November 2003
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Transformers

Contents

Dry-Type Transformer Family

Single-Phase, Types EP, DS-3, 60 Hz

Type EP 3-25 kVA

Product Description

Type EP

- 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.
- 185ºC Insulation System, 115ºC rise standard.
- Available in ratings through 37.5 kVA and 4160 volts primary.

Type DS-3

- Ventilated, NEMA 2 enclosure standard.
- Suitable for indoor applications, outdoors when weathershields are also installed.
- Upright mounting only.
- 220ºC Insulation System, 150ºC rise standard.
- Available in single-phase ratings 15 – 167 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.
- 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 by Eaton Corporation 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

Cutler-Hammer manufactured 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 9-120**.

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.

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Table 9-1. 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 DS-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 EP, 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 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.

Table 9-2. Average Sound Levels

NEMA ST-20 Average Sound Level in dB		
kVA	Ventilated	Encapsulated
0 – 9	40	45
10 – 50	45	50
51 – 150	50	55
151 – 300	55	57
301 – 500	60	59
501 – 700	62	61
701 – 1000	64	63
1001 – 1500	65	64

Winding Terminations

Primary and secondary windings are terminated in the wiring compartment. Encapsulated units have copper leads or stabs brought out for connections. 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's Cutler-Hammer business 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 9-122**.

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 Eaton's Cutler-Hammer business.

Product Selection

Additional Product Selection information begins on **Page 9-136**.

Type EP 3-37.5 kVA

Type DS-3 15-167 kVA

Table 9-3. Single-Phase Selection Information — Types EP, DS-3, 60 Hz

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
120 x 240 Volts to 120/240 Volts ①																		
.5	—	—	EP	115	6-1/2	4-7/8	4-5/8	13	165	124	117	6	FR57	3E	Indoor-	—	**S10N11S51N**	400.
1	—	—	EP	115	8-3/8	6	5-3/4	31	213	152	146	14	FR59A	3E	Outdoor	—	**S10N11S01N**	720.
1.5	—	—	EP	115	10-3/4	6-3/16	6-1/8	40	273	157	156	18	FR67	3E		—	**S10N11S16N**	890.
2	—	—	EP	115	10-3/4	6-3/16	6-1/8	40	273	157	156	18	FR68	3E	Indoor-	—	**S10N11S02N**	965.
3	—	—	EP	115	14-1/8	7-3/4	8	65	359	197	203	29	FR176	3E	Outdoor	—	**S10N11S03N**	1,050.
5	—	—	EP	115	16	10-3/8	9-7/8	113	406	263	251	51	FR177	3E		—	**S10N11S05N**	1,425.
7.5	—	—	EP	115	16	10-3/8	9-7/8	123	406	263	251	55	FR178	3E	Indoor-	—	**S10N11S07N**	1,830.
10	—	—	EP	115	19	13-3/8	10-1/2	191	482	339	266	87	FR179	3E	Outdoor	—	**S10N11S10N**	2,225.
15	—	—	EP	115	19	13-3/8	10-1/2	216	482	339	266	98	FR180	3E		—	**S10N11S15N**	2,780.
25	—	—	EP	115	22-3/8	16-3/8	14-1/2	375	568	416	368	170	FR182	3E		—	**S10N11S25N**	4,370.
37.5	②	②	DS-3	150	37-5/8	22-5/8	19-1/2	306	956	574	495	139	FR817	3XD	**WS11**	350.	**T10P11S37**	5,490.
50	②	②	DS-3	150	37-5/8	22-5/8	19-1/2	340	956	574	495	154	FR818	3XD	**WS11**	350.	**T10P11S50**	6,670.
208 Volts to 120/240 Volts ①																		
.5	—	—	EP	115	6-1/2	4-7/8	4-5/8	13	165	124	117	6	FR57	26A	Indoor-	—	**S29N11S51N**	410.
1	—	—	EP	115	8-3/8	6	5-3/4	31	213	152	146	14	FR59A	26A	Outdoor	—	**S29N11S01N**	625.
1.5	—	—	EP	115	10-3/4	6-3/16	6-1/8	40	273	157	156	18	FR67	26A		—	**S29N11S16N**	770.
2	—	—	EP	115	10-3/4	6-3/16	6-1/8	40	273	157	156	18	FR68	26A	Indoor-	—	**S29N11S02N**	985.
3	—	—	EP	115	14-1/8	7-3/4	8	65	359	197	203	29	FR176	26A	Outdoor	—	**S29N11S03N**	1,200.
5	—	—	EP	115	16	10-3/8	9-7/8	113	406	263	251	51	FR177	26A		—	**S29N11S05N**	1,775.
7.5	—	—	EP	115	16	10-3/8	9-7/8	123	406	263	251	55	FR178	26A	Indoor-	—	**S29N11S07N**	2,350.
10	—	—	EP	115	19	13-3/8	10-1/2	193	482	339	266	87	FR179	26A	Outdoor	—	**S29N11S10N**	2,830.
15	—	—	EP	115	19	13-3/8	10-1/2	216	482	339	266	98	FR180	26A		—	**S29N11S15N**	3,350.
25	—	—	EP	115	22-3/8	16-3/8	14-1/8	375	568	416	359	170	FR182	26A		—	**S29N11S25N**	4,780.
25	2@+2.5%	4@-2.5%	DS-3	150	31-1/4	22-5/8	17-1/2	212	793	574	445	96	FR816	260A	**WS11**	350.	**T29M11S25**	3,740.
37.5	2@+2.5%	4@-2.5%	DS-3	150	37-5/8	22-5/8	19-1/2	306	956	574	495	139	FR817	260A	**WS11**	350.	**T29M11S37**	4,580.
50	2@+2.5%	4@-2.5%	DS-3	150	37-5/8	22-5/8	19-1/2	340	956	574	495	154	FR818	260A	**WS11**	350.	**T29M11S50**	5,560.
75	2@+2.5%	4@-2.5%	DS-3	150	42-1/8	24	23-3/8	510	1070	610	594	232	FR819	260A	**WS16**	800.	**T29M11S75**	7,860.
100	1@+5%	2@-5%	DS-3	150	42-1/8	24	23-3/8	600	1070	610	594	272	FR820	260A	**WS16**	800.	**T29R11S99**	9,760.
277 Volts to 120/240 Volts ①																		
.5	—	—	EP	115	6-1/2	4-7/8	4-5/8	13	165	124	117	6	FR57	514B	Indoor-	—	**S27N11S51A**	410.
1	—	—	EP	115	8-3/8	6	5-3/4	31	213	152	146	14	FR59A	514B	Outdoor	—	**S27N11S01A**	625.
1.5	—		EP	115	10-3/4	6-3/16	6-1/8	40	273	157	156	18	FR67	514B		—	**S27N11S16A**	770.
2	—	—	EP	115	10-3/4	6-3/16	6-1/8	40	273	157	156	18	FR68	514B	Indoor-	—	**S27N11S02A**	985.
3	—	—	EP	115	14-1/8	7-3/4	8	65	359	197	203	29	FR176	514B	Outdoor	—	**S27N11S03N**	1,200.
5	—	—	EP	115	16	10-3/8	9-7/8	113	405	263	251	51	FR177	514B		—	**S27N11S05N**	1,775.
7.5	—	—	EP	115	16	10-3/8	9-7/8	123	406	263	251	55	FR178	514B	Indoor-	—	**S27N11S07N**	2,350.
10	—	—	EP	115	19	13-3/8	10-1/2	193	482	339	266	87	FR179	514B	Outdoor	—	**S27N11S10N**	2,830.
15	—	—	EP	115	19	13-3/8	10-1/2	216	482	339	266	98	FR180	514B		—	**S27N11S15N**	3,350.
25	—	—	EP	115	22-3/8	16-3/8	14-1/8	375	568	416	359	170	FR182	514B		—	**S27N11S25N**	4,780.
25	2@+2.5%	4@-2.5%	DS-3	150	31-1/4	22-5/8	17-1/2	212	793	574	445	96	FR816	262C	**WS11**	350.	**T27M11S25**	3,740.
37.5	2@+2.5%	4@-2.5%	DS-3	150	37-5/8	22-5/8	19-1/2	306	956	574	495	139	FR817	262C	**WS11**	350.	**T27M11S37**	4,580.
50	2@+2.5%	4@-2.5%	DS-3	150	37-5/8	22-5/8	19-1/2	340	956	574	495	154	FR818	262C	**WS11**	350.	**T27M11S50**	5,560.
75	2@+2.5%	4@-2.5%	DS-3	150	42-1/8	24	23-3/8	510	1070	610	594	232	FR819	262C	**WS16**	800.	**T27M11S75**	7,860.
100	2@+2.5%	4@-2.5%	DS-3	150	42-1/8	24	23-3/8	600	1070	610	594	272	FR820	262C	**WS16**	800.	**T27M11S99**	9,760.

① Contact Eaton's Cutler-Hammer business for availability of 0.05 – 0.25 kVA designs.

② 1@+5%, 2@-5% at 240 volts primary; 2@+2.5%, 4@-2.5% at 480 volts primary.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

Discount Symbol **DT-1**

Table 9-4. Single-Phase Selection Information — Types EP, DS-3, 60 Hz

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
240 x 480 Volts to 120/240 Volts																		
.050	—	—	EP	115	6-1/2	3-7/8	3-1/2	7	165	98	89	3	FR52	3A	Indoor-	—	**S20N11S81N**	75.
.075	—	—	EP	115	6-1/2	3-7/8	3-1/2	7	165	98	89	3	FR53	3A	Outdoor	—	**S20N11S85N**	85.
.100	—	—	EP	115	6-1/2	3-7/8	3-1/2	7	165	98	89	3	FR54	3A		—	**S20N11S82N**	95.
.150	—	—	EP	115	6-1/2	3-7/8	3-1/2	8	165	98	89	4	FR55	3A	Indoor-	—	**S20N11S83N**	110.
.25	—	—	EP	115	6-1/2	4-7/8	3-7/8	12	165	124	98	5	FR56	3A	Outdoor	—	**S20N11S26N**	135.
.5	—	—	EP	115	6-1/2	4-7/8	4-5/8	13	165	124	117	6	FR57	3A		—	**S20N11S51N**	170.
.75	—	—	EP	115	8-3/8	6	5-3/4	21	213	152	146	10	FR58A	3A	Indoor-	—	**S20N11S76N**	220.
1	—	—	EP	115	8-3/8	6	5-3/4	31	213	152	146	14	FR59A	3A	Outdoor	—	**S20N11S01N**	260.
1.5	—	—	EP	115	10-3/4	6-3/16	6-1/8	40	273	157	156	18	FR67	3A		—	**S20N11S16N**	320.
2	—	—	EP	115	10-3/4	6-3/16	6-1/8	40	273	157	156	18	FR68	3A	Indoor-	—	**S20N11S02N**	410.
3	—	—	EP	115	14-1/8	7-3/4	8	65	359	197	203	29	FR176	3A	Outdoor	—	**S20N11S03N**	500.
3	①	①	EP	115	14-1/8	7-3/4	8	65	359	197	203	29	FR176	9A		—	**S20K11S03N**	525.
5	—	—	EP	115	16	10-3/8	9-7/8	113	406	263	251	51	FR177	3A	Indoor-	—	**S20N11S05N**	740.
5	①	①	EP	115	16	10-3/8	9-7/8	113	406	263	251	51	FR177	9A	Outdoor	—	**S20K11S05N**	775.
7.5	—	—	EP	115	16	10-3/8	9-7/8	123	406	263	251	55	FR178	3A		—	**S20N11S07N**	980.
7.5	①	①	EP	115	16	10-3/8	9-7/8	123	406	263	251	55	FR178	9A	Indoor-	—	**S20K11S07N**	1,030.
10	—	—	EP	115	19	13-3/8	10-1/2	193	482	339	266	87	FR179	3A	Outdoor	—	**S20N11S10N**	1,180.
10	①	①	EP	115	19	13-3/8	10-1/2	193	482	339	266	87	FR179	9A		—	**S20K11S10N**	1,240.
15	—	—	EP	115	19	13-3/8	10-1/2	216	482	339	266	98	FR180	3A	Indoor-	—	**S20N11S15N**	1,540.
15	②	②	EP	115	19	13-3/8	10-1/2	216	482	339	266	98	FR180	23A	Outdoor	—	**S20L11S15N**	1,600.
25	—	—	EP	115	22-3/8	16-3/8	14-1/2	375	568	416	368	170	FR182	3A		—	**S20N11S25N**	1,900.
25	②	②	EP	115	22-3/8	16-3/8	14-1/2	375	568	416	368	170	FR182	23A	Indoor-	—	**S20L11S25N**	2,250.
37.5	②	②	EP	115	28-1/4	22-5/8	14-5/8	950	717	575	371	432	FR300A	23A	Outdoor	—	**S20L11S37**	9,400.
15	③	③	DS-3	150	30-1/4	16-7/8	15-7/8	147	768	428	402	67	FR815	3XA	**WS15**	350.	**T20P11S15**	1,440.
25	③	③	DS-3	150	31-1/4	22-5/8	17-1/2	212	793	574	445	96	FR816	3XA	**WS11**	350.	**T20P11S25**	1,870.
37.5	③	③	DS-3	150	37-5/8	22-5/8	19-1/2	306	956	574	495	139	FR817	3XA	**WS11**	350.	**T20P11S37**	2,290.
50	③	③	DS-3	150	37-5/8	22-5/8	19-1/2	340	956	574	495	154	FR818	3XA	**WS11**	350.	**T20P11S50**	3,220.
75	③	③	DS-3	150	42-1/8	24	23-3/8	510	1070	610	594	232	FR819	3XA	**WS16**	800.	**T20P11S75**	3,930.
100	③	③	DS-3	150	42-1/8	24	23-3/8	600	1070	610	594	272	FR820	3XA	**WS16**	800.	**T20P11S99**	4,880.
167	2@+2.5%	4@-2.5%	DS-3	150	62-1/2	30	34	1200	1597	762	863	545	FR814	288A	**WS13**	800.	**T48M11S67D** ④	9,500.

① 1@+10% FCBN at 240 volts; 2@+5% FCBN at 480 volts.
② 2@+5% FCBN at 240 volts; 4@+2.5% FCBN at 480 volts.
③ 1@+5%, 2@-5% at 240 volts primary; 2@+2.5%, 4@-2.5% at 480 volts primary.
④ 480V primary to 120/240 volts secondary.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Table 9-5. Single-Phase Selection Information — Types EP, DS-3, 60 Hz

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
190/200/208/220 x 380/400/416/440 Volts to 110/220 Volts 50/60 Hz — Export Model IP 22 Rated																		
.5	—	—	EP	115	10-3/4	6-1/8	6-5/8	42	273	155	166	19	FR67	538A	Indoor-	—	**S40N14S51CE**	760.
1	—	—	EP	115	10-3/4	6-1/8	6-5/8	42	273	155	166	19	FR67	538A	Outdoor	—	**S40N14S01CE**	830.
1.5	—	—	EP	115	10-3/4	6-1/8	6-5/8	46	273	155	166	21	FR67	538A		—	**S40N14S16CE**	1,030.
2	—	—	EP	115	11-1/8	7-3/4	8	70	281	197	203	33	FR176	538A		—	**S40N14S02CE**	1,225.
3	—	—	EP	115	12-7/8	10-3/8	9-7/8	113	326	264	251	51	FR177	538A	Indoor-	—	**S40N14S03CE**	1,570.
5	—	—	EP	115	12-7/8	10-3/8	9-7/8	140	326	264	251	63	FR178	538A	Outdoor	—	**S40N14S05CE**	2,000.
7.5	—	—	EP	115	15-7/8	13-3/8	10-5/8	193	402	340	267	87	FR179	538A		—	**S40N14S07CE**	2,625.
10	—	—	EP	115	15-7/8	13-3/8	10-5/8	216	402	340	267	98	FR180	538A	Indoor-	—	**S40N14S10CE**	3,160.
15	—	—	EP	115	17-1/8	16-3/8	14-1/8	375	433	415	359	170	FR182	538A	Outdoor	—	**S40N14S15CE**	4,060.
240 x 480 Volts to 120/240 Volts Stainless Steel ①																		
3	—	—	EP	115	14-1/8	7-11/16	8	65	359	195	203	29	FR176	3A	Indoor-	—	**S20N11S03SS**	750.
5	—	—	EP	115	16	10-3/8	9-7/8	113	406	263	251	51	FR177	3A	Outdoor	—	**S20N11S05SS**	1,110.
7.5	—	—	EP	115	16	10-3/8	9-7/8	123	406	263	251	55	FR178	3A		—	**S20N11S07SS**	1,470.
10	—	—	EP	115	19	13-3/8	10-1/2	179	482	339	266	87	FR179	3A	Indoor-	—	**S20N11S10SS**	1,770.
15	—	—	EP	115	19	13-3/8	10-1/2	216	482	339	266	98	FR180	3A	Outdoor	—	**S20N11S15SS**	2,200.
25	—	—	EP	115	21-5/16	16-3/8	14-1/8	375	566	416	359	170	FR182	3A		—	**S20N11S25SS**	2,850.
480 Volts to 120/240 Volts																		
1	—	2@-5%	EP	115	8-3/8	6	5-3/4	31	213	152	146	14	FR59A	2D	Indoor-	—	**S48G11S01N**	312.
1.5	—	2@-5%	EP	115	10-3/4	6-3/16	6-1/8	40	273	157	156	18	FR67	2D	Outdoor	—	**S48G11S16N**	385.
2	—	2@-5%	EP	115	10-3/4	6-3/16	6-1/8	40	273	157	156	18	FR68	2D		—	**S48G11S02N**	495.
3	—	2@-5%	EP	115	14-1/8	7-3/4	8	65	359	197	203	29	FR176	2D	Indoor-	—	**S48G11S03N**	600.
3	2@+2.5%	2@+2.5%	EP	115	14-1/8	7-3/4	8	65	359	197	203	29	FR176	16A	Outdoor	—	**S48D11S03N**	600.
5	—	2@-5%	EP	115	16	10-3/8	9-7/8	113	406	263	251	51	FR177	2D		—	**S48G11S05N**	890.
5	2@+2.5%	2@+2.5%	EP	115	16	10-3/8	9-7/8	113	406	263	251	51	FR177	16A	Indoor-	—	**S48D11S05N**	890.
7.5	—	2@-5%	EP	115	16	10-3/8	9-7/8	123	406	263	251	55	FR178	2D	Outdoor	—	**S48G11S07N**	1,180.
7.5	2@+2.5%	2@+2.5%	EP	115	16	10-3/8	9-7/8	123	406	263	251	55	FR178	16A		—	**S48D11S07N**	1,180.
10	—	2@-5%	EP	115	19	13-3/8	10-1/2	193	482	339	266	87	FR179	2D	Indoor-	—	**S48G11S10N**	1,415.
10	2@+2.5%	2@+2.5%	EP	115	19	13-3/8	10-1/2	193	482	339	266	87	FR179	16A	Outdoor	—	**S48D11S10N**	1,415.
15	—	2@-5%	EP	115	19	13-3/8	10-1/2	216	482	339	266	98	FR180	2D		—	**S48G11S15N**	1,850.
15	2@+2.5%	2@+2.5%	EP	115	19	13-3/8	10-1/2	216	482	339	266	98	FR180	16A	Indoor-	—	**S48D11S15N**	1,850.
25	—	2@-5%	EP	115	22-3/8	16-3/8	14-1/8	375	568	416	359	170	FR182	2D	Outdoor	—	**S48G11S25N**	2,395.
25	2@+2.5%	4@-2.5%	EP	115	20-3/4	19-1/8	13-5/8	175	525	483	349	80	FR132	83A		—	**S48M11S25N**	2,395.
480 Volts to 120/240 Volts Stainless Steel, Copper Windings ①																		
10	2@+2.5%	2@+2.5%	EP	115	19	13-3/8	10-1/2	208	482	339	266	94	FR179	16A	Indoor-	—	**S48D11S10SSCU**	2,620.
15	2@+2.5%	2@+2.5%	EP	115	19	13-3/8	10-1/2	235	482	339	266	106	FR180	16A	Outdoor	—	**S48D11S15SSCU**	3,500.
25	2@+2.5%	4@-2.5%	EP	115	20-3/4	19-1/8	13-5/8	175	525	483	349	80	FR132	83A		—	**S48M11S25SSCU**	4,430.
600 Volts to 120/240 Volts																		
.5	—	2@-5%	EP	115	6-1/2	4-7/8	4-5/8	13	165	124	117	6	FR57	2I	Indoor-	—	**S60G11S51N**	255.
.75	—	2@-5%	EP	115	8-3/8	6	5-3/4	21	213	152	146	10	FR58A	2I	Outdoor	—	**S60G11S76N**	330.
1	—	2@-5%	EP	115	8-3/8	6	5-3/4	31	213	152	146	14	FR59A	2I		—	**S60G11S01N**	390.
1.5	—	2@-5%	EP	115	10-3/4	6-3/16	6-1/8	40	273	157	156	18	FR67	2I	Indoor-	—	**S60G11S16N**	475.
2	—	2@-5%	EP	115	10-3/4	6-3/16	6-1/8	40	273	157	156	18	FR68	2I	Outdoor	—	**S60G11S02N**	610.
3	—	2@-5%	EP	115	14-1/8	7-3/4	8	65	359	197	203	29	FR176	2I		—	**S60G11S03N**	740.
5	—	2@-5%	EP	115	16	10-3/8	9-7/8	113	406	263	251	51	FR177	2I	Indoor-	—	**S60G11S05N**	1,110.
7.5	—	2@-5%	EP	115	16	10-3/8	9-7/8	123	406	263	251	55	FR178	2I	Outdoor	—	**S60G11S07N**	1,460.
10	—	2@-5%	EP	115	19	13-3/8	10-1/2	193	482	339	266	87	FR179	2I		—	**S60G11S10N**	1,760.
15	—	4@-2.5%	EP	115	19	13-3/8	10-1/2	216	482	339	266	98	FR180	527A	Indoor-	—	**S60J11S15N**	2,400.
25	—	4@-2.5%	EP	115	22-3/8	16-3/8	14-1/8	375	568	416	359	170	FR182	527A	Outdoor	—	**S60J11S25N**	2,825.
25	2 @ 2.5%	4@-2.5%	EP	115	20-3/4	19-1/8	13-5/8	175	525	483	349	80	FR132	83B		—	**S60M11S25N**	2,825.
25	2@+2.5%	4@-2.5%	DS-3	150	31-1/4	22-5/8	17-1/2	212	793	574	445	96	FR816	276B	**WS11**	350.	**T60M11S25B**	2,240.
37.5	2@+2.5%	4@-2.5%	DS-3	150	37-5/8	22-5/8	19-1/2	306	956	574	495	139	FR817	276B	**WS11**	350.	**T60M11S37**	2,750.
50	2@+2.5%	4@-2.5%	DS-3	150	37-5/8	22-5/8	19-1/2	340	956	574	495	154	FR818	276B	**WS11**	350.	**T60M11S50D**	3,340.
75	2@+2.5%	4@-2.5%	DS-3	150	42-1/8	24	23-3/8	510	1070	610	594	232	FR819	276B	**WS16**	800.	**T60M11S75**	4,720.
100	2@+2.5%	4@-2.5%	DS-3	150	42-1/8	24	23-3/8	600	1070	610	594	272	FR820	276B	**WS16**	800.	**T60M11S99**	5,860.
167	2@+2.5%	4@-2.5%	DS-3	150	62-7/8	30	34	1200	1597	762	863	545	FR814	288B	**WS13**	800.	**T60M11S67A**	11,400.

① NEMA 3R, 316 stainless steel enclosure.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Table 9-6. Single-Phase Selection Information — Types EP, DS-3, 60 Hz

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
2400 Volts to 120/240 Volts																		
1.5	—	—	EP	115	10-3/4	6-3/16	6-1/8	40	273	157	156	181	FR68	18A	Recommended Indoor Only	—	**S42N11S16N** ①	3,100.
3	—	4@-2.5%	EP	115	16	10-3/8	9-7/8	113	406	263	251	51	FR177	12A	Recommended Indoor Only	—	**S42J11S03N** ①	3,290.
5	—	4@-2.5%	EP	115	16	10-3/8	9-7/8	123	406	263	251	55	FR178	12A		—	**S42J11S05N** ①	3,460.
10	—	4@-2.5%	EP	115	19	13-3/8	10-1/2	216	482	339	266	87	FR179	12A		—	**S42J11S10N** ①	4,930.
15	—	4@-2.5%	EP	115	22-3/8	16-3/8	14-1/8	375	566	416	359	170	FR182	12A		—	**S42J11S15N** ①	5,830.
25	—	4@-2.5%	EP	115	26-3/8	16-3/8	14-1/8	405	668	416	359	183	FR190	12A		—	**S42J11S25N** ①	8,270.
37.5	2@+2.5%	2@-2.5%	DS-3	150	28	22	20	300	684	537	488	137	②	②	Recommended Indoor Only	—	**T42D11S37** ③④	5,500.
50	2@+2.5%	2@-2.5%	DS-3	150	30	24	26	420	732	586	635	191	②	②		—	**T42D11S50** ③④	6,350.
75	2@+2.5%	2@-2.5%	DS-3	150	30	24	26	500	732	586	635	228	②	②		—	**T42D11S75** ③④	7,860.
100	2@+2.5%	2@-2.5%	DS-3	150	36	27	26	570	879	659	635	260	②	②		—	**T42D11S99** ③④	8,600.
2400 Volts to 240/480 Volts																		
37.5	2@+2.5%	2@-2.5%	DS-3	150	28	22	20	300	684	537	488	137	②	②	Recommended Indoor Only	—	**T42D21S37** ③④	5,500.
50	2@+2.5%	2@-2.5%	DS-3	150	30	24	26	420	732	586	635	191	②	②		—	**T42D21S50** ③④	6,350.
4160 Volts to 120/240 Volts																		
1.5	—	—	EP	115	10-3/4	6-3/16	6-1/8	40	273	157	156	181	FR68	524G	Recommended Indoor Only	—	**S46N11S16N** ①	2,580.
3	—	4@-2.5%	EP	115	16	10-3/8	9-7/8	113	406	263	251	51	FR177	12B	Recommended Indoor Only	—	**S46J11S03N** ①	3,295.
5	—	4@-2.5%	EP	115	16	10-3/8	9-7/8	123	406	263	251	55	FR178	12B		—	**S46J11S05N** ①	3,460.
10	—	4@-2.5%	EP	115	19	13-3/8	10-1/2	193	482	339	266	87	FR179	12B		—	**S46J11S10A** ①	4,930.
15	—	4@-2.5%	EP	115	22-5/16	16-3/8	14-1/8	375	566	416	359	170	FR182	12B		—	**S46J11S15A** ①	5,830.
25	2@+2.5%	2@-2.5%	DS-3	150	28	22	20	280	984	537	488	128	②	②	Recommended Indoor Only	—	**T46D11S25** ③④	4,800.
37.5	2@+2.5%	2@-2.5%	DS-3	150	28	22	20	300	684	537	488	137	②	②		—	**T46D11S37** ③④	5,500.
50	2@+2.5%	2@-2.5%	DS-3	150	30	24	26	420	732	586	635	191	②	②		—	**T46D11S50** ③④	6,350.
75	2@+2.5%	2@-2.5%	DS-3	150	30	24	26	500	732	586	635	228	②	②	Recommended Indoor Only	—	**T46D11S75** ③④	7,860.
100	2@+2.5%	2@-2.5%	DS-3	150	36	27	26	570	879	659	635	260	②	②		—	**T46D11S99** ③④	8,600.
167	2@+2.5%	2@-2.5%	DS-3	150	50	33	35	1000	1220	806	854	455	②	②		—	**T46D11S67** ③④	16,800.
4160 Volts to 240/480 Volts																		
37.5	2@+2.5%	2@-2.5%	DS-3	150	28	22	20	300	684	537	488	137	②	②	Recommended Indoor Only	—	**T46D21S37** ③④	5,500.
50	2@+2.5%	2@-2.5%	DS-3	150	30	24	26	420	732	586	635	191	②	②		—	**T46D21S50** ③④	6,350.
75	2@+2.5%	2@-2.5%	DS-3	150	30	24	26	500	732	586	635	228	②	②		—	**T46D21S75** ③④	7,860.
100	2@+2.5%	2@-2.5%	DS-3	150	36	27	26	570	879	659	635	260	②	②		—	**T46D21S99** ③④	8,600.

