

Square D™ Brand EX Low Voltage Distribution Transformers

One product in the distribution system

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2016
Class 7400



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Square D™ Brand EX Low Voltage Distribution Transformers

Product Description

Product Description

General Information

The Square D™ Distribution Transformer is designed to supply power throughout the building. The transformer permits multiple voltages to be leveraged in the design of the system.

Advantages to designing a system with low voltage transformers:

- Distributes a voltage higher than required by the load to limit wire losses and voltage drop.
- Adds source impedance to the system, reducing common overcurrent at normal voltages.
- Mitigates harmonics through an internal magnetic circuit.
- Allows system grounding closer to the load which reduces capacitive noise.
- Utilizes multiple voltage equipment since transformers can be designed for any output voltage that is required.

Disadvantages to designing a system with low voltage distribution transformers:

- Reduces overall efficiency of the system due to internal losses within the transformer.
- Adds heat to the building if installed indoors (and in the HVAC system).

The impact on the efficiency of the system and the concerns for improvements in the market for energy consumption are why low voltage distribution transformers have been regulated through the Energy Policy and Conservation Act.

The first improvement to transformer efficiency was the development of NEMA TP1 – 1996 (updated 2002). This was a volunteer standard to increase the efficiency of transformers. The second was the 2005 Energy Act which mandated the NEMA TP1 – 2002 levels for all units manufactured after January 1, 2007. EAct2005 also authorized the Department of Energy to evaluate whether or not more stringent levels should be mandated.

The Department of Energy evaluated low voltage transformers as part of an overall Distribution Transformer analysis in 2010 and 2011. They published their advanced rule in 2012 increasing the levels slightly, but chose to increase to the maximum improvement in energy efficiency that was technologically feasible. This increase occurred after multiple comments from stake holders requesting that the levels be increased beyond the levels published in 2012. The final levels which were published in April 2013 effect all transformers manufactured after January 1, 2016. The increase in efficiency only effects three-phase units.

Square D™ Brand EX Low Voltage Distribution Transformers

Product Description

Department of Energy (DOE) Compliance

10 CFR 431 – Energy Conservation standards

431.196 (a) Low Voltage Transformers

(2) The efficiency of low voltage dry-type distribution transformers manufactured on or after January 1, 2016 shall be no less than that required for their kVA rating in the Table 1.

Table 1: Efficiency Ratings of Low Voltage Dry-Type Distribution Transformers

Single-phase ¹		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

NOTE: All efficiency values are at 35 percent of nameplate-rated load, determined according to the DOE Test Method for Measuring the Energy Consumption of Distribution Transformers under Appendix A to Subpart K of 10 CFR part 431.

¹ Single-phase ventilated transformer efficiencies remain the same as the 2007 levels. Single-phase transformers retain their design, EE prefix, and catalog numbering structure. For information on single-phase products, refer to the Energy Efficient Single Phase and Single Phase Watchdog section in Digest 177, Section 14 and to catalog no. 7400CT0601.

Low-voltage, dry-type distribution transformers with kVA ratings not appearing in Table 1 have their minimum efficiency level determined by linear interpolation of the kVA and efficiency values immediately above and below that kVA rating.

The new Type EX Energy Efficient Low Voltage Dry-Type Distribution Transformers comply with the new levels of efficiency.

Figure 1: Type EX Energy Efficient Low Voltage Dry-Type Distribution Transformer



Square D™ Brand EX Low Voltage Distribution Transformers

Product Features

Product Features

New Energy Efficient Transformer Family – EX

The efficiency levels set by the U.S. Department of Energy necessitated completely new transformer designs. Components used within Schneider Electric™ transformers were optimized for performance, including:

- **Coil**—Computer designed to reduce the losses with customized wire configurations used exclusively by Schneider Electric. Computer winding equipment to minimize variability during the winding process. Available as standard with aluminum conductor, but also available with copper.
- **Insulation System**—The system consists of a conductor wrap or coating, layer insulation, air gap spacing, and varnish material. The system is UL listed for a specific maximum temperature for average temperature rise, hot spot, and ambient temperature. Schneider Electric's EX family of transformers have a 428°F (220°C) insulation system, with an average temperature rise maximum of 302°F (150°C). The design also allows further reduction in conductor losses, while also offering the product with an average temperature rise of 239°F (115°C) or 176°F (80°C).

Figure 2: Insulation System



- **Core**—Transformers are designed with high grade grain oriented, non-aging silicon steel laminations with high magnetic permeability and low hysteresis and eddy current losses. The computer design program allows the design to keep the magnetic flux densities well below the saturation point. The laminations are carefully and evenly stacked in one of two core configurations: distributive gap or full step mitre. Then they are clamped together to ensure the most efficient magnetic circuit while providing a quiet quality offering of low voltage transformers.
- **Terminals**—Sized to allow the lugs to align with all corresponding Schneider Electric equipment (such as: circuit breakers, switches, panels, switchboards, and so forth). Layout separates the Primary and Secondary terminals and meet the NEC minimum bending requirements. Lugs are not shipped with the transformers to give the installer the flexibility to meet any distribution system conductors requested. All incoming terminals are sized for 125% or 250% lug landing.

NOTE: Both mechanical and compression lug kits are available from Schneider Electric.

Square D™ Brand EX Low Voltage Distribution Transformers

Product Features

- Enclosure—Two new enclosure styles: K and J. See Figure 3.
 - **Style K** units are designed with no top or rear ventilation and alcove tested with ½ in.(12.7 mm) clearance from the rear and sides. The front and rear panels are designed to attach to the cover, increasing the support strength of the tops. The base is vented and designed with a conduit entry and three locations for mounting a ground terminal bar.
 - **Style J** units are designed with no rear ventilation and alcove tested at ½ in.(12.7 mm) clearance from the rear and sides. The front and rear panels are designed to attach to the cover via a u-shaped lip, increasing the support strength of the tops. The open design of the enclosure base includes three locations for mounting a ground terminal bar.

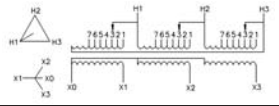
Both enclosures have mounting holes on the side allowing for the use of a floor mounting kit, to more easily bolt the unit to the floor.

Figure 3: Style K and J Enclosure

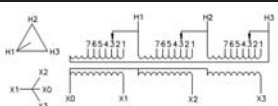


- Nameplate—Two nameplates are supplied with each unit (see Figure 4). One on the front cover which is required by standards, the second nameplate is attached to the core and coil, providing installation information inside the unit. The second nameplate also carries a UR listing for the core and coil, allowing the enclosure to be removed and the device installed in other equipment.

Figure 4: Sample Nameplates

 ENERGY EFFICIENT LOW VOLTAGE DISTRIBUTION TRANSFORMER, DRY TYPE		
CAT. NO. : EX75T3H STYLE NO. : EAV8550503 SERIAL NO. : Q2C Number DATE CODE : 1616	KVA : 75 PHASE : 3 FREQ. : 60 Hz % IZ : 5.83	PRI (H) VOLTS : 480D SEC (X) VOLTS : 208Y/120 PRI (H) AMPS : 90.2 SEC (X) AMPS : 208.2
WEIGHT : 638 LBS. TYPE : SO ENCL : 20K TYPE 1, TYPE 3R WHEN 7400WS20K INSTALLED TO BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE, SECTION 450.9, AND UL 1561, MAINTAIN MINIMUM CLEARANCE OF 6.5 INCH TO WALL OR OTHER OBSTRUCTIONS.	INS CLASS : 220° C RISE : 150° C AMB : 40 ° C EFFICIENCY : 98.60% @ 35% LOAD & 75°C MEETS FINAL RULE U.S. 10 CFR 431 APR 2013	
	TAP POSITIONS 	Primary TAP VOLTS 1 505 2 493 3 480 4 467 5 455 6 445 7 433
 POWER TRANSFORMER 127 H INS SYS. : 65 PDG220-1 MADE IN USA		

Attached to the Front Cover

 ENERGY EFFICIENT LOW VOLTAGE DISTRIBUTION TRANSFORMER, DRY TYPE		
CAT. NO. : EX75T3HOC STYLE NO. : EAV8550503 SERIAL NO. : Q2C Number DATE CODE : 1616	KVA : 75 PHASE : 3 FREQ. : 60 Hz % IZ : 5.83	PRI (H) VOLTS : 480D SEC (X) VOLTS : 208Y/120 PRI (H) AMPS : 90.2 SEC (X) AMPS : 208.2
WEIGHT : 518 LBS. TYPE : OS ENCL : NONE	INS CLASS : 220° C RISE : 150° C AMB : 40 ° C EFFICIENCY : 98.60% @ 35% LOAD & 75°C MEETS FINAL RULE U.S. 10 CFR 431 APR 2013	
	TAP POSITIONS 	Primary TAP VOLTS 1 505 2 493 3 480 4 467 5 455 6 445 7 433
NOT FOR USE ON COMBUSTIBLE FLOORS  POWER TRANSFORMER 127 H INS SYS : 65 PDG220-1 MADE IN USA		

Attached to the Core and Coil

Square D™ Brand EX Low Voltage Distribution Transformers

Product Features

- Testing—All designs are tested at state of the art test labs, UL certified, and part of the test program.
 - UL 1561 and NEMA ST-20 design and prototype testing are done on initial design
 - DOE product verification testing is completed yearly in compliance with 10 CFR 429
 - Routine testing is completed on 100% of all units shipped from the facilities.Testing is performed on all units shipped.
- Packaging—Shipping materials are updated to insure the new designs arrive undamaged from handling and logistics. Pallets are designed to increase clearances between units, and spacers are added underneath the box to prevent small dings in the enclosure. The enclosure design is also enhanced to prevent damage during shipments.
- Quiet Quality—All units are designed and tested to sound levels 3–6 dB below the NEMA ST-20 tables. Because each 3 dB cuts the audible sound in half, this new offering has the quietest units in the marketplace.
- Manufacturing—All units are built in two ISO registered facilities.
- Product Environmental Profile:
 - RoHS compliant
 - REACH compliant
 - Eco-Passport

Square D™ Brand EX Low Voltage Distribution Transformers

Electrical Data

Electrical Data

Table 2: Product Specifications / Catalog Numbers—Temp. Rise 150°C, Aluminum Wound

kVA	Primary Winding Delta	Full Capacity Taps	Secondary Winding	Efficiency @ 35% 167°F / 75°C	Temp. Rise (°C)	Inc Class	Sound Level	Catalog No.	Weight (lb.)	Enclosure
15	480	6–2.5% 2+4–	208Y/120	98.17%	150	220	39 dB	EX15T3H	245	17K
30				98.38%			39 dB	EX30T3H	400	18K
45				98.60%			39 dB	EX45T3H	490	18K
75				98.69%			44 dB	EX75T3H	710	20K
112.5				98.83%			44 dB	EX112T3H	920	21K
150				99.00%			47 dB	EX150T3H	1170	22K
225				99.06%			49 dB	EX225T3H	1825	25J
300				99.13%			49 dB	EX300T3H	1975	25J
500		4–2.5% 2+2–		99.24%			56 dB	EX500T68H	3100	30J
750				99.34%			58 dB	EX750T68H	4125	31J

Table 3: Product Specifications / Catalog Numbers—Temp. Rise 150°C, Copper Wound

kVA	Primary Winding Delta	Full Capacity Taps	Secondary Winding	Efficiency @ 35% 167°F / 75°C	Temp. Rise (°C)	Inc Class	Sound Level	Catalog No.	Weight (lb.)	Enclosure
15	480	6–2.5% 2+4–	208Y/120	98.10%	150	220	39 dB	EX15T3HCU	250	17K
30				98.48%			39 dB	EX30T3HCU	400	18K
45				98.57%			39 dB	EX45T3HCU	495	18K
75				98.70%			44 dB	EX75T3HCU	755	20K
112.5				98.94%			44 dB	EX112T3HCU	1025	21K
150				99.06%			47 dB	EX150T3HCU	1270	22K
225				99.04%			49 dB	EX225T3HCU	1545	25J
300				99.12%			49 dB	EX300T3HCU	1975	25J
500		4–2.5% 2+2–		99.32%			56 dB	EX500T68HCU	3705	30J
750				99.36%			58 dB	EX750T68HCU	4400	31J

