

Table 9-12. Three-Phase Selection Information — Types EPT, DT-3, 60 Hz

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. Kg	Frame	Wiring Diagram Number	Weathershield		Catalog Number	Price U.S. \$	
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. \$			
416 Δ Volts to 208Y/120 Volts																			
3	—	2-5%	EPT	115	13-3/8	15-15/16	8-5/16	116	340	405	211	53	201	70V	Indoor- Outdoor	—	Y43G28T03A	1,350.	
6	—	2-5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	65	200	70V	—	—	Y43G28T06A	1,575.	
9	—	2-5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	103	70V	—	—	Y43G28T09A	1,985.	
15	—	2-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	95	70V	—	—	Y43G28T15A	2,665.	
30	2-2.5%	4-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	422	676	638	324	191	243	84I	Indoor- Outdoor	—	Y43M28T30A	5,360.	
45	2-2.5%	4-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	724	372	299	244	84I	—	—	Y43M28T45A	6,120.	
75	2-2.5%	4-2.5%	EPT	115	30-3/4	30-1/8	15-5/8	1275	781	765	397	580	245	84I	—	—	Y43M28T75A ②	8,290.	
15	2-2.5%	4-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	909	280P	WS31	303.	V43M28T15A	1,890.	
30	2-2.5%	4-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	910A	280P	WS31	303.	V43M28T30A	2,315.	
45	2-2.5%	4-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	912A	280P	WS31	303.	V43M28T45A	2,890.	
75	2-2.5%	4-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	914B	280P	WS33	303.	V43M28T75A	4,065.	
112.5	2-2.5%	4-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	915B	280P	WS33	303.	V43M28T12A	6,280.	
150	2-2.5%	4-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	916A	280P	WS19	303.	V43M28T49A	7,960.	
225	2-2.5%	4-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	917	280P	WS34	688.	V43M28T22A	11,340.	
300	2-2.5%	4-2.5%	DT-3	150	56	31-1/4	24-1/4	1300	1422	794	616	590	918	280P	WS34	688.	V43M28T33A	14,480.	
500	2-2.5%	4-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1089	919	①	WS35	1,175.	V43M28T55A	23,720.	
440 Δ Volts to 220Y/127 Volts																			
3	—	2-5%	EPT	115	13-3/8	15-15/16	8-5/16	116	340	405	211	53	201	70G	Indoor- Outdoor	—	Y44G31T03A	1,350.	
6	—	2-5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	65	200	70G	—	—	Y44G31T06A	1,575.	
9	—	2-5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	103	70G	—	—	Y44G31T09A	1,985.	
15	—	2-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	95	70G	—	—	Y44G31T15A	2,665.	
30	2-2.5%	4-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	422	676	638	324	191	243	84O	Indoor- Outdoor	—	Y44M31T30A	5,360.	
45	2-2.5%	4-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	724	372	299	244	84O	—	—	Y44M31T45A	6,120.	
75	2-2.5%	4-2.5%	EPT	115	30-3/4	30-1/8	15-5/8	1275	781	765	397	580	245	84O	—	—	Y44M31T75A ②	8,290.	
15	2-2.5%	4-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	909	280J	WS31	303.	V44M31T15A	1,890.	
30	2-2.5%	4-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	910A	280J	WS31	303.	V44M31T30A	2,310.	
45	2-2.5%	4-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	912A	280J	WS31	303.	V44M31T45A	2,895.	
75	2-2.5%	4-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	914B	280J	WS33	303.	V44M31T75A	4,070.	
112.5	2-2.5%	4-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	915B	280J	WS33	303.	V44M31T12A	6,280.	
150	2-2.5%	4-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	916A	280J	WS19	303.	V44M31T49A	7,960.	
225	2-2.5%	4-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	917	280J	WS34	688.	V44M31T22A	11,340.	
300	2-2.5%	4-2.5%	DT-3	150	56	31-1/4	24-1/4	1300	1422	794	616	590	918	280J	WS34	688.	V44M31T33A	14,480.	
500	2-2.5%	4-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1089	919	275F	WS35	1,175.	V44M31T55A	23,720.	
480 Δ Volts to 208Y/120 Volts																			
3	—	2-5%	EPT	115	13-3/8	16	8-3/8	116	339	404	211	52	201	70A	Indoor- Outdoor	—	Y48G28T03N	1,230.	
6	—	2-5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	64	200	70A	—	—	Y48G28T06N	1,435.	
6	2-2.5%	2-2.5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	64	200	72B	—	—	Y48D28T06N	1,460.	
9	—	2-5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	103	70A	Indoor- Outdoor	—	Y48G28T09N	1,810.	
9	—	4-2.5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	103	72A	—	—	Y48J28T09N	1,810.	
9	2-2.5%	2-2.5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	103	72B	—	—	Y48D28T09N	1,810.	
15	—	2-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	441	499	265	124	95	70A	Indoor- Outdoor	—	Y48G28T15N	2,425.	
15	—	4-2.5%	EPT	115	17-3/8	19-11/16	10-7/16	275	441	499	265	124	95	72A	—	—	Y48J28T15N	2,425.	
15	2-2.5%	2-2.5%	EPT	115	17-3/8	19-11/16	10-7/16	275	441	499	265	124	95	72B	—	—	Y48D28T15N	2,425.	
30	2-2.5%	4-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	422	676	638	323	191	243	84A	Indoor- Outdoor	—	Y48M28T30N	4,865.	
45	2-2.5%	4-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	723	371	299	244	84A	—	—	Y48M28T45N	5,570.	
75	2-2.5%	4-2.5%	EPT	115	30-3/4	30-1/8	15-5/8	1275	781	765	397	580	245	84A	—	—	Y48M28T75N ②	7,540.	
15	2-2.5%	4-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	909	280B	WS31	303.	V48M28T15B	1,670.	
30	2-2.5%	4-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	239	765	511	359	108	910A	280B	WS31	303.	V48M28T30K	2,035.	
37.5	2-2.5%	4-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	140	911A	280B	WS31	303.	V48M28T37K	2,505.	
45	2-2.5%	4-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	140	912A	280B	WS31	303.	V48M28T45K	2,550.	
50	2-2.5%	4-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	913B	280B	WS33	303.	V48M28T50J	3,510.	
75	2-2.5%	4-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	486	217	914B	280B	WS33	303.	V48M28T75J	3,590.	
112.5	2-2.5%	4-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	663	486	272	915B	280B	WS33	303.	V48M28T12H	5,520.	
150	2-2.5%	4-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	916A	280B	WS19	303.	V48M28T49K	7,010.	
225	2-2.5%	4-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	793	616	499	917	280B	WS34	688.	V48M28T22L	9,990.	
300	2-2.5%	4-2.5%	DT-3	150	56	31-1/4	24-1/4	1300	1422	793	616	589	918	280B	WS34	688.	V48M28T33K	12,570.	
500	2-2.5%	4-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	919	275B	WS35	1,175.	V48M28T55G	20,890.	
750	2-2.5%	4-2.5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	920	275B	WS35	1,175.	V48M28T77F	35,310.	
1000	1-3.5%	1-3.5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	①	①	V48W28T11G	53,440.