① No UL label.
② Refer to your Cutler-Hammer sales office.
③ NEMA 3R enclosure and/or UL label available at additional cost. Specify at time of order entry if required.
④ Not seismic qualified.

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

Discount Symbol **DT-1**

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

Type EPT Encapsulated

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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.
- 185ºC Insulation System, 115ºC 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.
- 220ºC Insulation System, 150ºC 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.

Seismically Qualified

Cutler-Hammer manufactured 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 9-120**.

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 Eaton's Cutler-Hammer business.

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

Eaton's 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 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.

Table 9-8. Average Sound Levels

NEMA ST-20 Average Sound level (dB)		
kVA	Ventilated	Encapsulated
0 – 9	40	45
10 – 50	45	50
51 – 150	50	55
151 – 300	55	57
301 – 500	60	59
501 – 700	62	61
701 – 1000	64	63
1001 – 1500	65	64

① Applies to general purpose ventilated 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. 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.** The Cutler-Hammer business 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 9-122**.

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 Eaton's Cutler-Hammer business.

Product Selection

Additional Product Selection information begins on **Page 9-136**.

Table 9-9. 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		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
208 Δ Volts to 480Y/277 Volts																		
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	FR909	280E	**WS31**	350.	**V29M47T15N**	2,030.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280E	**WS31**	350.	**V29M47T30N**	2,590.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	140	FR912A	280E	**WS31**	350.	**V29M47T45N**	3,150.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	486	217	FR914B	280E	**WS33**	350.	**V29M47T75N**	4,460.
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	FR915B	280E	**WS33**	350.	**V29M47T12N**	6,450.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	660	585	344	FR916A	280E	**WS19**	350.	**V29M47T49N**	8,100.
225	1@+5%	2@-5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	333B	**WS34**	800.	**V29R47T22N**	11,850.
300	1@+5%	2@-5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	333B	**WS34**	800.	**V29R47T33N**	15,000.
500	—	2@-5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	290B	**WS35**	1,360.	**V29G47T55N**	22,400.
220 Δ Volts to 190Y/110 Volts																		
3	—	2@-5%	EPT	115	13-3/8	15-15/16	8-5/16	116	340	405	211	53	FR201	70I	Indoor-	—	**Y25G19T03A**	1,380.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	65	FR200	70I	Outdoor	—	**Y25G19T06A**	1,680.
9	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	70I		—	**Y25G19T09A**	2,170.
15	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	①	Indoor-	—	**Y25G19T15A**	2,730.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	422	676	638	324	191	FR243	①	Outdoor	—	**Y25M19T30A**	5,200.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	724	372	299	FR244	①		—	**Y25M19T45A**	6,500.
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	FR909	280Q	**WS31**	350.	**V25M19T15A**	1,825.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280Q	**WS31**	350.	**V25M19T30A**	2,330.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280Q	**WS31**	350.	**V25M19T45A**	2,840.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280Q	**WS33**	350.	**V25M19T75A**	4,010.
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	FR915B	280Q	**WS33**	350.	**V25M19T12A**	5,800.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280Q	**WS19**	350.	**V25M19T49A**	7,290.
225	1@+5%	2@-5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	289F	**WS34**	800.	**V25R19T22A**	10,660.
300	1@+5%	2@-5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	289F	**WS34**	800.	**V25R19T33A**	13,500.
500	—	2@-5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	289F	**WS35**	1,360.	**V25G19T55A**	21,600.
220 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	FR201	70Q	Indoor-	—	**Y25G28T03A**	1,590.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	65	FR200	70Q	Outdoor	—	**Y25G28T06A**	1,935.
9	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	70Q		—	**Y25G28T09A**	1,700.
15	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	70Q	Indoor-	—	**Y25G28T15A**	2,510.
30	2@+2.5%	4@-2.5%	EPT	115	26-3/8	25-1/4	12-3/4	422	676	638	324	191	FR243	84AF	Outdoor	—	**Y25M28T30A**	6,000.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	724	372	299	FR244	84AF		—	**Y25M28T45A**	7,500.
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	FR909	280Q	**WS31**	350.	**V25M28T15A**	1,825.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280Q	**WS31**	350.	**V25M28T30A**	2,330.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280Q	**WS31**	350.	**V25M28T45A**	2,840.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280Q	**WS33**	350.	**V25M28T75A**	4,010.
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	FR915B	280Q	**WS33**	350.	**V25M28T12A**	5,800.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280Q	**WS19**	350.	**V25M28T49A**	7,290.
225	1@+5%	2@-5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	289F	**WS34**	800.	**V25R28T22A**	10,660.
300	1@+5%	2@-5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	289F	**WS34**	800.	**V25R28T33A**	13,500.
500	—	2@-5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	289F	**WS35**	1,360.	**V25G28T55A**	21,600.
220 Δ Volts to 380Y/220 Volts																		
3	—	2@-5%	EPT	115	13-3/8	15-15/16	8-5/16	116	340	405	211	53	FR201	70X	Indoor-	—	**Y25G37T03A**	1,590.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	65	FR200	70X	Outdoor	—	**Y25G37T06A**	1,935.
9	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	70X		—	**Y25G37T09A**	2,505.
15	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	70X	Indoor-	—	**Y25G37T15A**	3,150.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	422	676	638	324	191	FR243	84AF	Outdoor	—	**Y25M37T30A**	6,000.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	724	372	299	FR244	84AF		—	**Y25M37T45A**	7,500.
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	FR909	280Q	**WS31**	350.	**V25M37T15A**	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	FR910A	280Q	**WS31**	350.	**V25M37T30A**	2,415.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280Q	**WS31**	350.	**V25M37T45A**	2,940.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280Q	**WS33**	350.	**V25M37T75A**	4,155.
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	FR915B	280Q	**WS33**	350.	**V25M37T12A**	6,020.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280Q	**WS19**	350.	**V25M37T49A**	7,560.
225	1@+5%	2@-5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	289F	**WS34**	800.	**V25R37T22A**	11,060.
300	1@+5%	2@-5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	289F	**WS34**	800.	**V25R37T33A**	14,000.
500	—	2@-5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	289F	**WS35**	1,360.	**V25G37T55A**	21,600.

① Refer to your Cutler-Hammer sales office.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Table 9-10. 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	Diagram Wiring Number	Weathershield		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
240 Δ Volts to 208Y/120 Volts																		
9	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	70C	Indoor-	—	**Y24G28T09N**	2,510.
15	—	2@-5%	EPT	115	17-3/8	19-3/4	10-1/2	275	441	499	265	124	FR95	70C	Outdoor	—	**Y24G28T15N**	3,150.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	422	676	638	323	191	FR243	84C		—	**Y24M28T30N**	6,000.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	723	371	299	FR244	84C		—	**Y24M28T45N**	7,500.
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	FR909	280C	**WS31**	350.	**V24M28T15B**	1,825.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280C	**WS31**	350.	**V24M28T30N**	2,330.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	140	FR912A	280C	**WS31**	350.	**V24M28T45N**	2,840.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	486	217	FR914B	280C	**WS33**	350.	**V24M28T75N**	4,010.
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	FR915B	280C	**WS33**	350.	**V24M28T12N**	5,800.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	280C	**WS19**	350.	**V24M28T49N**	7,290.
225	1@+5%	2@-5%	DT-3	150	62-1/4	31-1/4	24-1/4	1100	1422	793	616	499	FR918A	289A	**WS34**	800.	**V24R28T22N**	10,660.
300	1@+5%	2@-5%	DT-3	150	64-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	289A	**WS34**	800.	**V24R28T33N**	15,600.
500	—	2@-5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	290A	**WS35**	1,360.	**V24G28T55N**	22,600.
380 Δ Volts to 190Y/110 Volts																		
3	—	2@-5%	EPT	115	13-3/8	15-15/16	8-5/16	116	340	405	211	53	FR201	70F	Indoor-	—	**Y38G19T03A**	1,220.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	65	FR200	70F	Outdoor	—	**Y38G19T06A**	1,480.
9	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	70F		—	**Y38G19T09A**	1,920.
15	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	70F		—	**Y38G19T15A**	2,415.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	422	676	638	324	191	FR243	84AC	Indoor-	—	**Y38M19T30A**	4,600.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	724	372	299	FR244	84AC	Outdoor	—	**Y38M19T45A**	5,750.
75	2@+2.5%	4@-2.5%	EPT	115	32-1/4	30-1/8	15-5/8	1275	781	765	397	580	FR245	84AC		—	**Y38M19T75A** ①	7,150.
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	FR909	280L	**WS31**	350.	**V38M19T15A**	1,800.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280L	**WS31**	350.	**V38M19T30A**	2,000.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280L	**WS31**	350.	**V38M19T45A**	2,500.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280L	**WS33**	350.	**V38M19T75A**	3,400.
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	FR915B	280L	**WS33**	350.	**V38M19T12A**	4,900.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280L	**WS19**	350.	**V38M19T49A**	6,850.
225	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280L	**WS34**	800.	**V38M19T22A**	9,100.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	②	**WS34**	800.	**V38M19T33A**	11,500.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	②	**WS35**	1,360.	**V38M19T55A**	18,500.
380 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	FR201	70D	Indoor-	—	**Y38G28T03A**	1,275.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	65	FR200	70D	Outdoor	—	**Y38G28T06A**	1,550.
9	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	70D		—	**Y38G28T09A**	2,005.
15	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	70D		—	**Y38G28T15A**	2,520.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	422	676	638	324	191	FR243	84R	Indoor-	—	**Y38M28T30A**	4,600.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	724	372	299	FR244	84R	Outdoor	—	**Y38M28T45A**	5,750.
75	2@+2.5%	4@-2.5%	EPT	115	32-1/4	30-1/8	15-5/8	1275	781	765	397	580	FR245	84R		—	**Y38M28T75A** ①	7,130.
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	FR909	280L	**WS31**	350.	**V38M28T15A**	1,800.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280L	**WS31**	350.	**V38M28T30A**	2,000.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280L	**WS31**	350.	**V38M28T45A**	2,500.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280L	**WS33**	350.	**V38M28T75A**	3,400.
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	FR915B	280L	**WS33**	350.	**V38M28T12A**	4,900.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280L	**WS19**	350.	**V38M28T49A**	6,850.
225	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280L	**WS34**	800.	**V38M28T22A**	9,100.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280L	**WS34**	800.	**V38M28T33A**	11,500.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	②	**WS35**	1,360.	**V38M28T55A**	18,500.
380 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	FR201	70F	Indoor-	—	**Y38G31T03A**	1,220.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	65	FR200	70F	Outdoor	—	**Y38G31T06A**	1,480.
9	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	70F		—	**Y38G31T09A**	1,920.
15	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	70F		—	**Y38G31T15A**	2,415.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	422	676	638	324	191	FR243	84R	Indoor-	—	**Y38M31T30A**	4,600.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	724	372	299	FR244	84R	Outdoor	—	**Y38M31T45A**	5,750.
75	2@+2.5%	4@-2.5%	EPT	115	32-1/4	30-1/8	15-5/8	1275	781	765	397	580	FR245	84R		—	**Y38M31T75A** ①	7,130.
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	FR909	280L	**WS31**	350.	**V38M31T15A**	1,800.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280L	**WS31**	350.	**V38M31T30A**	2,000.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280L	**WS31**	350.	**V38M31T45A**	2,500.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280L	**WS33**	350.	**V38M31T75A**	3,400.
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	FR915B	280L	**WS33**	350.	**V38M31T12A**	4,900.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280L	**WS19**	350.	**V38M31T49A**	6,850.
225	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280L	**WS34**	800.	**V38M31T22A**	9,100.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280L	**WS34**	800.	**V38M31T33A**	11,500.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	275H	**WS35**	1,360.	**V38M31T55A**	18,500.

① Floor mount only.

② Refer to your Cutler-Hammer sales office.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Table 9-11. 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		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
380 Δ Volts to 220 Δ Volts																		
3	—	2@-5%	EPT	115	13-3/8	15-15/16	8-5/16	116	340	405	211	53	FR201	74K	Indoor-	—	**Y38G25T03A**	1,220.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	65	FR200	74K	Outdoor	—	**Y38G25T06A**	1,480.
9	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	74K		—	**Y38G25T09A**	1,920.
15	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	74K		—	**Y38G25T15A**	2,415.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	422	676	638	324	191	FR243	①	Indoor-	—	**Y38M25T30A**	4,600.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	724	372	299	FR244	①	Outdoor	—	**Y38M25T45A**	5,750.
75	2@+2.5%	4@-2.5%	EPT	115	32-1/4	30-1/8	15-5/8	1275	819	765	397	580	FR245	①		—	**Y38M25T75A** ②	7,150.
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	FR909	281D	**WS31**	350.	**V38M25T15A**	1,800.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	281D	**WS31**	350.	**V38M25T30A**	2,000.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	281D	**WS31**	350.	**V38M25T45A**	2,500.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	281D	**WS33**	350.	**V38M25T75A**	3,400.
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	FR915B	281D	**WS33**	350.	**V38M25T12A**	4,900.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	281D	**WS19**	350.	**V38M25T49A**	6,850.
225	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	281D	**WS34**	800.	**V38M25T22A**	9,100.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	281D	**WS34**	800.	**V38M25T33A**	11,500.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	①	**WS35**	1,360.	**V38M25T55A**	18,500.
380 Δ Volts to 380Y/220 Volts																		
3	—	2@-5%	EPT	115	13-3/8	15-15/16	8-5/16	116	340	405	211	53	FR201	70D	Indoor-	—	**Y38G37T03A**	1,380.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	65	FR200	70D	Outdoor	—	**Y38G37T06A**	1,670.
9	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	70D		—	**Y38G37T09A**	2,170.
15	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	70D		—	**Y38G37T15A**	2,730.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	422	676	638	324	191	FR243	84H	Indoor-	—	**Y38M37T30A**	5,200.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	724	372	299	FR244	84H	Outdoor	—	**Y38M37T45A**	6,500.
75	2@+2.5%	4@-2.5%	EPT	115	32-1/4	30-1/8	15-5/8	1275	819	765	397	580	FR245	84H		—	**Y38M37T75A** ②	8,060.
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	FR909	280L	**WS31**	350.	**V38M37T15A**	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	FR910A	280L	**WS31**	350.	**V38M37T30A**	2,415.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280L	**WS31**	350.	**V38M37T45A**	2,940.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280L	**WS33**	350.	**V38M37T75A**	4,160.
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	FR915B	280L	**WS33**	350.	**V38M37T12A**	6,020.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280L	**WS19**	350.	**V38M37T49A**	7,560.
225	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280L	**WS34**	800.	**V38M37T22A**	11,060.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280L	**WS34**	800.	**V38M37T33A**	14,000.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	①	**WS35**	1,360.	**V38M37T55A**	22,400.
380 Δ Volts to 480Y/277 Volts																		
3	—	2@-5%	EPT	115	13-3/8	15-15/16	8-5/16	116	340	405	211	53	FR201	70F	Indoor-	—	**Y38G47T03A**	1,590.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	65	FR200	70F	Outdoor	—	**Y38G47T06A**	1,935.
9	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	70F		—	**Y38G47T09A**	2,505.
15	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	70F		—	**Y38G47T15A**	3,150.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	422	676	638	324	191	FR243	84AB	Indoor-	—	**Y38M47T30A**	6,000.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	724	372	299	FR244	84AB	Outdoor	—	**Y38M47T45A**	7,500.
75	2@+2.5%	4@-2.5%	EPT	115	32-1/4	30-1/8	15-5/8	1275	819	765	397	580	FR245	84AB		—	**Y38M47T75A** ②	9,300.
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	FR909	280L	**WS31**	350.	**V38M47T15A**	2,090.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280L	**WS31**	350.	**V38M47T30A**	2,675.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280L	**WS31**	350.	**V38M47T45A**	3,260.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280L	**WS33**	350.	**V38M47T75A**	4,600.
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	FR915B	280L	**WS33**	350.	**V38M47T12A**	6,665.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280L	**WS19**	350.	**V38M47T49A**	8,370.
225	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280L	**WS34**	800.	**V38M47T22A**	12,245.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280L	**WS34**	800.	**V38M47T33A**	15,500.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	①	**WS35**	1,360.	**V38M47T55A**	24,800.

① Refer to your Cutler-Hammer sales office.

② Floor mount only.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

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		Style 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	FR201	70V	Indoor-	—	**Y43G28T03A**	1,275.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	65	FR200	70V	Outdoor	—	**Y43G28T06A**	1,550.
9	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	70V		—	**Y43G28T09A**	2,005.
15	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	70V		—	**Y43G28T15A**	2,520.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	422	676	638	324	191	FR243	84I	Indoor-	—	**Y43M28T30A**	4,600.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	724	372	299	FR244	84I	Outdoor	—	**Y43M28T45A**	5,750.
75	2@+2.5%	4@-2.5%	EPT	115	32-1/4	30-1/8	15-5/8	1275	819	765	397	580	FR245	84I		—	**Y43M28T75A** ②	7,150.
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	FR909	280P	**WS31**	350.	**V43M28T15A**	1,800.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280P	**WS31**	350.	**V43M28T30A**	2,000.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280P	**WS31**	350.	**V43M28T45A**	2,530.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280P	**WS33**	350.	**V43M28T75A**	3,450.
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	FR915B	280P	**WS33**	350.	**V43M28T12A**	4,950.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280P	**WS19**	350.	**V43M28T49A**	6,850.
225	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280P	**WS34**	800.	**V43M28T22A**	9,080.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280P	**WS34**	800.	**V43M28T33A**	11,500.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	①	**WS35**	1,360.	**V43M28T55A**	18,500.
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	FR201	70G	Indoor-	—	**Y44G31T03A**	1,590.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	65	FR200	70G	Outdoor	—	**Y44G31T06A**	1,935.
9	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	70G		—	**Y44G31T09A**	2,505.
15	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	70G		—	**Y44G31T15A**	3,150.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	422	676	638	324	191	FR243	84O	Indoor-	—	**Y44M31T30A**	4,600.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	724	372	299	FR244	84O	Outdoor	—	**Y44M31T45A**	5,750.
75	2@+2.5%	4@-2.5%	EPT	115	32-1/4	30-1/8	15-5/8	1275	819	765	397	580	FR245	84O		—	**Y44M31T75A** ②	7,150.
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	FR909	280J	**WS31**	350.	**V44M31T15A**	1,800.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280J	**WS31**	350.	**V44M31T30A**	2,000.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280J	**WS31**	350.	**V44M31T45A**	2,500.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280J	**WS33**	350.	**V44M31T75A**	3,420.
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	FR915B	280J	**WS33**	350.	**V44M31T12A**	4,945.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280J	**WS19**	350.	**V44M31T49A**	6,220.
225	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280J	**WS34**	800.	**V44M31T22A**	9,100.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280J	**WS34**	800.	**V44M31T33A**	11,500.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	275F	**WS35**	1,360.	**V44M31T55A**	18,500.
480 Δ Volts to 208Y/120 Volts																		
3	—	2@-5%	EPT	115	13-3/8	16	8-3/8	116	339	404	211	52	FR201	70A	Indoor-	—	**Y48G28T03N**	1,060.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	64	FR200	70A	Outdoor	—	**Y48G28T06N**	1,290.
6	2@+2.5%	2@-2.5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	64	FR200	72B		—	**Y48D28T06N**	1,290.
9	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	70A	Indoor-	—	**Y48G28T09N**	1,670.
9	—	4@-2.5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	503A	Outdoor	—	**Y48J28T09N**	1,670.
9	2@+2.5%	2@-2.5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	72B		—	**Y48D28T09N**	1,670.
15	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	441	499	265	124	FR95	70A	Indoor-	—	**Y48G28T15N**	2,100.
15	—	4@-2.5%	EPT	115	17-3/8	19-11/16	10-7/16	275	441	499	265	124	FR95	72A	Outdoor	—	**Y48J28T15N**	2,100.
15	2@+2.5%	2@-2.5%	EPT	115	17-3/8	19-11/16	10-7/16	275	441	499	265	124	FR95	72B		—	**Y48D28T15N**	2,100.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	422	676	638	323	191	FR243	84A	Indoor-	—	**Y48M28T30N**	4,000.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	723	371	299	FR244	84A	Outdoor	—	**Y48M28T45N**	5,000.
75	2@+2.5%	4@-2.5%	EPT	115	32-1/4	30-1/8	15-5/8	1275	819	765	397	580	FR245	84A		—	**Y48M28T75N** ②	6,800.
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	FR909	280B	**WS31**	350.	**V48M28T15B**	1,350.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	239	765	511	359	108	FR910A	280B	**WS31**	350.	**V48M28T30K**	1,725.
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	FR911A	280B	**WS31**	350.	**V48M28T37K**	2,040.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	140	FR912A	280B	**WS31**	350.	**V48M28T45K**	2,100.
50	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR913B	280B	**WS33**	350.	**V48M28T50J**	2,920.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	486	217	FR914B	280B	**WS33**	350.	**V48M28T75J**	2,970.
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	FR915B	280B	**WS33**	350.	**V48M28T12H**	4,300.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	280B	**WS19**	350.	**V48M28T49K**	5,400.
225	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	280B	**WS34**	800.	**V48M28T22L**	7,900.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280B	**WS34**	800.	**V48M28T33K**	10,000.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	275A	**WS35**	1,360.	**V48M28T55G**	16,000.
750	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	275A	**WS35**	1,360.	**V48M28T77F**	26,000.
1000	1@+3.5%	1@-3.5%	DT-3	150	68	64	45	4350	1727	1625	1143	1972		①	①	—	**V48W28T11G** ③	46,500.

① Refer to your Cutler-Hammer sales office.
② Floor mount only.
③ Not seismic qualified.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Table 9-13. 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		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
480 Δ Volts to 208Y/120 Volts — Copper Windings																		
15	2@+2.5%	2@-2.5%	EPT	115	17-3/8	19-11/16	10-7/16	300	441	499	265	136	FR95	72B	Indoor-	—	**Y48D28T15CU**	2,860.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	505	676	638	323	230	FR243	84A	Outdoor	—	**Y48M28T30CU**	5,440.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	745	673	723	371	339	FR244	84A		—	**Y48M28T45CU**	6,800.
75	2@+2.5%	4@-2.5%	EPT	115	32-1/4	30-1/8	15-5/8	1450	819	765	397	659	FR245	84A		—	**Y48M28T75CU** ①	9,100.
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	172	635	511	359	78	FR909	280B	**WS31**	350.	**V48M28T15CU**	2,000.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	300	765	511	359	136	FR910A	280B	**WS31**	350.	**V48M28T30CU**	2,380.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	370	765	511	359	168	FR912A	280B	**WS31**	350.	**V48M28T45CU**	2,890.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	550	1000	663	486	250	FR914B	280B	**WS33**	350.	**V48M28T75CU**	4,390.
112.5	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	675	1000	663	486	307	FR915B	280B	**WS33**	350.	**V48M28T12CU**	6,000.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	850	1171	712	585	386	FR916A	280B	**WS19**	350.	**V48M28T49CU**	8,200.
225	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1200	1422	793	616	545	FR917	280B	**WS34**	800.	**V48M28T22CU**	11,030.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	2150	1581	794	768	977	FR918A	280B	**WS34**	800.	**V48M28T33CU**	14,000.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	3100	1905	1130	914	1409	FR919	275A	**WS35**	1,360.	**V48M28T55CU**	22,350.
750	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	3600	1905	1130	914	1636	FR920	275A	**WS35**	1,360.	**V48M28T77CU**	38,000.
1000	1@+3.5%	1@-3.5%	DT-3	150	68	64	45	5500	1727	1625	1143	2500	②	②	②	—	**V48W28T11CU** ③	65,100.
480 Δ Volts to 208Y/120 Volts Stainless Steel ④																		
3	—	2@-5%	EPT	115	13-7/8	16	8-3/8	116	340	405	211	53	FR201	70A	Indoor-	—	**Y48G28T03SS**	1,590.
6	2@+2.5%	2@-2.5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	65	FR200	72B	Outdoor	—	**Y48D28T06SS**	1,935.
9	2@+2.5%	2@-2.5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	75	FR103	72B		—	**Y48D28T09SS**	2,500.
15	2@+2.5%	2@-2.5%	EPT	115	17-3/8	19-11/16	10-7/16	275	441	499	265	124	FR95	72B		—	**Y48D28T15SS**	3,150.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	422	676	638	323	191	FR243	84A	Indoor-	—	**Y48M28T30SS**	6,000.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	723	371	299	FR244	84A	Outdoor	—	**Y48M28T45SS**	7,500.
75	2@+2.5%	4@-2.5%	EPT	115	32-1/4	30-1/8	15-5/8	1275	819	765	397	453	FR245	84A		—	**Y48M28T75SS** ①	9,300.
480 Δ Volts to 208Y/120 Volts Stainless Steel, Copper Windings ④																		
15	2@+2.5%	2@-2.5%	EPT	115	17-3/8	19-11/16	10-7/16	300	441	499	265	136	FR95	72B	Indoor-	—	**Y48D28T15SSCU**	3,880.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	504	676	638	323	229	FR243	84A	Outdoor	—	**Y48M28T30SSCU**	7,400.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	745	673	723	371	338	FR244	84A		—	**Y48M28T45SSCU**	9,250.
480 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	FR201	70A	Indoor-	—	**Y48G31T03A**	1,590.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	65	FR200	70A	Outdoor	—	**Y48G31T06A**	1,935.
9	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	70A		—	**Y48G31T09A**	2,505.
15	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	70A		—	**Y48G31T15A**	3,150.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	422	676	638	324	191	FR243	84K	Indoor-	—	**Y48M31T30A**	4,600.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	724	372	299	FR244	84K	Outdoor	—	**Y48M31T45A**	5,750.
75	2@+2.5%	4@-2.5%	EPT	115	32-1/4	30-1/8	15-5/8	1275	819	765	397	580	FR245	84K		—	**Y48M31T75A** ①	7,150.
15	2@+2.5%	4@-2.5%	DT-3	150	25	20 1/8	14 1/8	152	635	511	359	69	FR909	280B	**WS31**	350.	**V48M31T15A**	1,550.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280B	**WS31**	350.	**V48M31T30A**	2,000.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280B	**WS31**	350.	**V48M31T45A**	2,415.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280B	**WS33**	350.	**V48M31T75A**	3,415.
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	FR915B	280B	**WS33**	350.	**V48M31T12A**	4,945.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280B	**WS19**	350.	**V48M31T49A**	6,210.
225	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280B	**WS34**	800.	**V48M31T22A**	9,100.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280B	**WS34**	800.	**V48M31T33A**	11,500.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	275A	**WS35**	1,360.	**V48M31T55A**	18,500.

