 | 104 | 215 | 91.8 | 95.0 | 95.8 | 95.9 | 2.3 | 3.3 | 2.0 | 4.6 | 45 |
| 7.5 | 123 | 133 | 129 | 250 | 93.2 | 96.0 | 96.7 | 95.9 | 1.5 | 2.4 | 2.4 | 3.4 | 45 |
| 10 | 193 | 208 | 153 | 295 | 93.9 | 96.3 | 97.0 | 97.2 | 1.5 | 2.5 | 2.0 | 3.3 | 50 |
| 15 | 216 | 235 | 209 | 435 | 94.4 | 96.6 | 97.1 | 97.2 | 1.6 | 2.8 | 1.6 | 3.6 | 50 |
| 25 | 385 | 414 | 191 | 440 | 96.8 | 98.0 | 98.3 | 98.4 | 1.1 | 2.5 | 1.6 | 4.2 | 50 |
| 37.5 | 735 | 856 | 225 | 370 | 97.4 | 98.3 | 98.5 | 98.4 | 1.2 | 2.6 | 2.8 | 4.0 | 50 |

Type EPT 115°C Rise ^③

| kVA | Weight Lbs | | Losses in Watts | | Efficiency | | | | % Regulation | | % Impedance ^② | | Sound Level dB |
|-----|------------|------|-----------------|-------|------------|----------|----------|-----------|--------------|----------|--------------------------|------|----------------|
| | Al | Cu | No Load | Total | 1/4 Load | 1/2 Load | 3/4 Load | Full Load | 100% P.F. | 80% P.F. | Min. | Max. | |
| 3 | 116 | 123 | 110 | 165 | 87.3 | 92.6 | 94.3 | 94.9 | 2.1 | 6.1 | 2.4 | 8.0 | 45 |
| 6 | 143 | 153 | 145 | 275 | 90.9 | 94.5 | 95.5 | 95.7 | 2.2 | 3.1 | 2.9 | 4.9 | 45 |
| 9 | 166 | 178 | 195 | 375 | 91.6 | 95.0 | 95.9 | 96.1 | 2.0 | 2.8 | 2.0 | 3.6 | 45 |
| 15 | 275 | 300 | 265 | 545 | 93.0 | 95.7 | 96.5 | 96.6 | 1.9 | 3.1 | 1.9 | 3.9 | 50 |
| 30 | 422 | 504 | 250 | 665 | 96.5 | 97.7 | 98.0 | 97.9 | 1.5 | 2.5 | 1.8 | 3.8 | 50 |
| 45 | 660 | 745 | 300 | 740 | 97.2 | 98.2 | 98.4 | 98.5 | 1.0 | 2.1 | 1.8 | 4.0 | 50 |
| 75 | 1275 | 1450 | 400 | 945 | 97.7 | 98.6 | 98.8 | 98.8 | 0.8 | 1.6 | 1.7 | 3.4 | 55 |

Notes

^① Typical values for aluminum windings. Contact Eaton for values of copper windings. Up-to-date design data is available at www.eaton.com.

^② Actual impedance may be $\pm 7.5\%$.

^③ Type EPT transformers 3–15 kVA are T-T connected.

Performance data is based upon 480 volt Delta primary and a 208Y/120 volt secondary for three-phase transformers; 240 x 480 volt primary and a 120/240 volt secondary for single-phase transformers. All data is subject to future revision. Refer to Eaton for 5 kV class information. All data is subject to future revision.

Typical Data for DOE 2016 Energy-Efficient Low-Voltage Dry-Type Distribution Transformers, Aluminum Wound ^①

Type DS-3 150°C Rise DOE 2016 Single-Phase

| kVA | Frame | Weight | Losses in Watts | | Efficiency (T. Rise +20° C) | | | | % Regulation | | | % Impedance | | | Sound Level dB | DOE 2016 Efficiency | Practical Inrush |
|------|-------|--------|-----------------|----------------------|-----------------------------|----------|----------|-----------|--------------|----------|--------|-------------|------|----|----------------|---------------------|------------------|
| | | | No Load | Total at Rise +20° C | 1/4 Load | 1/2 Load | 3/4 Load | Full Load | 100% P.F. | 80% P.F. | % Imp. | % X | % R | | | | |
| 15 | 842A | 200 | 54 | 669 | 97.89 | 97.76 | 96.97 | 95.75 | 4.1 | 4.2 | 4.37 | 1.51 | 4.10 | 45 | 97.70 | 320 | |
| 25 | 842A | 275 | 74 | 1004 | 98.20 | 98.05 | 97.30 | 96.15 | 3.7 | 3.7 | 3.71 | 1.88 | 3.20 | 45 | 98.00 | 550 | |
| 37.5 | 843A | 310 | 78 | 1328 | 98.60 | 98.34 | 97.65 | 96.59 | 3.3 | 5.6 | 5.86 | 4.82 | 3.33 | 45 | 98.20 | 930 | |
| 50 | 843A | 390 | 105 | 2005 | 98.48 | 98.16 | 97.37 | 96.20 | 3.8 | 5.7 | 5.84 | 4.43 | 3.80 | 45 | 98.30 | 360 | |
| 75 | 844A | 650 | 180 | 2330 | 98.54 | 98.42 | 97.86 | 96.99 | 2.9 | 4.1 | 4.15 | 3.00 | 2.87 | 50 | 98.50 | 820 | |
| 100 | 844A | 690 | 208 | 3028 | 98.67 | 98.50 | 97.93 | 97.07 | 2.8 | 4.9 | 5.13 | 4.29 | 2.82 | 50 | 98.60 | 760 | |
| 167 | 814A | 1610 | 900 | 4887 | 98.60 | 98.70 | 98.40 | 98.00 | 1.40 | 6.80 | 9.70 | 9.50 | 1.80 | 55 | 98.70 | 416 | |

Type DS-3 115°C Rise DOE 2016 Single-Phase

| kVA | Frame | Weight | Losses in Watts | | Efficiency (T. Rise +20° C) | | | | % Regulation | | | % Impedance | | | Sound Level dB | DOE 2016 Efficiency | Practical Inrush |
|------|-------|--------|-----------------|----------------------|-----------------------------|----------|----------|-----------|--------------|----------|--------|-------------|------|----|----------------|---------------------|------------------|
| | | | No Load | Total at Rise +20° C | 1/4 Load | 1/2 Load | 3/4 Load | Full Load | 100% P.F. | 80% P.F. | % Imp. | % X | % R | | | | |
| 15 | 842A | 200 | 54 | 656 | 97.90 | 97.77 | 96.98 | 95.76 | 4.0 | 4.2 | 4.33 | 1.62 | 4.01 | 45 | 97.70 | 323 | |
| 25 | 842A | 275 | 74 | 984 | 98.21 | 98.06 | 97.31 | 96.16 | 3.6 | 3.2 | 3.67 | 0.50 | 3.64 | 45 | 98.00 | 556 | |
| 37.5 | 843A | 310 | 78 | 1301 | 98.61 | 98.35 | 97.66 | 96.60 | 3.3 | 5.5 | 5.80 | 4.80 | 3.26 | 45 | 98.20 | 939 | |
| 50 | 843A | 390 | 105 | 1965 | 98.49 | 98.17 | 97.38 | 96.21 | 3.7 | 5.7 | 5.78 | 4.43 | 3.72 | 45 | 98.30 | 364 | |
| 75 | 844A | 650 | 180 | 2283 | 98.55 | 98.43 | 97.87 | 97.00 | 2.8 | 4.1 | 4.11 | 3.00 | 2.80 | 50 | 98.50 | 828 | |

Type DS-3 80°C Rise DOE 2016 Single-Phase

| kVA | Frame | Weight | Losses in Watts | | Efficiency (T. Rise +20° C) | | | | % Regulation | | | % Impedance | | | Sound Level dB | DOE 2016 Efficiency | Practical Inrush |
|------|-------|--------|-----------------|----------------------|-----------------------------|----------|----------|-----------|--------------|----------|--------|-------------|------|----|----------------|---------------------|------------------|
| | | | No Load | Total at Rise +20° C | 1/4 Load | 1/2 Load | 3/4 Load | Full Load | 100% P.F. | 80% P.F. | % Imp. | % X | % R | | | | |
| 15 | 842A | 275 | 74 | 344 | 97.85 | 98.26 | 98.05 | 97.65 | 1.8 | 2.2 | 2.23 | 1.31 | 1.80 | 45 | 97.70 | 550 | |
| 25 | 843A | 310 | 78 | 678 | 98.40 | 98.58 | 98.34 | 97.96 | 2.4 | 3.8 | 3.91 | 3.08 | 2.40 | 45 | 98.00 | 930 | |
| 37.5 | 843A | 390 | 105 | 1010 | 98.28 | 98.44 | 98.16 | 97.73 | 2.4 | 4.1 | 4.38 | 3.66 | 2.41 | 45 | 98.20 | 360 | |
| 50 | 844A | 650 | 180 | 930 | 98.25 | 98.58 | 98.42 | 98.12 | 1.5 | 2.6 | 2.77 | 2.32 | 1.50 | 45 | 98.30 | 820 | |
| 75 | 844A | 690 | 208 | 1588 | 98.44 | 98.69 | 98.50 | 98.19 | 1.8 | 3.5 | 3.85 | 3.38 | 1.84 | 50 | 98.50 | 760 | |

Note

^① Typical values for aluminum windings. Contact Eaton for values of copper windings. Up-to-date design data is available at www.eaton.com.

Typical Data for DOE 2016 Energy-Efficient Low-Voltage Dry-Type Distribution Transformers—Aluminum Wound

Type DT-3 150°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 225 | 69 | 573 | 97.85 | 97.70 | 97.11 | 96.43 | 3.7 | 3.7 | 3.74 | 1.6 | 3.4 | 45 | 97.89 | 70 |
| 30 | 409 | 129 | 802 | 97.99 | 98.17 | 97.87 | 97.45 | 2.4 | 2.4 | 2.44 | 1.0 | 2.2 | 45 | 98.23 | 218 |
| 45 | 416 | 140 | 1287 | 98.37 | 98.25 | 97.80 | 97.27 | 3.3 | 3.5 | 3.51 | 2.4 | 2.5 | 45 | 98.40 | 165 |
| 75 | 570 | 210 | 1887 | 98.52 | 98.44 | 98.05 | 97.59 | 3.3 | 3.6 | 3.61 | 2.8 | 2.2 | 50 | 98.60 | 270 |
| 112.5 | 976 | 280 | 2516 | 98.70 | 98.63 | 98.28 | 97.86 | 3.9 | 4.3 | 4.37 | 3.9 | 2.0 | 50 | 98.74 | 302 |
| 150 | 1239 | 350 | 2983 | 98.77 | 98.74 | 98.44 | 98.08 | 3.1 | 3.4 | 3.46 | 3.0 | 1.8 | 50 | 98.83 | 516 |
| 225 | 1624 | 495 | 4118 | 98.86 | 98.84 | 98.57 | 98.24 | 3.8 | 4.2 | 4.29 | 4.0 | 1.6 | 55 | 98.94 | 721 |
| 300 | 2283 | 640 | 5236 | 98.98 | 98.92 | 98.65 | 98.33 | 3.9 | 4.3 | 4.45 | 4.2 | 1.5 | 55 | 99.02 | 731 |

Type DT-3 115°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 231 | 65 | 521 | 97.94 | 97.86 | 97.35 | 96.74 | 3.4 | 3.5 | 3.54 | 1.8 | 3.0 | 45 | 97.89 | 70 |
| 30 | 420 | 122 | 691 | 98.10 | 98.35 | 98.12 | 97.79 | 2.1 | 2.2 | 2.21 | 1.1 | 1.9 | 45 | 98.23 | 196 |
| 45 | 429 | 140 | 1217 | 98.40 | 98.32 | 97.91 | 97.42 | 3.5 | 3.8 | 3.81 | 3.0 | 2.4 | 45 | 98.40 | 146 |
| 75 | 605 | 210 | 1816 | 98.58 | 98.50 | 98.13 | 97.69 | 3.5 | 3.8 | 3.82 | 3.2 | 2.1 | 50 | 98.60 | 244 |
| 112.5 | 982 | 260 | 2436 | 98.73 | 98.66 | 98.32 | 97.91 | 4.0 | 4.4 | 4.53 | 4.1 | 1.9 | 50 | 98.74 | 265 |
| 150 | 1253 | 350 | 3014 | 98.76 | 98.72 | 98.42 | 98.06 | 3.5 | 3.9 | 3.97 | 3.6 | 1.8 | 50 | 98.83 | 447 |
| 225 | 1633 | 495 | 3757 | 98.90 | 98.91 | 98.68 | 98.39 | 4.7 | 5.1 | 5.3 | 5.1 | 1.4 | 55 | 98.94 | 610 |
| 300 | 2283 | 600 | 4668 | 98.99 | 98.99 | 98.77 | 98.50 | 3.9 | 4.4 | 4.52 | 4.3 | 1.4 | 55 | 99.02 | 675 |

Type DT-3 80°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 237 | 65 | 508 | 97.97 | 97.90 | 97.41 | 96.82 | 3.6 | 3.8 | 3.81 | 2.4 | 3.0 | 45 | 97.89 | 70 |
| 30 | 433 | 140 | 557 | 98.13 | 98.54 | 98.46 | 98.25 | 1.9 | 2.1 | 2.15 | 1.6 | 1.4 | 45 | 98.23 | 165 |
| 45 | 570 | 210 | 724 | 98.25 | 98.70 | 98.66 | 98.51 | 1.7 | 2.0 | 2.04 | 1.7 | 1.1 | 50 | 98.40 | 270 |
| 75 | 982 | 256 | 1104 | 98.58 | 98.87 | 98.78 | 98.60 | 2.3 | 2.7 | 2.75 | 2.5 | 1.1 | 50 | 98.60 | 302 |
| 112.5 | 1274 | 365 | 1701 | 98.66 | 98.90 | 98.78 | 98.57 | 2.2 | 2.5 | 2.62 | 2.3 | 1.2 | 50 | 98.74 | 516 |
| 150 | 1628 | 414 | 1781 | 98.74 | 99.03 | 98.98 | 98.85 | 2.4 | 2.8 | 2.9 | 2.8 | 0.9 | 55 | 98.83 | 721 |
| 225 | 2207 | 761 | 3337 | 98.84 | 98.99 | 98.86 | 98.65 | 2.7 | 3.1 | 3.17 | 3.0 | 1.1 | 55 | 98.94 | 731 |
| 300 | 2283 | 565 | 3642 | 99.00 | 99.12 | 98.99 | 98.80 | 3.8 | 4.3 | 4.51 | 4.4 | 1.0 | 60 | 99.02 | 694 |

Typical Data for DOE 2016 Energy-Efficient Low-Voltage Dry-Type Distribution Transformers—Aluminum Wound

Type KT-4 150°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Trise +20°C | X Trise +20°C | R Trise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|--------------------|---------------|---------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 407 | 91 | 324 | 97.51 | 98.18 | 98.15 | 97.96 | 1.7 | 1.8 | 1.77 | 0.9 | 1.6 | 45 | 97.89 | 70 |
| 30 | 437 | 122 | 755 | 98.08 | 98.26 | 97.98 | 97.59 | 2.5 | 2.7 | 2.66 | 1.6 | 2.1 | 45 | 98.23 | 196 |
| 45 | 439 | 140 | 1323 | 98.35 | 98.21 | 97.74 | 97.19 | 3.9 | 4.2 | 4.18 | 3.2 | 2.6 | 45 | 98.40 | 146 |
| 75 | 599 | 210 | 1971 | 98.53 | 98.40 | 97.98 | 97.49 | 3.7 | 4.0 | 4.05 | 3.3 | 2.3 | 50 | 98.60 | 244 |
| 112.5 | 987 | 365 | 1833 | 98.60 | 98.82 | 98.69 | 98.45 | 2.6 | 3.0 | 3.07 | 2.8 | 1.3 | 50 | 98.74 | 265 |
| 150 | 1637 | 495 | - | - | - | - | - | - | - | - | - | - | 55 | 98.83 | 447 |
| 225 | 1642 | 471 | 3944 | 98.88 | 98.87 | 98.61 | 98.30 | 4.8 | 5.3 | 5.43 | 5.2 | 1.5 | 55 | 98.94 | 610 |
| 300 | 2394 | 600 | 5069 | 98.99 | 98.94 | 98.68 | 98.38 | 4.4 | 4.8 | 4.99 | 4.8 | 1.5 | 55 | 99.02 | 675 |

Type KT-4 115°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Trise +20°C | X Trise +20°C | R Trise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|--------------------|---------------|---------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 402 | 91 | 294 | 97.48 | 98.24 | 98.27 | 98.13 | 1.6 | 1.7 | 1.7 | 1.0 | 1.4 | 45 | 97.89 | 136 |
| 30 | 415 | 122 | 695 | 98.12 | 98.35 | 98.12 | 97.78 | 2.2 | 2.4 | 2.38 | 1.4 | 1.9 | 45 | 98.23 | 196 |
| 45 | 619 | 193 | 784 | 98.18 | 98.60 | 98.53 | 98.34 | 2.0 | 2.3 | 2.34 | 1.9 | 1.3 | 50 | 98.40 | 244 |
| 75 | 984 | 260 | 1343 | 98.49 | 98.71 | 98.55 | 98.29 | 2.8 | 3.2 | 3.25 | 2.9 | 1.4 | 50 | 98.60 | 265 |
| 112.5 | 1236 | 365 | 1687 | 98.62 | 98.88 | 98.78 | 98.57 | 2.5 | 2.9 | 2.98 | 2.7 | 1.2 | 50 | 98.74 | 447 |
| 150 | 1662 | 495 | 1974 | 98.65 | 98.96 | 98.90 | 98.75 | 3.0 | 3.4 | 3.57 | 3.4 | 1.0 | 55 | 98.83 | 610 |
| 225 | 2353 | 542 | 3005 | 98.88 | 99.03 | 98.91 | 98.71 | 3.1 | 3.5 | 3.68 | 3.5 | 1.1 | 55 | 98.94 | 675 |
| 300 | 2198 | 582 | 4188 | 98.88 | 99.00 | 98.84 | 98.61 | 3.2 | 3.6 | 3.73 | 3.5 | 1.2 | 55 | 99.02 | 1027 |

Type KT-4 80°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Trise +20°C | X Trise +20°C | R Trise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|--------------------|---------------|---------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 254 | 65 | 543 | 97.71 | 97.69 | 97.17 | 96.55 | 3.6 | 3.7 | 3.67 | 1.8 | 3.2 | 45 | 97.89 | 58 |
| 30 | 437 | 140 | 591 | 98.12 | 98.50 | 98.38 | 98.15 | 2.2 | 2.5 | 2.52 | 2.0 | 1.5 | 45 | 98.23 | 146 |
| 45 | 619 | 180 | 730 | 98.32 | 98.71 | 98.64 | 98.45 | 2.0 | 2.3 | 2.36 | 2.0 | 1.2 | 50 | 98.40 | 244 |
| 75 | 1027 | 260 | 1159 | 98.49 | 98.80 | 98.70 | 98.51 | 2.7 | 3.1 | 3.18 | 2.9 | 1.2 | 50 | 98.60 | 265 |
| 112.5 | 1643 | 444 | 1213 | 98.50 | 99.00 | 99.06 | 98.99 | 2.1 | 2.5 | 2.64 | 2.5 | 0.7 | 55 | 98.74 | 610 |
| 150 | 1710 | 408 | 1853 | 98.86 | 99.07 | 98.98 | 98.82 | 2.9 | 3.4 | 3.52 | 3.4 | 1.0 | 55 | 98.83 | 611 |
| 225 | 2680 | 621 | 2405 | 98.78 | 99.09 | 99.07 | 98.96 | 3.0 | 3.5 | 3.67 | 3.6 | 0.8 | 60 | 98.94 | 757 |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Typical Data for DOE 2016 Energy-Efficient Low-Voltage Dry-Type Distribution Transformers—Aluminum Wound

2

Type KT-9 150°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 406 | 91 | 315 | 97.52 | 98.20 | 98.19 | 98.01 | 1.6 | 1.7 | 1.68 | 0.8 | 1.5 | 45 | 97.89 | 70 |
| 30 | 416 | 122 | 770 | 98.04 | 98.22 | 97.94 | 97.54 | 2.4 | 2.5 | 2.47 | 1.2 | 2.2 | 45 | 98.23 | 196 |
| 45 | 594 | 193 | 817 | 98.18 | 98.57 | 98.48 | 98.27 | 2.1 | 2.4 | 2.4 | 2.0 | 1.4 | 50 | 98.40 | 244 |
| 75 | 1012 | 256 | 1323 | 98.49 | 98.72 | 98.56 | 98.31 | 3.0 | 3.4 | 3.5 | 3.2 | 1.4 | 50 | 98.60 | 265 |
| 112.5 | 1297 | 365 | 1907 | 98.59 | 98.80 | 98.65 | 98.39 | 2.7 | 3.1 | 3.18 | 2.9 | 1.4 | 50 | 98.74 | 447 |
| 150 | 1652 | 385 | 1840 | 98.87 | 99.07 | 98.98 | 98.82 | 3.0 | 3.4 | 3.61 | 3.5 | 1.0 | 50 | 98.83 | — |
| 225 | 2379 | 617 | 3346 | 98.82 | 98.96 | 98.81 | 98.59 | 3.1 | 3.6 | 3.7 | 3.5 | 1.2 | 55 | 98.94 | 618.48 |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Type KT-9 115°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 412 | 91 | 290 | 97.58 | 98.29 | 98.32 | 98.17 | 1.5 | 1.6 | 1.61 | 0.9 | 1.3 | 45 | 97.89 | — |
| 30 | 437 | 140 | 636 | 98.04 | 98.40 | 98.26 | 97.99 | 2.6 | 2.9 | 2.98 | 2.5 | 1.7 | 45 | 98.23 | 196 |
| 45 | 619 | 193 | 772 | 98.20 | 98.62 | 98.55 | 98.36 | 2.0 | 2.3 | 2.29 | 1.9 | 1.3 | 50 | 98.40 | 244 |
| 75 | 977 | 260 | 1226 | 98.50 | 98.77 | 98.66 | 98.44 | 2.6 | 3.0 | 3.11 | 2.8 | 1.3 | 50 | 98.60 | 265 |
| 112.5 | 1760 | 495 | 1369 | 98.41 | 98.93 | 98.97 | 98.89 | 2.1 | 2.6 | 2.7 | 2.6 | 0.8 | 55 | 98.74 | — |
| 150 | 1800 | 489 | 1911 | 98.80 | 99.05 | 98.98 | 98.82 | 3.0 | 3.5 | 3.64 | 3.5 | 0.9 | 55 | 98.83 | 610 |
| 225 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Type KT-9 80°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 30 | 435 | 140 | 617 | 98.14 | 98.48 | 98.33 | 98.07 | 2.4 | 2.7 | 2.7 | 2.2 | 1.6 | 45 | 98.23 | — |
| 45 | 927 | 221 | 554 | 97.89 | 98.67 | 98.81 | 98.78 | 1.4 | 1.7 | 1.82 | 1.7 | 0.7 | 50 | 98.40 | 244 |
| 75 | 1098 | 288 | 883 | 98.42 | 98.91 | 98.95 | 98.87 | 1.6 | 1.9 | 2.01 | 1.8 | 0.8 | 50 | 98.60 | 447 |
| 112.5 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 150 | 2416 | 515 | 1537 | 98.70 | 99.10 | 99.12 | 99.04 | 1.8 | 2.2 | 2.3 | 2.2 | 0.7 | 55 | 98.83 | 675 |
| 225 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Typical Data for DOE 2016 Energy-Efficient Low-Voltage Dry-Type Distribution Transformers—Aluminum Wound