Table 4: Product Specifications / Catalog Numbers—Temp. Rise 115°C, Aluminum Wound

kVA	Primary Winding Delta	Full Capacity Taps	Secondary Winding	Efficiency @ 35% 167°F / 75°C	Temp. Rise (°C)	Inc Class	Sound Level	Catalog No.	Weight (lb.)	Enclosure
15	480	6–2.5% 2+4–	208Y/120	98.20%	115	220	39 dB	EX15T3HF	245	17K
30				98.41%			39 dB	EX30T3HF	400	18K
45				98.62%			39 dB	EX45T3HF	490	18K
75				98.71%			44 dB	EX75T3HF	920	20K
112.5				98.78%			47 dB	EX112T3HF	1170	21K
150				98.78%			49 dB	EX150T3HF	1825	22K
225				99.08%			49 dB	EX225T3HF	1825	25J
300				99.15%			49 dB	EX300T3HF	1975	25J
500		4–2.5% 2+2–		99.26%			56 dB	EX500T68HF	3100	30J
750				99.35%			58 dB	EX750T68HF	4125	31J

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Electrical Data

Table 5: Product Specifications / Catalog Numbers—Temp. Rise 115°C, Copper Wound

kVA	Primary Winding Delta	Full Capacity Taps	Secondary Winding	Efficiency @ 35% 167°F / 75°C	Temp. Rise (°C)	Inc Class	Sound Level	Catalog No.	Weight (lb.)	Enclosure
15	480	6–2.5% 2+4–	208Y/120	98.20%	115	220	39 dB	EX15T3HFCU	245	17K
30				98.50%			39 dB	EX30T3HFCU	400	18K
45				98.60%			39 dB	EX45T3HFCU	490	18K
75				98.73%			44 dB	EX75T3HFCU	920	20K
112.5				98.96%			44 dB	EX112T3HFCU	1170	21K
150				99.01%			47 dB	EX150T3HFCU	1825	22J
225				99.06%			49 dB	EX225T3HFCU	1825	25J
300				99.14%			49 dB	EX300T3HFCU	1975	25J
500				4–2.5% 2+2–			99.33%	56 dB	EX500T68HFCU	3100
750		99.37%					58 dB	EX750T68HFCU	4125	31J

Table 6: Product Specifications / Catalog Numbers—Temp. Rise 80°C, Aluminum Wound

kVA	Primary Winding Delta	Full Capacity Taps	Secondary Winding	Efficiency @ 35% 167°F / 75°C	Temp. Rise (°C)	Inc Class	Sound Level	Catalog No.	Weight (lb.)	Enclosure
15	480	6–2.5% 2+4–	208Y/120	98.26%	80	220	39 dB	EX15T3HB	400	18K
30				98.58%			39 dB	EX30T3HB	490	18K
45				98.73%			44 dB	EX45T3HB	710	20K
75				98.89%			44 dB	EX75T3HB	920	21K
112.5				99.05%			47 dB	EX112T3HB	1170	22K
150				99.05%			49 dB	EX150T3HB	1825	25J
225				99.11%			49 dB	EX225T3HB	1975	25J
300				4–2.5% 2+2–			99.15%	56 dB	EX300T68HB	3100
500		99.29%					58 dB	EX500T68HB	4125	31J

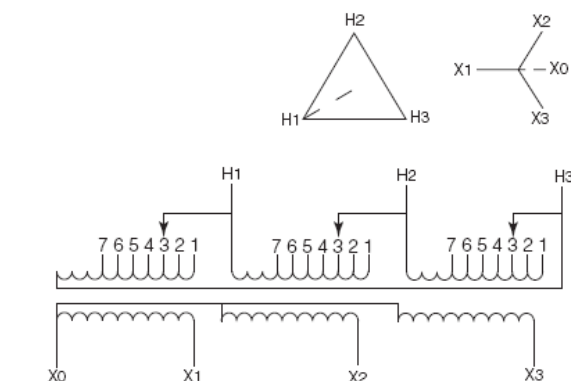
Table 7: Product Specifications / Catalog Numbers—Temp. Rise 80°C, Copper Wound

kVA	Primary Winding Delta	Full Capacity Taps	Secondary Winding	Efficiency @ 35% 167°F / 75°C	Temp. Rise (°C)	Inc Class	Sound Level	Catalog No.	Weight (lb.)	Enclosure	
15	480	6–2.5% 2+4–	208Y/120	98.26%	80	220	39 dB	EX15T3HBCU	400	18K	
30				98.58%			39 dB	EX30T3HBCU	490	18K	
45				98.69%			44 dB	EX45T3HBCU	710	20K	
75				98.97%			44 dB	EX75T3HBCU	920	21K	
112.5				99.03%			47 dB	EX112T3HBCU	1170	22K	
150				99.04%			49 dB	EX150T3HBCU	1825	25J	
225				99.12%			49 dB	EX225T3HBCU	1975	25J	
300		4–2.5% 2+2–		99.20%			56 dB	EX300T68HBCU	3100	30J	
500				99.34%			58 dB	EX500T68HBCU	4125	31J	

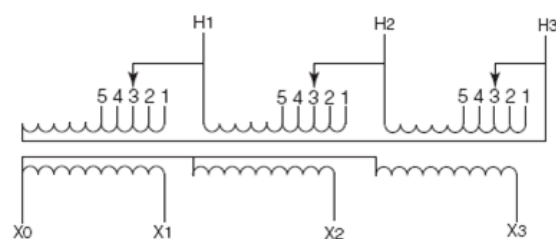
Square D™ Brand EX Low Voltage Distribution Transformers

Electrical Data

Figure 5: Phase Relationships / Wiring Diagram



TAPS 6 — 2.5% 2 FCAB, 4 FCBN



TAPS 5-2.5% 2 FCAN, 2 FCBN

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Electrical Data

The transformer source impedance limits the overcurrent on the secondary terminals. Table 8 provides the maximum amount of overcurrent available:

Table 8: Technical data: IZ, IX, X/R, and Let Through Current— -H and -HCU Suffix

Catalog	Secondary Winding	Secondary NP Current	Secondary NEC 125%	IZ%	%IX	X/R	Infinite Primary Bus Let Through kA
EX15T3H	208Y/120	41.6	60	4.7%	3.23%	0.93	0.9
EX30T3H		83.3	110	3.8%	1.56%	0.45	2.2
EX45T3H		124.9	175	3.9%	2.74%	0.99	3.2
EX75T3H		208.2	300	5.2%	4.29%	1.45	4.0
EX112T3H		312.3	400	4.3%	3.45%	1.32	7.2
EX150T3H		416.4	600	4.2%	3.60%	1.69	10.0
EX225T3H		624.5	800	4.6%	4.18%	2.24	13.7
EX300T3H		832.7	1,200	4.4%	4.14%	2.82	19.0
EX500T68H		1387.9	2,000	4.9%	4.74%	3.58	28.2
EX750T68H		2081.8	3,000	5.0%	4.85%	4.33	41.8
EX15T3HCU	208Y/120	41.6	60	4.40%	2.03%	0.52	1.0
EX30T3HCU		83.3	110	3.70%	2.13%	0.7	2.3
EX45T3HCU		124.9	175	4.40%	3.34%	1.15	2.8
EX75T3HCU		208.2	300	3.60%	2.62%	1.04	5.7
EX112T3HCU		312.3	400	4.20%	3.53%	1.57	7.5
EX150T3HCU		416.4	600	3.80%	3.42%	2.15	11.0
EX225T3HCU		624.5	800	6.90%	6.62%	3.5	9.1
EX300T3HCU		832.7	1,200	5%	4.75%	2.99	16.6
EX500T68HCU		1,387.9	2,000	4.80%	4.65%	4.37	29.1
EX750T68HCU		2,081.8	3,000	5.30%	5.19%	4.32	39.1

Calculation of regulation on a transformer is complex, requiring information about load power factor as well as amperage. Since complete information is often lacking, a worse case calculation, as shown below, is often used to provide conservative results:

$$\text{Voltage drop (\%)} = \frac{\text{Maximum load current}}{\text{Transformer secondary full load rating}} \times \text{Impedance (\%)}$$

Square D™ Brand EX Low Voltage Distribution Transformers

Electrical Data

Table 9: Technical data: IZ, IX, X/R, and Let Through Current— -HF and -HFCU Suffix

Catalog	Secondary Winding	Secondary NP Current	Secondary NEC 125%	IZ%	%IX	X/R	Infinite Primary Bus Let Through kA
EX15T3HF	208Y/120	41.6	60	4.50%	3.23%	1.03	0.9
EX30T3HF		83.3	110	3.50%	1.56%	0.49	2.4
EX45T3HF		124.9	175	5.10%	4.29%	1.6	4.1
EX75T3HF		208.2	300	4.30%	3.45%	1.32	7.2
EX112T3HF		312.3	400	4.40%	3.60%	1.43	9.5
EX150T3HF		416.4	600	3.80%	3.42%	2.15	11.0
EX225T3HF		624.5	800	4.50%	4.18%	2.47	13.9
EX300T3HF		832.7	1,200	4.30%	4.14%	3.11	19.2
EX500T68HF		1,387.9	2,000	4.9%	4.74%	3.95	28.4
EX750T68HF		2,081.8	3,000	5.0%	4.85%	4.78	42.0
EX15T3HFCU	208Y/120	41.6	60	4.10%	2.03%	0.58	1.0
EX30T3HFCU		83.3	110	3.50%	2.13%	0.78	2.4
EX45T3HFCU		124.9	175	4.30%	3.34%	1.26	2.9
EX75T3HFCU		208.2	300	3.60%	2.62%	1.04	5.7
EX112T3HFCU		312.3	400	4.10%	3.53%	1.73	7.6
EX150T3HFCU		416.4	600	3.90%	3.54%	2.14	10.7
EX225T3HFCU		624.5	800	6.80%	6.62%	3.85	9.1
EX300T3HFCU		832.7	1,200	5%	4.75%	3.29	16.8
EX500T68HFCU		1,387.9	2,000	4.80%	4.65%	4.81	29.2
EX750T68HFCU		2,081.8	3,000	5.30%	5.19%	4.75	39.2

Table 10: Technical data: IZ, IX, X/R, and Let Through Current— -HB and -HBCU Suffix

Catalog	Secondary Winding	Secondary NP Current	Secondary NEC 125%	IZ%	%IX	X/R	Infinite Primary Bus Let Through kA
EX15T3HB	208Y/120	41.6	60	4.7%	3.23%	0.93	0.9
EX30T3HB		83.3	110	3.8%	1.56%	0.45	2.2
EX45T3HB		124.9	175	3.9%	2.74%	0.99	3.2
EX75T3HB		208.2	300	5.2%	4.29%	1.45	4.0
EX112T3HB		312.3	400	4.3%	3.45%	1.32	7.2
EX150T3HB		416.4	600	4.2%	3.60%	1.69	10.0
EX225T3HB		624.5	800	4.6%	4.18%	2.24	13.7
EX300T68HB		832.7	1,200	4.4%	4.14%	2.82	19.0
EX500T68HB		1,387.9	2,000	4.9%	4.74%	3.58	28.2
EX750T68HB		2,081.8	3,000	5.0%	4.85%	4.33	41.8
EX15T3HBCU	208Y/120	41.6	60	4.40%	2.03%	0.52	1.0
EX30T3HBCU		83.3	110	3.70%	2.13%	0.7	2.3
EX45T3HBCU		124.9	175	4.40%	3.34%	1.15	2.8
EX75T3HBCU		208.2	300	3.60%	2.62%	1.04	5.7
EX112T3HBCU		312.3	400	4.20%	3.53%	1.57	7.5
EX150T3HBCU		416.4	600	3.80%	3.42%	2.15	11.0
EX225T3HBCU		624.5	800	6.90%	6.62%	3.5	9.1
EX300T68HBCU		832.7	1,200	5%	4.75%	2.99	16.6
EX500T68HBCU		1,387.9	2,000	4.80%	4.65%	4.37	29.1
EX750T68HBCU		2,081.8	3,000	5.30%	5.19%	4.32	39.1

Square D™ Brand EX Low Voltage Distribution Transformers

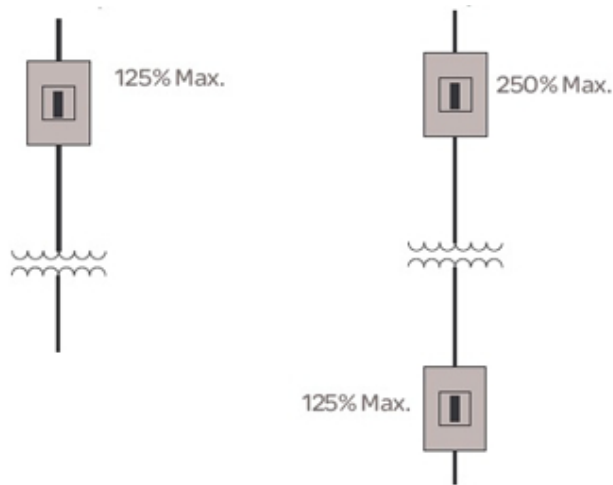
Electrical Data

When voltage is applied to the input winding of a transformer there can be a brief period of inrush current until the transformer core is stabilized. Inrush lasts approximately 6 power cycles, or about 0.1 seconds. The magnitude of the inrush varies depending on when the switch closes on the power wave, so that inrush can be anywhere from zero to greater than the full load current rating of the transformer. In addition, the impedance of the supply system can influence the amount of inrush current the transformer can draw. To avoid tripping breakers, or blowing fuses on the primary side of the transformer during energizing, careful coordination of fuse sizes or breaker handle ratings and magnetic trip settings is essential. This coordination requires information about maximum possible inrush to be expected from the particular transformer in question.