① Floor mount only.
② Refer to your Cutler-Hammer sales office.
③ Not seismic qualified.
④ NEMA 3R, 316 stainless steel enclosure.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Table 9-14. 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		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
480 Δ Volts to 240 Δ Volts With 120 Volt Lighting Tap on B Phase ①																		
3	—	2@-5%	EPT	115	13-3/8	16	8-3/8	116	339	404	211	52	FR201	74A	Indoor-	—	**Y48G24T03N** ②	1,190.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	64	FR200	74A	Outdoor	—	**Y48G24T06N** ②	1,450.
9	—	4@-2.5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	73A		—	**Y48J24T09N** ②	1,870.
15	—	4@-2.5%	EPT	115	17-3/8	19-3/4	10-1/2	275	441	499	265	124	FR95	73A	Indoor-	—	**Y48J24T15N** ②	2,350.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	422	676	638	323	191	FR243	85A	Outdoor	—	**Y48M24T30N** ②	4,480.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	723	371	299	FR244	85A		—	**Y48M24T45N** ②	5,600.
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	FR909	282B	**WS31**	350.	**V48M22T15B**	1,550.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	282B	**WS31**	350.	**V48M22T30N**	2,000.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	140	FR912A	282B	**WS31**	350.	**V48M22T45N**	2,500.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	486	217	FR914B	282B	**WS33**	350.	**V48M22T75N**	3,420.
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	FR915B	282B	**WS33**	350.	**V48M22T12N**	4,900.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28-1/8	23	760	1171	712	585	344	FR916A	282B	**WS19**	350.	**V48M22T49N**	6,210.
225	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	282B	**WS34**	800.	**V48M22T22N**	9,100.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	282B	**WS34**	800.	**V48M22T33N**	11,500.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	291A	**WS35**	1,360.	**V48M22T55N**	18,500.
750	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	291A	**WS35**	1,360.	**V48M22T77N**	32,600.
1000	1@+3.5%	1@-3.5%	DT-3	150	68	64	45	4350	1727	1625	1143	1972	③	③	③	—	**V48W22T11N** ④	53,500.
480 Δ Volts to 380Y/220 Volts																		
3	—	2@-5%	EPT	115	13-3/8	15-15/16	8-5/16	116	340	405	211	53	FR201	70R	Indoor-	—	**Y48G37T03A**	1,590.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	65	FR200	70R	Outdoor	—	**Y48G37T06A**	1,935.
9	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	70R		—	**Y48G37T09A**	2,505.
15	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	70R		—	**Y48G37T15A**	3,150.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	422	676	638	324	191	FR243	84A	Indoor-	—	**Y48M37T30A**	4,600.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	724	372	299	FR244	84A	Outdoor	—	**Y48M37T45A**	5,750.
75	2@+2.5%	4@-2.5%	EPT	115	32-1/4	30-1/8	15-5/8	1275	819	765	397	580	FR245	84A		—	**Y48M37T75A** ⑤	7,150.
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	FR909	280B	**WS31**	350.	**V48M37T15A**	1,800.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280B	**WS31**	350.	**V48M37T30A**	2,000.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280B	**WS31**	350.	**V48M37T45A**	2,500.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280B	**WS33**	350.	**V48M37T75A**	3,400.
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	FR915B	280B	**WS33**	350.	**V48M37T12A**	4,900.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280B	**WS19**	350.	**V48M37T49A**	6,850.
225	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280B	**WS34**	800.	**V48M37T22A**	9,100.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280B	**WS34**	800.	**V48M37T33A**	11,500.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	275A	**WS35**	1,360.	**V48M37T55A**	18,500.

① Center Tap capacity limited to 5% of rated kVA.
② Do not include 120 volt lighting tap.
③ Refer to your Cutler-Hammer sales office.
④ Not seismic qualified.
⑤ Floor mount only.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

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

Table 9-15. 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		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
480 Δ Volts to 380 Δ Volts																		
3	—	2@-5%	EPT	115	13-3/8	15-15/16	8-5/16	116	340	405	211	53	FR201	74B	Indoor-	—	**Y48G38T03A**	1,590.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	65	FR200	74B	Outdoor	—	**Y48G38T06A**	1,935.
9	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	74B		—	**Y48G38T09A**	2,505.
15	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	74B		—	**Y48G38T15A**	3,150.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	422	676	638	324	191	FR243	85A	Indoor-	—	**Y48M38T30A**	4,600.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	724	372	299	FR244	85A	Outdoor	—	**Y48M38T45A**	5,750.
75	2@+2.5%	4@-2.5%	EPT	115	32-1/4	30-1/8	15-5/8	1275	819	765	397	580	FR245	85A		—	**Y48M38T75A** ①	7,150.
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	FR909	281B	**WS31**	350.	**V48M38T15A**	1,500.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	281B	**WS31**	350.	**V48M38T30A**	2,000.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	281B	**WS31**	350.	**V48M38T45A**	2,500.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	281B	**WS33**	350.	**V48M38T75A**	3,400.
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	FR915B	281B	**WS33**	350.	**V48M38T12A**	4,900.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	281B	**WS19**	350.	**V48M38T49A**	6,850.
225	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	281B	**WS34**	800.	**V48M38T22A**	9,100.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	281B	**WS34**	800.	**V48M38T33A**	11,500.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	274B	**WS35**	1,360.	**V48M38T55A**	18,500.
480 Δ Volts to 416Y/240 Volts																		
3	—	2@-5%	EPT	115	13-3/8	15-15/16	8-5/16	116	340	405	211	53	FR201	70A	Indoor-	—	**Y48G51T03A**	1,590.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	65	FR200	70A	Outdoor	—	**Y48G51T06A**	1,935.
9	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	70A		—	**Y48G51T09A**	2,505.
15	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	70A		—	**Y48G51T15A**	3,150.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	422	676	638	324	191	FR243	84E	Indoor-	—	**Y48M51T30A**	4,600.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	724	372	299	FR244	84E	Outdoor	—	**Y48M51T45A**	5,750.
75	2@+2.5%	4@-2.5%	EPT	115	32-1/4	30-1/8	15-5/8	1275	819	765	397	580	FR245	84E		—	**Y48M51T75A** ①	7,150.
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	FR909	280B	**WS31**	350.	**V48M51T15A**	2,110.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280B	**WS31**	350.	**V48M51T30A**	2,350.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280B	**WS31**	350.	**V48M51T45A**	2,940.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280B	**WS33**	350.	**V48M51T75A**	4,000.
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	FR915B	280B	**WS33**	350.	**V48M51T12A**	5,750.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280B	**WS19**	350.	**V48M51T49A**	8,040.
225	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280B	**WS34**	800.	**V48M51T22A**	10,680.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280B	**WS34**	800.	**V48M51T33A**	13,500.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	275A	**WS35**	1,360.	**V48M51T55A**	21,700.
480 Δ Volts to 440Y/254 Volts																		
3	—	2@-5%	EPT	115	13-3/8	15-15/16	8-5/16	116	340	405	211	53	FR201	②	Indoor-	—	**Y48G35T03A**	1,590.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	65	FR200	②	Outdoor	—	**Y48G35T06A**	1,935.
9	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	②		—	**Y48G35T09A**	2,505.
15	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	②		—	**Y48G35T15A**	3,150.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	422	676	638	324	191	FR243	84A	Indoor-	—	**Y48M35T30A**	4,600.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	724	372	299	FR244	84A	Outdoor	—	**Y48M35T45A**	5,750.
75	2@+2.5%	4@-2.5%	EPT	115	32-1/4	30-1/8	15-5/8	1275	819	765	397	580	FR245	84A		—	**Y48M35T75A** ①	7,150.
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	FR909	280B	**WS31**	350.	**V48M35T15A**	1,800.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280B	**WS31**	350.	**V48M35T30A**	2,000.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280B	**WS31**	350.	**V48M35T45A**	2,500.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280B	**WS33**	350.	**V48M35T75A**	3,400.
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	FR915B	280B	**WS33**	350.	**V48M35T12A**	4,900.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280B	**WS19**	350.	**V48M35T49A**	6,850.
225	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280B	**WS34**	800.	**V48M35T22A**	9,100.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280B	**WS34**	800.	**V48M35T33A**	11,500.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	②	**WS35**	1,360.	**V48M35T55A**	18,500.

① Floor mount only.

② Refer to your Cutler-Hammer sales office.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Table 9-16. 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		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
480 Δ Volts to 480Y/277 Volts																		
9	2@+2.5%	2@-2.5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	72C	Indoor-	—	**Y48D47T09N**	2,170.
15	2@+2.5%	2@-2.5%	EPT	115	17-3/8	19-3/4	10-1/2	275	441	499	265	124	FR95	72C	Outdoor	—	**Y48D47T15N**	2,730.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	422	676	638	323	191	FR243	84D		—	**Y48M47T30N**	5,200.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	723	371	299	FR244	84D		—	**Y48M47T45N**	6,500.
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	FR909	280B	**WS31**	350.	**V48M47T15B**	1,830.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280B	**WS31**	350.	**V48M47T30N**	2,330.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	140	FR912A	280B	**WS31**	350.	**V48M47T45G**	2,840.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	486	217	FR914B	280B	**WS33**	350.	**V48M47T75F**	4,010.
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	FR915B	280B	**WS33**	350.	**V48M47T12E**	5,810.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	280B	**WS19**	350.	**V48M47T49F**	7,290.
225	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	280B	**WS34**	800.	**V48M47T22F**	10,670.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280B	**WS34**	800.	**V48M47T33E**	13,500.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	275A	**WS35**	1,360.	**V48M47T55F**	21,600.
750	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	275A	**WS35**	1,360.	**V48M47T77A**	35,100.
600 Δ Volts to 208Y/120 Volts																		
9	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	70B	Indoor-	—	**Y60G28T09N**	2,000.
15	—	2@-5%	EPT	115	17-3/8	19-3/4	10-1/2	275	441	499	265	124	FR95	70B	Outdoor	—	**Y60G28T15N**	2,520.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	422	676	638	323	191	FR243	84B		—	**Y60M28T30N**	4,800.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	723	371	299	FR244	84B		—	**Y60M28T45N**	6,000.
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	FR909	280A	**WS31**	350.	**V60M28T15A**	2,390.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280A	**WS31**	350.	**V60M28T30N**	2,390.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	140	FR912A	280A	**WS31**	350.	**V60M28T45H**	2,990.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	486	217	FR914B	280A	**WS33**	350.	**V60M28T75G**	4,061.
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	FR915B	280A	**WS33**	350.	**V60M28T12F**	5,860.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	280A	**WS19**	350.	**V60M28T49F**	8,190.
225	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	280A	**WS34**	800.	**V60M28T22G**	10,870.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280A	**WS34**	800.	**V60M28T33F**	13,740.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	275C	**WS35**	1,360.	**V60M28T55A**	22,100.
600 Δ Volts to 240 Δ Volts																		
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	422	676	638	323	191	FR243	85B	Indoor-	—	**Y60M24T30N**	5,000.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	660	673	723	371	299	FR244	85B	Outdoor	—	**Y60M24T45N**	6,250.
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	FR909	281A	**WS31**	350.	**V60M24T15A**	2,390.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	281A	**WS31**	350.	**V60M24T30A**	2,390.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	140	FR912A	281A	**WS31**	350.	**V60M24T45H**	2,990.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	486	217	FR914B	281A	**WS33**	350.	**V60M24T75G**	4,061.
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	FR915B	281A	**WS33**	350.	**V60M24T12E**	5,860.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	281A	**WS19**	350.	**V60M24T49F**	8,190.
225	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	281A	**WS34**	800.	**V60M24T22G**	10,870.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	281A	**WS34**	800.	**V60M24T33F**	13,740.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	274A	**WS35**	1,360.	**V60M24T55A**	22,100.
2400 Δ Volts to 208Y/120 Volts																		
3	2@+2.5%	2@-2.5%	EPT	115	10	18-7/8	6-1/2	115	254	479	165	52	FR102	65B	Recom-	—	**Y42D28T03N** ①	5,630.
6	2@+2.5%	2@-2.5%	EPT	115	11	25	7-1/2	160	279	635	191	73	FR97	65B	ended		**Y42D28T06N** ①	6,450.
9	2@+2.5%	2@-2.5%	EPT	115	12	29	8-1/2	210	305	737	216	95	FR96	65B	Indoor Only		**Y42D28T09N** ①	8,070.
15	2@+2.5%	2@-2.5%	EPT	115	18-1/2	21	10-1/2	340	470	533	267	154	FR195	65B	Recom-	—	**Y42D28T15N** ①	10,200.
30	2@+2.5%	2@-2.5%	EPT	115	27-11/16	20-11/16	12	475	703	525	305	216	FR196	65B	ended Indoor Only	—	**Y42D28T30N** ①	13,400.
45	2@+2.5%	2@-2.5%	DT-3	150	32-1/2	30	24	460	826	762	610	209	②	②	Recom-	—	**V42D28T45G** ③④	7,500.
75	2@+2.5%	2@-2.5%	DT-3	150	32-1/2	30	24	620	902	762	610	282	②	②	ended	—	**V42D28T75H** ③④	8,950.
112.5	2@+2.5%	2@-2.5%	DT-3	150	36	33	26	800	914	838	660	364	②	②	Indoor Only	—	**V42D28T12H** ③④	9,450.
150	2@+2.5%	2@-2.5%	DT-3	150	36	33	26	980	914	838	660	445	②	②	Recom-	—	**V42D28T49K** ③④	11,400.
225	2@+2.5%	2@-2.5%	DT-3	150	50	39-3/4	37	1450	1270	1010	940	659	②	②	ended	—	**V42D28T22J** ③④	15,600.
300	2@+2.5%	2@-2.5%	DT-3	150	51	39-3/4	37	1620	1010	1010	940	736	②	②	Indoor Only	—	**V42D28T33J** ③④	21,000.
500	2@+2.5%	2@-2.5%	DT-3	150	59	48-3/4	41	2400	1238	1238	1041	1091	②	②	Recom-	—	**V42D28T55G** ③④	32,000.
750	2@+2.5%	2@-2.5%	DT-3	150	75	44-1/2	36	3300	1905	1130	914	1498	FR920	266A	ended	—	**V42D28T77** ③④	42,000.
1000	2@+2.5%	2@-2.5%	DT-3	150	90	69	42	4500	2286	1753	1067	2043	FR922	266A	Indoor Only	—	**V42D28T11** ③④	52,000.

① No UL label. Contact your local Cutler-Hammer sales office if UL label is required.
② Refer to your Cutler-Hammer sales office.
③ NEMA 3R enclosure and/or UL label available at an additional cost. Specify at time of order entry if required.
④ Not seismic qualified.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Table 9-17. 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		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
2400 Δ Volts to 480Y/277 Volts ①②																		
45	2@+2.5%	2@-2.5%	DT-3	150	32-1/2	30	24	460	826	762	610	209	③	③	Recom-	—	**V42D47T45G**	7,500.
75	2@+2.5%	2@-2.5%	DT-3	150	32-1/2	30	24	620	902	762	610	282	③	③	mended	—	**V42D47T75F**	8,950.
112.5	2@+2.5%	2@-2.5%	DT-3	150	36	33	26	800	914	838	660	364	③	③	Indoor	—	**V42D47T12F**	9,450.
															Only			
150	2@+2.5%	2@-2.5%	DT-3	150	36	33	26	980	914	838	660	445	③	③	Recom-	—	**V42D47T49G**	11,400.
225	2@+2.5%	2@-2.5%	DT-3	150	50	39-3/4	37	1450	1270	1010	940	659	③	③	mended	—	**V42D47T22H**	15,600.
300	2@+2.5%	2@-2.5%	DT-3	150	51	39-3/4	37	1620	1010	1010	940	736	③	③	Indoor	—	**V42D47T33G**	21,000.
															Only			
500	2@+2.5%	2@-2.5%	DT-3	150	59	48-3/4	41	2400	1238	1238	1041	1091	③	③	Recom-	—	**V42D47T55H**	32,000.
750	2@+2.5%	2@-2.5%	DT-3	150	③	③	③	③	③	③	③	③	③	③	mended	—	**V42D47T77**	42,000.
1000	2@+2.5%	2@-2.5%	DT-3	150	③	③	③	③	③	③	③	③	③	③	Indoor	—	**V42D47T11A**	52,000.
															Only			
4160 Δ Volts to 208Y/120 Volts																		
3	2@+2.5%	2@-2.5%	EPT	115	10	18-7/8	6-1/2	115	254	479	165	52	FR102	65C	Recom-	—	**Y46D28T03N** ④	5,800.
6	2@+2.5%	2@-2.5%	EPT	115	11	25	7-1/2	160	279	635	191	73	FR97	65C	mended	—	**Y46D28T06N** ④	6,450.
9	2@+2.5%	2@-2.5%	EPT	115	12	29	8-1/2	210	305	737	216	95	FR96	65C	Indoor	—	**Y46D28T09N** ④	8,070.
															Only			
15	2@+2.5%	2@-2.5%	EPT	115	18-1/2	21	10-1/2	340	470	533	267	154	FR195	65C	Recom-	—	**Y46D28T15N** ①	10,200.
30	2@+2.5%	2@-2.5%	EPT	115	27-11/16	20-11/16	12	475	703	525	305	216	FR196	65C	mended	—	**Y46D28T30N** ①	13,400.
															Indoor			
															Only			
45	2@+2.5%	2@-2.5%	DT-3	150	32-1/2	30	24	460	826	762	610	209	③	③	Recom-	—	**V46D28T45H** ①②	7,500.
75	2@+2.5%	2@-2.5%	DT-3	150	32-1/2	30	24	620	902	762	610	282	③	③	mended	—	**V46D28T75H** ①②	8,950.
112.5	2@+2.5%	2@-2.5%	DT-3	150	36	33	26	800	914	838	660	364	③	③	Indoor	—	**V46D28T12H** ①②	9,450.
150	2@+2.5%	2@-2.5%	DT-3	150	36	33	26	980	914	838	660	445	③	③	Only	—	**V46D28T49K** ①②	11,400.
225	2@+2.5%	2@-2.5%	DT-3	150	50	39-3/4	37	1450	1270	1010	940	659	③	③	Recom-	—	**V46D28T22J** ①②	15,600.
300	2@+2.5%	2@-2.5%	DT-3	150	51	39-3/4	37	1620	1010	1010	940	736	③	③	mended	—	**V46D28T33J** ①②	21,000.
500	2@+2.5%	2@-2.5%	DT-3	150	59	48-3/4	41	2400	1238	1238	1041	1091	③	③	Indoor	—	**V46D28T55H** ①②	32,000.
															Only			
750	2@+2.5%	2@-2.5%	DT-3	150	③	③	③	③	③	③	③	③	③	③	Recom-	—	**V46D28T77** ①②	42,000.
1000	2@+2.5%	2@-2.5%	DT-3	150	③	③	③	③	③	③	③	③	③	③	mended	—	**V46D28T11** ①②	52,000.
1500	2@+2.5%	2@-2.5%	DT-3	150	③	③	③	③	③	③	③	③	③	③	Indoor	—	**V46D28T14** ①②	65,000.
															Only			
4160 Δ Volts to 240 Δ Volts ①②																		
45	2@+2.5%	2@-2.5%	DT-3	150	32-1/2	30	24	460	826	762	610	209	③	③	Recom-	—	**V46D24T45F**	7,500.
75	2@+2.5%	2@-2.5%	DT-3	150	32-1/2	30	24	620	902	762	610	282	③	③	mended	—	**V46D24T75F**	8,950.
112.5	2@+2.5%	2@-2.5%	DT-3	150	36	33	26	800	914	838	660	364	③	③	Indoor	—	**V46D24T12F**	9,450.
															Only			
150	2@+2.5%	2@-2.5%	DT-3	150	36	33	26	980	914	838	660	445	③	③	Recom-	—	**V46D24T49H**	11,400.
225	2@+2.5%	2@-2.5%	DT-3	150	50	39-3/4	37	1450	1270	1010	940	659	③	③	mended	—	**V46D24T22G**	15,600.
300	2@+2.5%	2@-2.5%	DT-3	150	51	39-3/4	37	1620	1010	1010	940	736	③	③	Indoor	—	**V46D24T33G**	21,000.
															Only			
500	2@+2.5%	2@-2.5%	DT-3	150	59	48-3/4	41	2400	1238	1238	1041	1091	—	—	Recom-	—	**V46D24T55B**	32,000.
750	2@+2.5%	2@-2.5%	DT-3	150	③	③	③	③	③	③	③	③	③	③	mended	—	**V46D24T77**	42,000.
1000	2@+2.5%	2@-2.5%	DT-3	150	③	③	③	③	③	③	③	③	③	③	Indoor	—	**V46D24T11A**	52,000.
															Only			
4160 Δ Volts to 480Y/277 Volts ①②																		
45	2@+2.5%	2@-2.5%	DT-3	150	32-1/2	30	24	460	826	762	610	209	③	③	Recom-	—	**V46D47T45G**	7,500.
75	2@+2.5%	2@-2.5%	DT-3	150	32-1/2	30	24	620	902	762	610	282	③	③	mended	—	**V46D47T75G**	8,950.
112.5	2@+2.5%	2@-2.5%	DT-3	150	36	33	26	800	914	838	660	364	③	③	Indoor	—	**V46D47T12G**	9,450.
															Only			
150	2@+2.5%	2@-2.5%	DT-3	150	36	33	26	980	914	838	660	445	③	③	Recom-	—	**V46D47T49J**	11,400.
225	2@+2.5%	2@-2.5%	DT-3	150	50	39-3/4	37	1450	1270	1010	940	659	③	③	mended	—	**V46D47T22H**	15,600.
300	2@+2.5%	2@-2.5%	DT-3	150	51	39-3/4	37	1620	1010	1010	940	736	③	③	Indoor	—	**V46D47T33H**	21,000.
															Only			
500	2@+2.5%	2@-2.5%	DT-3	150	59	48-3/4	41	2400	1238	1238	1041	1091	③	③	Recom-	—	**V46D47T55H**	32,000.
750	2@+2.5%	2@-2.5%	DT-3	150	③	③	③	③	③	③	③	③	③	③	mended	—	**V46D47T77**	42,000.
1000	2@+2.5%	2@-2.5%	DT-3	150	③	③	③	③	③	③	③	③	③	③	Indoor	—	**V46D47T11**	52,000.
															Only			
1500	2@+2.5%	2@-2.5%	DT-3	150	③	③	③	③	③	③	③	③	③	③	③	—	**V46D47T14F**	65,000.

① NEMA 3R enclosure and/or UL label available at additional cost. Specify at time of order entry if required.
② Not seismic qualified.
③ Refer to your Cutler-Hammer sales office.
④ No UL label.

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

Discount Symbol **DT-1**

Three-Phase, Types EPT, DT-3, 50/60 Hz

Type EPT Encapsulated

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.
- 185ºC Insulation System, 115ºC 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.
- 220ºC Insulation System, 150ºC 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.

Seismically Qualified

Cutler-Hammer manufactured 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 9-120**.

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 Eaton's Cutler-Hammer business.

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Table 9-18. 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

Eaton's 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 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.

Table 9-19. Average Sound Levels

NEMA ST-20 Average Sound Level (dB)		
kVA	Ventilated	Encapsulated
0 – 9	40	45
10 – 50	45	50
51 – 150	50	55
151 – 300	55	57
301 – 500	60	59
501 – 700	62	61
701 – 1000	64	63
1001 – 1500	65	64

① Applies to general purpose ventilated 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. 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.** The Cutler-Hammer business 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 9-122**.

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 Eaton's Cutler-Hammer business.

Product Selection

Additional Product Selection information begins on **Page 9-136**.

Table 9-20. Three-Phase Selection Information — Types EPT, DT-3, 50/60 Hz

Note: For 50/60 Hz single-phase transformers contact your local Cutler-Hammer sales office.

kVA	Full Cap. Taps		Type	°C	Dimensions (Inches)			Wt.	Dimensions (mm)			Wt.	Frame	Wiring	Weathershield		Style	Price
	FCAN	FCBN		Temp. Rise	H	W	D	Lbs.	H	W	D	kg		Diagram Number	Catalog Number	Price U.S. $	Number	U.S. $
380 Δ Volts to 208Y/120 Volts, 50/60 Hz																		
3	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	165	403	419	251	75	FR200	70D	Indoor-	—	**Y38G28T03X**	1,600.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	190	403	419	251	86	FR103	70D	Outdoor	—	**Y38G28T06X**	1,950.
9	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	70D		—	**Y38G28T09X**	2,525.
15	—	2@-5%	EPT	115	15-15/16	25-3/4	8-3/8	350	405	654	213	159	FR96	70D	Indoor-	—	**Y38G28T15X**	3,175.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	490	676	638	324	223	FR243	84W	Outdoor	—	**Y38M28T30X**	5,800.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	790	673	724	372	359	FR244	84W		—	**Y38M28T45X**	7,250.
15	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280L	**WS31**	350.	**V38M28T15X**	2,260.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280L	**WS31**	350.	**V38M28T30X**	2,520.
45	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280L	**WS33**	350.	**V38M28T45X**	3,150.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	280L	**WS33**	350.	**V38M28T75X**	4,280.
112.5	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280L	**WS19**	350.	**V38M28T12X**	6,170.
150	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	30-1/4	1100	1422	794	616	499	FR917	280L	**WS34**	800.	**V38M28T49X**	9,100.
225	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280L	**WS34**	800.	**V38M28T22X**	11,500.
300	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	280L	**WS35**	1,360.	**V38M28T33X**	18,300.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	①	**WS35**	1,360.	**V38M28T55X**	23,100.
380 Δ Volts to 220Y/127 Volts, 50/60 Hz																		
3	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	165	403	419	251	75	FR200	70F	Indoor-	—	**Y38G31T03X**	1,540.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	190	403	419	251	86	FR103	70F	Outdoor	—	**Y38G31T06X**	1,860.
9	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	70F		—	**Y38G31T09X**	2,420.
15	—	2@-5%	EPT	115	15-15/16	25-3/4	8-3/8	350	405	654	213	159	FR96	70F	Indoor-	—	**Y38G31T15X**	3,040.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	490	676	638	324	223	FR243	84H	Outdoor	—	**Y38M31T30X**	5,800.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	790	673	724	372	359	FR244	84H		—	**Y38M31T45X**	7,250.
15	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280L	**WS31**	350.	**V38M31T15X**	2,270.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280L	**WS31**	350.	**V38M31T30X**	2,520.
45	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280L	**WS33**	350.	**V38M31T45X**	3,150.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	280L	**WS33**	350.	**V38M31T75X**	4,300.
112.5	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280L	**WS19**	350.	**V38M31T12X**	6,170.
150	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280L	**WS34**	800.	**V38M31T49X**	8,570.
225	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280L	**WS34**	800.	**V38M31T22X**	11,375.
300	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	275H	**WS35**	1,360.	**V38M31T33X**	18,300.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	275H	**WS35**	1,360.	**V38M31T55X**	23,100.
380 Δ Volts to 380Y/220 Volts, 50/60 Hz																		
3	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	165	403	419	251	75	FR200	70D	Indoor-	—	**Y38G37T03X**	1,740.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	190	403	419	251	86	FR103	70D	Outdoor	—	**Y38G37T06X**	2,100.
9	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	70D		—	**Y38G37T09X**	2,740.
15	—	2@-5%	EPT	115	15-15/16	25-3/4	8-3/8	350	405	654	213	159	FR96	70D	Indoor-	—	**Y38G37T15X**	3,440.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	490	676	638	324	223	FR243	84H	Outdoor	—	**Y38M37T30X**	6,550.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	790	673	724	372	359	FR244	84H		—	**Y38M37T45X**	8,190.
15	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280L	**WS31**	350.	**V38M37T15X**	2,380.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280L	**WS31**	350.	**V38M37T30X**	3,040.
45	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280L	**WS33**	350.	**V38M37T45X**	3,700.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	280L	**WS33**	350.	**V38M37T75X**	5,240.
112.5	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280L	**WS19**	350.	**V38M37T12X**	7,580.
150	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280L	**WS34**	800.	**V38M37T49X**	9,525.
225	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280L	**WS34**	800.	**V38M37T22X**	13,930.
300	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	280L	**WS35**	1,360.	**V38M37T33X**	17,640.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	①	**WS35**	1,360.	**V38M37T55X**	28,220.