Type KT-13 150°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 406 | 91 | 315 | 97.52 | 98.20 | 98.19 | 98.01 | 1.6 | 1.7 | 1.68 | 0.8 | 1.5 | 45 | 97.89 | 70 |
| 30 | 416 | 122 | 770 | 98.04 | 98.22 | 97.94 | 97.54 | 2.4 | 2.5 | 2.47 | 1.2 | 2.2 | 45 | 98.23 | 196 |
| 45 | 594 | 193 | 817 | 98.18 | 98.57 | 98.48 | 98.27 | 2.1 | 2.4 | 2.4 | 2.0 | 1.4 | 53 | 98.40 | 244 |
| 75 | 1012 | 256 | 1323 | 98.49 | 98.72 | 98.56 | 98.31 | 3.0 | 3.4 | 3.5 | 3.2 | 1.4 | 53 | 98.60 | 265 |
| 112.5 | 1297 | 365 | 1907 | 98.59 | 98.80 | 98.65 | 98.39 | 2.7 | 3.1 | 3.18 | 2.9 | 1.4 | 53 | 98.74 | 447 |
| 150 | 1425 | 415 | 2050 | 98.72 | 98.96 | 98.86 | 98.68 | 3.1 | 3.5 | 3.64 | 3.5 | 1.1 | 53 | 98.83 | 610 |
| 225 | 2341 | 600 | 3072 | 98.86 | 99.02 | 98.89 | 98.70 | 3.2 | 3.6 | 3.75 | 3.6 | 1.1 | 58 | 98.94 | 675 |
| 300 | 2400 | 676 | 4090 | 98.91 | 99.03 | 98.89 | 98.68 | 4.1 | 4.6 | 4.78 | 4.6 | 1.1 | 63 | 99.02 | 526 |

Type KT-13 115°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 412 | 91 | 290 | 97.58 | 98.29 | 98.32 | 98.17 | 1.5 | 1.6 | 1.61 | 0.9 | 1.3 | 45 | 97.89 | 136 |
| 30 | 437 | 140 | 636 | 98.04 | 98.40 | 98.26 | 97.99 | 2.6 | 2.9 | 2.98 | 2.5 | 1.7 | 48 | 98.23 | 196 |
| 45 | 619 | 193 | 772 | 98.20 | 98.62 | 98.55 | 98.36 | 2.0 | 2.3 | 2.29 | 1.9 | 1.3 | 53 | 98.40 | 244 |
| 75 | 977 | 260 | 1226 | 98.50 | 98.77 | 98.66 | 98.44 | 2.6 | 3.0 | 3.11 | 2.8 | 1.3 | 53 | 98.60 | 265 |
| 112.5 | 1760 | 495 | 1369 | 98.41 | 98.93 | 98.97 | 98.89 | 2.1 | 2.6 | 2.7 | 2.6 | 0.8 | 58 | 98.74 | 610 |
| 150 | 1800 | 489 | 1911 | 98.80 | 99.05 | 98.98 | 98.82 | 3.0 | 3.5 | 3.64 | 3.5 | 0.9 | 58 | 98.83 | 610 |
| 225 | 1927 | 570 | - | - | - | - | - | - | - | - | - | - | 63 | 98.94 | - |
| 300 | 2894 | 620 | 4300 | 98.91 | 99.00 | 98.83 | 98.60 | 4.8 | 5.3 | 5.52 | 5.4 | 1.2 | 63 | 99.02 | 577.55 |

Type KT-13 80°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 30 | 435 | 140 | 617 | 98.14 | 98.48 | 98.33 | 98.07 | 2.4 | 2.7 | 2.7 | 2.2 | 1.6 | 48 | 98.23 | 244 |
| 45 | 927 | 221 | 554 | 97.89 | 98.67 | 98.81 | 98.78 | 1.4 | 1.7 | 1.82 | 1.7 | 0.7 | 53 | 98.40 | 344 |
| 75 | 1098 | 288 | 883 | 98.42 | 98.91 | 98.95 | 98.87 | 1.6 | 1.9 | 2.01 | 1.8 | 0.8 | 53 | 98.60 | 447 |
| 112.5 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 150 | 2416 | 515 | 1537 | 98.70 | 99.10 | 99.12 | 99.04 | 1.8 | 2.2 | 2.3 | 2.2 | 0.7 | 58 | 98.83 | 675 |
| 225 | 2816 | 757 | 2649 | 98.85 | 99.11 | 99.06 | 98.93 | 2.9 | 3.4 | 3.55 | 3.4 | 0.8 | 63 | 98.94 | 642 |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Typical Data for DOE 2016 Energy-Efficient Low-Voltage Dry-Type Distribution Transformers—Copper Wound

2

Type DS-3 150°C Rise DOE 2016 Single-Phase

| kVA | Frame | Weight | Losses in Watts | | Efficiency (T. Rise +20° C) | | | | % Regulation | | % Impedance | | | Sound Level dB | DOE 2016 Efficiency | Practical Inrush |
|------|-------|--------|-----------------|----------------------|-----------------------------|----------|----------|-----------|--------------|----------|-------------|------|------|----------------|---------------------|------------------|
| | | | No Load | Total at Rise +20° C | 1/4 Load | 1/2 Load | 3/4 Load | Full Load | 100% P.F. | 80% P.F. | % Imp. | % X | % R | | | |
| 15 | 842A | 216 | 54 | 480 | 98.06 | 98.16 | 97.68 | 96.92 | 2.7 | 3.2 | 3.26 | 1.60 | 2.84 | 45 | 97.70 | 335 |
| 25 | 842A | 295 | 74 | 961 | 98.32 | 98.32 | 97.80 | 96.98 | 2.6 | 2.9 | 2.98 | 1.22 | 2.72 | 45 | 98.00 | 267 |
| 37.5 | 843A | 440 | 78 | 1254 | 98.60 | 98.36 | 97.71 | 96.77 | 3.1 | 5.5 | 5.83 | 4.91 | 3.14 | 45 | 98.20 | 588 |
| 50 | 843A | 450 | 105 | 1544 | 98.60 | 98.41 | 97.78 | 96.83 | 2.8 | 4.1 | 4.13 | 2.96 | 2.88 | 45 | 98.30 | 472 |
| 75 | 844A | 890 | 180 | 2129 | 98.58 | 98.52 | 98.02 | 97.25 | 2.1 | 3.5 | 3.47 | 2.30 | 2.60 | 50 | 98.50 | 919 |
| 100 | 844A | 950 | 208 | 2843 | 98.78 | 98.73 | 98.33 | 97.71 | 1.8 | 4.2 | 4.32 | 3.42 | 2.64 | 50 | 98.60 | 828 |
| 167 | 814A | 1665 | 570 | 3094 | 98.70 | 98.80 | 98.60 | 98.30 | 1.50 | 6.30 | 9.00 | 8.80 | 1.50 | 55 | 98.70 | 955 |

Type DS-3 115°C Rise DOE 2016 Single-Phase

| kVA | Frame | Weight | Losses in Watts | | Efficiency (T. Rise +20° C) | | | | % Regulation | | % Impedance | | | Sound Level dB | DOE 2016 Efficiency | Practical Inrush |
|------|-------|--------|-----------------|----------------------|-----------------------------|----------|----------|-----------|--------------|----------|-------------|------|------|----------------|---------------------|------------------|
| | | | No Load | Total at Rise +20° C | 1/4 Load | 1/2 Load | 3/4 Load | Full Load | 100% P.F. | 80% P.F. | % Imp. | % X | % R | | | |
| 15 | 842A | 218 | 54 | 470 | 98.07 | 98.17 | 97.69 | 96.93 | 2.8 | 3.2 | 3.23 | 1.65 | 2.78 | 45 | 97.70 | 247 |
| 25 | 842A | 300 | 74 | 942 | 98.33 | 98.33 | 97.81 | 96.99 | 3.5 | 2.7 | 2.95 | 0.64 | 2.88 | 45 | 98.00 | 1162 |
| 37.5 | 843A | 450 | 78 | 1229 | 98.61 | 98.37 | 97.72 | 96.78 | 3.1 | 5.4 | 5.77 | 4.89 | 3.07 | 45 | 98.20 | 338 |
| 50 | 843A | 464 | 105 | 1513 | 98.61 | 98.42 | 97.79 | 96.84 | 2.8 | 4.1 | 4.09 | 2.96 | 2.82 | 45 | 98.30 | 780 |
| 75 | 844A | 900 | 180 | 2086 | 98.59 | 98.53 | 98.03 | 97.26 | 2.5 | 3.4 | 3.44 | 2.31 | 2.54 | 50 | 98.50 | 1041 |

Type DS-3 80°C Rise DOE 2016 Single-Phase

| kVA | Frame | Weight | Losses in Watts | | Efficiency (T. Rise +20° C) | | | | % Regulation | | % Impedance | | | Sound Level dB | DOE 2016 Efficiency | Practical Inrush |
|------|-------|--------|-----------------|----------------------|-----------------------------|----------|----------|-----------|--------------|----------|-------------|------|------|----------------|---------------------|------------------|
| | | | No Load | Total at Rise +20° C | 1/4 Load | 1/2 Load | 3/4 Load | Full Load | 100% P.F. | 80% P.F. | % Imp. | % X | % R | | | |
| 15 | 842A | 295 | 74 | 284 | 97.92 | 98.43 | 98.32 | 98.04 | 1.4 | 1.8 | 1.79 | 1.11 | 1.40 | 45 | 97.70 | 588 |
| 25 | 843A | 440 | 78 | 373 | 98.40 | 98.59 | 98.36 | 98.00 | 1.2 | 3.2 | 3.89 | 3.70 | 1.18 | 45 | 98.00 | 472 |
| 37.5 | 843A | 450 | 105 | 456 | 98.35 | 98.61 | 98.41 | 98.07 | 0.9 | 2.5 | 3.10 | 2.95 | 0.94 | 45 | 98.20 | 919 |
| 50 | 844A | 890 | 180 | 755 | 98.28 | 98.65 | 98.52 | 98.26 | 1.2 | 2.1 | 2.31 | 2.01 | 1.15 | 45 | 98.30 | 828 |
| 75 | 844A | 950 | 208 | 856 | 98.51 | 98.84 | 98.73 | 98.52 | 0.9 | 2.6 | 3.24 | 3.12 | 0.86 | 50 | 98.50 | 955 |

Typical Data for DOE 2016 Energy-Efficient Low-Voltage Dry-Type Distribution Transformers—Copper Wound

Type DT-3 150°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Trise +20°C | X Trise +20°C | R Trise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|--------------------|---------------|---------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 250 | 75 | 467 | 97.83 | 97.95 | 97.58 | 97.08 | 2.9 | 3.0 | 3.00 | 1.5 | 2.6 | 45 | 97.89 | 109 |
| 30 | 415 | 119 | 823 | 98.03 | 98.15 | 97.81 | 97.37 | 2.5 | 2.5 | 2.56 | 1.0 | 2.3 | 45 | 98.23 | 262 |
| 45 | 478 | 123 | 1288 | 98.44 | 98.27 | 97.80 | 97.26 | 3.2 | 3.4 | 3.44 | 2.3 | 2.6 | 45 | 98.40 | 181 |
| 75 | 676 | 210 | 1937 | 98.52 | 98.41 | 98.01 | 97.53 | 3.0 | 3.2 | 3.21 | 2.2 | 2.3 | 50 | 98.60 | 399 |
| 112.5 | 1263 | 270 | 2474 | 98.73 | 98.65 | 98.31 | 97.89 | 3.3 | 3.6 | 3.63 | 3.1 | 2.0 | 50 | 98.74 | 351 |
| 150 | 1410 | 360 | 2861 | 98.78 | 98.77 | 98.50 | 98.16 | 3.0 | 3.3 | 3.39 | 3.0 | 1.7 | 50 | 98.83 | 597 |
| 225 | 1883 | 420 | 4815 | 98.88 | 98.72 | 98.35 | 97.93 | 4.6 | 5.0 | 5.14 | 4.8 | 2.0 | 55 | 98.94 | 540 |
| 300 | 2485 | 515 | 5475 | 98.92 | 98.85 | 98.56 | 98.21 | 3.7 | 4.1 | 4.21 | 3.9 | 1.7 | 55 | 99.02 | 858 |

Type DT-3 115°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Trise +20°C | X Trise +20°C | R Trise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|--------------------|---------------|---------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 241 | 75 | 445 | 97.89 | 98.03 | 97.69 | 97.23 | 2.7 | 2.8 | 2.77 | 1.3 | 2.5 | 45 | 97.89 | 109 |
| 30 | 433 | 116 | 747 | 98.09 | 98.27 | 97.99 | 97.60 | 2.2 | 2.3 | 2.3 | 0.9 | 2.1 | 45 | 98.23 | 235 |
| 45 | 471 | 123 | 1208 | 98.48 | 98.35 | 97.92 | 97.42 | 3.2 | 3.5 | 3.46 | 2.5 | 2.4 | 45 | 98.40 | 170 |
| 75 | 665 | 214 | 1758 | 98.53 | 98.51 | 98.17 | 97.75 | 2.7 | 3.0 | 2.97 | 2.1 | 2.1 | 50 | 98.60 | 378 |
| 112.5 | 1271 | 270 | 2336 | 98.72 | 98.69 | 98.38 | 98.00 | 3.5 | 3.9 | 4 | 3.6 | 1.8 | 50 | 98.74 | 307 |
| 150 | 1422 | 360 | 2156 | 98.90 | 99.00 | 98.84 | 98.62 | 3.0 | 3.4 | 3.56 | 3.4 | 1.2 | 50 | 98.83 | 546 |
| 225 | 2082 | 420 | 4567 | 98.90 | 98.77 | 98.43 | 98.03 | 4.8 | 5.3 | 5.41 | 5.1 | 1.8 | 55 | 98.94 | 455 |
| 300 | 2568 | 570 | 5416 | 98.93 | 98.87 | 98.58 | 98.25 | 4.2 | 4.7 | 4.8 | 4.5 | 1.6 | 55 | 99.02 | 707 |

Type DT-3 80°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Trise +20°C | X Trise +20°C | R Trise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|--------------------|---------------|---------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 239 | 75 | 439 | 97.89 | 98.05 | 97.72 | 97.26 | 2.8 | 3.0 | 2.96 | 1.7 | 2.4 | 45 | 97.89 | 92 |
| 30 | 466 | 205 | 645 | 98.26 | 98.58 | 98.46 | 98.22 | 1.9 | 2.1 | 2.06 | 1.4 | 1.5 | 45 | 98.23 | 181 |
| 45 | 667 | 210 | 773 | 98.30 | 98.68 | 98.61 | 98.42 | 1.7 | 1.9 | 1.95 | 1.5 | 1.3 | 50 | 98.40 | 399 |
| 75 | 1147 | 270 | 1162 | 98.47 | 98.79 | 98.71 | 98.52 | 2.2 | 2.6 | 2.68 | 2.4 | 1.2 | 50 | 98.60 | 351 |
| 112.5 | 1385 | 360 | 1631 | 98.66 | 98.92 | 98.82 | 98.62 | 2.2 | 2.6 | 2.69 | 2.4 | 1.1 | 50 | 98.74 | 597 |
| 150 | 1895 | 420 | 2287 | 98.74 | 98.91 | 98.76 | 98.54 | 2.9 | 3.4 | 3.48 | 3.2 | 1.2 | 55 | 98.83 | 540 |
| 225 | 2385 | 513 | 2854 | 98.89 | 99.06 | 98.94 | 98.76 | 2.6 | 3.1 | 3.2 | 3.0 | 1.0 | 55 | 98.94 | 707 |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Typical Data for DOE 2016 Energy-Efficient Low-Voltage Dry-Type Distribution Transformers—Copper Wound

2

Type KT-4 150°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 418 | 86.17 | 351 | 97.62 | 98.15 | 98.05 | 97.79 | 1.9 | 1.9 | 1.9 | 0.7 | 1.8 | 45 | 97.89 | 154 |
| 30 | 458 | 123 | 644 | 98.13 | 98.42 | 98.24 | 97.94 | 2.2 | 2.4 | 2.38 | 1.6 | 1.7 | 45 | 98.23 | 170 |
| 45 | 480 | 123 | 757 | 98.17 | 98.56 | 98.47 | 98.25 | 3.0 | 3.4 | 3.52 | 3.2 | 1.4 | 45 | 98.40 | 168 |
| 75 | 1274 | 270 | 1063 | 98.58 | 98.90 | 98.83 | 98.67 | 1.7 | 2.0 | 2.05 | 1.8 | 1.1 | 50 | 98.60 | 307 |
| 112.5 | 1818 | 360 | 1667 | 98.63 | 98.88 | 98.78 | 98.58 | 2.1 | 2.5 | 2.56 | 2.3 | 1.2 | 50 | 98.74 | 546 |
| 150 | 2105 | 439 | 2394 | 98.71 | 98.87 | 98.71 | 98.48 | 3.4 | 3.8 | 3.98 | 3.8 | 1.3 | 55 | 98.83 | 455 |
| 225 | 2674 | 570 | 3032 | 98.89 | 99.04 | 98.91 | 98.71 | 3.2 | 3.6 | 3.76 | 3.6 | 1.1 | 55 | 98.94 | 707 |
| 300 | 2737 | 570 | 5057 | 98.99 | 98.94 | 98.68 | 98.37 | 4.6 | 5.0 | 5.2 | 5.0 | 1.5 | 55 | 99.02 | 720 |

Type KT-4 115°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 414 | 86 | 338 | 97.50 | 98.12 | 98.06 | 97.83 | 1.9 | 2.0 | 1.98 | 1.1 | 1.7 | 45 | 97.89 | 154.39 |
| 30 | 417 | 123 | 642 | 98.15 | 98.44 | 98.25 | 97.95 | 2.1 | 2.3 | 2.31 | 1.5 | 1.7 | 45 | 98.23 | 170 |
| 45 | 684 | 190 | 777 | 98.21 | 98.62 | 98.55 | 98.35 | 1.5 | 1.7 | 1.7 | 1.1 | 1.3 | 50 | 98.40 | 378 |
| 75 | 1083 | 270 | 1147 | 98.62 | 98.88 | 98.77 | 98.58 | 1.9 | 2.2 | 2.24 | 1.9 | 1.2 | 50 | 98.60 | 307 |
| 112.5 | 1394 | 350 | 1673 | 98.60 | 98.87 | 98.77 | 98.57 | 2.3 | 2.7 | 2.74 | 2.5 | 1.2 | 50 | 98.74 | 546 |
| 150 | 2103 | 420 | 2260 | 98.74 | 98.91 | 98.77 | 98.55 | 3.5 | 3.9 | 4.1 | 3.9 | 1.2 | 55 | 98.83 | 455 |
| 225 | 2150 | 570 | 2966 | 98.88 | 99.04 | 98.92 | 98.73 | 3.0 | 3.4 | 3.6 | 3.4 | 1.1 | 55 | 98.94 | 707 |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Type KT-4 80°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 30 | 482 | 110 | 556 | 98.24 | 98.57 | 98.44 | 98.19 | 1.9 | 2.1 | 2.12 | 1.5 | 1.5 | 45 | 98.23 | 170 |
| 45 | 669 | 195 | 704 | 98.21 | 98.69 | 98.66 | 98.51 | 1.4 | 1.6 | 1.57 | 1.1 | 1.1 | 50 | 98.40 | 378 |
| 75 | 1210 | 243 | 1124 | 98.49 | 98.81 | 98.72 | 98.54 | 2.4 | 2.7 | 2.83 | 2.6 | 1.2 | 50 | 98.60 | 307 |
| 112.5 | 1287 | 360 | 1653 | 98.65 | 98.91 | 98.80 | 98.60 | 2.3 | 2.7 | 2.76 | 2.5 | 1.1 | 50 | 98.74 | 546 |
| 150 | 2138 | 420 | 1610 | 98.85 | 99.13 | 99.09 | 98.98 | 2.8 | 3.3 | 3.47 | 3.4 | 0.8 | 55 | 98.83 | 455 |
| 225 | 2727 | 584 | 2996 | 98.88 | 99.04 | 98.92 | 98.73 | 3.1 | 3.5 | 3.7 | 3.5 | 1.1 | 55 | 98.94 | 693.89 |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Typical Data for DOE 2016 Energy-Efficient Low-Voltage Dry-Type Distribution Transformers—Copper Wound

