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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.

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.

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 K-Factor, Buck-Boost, Marine Duty Transformers—Example: S20N11S05A

Prefix Options		Primary Voltage		kVA		Suffix Options	
C = CSA labeled ventilated transformer Marine Duty Q = EPM marine (1-Ph encapsulated) L = EPTM Marine (3-Ph encapsulated) R = DS-3M marine (1-Ph ventilated) M = DT-3M marine (3-Ph ventilated)		13 = 110 x 220 12 = 120 10 = 120 x 240 29 = 208 72 = 200 25 = 220 23 = 230 24 = 240 20 = 240 x 480 27 = 277 38 = 380 39 = 400 43 = 416 44 = 440 45 = 450 48 = 480 57 = 575 60 = 600 42 = 2400 46 = 4160 49 = 4800 40 = Export model 54 = 120/208/240/277		81 = 0.05 85 = 0.075 82 = 0.10 83 = 0.15 26 = 0.25 51 = 0.50 76 = 0.75 01 = 1 16 = 1.5 02 = 2 03 = 3 05 = 5 06 = 6 07 = 7.5 09 = 9 10 = 10 15 = 15 21 = 22.5 25 = 25 30 = 30 37 = 37.5 45 = 45 50 = 50 75 = 75 99 = 100 12 = 112.5 49 = 150 67 = 167 22 = 225 52 = 250 33 = 300 54 = 333 55 = 500 60 = 600 77 = 750 11 = 1000 14 = 1500		A...Y = ① CU = ② SS = ③ ZZ = ④ NV = ⑤ X = ⑥ LS = ⑦ AF = ⑧ TR = ⑨ SR = ⑩ CE = ⑪ T = ⑫ E3 = ⑬ SS4X = ⑭ Z = ⑮ S6 = ⑯ I2 = ⑰ I3 = ⑱ I4 = ⑲ ES = ⑳ DE = ㉑ DN = ㉒ EE = ㉓ E6 = ㉔ EE6 = ㉕	
Type		Temperature Rise		Secondary Voltage			
S = EP (single-phase encapsulated) Y = EPT (three-phase encapsulated) T = DS-3 (single-phase ventilated) V = DT-3 (three-phase ventilated) P = Mini-power center Z = Class 1 Division 2 Groups A, B, C, D Nonlinear H = KT-4 (three-phase ventilated) B = KT-9 (three-phase ventilated) N = KT-13 (three-phase ventilated) G = KT-20 (three-phase ventilated) J = KT-30 (three-phase ventilated) HT = KT-4 (single-phase ventilated) NT = KT-13 (single-phase ventilated) GT = KT-20 (single-phase ventilated)		T = 150°C rise with 220°C insulation system (ventilated); 115°C rise with 180°C insulation system (encapsulated and MPC three-phase) F = 115°C rise with 220°C insulation system (ventilated) B = 80°C rise with 220°C insulation system (ventilated); 80°C rise with 180°C insulation system (encapsulated) H = 130°C rise with 200°C insulation system (ventilated) G = 115°C rise with 200°C insulation system (ventilated) J = 80°C rise with 200°C insulation system (ventilated) P = 115°C rise with 130°C insulation system (encapsulated single-phase ≤2 kVA) S = 115°C rise with 180°C insulation system (encapsulated and MPC single-phase); 150°C rise with 220°C insulation system (ventilated single-phase) E = Electrostatically shielded		04 = 12/24 06 = 16/32 08 = 24/48 14 = 110/220 12 = 120 11 = 120/240 54 = 127/254 19 = 190Y/110 28 = 208Y/120 29 = 208 25 = 220 delta 31 = 220Y/127 26 = 220 delta/110 midtap 22 = 240 delta/120 midtap 64 = 240Y/139 24 = 240 delta 21 = 240/480 27 = 277 38 = 380 delta 37 = 380Y/220 34 = 400Y/231 51 = 416Y/240 35 = 440Y/254 62 = 460Y/266 47 = 480Y/277 48 = 480 delta 60 = 600 delta 61 = 600Y/346 42 = 2400 41 = 4160Y/2400 46 = 4160 49 = 4800			
Taps							
D = 2 at +2.5%, 2 at -2.5% E = 1 at +5%, 1 at -5% F = 1 at -10% G = 2 at -5% J = 4 at -2.5% K = 1 at -10% x 2 at -5% L = 2 at -5% x 4 at -2.5% M = 2 at +2.5%, 4 at -2.5% N = None R = 1 at +5%, 2 at -5% P = 1 at +5%, 2 at -5% x 2 at +2.5%, 4 at -2.5% T = 1 at +4.2%, 1 at -4.2% U = 1 at +2.5%, 3 at -2.5% W = 1 at +3.5%, 1 at -3.5% X = 2 at +3.1%, 2 at -3.1%							