Schneider Electric has taken the inrush data for our units and plotted this data on our circuit breakers' trip curves. As a result of this data, it has been determined that circuit breakers sized at either the NEC 125% or 250% levels will energize the product without tripping.

Tables 19, 20, 21, 22, and 23 on pages 31-35 permits completion of the analysis by supplying the maximum inrush times rated, but also includes the type of breaker at the NEC level listed for a quick guide to choosing the proper transformer breaker.

Figure 6: Primary and Secondary Protection



The following tables were developed by modeling the transformers in PTW software and plotting trip curves for each listed trip unit at the given amperage. Then, it was verified whether or not the device could carry the full load inrush multiplier at 0.01 seconds.

NOTE: Setting is the minimum instantaneous (INST) level for the sensor. For circuit breakers with trips allowing settings, the value is shown and the sensor is in ().

Square D™ Brand EX Low Voltage Distribution Transformers

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Transformer efficiency can be defined as the percentage of power out compared to the percentage of power in. A perfect zero loss transformer would have the same power in as out, and would be 100% efficient. With the implementation of EPACT2005 Final Rule 10 CFR 431 Subpart K, most low voltage transformers exceed 98% at 35% load.

For compliance with the 2005 Energy Act, manufacturers must measure and calculate the efficiency levels using the following formula:

$$\% \text{ Efficiency} = \frac{100 \times P \times VA}{(P \times VA) + \text{Core Loss} + (P^2 \times \text{Coil Loss} \times T)}$$

Where:

P = per unit load (EPACT2005 = 0.35)

T = correction factor for winding material and temperature correction (convert to 167°F [75°C])
(302°F [150°C] Rise AL = 0.8152; CU = 0.8193)

Correction factors are used because resistance losses vary by temperature and winding material. See 10 CFR 431.192 for more details on formula..

Table 11: Transformer Efficiency

kVA	Part Number	No Load	Coil Loss	Total Loss 35% / 167°F (75°C)	Power Out 35% Load / 167°F (75°C)	Power In 35% Load / 167°F (75°C)	Efficiency 35% Load / 167°F (75°C)	Minimum Efficiency EPACT 2005 10 CFR 431
15	EX15T3H	46	521	98.0	5250	5348.03	98.17%	97.89%
30	EX30T3H	69	1050	173.4	10500	10673.37	98.38%	98.23%
45	EX45T3H	100	1242	223.8	15750	15973.84	98.60%	98.40%
75	EX75T3H	128	2219	349.8	26250	26599.81	98.68%	98.60%
112.5	EX112T3H	171	2938	464.7	39375	39839.66	98.83%	98.74%
150	EX150T3H	210	3192	528.8	52500	53028.76	99.00%	98.83%
225	EX225T3H	328	4198	747.2	78750	79497.22	99.06%	98.94%
300	EX300T3H	479	4397	917.9	105000	105917.89	99.13%	99.02%
500	EX500T68H	672	6617	1333.0	175000	176333.03	99.24%	99.14%
750	EX750T68H	900	8391	1737.9	262500	264237.94	99.34%	99.23%

Manufacturers are required to use sampling plans for Distribution Transformers under Department of Energy 10 CFR 429.47.

Manufacturers can use actual test results in accordance with 10 CFR 431.193, to certify:

- a. Basic Models
- b. kVA Groups

Manufacturers may also use Alternative Methods for Determining Efficiency for (AEDM) per 10 CFR 429.70.

Core loss (No-Load Loss): When a transformer is energized on the primary side, the laminated steel core carries a magnetic field, or flux. This magnetic field causes certain losses in the core, generating heat and dissipating real power from the primary source even when no load is on the secondary side of the transformer.

Coil Loss (Load Loss): Under load, a transformer loses energy in the form of heat within the winding conductors. That's because these conductors have a certain amount of resistance. Nearly all of the coil loss can be accounted for by the simple I^2R (current in amperes squared times resistance in ohms) formula for watts. There is a small amount of stray losses, and the sum of these and I^2R watts equal total coil loss.

These losses are typically reported by engineering in watts. Many contractors interested in air conditioning requirements of a building will request the BTU/HR (British Thermal Units per hour) equivalent, which can be determined as follows: $\text{BTU/HR} = 3.412 \times \text{Losses in Watts}$.

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Table 12: Transformer Core and Coil Loss–Catalog Numbers -H and -HCU

kVA	Part Number	Watts		Calculated Load per ST-20, 338°F (170°C)				
		No Load	Coil Loss	1/6 Watts BTUs/Hr	1/4 Watts BTUs/Hr	1/2 Watts BTUs/Hr	3/4 Watts BTUs/Hr	Full Watts BTUs/Hr
15	EX15T3H	46	521	60	79	176	339	567
				206	268	601	1157	1935
30	EX30T3H	54	1050	83	120	317	645	1104
				284	409	1080	2200	3767
45	EX45T3H	90	1242	125	168	401	789	1332
				426	573	1367	2692	4546
75	EX75T3H	135	2219	197	274	690	1384	2354
				672	935	2355	4721	8033
112.5	EX112T3H	180	2938	262	364	915	1833	3118
				894	1242	3122	6254	10640
150	EX150T3H	210	3192	299	410	1008	2006	3402
				1019	1397	3439	6843	11608
225	EX225T3H	328	4198	445	590	1378	2689	4526
				1517	2014	4700	9176	15443
300	EX300T3H	601	4397	724	876	1701	3075	4998
				2469	2990	5803	10491	17055
500	EX500T68H	902	6617	1086	1316	2556	4624	7519
				3705	4489	8722	15778	25655
750	EX750T68H	900	8391	1133	1424	2998	5620	9291
				3866	4860	10228	19175	31701
15	EX15T3HCU	43	580	60	80	188	370	624
				205	273	641	1262	2129
30	EX30T3HCU	72	907	98	128	298	582	979
				334	437	1017	1986	3340
45	EX45T3HCU	96	1310	132	178	424	833	1406
				450	607	1447	2842	4797
75	EX75T3HCU	139	2044	196	267	650	1289	2183
				669	911	2218	4398	7448
112.5	EX112T3HCU	167	2534	238	325	800	1592	2700
				812	1109	2730	5432	9212
150	EX150T3HCU	259	2386	325	408	856	1601	2645
				1109	1392	2921	5463	9025
225	EX225T3HCU	333	4262	452	599	1398	2730	4595
				1542	2044	4770	9315	15678
300	EX300T3HCU	449	4768	581	747	1939	3131	5217
				1982	2549	6616	10683	17800
500	EX500T68HCU	667	5324	815	1000	1998	4993	5991
				2781	3412	6817	17036	20441
750	EX750T68HCU	786	9011	1037	1349	3038	8107	9796
				3538	4603	10366	27661	33424

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Table 13: Transformer Core and Coil Loss–Catalog Numbers -HF and -HFCU

kVA	Part Number	Watts		Calculated Load per ST-20, 338°F (170°C)				
		No Load	Coil Loss	1/6 Watts BTUs/Hr	1/4 Watts BTUs/Hr	1/2 Watts BTUs/Hr	3/4 Watts BTUs/Hr	Full Watts BTUs/Hr
15	EX15T3HF	46	472	60	80	164	312	518
				205	273	560	1065	1767
30	EX30T3HF	69	952	96	128	307	604	1021
				328	437	1047	2061	3484
45	EX45T3HF	100	1126	132	170	381	733	1226
				450	580	1300	2501	4183
75	EX75T3HF	128	2011	184	254	631	1260	2140
				628	867	2153	4299	7302
112.5	EX112T3HF	171	2939	253	355	906	1825	3110
				863	1211	3091	6227	10611
150	EX150T3HF	210	2894	291	391	934	1838	3104
				993	1334	3187	6271	10591
225	EX225T3HF	328	3806	434	566	1279	2469	4134
				1481	1931	4364	8424	14105
300	EX300T3HF	479	3987	590	728	1725	2722	4466
				2013	2484	5886	9287	15238
500	EX500T68HF	672	6000	839	1047	2172	5547	6672
				2863	3572	7411	18926	22765
750	EX750T68HF	900	7608	1111	1376	2802	7081	8508
				3791	4695	9560	24160	29029
15	EX15T3HFCU	43	527	58	76	175	340	571
				198	259	597	1160	1948
30	EX30T3HFCU	72	825	95	123	278	535	896
				324	420	949	1825	3057
45	EX45T3HFCU	96	1190	129	171	394	766	1287
				440	583	1344	2614	4391
75	EX75T3HFCU	139	1858	191	256	604	1185	1997
				652	873	2061	4043	6814
112.5	EX112T3HFCU	167	2303	231	311	742	1462	2470
				788	1061	2532	4988	8428
150	EX150T3HFCU	259	2484	328	414	880	1656	2743
				1119	1413	3003	5650	9359
225	EX225T3HFCU	333	2874	413	575	1301	2512	4207
				1409	1962	4439	8571	14354
300	EX300T3HFCU	449	4334	570	720	1804	2887	4783
				1945	2457	6155	9850	16320
500	EX500T68HFCU	667	4839	802	970	1877	4599	5506
				2736	3310	6404	15692	18786
750	EX750T68HFCU	786	8191	1014	1297	2833	7440	8976
				3460	4425	9666	25385	30626

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Table 14: Transformer Core and Coil Loss–Catalog Numbers -HB and -HBCU