① Refer to your Cutler-Hammer sales office.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Table 9-21. Three-Phase Selection Information — Types EPT, DT-3, 50/60 Hz

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
380 Δ Volts to 416Y/240 Volts, 50/60 Hz																		
3	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	165	403	419	251	75	FR200	①	Indoor-	—	**Y38G51T03X**	1,685.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	190	403	419	251	86	FR103	①	Outdoor	—	**Y38G51T06X**	2,440.
9	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	①		—	**Y38G51T09X**	3,160.
15	—	2@-5%	EPT	115	15-15/16	25-3/4	8-3/8	350	405	654	213	159	FR96	①	Indoor-	—	**Y38G51T15X**	3,970.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	490	676	638	324	223	FR243	①	Outdoor	—	**Y38M51T30X**	7,560.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	790	673	724	372	359	FR244	①		—	**Y38M51T45X**	9,450.
15	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280L	**WS31**	350.	**V38M51T15X**	2,360.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280L	**WS31**	350.	**V38M51T30X**	3,020.
45	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280L	**WS33**	350.	**V38M51T45X**	3,675.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	280L	**WS33**	350.	**V38M51T75X**	5,200.
112.5	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280L	**WS19**	350.	**V38M51T12X**	7,525.
150	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280L	**WS34**	800.	**V38M51T49X**	9,450.
225	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280L	**WS34**	800.	**V38M51T22X**	13,820.
300	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	①	**WS35**	1,360.	**V38M51T33X**	17,500.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	①	**WS35**	1,360.	**V38M51T55X**	28,000.
400 Δ Volts to 208Y/120 Volts, 50/60 Hz																		
3	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	165	403	419	251	75	FR200	66E	Indoor-	—	**Y39G28T03X**	1,540.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	190	403	419	251	86	FR103	66E	Outdoor	—	**Y39G28T06X**	1,860.
9	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	66E		—	**Y39G28T09X**	2,525.
15	—	2@-5%	EPT	115	15-15/16	25-3/4	8-3/8	350	405	654	213	159	FR96	66E	Indoor-	—	**Y39G28T15X**	3,175.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	490	676	638	324	223	FR243	84Z	Outdoor	—	**Y39M28T30X**	5,200.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	790	673	724	372	359	FR244	84Z		—	**Y39M28T45X**	7,250.
15	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280K	**WS31**	350.	**V39M28T15X**	2,380.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280K	**WS31**	350.	**V39M28T30X**	3,040.
45	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280K	**WS33**	350.	**V39M28T45X**	3,700.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	280K	**WS33**	350.	**V39M28T75X**	5,230.
112.5	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280K	**WS19**	350.	**V39M28T12X**	7,570.
150	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280K	**WS34**	800.	**V39M28T49X**	9,500.
225	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280K	**WS34**	800.	**V39M28T22X**	13,900.
300	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	①	**WS35**	1,360.	**V39M28T33X**	17,600.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	①	**WS35**	1,360.	**V39M28T55X**	28,160.
400 Δ Volts to 400Y/231 Volts, 50/60 Hz																		
3	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	165	403	419	251	75	FR200	70U	Indoor-	—	**Y39G34T03X**	1,740.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	190	403	419	251	86	FR103	70U	Outdoor	—	**Y39G34T06X**	2,100.
9	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	70U		—	**Y39G34T09X**	2,740.
15	—	2@-5%	EPT	115	15-15/16	25-3/4	8-3/8	350	405	654	213	159	FR96	70U	Indoor-	—	**Y39G34T15X**	3,440.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	490	676	638	324	223	FR243	84V	Outdoor	—	**Y39M34T30X**	5,200.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	790	673	724	372	359	FR244	84V		—	**Y39M34T45X**	7,250.
15	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280K	**WS31**	350.	**V39M34T15X**	2,380.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280K	**WS31**	350.	**V39M34T30X**	3,040.
45	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280K	**WS33**	350.	**V39M34T45X**	3,700.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	280K	**WS33**	350.	**V39M34T75X**	5,230.
112.5	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280K	**WS19**	350.	**V39M34T12X**	7,570.
150	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280K	**WS34**	800.	**V39M34T49X**	9,500.
225	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280K	**WS34**	800.	**V39M34T22X**	13,900.
300	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	①	**WS35**	1,360.	**V39M34T33X**	17,600.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	①	**WS35**	1,360.	**V39M34T55X**	28,160.

① Refer to your Cutler-Hammer sales office.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Table 9-22. Three-Phase Selection Information — Types EPT, DT-3, 50/60 Hz

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
416 Δ Volts to 208Y/120 Volts, 50/60 Hz																		
3	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	165	403	419	251	75	FR200	70V	Indoor-	—	**Y43G28T03X**	1,600.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	190	403	419	251	86	FR103	70V	Outdoor	—	**Y43G28T06X**	1,950.
9	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	70V		—	**Y43G28T09X**	2,525.
15	—	2@-5%	EPT	115	15-15/16	25-3/4	8-3/8	350	405	654	213	159	FR96	70V	Indoor-	—	**Y43G28T15X**	3,175.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	490	676	638	324	223	FR243	84I	Outdoor	—	**Y43M28T30X**	5,800.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	790	673	724	372	359	FR244	84I		—	**Y43M28T45X**	7,250.
15	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280P	**WS31**	350.	**V43M28T15X**	2,260.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280P	**WS31**	350.	**V43M28T30X**	2,520.
45	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280P	**WS33**	350.	**V43M28T45X**	3,150.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	280P	**WS33**	350.	**V43M28T75X**	4,570.
112.5	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280P	**WS19**	350.	**V43M28T12X**	6,230.
150	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280P	**WS34**	800.	**V43M28T49X**	8,570.
225	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280P	**WS34**	800.	**V43M28T22X**	11,450.
300	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	①	**WS35**	1,360.	**V43M28T33X**	18,300.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	①	**WS35**	1,360.	**V43M28T55X**	23,400.
416 Δ Volts to 220 Δ Volts With 110 Volt Lighting Tap on B Phase, 50/60 Hz ②																		
15	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	282J	**WS31**	350.	**V43M26T15X**	1,960.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	282J	**WS31**	350.	**V43M26T30X**	2,520.
45	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	282J	**WS33**	350.	**V43M26T45X**	3,045.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	282J	**WS33**	350.	**V43M26T75X**	4,310.
112.5	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	282J	**WS19**	350.	**V43M26T12X**	6,235.
150	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	282J	**WS34**	800.	**V43M26T49X**	7,830.
225	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	282J	**WS34**	800.	**V43M26T22X**	11,450.
300	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	①	**WS35**	1,360.	**V43M26T33X**	14,500.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	①	**WS35**	1,360.	**V43M26T55X**	23,200.
416 Δ Volts to 220Y/127 Volts, 50/60 Hz																		
3	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	165	403	419	251	75	FR200	70V	Indoor-	—	**Y43G31T03X**	1,550.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	190	403	419	251	86	FR103	70V	Outdoor	—	**Y43G31T06X**	1,890.
9	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	70V		—	**Y43G31T09X**	2,340.
15	—	2@-5%	EPT	115	15-15/16	25-3/4	8-3/8	350	405	654	213	159	FR96	70V	Indoor-	—	**Y43G31T15X**	3,050.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	490	676	638	324	223	FR243	①	Outdoor	—	**Y43M31T30X**	5,800.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	790	673	724	372	359	FR244	①		—	**Y43M31T45X**	7,250.
15	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280S	**WS31**	350.	**V43M31T15X**	2,260.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280S	**WS31**	350.	**V43M31T30X**	2,520.
45	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280S	**WS33**	350.	**V43M31T45X**	3,150.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	280S	**WS33**	350.	**V43M31T75X**	4,570.
112.5	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280S	**WS19**	350.	**V43M31T12X**	6,230.
150	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280S	**WS34**	800.	**V43M31T49X**	8,570.
225	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280S	**WS34**	800.	**V43M31T22X**	11,450.
300	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	①	**WS35**	1,360.	**V43M31T33X**	18,300.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	①	**WS35**	1,360.	**V43M31T55X**	23,400.
416 Δ Volts to 240 Δ Volts, 50/60 Hz																		
3	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	165	403	419	251	75	FR200	74I	Indoor-	—	**Y43G24T03X**	1,550.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	190	403	419	251	86	FR103	74I	Outdoor	—	**Y43G24T06X**	1,890.
9	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	74I		—	**Y43G24T09X**	2,430.
15	—	2@-5%	EPT	115	15-15/16	25-3/4	8-3/8	350	405	654	213	159	FR96	74I	Indoor-	—	**Y43G24T15X**	3,060.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	490	676	638	324	223	FR243	①	Outdoor	—	**Y43M24T30X**	5,820.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	790	673	724	372	359	FR244	①		—	**Y43M24T45X**	7,280.
15	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	281AD	**WS31**	350.	**V43M24T15X**	1,960.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	281AD	**WS31**	350.	**V43M24T30X**	2,520.
45	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	281AD	**WS33**	350.	**V43M24T45X**	3,045.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	281AD	**WS33**	350.	**V43M24T75X**	4,310.
112.5	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	281AD	**WS19**	350.	**V43M24T12X**	6,235.
150	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	281AD	**WS34**	800.	**V43M24T49X**	7,830.
225	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	281AD	**WS34**	800.	**V43M24T22X**	11,450.
300	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	①	**WS35**	1,360.	**V43M24T33X**	14,500.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	①	**WS35**	1,360.	**V43M24T55X**	23,200.

① Refer to your Cutler-Hammer sales office.

② Center Tap capacity limited to 5% of rated kVA.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Table 9-23. Three-Phase Selection Information — Types EPT, DT-3, 50/60 Hz

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
416 Δ Volts to 416Y/240 Volts, 50/60 Hz																		
3	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	165	403	419	251	75	FR200	66F	Indoor-	—	**Y43G51T03X**	1,550.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	190	403	419	251	86	FR103	66F	Outdoor	—	**Y43G51T06X**	1,890.
9	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	66F		—	**Y43G51T09X**	2,340.
15	—	2@-5%	EPT	115	15-15/16	25-3/4	8-3/8	350	405	654	213	159	FR195	66F	Indoor-	—	**Y43G51T15X**	3,050.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	490	676	638	324	223	FR243	84J	Outdoor	—	**Y43M51T30X**	5,800.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	790	673	724	372	359	FR244	84J		—	**Y43M51T45X**	7,250.
15	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280S	**WS31**	350.	**V43M51T15X**	2,110.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280S	**WS31**	350.	**V43M51T30X**	2,350.
45	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280S	**WS33**	350.	**V43M51T45X**	2,940.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	280S	**WS33**	350.	**V43M51T75X**	4,260.
112.5	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280S	**WS19**	350.	**V43M51T12X**	5,800.
150	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280S	**WS34**	800.	**V43M51T49X**	7,980.
225	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280S	**WS34**	800.	**V43M51T22X**	10,660.
300	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	275N	**WS35**	1,360.	**V43M51T33X**	17,040.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	275N	**WS35**	1,360.	**V43M51T55X**	21,790.
480 Δ Volts to 208Y/120 Volts, 50/60 Hz																		
3	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	165	403	419	251	75	FR200	70A	Indoor-	—	**Y48G28T03X**	1,340.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	190	403	419	251	86	FR103	70A	Outdoor	—	**Y48G28T06X**	1,630.
9	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	70A		—	**Y48G28T09X**	2,110.
15	—	2@-5%	EPT	115	15-15/16	25-3/4	8-3/8	350	405	654	213	159	FR96	70A	Indoor-	—	**Y48G28T15X**	2,650.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	490	676	638	324	223	FR243	84A	Outdoor	—	**Y48M28T30X**	5,200.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	790	673	724	372	359	FR244	84A		—	**Y48M28T45X**	6,500.
15	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280B	**WS31**	350.	**V48M28T15X**	1,720.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280B	**WS31**	350.	**V48M28T30X**	2,175.
45	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280B	**WS33**	350.	**V48M28T45X**	2,650.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	280B	**WS33**	350.	**V48M28T75X**	3,750.
112.5	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280B	**WS19**	350.	**V48M28T12X**	6,170.
150	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280B	**WS34**	800.	**V48M28T49X**	6,810.
225	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280B	**WS34**	800.	**V48M28T22X**	9,900.
300	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	275A	**WS35**	1,360.	**V48M28T33X**	12,800.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	275A	**WS35**	1,360.	**V48M28T55X**	20,160.
480 Δ Volts to 220Y/127 Volts, 50/60 Hz																		
3	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	165	403	419	251	75	FR200	70A	Indoor-	—	**Y48G31T03X**	2,000.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	190	403	419	251	86	FR103	70A	Outdoor	—	**Y48G31T06X**	2,440.
9	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	70A		—	**Y48G31T09X**	3,160.
15	—	2@-5%	EPT	115	15-15/16	25-3/4	8-3/8	350	405	654	213	159	FR96	70A	Indoor-	—	**Y48G31T15X**	3,970.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	490	676	638	324	223	FR243	84K	Outdoor	—	**Y48M31T30X**	5,800.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	790	673	724	372	359	FR244	84K		—	**Y48M31T45X**	7,250.
15	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280B	**WS31**	350.	**V48M31T15X**	1,960.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280B	**WS31**	350.	**V48M31T30X**	2,520.
45	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280B	**WS33**	350.	**V48M31T45X**	3,060.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	280B	**WS33**	350.	**V48M31T75X**	4,310.
112.5	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280B	**WS19**	350.	**V48M31T12X**	6,230.
150	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280B	**WS34**	800.	**V48M31T49X**	7,850.
225	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280B	**WS34**	800.	**V48M31T22X**	11,375.
300	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	275A	**WS35**	1,360.	**V48M31T33X**	14,500.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	275A	**WS35**	1,360.	**V48M31T55X**	23,100.
480 Δ Volts to 380Y/220 Volts, 50/60 Hz																		
3	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	165	403	419	251	75	FR200	70R	Indoor-	—	**Y48G37T03X**	2,000.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	190	403	419	251	86	FR103	70R	Outdoor	—	**Y48G37T06X**	2,440.
9	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	70R		—	**Y48G37T09X**	3,160.
15	—	2@-5%	EPT	115	15-15/16	25-3/4	8-3/8	350	405	654	213	159	FR96	70R	Indoor-	—	**Y48G37T15X**	3,970.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	490	676	638	324	223	FR243	70R	Outdoor	—	**Y48M37T30X**	5,800.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	790	673	724	372	359	FR244	①		—	**Y48M37T45X**	7,250.
15	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280B	**WS31**	350.	**V48M37T15X**	2,270.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280B	**WS31**	350.	**V48M37T30X**	2,520.
45	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280B	**WS33**	350.	**V48M37T45X**	3,150.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	280B	**WS33**	350.	**V48M37T75X**	4,300.
112.5	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280B	**WS19**	350.	**V48M37T12X**	6,175.
150	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280B	**WS34**	800.	**V48M37T49X**	8,570.
225	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280B	**WS34**	800.	**V48M37T22X**	11,375.
300	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	275A	**WS35**	1,360.	**V48M37T33X**	18,300.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	275A	**WS35**	1,360.	**V48M37T55X**	23,100.

① Refer to your Cutler-Hammer sales office.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Table 9-24. Three-Phase Selection Information — Types EPT, DT-3, 50/60 Hz

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
480 Δ Volts to 400Y/231 Volts, 50/60 Hz																		
3	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	165	403	419	251	75	FR200	70A	Indoor-	—	**Y48G34T03X**	2,000.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	190	403	419	251	86	FR103	70A	Outdoor	—	**Y48G34T06X**	2,440.
9	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	70A		—	**Y48G34T09X**	3,160.
15	—	2@-5%	EPT	115	15-15/16	25-3/4	8-3/8	350	405	654	213	159	FR96	70A	Indoor-	—	**Y48G34T15X**	3,970.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	490	676	638	324	223	FR243	①	Outdoor	—	**Y48M34T30X**	5,800.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	790	673	724	372	359	FR244	①		—	**Y48M34T45X**	7,250.
15	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280B	**WS31**	350.	**V48M34T15X**	2,270.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280B	**WS31**	350.	**V48M34T30X**	2,520.
45	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280B	**WS33**	350.	**V48M34T45X**	3,150.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	280B	**WS33**	350.	**V48M34T75X**	4,300.
112.5	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280B	**WS19**	350.	**V48M34T12X**	6,170.
150	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280B	**WS34**	800.	**V48M34T49X**	8,570.
225	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280B	**WS34**	800.	**V48M34T22X**	11,375.
300	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1089	FR919	①	**WS35**	1,360.	**V48M34T33X**	14,375.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	①	**WS35**	1,360.	**V48M34T55X**	23,050.
480 Δ Volts to 480Y/277 Volts, 50/60 Hz																		
3	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	165	403	419	251	75	FR200	70L	Indoor-	—	**Y48G47T03X**	2,000.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	190	403	419	251	86	FR103	70L	Outdoor	—	**Y48G47T06X**	2,440.
9	—	2@-5%	EPT	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95	70L		—	**Y48G47T09X**	3,160.
15	—	2@-5%	EPT	115	15-15/16	25-3/4	8-3/8	350	405	654	213	159	FR96	70L	Indoor-	—	**Y48G47T15X**	3,970.
30	2@+2.5%	4@-2.5%	EPT	115	26-5/8	25-1/4	12-3/4	490	676	638	324	223	FR243	84D	Outdoor	—	**Y48M47T30X**	6,550.
45	2@+2.5%	4@-2.5%	EPT	115	26-1/2	28-1/2	14-5/8	790	673	724	372	359	FR244	84D		—	**Y48M47T45X**	8,190.
15	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280B	**WS31**	350.	**V48M47T15X**	2,305.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280B	**WS31**	350.	**V48M47T30X**	2,935.
45	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280B	**WS33**	350.	**V48M47T45X**	3,575.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	280B	**WS33**	350.	**V48M47T75X**	5,050.
112.5	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280B	**WS19**	350.	**V48M47T12X**	7,320.
150	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280B	**WS34**	800.	**V48M47T49X**	9,180.
225	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280B	**WS34**	800.	**V48M47T22X**	13,440.
300	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1089	FR919	275A	**WS35**	1,360.	**V48M47T33X**	17,000.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	275A	**WS35**	1,360.	**V48M47T55X**	27,200.

① Refer to your Cutler-Hammer sales office.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Single- and Three-Phase, Types EP, DS-3, EPT, DT-3, 60 Hz

Type DT-3

9

Product Description

Types EP, 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.
- 185ºC Insulation System, 115ºC rise standard.
- Available in single-phase ratings through 37.5 kVA and 4160 volts primary (EP).
- Available in three-phase ratings through 75 kVA and 4160 volts primary (EPT).

Types DS-3, DT-3

- Ventilated, NEMA 2 enclosure standard.
- Suitable for indoor applications, outdoors when weathershields are also installed.
- Upright mounting only.
- 220ºC Insulation System, 150ºC rise 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).

Application Description

Electrostatically shielded transformers are used to protect sensitive electrical equipment from undesirable high frequency signals commonly generated by lighting, switching surges, motors, and SCRs feeding noise back into the line. An electrostatic shield, consisting of a single turn of aluminum foil placed between the primary and secondary winding, is used to provide from 30 to 70 dB attenuation of wide band line-to-ground (common mode) noise.

Typical uses of shielded isolation transformers include:

- Suppression of transients and noise which travels from its source to the sensitive load equipment.
- Suppression of noise and transients at the point where the noise or transients are originating, thus preventing them from backfeeding from the source to the feeders.
- Transform one voltage level to another.
- Isolate one circuit from another.

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 by Eaton Corporation 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

Cutler-Hammer manufactured 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 9-120**.

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.

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Table 9-25. 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, Types DS-3 and 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, Types EP and EPT, utilize a NEMA 3R rated enclosure as standard.

Sound Levels

All Eaton's Cutler-Hammer 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.

Table 9-26. Average Sound Levels

NEMA ST-20 Average Sound Level in dB		
kVA	Ventilated	Encapsulated
0 – 9	40	45
10 – 50	45	50
51 – 150	50	55
151 – 300	55	57
301 – 500	60	59
501 – 700	62	61
701 – 1000	64	63
1001 – 1500	65	64

Winding Terminations

Primary and secondary windings are terminated in the wiring compartment. Encapsulated units have copper leads or stabs brought out for connections. Ventilated transformers have leads brought out to aluminum pads that are predrilled to accept Cu/Al lugs. **Lugs are not supplied with these transformers.** The Cutler-Hammer business 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 9-122**.

Product Selection

Additional Product Selection information begins on **Page 9-136**.

Table 9-27. Single-Phase Selection Information — Types EP, 60 Hz

kVA	Full Cap. Taps		Type	°C	Dimensions (Inches)			Wt.	Dimensions (mm)			Wt.	Frame	Wiring Diagram	Weathershield		Style	Price
	FCAN	FCBN		Temp. Rise	H	W	D	Lbs.	H	W	D	kg		Number	Catalog Number	Price U.S. $	Number	U.S. $
120 x 240 Volts to 120/240 Volts																		
3	—	—	EP	115	14-1/8	7-3/4	8	65	359	197	203	29	FR176	90B	Indoor-	—	**S10N11E03N**	1,155.
5	—	—	EP	115	16	10-3/8	9-7/8	113	406	263	251	51	FR177	90B	Outdoor	—	**S10N11E05N**	1,560.
7.5	—	—	EP	115	16	10-3/8	9-7/8	123	406	263	251	55	FR178	90B		—	**S10N11E07N**	2,010.
10	—	—	EP	115	19	13-3/8	10-1/2	193	482	339	266	87	FR179	90B	Indoor-	—	**S10N11E10N**	2,450.
15	—	—	EP	115	19	13-3/8	10-1/2	216	482	339	266	98	FR180	90B	Outdoor	—	**S10N11E15N**	3,350.
25	—	—	EP	115	22-3/8	16-3/8	14-1/8	375	568	416	359	170	FR182	90B		—	**S10N11E25N**	4,800.
120 Volts to 120 Volts																		
3	—	—	EP	115	14-1/8	7-3/4	8	65	359	197	203	29	FR176	77A	Indoor-	—	**S12N12E03N**	1,155.
5	—	—	EP	115	16	10-3/8	9-7/8	113	406	263	251	51	FR177	77A	Outdoor	—	**S12N12E05N**	1,560.
7.5	—	—	EP	115	16	10-3/8	9-7/8	123	406	263	251	55	FR178	77A		—	**S12N12E07N**	2,010.
10	—	—	EP	115	19	13-3/8	10-1/2	193	482	339	266	87	FR179	77A	Indoor-	—	**S12N12E10N**	2,450.
15	—	—	EP	115	19	13-3/8	10-1/2	216	482	339	266	98	FR180	77A	Outdoor	—	**S12N12E15N**	3,350.
25	—	—	EP	115	22-3/8	16-3/8	14-1/8	375	568	416	359	170	FR182	77A		—	**S12N12E25N**	4,800.
208 Volts to 120/240 Volts																		
3	—	—	EP	115	14-1/8	7-3/4	8	65	359	197	203	29	FR176	578A	Indoor-	—	**S29N11E03N**	1,320.
5	—	—	EP	115	16	10-3/8	9-7/8	113	406	263	251	51	FR177	578A	Outdoor	—	**S29N11E05N**	1,950.
7.5	—	—	EP	115	16	10-3/8	9-7/8	123	406	263	251	55	FR178	578A		—	**S29N11E07N**	2,585.
10	—	—	EP	115	19	13-3/8	10-1/2	193	482	339	266	87	FR179	578A	Indoor-	—	**S29N11E10N**	3,100.
15	—	—	EP	115	19	13-3/8	10-1/2	216	482	339	266	98	FR180	578A	Outdoor	—	**S29N11E15N**	3,650.
25	—	—	EP	115	22-3/8	16-3/8	14-1/8	375	568	416	359	170	FR182	578A		—	**S29N11E25N**	5,200.
208 Volts to 208 Volts																		
3	—	—	EP	115	14-1/8	7-3/4	8	65	359	197	203	29	FR176	77B	Indoor-	—	**S29N29E03N**	1,320.
5	—	—	EP	115	16	10-3/8	9-7/8	113	406	263	251	51	FR177	77B	Outdoor	—	**S29N29E05N**	1,950.
7.5	—	—	EP	115	16	10-3/8	9-7/8	123	406	263	251	55	FR178	77B		—	**S29N29E07N**	2,585.
10	—	—	EP	115	19	13-3/8	10-1/2	193	482	339	266	87	FR179	77B	Indoor-	—	**S29N29E10N**	3,100.
15	—	—	EP	115	19	13-3/8	10-1/2	216	482	339	266	98	FR180	77B	Outdoor	—	**S29N29E15N**	3,350.
25	—	—	EP	115	22-3/8	16-3/8	14-1/8	375	568	416	359	170	FR182	77B		—	**S29N29E25N**	5,200.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Single-Phase, Types EP, DS-3, 60 Hz

Table 9-28. Single-Phase Selection Information — Types EP, DS-3, 60 Hz

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
240 Volts to 240 Volts																		
3	—	—	EP	115	14-1/8	7-3/4	8	65	359	197	203	29	FR176	77C	Indoor-	—	**S24N24E03N**	1,155.
5	—	—	EP	115	16	10-3/8	9-7/8	113	406	263	251	51	FR177	77C	Outdoor	—	**S24N24E05N**	1,560.
7.5	—	—	EP	115	16	10-3/8	9-7/8	123	406	263	251	55	FR178	77C		—	**S24N24E07N**	2,010.
10	—	—	EP	115	19	13-3/8	10-1/2	193	482	339	266	87	FR179	77C	Indoor-	—	**S24N24E10N**	2,450.
15	—	—	EP	115	19	13-3/8	10-1/2	216	482	339	266	98	FR180	77C	Outdoor	—	**S24N24E15N**	3,350.
25	—	—	EP	115	22-3/8	16-3/8	14-1/8	375	568	416	359	170	FR182	77C		—	**S24N24E25N**	4,800.
277 Volts to 120/240 Volts																		
3	—	—	EP	115	14-1/8	7-3/4	8	65	359	197	203	29	FR176	513B	Indoor-	—	**S27N11E03N**	1,320.
5	—	—	EP	115	16	10-3/8	9-7/8	113	406	263	251	51	FR177	513B	Outdoor	—	**S27N11E05N**	1,950.
7.5	—	—	EP	115	16	10-3/8	9-7/8	123	406	263	251	55	FR178	513B		—	**S27N11E07N**	2,585.
10	—	—	EP	115	19	13-3/8	10-1/2	193	482	339	266	87	FR179	513B	Indoor-	—	**S27N11E10N**	3,100.
15	—	—	EP	115	19	13-3/8	10-1/2	216	482	339	266	98	FR180	513B	Outdoor	—	**S27N11E15N**	3,650.
25	—	—	EP	115	22-3/8	16-3/8	14-1/8	375	568	416	359	170	FR182	513B		—	**S27N11E25N**	5,200.
240 x 480 Volts to 120/240 Volts																		
.25	—	—	EP	115	6-1/2	4-7/8	3-7/8	12	165	124	98	5	FR56	90A	Indoor-	—	**S20N11E26A**	150.
.50	—	—	EP	115	6-1/2	4-7/8	4-5/8	13	165	124	117	6	FR57	90A	Outdoor	—	**S20N11E51A**	190.
.75	—	—	EP	115	8-3/8	6	5-3/4	21	213	152	146	10	FR58A	90A		—	**S20N11E76A**	245.
1	—	—	EP	115	8-3/8	6	5-3/4	31	213	152	146	14	FR59A	90A	Indoor-	—	**S20N11E01A**	290.
1.5	—	—	EP	115	10-3/4	6-3/16	6-1/8	40	273	157	156	18	FR67	90A	Outdoor	—	**S20N11E16A**	355.
2	—	—	EP	115	10-3/4	6-3/16	6-1/8	40	273	157	156	18	FR68	90A		—	**S20N11E02A**	450.
3	—	—	EP	115	14-1/8	7-11/16	8	65	359	195	203	29	FR176	90A	Indoor-	—	**S20N11E03A**	550.
5	—	—	EP	115	16	10-3/8	9-7/8	113	406	263	251	51	FR177	90A	Outdoor	—	**S20N11E05A**	815.
7.5	—	—	EP	115	16	10-3/8	9-7/8	123	406	263	251	55	FR178	90A		—	**S20N11E07A**	1,080.
10	—	—	EP	115	19	13-3/8	10-1/2	193	482	339	266	87	FR179	90A	Indoor-	—	**S20N11E10A**	1,300.
15	—	—	EP	115	19	13-3/8	10-1/2	216	482	339	266	98	FR180	90A	Outdoor	—	**S20N11E15A**	1,750.
25	①	①	EP	115	22-3/8	16-3/8	14-1/8	375	568	416	359	170	FR182	526A		—	**S20L11E25A**	2,475.
15	②	②	DS-3	150	30-1/4	16-7/8	15-7/8	147	768	428	402	67	FR815	261A	**WS15**	350.	**T20P11E15**	1,600.
25	②	②	DS-3	150	31-1/4	22-5/8	17-1/2	212	793	574	445	96	FR816	261A	**WS11**	350.	**T20P11E25**	2,075.
37.5	②	②	DS-3	150	37-5/8	22-5/8	19-1/2	306	953	574	495	139	FR817	261A	**WS11**	350.	**T20P11E37**	2,540.
50	②	②	DS-3	150	37-5/8	22-5/8	19-1/2	340	953	574	495	154	FR818	261A	**WS11**	350.	**T20P11E50**	3,080.
75	②	②	DS-3	150	42-1/8	24	23-3/8	510	1070	610	594	233	FR819	261A	**WS16**	800.	**T20P11E75**	4,350.
100	②	②	DS-3	150	42-1/8	24	23-3/8	600	1070	610	594	274	FR820	261A	**WS16**	800.	**T20P11E99**	5,400.