① Refer to your Cutler-Hammer sales office.

② Floor mount only.

For other ratings or styles not shown, or for special enclosure types (including stainless steel) refer to Cutler-Hammer.

Discount Symbol DT-1

Three-Phase, Types EPT, DT-3, 60 Hz

Three-Phase, Types EPT,
DT-3, 60 Hz

Type EPT Encapsulated

9

Product Description

Type EPT

- Sand and Resin 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
- 185°C Insulation System, 115°C rise standard
- Available in ratings through 75 kVA and 4160 volts primary

Type 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
- Available in three-phase ratings 15 - 1500 kVA and up to 4160 volts primary

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

- UL Listed
- 60 Hz operation standard, 50/60 Hz operation available
- Short-term overload capability as required by ANSI.
- Meet NEMA ST-20 sound levels

Standards and Certifications

Industry Standards

All Cutler-Hammer 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

Seismic Qualified

All Cutler-Hammer dry type distribution transformers are seismically qualified, and exceed requirements of the Uniform Building Code (UBC) and California Code Title 24.

Options and Accessories

Please refer to **Page 9-112**.

Product Specifications

Frequency

Cutler-Hammer standard dry type distribution transformers are designed for 60 Hertz 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.

The following pages provide listings for most standard transformer ratings and styles.

For other ratings or styles not shown, or for special enclosure types (including stainless steel) refer to Cutler-Hammer.

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Table 9-7. 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
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

Cutler-Hammer ventilated transformers, Type DT-3, utilize a NEMA 2 rated (drip-proof) enclosure as standard, and are rated NEMA 3R with the addition of weathershields. Cutler-Hammer encapsulated transformers, Type EPT, utilize a NEMA 3R rated enclosure as standard.