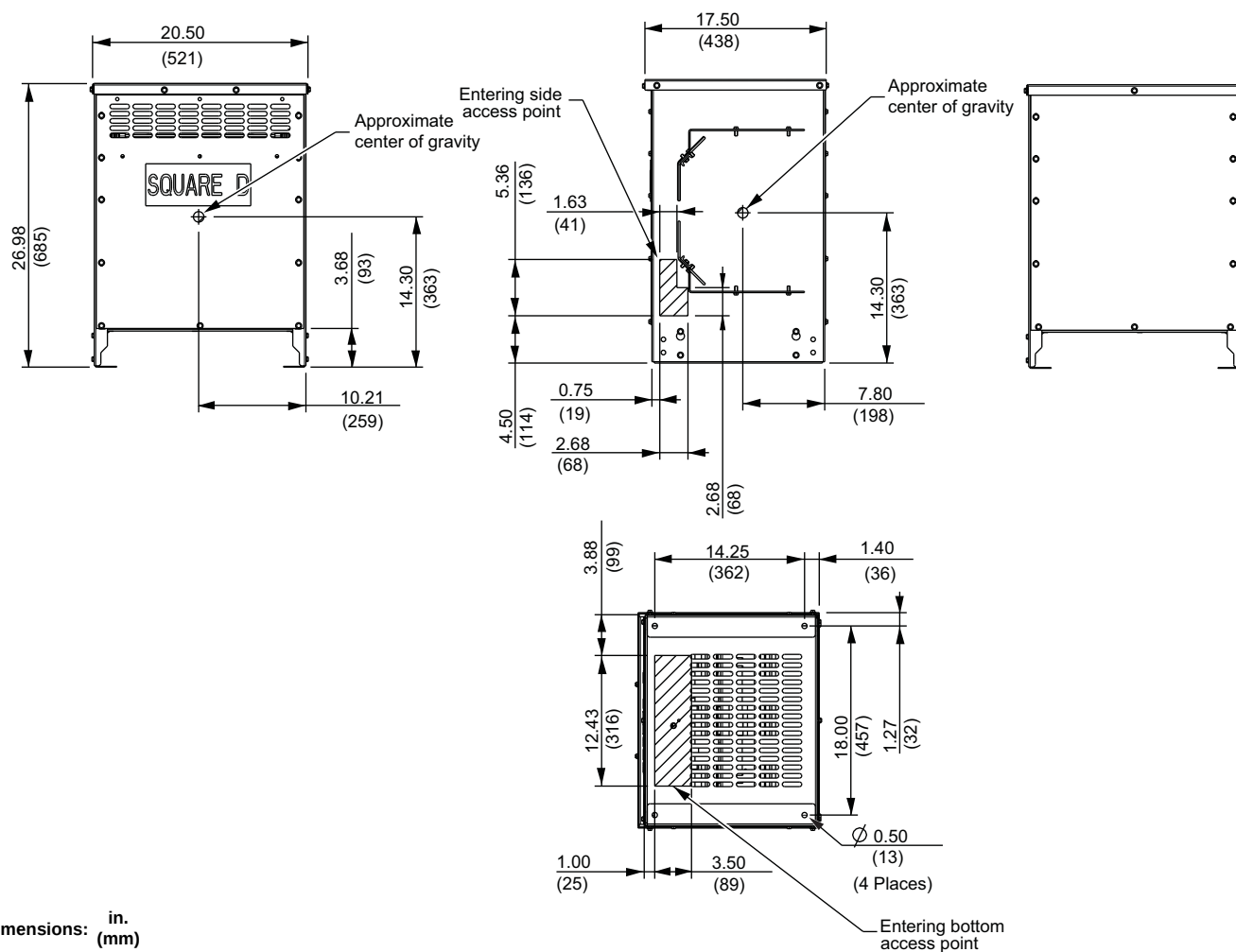
KVA	Part Number	Watts		Calculated Load per ST-20, 338°F (170°C)				
		No Load	Coil Loss	1/6 Watts BTUs/Hr	1/4 Watts BTUs/Hr	1/2 Watts BTUs/Hr	3/4 Watts BTUs/Hr	Full Watts BTUs/Hr
15	EX15T3HB	69	214	75	82	122	189	282
				256	280	416	645	962
30	EX30T3HB	100	449	113	128	212	352	549
				386	437	723	1201	1873
45	EX45T3HB	128	650	146	169	291	494	778
				498	577	993	1686	2655
75	EX75T3HB	171	1062	201	238	437	769	1233
				686	812	1491	2624	4207
112.5	EX112T3HB	210	1460	251	301	575	1031	1670
				856	1027	1962	3518	5698
150	EX150T3HB	328	1518	371	423	707	1181	1845
				1266	1443	2412	4030	6295
225	EX225T3HB	479	2012	535	605	982	1610	2491
				1825	2064	3351	5493	8499
300	EX300T68HB	672	1937	726	793	1278	1762	2610
				2477	2706	4361	6012	8905
500	EX500T68HB	900	3033	985	1090	1658	3364	3933
				3361	3719	5657	11478	13419
15	EX15T3HBCU	72	186	78	83	118	176	257
				266	283	403	601	877
30	EX30T3HBCU	96	476	110	126	215	364	573
				375	430	734	1242	1955
45	EX45T3HBCU	139	602	156	177	290	478	741
				532	604	989	1631	2528
75	EX75T3HBCU	167	921	193	224	397	685	1088
				659	764	1355	2337	3712
112.5	EX112T3HBCU	259	1098	290	328	534	877	1357
				989	1119	1822	2992	4630
150	EX150T3HBCU	333	1549	377	430	720	1204	1882
				1286	1467	2457	4108	6421
225	EX225T3HBCU	449	2194	510	586	998	1683	2643
				1740	1999	3405	5742	9018
300	EX300T68HBCU	667	1568	711	765	1157	1549	2235
				2426	2610	3948	5285	7626
500	EX500T68HBCU	786	3276	877	990	1604	3447	4061
				2992	3378	5473	11761	13856

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Dimensional Drawings

Dimensional Drawings

Figure 7: Enclosure 17K



Accessories

Weathershield	7400WS17K
Wall mounting bracket	7400WMB17K
Ceiling mounting bracket	7400CMB17K
Floor mounting bracket	7400FBM
State of CA only (OSP label)	7400CAOSHPDK

Enclosure Parts (Replacement Parts)

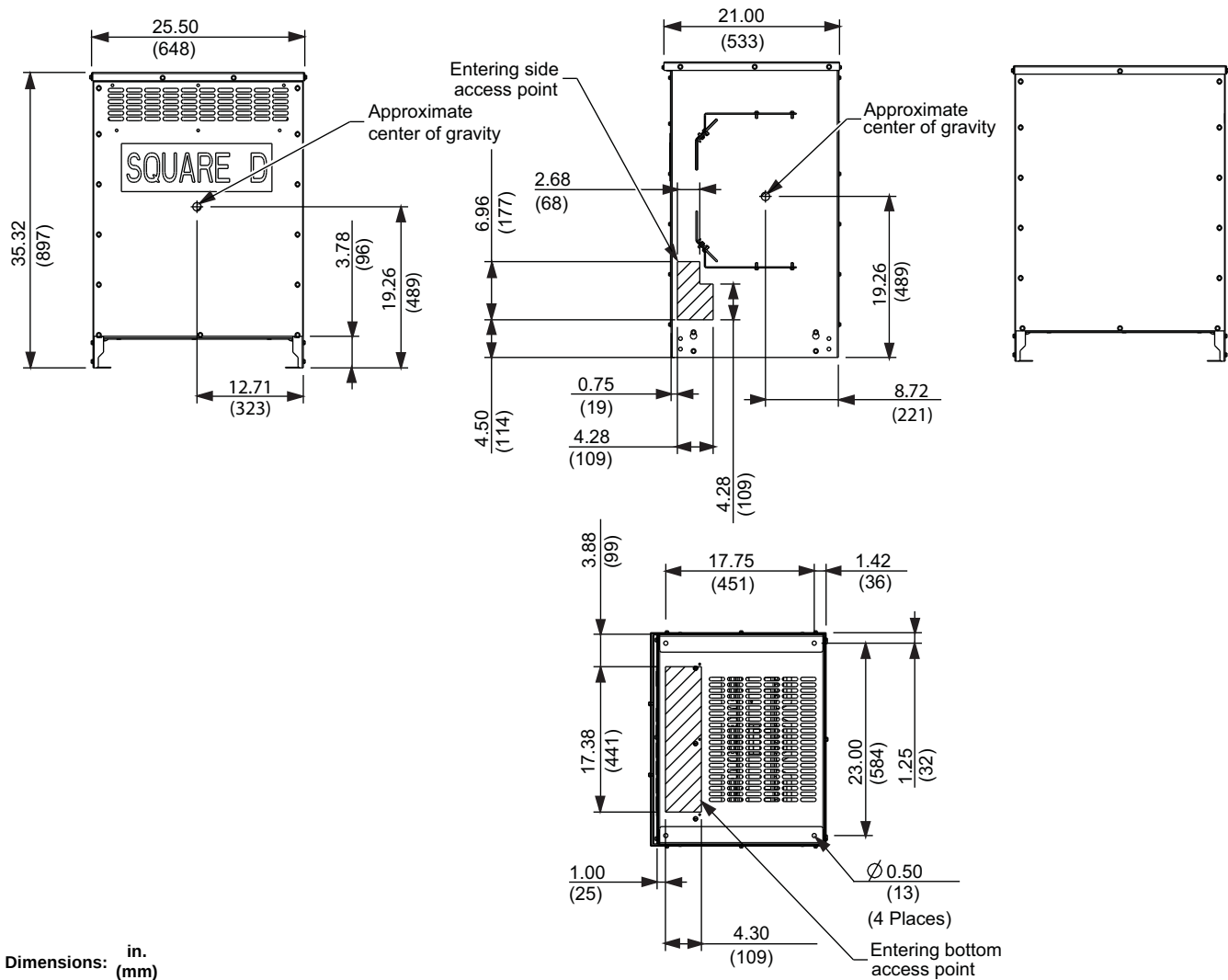
Top cover	EAV97922
Side panel	EAV97912
Front cover with labels	EAV97924
Rear cover	EAV97925
Base assembly	EAV97907

When ordering front cover with labels, Catalog No., Serial No., and Date Code in Engineering Notes must be supplied (see Figure 4 for location information on Namplate). Serial number may also be obtained from Core and Coils.

Square D™ Brand EX Low Voltage Distribution Transformers

Dimensional Drawings

Figure 8: Enclosure 18K



Accessories

Weathershield	7400WS18K
Wall mounting bracket	7400WMB18K20K
Ceiling mounting bracket	7400CMB18K
Floor mounting bracket	7400FBM
State of CA only (OSP label)	7400CAOSHPDK

Enclosure Parts (Replacement Parts)

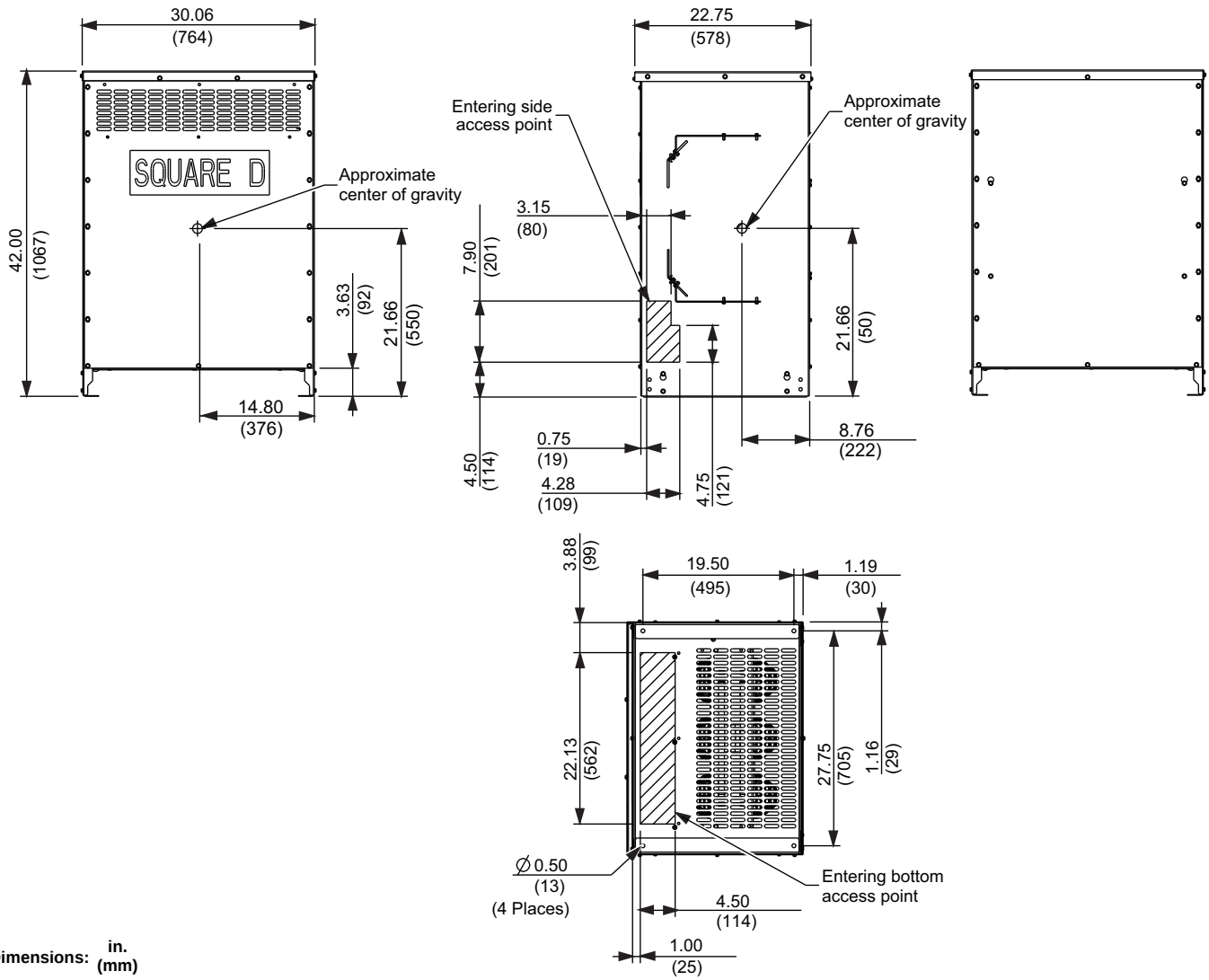
Top cover	NHA48593
Side panel	NHA48584
Front cover with labels	NHA48587
Rear cover	NHA53881
Base assembly	NHA48364

When ordering front cover with labels, Catalog No., Serial No., and Date Code in Engineering Notes must be supplied (see Figure 4 for location information on Namplate). Serial number may also be obtained from Core and Coils.