Type KT-9 150°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Trise +20°C | X Trise +20°C | R Trise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|--------------------|---------------|---------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 430 | 116 | 306 | 97.53 | 98.29 | 98.34 | 98.21 | 1.4 | 1.5 | 1.51 | 0.8 | 1.3 | 45 | 97.89 | — |
| 30 | 505 | 118 | 667 | 98.19 | 98.42 | 98.20 | 97.87 | 2.3 | 2.5 | 2.48 | 1.7 | 1.8 | 45 | 98.23 | — |
| 45 | 699 | 190 | 837 | 98.12 | 98.52 | 98.43 | 98.21 | 1.8 | 2.0 | 1.96 | 1.3 | 1.4 | 50 | 98.40 | — |
| 75 | 1103 | 245 | 1284 | 98.51 | 98.74 | 98.59 | 98.35 | 2.5 | 2.8 | 2.88 | 2.5 | 1.4 | 50 | 98.60 | — |
| 112.5 | 1424 | 380 | 1566 | 98.68 | 98.96 | 98.88 | 98.70 | 1.9 | 2.2 | 2.28 | 2.0 | 1.1 | 50 | 98.74 | 546 |
| 150 | 2132 | 418 | 2337 | 98.80 | 98.93 | 98.76 | 98.52 | 3.1 | 3.5 | 3.65 | 3.4 | 1.3 | 55 | 98.83 | 455 |
| 225 | 2628 | 561 | 3130 | 98.83 | 98.99 | 98.86 | 98.65 | 3.1 | 3.5 | 3.64 | 3.5 | 1.1 | 55 | 98.94 | — |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Type KT-9 115°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Trise +20°C | X Trise +20°C | R Trise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|--------------------|---------------|---------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 398 | 116 | — | — | — | — | — | — | — | — | — | — | 45 | 97.89 | — |
| 30 | 478 | 123 | 612 | 98.28 | 98.54 | 98.36 | 98.07 | 1.9 | 2.1 | 2.1 | 1.3 | 1.6 | 45 | 98.23 | 170 |
| 45 | 658 | 190 | 773 | 98.17 | 98.61 | 98.54 | 98.35 | 1.6 | 1.8 | 1.82 | 1.3 | 1.3 | 50 | 98.40 | 378 |
| 75 | 1115 | 250 | 1245 | 98.48 | 98.74 | 98.62 | 98.40 | 2.4 | 2.7 | 2.8 | 2.5 | 1.3 | 50 | 98.60 | 307 |
| 112.5 | 2150 | 337 | 1589 | 98.64 | 98.91 | 98.82 | 98.63 | 3.1 | 3.5 | 3.65 | 3.5 | 1.1 | 55 | 98.74 | — |
| 150 | 2200 | 418 | 2488 | 98.72 | 98.85 | 98.67 | 98.41 | 3.4 | 3.8 | 3.9 | 3.6 | 1.4 | 55 | 98.83 | 455 |
| 225 | 3043 | 695 | 2226 | 98.78 | 99.14 | 99.15 | 99.07 | 2.9 | 3.4 | 3.56 | 3.5 | 0.7 | 55 | 98.94 | — |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Type KT-9 80°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Trise +20°C | X Trise +20°C | R Trise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|--------------------|---------------|---------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 434 | 116 | 263 | 97.66 | 98.46 | 98.57 | 98.51 | 1.1 | 1.2 | 1.17 | 0.6 | 1.0 | 45 | 97.89 | — |
| 30 | 507 | 110 | 546 | 98.24 | 98.58 | 98.46 | 98.22 | 1.9 | 2.1 | 2.1 | 1.5 | 1.5 | 45 | 98.23 | 170 |
| 45 | 703 | 146 | 850 | 98.43 | 98.63 | 98.45 | 98.17 | 2.2 | 2.4 | 2.45 | 1.9 | 1.6 | 50 | 98.40 | — |
| 75 | 1112 | 290 | 1004 | 98.46 | 98.87 | 98.86 | 98.73 | 2.2 | 2.6 | 2.68 | 2.5 | 1.0 | 50 | 98.60 | 307 |
| 112.5 | 1927 | 380 | — | — | — | — | — | — | — | — | — | — | 50 | 98.74 | — |
| 150 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 225 | 3345 | 695 | 2031 | 98.86 | 99.20 | 99.22 | 99.16 | 2.8 | 3.3 | 3.5 | 3.4 | 0.6 | — | 98.94 | — |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Typical Data for DOE 2016 Energy-Efficient Low-Voltage Dry-Type Distribution Transformers—Copper Wound

Type KT-13 150°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 430 | 116 | 306 | 97.53 | 98.29 | 98.34 | 98.21 | 1.4 | 1.5 | 1.51 | 0.8 | 1.3 | 45 | 97.89 | 235 |
| 30 | 480 | 118 | 652 | 98.19 | 98.44 | 98.23 | 97.91 | 2.3 | 2.5 | 2.49 | 1.7 | 1.8 | 48 | 98.23 | 170 |
| 45 | 658 | 190 | 821 | 98.17 | 98.56 | 98.47 | 98.25 | 1.7 | 1.8 | 1.83 | 1.2 | 1.4 | 53 | 98.40 | 378 |
| 75 | 1115 | 245 | 1280 | 98.58 | 98.78 | 98.62 | 98.37 | 2.4 | 2.7 | 2.8 | 2.4 | 1.4 | 53 | 98.60 | 307 |
| 112.5 | 1424 | 380 | 1566 | 98.68 | 98.96 | 98.88 | 98.70 | 1.9 | 2.2 | 2.28 | 2.0 | 1.1 | 53 | 98.74 | 546 |
| 150 | 2132 | 418 | 2337 | 98.80 | 98.93 | 98.76 | 98.52 | 3.1 | 3.5 | 3.65 | 3.4 | 1.3 | 58 | 98.83 | 455 |
| 225 | 2628 | 561 | 3130 | 98.83 | 98.99 | 98.86 | 98.65 | 3.1 | 3.5 | 3.64 | 3.5 | 1.1 | 58 | 98.94 | 707 |
| 300 | — | 658 | — | — | — | — | — | — | — | — | — | — | — | 99.02 | — |

Type KT-13 115°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 398 | 116 | 289 | 97.65 | 98.39 | 98.45 | 98.35 | 1.4 | 1.5 | 1.51 | 1.0 | 1.2 | 45 | 97.89 | 235 |
| 30 | 478 | 123 | 612 | 98.28 | 98.54 | 98.36 | 98.07 | 1.9 | 2.1 | 2.1 | 1.3 | 1.6 | 48 | 98.23 | 170 |
| 45 | 658 | 190 | 773 | 98.17 | 98.61 | 98.54 | 98.35 | 1.6 | 1.8 | 1.82 | 1.3 | 1.3 | 53 | 98.40 | 378 |
| 75 | 1115 | 250 | 1245 | 98.48 | 98.74 | 98.62 | 98.40 | 2.4 | 2.7 | 2.8 | 2.5 | 1.3 | 53 | 98.60 | 307 |
| 112.5 | 2150 | 337 | 1589 | 98.64 | 98.91 | 98.82 | 98.63 | 3.1 | 3.5 | 3.65 | 3.5 | 1.1 | 58 | 98.74 | 315 |
| 150 | 2013 | 418 | 2488 | 98.72 | 98.85 | 98.67 | 98.41 | 3.4 | 3.8 | 3.9 | 3.6 | 1.4 | 58 | 98.83 | 455 |
| 225 | 3043 | 695 | 2226 | 98.78 | 99.14 | 99.15 | 99.07 | 2.9 | 3.4 | 3.56 | 3.5 | 0.7 | 58 | 98.94 | — |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Type KT-13 80°C Rise DOE 2016

| kVA | Weight | Loss in Watts | | Efficiency (T. Rise +20°C) | | | Full Load | % Regulation | | % Imp. Rise +20°C | X Rise +20°C | R Rise +20°C | Sound Level dB | DOE 2016 Efficiency | Inrush Practical Max. |
|-------|--------|---------------|---------------------|----------------------------|-------|-------|-----------|--------------|--------|-------------------|--------------|--------------|----------------|---------------------|-----------------------|
| | | No Load | Total at Rise +20°C | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 434 | 116 | 263 | 97.66 | 98.46 | 98.57 | 98.51 | 1.1 | 1.2 | 1.17 | 0.6 | 1.0 | 45 | 97.89 | 235 |
| 30 | 507 | 110 | 546 | 98.24 | 98.58 | 98.46 | 98.22 | 1.9 | 2.1 | 2.1 | 1.5 | 1.5 | 48 | 98.23 | 170 |
| 45 | 703 | 146 | 850 | 98.43 | 98.63 | 98.45 | 98.17 | 2.2 | 2.4 | 2.45 | 1.9 | 1.6 | 53 | 98.40 | 195 |
| 75 | 1112 | 290 | 1004 | 98.46 | 98.87 | 98.86 | 98.73 | 2.2 | 2.6 | 2.68 | 2.5 | 1.0 | 53 | 98.60 | 307 |
| 112.5 | 1927 | 380 | — | — | — | — | — | — | — | — | — | — | 53 | 98.74 | 315 |
| 150 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 225 | 3345 | 695 | 2031 | 98.86 | 99.20 | 99.22 | 99.16 | 2.8 | 3.3 | 3.5 | 3.4 | 0.6 | — | 98.94 | — |
| 300 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

Typical Data for General-Purpose Dry-Type Distribution Transformers, Aluminum Wound

Type DS-3 150°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | % Imp. Trise +20 | X Trise +20 | R Trise +20 | Sound Level dB | TP1 Efficiency | Practical Max. |
|-----|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|------------------|-------------|-------------|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 196 | 80 | 518 | 97.5 | 97.7 | 97.3 | 96.7 | 2.0 | 2.5 | 3.46 | 1.9 | 2.9 | 45 | 97.70 | 303 |
| 25 | 261 | 110 | 736 | 98.2 | 98.2 | 97.8 | 97.3 | 1.6 | 2.1 | 2.97 | 1.6 | 2.5 | 45 | 98.00 | 492 |
| 38 | 304 | 132 | 1141 | 98.3 | 98.1 | 97.7 | 97.1 | 1.8 | 3.8 | 4.85 | 4.0 | 2.7 | 45 | 98.20 | 352 |
| 50 | 396 | 145 | 1699 | 98.4 | 98.1 | 97.5 | 96.8 | 2.1 | 4.2 | 5.32 | 4.3 | 3.1 | 45 | 98.30 | 359 |
| 75 | 688 | 260 | 1622 | 98.4 | 98.6 | 98.3 | 97.9 | 1.5 | 2.7 | 3.46 | 2.9 | 1.8 | 50 | 98.50 | 1143 |
| 100 | 699 | 300 | 2527 | 98.5 | 98.4 | 98.1 | 97.6 | 1.9 | 4.0 | 5.17 | 4.7 | 2.2 | 50 | 98.60 | 865 |
| 167 | 1610 | 900 | 3987 | 68.7 | 98.7 | 98.4 | 98.0 | 1.4 | 6.8 | 9.70 | 9.5 | 1.8 | 55 | 98.70 | 416 |

Type DS-3 115°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | % Imp. Trise +20 | X Trise +20 | R Trise +20 | Sound Level dB | TP1 Efficiency | Practical Max. |
|------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|------------------|-------------|-------------|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 246 | 80 | 519 | 97.8 | 97.8 | 97.3 | 96.8 | 2.1 | 3.1 | 3.9 | 2.6 | 2.9 | 45 | 97.70 | 244 |
| 25 | 373 | 300 | 766 | 97.7 | 98.1 | 98.0 | 97.7 | 1.4 | 2.8 | 3.3 | 2.8 | 1.9 | 45 | 98.00 | 367 |
| 37.5 | 380 | 125 | 1182 | 98.2 | 98.4 | 98.1 | 97.8 | 2.0 | 3.1 | 4.1 | 2.9 | 2.8 | 45 | 98.20 | 205 |
| 50 | 590 | 300 | 417 | 98.4 | 98.3 | 97.9 | 97.4 | 1.8 | 4.1 | 5.2 | 5.2 | 0.2 | 45 | 98.30 | 511 |
| 75 | 689 | 170 | 2356 | 98.5 | 98.2 | 97.6 | 97.0 | 2.7 | 5.6 | 6.9 | 6.3 | 2.9 | 50 | 98.50 | 572 |

Type DS-3 80°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | % Imp. Trise +20 | X Trise +20 | R Trise +20 | Sound Level dB | TP1 Efficiency | Practical Max. |
|------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|------------------|-------------|-------------|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 360 | 115 | 269 | 97.4 | 98.3 | 98.4 | 98.4 | 0.8 | 1.7 | 2.0 | 1.8 | 1.0 | 45 | 97.70 | 460 |
| 25 | 370 | 120 | 580 | 97.8 | 98.2 | 98.0 | 97.8 | 1.5 | 3.2 | 3.9 | 3.4 | 1.8 | 45 | 98.00 | 348 |
| 37.5 | 565 | 150 | 834 | 98.1 | 98.4 | 98.1 | 97.8 | 1.5 | 3.3 | 4.1 | 3.6 | 1.8 | 45 | 98.20 | 490 |
| 50 | 680 | 175 | 1014 | 98.4 | 98.5 | 98.4 | 98.1 | 1.5 | 3.4 | 4.2 | 3.9 | 1.7 | 45 | 98.30 | 577 |
| 75 | 900 | 260 | 1387 | 98.3 | 98.6 | 98.5 | 98.2 | 1.4 | 3.5 | 4.3 | 4.0 | 1.5 | 50 | 98.50 | 807 |

Type DT-3 150°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | % Imp. Trise +20 | X Trise +20 | R Trise +20 | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|------------------|-------------|-------------|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 204 | 95 | 778 | 96.6 | 96.7 | 96.0 | 95.1 | 4.8 | 4.0 | 4.8 | 1.4 | 4.6 | 45 | 97.00 | 127 |
| 30 | 291 | 165 | 1207 | 97.2 | 97.3 | 96.9 | 96.2 | 3.7 | 5.6 | 4.6 | 3.0 | 3.5 | 45 | 97.50 | 159 |
| 37.5 | 381 | 210 | 1428 | 97.5 | 97.5 | 97.0 | 96.4 | 3.5 | 5.5 | 4.5 | 3.1 | 3.2 | 45 | 97.70 | 161 |
| 45 | 351 | 210 | 1911 | 97.5 | 97.4 | 96.7 | 96.0 | 3.8 | 6.3 | 5.1 | 3.4 | 3.8 | 45 | 97.70 | 188 |
| 50 | 531 | 270 | 1316 | 97.7 | 98.1 | 97.9 | 97.5 | 2.2 | 4.0 | 3.2 | 2.4 | 2.1 | 45 | 98.00 | 333 |
| 75 | 553 | 300 | 2917 | 97.9 | 97.7 | 97.0 | 96.3 | 3.6 | 6.6 | 5.3 | 4.0 | 3.5 | 50 | 98.00 | 187 |
| 112.5 | 793 | 400 | 3693 | 98.0 | 98.0 | 97.5 | 96.9 | 3.2 | 7.5 | 6.0 | 5.2 | 2.9 | 50 | 98.20 | 350 |
| 150 | 913 | 490 | 4923 | 98.2 | 98.0 | 97.5 | 96.9 | 3.2 | 6.5 | 5.3 | 4.4 | 3.0 | 50 | 98.30 | 506 |
| 225 | 1343 | 650 | 6476 | 98.4 | 98.2 | 97.8 | 97.2 | 2.8 | 6.3 | 5.1 | 4.4 | 2.6 | 55 | 98.50 | 734 |
| 300 | 1597 | 750 | 8239 | 98.5 | 98.3 | 97.9 | 97.3 | 2.9 | 8.9 | 7.6 | 7.2 | 2.5 | 55 | 98.60 | 699 |
| 500 | 2590 | 1400 | 9782 | 98.6 | 98.7 | 98.5 | 98.1 | 1.9 | 8.2 | 7.2 | 7.0 | 1.7 | 60 | 98.70 | 1256 |
| 750 | 3340 | 1800 | 12,692 | 98.8 | 98.9 | 98.7 | 98.4 | 1.8 | 8.9 | 8.0 | 7.9 | 1.5 | 64 | 98.80 | 1507 |

Typical Data for General-Purpose Dry-Type Distribution Transformers, Aluminum Wound

Type DT-3 115°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | % Imp. Trise +20 | X Trise +20 | R Trise +20 | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|------------------|-------------|-------------|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 202 | 100 | 743 | 96.7 | 96.8 | 96.2 | 95.4 | 4.4 | 3.9 | 4.4 | 1.2 | 4.3 | 45 | 97.00 | 127 |
| 30 | 311 | 165 | 1492 | 97.3 | 97.1 | 96.3 | 95.5 | 4.5 | 4.8 | 4.8 | 1.8 | 4.4 | 45 | 97.50 | 137 |
| 45 | 418 | 220 | 1458 | 97.8 | 97.9 | 97.5 | 97.0 | 2.8 | 5.4 | 4.6 | 3.7 | 2.8 | 45 | 97.70 | 183 |
| 50 | 556 | 270 | 1211 | 97.6 | 98.1 | 98.0 | 97.7 | 1.9 | 3.7 | 3.2 | 2.6 | 1.9 | 45 | 98.00 | 297 |
| 75 | 581 | 300 | 2415 | 97.9 | 97.9 | 97.5 | 96.9 | 3.0 | 6.7 | 5.9 | 5.1 | 2.8 | 50 | 98.00 | 252 |
| 112.5 | 829 | 440 | 3209 | 98.0 | 98.1 | 97.8 | 97.3 | 2.6 | 3.6 | 3.1 | 1.9 | 2.5 | 50 | 98.20 | 433 |
| 150 | 996 | 530 | 3781 | 98.1 | 98.3 | 97.9 | 97.5 | 2.4 | 5.8 | 5.2 | 4.7 | 2.2 | 50 | 98.30 | 511 |
| 225 | 1569 | 720 | 5205 | 98.4 | 98.4 | 98.1 | 97.8 | 2.2 | 6.8 | 6.2 | 5.8 | 2.0 | 55 | 98.50 | 631 |
| 300 | 1908 | 830 | 6926 | 98.5 | 98.5 | 98.2 | 97.8 | 2.3 | 6.0 | 5.4 | 4.9 | 2.0 | 55 | 98.60 | 872 |
| 500 | 3117 | 1650 | 6968 | 98.5 | 98.9 | 98.8 | 98.7 | 1.2 | 6.6 | 6.6 | 6.5 | 1.1 | 60 | 98.70 | 1310 |
| 750 | 4884 | 2000 | 9335 | 98.9 | 99.1 | 99.0 | 98.8 | 1.3 | 8.7 | 9.0 | 8.9 | 1.0 | 64 | 98.80 | 1486 |

Type DT-3 80°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | % Imp. Trise +20 | X Trise +20 | R Trise +20 | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|------------------|-------------|-------------|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 276 | 165 | 551 | 96.7 | 97.4 | 97.2 | 96.8 | 3.4 | 3.9 | 3.5 | 2.3 | 2.6 | 45 | 97.00 | 119 |
| 30 | 350 | 180 | 904 | 97.3 | 97.8 | 97.6 | 97.2 | 2.5 | 3.9 | 3.4 | 2.5 | 2.4 | 45 | 97.50 | 112 |
| 45 | 540 | 290 | 1027 | 97.7 | 98.2 | 98.2 | 97.9 | 1.7 | 3.5 | 3.3 | 2.9 | 1.6 | 45 | 97.70 | 317 |
| 75 | 810 | 360 | 1782 | 97.8 | 98.2 | 98.0 | 97.7 | 0.3 | 3.5 | 4.3 | 3.9 | 1.9 | 50 | 98.00 | 355 |
| 112.5 | 944 | 470 | 2521 | 98.2 | 98.4 | 98.2 | 97.9 | 1.9 | 4.4 | 4.1 | 3.7 | 1.8 | 50 | 98.20 | 518 |
| 150 | 1438 | 650 | 2760 | 98.2 | 98.6 | 98.5 | 98.3 | 1.5 | 4.8 | 4.7 | 4.5 | 1.4 | 50 | 98.30 | 555 |
| 225 | 1746 | 830 | 4047 | 98.3 | 98.6 | 98.5 | 98.3 | 1.6 | 5.5 | 5.6 | 5.4 | 1.4 | 55 | 98.50 | 667 |
| 300 | 2400 | 1100 | 5338 | 98.6 | 99.0 | 99.0 | 98.9 | 1.6 | 5.9 | 6.1 | 5.9 | 1.4 | 55 | 98.60 | 885 |
| 500 | 3418 | 1800 | 5858 | 98.6 | 99.0 | 99.0 | 98.9 | 0.9 | 4.9 | 5.4 | 5.3 | 0.8 | 60 | 98.70 | 1487 |

Type KT-4 150°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | % Imp. Trise +20 | X Trise +20 | R Trise +20 | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|------------------|-------------|-------------|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 206 | 100 | 883 | 96.7 | 96.5 | 95.6 | 94.6 | 5.5 | 5.2 | 5.5 | 1.8 | 5.2 | 45 | 97.00 | 125 |
| 30 | 311 | 165 | 1263 | 97.2 | 97.3 | 96.7 | 96.0 | 3.9 | 7.4 | 6.0 | 4.8 | 3.7 | 45 | 97.50 | 151 |
| 45 | 400 | 220 | 1554 | 97.7 | 97.7 | 97.3 | 96.7 | 3.2 | 5.9 | 4.8 | 3.8 | 3.0 | 45 | 97.70 | 236 |
| 75 | 547 | 300 | 2622 | 97.9 | 97.8 | 97.2 | 96.6 | 3.3 | 6.7 | 5.3 | 4.4 | 3.1 | 50 | 98.00 | 331 |
| 112.5 | 800 | 440 | 3525 | 98.0 | 98.0 | 97.6 | 97.0 | 3.0 | 7.4 | 6.0 | 5.3 | 2.7 | 50 | 98.20 | 360 |
| 150 | 1010 | 530 | 4055 | 98.1 | 98.2 | 97.8 | 97.4 | 2.6 | 6.6 | 5.4 | 4.8 | 2.3 | 50 | 98.30 | 524 |
| 225 | 1680 | 700 | 5879 | 98.3 | 98.3 | 97.9 | 97.5 | 2.6 | 7.6 | 6.3 | 5.9 | 2.3 | 55 | 98.50 | 647 |
| 300 | 2122 | 1100 | 5895 | 98.4 | 98.6 | 98.4 | 98.1 | 1.9 | 6.8 | 5.9 | 5.7 | 1.6 | 55 | 98.60 | 954 |
| 500 | 3201 | 1800 | 7054 | 98.5 | 98.9 | 98.8 | 98.7 | 1.3 | 5.9 | 5.4 | 5.2 | 1.1 | 60 | 98.70 | 1529 |

Typical Data for General-Purpose Dry-Type Distribution Transformers, Aluminum Wound**Type KT-4 115°C Rise NEMA TP-1**