Sound Levels

All Cutler-Hammer 600 volt class general purpose dry type distribution transformers are designed to meet NEMA ST-20 levels listed here. Lower sound levels are available and must be designed specially.

Table 9-8. Sound Levels

kVA	NEMA Average ^① Sound Level in dB
0 – 9	40
10 – 50	45
51 – 150	50
151 – 300	55
301 – 500	60
501 – 700	62
701 – 1000	64
1001 – 1500	65

^① Applies to general purpose transformers only.

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.** Cutler-Hammer recommends 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 2 similar coils in each winding which 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.

Technical Data and Specifications

Please refer to **Page 9-114**.

The following pages provide listings for most standard transformer ratings and styles.

For other ratings or styles not shown, or for special enclosure types (including stainless steel) refer to Cutler-Hammer.

Technical Data and Specifications

General Purpose — EP Sand and Resin Encapsulated



EP Sand and Resin Encapsulated

Cutler-Hammer EP general purpose transformers are single-phase, sand and resin encapsulated designs suitable for indoor or outdoor applications. The totally-enclosed non-ventilated NEMA 3R enclosure makes it ideally suited for use in areas that contain dust, moisture, or corrosive fumes. Available in ratings through 37.5 kVA and 4160 volts, type EP transformers can be mounted in any position for indoor installations and in upright positions only for outdoor installations. Type EP transformers utilize a 185°C insulation system with 115°C rise standard.

General Purpose — EPT Sand and Resin Encapsulated



EPT Sand and Resin Encapsulated

Type EPT sand and resin encapsulated, 3-phase transformers are available in ratings of 3 – 75 kVA, up to 4160V primary. The totally-enclosed non-ventilated NEMA 3R enclosure makes the EPT ideally suited for outdoor as well as indoor locations. Type EPT transformers utilize a 185°C insulation system with 115°C standard.

General Purpose — DS-3 Ventilated



DS-3 Ventilated

DS-3 general purpose transformers are single-phase ventilated units designed primarily for indoor locations (also for outdoor with the addition of weathershields). The DS-3 utilizes a 220°C insulation system with 150°C rise and is available in ratings of 15 – 167 kVA and up to 4160V primary.

General Purpose — DT-3 Ventilated



Three-Phase DT-3 Ventilated

The three-phase DT-3 ventilated dry type is available in ratings of 15 – 1500 kVA and up to 4160V. Its 220°C insulation system (150°C rise) is self-extinguishing. DT-3 enclosures are designed for indoor locations (or outdoors on 600 volts and below with addition of weathershields).

Non-Linear (K-factor)



Non-Linear Transformer

Non-linear transformers are designed to withstand the overheating effects caused by harmonics resulting from non-linear (non-sinusoidal) loads. Office equipment using solid-state switching power supplies such as computers, laser printers, and copiers are sources of harmonic distortion in power systems. Non-linear transformers are specifically designed for these applications. Their coils are designed to reduce stray losses, their cores have reduced induction levels, and their neutrals can carry at least 200% of normal phase current.

Energy Efficient



NEMA TP-1-1996 — Energy Efficient

Cutler-Hammer low temperature rise units are a solution for improved energy efficiency. Their lower conductor losses result in energy conservation and their lower rise give longer insulation life. Available in ratings through 1000 kVA, 115°C or 80°C rise, all Cutler-Hammer energy efficient units through 750 kVA are UL listed and utilize the 220°C insulation system.

NEMA TP-1-1996 Energy Efficient transformers are specifically designed to meet the strict efficiency standards set forth in NEMA Standard TP-1-1996. Cores and coils are optimized to provide maximum efficiency at 35% of nameplate rating.

Catalog Numbering System

Table 9-152. General Purpose, Energy Efficient, Mini-Power Center, Shielded Isolation, Non-Linear, Buck-Boost, Marine Duty Transformers — Example: S20N11S05A