Square D™ Brand EX Low Voltage Distribution Transformers

Dimensional Drawings

Figure 9: Enclosure 20K



Accessories

Weathershield	7400WS20K
Wall mounting bracket	7400WMB18K20K
Ceiling mounting bracket	7400CMB20K
Floor mounting bracket	7400FBM
State of CA only (OSP label)	7400CAOSHDPK

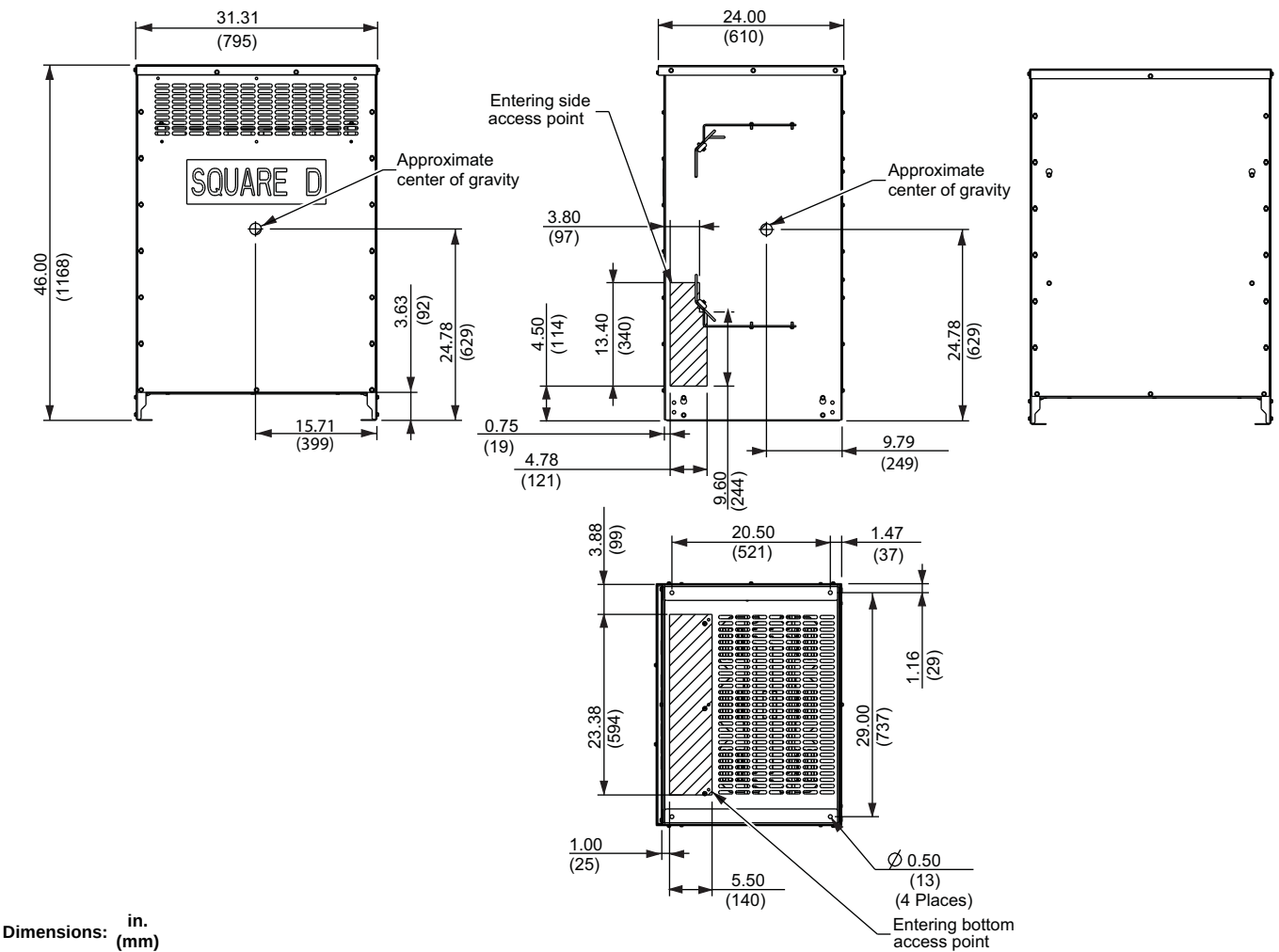
Enclosure Parts (Replacement Parts)

Top cover	EAV85836
Side panel	EAV85835
Front cover with labels	EAV85837
Rear cover	EAV85838
Rear shield	NHA12634
Core leg	EAV94531
Base assembly	EAV85833

When ordering front cover with labels, Catalog No., Serial No., and Date Code in Engineering Notes must be supplied (see Figure 4 for location information on Nameplate). Serial number may also be obtained from Core and Coils.

Square D™ Brand EX Low Voltage Distribution Transformers
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Figure 10: Enclosure 21K



Accessories

Weathershield	7400WS21K
Ceiling mounting bracket	7400CMB21K
Floor mounting bracket	7400FBM
State of CA only (OSP label)	7400CAOSHDPK

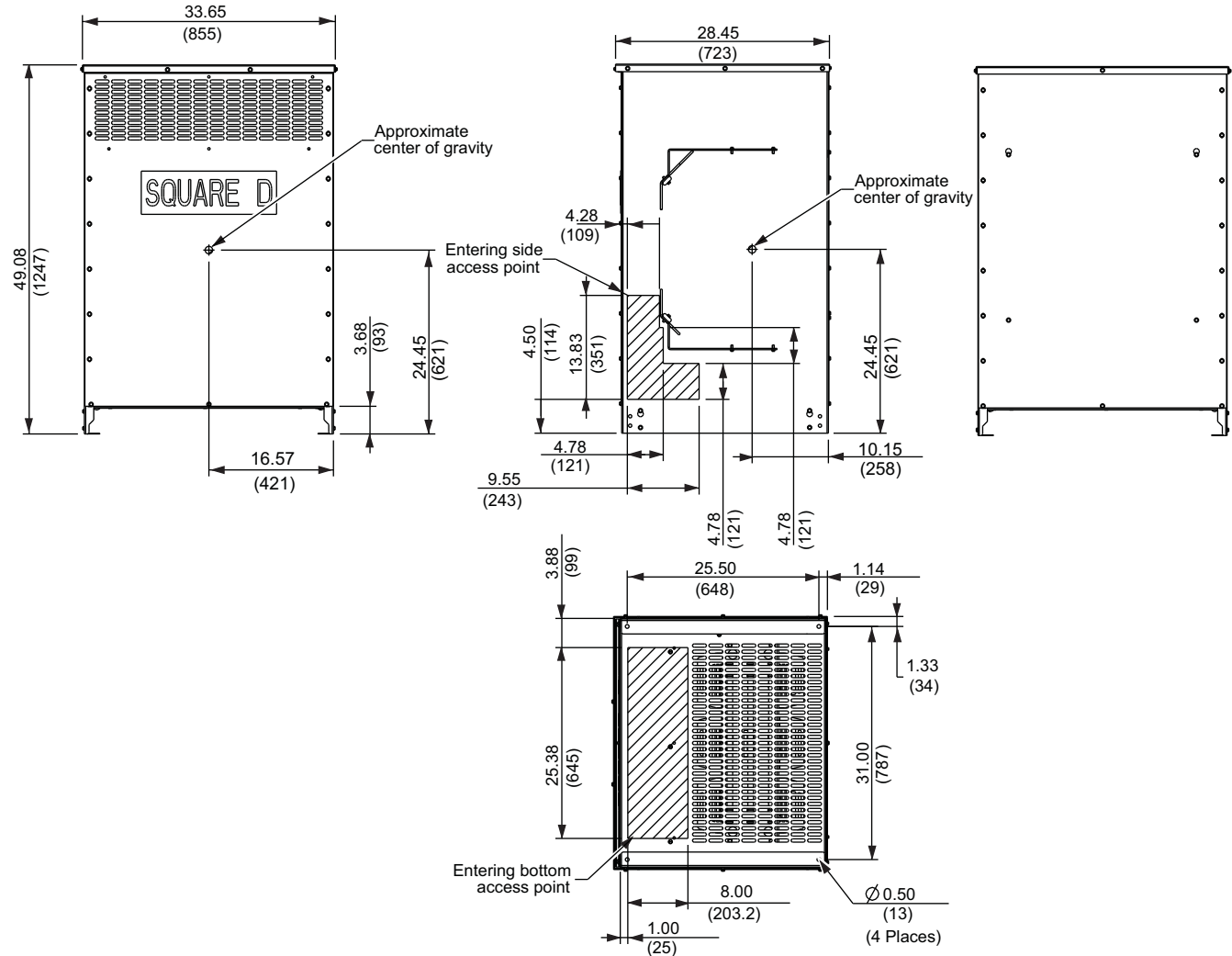
Enclosure Parts (Replacement Parts)

Top cover	NHA52142
Side panel	NHA52134
Front cover with labels	NHA52143
Rear cover	NHA52144
Rear shield	NHA52145
Core leg	NHA52133
Base assembly	NHA52091

When ordering front cover with labels, Catalog No., Serial No., and Date Code in Engineering Notes must be supplied (see Figure 4 for location information on Nameplate). Serial number may also be obtained from Core and Coils.

Square D™ Brand EX Low Voltage Distribution Transformers
Dimensional Drawings

Figure 11: Enclosure 22K



Accessories

Weathershield	7400WS22K
Ceiling mounting bracket	7400CMB22K
Floor mounting bracket	7400FBM
State of CA only (OSP label)	7400CAOSHPPDK

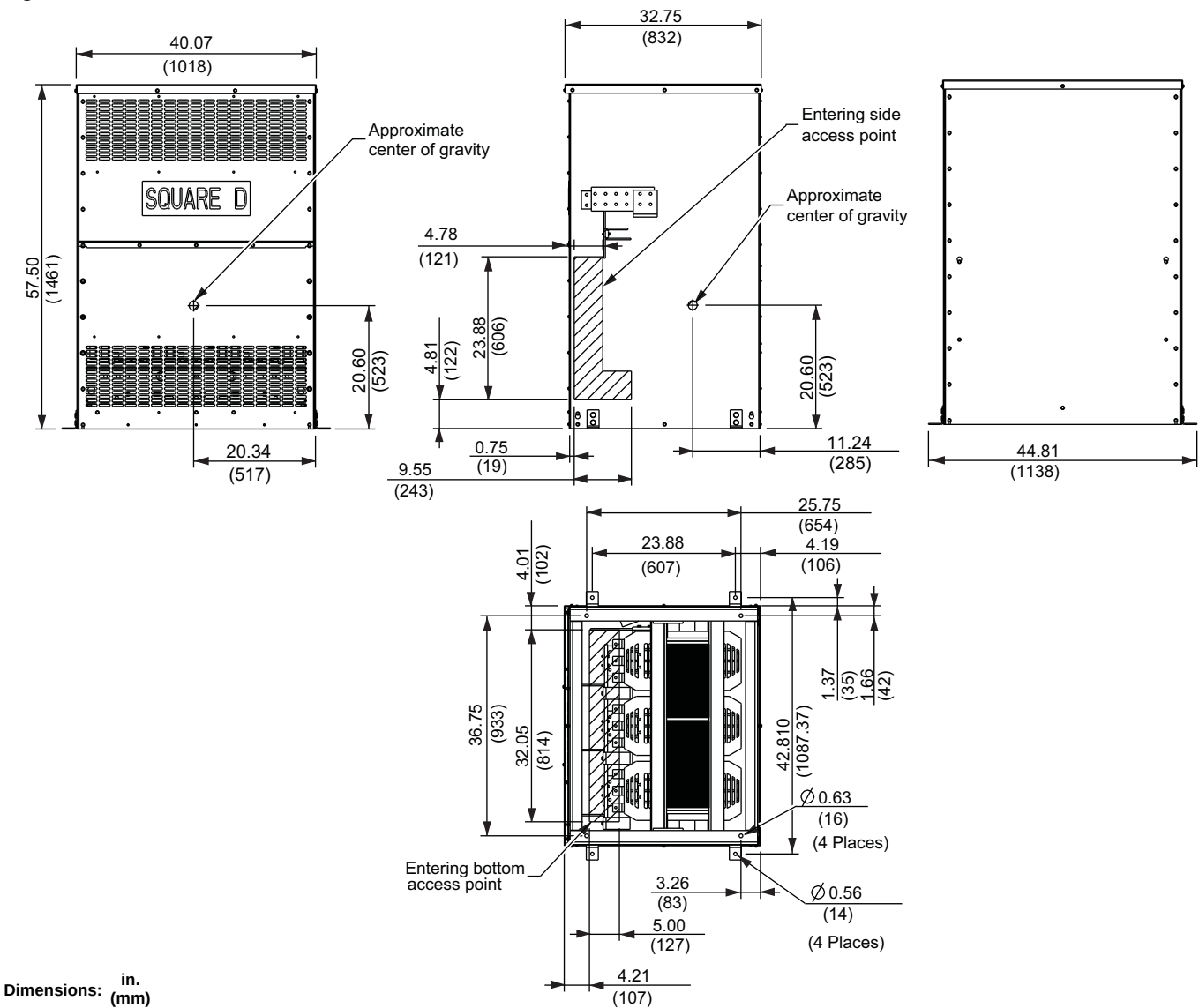
Enclosure Parts (Replacement Parts)