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | % Imp. Trise +20 | X Trise +20 | R Trise +20 | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|------------------|-------------|-------------|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 307 | 135 | 394 | 96.3 | 97.5 | 97.6 | 97.5 | 1.8 | 2.7 | 2.2 | 1.4 | 1.7 | 45 | 97.00 | 163 |
| 30 | 313 | 165 | 1344 | 97.4 | 97.3 | 96.6 | 95.9 | 4.1 | 5.1 | 4.6 | 2.4 | 3.9 | 45 | 97.50 | 194 |
| 45 | 400 | 220 | 1463 | 97.8 | 97.9 | 97.5 | 97.0 | 3.0 | 6.1 | 5.2 | 4.4 | 2.8 | 45 | 97.70 | 197 |
| 75 | 587 | 285 | 2355 | 97.9 | 97.9 | 97.5 | 97.0 | 2.9 | 6.7 | 5.9 | 5.2 | 2.8 | 50 | 98.00 | 274 |
| 112.5 | 947 | 470 | 2910 | 97.9 | 98.1 | 97.9 | 97.5 | 2.4 | 5.0 | 4.3 | 3.7 | 2.2 | 50 | 98.20 | 482 |
| 150 | 1243 | 560 | 4119 | 98.1 | 98.2 | 97.8 | 97.4 | 2.5 | 6.6 | 5.7 | 5.2 | 2.4 | 50 | 98.30 | 489 |
| 225 | 1680 | 700 | 5413 | 98.3 | 98.3 | 98.1 | 97.7 | 2.3 | 7.5 | 7.0 | 6.7 | 2.1 | 55 | 98.50 | 573 |
| 300 | 2480 | 1100 | 5735 | 98.4 | 98.7 | 98.5 | 98.2 | 1.8 | 6.7 | 6.3 | 6.1 | 1.5 | 55 | 98.60 | 849 |

Type KT-4 80°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | % Imp. Trise +20 | X Trise +20 | R Trise +20 | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|------------------|-------------|-------------|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 378 | 165 | 416 | 96.4 | 97.6 | 97.7 | 97.6 | 1.7 | 2.9 | 2.5 | 1.9 | 1.7 | 45 | 97.00 | 160 |
| 30 | 365 | 188 | 877 | 97.2 | 97.7 | 97.6 | 97.2 | 2.4 | 3.9 | 3.5 | 2.6 | 2.3 | 45 | 97.50 | 194 |
| 45 | 550 | 285 | 1055 | 97.4 | 98.1 | 98.0 | 97.8 | 1.8 | 3.7 | 3.4 | 2.9 | 1.7 | 45 | 97.70 | 236 |
| 75 | 774 | 360 | 1784 | 97.8 | 98.2 | 98.0 | 97.7 | 2.0 | 4.7 | 4.5 | 4.0 | 1.9 | 50 | 98.00 | 328 |
| 112.5 | 1380 | 550 | 1872 | 97.9 | 98.5 | 98.5 | 98.4 | 1.3 | 4.2 | 4.2 | 4.1 | 1.2 | 50 | 98.20 | 525 |
| 150 | 1604 | 700 | 2728 | 98.0 | 98.5 | 98.5 | 98.3 | 1.4 | 4.4 | 4.5 | 4.3 | 1.4 | 50 | 98.30 | 626 |
| 225 | 2336 | 850 | 3728 | 98.4 | 98.7 | 98.6 | 98.4 | 1.4 | 5.0 | 5.2 | 5.1 | 1.3 | 55 | 98.50 | 882 |
| 300 | 2689 | 1100 | 4589 | 98.4 | 98.8 | 98.7 | 98.5 | 1.4 | 5.5 | 5.8 | 5.6 | 1.2 | 55 | 98.60 | 870 |

Type KT-13 150°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | % Imp. Trise +20 | X Trise +20 | R Trise +20 | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|------------------|-------------|-------------|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 271 | 165 | 604 | 96.7 | 97.3 | 97.0 | 96.5 | 3.1 | 4.2 | 3.6 | 2.1 | 2.9 | 45 | 97.00 | 126 |
| 30 | 365 | 198 | 977 | 97.1 | 97.6 | 97.3 | 96.9 | 2.7 | 4.3 | 3.5 | 2.4 | 2.6 | 45 | 97.50 | 188 |
| 45 | 545 | 280 | 1215 | 97.5 | 98.0 | 97.8 | 97.4 | 2.2 | 4.2 | 3.3 | 2.6 | 2.1 | 45 | 97.70 | 277 |
| 75 | 812 | 360 | 2139 | 97.7 | 98.0 | 97.8 | 97.4 | 2.6 | 5.9 | 4.9 | 4.3 | 2.4 | 50 | 98.00 | 302 |
| 112.5 | 920 | 490 | 3059 | 98.0 | 98.2 | 97.8 | 97.4 | 2.4 | 5.0 | 4.1 | 3.4 | 2.3 | 50 | 98.20 | 504 |
| 150 | 1221 | 530 | 4297 | 98.1 | 98.1 | 97.7 | 97.2 | 2.7 | 6.5 | 5.3 | 4.6 | 2.5 | 50 | 98.30 | 597 |
| 225 | 1960 | 830 | 4461 | 98.3 | 98.6 | 98.3 | 98.0 | 1.9 | 6.6 | 6.1 | 5.9 | 1.6 | 55 | 98.50 | 590 |
| 300 | 2358 | 1100 | 5931 | 98.4 | 98.6 | 98.4 | 98.2 | 1.9 | 7.2 | 6.3 | 6.0 | 1.6 | 55 | 98.60 | 847 |

Typical Data for General-Purpose Dry-Type Distribution Transformers, Aluminum Wound

2

Type KT-13 115°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | % Imp. Trise +20 | X Trise +20 | R Trise +20 | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|------------------|-------------|-------------|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 332 | 165 | 432 | 96.6 | 97.6 | 97.6 | 97.4 | 1.9 | 3.2 | 2.8 | 2.2 | 1.8 | 45 | 97.00 | 136 |
| 30 | 390 | 200 | 903 | 97.3 | 97.8 | 97.6 | 97.2 | 2.5 | 4.4 | 3.6 | 2.8 | 2.3 | 45 | 97.50 | 120 |
| 45 | 548 | 280 | 1187 | 97.5 | 98.1 | 98.0 | 97.7 | 2.2 | — | 3.0 | 2.3 | 2.0 | 45 | 97.70 | 278 |
| 75 | 808 | 360 | 1850 | 97.8 | 98.1 | 97.8 | 97.5 | 2.4 | 5.6 | 4.8 | 4.3 | 2.2 | 50 | 98.00 | 268 |
| 112.5 | 990 | 540 | 2373 | 97.9 | 98.3 | 98.2 | 98.0 | 1.8 | 4.5 | 4.0 | 3.6 | 1.6 | 50 | 98.20 | 434 |
| 150 | 1600 | 650 | 2372 | 98.1 | 98.5 | 98.4 | 98.1 | 1.3 | 3.4 | 3.0 | 2.8 | 1.1 | 50 | 98.30 | 644 |
| 225 | 2306 | 850 | 4001 | 98.3 | 98.7 | 98.6 | 98.3 | 1.6 | 4.9 | 5.1 | 4.9 | 1.4 | 55 | 98.50 | 836 |
| 300 | 3291 | 1100 | 4583 | 98.4 | 98.8 | 98.7 | 98.5 | 1.3 | 6.2 | 6.3 | 6.2 | 1.2 | 55 | 98.60 | 950 |

Type KT-13 80°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | % Imp. Trise +20 | X Trise +20 | R Trise +20 | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|------------------|-------------|-------------|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | | | | | | |
| 15 | 315 | 165 | 536 | 96.4 | 97.3 | 97.2 | 96.9 | 2.5 | 3.9 | 3.6 | 2.5 | 2.5 | 45 | 97.00 | 125 |
| 30 | 408 | 188 | 854 | 97.4 | 97.9 | 97.7 | 97.3 | 2.3 | 4.0 | 3.6 | 2.8 | 2.2 | 45 | 97.50 | 166 |
| 45 | 555 | 280 | 982 | 97.6 | 98.2 | 98.2 | 98.0 | 1.6 | 3.2 | 3.0 | 2.5 | 1.6 | 45 | 97.70 | 218 |
| 75 | 838 | 400 | 1289 | 97.8 | 98.4 | 98.5 | 98.4 | 1.3 | 3.0 | 2.9 | 2.6 | 1.2 | 50 | 98.00 | 541 |
| 112.5 | 1367 | 550 | 1905 | 97.9 | 98.5 | 98.5 | 98.4 | 1.3 | 4.2 | 4.4 | 4.2 | 1.2 | 50 | 98.20 | 390 |
| 150 | 1607 | 668 | 2474 | 98.2 | 98.6 | 98.6 | 98.4 | 1.4 | 4.6 | 4.7 | 4.5 | 1.2 | 50 | 98.30 | 520 |
| 225 | 2582 | 850 | 3471 | 98.3 | 98.7 | 98.7 | 98.5 | 1.3 | 5.1 | 6.3 | 6.2 | 1.2 | 55 | 98.50 | 719 |
| 300 | 3228 | 1100 | 3978 | 98.3 | 98.8 | 98.8 | 98.7 | 1.1 | 4.2 | 4.5 | 4.3 | 1.0 | 55 | 98.60 | 1085 |

Typical Data for General-Purpose Dry-Type Distribution Transformers, Copper Wound

Type DS-3 150°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 270 | 80 | 605 | 97.6 | 97.5 | 96.9 | 96.3 | 3.5 | 4.2 | 4.2 | 2.3 | 3.5 | 45 | 97.70 | 183 |
| 25 | 406 | 115 | 732 | 97.9 | 98.1 | 97.7 | 97.3 | — | — | 3.5 | 2.5 | 2.5 | 45 | 98.00 | 459 |
| 37.5 | 453 | 125 | 1154 | 98.2 | 98.1 | 97.6 | 97.0 | 2.7 | 3.7 | 4.8 | 4.0 | 2.7 | 45 | 98.20 | 440 |
| 50 | 657 | 160 | 1159 | 98.3 | 98.4 | 98.1 | 97.7 | 2.0 | 3.3 | 3.8 | 3.8 | 2.0 | 45 | 98.30 | 440 |
| 75 | 803 | 175 | 2259 | 98.5 | 98.3 | 97.7 | 97.1 | 2.8 | 4.8 | 6.5 | 5.8 | 2.8 | 50 | 98.50 | 711 |
| 100 | 960 | 250 | 2504 | 98.6 | 98.4 | 98.0 | 97.5 | 2.3 | 4.3 | 5.5 | 5.0 | 2.3 | 50 | 98.60 | 926 |
| 167 | 1665 | 570 | 3094 | 98.7 | 98.8 | 98.6 | 98.3 | 1.5 | 6.3 | 9.0 | 8.8 | 1.5 | 50 | 98.70 | 955 |

Type DS-3 115°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 264 | 80 | 437 | 97.8 | 98.1 | 97.8 | 97.3 | 2.4 | 2.2 | 3.3 | 2.2 | 2.4 | 45 | 97.70 | 239 |
| 25 | 420 | 110 | 603 | 97.9 | 98.2 | 98.0 | 97.7 | 2.0 | 2.9 | 3.2 | 2.6 | 2.0 | 45 | 98.00 | 287 |
| 37.5 | 450 | 125 | 1217 | 98.2 | 98.0 | 97.5 | 96.9 | 2.9 | 4.5 | 5.9 | 5.1 | 2.9 | 45 | 98.20 | 433 |
| 50 | 703 | 300 | 1409 | 98.4 | 98.4 | 98.0 | 97.6 | 2.2 | 3.8 | 4.7 | 4.1 | 2.2 | — | 98.30 | 499 |
| 75 | 793 | 175 | 2178 | 98.5 | 98.3 | 97.8 | 97.2 | 2.7 | 4.7 | 6.2 | 5.6 | 2.7 | 50 | 98.50 | 702 |

Type DS-3 80°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 407 | 115 | 293 | 97.3 | 98.2 | 98.3 | 98.2 | 1.2 | 1.7 | 1.8 | 1.4 | 1.2 | 45 | 97.70 | 125 |
| 25 | 430 | 300 | 679 | 97.9 | 98.4 | 98.3 | 98.1 | 1.5 | 2.6 | 3.0 | 2.6 | 1.5 | 45 | 98.00 | 164 |
| 37.5 | 685 | 300 | 729 | 98.1 | 98.6 | 98.6 | 98.5 | 1.1 | 2.2 | 2.6 | 2.3 | 1.1 | 45 | 98.20 | 205 |
| 50 | 799 | 180 | 1013 | 98.3 | 98.6 | 98.4 | 98.1 | 1.7 | 2.9 | 3.4 | 2.9 | 1.7 | 45 | 98.30 | 329 |
| 75 | 1042 | 250 | 1447 | 98.3 | 98.6 | 98.4 | 98.1 | 1.6 | 3.4 | 3.8 | 3.5 | 1.6 | 50 | 98.50 | 338 |

Type DT-3 150°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 250 | 150 | 755 | 98.9 | 97.0 | 96.4 | 95.7 | 4.2 | 5.3 | 4.8 | 2.6 | 4.0 | 45 | 97.00 | 107 |
| 30 | 350 | 165 | 1100 | 97.3 | 97.5 | 97.0 | 96.5 | 3.2 | 4.5 | 5.2 | 4.1 | 3.1 | 45 | 97.50 | 204 |
| 37.5 | 415 | 210 | 1382 | 97.5 | 97.6 | 97.1 | 96.5 | 3.2 | 4.8 | 4.0 | 2.5 | 3.1 | 45 | 97.70 | 213 |
| 45 | 416 | 215 | 1786 | 97.4 | 97.4 | 96.9 | 96.2 | 3.6 | 5.5 | 4.6 | 3.0 | 3.5 | 45 | 97.70 | 212 |
| 50 | 647 | 270 | 1220 | 97.7 | 98.2 | 98.0 | 97.7 | 2.0 | 3.5 | 2.8 | 2.0 | 1.9 | 45 | 98.00 | 357 |
| 75 | 643 | 320 | 2903 | 97.9 | 97.5 | 97.1 | 96.4 | 3.6 | 7.4 | 4.3 | 2.5 | 3.4 | 50 | 98.00 | 338 |
| 112.5 | 876 | 420 | 3699 | 97.9 | 97.9 | 97.4 | 96.8 | 3.0 | 6.7 | 5.1 | 4.2 | 2.9 | 50 | 98.20 | 395 |
| 150 | 1064 | 530 | 4269 | 98.1 | 98.2 | 97.8 | 97.3 | 2.7 | 5.3 | 4.3 | 3.5 | 2.5 | 50 | 98.30 | 584 |
| 225 | 1569 | 560 | 7124 | 98.4 | 98.1 | 97.5 | 97.0 | 3.2 | 8.7 | 7.4 | 6.8 | 2.9 | 55 | 98.50 | 832 |
| 300 | 2050 | 730 | 7959 | 98.4 | 98.3 | 97.9 | 97.4 | 2.6 | 6.7 | 5.5 | 4.9 | 2.4 | 55 | 98.60 | 964 |
| 500 | 3681 | 1400 | 8292 | 98.8 | 98.9 | 98.7 | 98.4 | 1.6 | 7.4 | 6.8 | 6.7 | 1.4 | 60 | 98.70 | 1279 |

Typical Data for General-Purpose Dry-Type Distribution Transformers, Copper Wound

Type DT-3 115°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 256 | 95 | 669 | 97.7 | 97.8 | 97.3 | 96.7 | 4.0 | 5.4 | 4.8 | 2.9 | 3.8 | 45 | 97.00 | 76 |
| 30 | 337 | 180 | 1077 | 97.7 | 97.8 | 97.3 | 96.8 | 3.0 | 6.2 | 4.6 | 3.5 | 3.0 | 45 | 97.50 | 144 |
| 45 | 446 | 215 | 1625 | 97.7 | 97.7 | 97.2 | 96.6 | 3.2 | 5.2 | 4.4 | 3.1 | 3.1 | 45 | 97.70 | 219 |
| 50 | 630 | 270 | 1213 | 97.8 | 98.2 | 98.0 | 97.7 | 2.0 | 3.5 | 3.0 | 2.3 | 1.9 | 45 | 98.00 | 320 |
| 75 | 662 | 320 | 2346 | 97.9 | 98.0 | 97.6 | 97.0 | 2.8 | 5.4 | 4.7 | 3.9 | 2.7 | 50 | 98.00 | 280 |
| 112.5 | 914 | 400 | 2953 | 98.1 | 98.2 | 97.9 | 97.4 | 2.5 | 5.7 | 5.0 | 4.5 | 2.3 | 50 | 98.20 | 345 |
| 150 | 1132 | 530 | 3364 | 98.3 | 98.5 | 98.2 | 97.8 | 2.0 | 4.8 | 4.4 | 4.0 | 1.9 | 50 | 98.30 | 535 |
| 225 | 2036 | 650 | 6445 | 98.4 | 98.3 | 97.8 | 97.3 | 2.9 | 8.8 | 8.1 | 7.7 | 2.6 | 55 | 98.50 | 524 |
| 300 | 2325 | 830 | 6038 | 98.6 | 98.7 | 98.4 | 98.1 | 2.0 | 5.7 | 5.2 | 4.9 | 1.7 | 55 | 98.60 | 620 |
| 500 | 3681 | 1400 | 7841 | 98.8 | 98.9 | 98.7 | 98.5 | 1.4 | 6.8 | 6.8 | 6.6 | 1.3 | 60 | 98.70 | 1344 |

Type DT-3 80°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 349 | 135 | 390 | 96.6 | 97.7 | 97.7 | 97.6 | 1.8 | 2.4 | 2.1 | 1.3 | 1.7 | 45 | 97.00 | 150 |
| 30 | 410 | 210 | 823 | 97.3 | 97.9 | 97.7 | 97.4 | 2.1 | 3.4 | 3.0 | 2.1 | 2.0 | 45 | 97.50 | 164 |
| 45 | 504 | 200 | 1308 | 97.9 | 98.0 | 97.7 | 97.2 | 2.5 | 4.5 | 3.9 | 3.1 | 2.5 | 45 | 97.70 | 158 |
| 75 | 818 | 370 | 1837 | 97.9 | 98.2 | 98.0 | 97.7 | 2.0 | 9.3 | 4.3 | 3.8 | 2.0 | 50 | 98.00 | 312 |
| 112.5 | 1065 | 440 | 2409 | 98.1 | 98.3 | 98.0 | 97.6 | 1.8 | 3.8 | 3.3 | 2.8 | 1.8 | 50 | 98.20 | 584 |
| 150 | 1410 | 650 | 3349 | 98.3 | 98.5 | 98.3 | 97.9 | 1.9 | 3.9 | 3.7 | 3.2 | 1.8 | 50 | 98.30 | 531 |
| 225 | 2030 | 830 | 4096 | 98.4 | 98.7 | 98.5 | 98.3 | 1.6 | 5.4 | 5.4 | 5.2 | 1.5 | 55 | 98.50 | 856 |
| 300 | 3041 | 1100 | 4646 | 98.5 | 98.8 | 98.7 | 98.5 | 1.4 | 5.6 | 6.1 | 6.0 | 1.2 | 55 | 98.60 | 1251 |

Type KT-4 80°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 251 | 100 | 635 | 96.8 | 97.1 | 96.6 | 96.0 | 3.7 | 5.0 | 4.2 | 2.1 | 3.6 | 45 | 97.00 | 88 |
| 30 | 326 | 165 | 1134 | 97.4 | 97.5 | 97.1 | 96.5 | 3.5 | 5.3 | 4.3 | 2.9 | 3.2 | 45 | 97.50 | 168 |
| 45 | 479 | 220 | 1505 | 97.6 | 97.8 | 97.3 | 96.8 | 3.0 | 5.6 | 5.0 | 4.1 | 2.9 | 45 | 97.70 | 223 |
| 75 | 463 | 300 | 2883 | 97.9 | 97.7 | 97.1 | 96.4 | 3.6 | 7.1 | 5.9 | 4.7 | 3.4 | 50 | 98.00 | 325 |
| 112.5 | 977 | 440 | 2952 | 98.1 | 98.2 | 97.9 | 97.5 | 2.6 | 6.6 | 5.6 | 5.1 | 2.2 | 50 | 98.20 | 344 |
| 150 | 1212 | 540 | 3716 | 98.3 | 98.4 | 98.0 | 97.6 | 2.4 | 6.0 | 5.1 | 4.6 | 2.1 | 50 | 98.30 | 524 |
| 225 | 1815 | 650 | 5420 | 98.4 | 98.5 | 98.1 | 97.7 | 2.4 | 7.6 | 6.5 | 6.2 | 2.1 | 55 | 98.50 | 565 |
| 300 | 2400 | 830 | 6259 | 98.6 | 98.6 | 98.4 | 98.0 | 2.2 | 6.3 | 5.2 | 4.9 | 1.8 | 55 | 98.60 | 864 |

Typical Data for General-Purpose Dry-Type Distribution Transformers, Copper Wound**Type KT-4 115°C Rise NEMA TP-1**

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 256 | 95 | 702 | 96.7 | 96.9 | 96.3 | 95.6 | 4.2 | 5.7 | 5.0 | 2.9 | 4.0 | 45 | 97.00 | 93 |
| 30 | 341 | 165 | 1007 | 97.4 | 97.6 | 97.3 | 96.8 | 3.0 | 4.8 | 4.2 | 3.1 | 2.8 | 45 | 97.50 | 155 |
| 45 | 526 | 220 | 1200 | 97.9 | 98.1 | 97.9 | 97.5 | 2.3 | 5.0 | 4.1 | 3.5 | 2.2 | 50 | 97.70 | 211 |
| 75 | 759 | 300 | 1715 | 98.1 | 98.3 | 98.1 | 97.8 | 1.9 | 5.0 | 4.5 | 4.1 | 1.9 | 50 | 98.00 | 309 |
| 112.5 | 1030 | 470 | 2735 | 98.0 | 98.3 | 98.0 | 97.7 | 2.2 | 4.4 | 3.8 | 3.2 | 2.0 | 50 | 98.20 | 390 |
| 150 | 1631 | 650 | 3076 | 98.2 | 98.5 | 98.3 | 98.1 | 1.7 | 4.9 | 4.5 | 4.2 | 1.6 | 50 | 98.30 | 416 |
| 225 | 1965 | 690 | 4434 | 98.5 | 98.6 | 98.4 | 98.1 | 1.9 | 5.6 | 5.3 | 5.0 | 1.7 | 55 | 98.50 | 659 |
| 300 | 2337 | 830 | 6127 | 98.6 | 98.7 | 98.4 | 98.0 | 2.0 | 5.2 | 4.7 | 4.3 | 1.8 | 55 | 98.60 | 729 |