S 20 N 11 S 05 A																																																																																																																																																									
<table border="1"> <thead> <tr> <th>Type</th> </tr> </thead> <tbody> <tr> <td>S = EP</td> </tr> <tr> <td>Y = EPT</td> </tr> <tr> <td>T = DS-3</td> </tr> <tr> <td>V = DT-3</td> </tr> <tr> <td>P = Mini-Power Center</td> </tr> <tr> <td>Non-Linear</td> </tr> <tr> <td>H = KT-4</td> </tr> <tr> <td>B = KT-9</td> </tr> <tr> <td>N = KT-13</td> </tr> <tr> <td>G = KT-20</td> </tr> <tr> <td>J = KT-30</td> </tr> <tr> <td>A = KT-40</td> </tr> <tr> <td>K = KT-50</td> </tr> <tr> <td>Q = EPM Marine</td> </tr> <tr> <td>L = EPTM Marine</td> </tr> <tr> <td>R = DS-3M Marine</td> </tr> <tr> <td>M = DT-3M Marine</td> </tr> <tr> <td>Z = Class 1 Division 2 Groups C and D</td> </tr> </tbody> </table>	Type	S = EP	Y = EPT	T = DS-3	V = DT-3	P = Mini-Power Center	Non-Linear	H = KT-4	B = KT-9	N = KT-13	G = KT-20	J = KT-30	A = KT-40	K = KT-50	Q = EPM Marine	L = EPTM Marine	R = DS-3M Marine	M = DT-3M Marine	Z = Class 1 Division 2 Groups C and D	<table border="1"> <thead> <tr> <th>Primary Voltage</th> </tr> </thead> <tbody> <tr> <td>13 = 110 x 220</td> </tr> <tr> <td>12 = 120</td> </tr> <tr> <td>10 = 120 x 240</td> </tr> <tr> <td>29 = 208</td> </tr> <tr> <td>72 = 200</td> </tr> <tr> <td>25 = 220</td> </tr> <tr> <td>23 = 230</td> </tr> <tr> <td>24 = 240</td> </tr> <tr> <td>20 = 240 x 480</td> </tr> <tr> <td>27 = 277</td> </tr> <tr> <td>38 = 380</td> </tr> <tr> <td>39 = 400</td> </tr> <tr> <td>43 = 416</td> </tr> <tr> <td>44 = 440</td> </tr> <tr> <td>45 = 450</td> </tr> <tr> <td>48 = 480</td> </tr> <tr> <td>57 = 575</td> </tr> <tr> <td>60 = 600</td> </tr> <tr> <td>42 = 2400</td> </tr> <tr> <td>46 = 4160</td> </tr> <tr> <td>49 = 4800</td> </tr> <tr> <td>40 = Export Model</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Taps</th> </tr> </thead> <tbody> <tr> <td>D = +2 - 2.5%, -2 - 2.5%</td> </tr> <tr> <td>E = +1 - 5%, -1 - 5%</td> </tr> <tr> <td>F = -1 - 10%</td> </tr> <tr> <td>G = -2 - 5%</td> </tr> <tr> <td>J = -4 - 2.5%</td> </tr> <tr> <td>K = -1 - 10% x -2 - 5%</td> </tr> <tr> <td>L = -2 - 5% x -4 - 2.5%</td> </tr> <tr> <td>M = +2 - 2.5%, -4 - 2.5%</td> </tr> <tr> <td>N = None</td> </tr> <tr> <td>R = +1 - 5%, -2 - 5%</td> </tr> <tr> <td>P = +1 - 5%, -2 - 5% x +2 - 2.5%, -4 - 2.5%</td> </tr> <tr> <td>T = +1 - 4.2%, -1 - 4.2%</td> </tr> <tr> <td>U = +1 - 2.5%, -3 - 2.5%</td> </tr> <tr> <td>W = +1 - 3.5%, -1 - 3.5%</td> </tr> <tr> <td>X = +2 - 3.1%, -2 - 3.1%</td> </tr> </tbody> </table>	Primary Voltage	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	Taps	D = +2 - 2.5%, -2 - 2.5%	E = +1 - 5%, -1 - 5%	F = -1 - 10%	G = -2 - 5%	J = -4 - 2.5%	K = -1 - 10% x -2 - 5%	L = -2 - 5% x -4 - 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① Copper Windings.

② Stainless Steel (utilizes 316 stainless steel, does not imply a NEMA 4X rating).

③ Open Type Core and Coil Assembly.

④ Totally Enclosed Non-Ventilated DS-3 or DT-3.

⑤ 50/60 Hz.

⑥ Low Sound Design.

⑦ Fungus Proof.

⑧ Certified test report of standard production tests.

⑨ Certified sound level report.

® Model number is not used on newly designed/redesigned transformers.

Note: For the Cutler-Hammer Industrial Control Transformers Catalog Numbering System see **Page 9-124**.

Note: Contact your local Cutler-Hammer sales office for voltage combinations not shown. Use table for catalog number breakdown only.