Top cover	NHA54455
Side panel	NHA54456
Front cover with labels	NHA54457
Rear cover	NHA54458
Rear shield	NHA55800
Core leg	NHA54437
Base assembly	EAV99530

When ordering front cover with labels, Catalog No., Serial No., and Date Code in Engineering Notes must be supplied (see Figure 4 for location information on Nameplate). Serial number may also be obtained from Core and Coils.

Square D™ Brand EX Low Voltage Distribution Transformers
Dimensional Drawings

Figure 12: Enclosure 25J



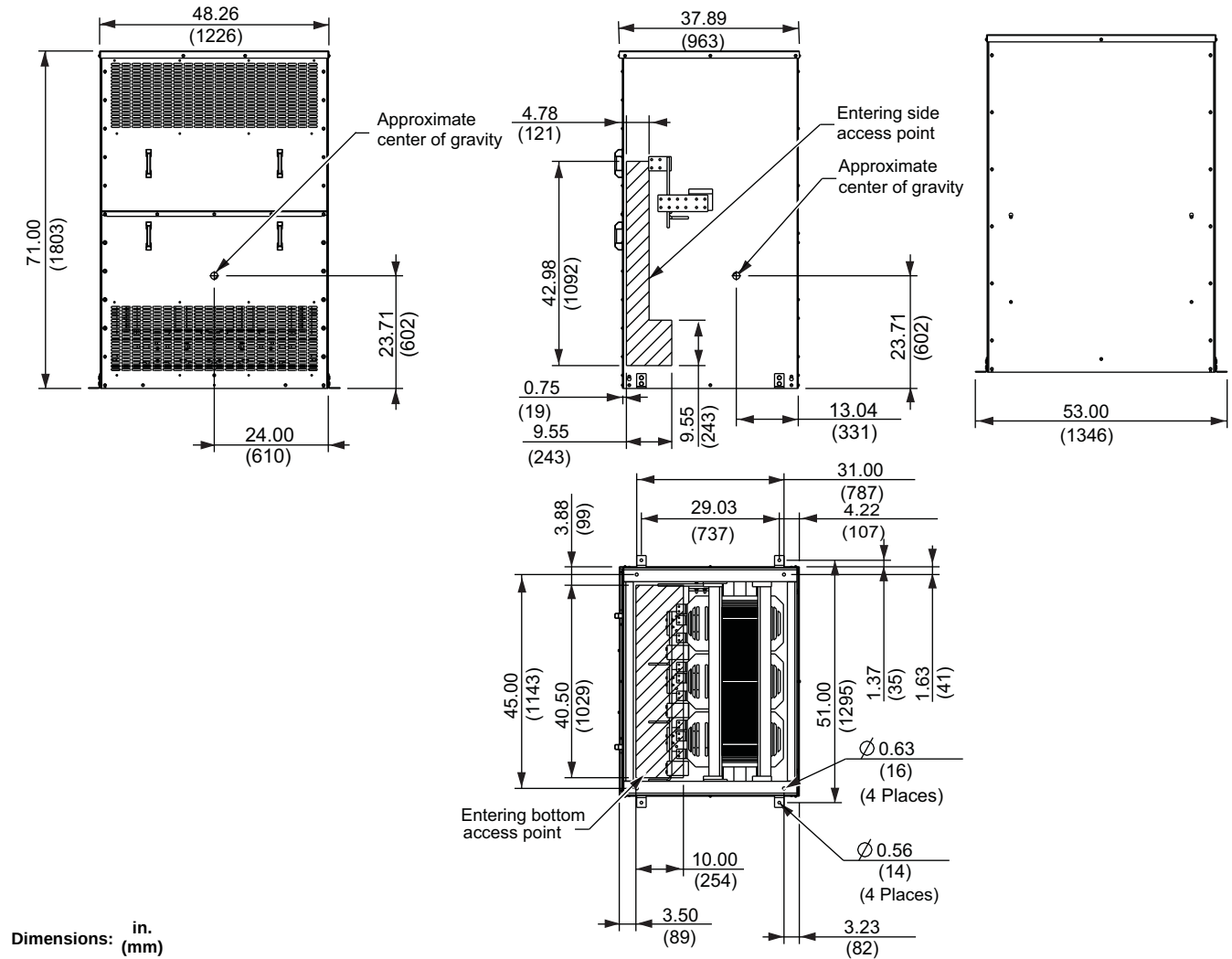
Accessories	
Weathershield	7400WS25J
Floor mounting bracket	7400FBM
State of CA only (OSP label)	7400CAOSHPDJ
Enclosure Parts (Replacement Parts)	
Top cover	NHA24800
Side panel	NHA24307
Front cover with labels	NHA96025
Rear cover	NHA24801
Rear shield	NHA24878

When ordering front cover with labels, Catalog No., Serial No., and Date Code in Engineering Notes must be supplied (see Figure 4 for location information on Namplate). Serial number may also be obtained from Core and Coils.

Square D™ Brand EX Low Voltage Distribution Transformers

Dimensional Drawings

Figure 13: Enclosure 30J



Accessories

Weathershield	7400WS30J
Floor mounting bracket	7400FBM
State of CA only (OSP label)	7400CAOSHDPDJ

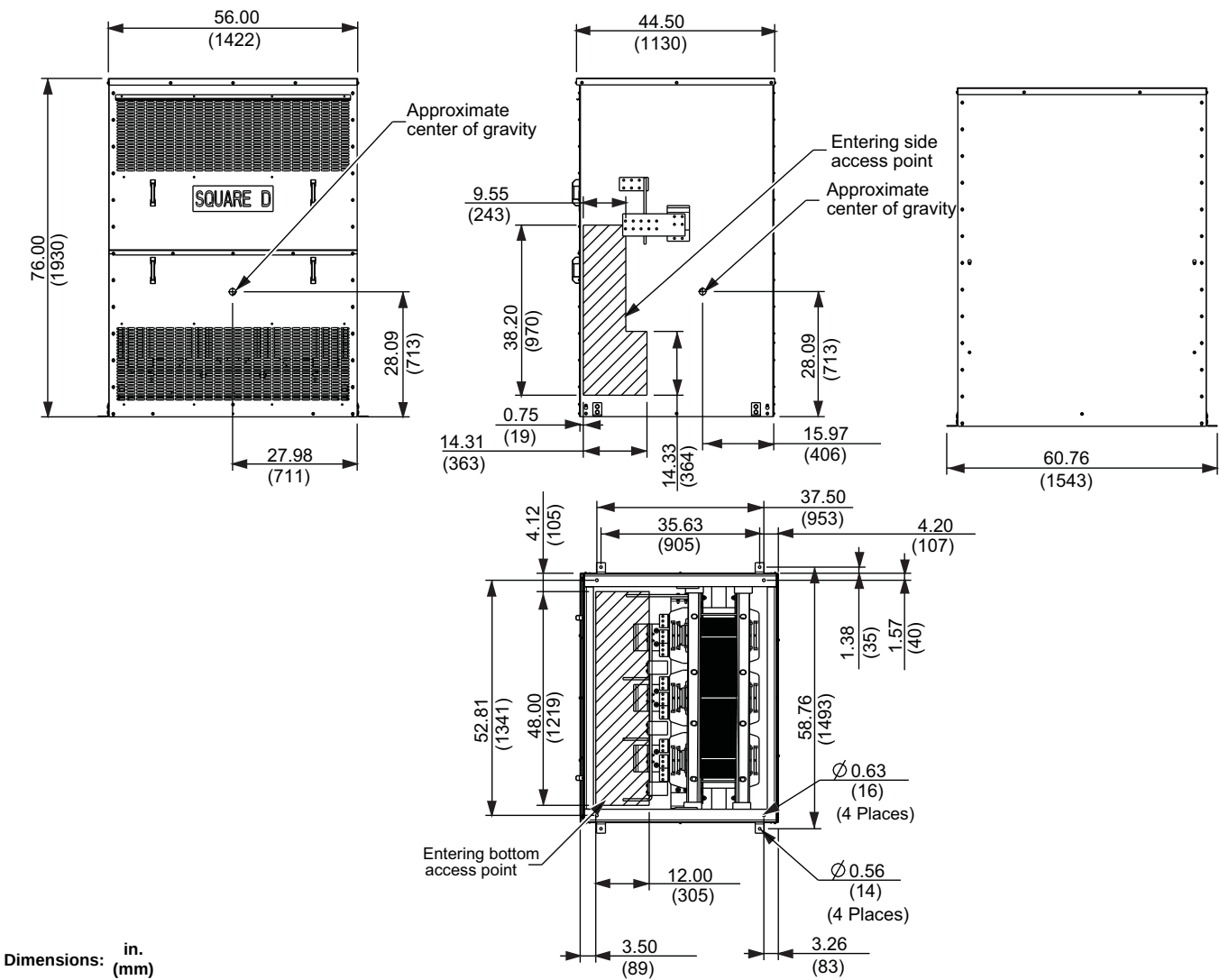
Enclosure Parts (Replacement Parts)

Top cover	NHA54183
Side panel	NHA54182
Front cover upper with labels	NHA96044
Front cover lower	NHA96045
Rear cover	NHA54186
Rear shield	NHA54187

When ordering front cover with labels, Catalog No., Serial No., and Date Code in Engineering Notes must be supplied (see Figure 4 for location information on Nameplate). Serial number may also be obtained from Core and Coils.

Square D™ Brand EX Low Voltage Distribution Transformers
Dimensional Drawings

Figure 14: Enclosure 31J



Accessories

Weathershield	7400WS31J
Floor mounting bracket	7400FBM
State of CA only (OSP label)	7400CAOSHPDJ

Enclosure Parts (Replacement Parts)

Top cover	NHA30139
Side panel	NHA30140
Front cover upper with labels	NHA96046
Front cover lower	NHA96047
Rear cover	NHA30133
Rear shield	NHA30130

When ordering front cover with labels, Catalog No., Serial No., and Date Code in Engineering Notes must be supplied (see Figure 4 for location information on Namplate). Serial number may also be obtained from Core and Coils.

Accessories

Mounting Bracket Options

Mounting brackets are available for each unit to provide multiple options for attaching the units to the floor.