Type KT-4 80°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 365 | 165 | 371 | 97.0 | 98.0 | 98.1 | 98.0 | 1.5 | 2.3 | 2.1 | 1.5 | 1.4 | 45 | 97.00 | 166 |
| 30 | 424 | 210 | 787 | 97.3 | 97.9 | 97.8 | 97.6 | 2.0 | 3.2 | 2.9 | 2.2 | 1.9 | 45 | 97.50 | 219 |
| 45 | 653 | 290 | 977 | 97.4 | 98.1 | 98.1 | 98.0 | 1.6 | 3.1 | 3.0 | 2.5 | 1.5 | 45 | 97.70 | 308 |
| 75 | 640 | 350 | 1951 | 97.8 | 98.1 | 97.8 | 97.5 | 2.2 | 5.2 | 4.9 | 4.4 | 2.1 | 50 | 98.00 | 284 |
| 112.5 | 1264 | 560 | 2009 | 98.2 | 98.7 | 98.6 | 98.4 | 1.4 | 4.3 | 4.2 | 4.0 | 1.3 | 50 | 98.20 | 483 |
| 150 | 1825 | 650 | 2873 | 98.5 | 98.7 | 98.5 | 98.2 | 1.6 | 6.1 | 6.4 | 6.3 | 1.5 | 50 | 98.30 | 429 |
| 225 | 2096 | 890 | 4449 | 98.3 | 98.6 | 98.4 | 98.1 | 1.8 | 6.5 | 6.6 | 6.4 | 1.6 | 55 | 98.50 | 764 |

Type KT-13 150°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 346 | 165 | 461 | 96.2 | 97.4 | 97.5 | 97.3 | 2.1 | 3.0 | 2.5 | 1.6 | 2.0 | 45 | 97.00 | 176 |
| 30 | 390 | 190 | 908 | 97.2 | 97.7 | 97.5 | 97.1 | 2.6 | 4.0 | 3.3 | 2.3 | 2.4 | 45 | 97.50 | 193 |
| 45 | 623 | 235 | 1328 | 97.6 | 97.9 | 97.6 | 97.2 | 2.5 | 3.2 | 2.8 | 1.4 | 2.4 | 45 | 97.70 | 285 |
| 75 | 848 | 370 | 2402 | 97.7 | 97.9 | 97.5 | 97.0 | 2.8 | 5.7 | 4.5 | 3.6 | 2.7 | 50 | 98.00 | 348 |
| 112.5 | 1080 | 455 | 2991 | 98.0 | 98.2 | 97.9 | 97.4 | 2.4 | 4.3 | 3.5 | 2.7 | 2.3 | 50 | 98.20 | 393 |
| 150 | 1431 | 600 | 3686 | 98.2 | 98.3 | 98.1 | 97.7 | 2.3 | 5.1 | 4.2 | 3.7 | 2.1 | 50 | 98.30 | 416 |
| 225 | 2129 | 830 | 4250 | 98.4 | 98.6 | 98.4 | 98.2 | 2.0 | 6.3 | 5.4 | 5.1 | 1.5 | 55 | 98.50 | 923 |

Type KT-13 115°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 341 | 165 | 378 | 96.6 | 97.8 | 97.9 | 97.9 | 1.5 | 2.4 | 2.1 | 1.6 | 1.4 | 45 | 97.00 | 157 |
| 30 | 444 | 188 | 824 | 97.1 | 97.8 | 97.6 | 97.3 | 2.2 | 3.6 | 3.1 | 2.2 | 2.1 | 45 | 97.50 | 206 |
| 45 | 598 | 250 | 1476 | 97.4 | 97.7 | 97.4 | 96.9 | 2.8 | 4.6 | 4.0 | 2.9 | 2.7 | 45 | 97.70 | 313 |
| 75 | 894 | 350 | 2128 | 97.9 | 98.1 | 97.9 | 97.5 | 1.9 | 5.1 | 4.6 | 4.0 | 2.4 | 50 | 98.00 | 282 |
| 112.5 | 1054 | 460 | 2612 | 98.1 | 98.3 | 98.1 | 97.8 | 2.0 | 4.3 | 3.3 | 2.6 | 1.9 | 50 | 98.20 | 458 |
| 150 | 1399 | 600 | 3185 | 98.2 | 98.5 | 98.3 | 98.0 | 2.0 | 5.9 | 5.4 | 5.1 | 1.7 | 50 | 98.30 | 460 |
| 225 | 2088 | 890 | 4382 | 98.3 | 98.6 | 98.4 | 98.2 | 1.8 | 6.1 | 5.7 | 5.5 | 1.6 | 55 | 98.50 | 830 |

Typical Data for General-Purpose Dry-Type Distribution Transformers, Copper Wound

Type KT-13 80°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 370 | 165 | 382 | 96.7 | 97.8 | 97.9 | 97.8 | 1.5 | 2.4 | 2.2 | 1.6 | 1.4 | 45 | 97.00 | 157 |
| 30 | 490 | 188 | 595 | 97.4 | 98.2 | 98.2 | 98.1 | 1.4 | 3.0 | 2.8 | 2.5 | 1.4 | 45 | 97.50 | 197 |
| 45 | 635 | 290 | 1189 | 97.4 | 97.9 | 97.8 | 97.5 | 2.1 | 3.9 | 3.5 | 2.8 | 2.0 | 45 | 97.70 | 245 |
| 75 | 987 | 410 | 1351 | 97.7 | 98.9 | 98.4 | 98.3 | 1.4 | 2.8 | 2.6 | 2.3 | 1.3 | 50 | 98.00 | 530 |
| 112.5 | 854 | 560 | 2039 | 98.1 | 98.6 | 98.5 | 98.3 | 1.4 | 4.2 | 4.3 | 4.1 | 1.3 | 50 | 98.20 | 458 |
| 150 | 1807 | 650 | 3053 | 98.0 | 98.4 | 98.3 | 98.0 | 1.7 | 4.3 | 4.0 | 3.7 | 1.6 | 50 | 98.30 | 490 |
| 225 | 4091 | 1200 | 2364 | 98.2 | 98.9 | 99.1 | 99.1 | 0.6 | 2.7 | 2.9 | 2.8 | 0.5 | 55 | 98.50 | 1440 |

Type KT-13 115°C Rise E3 Efficient

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 3.25 | 78 | 359 | 97.6 | 98.1 | 98.0 | 97.7 | 2.0 | 3.7 | 3.2 | 2.6 | 1.9 | 45 | 98.00 | 102 |
| 30 | 370 | 125 | 636 | 98.1 | 98.4 | 98.3 | 98.0 | 1.7 | 2.7 | 2.3 | 1.6 | 1.7 | 45 | 98.30 | 260 |
| 45 | 635 | 135 | 1076 | 98.5 | 98.5 | 98.1 | 97.7 | 2.2 | 4.1 | 3.5 | 2.8 | 2.1 | 45 | 98.50 | 206 |
| 75 | 870 | 225 | 1529 | 98.5 | 98.6 | 98.4 | 98.0 | 1.9 | 4.9 | 4.4 | 4.1 | 1.7 | 50 | 98.60 | 331 |
| 112.5 | 1526 | 350 | 1768 | 98.6 | 98.8 | 98.7 | 98.5 | 1.3 | 3.5 | 3.1 | 2.8 | 1.3 | 50 | 98.80 | 816 |
| 150 | 1665 | 350 | 2419 | 97.8 | 98.9 | 98.7 | 98.4 | 1.5 | 4.5 | 4.2 | 3.9 | 1.4 | 50 | 98.90 | 659 |
| 225 | 2094 | 650 | 3650 | 98.9 | 98.9 | 98.8 | 98.5 | 1.5 | 5.4 | 5.2 | 5.1 | 1.3 | 55 | 99.00 | 895 |
| 300 | 3900 | 750 | 3731 | 98.9 | 99.1 | 99.0 | 98.8 | 1.3 | 5.2 | 5.2 | 5.1 | 1.0 | 55 | 99.04 | 997 |

Type KT-9 115°C Rise E3 Efficient

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 335 | 78 | 353 | 97.4 | 98.0 | 98.0 | 97.7 | 2.0 | 3.7 | 3.2 | 2.6 | 1.8 | 45 | 98.00 | 96 |
| 30 | 406 | 125 | 670 | 98.0 | 98.3 | 98.1 | 97.8 | 1.9 | 2.7 | 2.4 | 1.5 | 1.8 | 45 | 98.30 | 260 |
| 45 | 635 | 135 | 1075 | 98.6 | 98.5 | 98.2 | 97.7 | 2.3 | 4.1 | 3.5 | 2.8 | 2.1 | 45 | 98.50 | 201 |
| 75 | 870 | 210 | 1551 | 98.5 | 98.6 | 98.3 | 98.0 | 1.9 | 4.0 | 3.6 | 3.1 | 1.8 | 50 | 98.60 | 319 |
| 112.5 | 1526 | 350 | 1583 | 98.6 | 98.9 | 98.8 | 98.6 | 1.2 | 3.0 | 2.7 | 2.5 | 1.1 | 50 | 98.80 | 827 |
| 150 | 1665 | 350 | 2463 | 98.8 | 98.9 | 98.7 | 98.4 | 1.6 | 4.5 | 4.2 | 4.0 | 1.4 | 50 | 98.90 | 643 |
| 225 | 2094 | 650 | 3766 | 98.8 | 98.9 | 98.7 | 98.4 | 1.7 | 5.5 | 5.2 | 5.0 | 1.4 | 55 | 99.00 | 926 |

Typical Data for General-Purpose Dry-Type Distribution Transformers, Copper Wound**Type NON HMT 115°C Rise NEMA TP-1**

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | 362 | 80 | 527 | 97.6 | 97.7 | 97.3 | 96.7 | 3.2 | 5.9 | 5.1 | 4.2 | 3.0 | 45 | 97.00 | — |
| 30 | 430 | 100 | 1040 | 98.3 | 98.0 | 97.4 | 96.7 | 3.2 | 6.2 | 5.4 | 4.4 | 3.1 | 45 | 97.50 | — |
| 45 | 627 | 170 | 1368 | 98.3 | 98.2 | 97.7 | 97.2 | 2.8 | 6.0 | 5.2 | 4.4 | 2.7 | 45 | 97.70 | — |
| 75 | 926 | 250 | 2096 | 98.4 | 98.3 | 97.9 | 97.4 | 2.6 | 7.0 | 6.2 | 5.7 | 2.5 | 50 | 98.00 | — |
| 112.5 | 1628 | 400 | 2515 | 98.4 | 98.5 | 98.3 | 97.9 | 2.0 | 5.5 | 4.9 | 4.5 | 1.9 | 50 | 98.20 | — |
| 150 | 2001 | 500 | 2688 | 98.5 | 98.7 | 98.6 | 98.3 | 1.6 | 5.6 | 5.2 | 5.0 | 1.5 | 50 | 98.30 | — |
| 225 | 3596 | 590 | 3310 | 98.8 | 98.9 | 98.8 | 98.6 | 1.5 | 6.2 | 6.0 | 5.9 | 1.2 | 55 | 98.50 | — |
| 300 | 3891 | 800 | 4854 | 98.7 | 98.9 | 98.7 | 98.4 | 1.7 | 7.1 | 7.0 | 6.8 | 1.4 | 55 | 98.60 | — |

Type THR HMT 115°C Rise NEMA TP-1

| kVA | Weight | Losses in Watts | | Efficiency (Trise +20°) | | | Full Load | % Regulation | | | X | R | Sound Level dB | TP1 Efficiency | Practical Max. |
|-------|--------|-----------------|-------------------|-------------------------|------|------|-----------|--------------|--------|--------|-----|-----|----------------|----------------|----------------|
| | | No Load | Total at Rise +20 | 25% | 50% | 75% | | 100% PF | 80% PF | % Imp. | | | | | |
| 15 | — | 80 | 708 | 97.1 | 97.0 | 96.4 | 95.5 | 4.3 | 7.4 | 6.3 | 4.7 | 4.2 | 45 | 97.00 | — |
| 30 | 450 | 100 | 1409 | 98.0 | 97.4 | 96.5 | 95.6 | 4.7 | 8.0 | 6.8 | 5.2 | 4.4 | 45 | 97.50 | — |
| 45 | 610 | 170 | 1374 | 98.2 | 98.1 | 97.7 | 97.1 | 2.8 | 4.8 | 4.2 | 3.2 | 2.7 | 45 | 97.70 | — |
| 75 | 868 | 250 | 2341 | 98.2 | 98.1 | 97.6 | 97.0 | 2.9 | 6.6 | 5.8 | 5.0 | 2.8 | 50 | 98.00 | — |
| 112.5 | 1643 | 400 | 2685 | 98.3 | 98.4 | 98.1 | 97.7 | 2.2 | 5.5 | 5.0 | 4.6 | 2.0 | 50 | 98.20 | — |
| 150 | — | 500 | 3304 | 98.5 | 98.6 | 98.3 | 97.9 | 2.0 | 6.7 | 6.3 | 6.0 | 1.9 | 50 | 98.30 | — |
| 225 | 3370 | 590 | 3712 | 98.7 | 98.8 | 98.7 | 98.4 | 1.7 | 6.6 | 6.4 | 6.2 | 1.4 | 55 | 98.50 | — |
| 300 | 3894 | 800 | 4688 | 98.9 | 99.0 | 98.8 | 98.5 | 1.7 | 7.4 | 7.2 | 7.1 | 1.3 | 55 | 98.60 | — |

Typical Specifications— General-Purpose (1000 kVA and Below)

2

General

Furnish and install, single-phase and three-phase general-purpose individually mounted dry-type transformers of the two-winding type, self-cooled, with ratings and voltages as indicated on the drawings. Transformers shall be manufactured by Eaton.

Transformers shall be designed, manufactured and tested in accordance with all the latest applicable ANSI, NEMA and IEEE Standards. All 600-volt class transformers through 1000 kVA shall be UL listed and bear the UL label.

Transformers shall be designed for continuous operation at rated kVA, for operation 24 hours a day, 365 days a year, with normal life expectancy as defined in ANSI C57.96.

Insulation Systems

Transformers shall be insulated as follows:

- **Type EP or EPT:**
0.050 through 75 kVA:
180°C insulation system
- **Type DS-3 or DT-3:**
15 kVA and above: 220°C insulation system

Required performance shall be obtained without exceeding the above indicated temperature rise in a 40°C maximum ambient, with a 30°C average over 24 hours.

All insulation materials shall be flame-retardant and shall not support combustion as defined in ASTM Standard Test Method D635.

Core and Coil Assemblies

Transformer core shall be constructed with high-grade, non-aging, silicon steel with high magnetic permeability, and low hysteresis and eddy current losses. Maximum magnetic flux densities shall be substantially below the saturation point. The transformer core volume shall allow efficient transformer operation at 10% above the nominal tap voltage. The core laminations shall be tightly clamped and compressed. Coils shall be wound of electrical-grade [aluminum] [copper] and continuous wound construction. BIL (basic impulse level) for all 600-volt class windings shall be 10 kV.

On encapsulated units rated [75 kVA and below] [15 kVA and below] [9 kVA and below], the core and coil assembly shall be completely encapsulated in a proportioned mixture of resin or epoxy and aggregate to provide a moisture-proof, shock-resistant seal. The core and coil encapsulation system shall minimize the sound level.

On ventilated units rated [15 kVA and above] [30 kVA and above] [112.5 kVA and above], the core and coil assembly shall be installed on neoprene vibration-absorbing pads.

Enclosures

The enclosure shall be made of heavy-gauge steel and shall be finished using a continuous process of degreasing, cleaning and phosphatizing, followed by electrostatic deposition of a thermosetting polyester powder coating and subsequent baking. The coating color shall be ANSI 61 and shall be UL recognized for outdoor use. The maximum temperature on top of the enclosure shall not exceed 90°C.

On units rated [75 kVA and below] [15 kVA and below] [9 kVA and below] encapsulated, the enclosure construction shall be totally enclosed, non-ventilated, NEMA 3R, with lifting provisions.

On units rated [15 kVA and above] [30 kVA and above] [112.5 kVA and above], the enclosure construction shall be ventilated, NEMA 2, drip-proof, with lifting provisions. All ventilation openings shall be protected against falling dirt. On outdoor units, provide suitable weathershields over ventilation openings.

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilated (up to 1.2 kV) K-Factor 1, 4, 9 | Self-Cooled Ventilated (up to 1.2 kV) K-Factor 13, 20 | Encapsulated (up to 1.2 kV) |
|---------------------------------|---|--|--------------------------------|
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Tests

The following tests shall be performed as standard on all transformers:

1. Ratio tests at the rated voltage connection and at all tap connections.
2. Polarity and phase relation tests on the rated voltage connection.
3. Applied potential tests.
4. Induced potential test.
5. No-load and excitation current at rated voltage on the rated voltage connection.

Sound Levels

Transformer average sound levels shall not exceed the following ANSI and NEMA levels for self-cooled ratings measured in accordance with NEMA ST-20.

Typical Specification— DOE 2016 Energy-Efficient Transformers

General

Furnish and install, single- and three-phase energy-efficient dry-type transformers that comply with CFR Title 10 Chapter II Part 431, Appendix A of Subpart K 2016. Transformers shall be of the two-winding type, self-cooled, with ratings (kVA) as indicated on the drawings. Transformer's losses shall conform to 10 CFR Part 431 requirements. Transformers shall be manufactured by Eaton.

Transformers shall be designed, manufactured and tested in accordance with all the latest applicable ANSI, NEMA and IEEE Standards, and shall be listed by Underwriters Laboratories and bear the UL label.

Transformers shall be designed for continuous operation at rated kVA, for 24 hours a day, 365 days a year, with normal life expectancy as defined in ANSI C57.96.

Insulation System and Temperature Rise

Transformers shall be insulated with a 220°C insulation system. Transformers shall be 150°C rise and shall be capable of carrying a 15% continuous overload without exceeding a 150°C rise. Required performance shall be obtained without exceeding the above rise in a 40°C maximum, 30°C average ambient temperature.

All insulation materials shall be flame-retardant and shall not support combustion as defined in ASTM Standard Test Method D635.

Core and Coil Assemblies

Transformer core shall be constructed with high-grade, non-aging, silicon steel with high magnetic permeability, and low hysteresis and eddy current losses. Maximum magnetic flux densities shall be substantially below the saturation point.

The transformer core volume shall allow efficient transformer operation at 10% above the nominal tap voltage. The core laminations shall be tightly clamped and compressed. Coils shall be wound of electrical grade [aluminum] [copper] and continuous wound construction. BIL (basic impulse level) for all 600-volt class windings shall be 10 kV.

The core and coil assembly shall be installed on neoprene vibration-absorbing pads.

Enclosures

The enclosure shall be made of heavy gauge steel and shall be finished utilizing a continuous process of degreasing, cleaning and phosphatizing, followed by electrostatic deposition of a thermosetting polyester powder coating and subsequent baking. The coating color shall be ANSI 61 and shall be UL recognized for outdoor use.

The enclosure construction shall be ventilated, NEMA 2, drip-proof, with lifting provisions. All ventilation openings shall be protected against falling dirt.

All transformers shall be equipped with a wiring compartment suitable for conduit entry and large enough to allow convenient wiring. The maximum temperature on top of the enclosure shall not exceed 90°C.

Tests

The following tests shall be performed as standard on all transformers:

1. Ratio tests at the rated voltage connection and at all tap connections.
2. Polarity and phase relation tests on the rated voltage connection.
3. Applied potential tests.
4. Induced potential test.
5. No-load and excitation current at rated voltage on the rated voltage connection.

Efficiency

Transformers shall be energy-efficient with minimum efficiencies as set forth per NEMA TP-1-2002 and U.S. DOE 10 CFR Parts 430 and 431 when operated at 35% of full load capacity. Transformer must bear the UL Energy Efficiency Verification Mark to confirm that the unit meets the requirements of 10 CFR Part 431.

DOE 2016 Efficiency Levels

Dry-Type Distribution Transformers—Low-Voltage (600 V and below)

| Single-Phase kVA | Efficiency | Three-Phase kVA | Efficiency |
|---------------------|------------|--------------------|------------|
| | | | |
| 25 | 98.00 | 30 | 98.23 |
| 37.5 | 98.20 | 45 | 98.40 |
| 50 | 98.30 | 75 | 98.60 |
| 75 | 98.50 | 112.5 | 98.74 |
| 100 | 98.60 | 150 | 98.83 |
| 167 | 98.70 | 225 | 98.94 |
| 250 | 98.80 | 300 | 99.02 |
| 333 | 98.90 | 500 | 99.14 |
| — | — | 750 | 99.23 |
| — | — | 1000 | 99.28 |

Sound Levels

Transformer average sound levels shall not exceed the following ANSI and NEMA levels for self-cooled ratings.

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilated (up to 1.2 kV) | | Encapsulated (up to 1.2 kV) |
|---------------------------------|---------------------------------------|-----------------|--------------------------------|
| | K-Factor 1, 4, 9 | K-Factor 13, 20 | |
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Typical Specifications— Dry-Type Transformers for Nonlinear Loads

General

Furnish and install, individually mounted dry-type transformers of the two-winding type, self-cooled, with ratings and voltages as indicated on the drawings.

Transformers shall be manufactured by Eaton.

Transformers shall be designed, manufactured and tested in accordance with all the latest applicable ANSI, NEMA and IEEE Standards. All 600-volt class transformers through 500 kVA shall be UL listed as suitable for non-sinusoidal current loads with K factor not to exceed [4] [13] [20].

Insulation Systems

Transformers shall be insulated with a UL recognized 220°C insulation system. Winding temperature rise shall be [80°C] [115°C] [150°C].

Required performance shall be obtained without exceeding the above indicated temperature rise in a 40°C maximum ambient, with a 30°C average.

All insulation materials shall be flame-retardant and shall not support combustion as defined in ASTM Standard Test Method D635.

Core and Coil Assemblies

Transformer core shall be constructed with high-grade, non-aging, silicon steel with high magnetic permeability, and low hysteresis and eddy current losses. Maximum magnetic flux densities shall be substantially below the saturation point. The transformer core volume shall allow efficient transformer operation at 10% above the nominal tap voltage. The core laminations shall be tightly clamped and compressed.

Transformer coils shall be wound of electrical-grade [aluminum] [copper] conductor with continuous wound construction. An electrostatic shield consisting of a single turn of aluminum shall be placed between the primary and secondary winding and grounded to the transformer core. BIL (basic impulse level) for all 600-volt class windings shall be 10 kV.

The core and coil assembly shall be installed on neoprene vibration-absorbing pads.

The neutral conductor shall be rated to carry 200% of normal phase current.

Enclosures

The enclosure shall be made of heavy gauge steel and shall be finished utilizing a continuous process of degreasing, cleaning and phosphatizing, followed by electrostatic deposition of a polymer polyester powder coating and baking. The coating color shall be ANSI 61 and shall be UL recognized for outdoor use. The maximum temperature on top of the enclosure shall not exceed 90°C.