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 CSL3 DOE 2007 energy-efficient.
- ⑭ NEMA 4X Grade 304 stainless steel enclosure.
- ⑮ Easy install base.

- ⑯ Grade 316 stainless steel enclosure (does not imply NEMA 4X rating).
- ⑰ Integral 2-inch infrared viewing window.
- ⑱ Integral 3-inch infrared viewing window.
- ⑲ Integral 4-inch infrared viewing window.
- ⑳ Electrostatic shield.
- ㉑ Double aluminum electrostatic shield.
- ㉒ Double neutral.
- ㉓ TP-1 energy-efficient.
- ㉔ 2016 enclosure construction (Non-TP1 energy-efficient).
- ㉕ TP-1 energy-efficient with 2016 enclosure construction.

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.

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	

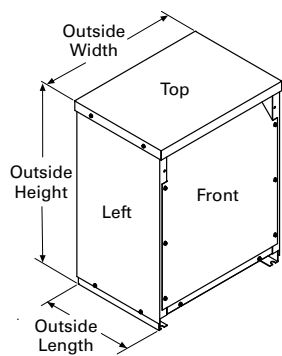
Notes

^① If motors are started more than once per hour, increase minimum transformer kVA by 20%.

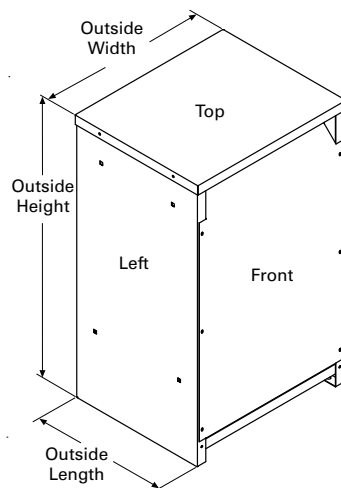
When motor service factor is greater than 1, increase full load amperes proportionally.
Example: If service factor is 1.15, increase above ampere values by 15%.

Dimensions

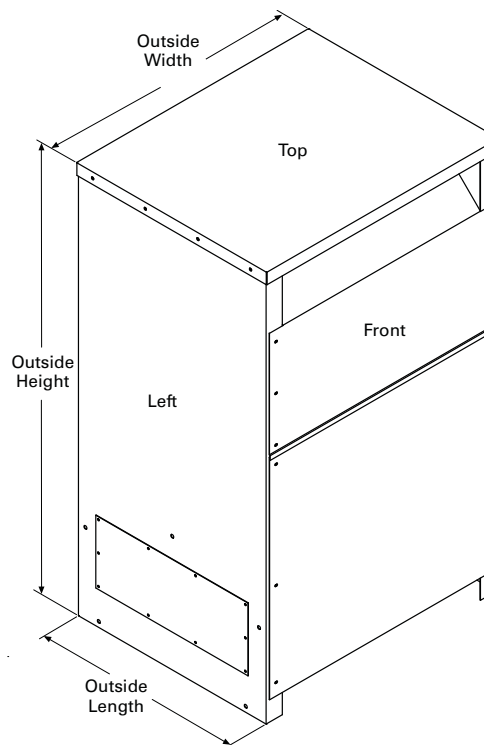
Approximate Dimensions in Inches (mm)

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)