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

② 1@+5%, 2@-5% at 240 volts primary; 2@+2.5%, 4@-2.5% at 480 volts primary.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Table 9-29. 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		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
208 Δ Volts to 208Y/120 Volts																		
15	2@+2.5%	2@-2.5%	EPT	115	17-3/8	19-3/4	10-1/2	275	441	502	266	124	FR95	86A	Indoor-	—	**Y29D28E15B**	2,950.
															Outdoor	—	**—**	—
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	FR909	283A	**WS31**	350.	**V29M28E15A**	2,080.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283A	**WS31**	350.	**V29M28E30B**	2,660.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	140	FR912A	283A	**WS31**	350.	**V29M28E45B**	3,235.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	283A	**WS33**	350.	**V29M28E75B**	4,575.
112.5	1@+5%	2@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	663	485	272	FR915B	287A	**WS33**	350.	**V29R28E12B**	6,620.
150	1@+5%	2@-5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	287A	**WS19**	350.	**V29R28E49B**	8,300.
225	1@+5%	2@-5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	287A	**WS34**	800.	**V29R28E22B**	12,100.
300	1@+5%	2@-5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	287A	**WS34**	800.	**V29R28E33B**	15,400.
480 Δ Volts to 208Y/120 Volts																		
3	2@+2.5%	2@-2.5%	EPT	115	13-3/8	15-5/16	8-5/16	116	339	404	211	52	FR201	86B	Indoor-	—	**Y48D28E03A**	1,165.
6	2@+2.5%	2@-2.5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	64	FR200	86B	Outdoor	—	**Y48D28E06A**	1,420.
9	2@+2.5%	2@-2.5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	86B		—	**Y48D28E09N**	1,840.
15	2@+2.5%	2@-2.5%	EPT	115	17-3/8	19-3/4	10-1/2	275	441	419	251	75	FR95	86B		—	**Y48D28E15B**	2,310.
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	FR909	283B	**WS31**	350.	**V48M28E15B**	1,485.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	239	765	511	359	108	FR910A	283B	**WS31**	350.	**V48M28E30B**	1,900.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	140	FR912A	283B	**WS31**	350.	**V48M28E45B**	2,310.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	283B	**WS33**	350.	**V48M28E75B**	3,270.
112.5	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	663	485	272	FR915B	283B	**WS33**	350.	**V48M28E12B**	4,945.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	283B	**WS19**	350.	**V48M28E49B**	6,200.
225	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	283B	**WS34**	800.	**V48M28E22B**	9,000.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	283B	**WS34**	800.	**V48M28E33B**	11,500.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	292A	**WS35**	1,360.	**V48M28E55G**	18,400.
750	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	292A	**WS35**	1,360.	**V48M28E77B**	28,600.
1000	1@+3.5%	1@-3.5%	DT-3	150	68	64	45	4350	1727	1625	1143	1912		①	①	—	**V48W28E11A** ②	51,200.
480 Δ Volts to 208Y/120 Volts — Copper Windings																		
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	172	635	511	359	78	FR909	283B	**WS31**	350.	**V48M28E15CU**	2,300.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	300	765	511	359	136	FR910A	283B	**WS31**	350.	**V48M28E30CU**	2,520.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	370	765	511	359	168	FR912A	283B	**WS31**	350.	**V48M28E45CU**	3,180.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	550	1000	663	485	250	FR914B	283B	**WS33**	350.	**V48M28E75CU**	4,830.
112.5	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	675	1000	663	485	307	FR915B	283B	**WS33**	350.	**V48M28E12CU**	6,600.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	850	1171	712	585	386	FR916A	283B	**WS19**	350.	**V48M28E49CU**	9,020.
225	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1200	1422	793	616	545	FR917	283B	**WS34**	800.	**V48M28E22CU**	12,150.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	2150	1581	794	768	977	FR918A	283B	**WS34**	800.	**V48M28E33CU**	15,200.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	292A	**WS35**	1,360.	**V48M28E55CU**	24,590.
480 Δ Volts to 480Y/277 Volts																		
9	2@+2.5%	2@-2.5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	86C	Indoor-	—	**Y48D47E09N**	2,380.
15	2@+2.5%	2@-2.5%	EPT	115	17-3/8	19-3/4	10-1/2	275	441	419	266	75	FR95	86C	Outdoor	—	**Y48D47E15B**	3,000.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283B	**WS31**	350.	**V48M47E30B**	2,560.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	140	FR912A	283B	**WS31**	350.	**V48M47E45B**	3,120.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	283B	**WS33**	350.	**V48M47E75B**	4,410.
112.5	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	663	485	272	FR915B	283B	**WS33**	350.	**V48M47E12B**	6,390.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	283B	**WS19**	350.	**V48M47E49B**	8,000.
225	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	283B	**WS34**	800.	**V48M47E22B**	11,730.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	283B	**WS34**	800.	**V48M47E33B**	14,850.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	292A	**WS35**	1,360.	**V48M47E55G**	23,750.
750	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	292A	**WS35**	1,360.	**V48M47E77A**	38,600.

① Refer to your Cutler-Hammer sales office.
② Not seismic qualified.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Table 9-30. 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		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
480 Δ Volts to 240 Δ Volts																		
3	—	2@-5%	EPT	115	13-3/8	16	8-3/8	116	339	404	211	52	FR201	88A	Indoor-	—	**Y48G24E03A**	1,310.
6	—	2@-5%	EPT	115	15-7/8	16-1/2	9-7/8	143	403	419	251	64	FR200	88A	Outdoor	—	**Y48G24E06A**	1,590.
9	—	4@-2.5%	EPT	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103	505B		—	**Y48J24E09A**	2,060.
15	—	4@-2.5%	EPT	115	17-3/8	19-3/4	10-1/2	275	441	502	266	75	FR95	505B		—	**Y48J24E15A**	2,585.
480 Δ Volts to 240 Δ Volts With 120 Volt Lighting Tap on B Phase ①																		
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	FR909	284B	**WS31**	350.	**V48M22E15B**	1,700.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	284B	**WS31**	350.	**V48M22E30A**	2,200.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	140	FR912A	284B	**WS31**	350.	**V48M22E45A**	2,750.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	284B	**WS33**	350.	**V48M22E75A**	3,760.
112.5	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	663	485	272	FR915B	284B	**WS33**	350.	**V48M22E12A**	5,390.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	284B	**WS19**	350.	**V48M22E49A**	6,830.
225	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	284B	**WS34**	800.	**V48M22E22A**	10,000.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	284B	**WS34**	800.	**V48M22E33A**	12,650.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	293A	**WS35**	1,360.	**V48M22E55A**	20,150.

① Center Tap capacity limited to 5% of rated kVA.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Single- and Three-Phase, Types EP, DS-3, EPT, DT-3, 60 Hz

Type DT-3

Product Description

Types EP, 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.
- 185ºC Insulation System, 115ºC rise standard.
- Available in single-phase ratings through 37.5 kVA and 4160 volts primary (EP).
- Available in three-phase ratings through 75 kVA and 4160 volts primary (EPT).

Types DS-3, DT-3

- Ventilated, NEMA 2 enclosure standard.
- Suitable for indoor applications, outdoors when weathershields are also installed.
- Upright mounting only.
- 220ºC Insulation System, 150ºC rise 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).

Application Description

Low Temperature Rise Energy Efficient transformers are designed with lower than normal conductor and total losses. Temperature rise is therefore lower resulting in greatly improved life expectancies and substantial increases in overload capabilities. 80°C and 115°C rise transformers can help cut operating expenses for systems requiring unit loading at 80 to 100% of the nameplate rating, 24 hours a day, or where load growth is expected.

A 115°C rise transformer can carry a continuous 15% overload, and the 80°C rise a 30% overload, without exceeding the insulation rating or seriously reducing the life expectancy of the transformer. However, when operating in an overload condition, the internal temperature increases as a result of the higher conductor losses. Efficiency decreases under this condition. Since transformers operate beyond nameplate capacities usually during peak load periods, the benefits remain.

NEMA TP-1-1996, compliant Energy Efficient Transformers are specifically designed to meet the energy efficiency standards set forth in NEMA Standards publication, TP-1-1996, *"Guide for Determining Energy Efficiency for Distribution Transformers."* Surveys have shown that the average loading of low voltage dry-type distribution transformers, over a 24 hour period, is approximately 35%. NEMA TP-1 compliant transformers are optimized to offer maximum efficiency at 35% of nameplate rating. In applications where the Eaton's Cutler-Hammer low temperature rise (115ºC or 80ºC) product offers significant energy savings.

The range of products covered by NEMA TP-1-1996 are:

Table 9-31. NEMA TP-1-1996 Product Range

Voltage Class	Primary Voltage	34.5 kV and below
	Secondary Voltage	600 V and below
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

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 Eaton's Cutler-Hammer business.

Transformers that are currently specifically excluded from the scope of NEMA Standard TP-1-1996 include:

- Liquid-filled transformers below 10 kVA.
- Dry-type transformers below 15 kVA.
- ac and dc drives transformers.
- Rectifier transformers and transformers designed for high harmonics.
- Autotransformers.
- Non-distribution transformers, such as UPS transformers.
- Special impedance, regulation, or harmonic transformers.
- Regulating transformers.
- Sealed and non-ventilated transformers.
- Retrofit 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 NEMA TP-1-1996.

Table 9-32. NEMA TP-1-1996 Efficiency Levels

Tables of Energy Efficiency NEMA Class 1 Efficiency Levels dry-type Distribution Transformers — Low Voltage			
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

Features, Benefits and Functions

- UL listed.
- 60 Hz operation (except as noted).
- 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 by Eaton Corporation 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

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

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Options and Accessories

Please refer to **Page 9-120**.

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.

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Table 9-33. 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, Types DS-3 and 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, Types EP and EPT, utilize a NEMA 3R rated enclosure.

Sound Levels

All Cutler-Hammer 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.

Table 9-34. Average Sound Levels

NEMA ST-20 Average Sound Level (dB)		
kVA	Ventilated	Encapsulated
0 – 9	40	45
10 – 50	45	50
51 – 150	50	55
151 – 300	55	57
301 – 500	60	59
501 – 700	62	61
701 – 1000	64	63
1001 – 1500	65	64

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 Eaton's Cutler-Hammer business.

Winding Terminations

Primary and secondary windings are terminated in the wiring compartment. Encapsulated units have copper leads or stabs brought out for connections. 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.** The Cutler-Hammer business 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 **Page 9-122.**

Product Selection

Additional Product Selection information begins on **Page 9-136**.

Table 9-35. Single-Phase Selection Information — Type DS-3 60 Hz NEMA TP-1 Compliant, ENERGY STAR Labeled

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
240 x 480 Volts to 120/240 Volts, Aluminum Windings																		
15	①	①	DS-3	150	31-1/4	22-5/8	17-1/2	212	768	428	402	67	816	3XA	**WS11**	350.	**T20P11S15EE**	1,810.
25	①	①	DS-3	150	31-1/4	22-5/8	17-1/2	212	768	428	402	67	816	3XA	**WS11**	350.	**T20P11S25EE**	2,420.
37.5	①	①	DS-3	150	37-5/8	22-5/8	19-1/2	306	956	574	495	139	817	3XA	**WS11**	350.	**T20P11S37EE**	2,860.
50	①	①	DS-3	150	42-1/8	24	23-3/8	510	1070	610	594	232	819	3XA	**WS16**	800.	**T20P11S50EE**	3,500.
75	①	①	DS-3	150	42-1/8	24	23-3/8	510	1070	610	594	232	819	3XA	**WS16**	800.	**T20P11S75EE**	4,910.
100	①	①	DS-3	150	62-1/2	30	34	1200	1597	762	863	545	814	3XA	**WS13**	800.	**T20P11S99EE**	6,020.
167	2@+2.5%	4@-2.5%	DS-3	150	62-1/2	30	34	1200	1597	762	863	545	814	288A	**WS13**	800.	**T48M11S67EE** ②	13,300.
15	①	①	DS-3	115	31-1/4	22-5/8	17-1/2	212	768	428	402	67	816	3XA	**WS11**	350.	**T20P11F15EE**	2,120.
25	①	①	DS-3	115	31-1/4	22-5/8	17-1/2	212	768	428	402	67	816	3XA	**WS11**	350.	**T20P11F25EE**	2,820.
37.5	①	①	DS-3	115	37-5/8	22-5/8	19-1/2	340	956	574	495	154	818	3XA	**WS11**	350.	**T20P11F37EE**	3,380.
50	①	①	DS-3	115	42-1/8	24	23-3/8	510	1070	610	594	232	819	3XA	**WS16**	800.	**T20P11F50EE**	4,100.
75	①	①	DS-3	115	42-1/8	24	23-3/8	510	1070	610	594	232	819	3XA	**WS16**	800.	**T20P11F75EE**	5,790.
100	①	①	DS-3	115	62-1/2	30	34	1200	1597	762	863	545	814	288A	**WS13**	800.	**T20P11F99EE**	7,080.
15	①	①	DS-3	80	31-1/4	22-5/8	17-1/2	212	768	428	402	67	816	3XA	**WS11**	350.	**T20P11B15EE**	2,540.
25	①	①	DS-3	80	37-5/8	22-5/8	19-1/2	306	956	574	495	139	817	3XA	**WS11**	350.	**T20P11B25EE**	3,400.
37.5	①	①	DS-3	80	37-5/8	22-5/8	19-1/2	340	956	574	495	154	818	3XA	**WS11**	350.	**T20P11B37EE**	4,010.
50	①	①	DS-3	80	42-1/8	24	23-3/8	510	1070	610	594	232	819	3XA	**WS16**	800.	**T20P11B50EE**	4,900.
75	①	①	DS-3	80	42-1/8	24	23-3/8	600	1070	610	594	272	820	3XA	**WS16**	800.	**T20P11B75EE**	6,900.
100	①	①	DS-3	80	62-1/2	30	34	1200	1597	762	863	545	814	288A	**WS13**	800.	**T20P11B99EE**	9,220.
240 x 480 Volts to 120/240 Volts, Copper Windings																		
15	①	①	DS-3	150	31-1/4	22-5/8	17-1/2	237	768	428	402	108	816	3XA	**WS11**	350.	**T20P11S15CUEE**	2,450.
25	①	①	DS-3	150	37-5/8	22-5/8	19-1/2	345	956	574	495	158	817	3XA	**WS11**	350.	**T20P11S25CUEE**	3,280.
37.5	①	①	DS-3	150	37-5/8	22-5/8	19-1/2	345	956	574	495	158	817	3XA	**WS11**	350.	**T20P11S37CUEE**	3,890.
50	①	①	DS-3	150	37-5/8	22-5/8	19-1/2	381	956	574	495	173	818	3XA	**WS11**	350.	**T20P11S50CUEE**	4,750.
75	①	①	DS-3	150	42-1/8	24	23-3/8	614	1070	610	594	279	819	3XA	**WS16**	800.	**T20P11S75CUEE**	6,660.
100	①	①	DS-3	150	62-1/2	30	34	1440	1597	762	863	655	814	288A	**WS13**	800.	**T20P11S99CUEE**	8,220.
167	2@+2.5%	4@-2.5%	DS-3	150	62-1/2	30	34	1440	1597	762	863	655	814	288A	**WS13**	800.	**T48M11S67CUEE** ②	16,625.
15	①	①	DS-3	115	31-1/4	22-5/8	17-1/2	237	768	428	402	108	816	3XA	**WS11**	350.	**T20P11F15CUEE**	2,810.
25	①	①	DS-3	115	37-5/8	22-5/8	19-1/2	345	956	574	495	158	817	3XA	**WS11**	350.	**T20P11F25CUEE**	3,760.
37.5	①	①	DS-3	115	37-5/8	22-5/8	19-1/2	381	956	574	495	173	818	3XA	**WS11**	350.	**T20P11F37CUEE**	4,440.
50	①	①	DS-3	115	42-1/8	24	23-3/8	614	1070	610	594	279	819	3XA	**WS16**	800.	**T20P11F50CUEE**	5,430.
75	①	①	DS-3	115	42-1/8	24	23-3/8	614	1070	610	594	279	819	3XA	**WS16**	800.	**T20P11F75CUEE**	7,620.
100	①	①	DS-3	115	62-1/2	30	34	1440	1597	762	863	655	814	288A	**WS13**	800.	**T20P11F99CUEE**	9,350.
15	①	①	DS-3	80	31-1/4	22-5/8	17-1/2	237	768	428	402	108	816	3XA	**WS11**	350.	**T20P11B15CUEE**	3,260.
25	①	①	DS-3	80	37-5/8	22-5/8	19-1/2	345	956	574	495	158	817	3XA	**WS11**	350.	**T20P11B25CUEE**	4,360.
37.5	①	①	DS-3	80	37-5/8	22-5/8	19-1/2	381	956	574	495	173	818	3XA	**WS11**	350.	**T20P11B37CUEE**	5,150.
50	①	①	DS-3	80	42-1/8	24	23-3/8	614	1070	610	594	279	819	3XA	**WS16**	800.	**T20P11B50CUEE**	6,300.
75	①	①	DS-3	80	42-1/8	24	23-3/8	700	1070	610	594	318	820	3XA	**WS16**	800.	**T20P11B75CUEE**	8,850.
100	2@+2.5%	4@-2.5%	DS-3	80	62-1/2	30	34	1440	1597	762	863	655	814	288A	**WS13**	800.	**T48M11B99CUEE** ②	11,610.
208 Volts to 120/240 Volts, Aluminum Windings																		
15	2@+2.5%	4@-2.5%	DS-3	150	31-1/4	22-5/8	17-1/2	212	768	428	402	67	816	260A	**WS11**	350.	**T29M11S15EE**	3,015.
25	2@+2.5%	4@-2.5%	DS-3	150	31-1/4	22-5/8	17-1/2	212	768	428	402	67	816	260A	**WS11**	350.	**T29M11S25EE**	5,275.
37.5	2@+2.5%	4@-2.5%	DS-3	150	37-5/8	22-5/8	19-1/2	306	956	574	495	139	817	260A	**WS11**	350.	**T29M11S37EE**	6,460.
50	2@+2.5%	4@-2.5%	DS-3	150	42-1/8	24	23-3/8	510	1070	610	594	232	819	260A	**WS16**	800.	**T29M11S50EE**	7,840.
75	1@+5%	2@-5%	DS-3	150	42-1/8	24	23-3/8	510	1070	610	594	232	819	551A	**WS16**	800.	**T29R11S75EE**	11,085.
100	2@+2.5%	4@-2.5%	DS-3	150	62-1/2	30	34	1200	1597	762	863	545	814	260A	**WS13**	800.	**T29M11S99EE**	13,770.
277 Volts to 120/240 Volts, Aluminum Windings																		
15	2@+2.5%	4@-2.5%	DS-3	150	31-1/4	22-5/8	17-1/2	212	768	428	402	67	816	262C	**WS11**	350.	**T27M11S15EE**	3,015.
25	2@+2.5%	4@-2.5%	DS-3	150	31-1/4	22-5/8	17-1/2	212	768	428	402	67	816	262C	**WS11**	350.	**T27M11S25EE**	5,275.
37.5	2@+2.5%	4@-2.5%	DS-3	150	37-5/8	22-5/8	19-1/2	306	956	574	495	139	817	262C	**WS11**	350.	**T27M11S37EE**	6,460.
50	2@+2.5%	4@-2.5%	DS-3	150	42-1/8	24	23-3/8	510	1070	610	594	232	819	262C	**WS16**	800.	**T27M11S50EE**	7,840.
75	2@+2.5%	4@-2.5%	DS-3	150	42-1/8	24	23-3/8	510	1070	610	594	232	819	262C	**WS16**	800.	**T27M11S75EE**	11,085.
100	2@+2.5%	4@-2.5%	DS-3	150	62-1/2	30	34	1200	1597	762	863	545	814	262C	**WS13**	800.	**T27M11S99EE**	13,770.

① +1 – 5%, -2 – 5% at 240 volts primary; +2 – 2.5%, -4 – 2.5% at 480 volts primary.

② 480 volt primary only.

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

Discount Symbol **DT-1**

Table 9-36. Three-Phase Selection Information — Type DT-3 60 Hz NEMA TP-1 Compliant, ENERGY STAR Labeled

kVA	Full Cap. Taps		Type	°C	Dimensions (Inches)			Wt.	Dimensions (mm)			Wt.	Frame	Wiring	Weathershield		Style	Price
	FCAN	FCBN		Temp. Rise	H	W	D	Lbs.	H	W	D	kg		Diagram Number	Catalog Number	Price U.S. $	Number	U.S. $
480 Δ Volts to 208Y/120 Volts, Aluminum Windings																		
15	1@+2.5%	3@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	909	375A	**WS31**	350.	**V48U28T15EE**	1,830.
30	2@+2.5%	4@-2.5%	DT-3	150	30	20-1/8	14-1/8	310	762	511	359	140	912A	280B	**WS31**	350.	**V48M28T30EE**	2,330.
45	2@+2.5%	4@-2.5%	DT-3	150	30	20-1/8	14-1/8	310	762	511	359	140	912A	280B	**WS31**	350.	**V48M28T45EE**	2,840.
75	2@+2.5%	4@-2.5%	DT-3	150	39-1/4	26-1/8	19-1/8	480	995	663	486	217	914B	280B	**WS33**	350.	**V48M28T75EE**	4,025.
112.5	2@+2.5%	4@-2.5%	DT-3	150	39-1/4	26-1/8	19-1/8	600	995	663	486	272	915B	280B	**WS33**	350.	**V48M28T12EE**	5,850.
150	2@+2.5%	4@-2.5%	DT-3	150	46-5/8	28	23	785	1183	710	584	357	916A	280B	**WS19**	350.	**V48M28T49EE**	7,300.
225	2@+2.5%	4@-2.5%	DT-3	150	56-1/4	31-1/4	24-1/4	1100	1427	793	616	499	917	280B	**WS34**	800.	**V48M28T22EE**	10,680.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1444	1579	793	768	656	918A	280B	**WS34**	800.	**V48M28T33EE**	13,500.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	35-3/4	2400	1905	1129	908	1088	919	275A	**WS35**	1,360.	**V48M28T55EE**	21,800.
750	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	35-3/4	2900	1905	1129	908	1315	920	275A	**WS35**	1,360.	**V48M28T77EE**	36,800.
15	1@+2.5%	3@-2.5%	DT-3	115	25	20-1/8	14-1/8	152	635	511	359	69	909	375A	**WS31**	350.	**V48U28F15EE**	2,380.
30	2@+2.5%	4@-2.5%	DT-3	115	30	20-1/8	14-1/8	310	762	511	359	140	912A	280B	**WS31**	350.	**V48M28F30EE**	2,840.
45	2@+2.5%	4@-2.5%	DT-3	115	39-1/4	26-1/8	19-1/8	480	995	663	486	217	914B	280B	**WS33**	350.	**V48M28F45EE**	3,475.
75	2@+2.5%	4@-2.5%	DT-3	115	39-1/4	26-1/8	19-1/8	600	995	663	486	272	915B	280B	**WS33**	350.	**V48M28F75EE**	5,290.
112.5	2@+2.5%	4@-2.5%	DT-3	115	39-1/4	26-1/8	19-1/8	600	995	663	486	272	915B	280B	**WS33**	350.	**V48M28F12EE**	7,215.
150	2@+2.5%	4@-2.5%	DT-3	115	46-5/8	28	23	785	1183	710	584	357	916A	280B	**WS19**	350.	**V48M28F49EE**	9,850.
225	2@+2.5%	4@-2.5%	DT-3	115	56-1/4	31-1/4	24-1/4	1100	1427	793	616	499	917	280B	**WS34**	800.	**V48M28F22EE**	13,150.
300	2@+2.5%	4@-2.5%	DT-3	115	75	44-1/2	35-3/4	2400	1905	1129	908	1088	919	275A	**WS34**	800.	**V48M28F33EE**	16,490.
500	2@+2.5%	4@-2.5%	DT-3	115	75	44-1/2	35-3/4	2900	1905	1129	908	1315	920	275A	**WS35**	1,360.	**V48M28F55EE**	25,070.
750	2@+2.5%	4@-2.5%	DT-3	115	75	44-1/2	35-3/4	2900	1905	1129	908	1315	920	275A	**WS35**	1,360.	**V48M28F77EE**	40,365.
15	2@+2.5%	4@-2.5%	DT-3	80	30	20-1/8	14-1/8	230	762	511	359	104	910A	280B	**WS31**	350.	**V48M28B15EE**	2,800.
30	2@+2.5%	4@-2.5%	DT-3	80	30	20-1/8	14-1/8	310	762	511	359	140	912A	280B	**WS31**	350.	**V48M28B30EE**	3,250.
45	2@+2.5%	4@-2.5%	DT-3	80	39-1/4	26-1/8	19-1/8	480	995	663	486	217	914B	280B	**WS33**	350.	**V48M28B45EE**	4,085.
75	2@+2.5%	4@-2.5%	DT-3	80	39-1/4	26-1/8	19-1/8	600	995	663	486	272	915B	280B	**WS33**	350.	**V48M28B75EE**	6,190.
112.5	2@+2.5%	4@-2.5%	DT-3	80	46-5/8	28	23	785	1183	710	584	357	916A	280B	**WS19**	350.	**V48M28B12EE**	8,450.
150	2@+2.5%	4@-2.5%	DT-3	80	56-1/4	31-1/4	24-1/4	1100	1427	793	616	499	917	280B	**WS34**	800.	**V48M28B49EE**	11,550.
225	2@+2.5%	4@-2.5%	DT-3	80	62-1/4	31-1/4	30-1/4	1444	1579	793	768	656	918A	280B	**WS34**	800.	**V48M28B22EE**	15,450.
300	2@+2.5%	4@-2.5%	DT-3	80	75	44-1/2	35-3/4	2400	1905	1129	908	1088	919	275A	**WS35**	1,360.	**V48M28B33EE**	19,350.
500	2@+2.5%	4@-2.5%	DT-3	80	75	44-1/2	35-3/4	2900	1905	1129	908	1315	920	275A	**WS35**	1,360.	**V48M28B55EE**	29,430.
480 Δ Volts to 240 Δ Volts with 120 Volt Lighting Tap Phase B, Aluminum Windings																		
15	1@+2.5%	3@-2.5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	359	69	909	①	**WS31**	350.	**V48U22T15EE**	2,095.
30	2@+2.5%	4@-2.5%	DT-3	150	30	20-1/8	14-1/8	310	762	511	359	140	912A	282B	**WS31**	350.	**V48M22T30EE**	2,800.
45	2@+2.5%	4@-2.5%	DT-3	150	39-1/4	26-1/8	19-1/8	480	995	663	486	217	914B	282B	**WS33**	350.	**V48M22T45EE**	3,500.
75	2@+2.5%	4@-2.5%	DT-3	150	39-1/4	26-1/8	19-1/8	600	995	663	486	272	915B	282B	**WS33**	350.	**V48M22T75EE**	4,830.
112.5	2@+2.5%	4@-2.5%	DT-3	150	39-1/4	26-1/8	19-1/8	600	995	663	486	272	915B	282B	**WS33**	350.	**V48M22T12EE**	7,020.
150	2@+2.5%	4@-2.5%	DT-3	150	46-5/8	28	23	785	1183	710	584	357	916A	282B	**WS19**	350.	**V48M22T49EE**	8,760.
225	2@+2.5%	4@-2.5%	DT-3	150	56-1/4	31-1/4	24-1/4	1100	1427	793	616	499	917	282B	**WS34**	800.	**V48M22T22EE**	12,850.
300	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	35-3/4	2400	1905	1129	908	1088	919	282B	**WS35**	1,360.	**V48M22T33EE**	16,300.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	35-3/4	2900	1905	1129	908	1315	920	291A	**WS35**	1,360.	**V48M22T55EE**	26,500.