The enclosure construction shall be ventilated, NEMA 2, drip-proof, with lifting provisions. All ventilation openings shall be protected against falling dirt. On outdoor units, provide suitable weathershields over ventilation openings. **To ensure proper ventilation, locate the unit at least 6 inches (152.4 mm) from the adjacent wall or structure.**

Nonlinear Ratings

The transformers shall be specifically designed to supply circuits with a harmonic profile equal to or less than a K-factor of 4 or 13 as described below without exceeding [80°C] [115°C] [150°C] temperature rise.

Nonlinear Ratings

| Harmonic | K-4 | K-13 |
|-------------|--------|--------|
| Fundamental | 100.0% | 100.0% |
| 3rd | 34.0% | 70.0% |
| 5th | 22.0% | 42.0% |
| 7th | 3.0% | 5.0% |
| 9th | 1.0% | 3.0% |
| 11th | 0.7% | 3.0% |
| 13th | 0.5% | 1.0% |
| 15th | 0.3% | 0.7% |
| 17th | 0.3% | 0.6% |

Tests

The following tests shall be performed as standard on all transformers:

1. Ratio tests at the rated voltage connection and at all tap connections.
2. Polarity and phase relation tests on the rated voltage connection.
3. Applied potential tests.
4. Induced potential test.
5. No-load and excitation current at rated voltage on the rated voltage connection.

Sound Levels

Transformer average sound levels shall not exceed the following ANSI and NEMA levels for self-cooled ratings measured in accordance with NEMA ST-20.

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilated (up to 1.2 kV) | | Encapsulated (up to 1.2 kV) |
|---------------------------------|---------------------------------------|-----------------|--------------------------------|
| | K-Factor 1, 4, 9 | K-Factor 13, 20 | |
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Typical Specification— AC Adjustable Frequency Drive Isolation Transformers

General

Furnish and install, single-phase and three-phase general-purpose individually mounted dry-type transformers of the two-winding type, self-cooled, with ratings and voltages for input application as indicated on the drawings. Transformers shall be manufactured by Eaton.

Transformers shall be designed, manufactured and tested in accordance with all the latest applicable ANSI, NEMA and IEEE Standards. All 600-volt class transformers through 550 kVA shall be UL listed and bear the UL label.

Transformers shall be designed for continuous operation at rated kVA, for operation 24 hours a day, 365 days a year, with normal life expectancy as defined in ANSI C57.96.

Insulation Systems

Transformers shall be insulated with a UL recognized 220°C insulation system.

Required performance shall be obtained without exceeding the above indicated temperature rise in a 40°C maximum ambient, with a 30°C average over 24 hours.

All insulation materials shall be flame-retardant and shall not support combustion as defined in ASTM Standard Test Method D635.

Core and Coil Assemblies

Transformer core shall be constructed with high-grade, non-aging, silicon steel with high magnetic permeability, and low hysteresis and eddy current losses. Maximum magnetic flux densities shall be substantially below the saturation point. The transformer core volume shall allow efficient transformer operation at 10% above the nominal tap voltage. The core laminations shall be tightly clamped and compressed. Coils shall be wound of electrical-grade [aluminum] [copper] and continuous wound construction. BIL (basic impulse level) for all 600-volt class windings shall be 10 kV.

A temperature sensing device shall be imbedded in the center coil.

The core and coil assembly shall be installed on neoprene vibration-absorbing pads.

Enclosures

The enclosure shall be made of heavy-gauge steel and shall be finished using a continuous process of degreasing, cleaning, and phosphatizing, followed by electrostatic deposition of a thermosetting polyester powder coating and subsequent baking. The coating color shall be ANSI 61 and shall be UL recognized for outdoor use. The maximum temperature on top of the enclosure shall not exceed 90°C.

The enclosure construction shall be ventilated, NEMA 2, drip-proof, with lifting provisions. All ventilation openings shall be protected against falling dirt. **To ensure proper ventilation, locate the unit at least 6 inches (152.4 mm) from the adjacent wall or structure. On outdoor units, provide suitable weathershields over ventilation openings.**

Sound Levels

Transformer average sound levels shall not exceed the following ANSI and NEMA levels for self-cooled ratings measured in accordance with NEMA ST-20.

The following table lists the recommended kVA size of the drive isolation transformer for a specific horsepower requirement.

Three-Phase

| Horsepower AC Motor | kVA Minimum |
|------------------------|----------------|
| 5 | 7.5 |
| 7.5 | 11 |
| 10 | 14 |
| 15 | 20 |
| 20 | 27 |
| 25 | 34 |
| 30 | 40 |
| 40 | 51 |
| 50 | 63 |
| 60 | 75 |
| 75 | 93 |
| 100 | 118 |
| 125 | 145 |
| 150 | 175 |
| 200 | 220 |
| 250 | 275 |
| 300 | 330 |
| 400 | 440 |
| 500 | 550 |
| 600 | 660 |
| 700 | 770 |

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilated (up to 1.2 kV) | | Encapsulated (up to 1.2 kV) |
|---------------------------------|---------------------------------------|-----------------|--------------------------------|
| | K-Factor 1, 4, 9 | K-Factor 13, 20 | |
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Typical Specifications— Mini-Power Centers (3–30 kVA)

General

Furnish and install, single-phase and three-phase general-purpose individually mounted mini-power centers of the two-winding type, self-cooled, with ratings and voltages as indicated on the drawings. Mini-power centers shall be manufactured by Eaton.

Units shall be designed, manufactured and tested in accordance with all the latest applicable ANSI, NEMA, IEEE, CSA and UL standards, and shall be UL listed and CSA certified and bear the UL and CSA labels.

Units shall be designed for continuous operation at rated kVA, 24 hours a day, 365 days a year, with normal life expectancy as defined in ANSI C57.96.

Each mini-power center shall include a main primary breaker with an interrupting rating of 14 kA at 277/480 volts; an encapsulated dry-type transformer and a secondary panelboard with main breaker rated 10 kA interrupting rating at 120/240 volts.

1. All interconnecting wiring between the primary breaker and transformer, secondary main breaker and transformer, and distribution section shall be factory installed. Main primary, secondary and branch breakers shall be enclosed with a padlockable hinged door.
2. The secondary distribution section shall accommodate one-inch, plug-in breakers with 10 kA interrupting capacity.
3. On the all-copper, bolt-on designs, the secondary distribution section shall accommodate bolt-on breakers with 10 kA interrupting capacity.

Insulation System

Transformers shall be insulated with a 180°C insulation system.

Required performance shall be obtained without exceeding the above indicated temperature rise in a 40°C maximum ambient, with a 30°C average over 24 hours.

All insulation materials shall be flame-retardant and shall not support combustion as defined in ASTM Standard Test Method D635.

Core and Coil Assemblies

Transformer core shall be constructed with high-grade, non-aging, silicon steel with high magnetic permeability, and low hysteresis and eddy current losses. Maximum magnetic flux densities shall be substantially below the saturation point.

The transformer core volume shall allow efficient transformer operation at 10% above the nominal tap voltage. The core laminations shall be tightly clamped and compressed. Coils shall be wound of electrical-grade aluminum (copper) with continuous wound construction. BIL (basic impulse level) for all 600-volt class windings shall be 10 kV.

The core and coil assembly shall be completely encapsulated in a proportioned mixture of resin or epoxy and aggregate to provide a moisture-proof, shock-resistant seal. The core and coil encapsulation system shall minimize the sound level.

Enclosures

The enclosure shall be made of heavy-gauge steel and shall be finished using a continuous process of degreasing, cleaning, and phosphatizing, followed by electrostatic deposition of a thermosetting polymer polyester powder coating and subsequent baking. The coating color shall be ANSI 61 and shall be UL recognized for outdoor use. Mini-power centers shall be equipped with a wiring compartment suitable for conduit entry and large enough to allow convenient wiring. The maximum temperature on top of the enclosure shall not exceed 90°C. The core of the transformer shall be grounded to the enclosure. The enclosure shall be totally enclosed, non-ventilated, NEMA 3R, with lifting eyes.

Tests

The following tests shall be performed as standard on all transformers:

1. Ratio tests at the rated voltage connection and at all tap connections.
2. Polarity and phase relation tests on the rated voltage connection.
3. Applied potential tests.
4. Induced potential test.
5. No-load and excitation current at rated voltage on the rated voltage connection.

Sound Levels

Transformer average sound levels shall not exceed the following ANSI/NEMA levels for self-cooled ratings measured in accordance with NEMA ST-20.

Average Sound Levels

| kVA | NEMA Average Sound Level in dB |
|-------|--------------------------------|
| 0–9 | 45 |
| 10–30 | 50 |

Typical Specification— NEMA TP-1-2002 Compliant Energy-Efficient Transformers

General

Furnish and install, three-phase energy-efficient dry-type transformers that comply with NEMA Standard TP-1-2002 and U.S. DOE 10 CFR Parts 430 and 431. Transformers shall be of the two-winding type, self-cooled, with ratings (kVA) as indicated on the drawings. Transformer's losses shall conform to NEMA TP-1 requirements. Transformers shall be manufactured by Eaton.

Transformers shall be designed, manufactured and tested in accordance with all the latest applicable ANSI, NEMA and IEEE Standards, and shall be listed by Underwriters Laboratories and bear the UL label.

Transformers shall be designed for continuous operation at rated kVA, for 24 hours a day, 365 days a year, with normal life expectancy as defined in ANSI C57.96.

Insulation System and Temperature Rise

Transformers shall be insulated with a 220°C insulation system. Transformers shall be 150°C rise and shall be capable of carrying a 15% continuous overload without exceeding a 150°C rise. Required performance shall be obtained without exceeding the above rise in a 40°C maximum, 30°C average ambient temperature.

All insulation materials shall be flame-retardant and shall not support combustion as defined in ASTM Standard Test Method D635.

Core and Coil Assemblies

Transformer core shall be constructed with high-grade, non-aging, silicon steel with high magnetic permeability, and low hysteresis and eddy current losses. Maximum magnetic flux densities shall be substantially below the saturation point.

The transformer core volume shall allow efficient transformer operation at 10% above the nominal tap voltage. The core laminations shall be tightly clamped and compressed. Coils shall be wound of electrical grade [aluminum] [copper] and continuous wound construction. BIL (basic impulse level) for all 600-volt class windings shall be 10 kV.

The core and coil assembly shall be installed on neoprene vibration-absorbing pads.

Enclosures

The enclosure shall be made of heavy gauge steel and shall be finished utilizing a continuous process of degreasing, cleaning and phosphatizing, followed by electrostatic deposition of a thermosetting polyester powder coating and subsequent baking. The coating color shall be ANSI 61 and shall be UL recognized for outdoor use.

The enclosure construction shall be ventilated, NEMA 2, drip-proof, with lifting provisions. All ventilation openings shall be protected against falling dirt. **To ensure proper ventilation, locate the unit at least 6 inches (152.4 mm) from the adjacent wall or structure.**

All transformers shall be equipped with a wiring compartment suitable for conduit entry and large enough to allow convenient wiring. The maximum temperature on top of the enclosure shall not exceed 90°C.

Tests

The following tests shall be performed as standard on all transformers:

1. Ratio tests at the rated voltage connection and at all tap connections.
2. Polarity and phase relation tests on the rated voltage connection.
3. Applied potential tests.
4. Induced potential test.

5. No-load and excitation current at rated voltage on the rated voltage connection.

Efficiency

Transformers shall be energy-efficient with minimum efficiencies as set forth per NEMA TP-1-2002 and U.S. DOE 10 CFR Parts 430 and 431 when operated at 35% of full load capacity.

NEMA TP-1-2002 Efficiency Levels

NEMA Class 1 Efficiency Levels Dry-Type Distribution Transformers—Low-Voltage (600 V and below)

| Single-Phase | | Three-Phase | |
|--------------|------------|-------------|------------|
| kVA | Efficiency | kVA | Efficiency |
| 15 | 97.7 | 15 | 97.0 |
| 25 | 98.0 | 30 | 97.5 |
| 37.5 | 98.2 | 45 | 97.7 |
| 50 | 98.3 | 75 | 98.0 |
| 75 | 98.5 | 112.5 | 98.2 |
| 100 | 98.6 | 150 | 98.3 |
| 167 | 98.7 | 225 | 98.5 |
| 250 | 98.8 | 300 | 98.6 |
| 333 | 98.9 | 500 | 98.7 |
| — | — | 750 | 98.8 |
| — | — | 1000 | 98.9 |

Sound Levels

Transformer average sound levels shall not exceed the following ANSI and NEMA levels for self-cooled ratings.

Average Sound Levels

NEMA ST-20 Average Sound Level, dB

| Equivalent Winding kVA Range | Self-Cooled Ventilated (up to 1.2 kV) K-Factor 1, 4, 9 | Self-Cooled Ventilated (up to 1.2 kV) K-Factor 13, 20 | Encapsulated (up to 1.2 kV) |
|------------------------------|--|---|-----------------------------|
| 3.00 and below | 40 | 40 | 45 |
| 3.01 to 9.00 | 40 | 40 | 45 |
| 9.01 to 15.00 | 45 | 45 | 50 |
| 15.01 to 30.00 | 45 | 45 | 50 |
| 30.01 to 50.00 | 45 | 48 | 50 |
| 50.01 to 75.00 | 50 | 53 | 55 |
| 75.01 to 112.50 | 50 | 53 | 55 |
| 112.51 to 150.00 | 50 | 53 | 55 |
| 150.01 to 225.00 | 55 | 58 | 57 |
| 225.01 to 300.00 | 55 | 58 | 57 |
| 300.01 to 500.00 | 60 | 63 | 59 |
| 500.01 to 700.00 | 62 | 65 | 61 |
| 700.01 to 1000.00 | 64 | 67 | 63 |
| Greater than 1000 | Consult factory | Consult factory | Consult factory |

Glossary of Transformer Terms

Air cooled: A transformer that is cooled by the natural circulation of air around, or through, the core and coils.

Ambient noise level: The existing or inherent sound level of the area surrounding the transformer, prior to energizing the transformer. Measured in decibels.

Ambient temperature: The temperature of the air surrounding the transformer into which the heat of the transformer is dissipated.

Ampacity: The current-carrying capacity of an electrical conductor under stated thermal conditions. Expressed in amperes.

Ampere: The practical unit of electric current.

Attenuation: A decrease in signal power or voltage. Unit of measure is dB.

Autotransformer: A transformer in which part of the winding is common to both the primary and the secondary circuits.

Banked: Two or more single-phase transformers wired together to supply a three-phase load. Three single-phase transformers can be “banked” together to support a three-phase load. For example, three 10 kVA single-phase transformers “banked” together will have a 30 kVA three-phase capacity.

BIL: Basic impulse level. The ability of a transformer’s insulation system to withstand high voltage surges. All Eaton 600V-class transformers have a 10 kV BIL rating.

BTU: British thermal unit. In North America, the term “BTU” is used to describe the heat value (energy content) of fuels, and also to describe the power of heating and cooling systems, such as furnaces, stoves, barbecue grills and air conditioners. When used as a unit of power, BTU “per hour” (BTU/h) is understood, though this is often abbreviated to just “BTU.”

Buck-boost: The name of a standard, single-phase, two-winding transformer application with the low-voltage secondary windings connected as an autotransformer for boosting (increasing) or bucking (decreasing) voltages in small amounts. Applications can either be single-phase or three-phase.

CE: Mark to indicate third-party approved or self-certification to specific requirements of the European community.

Celsius (centigrade): Metric temperature measure.

$$^{\circ}\text{F} = (1.8 \times ^{\circ}\text{C}) + 32$$

$$^{\circ}\text{C} = (^{\circ}\text{F} - 32) / 1.8$$

Center tap: A tap at the mid-point of a winding. The center tap on three-phase delta-delta transformers is called a lighting tap. It provides 5% of the transformer’s kVA for single-phase loads.

Certified tests: Actual values taken during production tests and certified as applying to a given unit shipped on a specific order. Certified tests are serial number-specific.

Common mode: Electrical noise or voltage fluctuation that occurs between all of the line leads and the common ground, or between ground and line or neutral.

Compensated transformer: A transformer with a turns ratio that provides a higher than nameplate output (secondary) voltage at no load, and nameplate output (secondary) voltage at rated load. It is common for small transformers (2 kVA and less) to be compensated.

Conductor losses: Losses (expressed in watts) in a transformer that are incidental to carrying a load: coil resistance, stray loss due to stray fluxes in the

windings, core clamps, and the like, as well as circulating currents (if any) in parallel windings. Also called load losses.

Continuous rating: The load that a transformer can handle indefinitely without exceeding its specified temperature rise.

Core losses: Losses (expressed in watts) caused by magnetization of the core and its resistance to magnetic flux. Also called no-load losses or excitation losses. Core losses are always present when the transformer is energized.

CSA: Canadian Standards Association. The Canadian equivalent of Underwriters Laboratories (UL).

cUL: Mark to indicate UL Certification to specific CSA Standards.

Decibel (dB): Unit of measure used to express the magnitude of a change in signal or sound level.

Delta connection: A standard three-phase connection with the ends of each phase winding connected in series to form a closed loop with each phase 120 degrees from the other. Sometimes referred to as three-wire.

Dielectric tests: Tests that consist of the application of a voltage higher than the rated voltage for a specified time for the purpose of determining the adequacy against breakdowns of insulating materials and spacings under normal conditions.

DOE 2016 efficient: A revision to federal law 10 CFR Part 431 (2007) that mandates higher efficiency for distribution transformers manufactured for sale in the U.S. and U.S. Territories effective January 1, 2016. “TP-1” efficient transformers can no longer legally be manufactured for use in the U.S. as of this date.

Dry-type transformer: A transformer in which the core and coils are in a gaseous or dry compound insulating medium. A transformer that is cooled by a medium other than a liquid, normally by the circulation of air.

Eddy currents: The currents that are induced in the body of a conducting mass by the time variation of magnetic flux or varying magnetic field.

Efficiency: The ratio of the power output from a transformer to the total power input. Typically expressed as a %.

Electrostatic shield: Copper or other conducting sheet placed between primary and secondary windings, and grounded to reduce electrical interference and to provide additional protection from line-to-line or line-to-ground noise. Commonly referred to as “Faraday shield.”

There are no industry standards for electrostatic shield performance. Eaton-manufactured transformers have been tested by an independent laboratory to meet the following attenuation levels.

When tested per MIL-Std-220A, Method of Insertion Loss Measurement, with matched impedance no load technique:

1. Common mode noise attenuation: –80 dBA minimum at 0.1 kHz to 1.5 kHz; –55 dBA minimum at 1.51 kHz to 100 kHz.
2. Normal mode (Transverse mode) noise attenuation: –35 dBA minimum at 1.5 kHz to 10 kHz.

Primary to Secondary Capacitance of 24.74–18.06 picofarads on the range 100–20 kHz.

Encapsulated transformer: A transformer with its core coils either dipped or cast in an epoxy resin or other encapsulating substance.

Enclosure: A surrounding case or housing used to protect the contained equipment against external conditions and prevent personnel from accidentally contacting live parts.

Environmentally preferable product: A product that has a lesser or reduced negative effect on human health and the environment when compared to competing products that serve the same purpose. This comparison may consider raw materials acquisition, production, manufacturing, packaging, distribution, reuse, operation, maintenance and disposal of the product. This term includes recyclable products, recycled products and reusable products.

EPACT: The Energy Policy Act of 1992 (EPACT) is an important piece of legislation for efficiency because it established minimum efficiency levels for dry-type distribution transformers manufactured or imported after December 2006. EPACT, which was based on NEMA standards, defined a number of terms, including what constitutes an energy-efficient transformer. The DOE issued a rule that defines these transformers and how manufacturers must comply. DOE EPACT rule (PDF): Energy Efficiency Program for Certain Commercial and Industrial Equipment: Test Procedures, Labeling, and the Certification Requirements for Electric Motors. Final Rule. 10-CFR Part 431.

Excitation current: No load current. The current that flows in any winding used to excite the transformer when all other windings are open-circuited. It is usually expressed in percent of the rated current of a winding in which it is measured. Also called magnetizing current.

FCAN: “Full Capacity Above Nominal” taps. Designates the transformer will deliver its rated kVA when connected to a voltage source which is higher than the rated primary voltage.

FCBN: “Full Capacity Below Nominal” taps. Designates the transformer will deliver its rated kVA when connected to a voltage source which is lower than the rated primary voltage.

Frequency: On AC circuits, designates the number of times that polarity alternates from positive to negative and back again per second, such as 60 cycles per second. Typically measured in Hertz (Hz).

Ground: Connecting one side of a circuit to the earth through low resistance or low impedance paths to help prevent transmitting electrical shock to personnel.

Harmonic: A sinusoidal waveform with a frequency that is an integral multiple of the fundamental frequency (60 Hz).

60 H₃ fundamental
120 H₃ 2nd harmonic
180 H₃ 3rd harmonic
240 H₃ 4th harmonic

Harmonic distortion: Nonlinear distortion of a system characterized by the appearance of harmonic (non-sinusoidal) currents in the output, when the input is sinusoidal.

Harmonic distortion, total (THD): The square root of the sum of the squares of all harmonic currents present in a load, excluding the fundamental 60 Hz current. Usually expressed as a percent of the fundamental.

High voltage windings: In a two-winding transformer, the winding intended to have the greater voltage. Usually marked with “H” designations.

HMT: Harmonic Mitigating Transformer (HMT) is better able to handle the harmonic currents present in today’s electrical power system. thereby increasing system capacity, reducing distortion throughout a facility, help to minimize downtime and “mysterious” maintenance on equipment, and return the longevity of equipment life through reduced operational energy losses, thereby running cooler.

Hp: Horsepower. The energy required to raise 33,000 pounds a distance of one foot in one minute. 1 hp is equal to 746 watts, or 0.746 kW.

Hi pot: A standard test on dry-type transformers consisting of extra-high potentials (voltages) connected to the windings. Used to check the integrity of insulation materials and clearances.

Hottest-spot temperature: The highest temperature inside the transformer winding. Is greater than the measured average temperature of the coil conductors, when using the resistance change method.

Hysteresis: The tendency of a magnetic substance to persist in any state of magnetization.

Impedance: The retarding forces of current in an AC circuit; the current-limiting characteristics of a transformer. Symbol = Z

Inductance: In electrical circuits, the opposition to a change in the flow of electrical current. Symbol = L

Inducted potential test: A standard dielectric test of transformer insulation. Verifies the integrity of insulating materials and electrical clearances.