Figure 15: Style K Enclosure

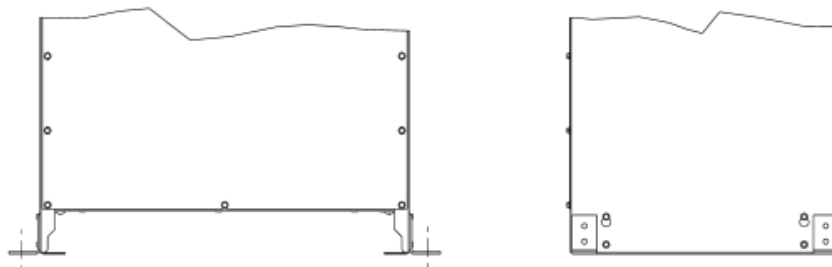


Figure 16: Style J Enclosure

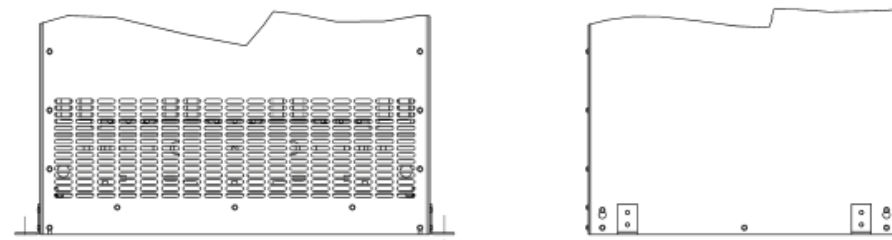


Figure 17: Floor Mounting Bracket (7400FMB)



Wall and Ceiling Mounting Brackets

NOTE: Wall mounting brackets are used with units weighing no more than 800 lb.
Ceiling mounting brackets are used with units weighing no more than 1200 lb.

Table 15: Mounting Bracket Enclosure Styles and Part Number

Enclosure Style	Wall Mount Bracket Part Number	Ceiling Mount Bracket Part Number
17K	7400WMB17K	7400CMB17K
18K	7400WMB18K20K	7400CMB18K20K
20K	7400WMB18K20K	7400CMB18K20K
21K	—	7400CMB21K
22K	—	7400CMB22K

Figure 18: Wall Mounted Transformer

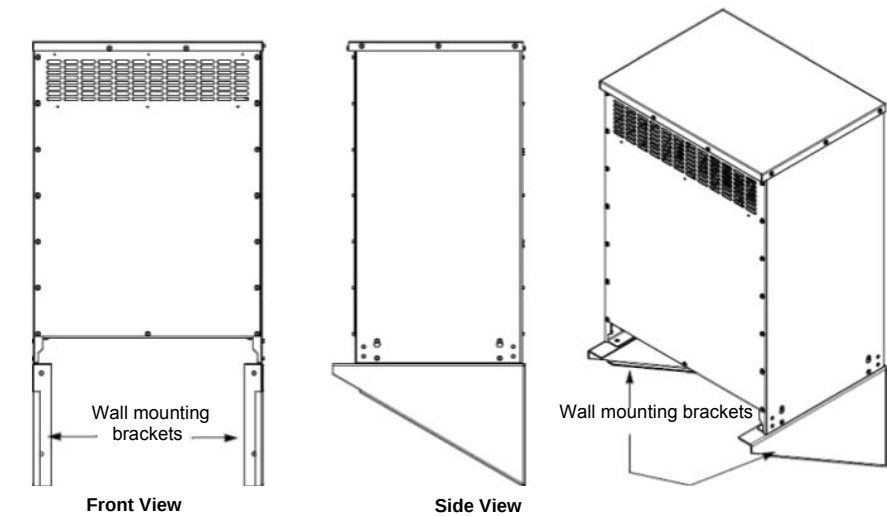
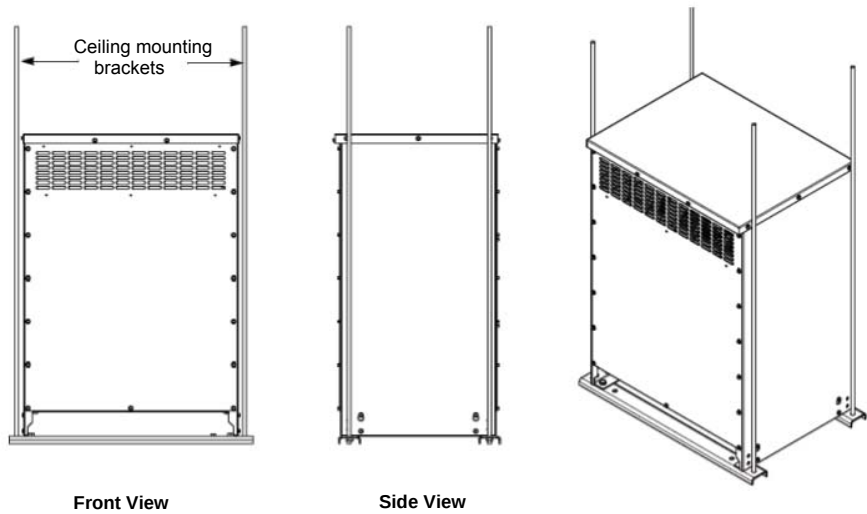


Figure 19: Ceiling Mounted Transformer



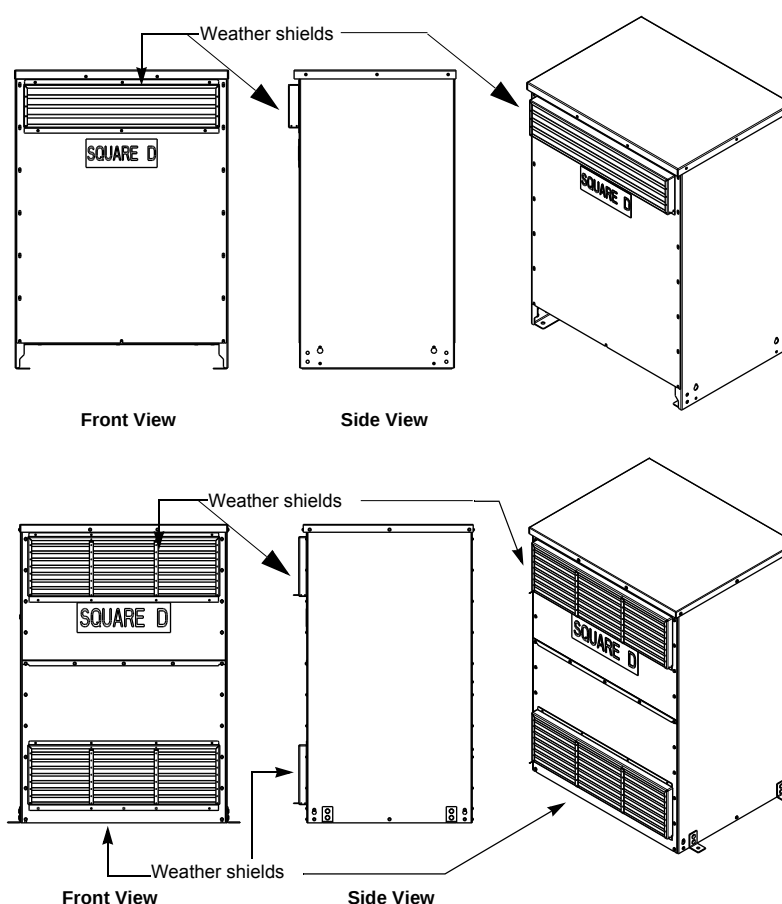
Square D™ Brand EX Low Voltage Distribution Transformers Accessories

Weather Shields

Table 16: Weather Shield—Enclosure Style and Part Number

Enclosure Style	Part Number
17K	7400WS17K
18K	7400WS18K
20K	7400WS20K
21K	7400WS21K
22K	7400WS22K
25J	7400WS25J
30J	7400WS30J
31J	7400WS31J

Figure 20: Weather Shield Enclosures



Square D™ Brand EX Low Voltage Distribution Transformers

Accessories

Terminal Lugs

Table 17 includes terminal sizes to handle lugs for the following wire range.
(All terminals allow for NEMA two hole lugs.)

Table 17: Terminal Sizes and Wire Ranges

kVA	300 V and Above		Below 300 V	
	Terminal Mechanical Lugs	Terminal Compression Lugs	Terminal Mechanical Lugs	Terminal Compression Lugs
15	(1) 2/0–14 AWG	(1) #12–10 AWG (1) #8–#1/0 AWG	(1) 2/0–14 AWG	(1) #8–#1/0 AWG
30	(1) 2/0–14 AWG	(1) #8–#1/0 AWG	(1) 350 kcmil–6 AWG	(1) #8–#1/0 AWG (1) #4–300 kcmil (1) 250–350 kcmil
45	(1) 2/0–14 AWG (1) 350 kcmil–6 AWG	(1) #8–#1/0 AWG (1) #4–300 kcmil	350 kcmil–6 AWG (1) 600 kcmil–4 AWG or (2) Equal 250 kcmil–1/0 AWG	(1) 250 kcmil–350 kcmil (1) #2/0–500 kcmil (2) #4–300 kcmil
75	(1) 2/0–14 AWG (1) 350 kcmil–6 AWG	(1) #8–#1/0 AWG (1) #4–300 kcmil (1) 250 kcmil–350 kcmil	(1) 600 kcmil–4 AWG or (2) Equal 250 kcmil–1/0 AWG	(2) #2/0–500 kcmil (1) 400–600 kcmil (AL) (2) #4–300 kcmil (2) 250–350 kcmil
112.5	(1) 350 kcmil–6 AWG (1) 600 kcmil–4 AWG or (2) Equal 250 kcmil–1/0 AWG	(1) 250 kcmil–350 kcmil (1) #2/0–500 kcmil (2) #4–300 kcmil	(2) 350 kcmil–6 AWG (2) 600 kcmil–2 AWG	(3) 250 kcmil–350 kcmil (3) #4–300 kcmil (2) 400–600 kcmil (AL)
150	(1) 600 kcmil–4 AWG or (2) Equal 250 kcmil–1/0 AWG	(1) 250 kcmil–350 kcmil (2) #4–300 kcmil	(3) 350 kcmil–6 AWG (2) 600 kcmil–2 AWG	(3) #2/0–500 kcmil (3) #4–300 kcmil (3) 400–600 kcmil (AL) (4) 250–350 kcmil
225	(1) 600 kcmil–2 AWG (2) 600 kcmil–2 AWG	(2) #2/0–500 kcmil (2) 400 kcmil–600 kcmil (AL) (2) #4–300 kcmil	(3) 600 kcmil–2 AWG	(4) #4–300 kcmil (4) #2/0–500 kcmil
300	(2) 600 kcmil–2 AWG	(3) 250 kcmil–350 kcmil (3) #2/0–500 kcmil (3) 400 kcmil–600 kcmil (AL)	(4) 600 kcmil–2 AWG	(6) #2/0–500 kcmil (6) 400–600 kcmil (AL)
500	(3) 600 kcmil–2 AWG	(4) #4–300 kcmil (4) #2/0–500 kcmil	(6) 600 kcmil–2 AWG	(9) #2/0–500 kcmil (9) 400–600 kcmil (AL)
750	(4) 600 kcmil–2 AWG	(6) #2/0–500 kcmil (6) 400 kcmil–600 kcmil (AL)	(9) 600 kcmil–2 AWG	(15) #2/0–500 kcmil (15) 400–600 kcmil (AL)

Square D™ Brand EX Low Voltage Distribution Transformers Accessories

Mechanical Lug Kits

Table 18: Square D Lug Kits for Dry-Type Transformers

Catalog Number	Lugs per Kit	Wire Range	Cap Screws	Current Range	Grounding Lugs per Kit	Wire Range	Bonding Lugs per Kit	Wire Range
Single-phase Primary, Single-phase Secondary, Three-phase Delta Primary, Three-phase Secondary								
DASKP100	3	1/0–14 STR	1/4 x 1 in.	Up to 100 A	Not Applicable	Not Applicable	Not Applicable	Not Applicable
DASKP250	3	350 kcmil–6 STR	3/8 x 2 in.	101–250 A				
DASKP400	3	600 kcmil–4 STR (2) 250 kcmil–1/0 STR	3/8 x 2 in.	201–400 A				
DASKP600	6	600 kcmil–4 STR (2) 250 kcmil–1/0 STR	3/8 x 2 in.	601–800 A				
DASKP1000	9	600 kcmil–2 STR	3/8 x 2 in.	601–800 A				
DASKP1200	12	600 kcmil–2 STR	3/8 x 2 in.	801–1200 A				
Single-phase Primary and Secondary, Three-phase Wye Secondary, Three-phase Delta with Center Tap								
DASKGS100	5	1/0–14 STR	1/4 x 1 in.	Up to 100 A	1	(4) 2/0–14 STR	1	2–14 STR
DASKGS250	5	350 kcmil–6 STR	3/8 x 2 in.	101–250 A	1	(4) 2/0–14 STR	1	2–14 STR
DASKGS400	5	600 kcmil–4 STR (2) 250 kcmil–1/0 STR	3/8 x 2 in.	201–400 A	1	(4) 2/0–14 STR	1	1/0–14 STR
DASKGS600	10	600 kcmil–4 STR (2) 250 kcmil–1/0 STR	3/8 x 2 in.	601–800 A	1	(4) 350 kcmil–6 STR	1	250 kcmil–6 STR
DASKGS1000	15	600 kcmil–2 STR	3/8 x 2 in.	601–800 A	1	(4) 350 kcmil–6 STR	1	250 kcmil–6 STR
DASKGS1200	20	600 kcmil–2 STR	3/8 x 2 in.	801–1200 A	1	(4) 350 kcmil–6 STR	1	250 kcmil–6 STR
DASKGS2000	25	600 kcmil–2 STR	3/8 x 2 in.	1201–2000 A	1	(4) 350 kcmil–6 STR	1	250 kcmil–6 STR

NOTE: Lugs are not supplied with transformer units. They must be purchased separately.