① Refer to your local Cutler-Hammer sales office.

Note: Additional voltage combinations are available. Contact your local Cutler-Hammer sales office for assistance if the voltage you require is not included in this catalog.

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

Discount Symbol **DT-1**

Table 9-36. (Continued) Three-Phase Selection Information — Type DT-3 60 Hz NEMA TP-1 Compliant, ENERGY STAR Labeled

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
480 Δ Volts to 208Y/120 Volts, Copper Windings																		
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	172	635	511	359	78	909	280B	**WS31**	350.	**V48M28T15CUEE**	2,800.
30	2@+2.5%	4@-2.5%	DT-3	150	30	20-1/8	14-1/8	370	762	511	359	168	912A	280B	**WS31**	350.	**V48M28T30CUEE**	3,170.
45	2@+2.5%	4@-2.5%	DT-3	150	30	20-1/8	14-1/8	370	762	511	359	168	912A	280B	**WS31**	350.	**V48M28T45CUEE**	3,870.
75	2@+2.5%	4@-2.5%	DT-3	150	39-1/4	26-1/8	19-1/8	675	995	663	486	307	915B	280B	**WS33**	350.	**V48M28T75CUEE**	5,470.
112.5	2@+2.5%	4@-2.5%	DT-3	150	39-1/4	26-1/8	19-1/8	675	995	663	486	307	915B	280B	**WS33**	350.	**V48M28T12CUEE**	7,960.
150	2@+2.5%	4@-2.5%	DT-3	150	46-5/8	28	23	870	1183	710	584	391	916A	280B	**WS19**	350.	**V48M28T49CUEE**	9,940.
225	2@+2.5%	4@-2.5%	DT-3	150	56-1/4	31-1/4	24-1/4	1200	1427	793	616	545	917	280B	**WS34**	800.	**V48M28T22CUEE**	15,500.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1894	1579	793	768	861	918A	280B	**WS34**	800.	**V48M28T33CUEE**	18,500.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	35-3/4	3100	1905	1129	908	1409	919	275A	**WS35**	1,360.	**V48M28T55CUEE**	29,800.
750	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	35-3/4	3600	1905	1129	908	1636	920	275A	**WS35**	1,360.	**V48M28T77CUEE**	47,390.
15	2@+2.5%	2@-2.5%	DT-3	115	25	20-1/8	14-1/8	172	635	511	359	78	909	266W	**WS31**	350.	**V48D28F15CUEE**	3,210.
30	2@+2.5%	4@-2.5%	DT-3	115	30	20-1/8	14-1/8	370	762	511	359	168	912A	280B	**WS31**	350.	**V48M28F30CUEE**	3,825.
45	2@+2.5%	4@-2.5%	DT-3	115	39-1/4	26-1/8	19-1/8	550	995	663	486	250	914B	280B	**WS33**	350.	**V48M28F45CUEE**	4,690.
75	2@+2.5%	4@-2.5%	DT-3	115	39-1/4	26-1/8	19-1/8	675	995	663	486	307	915B	280B	**WS33**	350.	**V48M28F75CUEE**	7,140.
112.5	2@+2.5%	4@-2.5%	DT-3	115	39-1/4	26-1/8	19-1/8	675	995	663	486	307	915B	280B	**WS33**	350.	**V48M28F12CUEE**	9,740.
150	2@+2.5%	4@-2.5%	DT-3	115	46-5/8	28	23	870	1183	710	584	391	916A	280B	**WS19**	350.	**V48M28F49CUEE**	13,300.
225	2@+2.5%	4@-2.5%	DT-3	115	56-1/4	31-1/4	24-1/4	1200	1427	793	616	545	917	280B	**WS34**	800.	**V48M28F22CUEE**	17,750.
300	2@+2.5%	4@-2.5%	DT-3	115	75	44-1/2	35-3/4	3100	1905	1129	908	1409	919	275A	**WS35**	1,360.	**V48M28F33CUEE**	22,250.
500	2@+2.5%	4@-2.5%	DT-3	115	75	44-1/2	35-3/4	3100	1905	1129	908	1409	919	275A	**WS35**	1,360.	**V48M28F55CUEE**	33,790.
750	2@+2.5%	4@-2.5%	DT-3	115	75	44-1/2	35-3/4	3600	1905	1129	908	1636	920	275A	**WS35**	1,360.	**V48M28F77CUEE**	52,000.
15	2@+2.5%	4@-2.5%	DT-3	80	30	20-1/8	14-1/8	300	762	511	359	136	910A	280B	**WS31**	350.	**V48M28B15CUEE**	3,780.
30	2@+2.5%	4@-2.5%	DT-3	80	30	20-1/8	14-1/8	370	762	511	359	168	912A	280B	**WS31**	350.	**V48M28B30CUEE**	4,130.
45	2@+2.5%	4@-2.5%	DT-3	80	39-1/4	26-1/8	19-1/8	675	995	663	486	307	915B	280B	**WS33**	350.	**V48M28B45CUEE**	5,510.
75	2@+2.5%	4@-2.5%	DT-3	80	39-1/4	26-1/8	19-1/8	675	995	663	486	307	915B	280B	**WS33**	350.	**V48M28B75CUEE**	8,350.
112.5	2@+2.5%	4@-2.5%	DT-3	80	46-5/8	28	23	870	1183	710	584	391	916A	280B	**WS19**	350.	**V48M28B12CUEE**	11,400.
150	2@+2.5%	4@-2.5%	DT-3	80	56-1/4	31-1/4	24-1/4	1200	1427	793	616	545	917	280B	**WS34**	800.	**V48M28B49CUEE**	15,600.
225	2@+2.5%	4@-2.5%	DT-3	80	62-1/4	31-1/4	30-1/4	1894	1579	793	768	861	918A	280B	**WS34**	800.	**V48M28B22CUEE**	20,860.
300	2@+2.5%	4@-2.5%	DT-3	80	75	44-1/2	35-3/4	3100	1905	1129	908	1409	919	275A	**WS35**	1,360.	**V48M28B33CUEE**	26,120.
500	2@+2.5%	4@-2.5%	DT-3	80	75	44-1/2	35-3/4	3600	1905	1129	908	1636	920	275A	**WS35**	1,360.	**V48M28B55CUEE**	37,060.
480 Δ Volts to 240 Δ Volts with 120 Volt Lighting Tap Phase B, Copper Windings																		
15	1@+2.5%	3@-2.5%	DT-3	150	25	20-1/8	14-1/8	172	635	511	359	78	909	①	**WS31**	350.	**V48U22T15CUEE**	2,830.
30	2@+2.5%	4@-2.5%	DT-3	150	30	20-1/8	14-1/8	370	762	511	359	168	912A	282B	**WS31**	350.	**V48M22T30CUEE**	3,790.
45	2@+2.5%	4@-2.5%	DT-3	150	39-1/4	26-1/8	19-1/8	550	995	663	486	250	914B	282B	**WS33**	350.	**V48M22T45CUEE**	4,730.
75	2@+2.5%	4@-2.5%	DT-3	150	39-1/4	26-1/8	19-1/8	675	995	663	486	307	915B	282B	**WS33**	350.	**V48M22T75CUEE**	6,470.
112.5	2@+2.5%	4@-2.5%	DT-3	150	39-1/4	26-1/8	19-1/8	675	995	663	486	307	915B	282B	**WS33**	350.	**V48M22T12CUEE**	9,480.
150	2@+2.5%	4@-2.5%	DT-3	150	46-5/8	28	23	870	1183	710	584	391	916A	282B	**WS19**	350.	**V48M22T49CUEE**	11,850.
225	2@+2.5%	4@-2.5%	DT-3	150	56-1/4	31-1/4	24-1/4	1200	1427	793	616	545	917	282B	**WS34**	800.	**V48M22T22CUEE**	17,380.
300	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	35-3/4	3100	1905	1129	908	1409	919	282B	**WS35**	1,360.	**V48M22T33CUEE**	21,900.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	35-3/4	3600	1905	1129	908	1636	920	291A	**WS35**	1,360.	**V48M22T55CUEE**	35,800.

① Refer to your local Cutler-Hammer sales office.

Note: Additional voltage combinations are available. Contact your local Cutler-Hammer sales office for assistance if the voltage you require is not included in this catalog.

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

Discount Symbol **DT-1**

Table 9-37. Single-Phase Selection Information — Type DS-3, 60 Hz Low Temperature Rise

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
240 x 480 Volts to 120/240 Volts																		
15	①	①	DS-3	80	30-1/4	16-7/8	15-7/8	147	768	428	402	67	FR816	3XA	**WS11**	350.	**T20P11B15**	1,980.
25	①	①	DS-3	80	31-1/4	22-5/8	17-1/2	212	793	574	445	96	FR817	3XA	**WS11**	350.	**T20P11B25**	2,560.
37.5	①	①	DS-3	80	37-5/8	22-5/8	19-1/2	306	953	574	495	139	FR818	3XA	**WS11**	350.	**T20P11B37**	3,125.
50	①	①	DS-3	80	37-5/8	22-5/8	19-1/2	340	953	574	495	154	FR819	3XA	**WS16**	800.	**T20P11B50**	3,790.
75	①	①	DS-3	80	42-1/8	24	23-3/8	510	1070	610	594	233	FR820	3XA	**WS16**	800.	**T20P11B75**	5,350.
100	2@+2.5%	4@-2.5%	DS-3	80	62-1/8	30	34	1150	1597	762	863	612	FR814	288A	**WS13**	800.	**T48M11B99A** ②	8,900.
15	①	①	DS-3	115	30-1/4	16-7/8	15-7/8	147	768	428	402	67	FR815	3XA	**WS15**	350.	**T20P11F15**	1,680.
25	①	①	DS-3	115	31-1/4	22-5/8	17-1/2	212	793	574	445	96	FR816	3XA	**WS11**	350.	**T20P11F25**	2,200.
37.5	①	①	DS-3	115	37-5/8	22-5/8	19-1/2	306	953	574	495	139	FR817	3XA	**WS11**	350.	**T20P11F37**	2,660.
50	①	①	DS-3	115	37-5/8	22-5/8	19-1/2	340	953	574	495	154	FR818	3XA	**WS11**	350.	**T20P11F50**	3,170.
75	①	①	DS-3	115	42-1/8	24	23-3/8	510	1070	610	594	233	FR819	3XA	**WS16**	800.	**T20P11F75**	4,520.
100	①	①	DS-3	115	42-1/8	24	23-3/8	600	1070	610	594	274	FR820	3XA	**WS16**	800.	**T20P11F99**	5,630.

① +1 – 5%, -2 – 5% at 240 volts primary; +2 – 2.5%, -4 – 2.5% at 480 volts primary.
② 480 volt primary only.

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

Discount Symbol **DT-1**

Table 9-38. Three-Phase Selection Information — Types EPT, DT-3, 60 Hz Low Temperature Rise

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
480 Δ Volts to 208Y/120 Volts																		
15	2@+2.5%	4@-2.5%	DT-3	80	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280B	**WS31**	350.	**V48M28B15A**	1,830.
30	2@+2.5%	4@-2.5%	DT-3	80	30-1/8	20-1/8	14-1/8	310	765	511	359	140	FR912A	280B	**WS31**	350.	**V48M28B30R**	2,350.
45	2@+2.5%	4@-2.5%	DT-3	80	39-3/8	26-1/8	19-1/8	480	1000	663	486	217	FR914B	280B	**WS33**	350.	**V48M28B45R**	2,860.
75	2@+2.5%	4@-2.5%	DT-3	80	39-3/8	26-1/8	19-1/8	600	1000	663	486	272	FR915B	280B	**WS33**	350.	**V48M28B75R**	4,040.
112.5	2@+2.5%	4@-2.5%	DT-3	80	46-1/8	28	23	820	1171	712	585	371	FR916A	280B	**WS19**	350.	**V48M28B12R**	5,850.
150	2@+2.5%	4@-2.5%	DT-3	80	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	280B	**WS34**	800.	**V48M28B49P**	7,350.
225	2@+2.5%	4@-2.5%	DT-3	80	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280B	**WS34**	800.	**V48M28B22P**	10,670.
300	2@+2.5%	4@-2.5%	DT-3	80	75	44-1/2	36	2400	1905	1130	914	1088	FR919	280B	**WS35**	1,360.	**V48M28B33R**	13,700.
500	2@+2.5%	4@-2.5%	DT-3	80	75	44-1/2	35-3/4	3000	1905	1131	908	1365	FR920	275A	**WS35**	1,360.	**V48M28B55R**	22,000.
750	—	—	—	—	—	—	—	—	—	—	—	—	—	—	**—**	—	**V48D28B77**	35,100.
1000	1@+4.2%	1@-4.2%	DT-3	80	①	①	①	①	①	①	①	①	①	①	①	—	**V48T28B11R** ②	65,100.
15	2@+2.5%	4@-2.5%	DT-3	115	25	20-1/8	14-1/8	152	635	511	359	69	FR909	280B	**WS31**	350.	**V48M28F15B**	1,570.
30	2@+2.5%	4@-2.5%	DT-3	115	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280B	**WS31**	350.	**V48M28F30R**	2,000.
45	2@+2.5%	4@-2.5%	DT-3	115	30-1/8	20-1/8	14-1/8	310	765	511	359	140	FR912A	280B	**WS31**	350.	**V48M28F45R**	2,440.
75	2@+2.5%	4@-2.5%	DT-3	115	39-3/8	26-1/8	19-1/8	480	1000	663	486	217	FR914B	280B	**WS33**	350.	**V48M28F75R**	3,450.
112.5	2@+2.5%	4@-2.5%	DT-3	115	39-3/8	26-1/8	19-1/8	600	1000	663	486	272	FR915B	280B	**WS19**	350.	**V48M28F12R**	4,950.
150	2@+2.5%	4@-2.5%	DT-3	115	46-1/8	28	23	760	1171	712	585	344	FR916A	280B	**WS33**	350.	**V48M28F49P**	6,250.
225	2@+2.5%	4@-2.5%	DT-3	115	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	280B	**WS34**	800.	**V48M28F22P**	9,100.
300	2@+2.5%	4@-2.5%	DT-3	115	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280B	**WS34**	800.	**V48M28F33P**	11,750.
500	2@+2.5%	4@-2.5%	DT-3	115	75	44-1/2	36	2400	1905	1130	914	1088	FR919	275A	**WS35**	1,360.	**V48M28F55P**	18,750.
750	1@+3.5%	1@-3.5%	DT-3	115	①	①	①	①	①	①	①	①	①	①	①	—	**V48W28F77T**	31,200.
1000	1@+4.2%	1@-4.2%	DT-3	115	①	①	①	①	①	①	①	①	①	①	①	—	**V48T28F11R** ②	55,550.
480 Δ Volts to 208Y/120 Volts, Copper Windings																		
9	2@+2.5%	2@-2.5%	EPT	80	17-3/8	19-11/16	10-7/16	300	441	499	265	136	FR95	72B	Indoor-	—	**Y48D28B09CU**	3,000.
															Outdoor	—	**—**	—
15	2@+2.5%	4@-2.5%	DT-3	80	30-1/8	20-1/8	14-1/8	300	765	511	359	136	FR910A	280B	**WS31**	350.	**V48M28B15CU**	2,700.
30	2@+2.5%	4@-2.5%	DT-3	80	30-1/8	20-1/8	14-1/8	370	765	511	359	168	FR912A	280B	**WS31**	350.	**V48M28B30CU**	3,100.
45	2@+2.5%	4@-2.5%	DT-3	80	39-3/8	26-1/8	19-1/8	550	1000	663	486	250	FR914B	280B	**WS33**	350.	**V48M28B45CU**	3,940.
75	2@+2.5%	4@-2.5%	DT-3	80	39-3/8	26-1/8	19-1/8	675	1000	663	486	307	FR915B	280B	**WS33**	350.	**V48M28B75CU**	5,970.
112.5	2@+2.5%	4@-2.5%	DT-3	80	46-1/8	28	20-3/16	850	1171	712	585	386	FR916A	280B	**WS19**	350.	**V48M28B12CU**	8,160.
150	2@+2.5%	4@-2.5%	DT-3	80	56	31-1/4	24-1/4	1200	1422	793	616	545	FR917	280B	**WS34**	800.	**V48M28B49CU**	11,150.
225	2@+2.5%	4@-2.5%	DT-3	80	62-1/4	31-1/4	30-1/4	2150	1581	794	768	977	FR918A	280B	**WS34**	800.	**V48M28B22CU**	14,900.
300	2@+2.5%	4@-2.5%	DT-3	80	75	44-1/2	36	3100	1905	1130	914	1409	FR919	280B	**WS35**	1,360.	**V48M28B33CU**	18,660.
500	2@+3.1%	2@-3.1%	DT-3	80	①	①	①	①	①	①	①	①	①	①	①	—	**V48M28B55CU**	33,700.
750	1@+3.5%	1@-3.5%	DT-3	80	①	①	①	①	①	①	①	①	①	①	①	—	**V48W28B77CU**	44,500.
15	2@+2.5%	4@-2.5%	DT-3	115	25	20-1/8	14-1/8	172	635	511	359	78	FR909	280B	**WS31**	350.	**V48M28F15CU**	2,300.
30	2@+2.5%	4@-2.5%	DT-3	115	30-1/8	20-1/8	14-1/8	300	765	511	359	136	FR910A	280B	**WS31**	350.	**V48M28F30CU**	2,740.
45	2@+2.5%	4@-2.5%	DT-3	115	30-1/8	20-1/8	14-1/8	370	765	511	359	168	FR912A	280B	**WS31**	350.	**V48M28F45CU**	3,350.
75	2@+2.5%	4@-2.5%	DT-3	115	39-3/8	26-1/8	19-1/8	550	1000	663	486	250	FR914B	280B	**WS33**	350.	**V48M28F75CU**	5,100.
112.5	2@+2.5%	4@-2.5%	DT-3	115	39-3/8	26-1/8	19-1/8	675	1000	663	486	307	FR915B	280B	**WS19**	350.	**V48M28F12CU**	6,960.
150	2@+2.5%	4@-2.5%	DT-3	115	46-1/8	28	23	850	1171	712	585	386	FR916A	280B	**WS33**	350.	**V48M28F49CU**	9,510.
225	2@+2.5%	4@-2.5%	DT-3	115	56	31-1/4	24-1/4	1200	1422	793	616	545	FR917	280B	**WS34**	800.	**V48M28F22CU**	12,690.
300	2@+2.5%	4@-2.5%	DT-3	115	62-1/4	31-1/4	30-1/4	2150	1581	794	768	977	FR918A	280B	**WS34**	800.	**V48M28F33CU**	16,000.
500	2@+2.5%	4@-2.5%	DT-3	115	75	44-1/2	36	3100	1905	1130	914	1409	FR919	275A	**WS35**	1,360.	**V48M28F55CU**	25,950.
750	1@+3.5%	1@-3.5%	DT-3	115	①	①	①	①	①	①	①	①	①	①	①	—	**V48W28F77CU**	39,500.
480 Δ Volts to 240 Δ Volts																		
30	2@+2.5%	4@-2.5%	DT-3	80	30-1/8	20-1/8	14-1/8	310	765	511	359	140	FR912A	281B	**WS31**	350.	**V48M24B30R**	2,700.
45	2@+2.5%	4@-2.5%	DT-3	80	39-3/8	26-1/8	19-1/8	480	1000	663	486	217	FR914B	281B	**WS33**	350.	**V48M24B45P**	3,400.
75	2@+2.5%	4@-2.5%	DT-3	80	39-3/8	26-1/8	19-1/8	600	1000	663	486	272	FR915B	281B	**WS33**	350.	**V48M24B75P**	4,630.
112.5	2@+2.5%	4@-2.5%	DT-3	80	46-1/8	28	23	760	1171	712	585	344	FR916A	281B	**WS19**	350.	**V48M24B12P**	6,660.
150	2@+2.5%	4@-2.5%	DT-3	80	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	281B	**WS34**	800.	**V48M24B49P**	9,250.
225	2@+2.5%	4@-2.5%	DT-3	80	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	281B	**WS34**	800.	**V48M24B22P**	12,300.
300	2@+2.5%	4@-2.5%	DT-3	80	75	44-1/2	36	2400	1905	1130	914	1088	FR919	281B	**WS35**	1,360.	**V48M24B33P**	15,525.
500	2@+3.1%	2@-3.1%	DT-3	80	①	①	①	①	①	①	①	①	①	①	①	—	**V48X24B55N**	26,400.
30	2@+2.5%	4@-2.5%	DT-3	115	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	281B	**WS31**	350.	**V48M24F30P**	2,300.
45	2@+2.5%	4@-2.5%	DT-3	115	30-1/8	20-1/8	14-1/8	310	765	511	359	140	FR912A	281B	**WS31**	350.	**V48M24F45P**	2,900.
75	2@+2.5%	4@-2.5%	DT-3	115	39-3/8	26-1/8	19-1/8	480	1000	663	486	217	FR914B	281B	**WS33**	350.	**V48M24F75P**	3,950.
112.5	2@+2.5%	4@-2.5%	DT-3	115	39-3/8	26-1/8	19-1/8	600	1000	663	486	272	FR915B	281B	**WS19**	350.	**V48M24F12P**	5,640.
150	2@+2.5%	4@-2.5%	DT-3	115	46-1/8	28	23	760	1171	712	585	344	FR916A	281B	**WS33**	350.	**V48M24F49P**	7,140.
225	2@+2.5%	4@-2.5%	DT-3	115	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	281B	**WS34**	800.	**V48M24F22P**	10,470.
300	2@+2.5%	4@-2.5%	DT-3	115	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	281B	**WS34**	800.	**V48M24F33P**	13,225.
500	2@+2.5%	4@-2.5%	DT-3	115	75	44-1/2	36	2400	1905	1130	914	1088	FR919	274B	**WS35**	1,360.	**V48M24F55N**	21,050.
750	1@+3.5%	1@-3.5%	DT-3	115	①	①	①	①	①	①	①	①	①	①	①	—	**V48W24F77N**	37,450.

① Refer to your Cutler-Hammer sales office.

② No UL label. Contact your local Cutler-Hammer sales office if UL label is required.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Energy Efficient Harmonic Mitigating Transformers

Product Description

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 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 – 300 kVA, up to 600 volts primary.

Application Description

Eaton's Cutler-Hammer harmonic mitigating transformers are available in three phase-shift configurations. Type NON is 0° phase-shift; Type NEG is -15°; and Type POS is +15° phase-shift. The harmonic profile of a specific load will determine which of these transformers, or combination of transformers, is best suited for a particular application. As with any method of treating harmonics, the load profile needs to be known.

Type NON harmonic mitigating transformers are ideally suited for applications where the nonlinear loads are single-phase. Such devices as computers, lighting ballasts, office equipment, diagnostic equipment, cash registers, and other electronic equipment are all common single-phase loads that generate harmonic currents. Single-phase loads, such as those previously mentioned, generate harmonic profiles that are rich in 3rd and other triplen (9th, 15th, 21st, …) harmonic currents. Type NON harmonic mitigating transformers treat triplen harmonics in the secondary windings such that these harmonics are not coupled into the primary delta.

In addition to treating triplen harmonics, Types POS and NEG harmonic mitigating transformers may be used in pairs to treat 5th, 7th, and higher order harmonics commonly generated by three-phase loads. As with Type NON transformers, POS and NEG treat triplen harmonics in the secondary of each transformer. 5th, 7th and other higher order harmonics pass through the transformers and are canceled in the common bus that feeds the pair of transformers. It is not necessary for the POS and NEG transformers to be located in the same room to achieve harmonic treatment. In order to attain maximum harmonic treatment, every effort should be made to balance the nonlinear loads phase-to-phase as well as between multiple transformers.

Features and Benefits

- 480 volt delta to 208Y/120 volt standard. Additional voltage combinations available.
- 150°C, 115°C, or 80°C temperature rise available.
- Copper windings and terminals standard.
- NEMA TP-1 energy efficient and labeled.
- 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.
- Low zero sequence impedance and zero sequence reactance.
- 220°C insulation system.
- Third party tested for harmonic performance and energy efficiency.
- Meets NEMA ST-20 sound standards.

Standards and Certifications

Industry Standards

All Cutler-Hammer dry-type transformers by Eaton Corporation are built and tested in accordance with applicable NEMA, ANSI, and IEEE Standards. Harmonic Mitigating Transformers are UL listed.

Seismic Qualified

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

Options and Accessories

Harmonic mitigating transformers are available with the same options and accessories as general purpose ventilated transformers. Please refer to **Page 9-120**.