Inrush current: The initial high peak of current that occurs in the first few cycles of energization, which can be 30 to 40 times the rated current.

Insulating transformer: Another term for an isolating transformer.

Insulation: Material with a high electrical resistance.

Insulation materials: Those materials used to insulate the transformer’s electrical windings from each other and ground.

Integral TVSS or SPD: Major Standard Change for Surge Protective Devices (formerly known as Transient Voltage Surge Suppressors). The primary safety standard for transient voltage surge suppressors (TVSS) has undergone major revisions in the past three years with mandatory compliance by manufacturers required by September 29, 2009. Even the name of the standard has changed from UL Standard for Safety for Transient Voltage Surge Suppressors, UL 1449 to UL Standard for Safety for Surge Protective Devices, UL 1449. This means that TVSS listed to the UL 1449 2nd Edition standard will no longer be able to be manufactured after September 29, 2009. All Surge Protective Devices must be designed, tested, manufactured and listed to the UL 1449 3rd Edition standard after this date.

Isolating transformer:

A transformer where the input (primary) windings are not connected to the output (secondary) windings (i.e., electrically isolated).

K-factor: A common industry term for the amount of harmonics produced by a given load. The larger the K-factor, the more harmonics that are present. Also used to define a transformer's ability to withstand the additional heating generated by harmonic currents.

kVA: Kilovolt-ampere. Designates the output that a transformer can deliver for a specified time at a rated secondary voltage and rated frequency without exceeding the specified temperature rise. When multiplied by the power factor, will give kilowatts or kW.

$$1000 \text{ VA} = 1 \text{ kVA}$$

Lamination: Thin sheets of electrical steel used to construct the core of a transformer.

Limiting temperature:

The maximum temperature at which a component or material may be operated continuously with no sacrifice in normal life expectancy.

Linear load: A load where the current waveform conforms to that of the applied voltage, or a load where a change in current is directly proportional to a change in applied voltage.

Live part: Any component consisting of an electrically conductive material that can be energized under conditions of normal use.

Load losses: I^2R losses in windings. Also see conductor losses.

Low-voltage winding: In a two-winding transformer, the winding intended to have the lesser voltage. Usually marked with "X" designations.

Mid-tap: See center tap.

Noise level: The relative intensity of sound, measured in decibels (dB). NEMA Standard ST-20 outlines the maximum allowable noise level for dry-type transformers.

Nonlinear load: A load where the current waveform does not conform to that of the applied voltage, or where a change in current is not proportional to a change in applied voltage.

Non-ventilated transformer: A transformer where the core and coil assembly is mounted inside an enclosure with no openings for ventilation. Also referred to as totally enclosed non-ventilated (TENV).

No load losses: Losses in a transformer that is excited at rated voltage and frequency but that is not supplying a load. No load losses include core losses, dielectric losses and conductor losses in the winding due to the exciting current. Also referred to as excitation losses.

Overload capability: Short-term overload capacity is designed into transformers as required by ANSI. Continuous overload capacity is not deliberately designed into a transformer because the design objective is to be within the allowed winding temperature rise with nameplate loading.

Percent IR (% resistance): Voltage drop due to resistance at rated current in percent of rated voltage.

Percent IX (% reactance): Voltage drop due to reactance at rated current in percent of rated voltage.

Percent IZ (% impedance): Voltage drop due to impedance at rated current in percent of rated voltage.

Phase: Type of AC electrical circuit; usually single-phase two- or three-wire, or three-phase three- or four-wire.

Polarity test: A standard test on transformers to determine instantaneous direction of the voltages in the primary compared to the secondary.

Primary taps: Taps added to the primary (input) winding. See Tap.

Primary voltage: The input circuit voltage.

Power factor: The cosine of the phase angle between a voltage and a current.

Ratio test: A standard test of transformers to determine the ratio of the input (primary) voltage to the output (secondary) voltage.

Reactance: The effect of inductive and capacitive components of a circuit producing other than unity power factor.

Reactor: A single winding device with an air or iron core that produces a specific amount of inductive reactance into a circuit. Normally used to reduce of control current.

Regulation: Usually expressed as the percent change in output voltage when the load goes from full load to no load.

Scott T connection: Connection for three-phase transformers. Instead of using three sets of coils for a three-phase load, the transformer uses only two sets of coils.

Series/multiple winding: A winding consisting of two or more sections that can be connected for series operation or multiple (parallel) operation. Also called series-parallel winding.

Short circuit: A low resistance connection, usually accidental, across part of a circuit, resulting in excessive current flow.

Sound levels: All transformers make some sound mainly due to the vibration generated in its core by alternating flux. All Eaton general-purpose dry-type distribution transformers are designed with sound levels lower than NEMA ST-20 maximum levels.

Star connection: Same as a wye connection.

Step-down transformer: A transformer where the input voltage is greater than the output voltage.

Step-up transformer: A transformer where the input voltage is less than the output voltage.

T-T connection: See Scott T connection.

Tap: A connection brought out of a winding at some point between its extremities, usually to permit changing the voltage or current ratio. Taps are typically used to compensate for above or below rated input voltage, in order to provide the rated output voltage. See FCAN and FCBN.

Temperature class: The maximum temperature that the insulation system of a transformer can continuously withstand. The common insulation classes are 105, 150, 180 (also 185) and 220.

Temperature rise: The increase over ambient temperature of the windings due to energizing and loading the transformer.

Total losses: The sum of the no-load losses and load losses.

Totally enclosed non-ventilated enclosure: The core and coil assembly is installed inside an enclosure that has no ventilation to cool the transformer. The transformer relies on heat to radiate from the enclosure for cooling.

Transformer tests:

Per NEMA ST-20, routine transformer production tests are performed on each transformer prior to shipment. These tests are: *Ratio tests* on the rated voltage connection; *Polarity and Phase Relation tests* on the rated connection; *No-Load and Excitation Current tests* at rated voltage on the rated voltage connection and *Applied Potential and Induced Potential tests*. Special tests include sound level testing.

Transverse mode: Electrical noise or voltage disturbance that occurs between phase and neutral, or from spurious signals across metallic hot line and the neutral conductor.

Turns ratio: The ratio of the number of turns in the high voltage winding to that in the low-voltage winding.

Typical test data: Tests that were performed on similar units that were previously manufactured and tested.

UL (Underwriters Laboratories): An independent safety testing organization.

Universal taps: A

combination of six primary voltage taps consisting of 2 at +2-1/2% FCAN and 4 at -2-1/2% FCBN.

Watt: A unit of electrical power when the current in a circuit is one ampere and the voltage is one volt.

Wye connection: A standard three-wire transformer connection with similar ends of single-phase coils connected together. The common point forms the electrical neutral point and may be grounded. Also referred to as three-phase four-wire. To obtain the line-to-neutral voltage, divide the line voltage by $\sqrt{3}$ (1.732).

Frequently Asked Questions About Transformers

2

Can 60 Hz transformers be used at other frequencies?

Transformers rated for 60 Hz can be applied to circuits with a higher frequency, as long as the nameplate voltages are not exceeded. The higher the frequency that you apply to a 60 Hz transformer, the less voltage regulation you will have. 60 Hz transformers may be used at lower frequencies but only at reduced voltages corresponding to the reduction in frequency. For example, a 480 to 120 volt 60 Hz transformer can carry rated kVA at 50 Hz but ONLY when applied as a 400 to 100 volt transformer (50/60 x 480 = 400).

Can single-phase transformers be used on a three-phase source?

Yes. Any single-phase transformer can be used on a three-phase source by connecting the primary terminals of the single-phase transformer to any two wires of a three-phase system. It does not matter whether the three-phase source is three-phase three-wire or three-phase four-wire. The output of the transformer will be single-phase.

Can transformers be used to create three-phase power from a single-phase system?

No. Single-phase transformers alone cannot be used to create the phase-shifts required for a three-phase system. Phase shifting devices (reactors or capacitors) or phase converters in conjunction with transformers are required to change single-phase power to three-phase.

What considerations need to be taken into account when operating transformers where high altitudes?

At altitudes greater than 3300 feet (1000 meters), the density of the air is less than at lower elevations. This reduces the ability of the air surrounding a transformer to cool it, so the temperature rise of the transformer is increased. Therefore, when a transformer is being installed at altitudes greater than 3300 feet above sea level, it is necessary to derate the usable capacity of the transformer. The table below lists the derating factors. As an example, a 75 kVA 480V–208Y/120V transformer installed at 10,000 feet needs to be derated by 4%. Instead of 208A output, the usable current is only 199A.

| Altitude | | Current Rating Factor |
|----------|--------|-----------------------|
| Feet | Meters | |
| 3300 | 1000 | 1.00 |
| 4000 | 1200 | 0.995 |
| 5000 | 1500 | 0.99 |
| 6000 | 1800 | 0.985 |
| 7000 | 2100 | 0.98 |
| 8000 | 2400 | 0.97 |
| 9000 | 2700 | 0.965 |
| 10,000 | 3000 | 0.96 |
| 12,000 | 3600 | 0.95 |
| 14,000 | 4200 | 0.935 |
| 15,000 | 4500 | 0.93 |

What considerations need to be taken into account when operating transformers where the ambient temperature is high?

Eaton’s dry-type transformers are designed in accordance with ANSI standards to operate in areas where the average maximum ambient temperature is 40°C. For operation in ambient temperatures above 40°C, there are two options:

1. Order a custom designed transformer made for the specific application.
2. Derate the nameplate kVA of a standard transformer by 8% for each 10°C of ambient above 40°C.

What is the normal life expectancy of a transformer?

When a transformer is operated under ANSI/IEEE basic loading conditions (ANSI C57.96), its normal life expectancy is 20 years. The ANSI/IEEE basic loading conditions are:

- A. The transformer is continuously loaded at rated kVA and rated voltages.
- B. The average temperature of the ambient air during any 24-hour period is equal to 30°C and at no time exceeds 40°C.
- C. The altitude where the transformer is installed does not exceed 3300 feet (1000 meters).

What are insulation classes?

Insulation classes were originally used to distinguish insulating materials operating at different temperatures. In the past, letters were used for the different designations. Recently, insulation system temperatures (°C) have replaced the letters’ designations.

Insulation Classes

| Previous Designation | Insulation System Rating (°C) |
|----------------------|-------------------------------|
| Class A | 105 |
| Class B | 150 |
| Class F | 180 |
| Class H | 220 |
| Class R | 220 |

How do you know if the enclosure temperature is too hot?

UL and CSA standards strictly regulate the highest temperature that an enclosure can reach. For ventilated transformers, the temperature of the enclosure should not increase by more than 50°C in a 40°C ambient at full rated current. For encapsulated transformers, the temperature of the enclosure should not increase by more than 65°C in a 25°C ambient at full rated current. This means that it is permissible for the temperature of the enclosure to reach 90°C (194°F). Although this temperature is very warm to the touch, it is within the allowed standards. A thermometer should be used to measure enclosure temperatures, not your hand.

Can transformers be reverse-connected (reverse-fed)?

Yes, with limitations. Eaton single-phase transformers rated 3 kVA and larger can be reverse-connected without any loss of kVA capacity or any adverse effects. Transformers rated 2 kVA and below, because there is a turns ratio compensation on the low-voltage winding that adjusts voltage between no load and full load conditions, should not be reverse-fed.

Three-phase transformers with either delta-delta or delta-wye configurations can also be reverse-connected for step-up operation. When reverse-feeding a delta-wye connected transformer, there are two important considerations to take into account: (1) The neutral is not connected, only the three-phase wires of the wye system are connected, and (2) the ground strap between X0 and the enclosure must be removed. Due to high inrush currents that may be created in these applications, it is recommended that you do not reverse-feed transformers rated more than 75 kVA. The preferred solution is to purchase an Eaton step-up transformer designed specifically for your application.

Can transformers be connected in parallel?

Yes, with certain restrictions. For single-phase transformers being connected in parallel, the voltages and impedances of the transformers must be equal (impedances must be within 7.5% of each other). For three-phase transformers, the same restrictions apply as for single-phase transformers, plus the phase shift of the transformers must be the same. For example, a delta-wye-connected transformer (30° phase shift) must be connected in parallel with another delta-wye-connected transformer, not a delta-delta connected-transformer (0° phase shift).

Why is the impedance of a transformer important?

The impedance of a transformer is important because it is used to determine the interrupting rating and trip rating of the circuit protection devices on the load or line side of the transformer. To calculate the maximum short circuit current on the load side of a transformer, use the following formula:

$$\text{Maximum Short Circuit} = \frac{\text{Full Load Current (Amps)}}{\text{Transformer Impedance}}$$

$$\frac{\text{Full Load Current (Amps)}}{\text{Transformer Impedance}}$$

Full load current for single-phase circuits is:

$$\frac{\text{Nameplate Volt-Amps}}{\text{Load (output) Voltage}}$$

and for three-phase circuits, the full load current is:

$$\frac{\text{Nameplate Volts-Amps}}{\text{Load (output) Volts} \times \sqrt{3}}$$

Example: For a standard three-phase, 75 kVA transformer, rated 480 volt delta primary and 208Y/120 volt secondary (catalog number V48M28T7516) and impedance equal to 5.1%, the full load current is:

$$\frac{75,000 \text{ VA}}{208 \text{ V} \times 1.732} = 208.2 \text{ A}$$

The maximum short circuit load current is:

$$\frac{208.2 \text{ A}}{0.051} = 4,082.4 \text{ A}$$

The circuit breaker or fuse on the secondary side of this transformer would have to have a minimum interrupting capacity of 4083 amperes at 208 volts. NEMA ST-20.

A similar transformer with lower impedance would require a primary circuit breaker or fuse with a higher interrupting capacity.

What clearances are required around transformers when they are installed?

All dry-type transformers depend upon the circulation of air for cooling; therefore, it is important that the flow of air around a transformer not be impeded. UL 1561 requires that there be no less than 6 inches (152.4 mm) clearance between any side transformer with ventilation openings and any wall or obstruction.

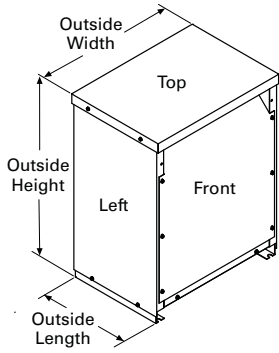
In compliance with NEC 450.9, Eaton's ventilated transformers have a note on their nameplates requiring a minimum of 6 inches (152.4 mm) clearance from the ventilation openings and walls or other obstructions. This clearance only addresses the ventilation needs of the transformer. There may be additional local codes and standards that affect installation clearances.

Transformers should not be mounted in such a manner that one unit will contribute to the additional heating of another unit, beyond allowable temperature limits, for example, where two units are mounted on a wall one above the other.

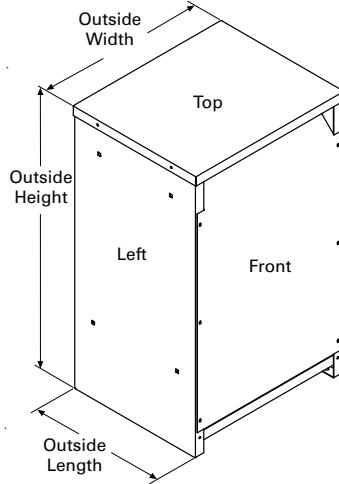
Dimensions

Approximate Dimensions in Inches (mm)

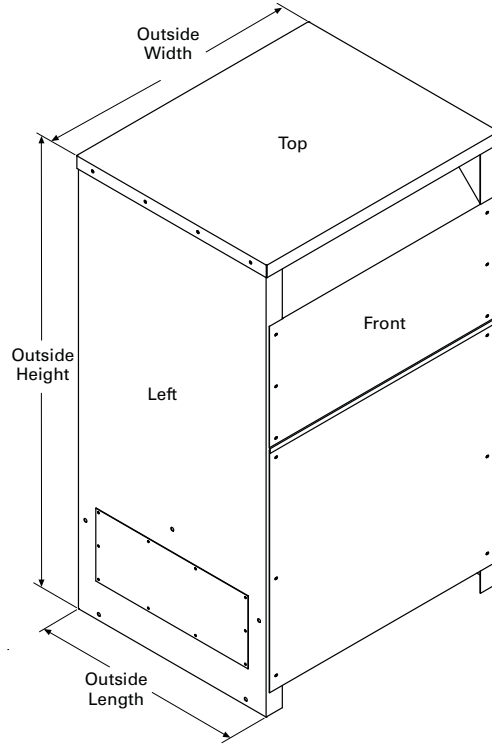
2 Enclosure Dimensional Drawings—Ventilated Transformers



Drawing 1



Drawing 2

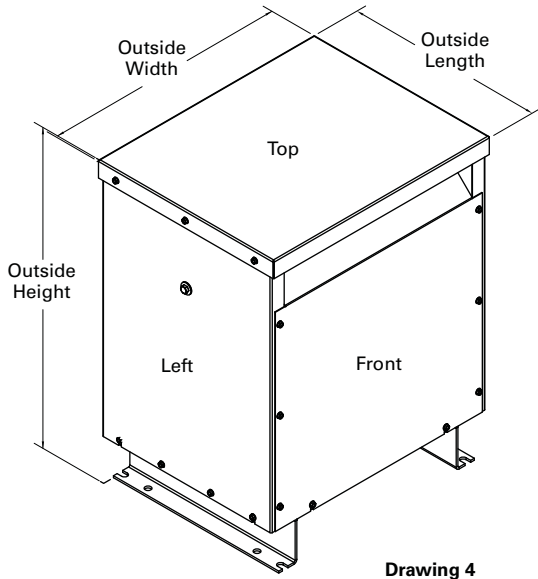


Drawing 3

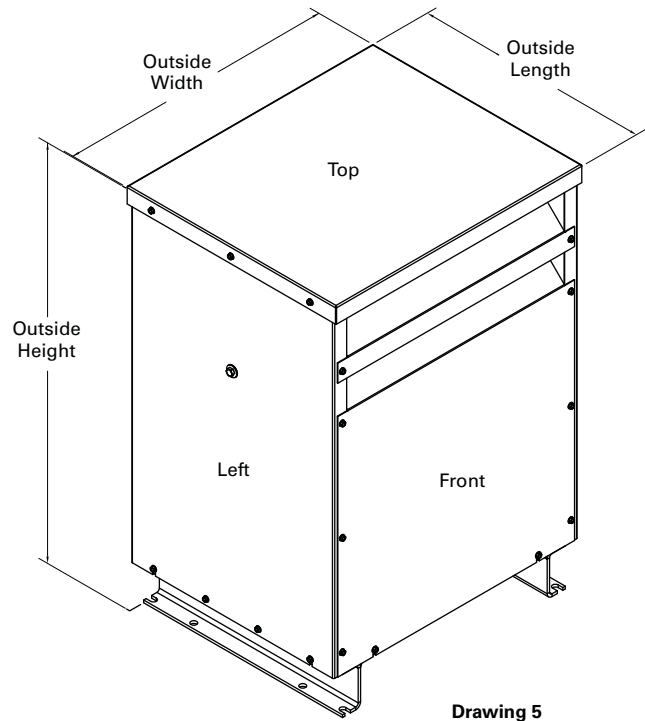
| Frame | Drawing Number | Dimensions | | |
|---------------|----------------|----------------|----------------|----------------|
| | | Height | Width | Length |
| FR816 | 1 | 31.30 (795.0) | 22.89 (581.4) | 18.39 (467.2) |
| FR818 | 1 | 37.59 (954.8) | 22.89 (581.4) | 20.36 (517.1) |
| FR819 | 2 | 42.03 (1067.6) | 24.22 (615.2) | 23.84 (605.5) |
| FR820 | 2 | 42.03 (1067.6) | 24.22 (615.2) | 23.84 (605.5) |
| FR814 | 2 | 62.91 (1597.9) | 29.97 (761.2) | 33.97 (862.8) |
| FR842, 842A | 1 | 33.75 (857.3) | 22.45 (570.2) | 17.40 (442.0) |
| FR843, 843A | 1 | 38.70 (983.0) | 23.51 (597.2) | 24.38 (619.3) |
| FR844, 844A | 2 | 44.92 (1141.0) | 26.27 (667.3) | 27.12 (688.8) |
| FR821 | 2 | 62.91 (1597.9) | 29.97 (761.2) | 33.97 (862.8) |
| FR912D | 1 | 30.00 (762.0) | 23.00 (584.2) | 16.50 (419.1) |
| FR914D/FR914F | 1 | 39.00 (990.6) | 29.00 (736.6) | 22.00 (558.8) |
| FR915D/FR915F | 1 | 39.00 (990.6) | 29.00 (736.6) | 22.00 (558.8) |
| FR916A | 2 | 48.56 (1233.4) | 28.22 (716.8) | 23.42 (594.9) |
| FR917 | 2 | 56.17 (1426.7) | 31.44 (798.6) | 24.67 (626.6) |
| FR918A | 2 | 62.18 (1579.4) | 31.44 (798.6) | 30.68 (779.3) |
| FR923 | 2 | 57.54 (1461.5) | 36.69 (931.9) | 32.65 (829.3) |
| FR924 | 2 | 68.37 (1736.6) | 44.46 (1129.3) | 36.44 (925.6) |
| FR928 | 2 | 56.16 (1426.5) | 32.93 (836.4) | 27.97 (710.4) |
| FR929 | 2 | 59.56 (1512.8) | 36.72 (932.7) | 32.50 (825.5) |
| FR919E | 3 | 75.00 (1905.0) | 44.20 (1122.7) | 36.23 (920.2) |
| FR920E | 3 | 75.00 (1905.0) | 44.20 (1122.7) | 36.23 (920.2) |
| FR922 | 3 | 90.00 (2286.0) | 69.26 (1759.2) | 42.65 (1083.3) |

Approximate Dimensions in Inches (mm)

Enclosure Dimensional Drawings—Ventilated Transformers, continued



Drawing 4



Drawing 5

| Frame | Drawing Number | Dimensions | | |
|-------|----------------|--------------|--------------|-------------|
| | | Height | Width | Length |
| FR939 | 4 | 28.00 (711) | 21.88 (556) | 17.75 (451) |
| FR940 | 5 | 36.88 (937) | 24.88 (632) | 21.13 (537) |
| FR942 | 5 | 43.00 (1092) | 30.50 (775) | 24.00 (610) |
| FR943 | 5 | 51.00 (1295) | 34.50 (876) | 31.50 (800) |
| FR944 | 5 | 60.00 (1524) | 38.00 (965) | 33.50 (851) |
| FR945 | 5 | 66.18 (1681) | 42.18 (1071) | 33.50 (851) |