Appendix—Circuit Breaker Selection

Table 19: Circuit Breaker Selection—EX15 and EX30

NEC% – Handle Rating in Amps																					
Catalog Number	RMS Inrush (x Rated Pri Current)	Primary Winding	NP Amps																		
NEC 125% – Handle Rating 25 Amps																					
NEC 250% – Handle Rating 45 Amps																					
FA	FC	FH	HD	HG	HJ	HL	HR	ED	EG	EJ	FA	FC	FH	HD	HG	HJ	HL	HR	ED	EG	EJ
EX15T3H	8.1	480 Delta	18	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
EX15T3HCU	11.8	480 Delta	18	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
EX15T3HF	8.1	480 Delta	18	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
EX15T3HFCU	11.8	480 Delta	18	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
EX15T3HB	18.6	480 Delta	18	—	—	—	Fixed	Fixed	Fixed	—	—	—	—	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
EX15T3HBCU	20.0	480 Delta	18	—	—	—	8 (60AS)			—	—	—	Fixed	Fixed	8 (60AS)			Fixed	Fixed	Fixed	Fixed

NEC 125% – Handle Rating 50 Amps																					
NEC 250% – Handle Rating 90 Amps																					
FA	FC	FH	HD	HG	HJ	HL	HR	ED	EG	EJ	FA	FC	FH	HD	HG	HJ	HL	HR	ED	EG	EJ
EX30T3H	9.3	480 Delta	36.1	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
EX30T3HCU	10.0	480 Delta	36.1	Fixed	Fixed	8 (60AS) / 6 (100AS) / 3 (150AS)			Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	
EX30T3HF	9.3	480 Delta	36.1	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
EX30T3HFCU	10.0	480 Delta	36.1	Fixed	Fixed	8 (60AS) / 6 (100AS) / 3 (150AS)			Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	
EX30T3HB	11.7	480 Delta	36.1	—	—	9 (60AS) / 6 (100AS) / 4 (150AS)			Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	
EX30T3HBCU	13.0	480 Delta	36.1	—	—	10 (60AS) / 6 (100AS) / 4 (150AS)			Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	

Square D™ Brand EX Low Voltage Distribution Transformers
Appendix—Circuit Breaker Selection

Table 20: Circuit Breaker Selection—EX45 and EX75

NEC% – Handle Rating in Amps																											
Catalog Number	RMS Inrush (x Rated Pri Current)	Primary Winding	NP Amps	NEC 125% – Handle Rating 70 Amps																NEC 250% – Handle Rating 125 Amps							
				FA	FC	FH	HD	HG	HJ	HL	HR	ED	EG	EJ	HD	HG	HJ	HL	HR	ED	EG	EJ					
EX45T3H	7.8	480 Delta	54.1	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	
EX45T3HCU	8.7	480 Delta	54.1	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	
EX45T3HF	7.8	480 Delta	54.1	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	
EX45T3HFCU	8.7	480 Delta	54.1	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	
EX45T3HB	12.7	480 Delta	54.1	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	
EX45T3HBCU	14.2	480 Delta	54.1	—	—	—	10 (100AS) / 7 (150AS)					—	—	—	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	

				NEC 125% – Handle Rating 125 Amps																NEC 250% – Handle Rating 225 Amps							
Catalog Number	RMS Inrush (x Rated Pri Current)	Primary Winding	NP Amps	HD	HG	HJ	HL	HR	ED	EG	EJ	JD	JG	JJ	JL	JR	LD	LG	LJ	LL	LR						
				Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	4 (250AS) / 3 (400AS)	4 (250AS) / 1.5 (600AS)						
EX75T3H	7.6	480 Delta	90.2	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	4 (250AS) / 3 (400AS)	4 (250AS) / 2 (600AS)								
EX75T3HCU	8.5	480 Delta	90.2	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	4 (250AS) / 3 (400AS)	4 (250AS) / 2 (600AS)								
EX75T3HF	8.6	480 Delta	90.2	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	4 (250AS) / 3 (400AS)	4 (250AS) / 2 (600AS)								
EX75T3HFCU	9.7	480 Delta	90.2	7 (150AS)	7 (150AS)	7 (150AS)	7 (150AS)	7 (150AS)	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	5 (250AS) / 3 (400AS)	5 (250AS) / 2 (600AS)									
EX75T3HB	8.6	480 Delta	90.2	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	4 (250AS) / 3 (400AS)	4 (250AS) / 2 (600AS)									
EX75T3HBCU	9.7	480 Delta	90.2	7 (150AS)	7 (150AS)	7 (150AS)	7 (150AS)	7 (150AS)	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	5 (250AS) / 3 (400AS)	5 (250AS) / 2 (600AS)									

Square D™ Brand EX Low Voltage Distribution Transformers

Appendix—Circuit Breaker Selection

Table 21: Circuit Breaker Selection—EX112 and EX150

NEC% – Handle Rating in Amps			
Catalog Number	RMS Inrush (x Rated Pri Current)	Primary Winding	NP Amps
NEC 125% – Handle Rating 175 Amps			
EX112T3H	5.7	480 Delta	135.3
EX112T3HCU	6.5	480 Delta	135.3
EX112T3HF	8.0	480 Delta	135.3
EX112T3HFCU	11.6	480 Delta	135.3
EX112T3HB	8.0	480 Delta	135.3
EX112T3HBCU	11.6	480 Delta	135.3
NEC 250% – Handle Rating 350 Amps			

Square D™ Brand EX Low Voltage Distribution Transformers

Appendix—Circuit Breaker Selection

Table 22: Circuit Breaker Selection—EX225 and EX300

Catalog Number	RMS Inrush (x Rated Pri Current)	Primary Winding	NP Amps	NEC% – Handle Rating in Amps															
				NEC 125% – Handle Rating 350 Amps								NEC 250% – Handle Rating 600 Amps							
				LD	LG	LJ	LL	LR	MG	MJ		LD	LG	LJ	LL	LR	MG	MJ	
EX225T3H	4.4	480 Delta	270.6		4 (400AS) / 3 (600AS)				Fixed	Fixed				3 (600AS)			Fixed	Fixed	
EX225T3HCU	5.1	480 Delta	270.6		5 (400AS) / 3 (600AS)				Fixed	Fixed				3 (600AS)			Fixed	Fixed	
EX225T3HF	4.4	480 Delta	270.6		4 (400AS) / 3 (600AS)				Fixed	Fixed				3 (600AS)			Fixed	Fixed	
EX225T3HFCU	5.1	480 Delta	270.6		5 (400AS) / 3 (600AS)				Fixed	Fixed				3 (600AS)			Fixed	Fixed	
EX225T3HB	7.3	480 Delta	270.6		6 (400AS) / 4 (600AS)				Fixed	Fixed				4 (600AS)			Fixed	Fixed	
EX225T3HBCU	8.2	480 Delta	270.6		8 (400AS) / 5 (600AS)				Fixed	Fixed				5 (600AS)			Fixed	Fixed	

Catalog Number	RMS Inrush (x Rated Pri Current)	Primary Winding	NP Amps	NEC 250% – Handle Rating 800 Amps															
				NEC 125% – Handle Rating 500 Amps								NEC 250% – Handle Rating 800 Amps							
				LD	LG	LJ	LL	LR	MG	MJ		MG	MJ	PG	PJ	PK	PL		
EX300T3H	5.5	480 Delta	360.8		4 (600AS)				Fixed	Fixed		Fixed	Fixed	3 (800AS) / 3 (1000AS) / 2 (1200AS)					
EX300T3HCU	6.2	480 Delta	360.8		5 (600AS)				Fixed	Fixed		Fixed	Fixed	4 (800AS) / 3 (1000AS) / 3 (1200AS)					
EX300T3HF	5.5	480 Delta	360.8		4 (600AS)				Fixed	Fixed		Fixed	Fixed	3 (800AS) / (1000AS) / 2 (1200AS)					
EX300T3HFCU	6.2	480 Delta	360.8		5 (600AS)				Fixed	Fixed		Fixed	Fixed	4 (800AS) / 3 (1000AS) / 3 (1200AS)					
EX300T68HB	3.5	480 Delta	360.8		3 (600AS)				Fixed	Fixed		Fixed	Fixed	2 (800AS) / 1.5 (1000AS) / 1.5 (1200AS)					
EX300T68HBCU	3.3	480 Delta	360.8		3 (600AS)				Fixed	Fixed		Fixed	Fixed	2 (800AS) / 1.5 (1000AS) / 1.5 (1200AS)					

Square D™ Brand EX Low Voltage Distribution Transformers

Appendix—Circuit Breaker Selection

Table 23: Circuit Breaker Selection—EX500 and EX750

Catalog Number	RMS Inrush (x Rated Pri Current)	Primary Winding	NP Amps	NEC – Handle Rating in Amps											
				NEC 125% – Handle Rating 800 Amps						NEC 250% – Handle Rating 1200 A					
				MG	MJ	PG	PJ	PK	PL	PG	PJ	PK	PL	PG	PL
EX500T68H	2.1	480 Delta	601.4	Fixed	Fixed	2 (800AS) / 1.5 (1000AS) / 1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)
EX500T68HCU	2.0	480 Delta	601.4	Fixed	Fixed	2 (800AS) / 1.5 (1000AS) / 1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)
EX500T68HF	2.1	480 Delta	601.4	Fixed	Fixed	2 (800AS) / 1.5 (1000AS) / 1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)
EX500T68HFCU	2.0	480 Delta	601.4	Fixed	Fixed	2 (800AS) / 1.5 (1000AS) / 1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)	1.5 (1200AS)
EX500T68HB	6.5	480 Delta	601.4	Fixed	Fixed	6 (800AS) / 5 (1000AS) / 4 (1200AS)	4 (1200AS)	4 (1200AS)	4 (1200AS)	4 (1200AS)	4 (1200AS)	4 (1200AS)	4 (1200AS)	4 (1200AS)	4 (1200AS)
EX500T68HBCU	6.2	480 Delta	601.4	Fixed	Fixed	6 (800AS) / 5 (1000AS) / 4 (1200AS)	4 (1200AS)	4 (1200AS)	4 (1200AS)	4 (1200AS)	4 (1200AS)	4 (1200AS)	4 (1200AS)	4 (1200AS)	4 (1200AS)

Catalog Number	RMS Inrush (x Rated Pri Current)	Primary Winding	NP Amps	NEC 125% – Handle Rating 1200 Amps						NEC 250% – Handle Rating 2000 Amps					
				PG	PJ	PK	PL	RG	RJ	RK	RL				
				PG	PJ	PK	PL	RG	RJ	RK	RL				
EX750T68H	4.3	480 Delta	902.1	4 (1200AS)	4 (1200AS)	4 (1200AS)	4 (1200AS)	3 (2000AS) / 2 (2500AS)							
EX750T68HCU	4.2	480 Delta	902.1	4 (1200AS)	4 (1200AS)	4 (1200AS)	4 (1200AS)	3 (2000AS) / 2 (2500AS)							
EX750T68HFCU	4.2	480 Delta	902.1	4 (1200AS)	4 (1200AS)	4 (1200AS)	4 (1200AS)	3 (2000AS) / 2 (2500AS)							

Square D™ Brand EX Low Voltage Distribution Transformers

Appendix—Circuit Breaker Selection

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