Product Specifications

Frequency

Cutler-Hammer standard 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:

Table 9-39. 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, Types DS-3 and DT-3 utilize a NEMA 2 rated (drip-proof) enclosure as a standard, and are rated NEMA 3R with the addition of weathershields. Cutler-Hammer encapsulated transformers, Types EP and 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 9-40. Average Sound Levels

NEMA ST-20 Average Sound Level (dB)		
kVA	Ventilated	Encapsulated
0 – 9	40	45
10 – 50	45	50
51 – 150	50	55
151 – 300	55	57
301 – 500	60	59
501 – 700	62	61
701 – 1000	64	63
1001 – 1500	65	64

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Table 9-41. Type NON Harmonic Mitigating Transformer Selection Information

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
480 Δ Volts to 208Y/120 Volts, Shielded, Copper Windings, NEMA TP-1 Energy Efficient, 0-Degree Phase-shift																		
15	2@+2.5%	4@-2.5%	DT-3	150	30	20-1/4	14-1/4	320	762	514	362	145	910A	200X	**WS31**	350.	**X48M28T15CUEENON**	6,070.
30	2@+2.5%	4@-2.5%	DT-3	150	30	20-1/4	14-1/4	420	762	514	362	191	912A	200X	**WS31**	350.	**X48M28T30CUEENON**	7,430.
45	2@+2.5%	4@-2.5%	DT-3	150	39-1/4	26-1/4	19-1/4	650	997	667	489	295	914B	200X	**WS33**	350.	**X48M28T45CUEENON**	9,100.
75	2@+2.5%	4@-2.5%	DT-3	150	46-5/8	28	23	850	1184	711	584	386	916A	200X	**WS19**	350.	**X48M28T75CUEENON**	11,710.
112.5	2@+2.5%	4@-2.5%	DT-3	150	56-1/4	31-1/4	24-1/4	2000	1429	794	616	909	917	200X	**WS34**	800.	**X48M28T12CUEENON**	15,450.
150	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	2170	1581	794	768	986	918A	200X	**WS34**	800.	**X48M28T49CUEENON**	21,400.
225	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	35-3/4	3100	1905	1130	908	1409	919	201X	**WS35**	1,360.	**X48M28T22CUEENON**	26,250.
300	2@+2.5%	2@-2.5%	DT-3	150	75	44-1/2	35-3/4	3300	1905	1130	908	1500	919	201X	**WS35**	1,360.	**X48M28T33CUEENON**	36,300.
15	2@+2.5%	4@-2.5%	DT-3	115	30	20-1/4	14-1/4	320	762	514	362	145	910A	200X	**WS31**	350.	**X48M28F15CUEENON**	6,620.
30	2@+2.5%	4@-2.5%	DT-3	115	30	20-1/4	14-1/4	420	762	514	362	191	912A	200X	**WS31**	350.	**X48M28F30CUEENON**	8,110.
45	2@+2.5%	4@-2.5%	DT-3	115	39-1/4	26-1/4	19-1/4	650	997	667	489	295	914B	200X	**WS33**	350.	**X48M28F45CUEENON**	9,930.
75	2@+2.5%	4@-2.5%	DT-3	115	46-5/8	28	23	850	1184	711	584	386	916A	200X	**WS19**	350.	**X48M28F75CUEENON**	12,770.
112.5	2@+2.5%	4@-2.5%	DT-3	115	56-1/4	31-1/4	24-1/4	2000	1429	794	616	909	917	200X	**WS34**	800.	**X48M28F12CUEENON**	16,850.
150	2@+2.5%	4@-2.5%	DT-3	115	62-1/4	31-1/4	30-1/4	2170	1581	794	768	986	918A	200X	**WS34**	800.	**X48M28F49CUEENON**	23,330.
225	2@+2.5%	4@-2.5%	DT-3	115	75	44-1/2	35-3/4	3100	1905	1130	908	1409	919	201X	**WS35**	1,360.	**X48M28F22CUEENON**	28,700.
300	2@+2.5%	4@-2.5%	DT-3	115	75	44-1/2	35-3/4	3300	1905	1130	908	1500	919	201X	**WS35**	1,360.	**X48M28F33CUEENON**	39,500.

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

Discount Symbol **DT-1**

Table 9-42. Type POS Harmonic Mitigating Transformer Selection Information

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
480 Δ Volts to 208Y/120 Volts. No Thermal Sensor, Shielded, Copper Windings, NEMA TP-1 Energy Efficient, +15-Degree Phase-shift																		
15	2@+2.5%	4@-2.5%	DT-3	150	30	20-1/4	14-1/4	320	762	514	362	145	910A	200X	**WS31**	350.	**X48M28T15CUEEPOS**	8,060.
30	2@+2.5%	4@-2.5%	DT-3	150	30	20-1/4	14-1/4	420	762	514	362	191	912A	200X	**WS31**	350.	**X48M28T30CUEEPOS**	9,085.
45	2@+2.5%	4@-2.5%	DT-3	150	39-1/4	26-1/4	19-1/4	650	997	667	489	295	914B	200X	**WS33**	350.	**X48M28T45CUEEPOS**	12,030.
75	2@+2.5%	4@-2.5%	DT-3	150	46-5/8	28	23	850	1184	711	584	386	916A	200X	**WS19**	350.	**X48M28T75CUEEPOS**	14,890.
112.5	2@+2.5%	4@-2.5%	DT-3	150	56-1/4	31-1/4	24-1/4	2000	1429	794	616	909	917	200X	**WS34**	800.	**X48M28T12CUEEPOS**	20,160.
150	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	2170	1581	794	768	986	918A	200X	**WS34**	800.	**X48M28T49CUEEPOS**	28,500.
225	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	35-3/4	3100	1905	1130	908	1409	919	201X	**WS35**	1,360.	**X48M28T22CUEEPOS**	33,300.
300	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	35-3/4	3300	1905	1130	908	1500	919	201X	**WS35**	1,360.	**X48M28T33CUEEPOS**	37,900.
15	2@+2.5%	4@-2.5%	DT-3	115	30	20-1/4	14-1/4	320	762	514	362	145	910A	200X	**WS31**	350.	**X48M28F15CUEEPOS**	8,770.
30	2@+2.5%	4@-2.5%	DT-3	115	30	20-1/4	14-1/4	420	762	514	362	191	912A	200X	**WS31**	350.	**X48M28F30CUEEPOS**	9,900.
45	2@+2.5%	4@-2.5%	DT-3	115	39-1/4	26-1/4	19-1/4	650	997	667	489	295	914B	200X	**WS33**	350.	**X48M28F45CUEEPOS**	13,100.
75	2@+2.5%	4@-2.5%	DT-3	115	46-5/8	28	23	850	1184	711	584	386	916A	200X	**WS19**	350.	**X48M28F75CUEEPOS**	16,200.
112.5	2@+2.5%	4@-2.5%	DT-3	115	56-1/4	31-1/4	24-1/4	2000	1429	794	616	909	917	200X	**WS34**	800.	**X48M28F12CUEEPOS**	21,900.
150	2@+2.5%	4@-2.5%	DT-3	115	62-1/4	31-1/4	30-1/4	2170	1581	794	768	986	918A	200X	**WS34**	800.	**X48M28F49CUEEPOS**	31,000.
225	2@+2.5%	4@-2.5%	DT-3	115	75	44-1/2	35-3/4	3100	1905	1130	908	1409	919	201X	**WS35**	1,360.	**X48M28F22CUEEPOS**	34,900.
300	2@+2.5%	4@-2.5%	DT-3	115	75	44-1/2	35-3/4	3300	1905	1130	908	1500	919	201X	**WS35**	1,360.	**X48M28F33CUEEPOS**	39,900.
480 Δ Volts to 208Y/120 Volts. Single Thermal Sensor Included, Shielded, Copper Windings, NEMA TP-1 Energy Efficient, +15-Degree Phase-shift																		
15	2@+2.5%	4@-2.5%	DT-3	115	30	20-1/4	14-1/4	320	762	514	362	145	910A	200X	**WS31**	350.	**X48M28F15TCUEEPOS**	8,790.
30	2@+2.5%	4@-2.5%	DT-3	115	30	20-1/4	14-1/4	420	762	514	362	191	912A	200X	**WS31**	350.	**X48M28F30TCUEEPOS**	9,920.
45	2@+2.5%	4@-2.5%	DT-3	115	39-1/4	26-1/4	19-1/4	650	997	667	489	295	914B	200X	**WS33**	350.	**X48M28F45TCUEEPOS**	13,120.
75	2@+2.5%	4@-2.5%	DT-3	115	46-5/8	28	23	850	1184	711	584	386	916A	200X	**WS19**	350.	**X48M28F75TCUEEPOS**	16,250.
112.5	2@+2.5%	4@-2.5%	DT-3	115	56-1/4	31-1/4	24-1/4	2000	1429	794	616	909	917	200X	**WS34**	800.	**X48M28F12TCUEEPOS**	22,000.
150	2@+2.5%	4@-2.5%	DT-3	115	62-1/4	31-1/4	30-1/4	2170	1581	794	768	986	918A	200X	**WS34**	800.	**X48M28F49TCUEEPOS**	31,100.
225	2@+2.5%	4@-2.5%	DT-3	115	75	44-1/2	35-3/4	3100	1905	1130	908	1409	919	201X	**WS35**	1,360.	**X48M28F22TCUEEPOS**	35,000.
300	2@+2.5%	4@-2.5%	DT-3	115	75	44-1/2	35-3/4	3300	1905	1130	908	1500	919	201X	**WS35**	1,360.	**X48M28F33TCUEEPOS**	43,000.

Table 9-43. Type NEG Harmonic Mitigating Transformer Selection Information

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
480 Δ Volts to 208Y/120 Volts. No Thermal Sensor, Shielded, Copper Windings, NEMA TP-1 Energy Efficient, -15-Degree Phase-shift																		
15	2@+2.5%	4@-2.5%	DT-3	150	30	20-1/4	14-1/4	320	762	514	362	145	910A	200X	**WS31**	350.	**X48M28T15CUEENEG**	8,060.
30	2@+2.5%	4@-2.5%	DT-3	150	30	20-1/4	14-1/4	420	762	514	362	191	912A	200X	**WS31**	350.	**X48M28T30CUEENEG**	9,085.
45	2@+2.5%	4@-2.5%	DT-3	150	39-1/4	26-1/4	19-1/4	650	997	667	489	295	914B	200X	**WS33**	350.	**X48M28T45CUEENEG**	12,030.
75	2@+2.5%	4@-2.5%	DT-3	150	46-5/8	28	23	850	1184	711	584	386	916A	200X	**WS19**	350.	**X48M28T75CUEENEG**	14,890.
112.5	2@+2.5%	4@-2.5%	DT-3	150	56-1/4	31-1/4	24-1/4	2000	1429	794	616	909	917	200X	**WS34**	800.	**X48M28T12CUEENEG**	20,160.
150	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	2170	1581	794	768	986	918A	200X	**WS34**	800.	**X48M28T49CUEENEG**	28,500.
225	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	35-3/4	3100	1905	1130	908	1409	919	201X	**WS35**	1,360.	**X48M28T22CUEENEG**	33,300.
300	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	35-3/4	3300	1905	1130	908	1500	919	201X	**WS35**	1,360.	**X48M28T33CUEENEG**	37,900.
15	2@+2.5%	4@-2.5%	DT-3	115	30	20-1/4	14-1/4	320	762	514	362	145	910A	200X	**WS31**	350.	**X48M28F15CUEENEG**	8,770.
30	2@+2.5%	4@-2.5%	DT-3	115	30	20-1/4	14-1/4	420	762	514	362	191	912A	200X	**WS31**	350.	**X48M28F30CUEENEG**	9,900.
45	2@+2.5%	4@-2.5%	DT-3	115	39-1/4	26-1/4	19-1/4	650	997	667	489	295	914B	200X	**WS33**	350.	**X48M28F45CUEENEG**	13,100.
75	2@+2.5%	4@-2.5%	DT-3	115	46-5/8	28	23	850	1184	711	584	386	916A	200X	**WS19**	350.	**X48M28F75CUEENEG**	16,200.
112.5	2@+2.5%	4@-2.5%	DT-3	115	56-1/4	31-1/4	24-1/4	2000	1429	794	616	909	917	200X	**WS34**	800.	**X48M28F12CUEENEG**	21,900.
150	2@+2.5%	4@-2.5%	DT-3	115	62-1/4	31-1/4	30-1/4	2170	1581	794	768	986	918A	200X	**WS34**	800.	**X48M28F49CUEENEG**	31,000.
225	2@+2.5%	4@-2.5%	DT-3	115	75	44-1/2	35-3/4	3100	1905	1130	908	1409	919	201X	**WS35**	1,360.	**X48M28F22CUEENEG**	34,900.
300	2@+2.5%	4@-2.5%	DT-3	115	75	44-1/2	35-3/4	3300	1905	1130	908	1500	919	201X	**WS35**	1,360.	**X48M28F33CUEENEG**	39,900.
480 Δ Volts to 208Y/120 Volts. Single Thermal Sensor Included, Shielded, Copper windings, NEMA TP-1 Energy Efficient, -15-Degree Phase-shift																		
15	2@+2.5%	4@-2.5%	DT-3	115	30	20-1/4	14-1/4	320	762	514	362	145	910A	200X	**WS31**	350.	**X48M28F15TCUEENEG**	8,790.
30	2@+2.5%	4@-2.5%	DT-3	115	30	20-1/4	14-1/4	420	762	514	362	191	912A	200X	**WS31**	350.	**X48M28F30TCUEENEG**	9,920.
45	2@+2.5%	4@-2.5%	DT-3	115	39-1/4	26-1/4	19-1/4	650	997	667	489	295	914B	200X	**WS33**	350.	**X48M28F45TCUEENEG**	13,120.
75	2@+2.5%	4@-2.5%	DT-3	115	46-5/8	28	23	850	1184	711	584	386	916A	200X	**WS19**	350.	**X48M28F75TCUEENEG**	16,250.
112.5	2@+2.5%	4@-2.5%	DT-3	115	56-1/4	31-1/4	24-1/4	2000	1429	794	616	909	917	200X	**WS34**	800.	**X48M28F12TCUEENEG**	22,000.
150	2@+2.5%	4@-2.5%	DT-3	115	62-1/4	31-1/4	30-1/4	2170	1581	794	768	986	918A	200X	**WS34**	800.	**X48M28F49TCUEENEG**	31,100.
225	2@+2.5%	4@-2.5%	DT-3	115	75	44-1/2	35-3/4	3100	1905	1130	908	1409	919	201X	**WS35**	1,360.	**X48M28F22TCUEENEG**	35,000.
300	2@+2.5%	4@-2.5%	DT-3	115	75	44-1/2	35-3/4	3300	1905	1130	908	1500	919	201X	**WS35**	1,360.	**X48M28F33TCUEENEG**	43,000.

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

Discount Symbol **DT-1**

K Factor Transformers

Single- and Three-Phase, Type KT, 60 Hz, for Nonlinear Loads

Type KT

Product Description

- Suitable for indoor or outdoor applications (with weathershield).
- Ventilated enclosures.
- 220°C Insulation system, 150°C Rise standard (self extinguishing).

Application Description

Cutler-Hammer KT Transformers by Eaton Corporation include several major design improvements that address the problems caused by non-linear loads and harmonics. They are designed to withstand the effects of harmonic currents without exceeding the temperature rating of the insulation system. The KT design compensates for the stresses on a transformer's winding insulation which prevents insulation breakdown and premature failure. The net result is longer transformer life.

Design Features

Core

A high grade, nonaging, silicon steel with high magnetic permeability provides reduced core induction levels, preventing saturation as a result of the higher frequency harmonics and resultant peak voltages. In a core approaching saturation, the current in the coil will increase as voltage drops because the core cannot absorb the additional magnetic flux. This core also provides reduced eddy currents or induced currents in the steel caused by the high ratios of peak-to-rms currents and voltages found in harmonic loads.

Coils

Windings are continuous wound aluminum or optional copper construction sized and configured to reduce overheating caused by harmonic currents. These coils reduce skin and proximity effect losses which occur when current carrying conductors next to each other and coiled around steel generate magnetic fields. These magnetic fields push the currents in the conductors away from each other causing increased losses and additional heating.

Neutral Bus

The neutral bus is sized and configured to accommodate at least 200% of the rated current. This compensates for the increased neutral currents found in non-linear loads thus reducing heat.

The K Factor

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.

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 relation-ship, 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.

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

Ih = 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 a Cutler-Hammer 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 since non-linear 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 diodecapacitor

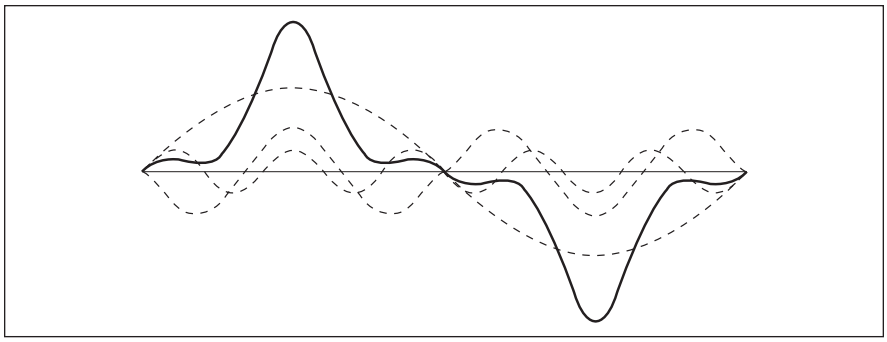

Figure 9-1. Harmonic currents found in non-linear loads cause wave shape distortion and create added stresses on transformers.

power supplies convert ac line voltage to low voltage dc. This process accomplished by charging capacitors during each line cycle with narrow pulses 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.

Features, Benefits and Functions

- 600 volt class standard.
- Three-phase, 480Δ – 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.
- 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, K40, K50 optional.
- Low sound level (-3 dB, -5 dB) available as options.

Standards and Certifications

Industry Standards

All Cutler-Hammer dry-type distribution and control transformers by Eaton Corporation 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

Cutler-Hammer manufactured 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 9-120**.

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.

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Table 9-44. 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 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 Eaton's Cutler-Hammer business.

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 KT, utilize a NEMA 2 rated (drip-proof) enclosure as standard, and are rated NEMA 3R with the addition of weathershields.

Sound Levels

All Cutler-Hammer 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.

Table 9-45. Average Sound Levels

NEMA ST-20 Average Sound Level (dB)		
kVA	Ventilated	Encapsulated
0 – 9	40	45
10 – 50	45	50
51 – 150	50	55
151 – 300	55	57
301 – 500	60	59
501 – 700	62	61
701 – 1000	64	63
1001 – 1500	65	64

Winding Terminations

Primary and secondary windings are terminated in the wiring compartment. 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.** The Cutler-Hammer business recommends external cables be rated 75°C for ventilated designs.

Technical Data and Specifications

Please refer to **Page 9-122**.

Product Selection

Additional Product Selection information begins on **Page 9-136**.

Table 9-46. Single Phase Selection Information — Type KS-4 — Transformers for Non-Sinusoidal Current Loads with K Factor Up to 4

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
240 x 480 Volts to 120/240 Volts, Aluminum Windings																		
15	①	①	KS-4	150	31-1/4	22-5/8	17-1/2	147	768	428	402	67	815	261A	**WS15**	350.	**HT20P11S15**	1,970.
25	①	①	KS-4	150	31-1/4	22-5/8	17-1/2	212	768	428	402	96	816	261A	**WS11**	350.	**HT20P11S25**	2,655.
37.5	①	①	KS-4	150	37-5/8	22-5/8	19-1/2	306	956	574	495	139	817	261A	**WS11**	350.	**HT20P11S37**	3,240.
50	①	①	KS-4	150	37-5/8	22-5/8	19-1/2	340	956	574	495	154	818	261A	**WS11**	350.	**HT20P11S50**	3,830.
75	①	①	KS-4	150	42-1/8	24	23-3/8	510	1070	610	594	232	819	261A	**WS16**	800.	**HT20P11S75**	5,560.
100	①	①	KS-4	150	42-1/8	24	23-3/8	600	1070	610	594	272	820	261A	**WS16**	800.	**HT20P11S99**	6,910.
15	①	①	KS-4	115	30-1/4	16-7/8	15-7/8	147	768	428	402	67	815	261A	**WS15**	350.	**HT20P11F15**	2,305.
25	①	①	KS-4	115	31-1/4	22-5/8	17-1/2	212	768	428	402	67	816	261A	**WS11**	350.	**HT20P11F25**	3,040.
37.5	①	①	KS-4	115	37-5/8	22-5/8	19-1/2	306	956	574	495	139	817	261A	**WS11**	350.	**HT20P11F37**	3,740.
50	①	①	KS-4	115	37-5/8	22-5/8	19-1/2	340	956	574	495	154	818	261A	**WS11**	350.	**HT20P11F50**	4,450.
75	①	①	KS-4	115	42-1/8	24	23-3/8	600	1070	610	594	272	820	261A	**WS16**	800.	**HT20P11F75**	6,495.
15	①	①	KS-4	80	31-1/4	22-5/8	17-1/2	212	768	428	402	67	816	261A	**WS11**	350.	**HT20P11B15**	2,680.
25	①	①	KS-4	80	37-5/8	22-5/8	19-1/2	306	956	574	495	139	817	261A	**WS11**	350.	**HT20P11B25**	3,600.
37.5	①	①	KS-4	80	37-5/8	22-5/8	19-1/2	340	956	574	495	154	818	261A	**WS11**	350.	**HT20P11B37**	4,435.
50	①	①	KS-4	80	42-1/8	24	23-3/8	510	1070	610	594	232	819	261A	**WS16**	800.	**HT20P11B50**	5,210.
75	①	①	KS-4	80	42-1/8	24	23-3/8	600	1070	610	594	272	820	261A	**WS16**	800.	**HT20P11B75**	7,580.
240 x 480 Volts to 120/240 Volts, Copper Windings																		
15	①	①	KS-4	150	30-1/4	16-7/8	15-7/8	165	768	428	402	75	815	261A	**WS15**	350.	**HT20P11S15CU**	2,760.
25	①	①	KS-4	150	31-1/4	22-5/8	17-1/2	237	768	428	402	108	816	261A	**WS11**	350.	**HT20P11S25CU**	3,720.
37.5	①	①	KS-4	150	37-5/8	22-5/8	19-1/2	345	956	574	495	158	817	261A	**WS11**	350.	**HT20P11S37CU**	4,540.
50	①	①	KS-4	150	37-5/8	22-5/8	19-1/2	381	956	574	495	173	818	261A	**WS11**	350.	**HT20P11S50CU**	5,365.
75	①	①	KS-4	150	42-1/8	24	23-3/8	614	1070	610	594	279	819	261A	**WS16**	800.	**HT20P11S75CU**	7,785.
100	①	①	KS-4	150	42-1/8	24	23-3/8	700	1070	610	594	318	820	261A	**WS16**	800.	**HT20P11S99CU**	9,680.
15	①	①	KS-4	115	30-1/4	16-7/8	15-7/8	165	768	428	402	75	815	261A	**WS15**	350.	**HT20P11F15CU**	3,230.
25	①	①	KS-4	115	31-1/4	22-5/8	17-1/2	237	768	428	402	108	816	261A	**WS11**	350.	**HT20P11F25CU**	4,260.
37.5	①	①	KS-4	115	37-5/8	22-5/8	19-1/2	345	956	574	495	158	817	261A	**WS11**	350.	**HT20P11F37CU**	5,240.
50	①	①	KS-4	115	37-5/8	22-5/8	19-1/2	381	956	574	495	173	818	261A	**WS11**	350.	**HT20P11F50CU**	6,230.
75	①	①	KS-4	115	42-1/8	24	23-3/8	700	1070	610	594	318	820	261A	**WS16**	800.	**HT20P11F75CU**	9,095.
15	①	①	KS-4	80	31-1/4	22-5/8	17-1/2	237	768	428	402	108	816	261A	**WS11**	350.	**HT20P11B15CU**	3,750.
25	①	①	KS-4	80	37-5/8	22-5/8	19-1/2	345	956	574	495	158	817	261A	**WS11**	350.	**HT20P11B25CU**	5,045.
37.5	①	①	KS-4	80	37-5/8	22-5/8	19-1/2	381	956	574	495	173	818	261A	**WS11**	350.	**HT20P11B37CU**	6,210.
50	①	①	KS-4	80	42-1/8	24	23-3/8	614	1070	610	594	279	819	261A	**WS16**	800.	**HT20P11B50CU**	7,300.
75	①	①	KS-4	80	42-1/8	24	23-3/8	700	1070	610	594	318	820	261A	**WS16**	800.	**HT20P11B75CU**	10,615.

① 1@ +5%, 2@ -5% at 240 volt primary; 2@ +2.5%, 4@ -2.5% at 480 volt primary.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Table 9-47. Single Phase Selection Information — Type KS-13 — Transformers for Non-Sinusoidal Current Loads with K Factor Up to 13

kVA	Full Cap. Taps		Type	°C	Dimensions (Inches)			Wt.	Dimensions (mm)			Wt.	Frame	Wiring	Weathershield		Style	Price
	FCAN	FCBN		Temp. Rise	H	W	D	Lbs.	H	W	D	kg		Diagram Number	Catalog Number	Price U.S. $	Number	U.S. $
240 x 480 Volts to 120/240 Volts, Aluminum Windings																		
15	①	①	KS-13	150	30-1/4	16-7/8	15-7/8	147	768	428	402	67	815	261A	**WS15**	350.	**NT20P11S15**	2,620.
25	①	①	KS-13	150	37-5/8	22-5/8	19-1/2	306	956	574	495	139	817	261A	**WS11**	350.	**NT20P11S25**	3,520.
37.5	①	①	KS-13	150	37-5/8	22-5/8	19-1/2	340	956	574	495	154	818	261A	**WS11**	350.	**NT20P11S37**	4,320.
50	①	①	KS-13	150	42-1/8	24	23-3/8	510	1070	610	594	232	819	261A	**WS16**	800.	**NT20P11S50**	5,100.
75	①	①	KS-13	150	42-1/8	24	23-3/8	600	1070	610	594	272	820	261A	**WS16**	800.	**NT20P11S75**	7,400.
15	①	①	KS-13	115	31-1/4	22-5/8	17-1/2	212	768	428	402	67	816	261A	**WS11**	350.	**NT20P11F15**	3,060.
25	①	①	KS-13	115	37-5/8	22-5/8	19-1/2	306	956	574	495	139	817	261A	**WS11**	350.	**NT20P11F25**	4,050.
37.5	①	①	KS-13	115	37-5/8	22-5/8	19-1/2	340	956	574	495	154	818	261A	**WS11**	350.	**NT20P11F37**	4,980.
50	①	①	KS-13	115	42-1/8	24	23-3/8	510	1070	610	594	232	819	261A	**WS16**	800.	**NT20P11F50**	5,920.
75	①	①	KS-13	115	42-1/8	24	23-3/8	600	1070	610	594	272	820	261A	**WS16**	800.	**NT20P11F75**	8,660.
15	①	①	KS-13	80	31-1/4	22-5/8	17-1/2	212	768	428	402	67	816	261A	**WS11**	350.	**NT20P11B15**	3,560.
25	①	①	KS-13	80	37-5/8	22-5/8	19-1/2	306	956	574	495	139	817	261A	**WS11**	350.	**NT20P11B25**	4,800.
37.5	①	①	KS-13	80	37-5/8	22-5/8	19-1/2	340	956	574	495	154	818	261A	**WS11**	350.	**NT20P11B37**	5,900.
50	①	①	KS-13	80	42-1/8	24	23-3/8	510	1070	610	594	232	819	261A	**WS16**	800.	**NT20P11B50**	6,940.
75	①	①	KS-13	80	42-1/8	24	23-3/8	600	1070	610	594	272	820	261A	**WS16**	800.	**NT20P11B75**	10,100.
240 x 480 Volts to 120/240 Volts, Copper Windings																		
15	①	①	KS-13	150	30-1/4	16-7/8	15-7/8	165	768	428	402	75	815	261A	**WS15**	350.	**NT20P11S15CU**	3,670.
25	①	①	KS-13	150	37-5/8	22-5/8	19-1/2	345	956	574	495	158	817	261A	**WS11**	350.	**NT20P11S25CU**	4,930.
37.5	①	①	KS-13	150	37-5/8	22-5/8	19-1/2	381	956	574	495	173	818	261A	**WS11**	350.	**NT20P11S37CU**	6,050.
50	①	①	KS-13	150	42-1/8	24	23-3/8	614	1070	610	594	279	819	261A	**WS16**	800.	**NT20P11S50CU**	7,140.
75	①	①	KS-13	150	42-1/8	24	23-3/8	700	1070	610	594	318	820	261A	**WS16**	800.	**NT20P11S75CU**	10,360.
15	①	①	KS-13	115	31-1/4	22-5/8	17-1/2	237	768	428	402	108	816	261A	**WS11**	350.	**NT20P11F15CU**	4,285.
25	①	①	KS-13	115	37-5/8	22-5/8	19-1/2	345	956	574	495	158	817	261A	**WS11**	350.	**NT20P11F25CU**	5,670.
37.5	①	①	KS-13	115	37-5/8	22-5/8	19-1/2	381	956	574	495	173	818	261A	**WS11**	350.	**NT20P11F37CU**	6,975.
50	①	①	KS-13	115	42-1/8	24	23-3/8	614	1070	610	594	279	819	261A	**WS16**	800.	**NT20P11F50CU**	8,290.
75	①	①	KS-13	115	42-1/8	24	23-3/8	700	1070	610	594	318	820	261A	**WS16**	800.	**NT20P11F75CU**	12,125.
15	①	①	KS-13	80	31-1/4	22-5/8	17-1/2	237	768	428	402	108	816	261A	**WS11**	350.	**NT20P11B15CU**	4,985.
25	①	①	KS-13	80	37-5/8	22-5/8	19-1/2	345	956	574	495	158	817	261A	**WS11**	350.	**NT20P11B25CU**	6,720.
37.5	①	①	KS-13	80	37-5/8	22-5/8	19-1/2	381	956	574	495	173	818	261A	**WS11**	350.	**NT20P11B37CU**	8,260.
50	①	①	KS-13	80	42-1/8	24	23-3/8	614	1070	610	594	279	819	261A	**WS16**	800.	**NT20P11B50CU**	9,720.
75	①	①	KS-13	80	42-1/8	24	23-3/8	700	1070	610	594	318	820	261A	**WS16**	800.	**NT20P11B75CU**	14,140.