2.7

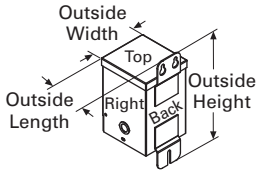
Transformers

Dimensions

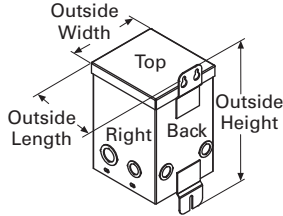
Approximate Dimensions in Inches (mm)

2

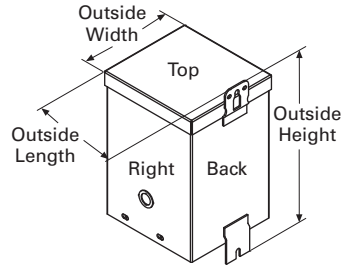
Enclosure Dimensional Drawings—Encapsulated Transformers (Type EP)



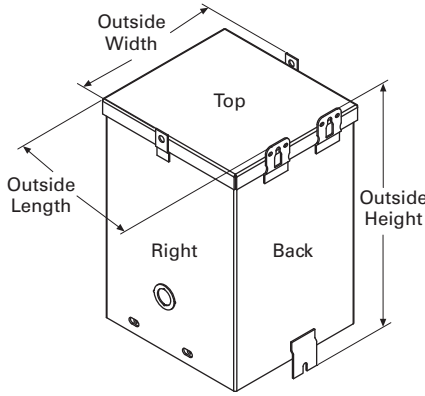
Drawing 6



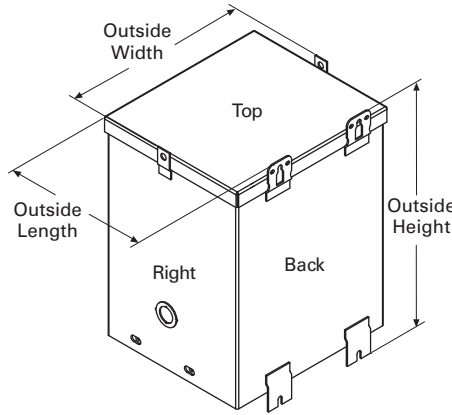
Drawing 7



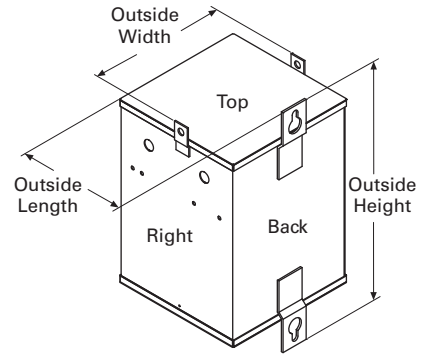
Drawing 8



Drawing 9



Drawing 10

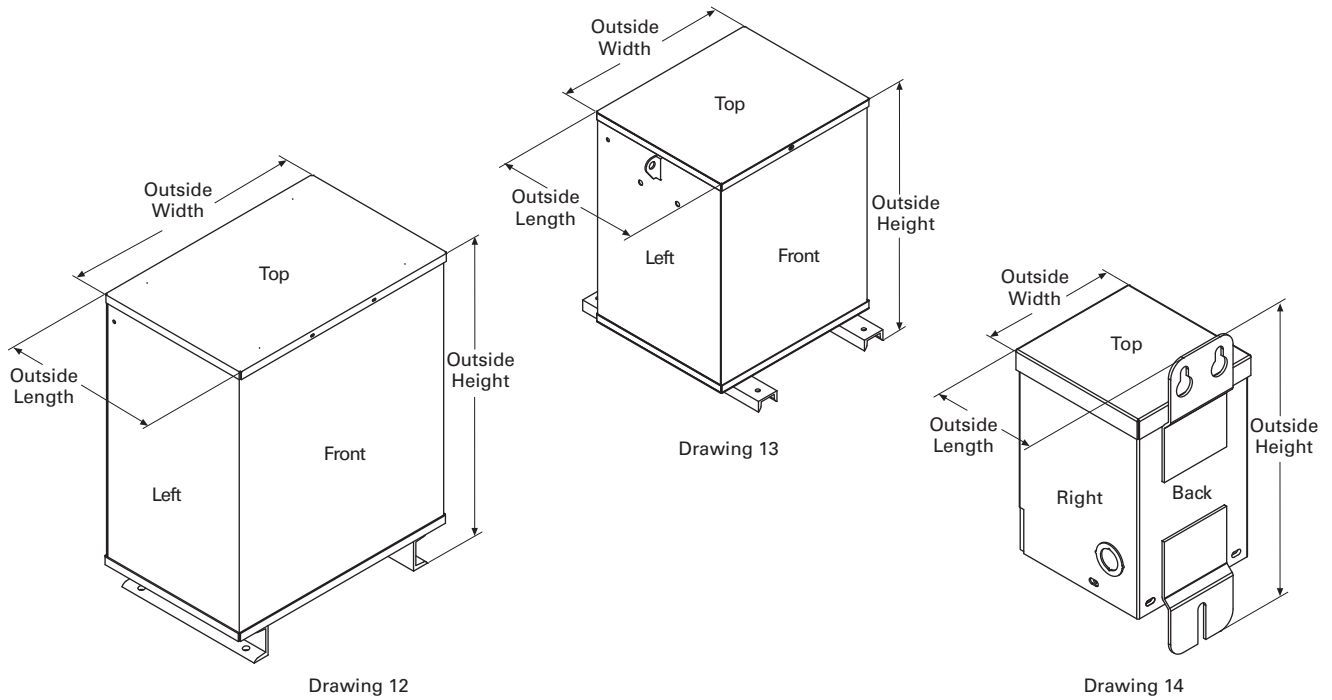


Drawing 11

| Frame | Drawing Number | Dimensions | | |
|-------|----------------|---------------|---------------|---------------|
| | | Height | Width | Length |
| FR52 | 6 | 8.91 (226.3) | 4.11 (104.4) | 4.00 (101.6) |
| FR54 | 6 | 8.91 (226.3) | 4.11 (104.4) | 4.00 (101.6) |
| FR55 | 6 | 8.91 (226.3) | 4.11 (104.4) | 4.00 (101.6) |
| FR56 | 7 | 8.97 (227.8) | 4.87 (123.7) | 4.06 (103.1) |
| FR57 | 7 | 8.97 (227.8) | 4.87 (123.7) | 4.91 (124.7) |
| FR58A | 7 | 11.28 (286.5) | 5.99 (152.1) | 5.75 (146.1) |
| FR59A | 7 | 11.28 (286.5) | 5.99 (152.1) | 5.75 (146.1) |
| FR67 | 7 | 13.41 (340.6) | 6.37 (161.8) | 6.52 (165.6) |
| FR68 | 7 | 13.41 (340.6) | 6.37 (161.8) | 6.52 (165.6) |
| FR176 | 8 | 14.25 (361.9) | 7.69 (195.3) | 8.00 (203.2) |
| FR177 | 9 | 16.00 (406.4) | 10.38 (263.7) | 9.89 (251.2) |
| FR301 | 11 | 22.26 (565.4) | 12.71 (322.8) | 12.79 (324.9) |
| FR178 | 9 | 16.00 (406.4) | 10.38 (263.7) | 9.89 (251.2) |
| FR302 | 11 | 25.26 (641.6) | 12.71 (322.8) | 12.79 (324.9) |
| FR304 | 11 | 25.26 (641.6) | 14.72 (373.9) | 14.82 (376.4) |
| FR179 | 9 | 19.00 (482.6) | 13.38 (339.9) | 10.52 (267.2) |
| FR180 | 9 | 19.00 (482.6) | 13.38 (339.9) | 10.52 (267.2) |
| FR182 | 10 | 23.31 (592.1) | 16.35 (415.3) | 14.12 (358.6) |
| FR190 | 10 | 26.31 (668.3) | 16.35 (415.3) | 14.12 (358.6) |

Approximate Dimensions in Inches (mm)

Enclosure Dimensional Drawings—Encapsulated Transformers Type EP (Single-Phase), continued



| Frame | Drawing Number | Dimensions | | |
|--------|----------------|---------------|---------------|---------------|
| | | Height | Width | Length |
| FR132 | 13 | 20.67 (525.0) | 19.02 (483.1) | 13.59 (345.2) |
| FR300A | 12 | 28.24 (717.3) | 22.42 (569.5) | 14.06 (357.1) |
| FR57P | 14 | 9.34 (237.2) | 4.45 (113.0) | 5.18 (131.6) |
| FR58AP | 14 | 11.68 (296.7) | 4.99 (126.7) | 5.99 (152.1) |
| FR567P | 14 | 13.03 (330.9) | 5.74 (145.8) | 6.56 (166.6) |
| FR568P | 14 | 13.78 (350.0) | 6.22 (158.0) | 6.32 (160.5) |

2.7

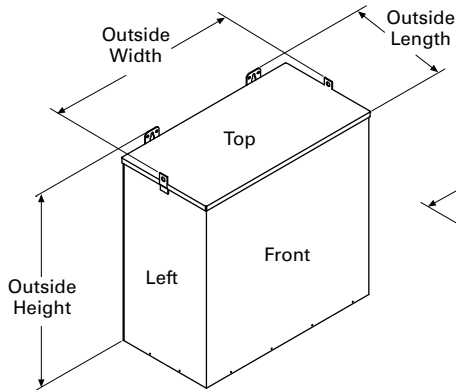
Transformers

Dimensions

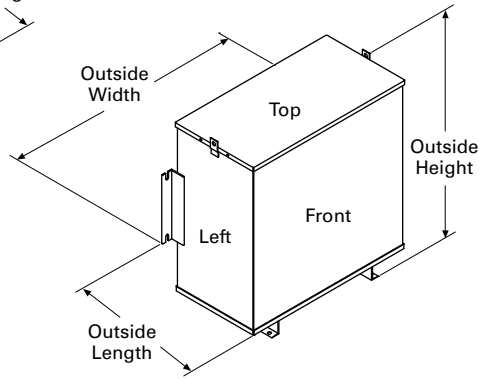
Approximate Dimensions in Inches (mm)

2

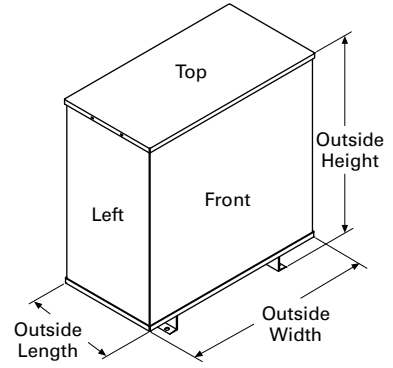
Enclosure Dimensional Drawings—Encapsulated Transformers (Type EPT)



Drawing 15



Drawing 16

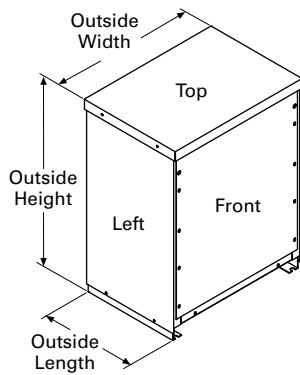


Drawing 17

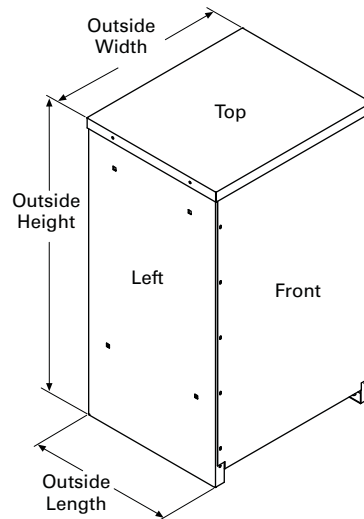
| Frame | Drawing Number | Dimensions | | |
|-------|----------------|---------------|---------------|---------------|
| | | Height | Width | Length |
| FR201 | 15 | 13.40 (340.4) | 15.93 (404.6) | 8.26 (209.8) |
| FR102 | 15 | 13.12 (333.2) | 19.59 (497.6) | 7.09 (180.1) |
| FR103 | 15 | 15.90 (403.9) | 16.93 (430.0) | 10.01 (254.3) |
| FR200 | 15 | 15.90 (403.9) | 16.93 (430.0) | 10.01 (254.3) |
| FR97 | 15 | 15.19 (385.8) | 25.68 (652.3) | 8.38 (212.9) |
| FR95 | 15 | 17.38 (441.5) | 20.00 (508.0) | 10.52 (267.2) |
| FR243 | 16 | 17.38 (441.5) | 20.00 (508.0) | 10.52 (267.2) |
| FR96 | 15 | 16.19 (411.2) | 29.68 (753.9) | 9.42 (239.3) |
| FR244 | 16 | 28.15 (715.0) | 26.58 (675.1) | 14.66 (372.4) |
| FR245 | 17 | 32.06 (814.3) | 30.29 (769.4) | 15.68 (398.3) |

Approximate Dimensions in Inches (mm)

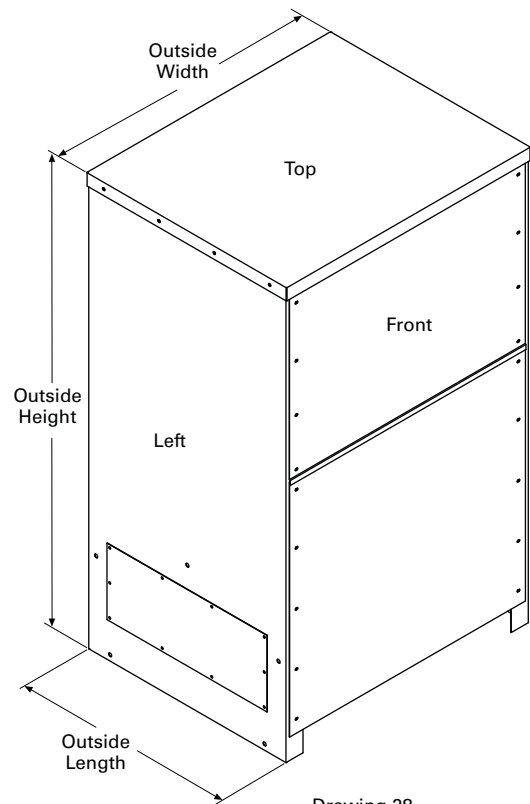
Enclosure Dimensional Drawings—Totally Enclosed Nonventilated Transformers



Drawing 26



Drawing 27



Drawing 28

| Frame | Drawing Number | Dimensions | | |
|-----------------|----------------|----------------|----------------|---------------|
| | | Height | Width | Length |
| FR818N | 26 | 37.59 (954.8) | 22.89 (581.4) | 20.36 (517.1) |
| FR819EN | 27 | 42.03 (1067.6) | 24.22 (615.2) | 23.84 (605.5) |
| FR820EN | 27 | 42.03 (1067.6) | 24.22 (615.2) | 23.84 (605.5) |
| FR814N | 27 | 62.91 (1597.9) | 29.97 (761.2) | 33.97 (862.8) |
| FR912DN | 26 | 30.00 (762.0) | 23.00 (584.2) | 16.50 (419.1) |
| FR914DN/FR914FN | 26 | 39.18 (995.2) | 29.00 (736.6) | 22.00 (558.8) |
| FR915DN/FR915FN | 26 | 39.18 (995.2) | 29.00 (736.6) | 22.00 (558.8) |
| FR916AN | 27 | 46.58 (1183.1) | 28.22 (716.8) | 23.42 (594.9) |
| FR917N | 27 | 56.18 (1427.0) | 31.44 (798.6) | 24.67 (626.8) |
| FR918AN | 27 | 62.18 (1579.4) | 31.44 (798.6) | 30.68 (779.3) |
| FR923N | 27 | 57.50 (1460.5) | 36.69 (931.9) | 32.65 (829.3) |
| FR919N | 28 | 75.00 (1905.0) | 44.21 (1122.9) | 36.23 (920.2) |
| FR920N | 28 | 75.00 (1905.0) | 44.21 (1122.9) | 36.23 (920.2) |

2.7

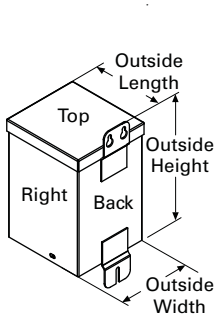
Transformers

Dimensions

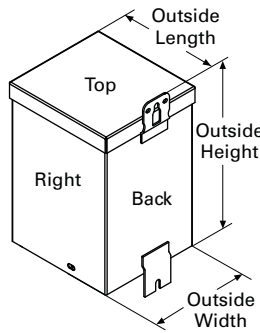
Approximate Dimensions in Inches (mm)

2

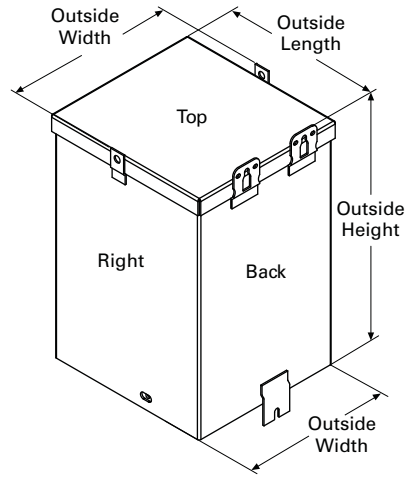
Enclosure Dimensional Drawings—Hazardous Location Transformers (Type EPZ)



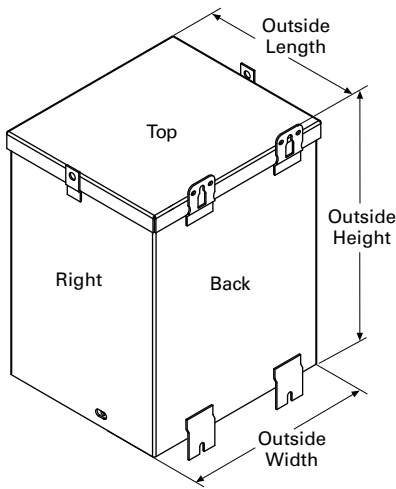
Drawing 21



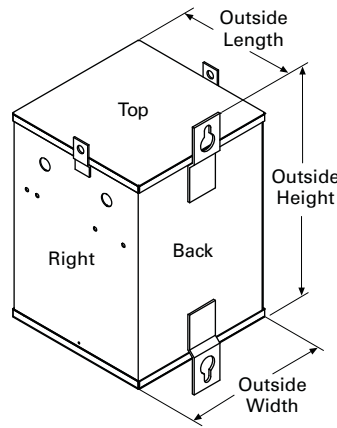
Drawing 22



Drawing 23



Drawing 24

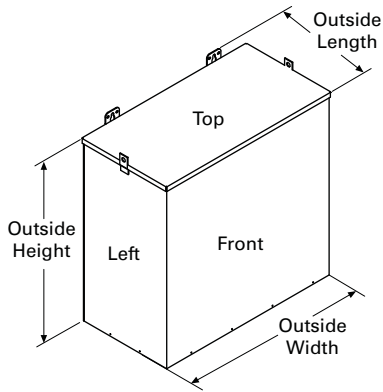


Drawing 25

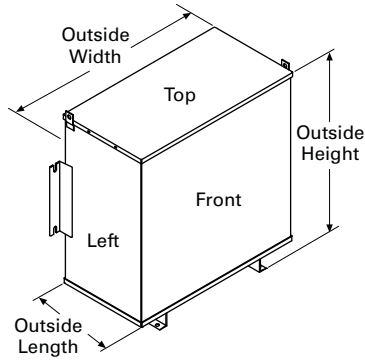
| Frame | Drawing Number | Dimensions Height | Width | Length |
|--------|----------------|-------------------|---------------|---------------|
| FR57H | 21 | 8.97 (227.8) | 4.87 (123.7) | 4.91 (124.7) |
| FR58H | 22 | 11.28 (286.5) | 5.99 (152.1) | 5.75 (146.1) |
| FR59H | 22 | 11.28 (286.5) | 5.99 (152.1) | 5.75 (146.1) |
| FR67H | 22 | 13.41 (340.6) | 6.37 (161.8) | 6.52 (165.6) |
| FR68H | 22 | 13.41 (340.6) | 6.37 (161.8) | 6.52 (165.6) |
| FR176H | 23 | 14.25 (361.9) | 7.69 (195.3) | 8.00 (203.2) |
| FR177H | 24 | 16.00 (406.4) | 10.38 (263.7) | 9.89 (251.2) |
| FR178H | 24 | 16.00 (406.4) | 10.38 (263.7) | 9.89 (251.2) |
| FR179H | 24 | 19.00 (482.6) | 13.38 (339.9) | 10.52 (267.2) |
| FR180H | 24 | 19.00 (482.6) | 13.38 (339.9) | 10.52 (267.2) |
| FR182H | 25 | 23.31 (592.1) | 16.35 (415.3) | 14.12 (358.6) |

Approximate Dimensions in Inches (mm)

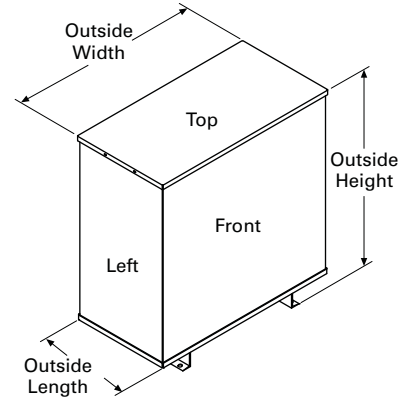
Enclosure Dimensional Drawings—Hazardous Location Transformers (Type EPTZ)



Drawing 18



Drawing 19



Drawing 20

| Frame | Drawing Number | Dimensions | | |
|--------|----------------|---------------|---------------|---------------|
| | | Height | Width | Length |
| FR201H | 18 | 13.40 (340.4) | 15.93 (404.6) | 8.26 (209.8) |
| FR200H | 18 | 15.90 (403.9) | 16.93 (430.0) | 10.01 (254.3) |
| FR103H | 18 | 15.90 (403.9) | 16.93 (430.0) | 10.01 (254.3) |
| FR95H | 18 | 17.38 (441.5) | 20.00 (508.0) | 10.52 (267.2) |
| FR243H | 19 | 17.38 (441.5) | 20.00 (508.0) | 10.52 (267.2) |
| FR244H | 19 | 28.15 (715.0) | 26.58 (675.1) | 14.66 (372.4) |
| FR245H | 20 | 32.06 (814.3) | 30.29 (769.4) | 15.68 (398.3) |