① 1@ +5%, 2@ -5% at 240 volt primary; 2@ +2.5%, 4@ -2.5% at 480 volt primary.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Table 9-48. Type KT-4 — Transformers for Non-Sinusoidal Current Loads with K Factor Up to 4

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
480 Δ Volts to 208Y/120 Volts																		
15	2@+2.5%	4@-2.5%	KT	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283B	**WS31**	350.	**H48M28T15A**	1,850.
30	2@+2.5%	4@-2.5%	KT	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283B	**WS31**	350.	**H48M28T30A**	2,570.
45	2@+2.5%	4@-2.5%	KT	150	30-1/8	20-1/8	14-1/8	310	765	511	359	140	FR912A	283B	**WS31**	350.	**H48M28T45A**	3,090.
75	2@+2.5%	4@-2.5%	KT	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	283B	**WS33**	350.	**H48M28T75A**	4,360.
112.5	2@+2.5%	4@-2.5%	KT	150	39-3/8	26-1/8	19-1/8	600	1000	663	485	272	FR915B	283B	**WS33**	350.	**H48M28T12A**	5,975.
150	2@+2.5%	4@-2.5%	KT	150	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	283B	**WS34**	800.	**H48M28T49A**	8,015.
225	2@+2.5%	4@-2.5%	KT	150	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	283B	**WS34**	800.	**H48M28T22A**	11,910.
300	2@+2.5%	4@-2.5%	KT	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	292A	**WS35**	1,360.	**H48M28T33B**	16,330.
500	2@+2.5%	4@-2.5%	KT	150	75	44-1/2	36	2800	1905	1130	914	1270	FR919	292A	**WS35**	1,360.	**H48M28T55A**	25,060.
15	2@+2.5%	4@-2.5%	KT	115	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283B	**WS31**	350.	**H48M28F15A**	2,040.
30	2@+2.5%	4@-2.5%	KT	115	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283B	**WS31**	350.	**H48M28F30A**	2,820.
45	2@+2.5%	4@-2.5%	KT	115	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	283B	**WS33**	350.	**H48M28F45A**	3,400.
75	2@+2.5%	4@-2.5%	KT	115	39-3/8	26-1/8	19-1/8	600	1000	663	485	272	FR915B	283B	**WS33**	350.	**H48M28F75A**	4,690.
112.5	2@+2.5%	4@-2.5%	KT	115	46-1/8	28	23	760	1171	712	585	344	FR916A	283B	**WS19**	350.	**H48M28F12A**	6,540.
150	2@+2.5%	4@-2.5%	KT	115	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	283B	**WS34**	800.	**H48M28F49A**	8,530.
225	2@+2.5%	4@-2.5%	KT	115	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	283B	**WS34**	800.	**H48M28F22A**	13,040.
300	2@+2.5%	4@-2.5%	KT	115	75	44-1/2	36	2400	1905	1130	914	1088	FR919	292A	**WS35**	1,360.	**H48M28F33A**	19,060.
500	2@+2.5%	4@-2.5%	KT	115	90	69	42	4500	2286	1752	1066	2041	FR922	292A	**WS36**	1,360.	**H48M28F55A**	27,560.
15	2@+2.5%	4@-2.5%	KT	80	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283B	**WS31**	350.	**H48M28B15A**	2,350.
30	2@+2.5%	4@-2.5%	KT	80	30-1/8	20-1/8	14-1/8	310	765	511	359	140	FR912A	283B	**WS31**	350.	**H48M28B30A**	2,970.
45	2@+2.5%	4@-2.5%	KT	80	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	283B	**WS33**	350.	**H48M28B45A**	4,475.
75	2@+2.5%	4@-2.5%	KT	80	39-3/8	26-1/8	19-1/8	600	1000	663	485	272	FR915B	283B	**WS33**	350.	**H48M28B75A**	5,680.
112.5	2@+2.5%	4@-2.5%	KT	80	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	283B	**WS34**	800.	**H48M28B12A**	8,000.
150	2@+2.5%	4@-2.5%	KT	80	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	283B	**WS34**	800.	**H48M28B49A**	11,660.
225	2@+2.5%	4@-2.5%	KT	80	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	283B	**WS34**	800.	**H48M28B22A**	16,430.
300	2@+2.5%	4@-2.5%	KT	80	75	44-1/2	36	2400	1905	1130	914	1088	FR919	292A	**WS35**	1,360.	**H48M28B33A**	21,200.
500	2@+2.5%	4@-2.5%	KT	80	75	44-1/2	35-3/4	3600	1905	1129	908	1636	FR920	292A	**WS35**	1,360.	**H48M28B55A**	32,480.
480 Δ Volts to 208Y/120 Volts (Copper Windings)																		
15	2@+2.5%	4@-2.5%	KT	150	30-1/8	20-1/8	14-1/8	300	765	511	359	136	FR910A	283B	**WS31**	350.	**H48M28T15CU**	2,260.
30	2@+2.5%	4@-2.5%	KT	150	30-1/8	20-1/8	14-1/8	300	765	511	359	136	FR910A	283B	**WS31**	350.	**H48M28T30CU**	2,750.
45	2@+2.5%	4@-2.5%	KT	150	30-1/8	20-1/8	14-1/8	370	765	511	359	168	FR912A	283B	**WS31**	350.	**H48M28T45CU**	3,545.
75	2@+2.5%	4@-2.5%	KT	150	39-3/8	26-1/8	19-1/8	675	1000	663	485	306	FR914B	283B	**WS33**	350.	**H48M28T75CU**	5,215.
112.5	2@+2.5%	4@-2.5%	KT	150	39-3/8	26-1/8	19-1/8	675	1000	663	485	306	FR915B	283B	**WS33**	350.	**H48M28T12CU**	6,315.
150	2@+2.5%	4@-2.5%	KT	150	56	31-1/4	24-1/4	1200	1422	793	616	545	FR917	283B	**WS34**	800.	**H48M28T49CU**	9,020.
225	2@+2.5%	4@-2.5%	KT	150	56	31-1/4	24-1/4	1200	1422	793	616	545	FR917	283B	**WS34**	800.	**H48M28T22CU**	12,510.
300	2@+2.5%	4@-2.5%	KT	150	62-1/4	31-1/4	30-1/4	2150	1581	794	768	977	FR918A	292A	**WS34**	800.	**H48M28T33CU**	18,530.
500	2@+2.5%	4@-2.5%	KT	150	75	44-1/2	36	3600	1905	1130	914	1636	FR919	292A	**WS35**	1,360.	**H48M28T55CU**	26,300.
15	2@+2.5%	4@-2.5%	KT	115	30-1/8	20-1/8	14-1/8	300	765	511	359	136	FR910A	283B	**WS31**	350.	**H48M28F15CU**	2,770.
30	2@+2.5%	4@-2.5%	KT	115	30-1/8	20-1/8	14-1/8	300	765	511	359	136	FR910A	283B	**WS31**	350.	**H48M28F30CU**	3,850.
45	2@+2.5%	4@-2.5%	KT	115	39-3/8	26-1/8	19-1/8	575	1000	663	485	261	FR914B	283B	**WS33**	350.	**H48M28F45CU**	4,635.
75	2@+2.5%	4@-2.5%	KT	115	39-3/8	26-1/8	19-1/8	675	1000	663	485	306	FR915B	283B	**WS33**	350.	**H48M28F75CU**	5,420.
112.5	2@+2.5%	4@-2.5%	KT	115	46-1/2	28	23	850	1171	712	585	386	FR916A	283B	**WS19**	350.	**H48M28F12CU**	7,075.
150	2@+2.5%	4@-2.5%	KT	115	56	31-1/4	24-1/4	1200	1422	793	616	545	FR917	283B	**WS34**	800.	**H48M28F49CU**	9,690.
225	2@+2.5%	4@-2.5%	KT	115	62-1/4	31-1/4	30-1/4	2150	1581	794	768	977	FR918A	283B	**WS34**	800.	**H48M28F22CU**	15,675.
300	2@+2.5%	4@-2.5%	KT	115	75	44-1/2	36	3100	1905	1130	914	1409	FR919	292A	**WS35**	1,360.	**H48M28F33CU**	22,860.
500	2@+2.5%	4@-2.5%	KT	115	75	44-1/2	35-3/4	3600	1905	1129	908	1636	FR920	292A	**WS35**	—	**H48M28F55CU**	28,940.
15	2@+2.5%	4@-2.5%	KT	80	30-1/8	20-1/8	14-1/8	300	765	511	359	136	FR910A	283B	**WS31**	350.	**H48M28B15CU**	3,145.
30	2@+2.5%	4@-2.5%	KT	80	30-1/8	20-1/8	14-1/8	370	765	511	359	168	FR912A	283B	**WS31**	350.	**H48M28B30CU**	4,360.
45	2@+2.5%	4@-2.5%	KT	80	39-3/8	26-1/8	19-1/8	575	1000	663	485	261	FR914B	283B	**WS33**	350.	**H48M28B45CU**	5,370.
75	2@+2.5%	4@-2.5%	KT	80	39-3/8	26-1/8	19-1/8	675	1000	663	485	306	FR915B	283B	**WS33**	350.	**H48M28B75CU**	6,760.
112.5	2@+2.5%	4@-2.5%	KT	80	56	31-1/4	24-1/4	1200	1422	793	616	545	FR917	283B	**WS34**	800.	**H48M28B12CU**	9,240.
150	2@+2.5%	4@-2.5%	KT	80	56	31-1/4	24-1/4	1200	1422	793	616	545	FR917	283B	**WS34**	800.	**H48M28B49CU**	12,060.
225	2@+2.5%	4@-2.5%	KT	80	62-1/4	31-1/4	30-1/4	2150	1581	794	768	977	FR918A	283B	**WS34**	800.	**H48M28B22CU**	18,050.
300	2@+2.5%	4@-2.5%	KT	80	75	44-1/2	36	3100	1905	1130	914	1409	FR919	292A	**WS35**	1,360.	**H48M28B33CU**	26,100.
500	2@+2.5%	4@-2.5%	KT	80	75	44-1/2	35-3/4	3600	1905	1129	908	1636	FR920	292A	**WS35**	1,360.	**H48M28B55CU**	34,200.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

Note: For Energy Star labeled K factor transformers, contact your local Cutler-Hammer sales office.

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

Discount Symbol **DT-1**

Table 9-49. Type KT-13 — Transformers for Non-Sinusoidal Current Loads with K Factor Up to 13

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
480 Δ Volts to 208Y/120 Volts																		
15	2@+2.5%	4@-2.5%	KT	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283B	**WS31**	350.	**N48M28T15A**	1,970.
30	2@+2.5%	4@-2.5%	KT	150	30-1/8	20-1/8	14-1/8	310	765	511	359	140	FR912A	283B	**WS31**	350.	**N48M28T30A**	2,845.
45	2@+2.5%	4@-2.5%	KT	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	283B	**WS33**	350.	**N48M28T45A**	3,370.
75	2@+2.5%	4@-2.5%	KT	150	39-3/8	26-1/8	19-1/8	600	1000	663	485	272	FR915B	283B	**WS33**	350.	**N48M28T75A**	4,660.
112.5	2@+2.5%	4@-2.5%	KT	150	46-1/8	28	23	760	1171	712	585	344	FR916A	283B	**WS19**	350.	**N48M28T12A**	6,535.
150	2@+2.5%	4@-2.5%	KT	150	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	283B	**WS34**	800.	**N48M28T49A**	8,780.
225	2@+2.5%	4@-2.5%	KT	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	283B	**WS34**	800.	**N48M28T22A**	12,140.
300	2@+2.5%	4@-2.5%	KT	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	292A	**WS35**	1,360.	**N48M28T33A**	17,870.
500	2@+2.5%	4@-2.5%	KT	150	90	69	42	4500	2286	1752	1066	2041	FR922	292A	**WS36**	1,360.	**N48M28T55A**	27,570.
15	2@+2.5%	4@-2.5%	KT	115	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283B	**WS31**	350.	**N48M28F15A**	2,410.
30	2@+2.5%	4@-2.5%	KT	115	30-1/8	20-1/8	14-1/8	310	765	511	359	140	FR912A	283B	**WS31**	350.	**N48M28F30A**	2,985.
45	2@+2.5%	4@-2.5%	KT	115	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	283B	**WS33**	350.	**N48M28F45A**	3,890.
75	2@+2.5%	4@-2.5%	KT	115	39-3/8	26-1/8	19-1/8	600	1000	663	485	272	FR915B	283B	**WS33**	350.	**N48M28F75A**	5,315.
112.5	2@+2.5%	4@-2.5%	KT	115	46-1/8	28	23	760	1171	712	585	344	FR916A	283B	**WS19**	350.	**N48M28F12A**	8,120.
150	2@+2.5%	4@-2.5%	KT	115	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	283B	**WS34**	800.	**N48M28F49A**	9,560.
225	2@+2.5%	4@-2.5%	KT	115	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	283B	**WS34**	800.	**N48M28F22A**	13,390.
300	2@+2.5%	4@-2.5%	KT	115	75	44-1/2	36	2400	1905	1130	914	1088	FR919	292A	**WS35**	1,360.	**N48M28F33A**	20,100.
500	2@+2.5%	4@-2.5%	KT	115	90	69	42	4500	2286	1752	1066	2041	FR922	292A	**WS36**	1,360.	**N48M28F55A**	30,400.
15	2@+2.5%	4@-2.5%	KT	80	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283B	**WS31**	350.	**N48M28B15A**	2,840.
30	2@+2.5%	4@-2.5%	KT	80	30-1/8	20-1/8	14-1/8	310	765	511	359	140	FR912A	283B	**WS31**	350.	**N48M28B30A**	3,730.
45	2@+2.5%	4@-2.5%	KT	80	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	283B	**WS33**	350.	**N48M28B45A**	4,755.
75	2@+2.5%	4@-2.5%	KT	80	46-1/8	28	23	760	1171	712	585	344	FR916A	283B	**WS33**	350.	**N48M28B75A**	6,160.
112.5	2@+2.5%	4@-2.5%	KT	80	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	283B	**WS34**	350.	**N48M28B12A**	8,840.
150	2@+2.5%	4@-2.5%	KT	80	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	283B	**WS34**	800.	**N48M28B49A**	12,565.
225	2@+2.5%	4@-2.5%	KT	80	75	44-1/2	36	2400	1905	1130	914	1088	FR919	292A	**WS35**	1,360.	**N48M28B22A**	17,140.
300	2@+2.5%	4@-2.5%	KT	80	75	44-1/2	36	3600	1905	1130	914	1636	FR919	292A	**WS35**	1,360.	**N48M28B33CU**	26,780.
480 Δ Volts to 208Y/120 Volts (Copper Windings)																		
15	2@+2.5%	4@-2.5%	KT	150	30-1/8	20-1/8	14-1/8	300	65	511	359	136	FR910A	283B	**WS31**	350.	**N48M28T15CU**	2,540.
30	2@+2.5%	4@-2.5%	KT	150	30-1/8	20-1/8	14-1/8	370	765	511	359	168	FR912A	283B	**WS31**	350.	**N48M28T30CU**	2,890.
45	2@+2.5%	4@-2.5%	KT	150	39-3/8	26-1/8	19-1/8	575	1000	663	485	261	FR914B	283B	**WS33**	350.	**N48M28T45CU**	4,270.
75	2@+2.5%	4@-2.5%	KT	150	39-3/8	26-1/8	19-1/8	675	1000	663	485	306	FR915B	283B	**WS33**	350.	**N48M28T75CU**	5,690.
112.5	2@+2.5%	4@-2.5%	KT	150	46-1/8	28	23	850	1171	712	585	386	FR916A	283B	**WS19**	350.	**N48M28T12CU**	7,460.
150	2@+2.5%	4@-2.5%	KT	150	56	31-1/4	24-1/4	1200	1422	793	616	545	FR917	283B	**WS34**	800.	**N48M28T49CU**	9,770.
225	2@+2.5%	4@-2.5%	KT	150	62-1/4	31-1/4	30-1/4	2150	1581	794	768	977	FR918A	283B	**WS34**	800.	**N48M28T22CU**	13,440.
300	2@+2.5%	4@-2.5%	KT	150	75	44-1/2	36	3100	1905	1130	914	1409	FR919	292A	**WS35**	1,360.	**N48M28T33CU**	22,330.
500	2@+2.5%	4@-2.5%	KT	150	①	①	①	①	①	①	①	①	①	①	①	—	**N48M28T55CU** ②	28,930.
15	2@+2.5%	4@-2.5%	KT	115	30-1/8	20-1/8	14-1/8	300	65	511	359	136	FR910A	283B	**WS31**	350.	**N48M28F15CU**	2,785.
30	2@+2.5%	4@-2.5%	KT	115	30-1/8	20-1/8	14-1/8	370	765	511	359	168	FR912A	283B	**WS31**	350.	**N48M28F30CU**	3,295.
45	2@+2.5%	4@-2.5%	KT	115	39-3/8	26-1/8	19-1/8	575	1000	663	485	261	FR914B	283B	**WS33**	350.	**N48M28F45CU**	4,430.
75	2@+2.5%	4@-2.5%	KT	115	39-3/8	26-1/8	19-1/8	675	1000	663	485	360	FR915B	283B	**WS33**	350.	**N48M28F75CU**	6,290.
112.5	2@+2.5%	4@-2.5%	KT	115	46-1/8	28	23	850	1171	712	585	386	FR916A	283B	**WS19**	350.	**N48M28F12CU**	9,025.
150	2@+2.5%	4@-2.5%	KT	115	56	31-1/4	24-1/4	1200	1422	793	616	545	FR917	283B	**WS34**	800.	**N48M28F49CU**	11,950.
225	2@+2.5%	4@-2.5%	KT	115	62-1/4	31-1/4	30-1/4	2150	1581	794	768	977	FR918A	283B	**WS34**	800.	**N48M28F22CU**	16,300.
300	2@+2.5%	4@-2.5%	KT	115	75	44-1/2	36	3100	1905	1130	914	1409	FR919	292A	**WS35**	1,360.	**N48M28F33CU**	24,560.
500	2@+2.5%	4@-2.5%	KT	115	①	①	①	①	①	①	①	①	①	①	①	—	**N48M28F55CU** ②	31,850.
15	2@+2.5%	4@-2.5%	KT	80	30-1/8	20-1/8	14-1/8	300	65	511	359	136	FR910A	283B	**WS31**	350.	**N48M28B15CU**	3,125.
30	2@+2.5%	4@-2.5%	KT	80	30-1/8	20-1/8	14-1/8	370	765	511	359	168	FR912A	283B	**WS31**	350.	**N48M28B30CU**	4,140.
45	2@+2.5%	4@-2.5%	KT	80	39-3/8	26-1/8	19-1/8	575	1000	663	485	261	FR914B	283B	**WS33**	350.	**N48M28B45CU**	5,570.
75	2@+2.5%	4@-2.5%	KT	80	46-1/8	28	23	950	1171	712	585	431	FR916A	283B	**WS33**	350.	**N48M28B75CU**	7,100.
112.5	2@+2.5%	4@-2.5%	KT	80	56	31-1/4	24-1/4	1200	1422	793	616	545	FR917	283B	**WS34**	350.	**N48M28B12CU**	10,270.
150	2@+2.5%	4@-2.5%	KT	80	62-1/4	31-1/4	30-1/4	2150	1581	794	768	977	FR917	283B	**WS34**	800.	**N48M28B49CU**	13,480.
225	2@+2.5%	4@-2.5%	KT	80	75	44-1/2	36	3100	1905	1130	914	1409	FR919	292A	**WS35**	1,360.	**N48M28B22CU**	20,520.
300	2@+2.5%	4@-2.5%	KT	80	75	44-1/2	36	3600	1905	1130	914	1636	FR919	292A	**WS35**	1,360.	**N48M28B33CU**	26,780.

① Refer to your Cutler-Hammer sales office.

② Not Seismic Qualified.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

Note: For Energy Star labeled K factor transformers, contact your local Cutler-Hammer sales office.

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

Discount Symbol **DT-1**

Table 9-50. Type KT-20 — Transformers for Non-Sinusoidal Current Loads with K Factor Up to 20

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
480 Δ Volts to 208Y/120 Volts																		
15	2@+2.5%	4@-2.5%	KT	150	30-1/8	20-1/8	14-1/8	230	765	511	358	104	FR910A	283B	**WS31**	350.	**G48M28T15A**	2,050.
30	2@+2.5%	4@-2.5%	KT	150	30-1/8	20-1/8	14-1/8	310	765	511	358	140	FR912A	283B	**WS31**	350.	**G48M28T30A**	3,010.
45	2@+2.5%	4@-2.5%	KT	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	283B	**WS33**	350.	**G48M28T45A**	3,960.
75	2@+2.5%	4@-2.5%	KT	150	39-3/8	26-1/8	19-1/8	600	1000	663	485	272	FR915B	283B	**WS33**	350.	**G48M28T75A**	5,600.
112.5	2@+2.5%	4@-2.5%	KT	150	46-1/8	28	23	760	1171	712	585	344	FR916A	283B	**WS19**	350.	**G48M28T12A**	8,780.
150	2@+2.5%	4@-2.5%	KT	150	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	283B	**WS34**	800.	**G48M28T49A**	9,860.
225	2@+2.5%	4@-2.5%	KT	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	283B	**WS34**	800.	**G48M28T22A**	13,420.
300	2@+2.5%	4@-2.5%	KT	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919	292A	**WS35**	1,360.	**G48M28T33A**	18,530.
500	2@+2.5%	4@-2.5%	KT	150	①	①	①	①	①	①	①	①	①	①	①	—	**G48M28T55A** ②	30,700.
15	2@+2.5%	4@-2.5%	KT	115	30-1/8	20-1/8	14-1/8	230	765	511	358	104	FR910A	283B	**WS31**	350.	**G48M28F15A**	2,655.
30	2@+2.5%	4@-2.5%	KT	115	30-1/8	20-1/8	14-1/8	310	765	511	358	140	FR912A	283B	**WS31**	350.	**G48M28F30A**	3,460.
45	2@+2.5%	4@-2.5%	KT	115	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	283B	**WS33**	350.	**G48M28F45A**	4,560.
75	2@+2.5%	4@-2.5%	KT	115	46-1/8	28	23	780	1171	712	585	354	FR916A	283B	**WS33**	350.	**G48M28F75A**	6,440.
112.5	2@+2.5%	4@-2.5%	KT	115	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	283B	**WS34**	350.	**G48M28F12A**	9,220.
150	2@+2.5%	4@-2.5%	KT	115	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	283B	**WS34**	800.	**G48M28F49A**	10,850.
225	2@+2.5%	4@-2.5%	KT	115	75	44-1/2	36	2400	1905	1130	914	1088	FR919	283B	**WS35**	800.	**G48M28F22A**	15,600.
300	2@+2.5%	4@-2.5%	KT	115	75	44-1/2	36	3100	1905	1130	914	1315	FR920	292A	**WS35**	1,360.	**G48M28F33A**	20,650.
500	2@+2.5%	4@-2.5%	KT	115	①	①	①	①	①	①	①	①	①	①	①	—	**G48M28F55A** ②	35,300.
15	2@+2.5%	4@-2.5%	KT	80	30-1/8	20-1/8	14-1/8	230	765	511	358	140	FR912A	283B	**WS31**	350.	**G48M28B15A**	2,990.
30	2@+2.5%	4@-2.5%	KT	80	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	283B	**WS31**	350.	**G48M28B30A**	4,060.
45	2@+2.5%	4@-2.5%	KT	80	39-3/8	26-1/8	19-1/8	600	1000	663	485	272	FR915B	283B	**WS31**	350.	**G48M28B45A**	5,350.
75	2@+2.5%	4@-2.5%	KT	80	46-1/8	28	23	860	1171	712	585	389	FR916A	283B	**WS33**	350.	**G48M28B75A**	7,560.
112.5	2@+2.5%	4@-2.5%	KT	80	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	283B	**WS34**	350.	**G48M28B12A**	9,860.
150	2@+2.5%	4@-2.5%	KT	80	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	283B	**WS34**	800.	**G48M28B49A**	13,400.
225	2@+2.5%	4@-2.5%	KT	80	75	44-1/2	36	2400	1905	1130	914	1088	FR919	283B	**WS35**	800.	**G48M28B22A**	19,800.
300	2@+2.5%	4@-2.5%	KT	80	①	①	①	①	①	①	①	①	①	①	①	—	**G48M28B33A** ②	25,700.
480 Δ Volts to 208Y/120 Volts (Copper Windings)																		
15	2@+2.5%	4@-2.5%	KT	150	30-1/8	20-1/8	14-1/8	300	765	511	358	136	FR910A	283B	**WS31**	350.	**G48M28T15CU**	2,770.
30	2@+2.5%	4@-2.5%	KT	150	30-1/8	20-1/8	14-1/8	370	765	511	358	168	FR912A	283B	**WS31**	350.	**G48M28T30CU**	4,120.
45	2@+2.5%	4@-2.5%	KT	150	39-3/8	26-1/8	19-1/8	575	1000	663	485	261	FR914B	283B	**WS33**	350.	**G48M28T45CU**	5,430.
75	2@+2.5%	4@-2.5%	KT	150	39-3/8	26-1/8	19-1/8	675	1000	663	485	306	FR915B	283B	**WS33**	350.	**G48M28T75CU**	7,660.
112.5	2@+2.5%	4@-2.5%	KT	150	46-1/8	28	23	850	1171	712	585	386	FR916A	283B	**WS19**	350.	**G48M28T12CU**	11,400.
150	2@+2.5%	4@-2.5%	KT	150	56	31-1/4	24-1/4	1200	1422	793	616	545	FR917	283B	**WS34**	800.	**G48M28T49CU**	12,820.
225	2@+2.5%	4@-2.5%	KT	150	62-1/4	31-1/4	30-1/4	2150	1581	794	768	977	FR918A	283B	**WS34**	800.	**G48M28T22CU**	17,400.
300	2@+2.5%	4@-2.5%	KT	150	75	44-1/2	36	3100	1905	1130	914	1409	FR919	292A	**WS35**	1,360.	**G48M28T33CU**	24,560.
500	2@+2.5%	4@-2.5%	KT	150	①	①	①	①	①	①	①	①	①	①	①	—	**G48M28T55CU** ②	39,900.
15	2@+2.5%	4@-2.5%	KT	115	30-1/8	20-1/8	14-1/8	300	765	511	358	136	FR910A	283B	**WS31**	350.	**G48M28F15CU**	3,180.
30	2@+2.5%	4@-2.5%	KT	115	30-1/8	20-1/8	14-1/8	370	765	511	358	168	FR912A	283B	**WS31**	350.	**G48M28F30CU**	4,665.
45	2@+2.5%	4@-2.5%	KT	115	39-3/8	26-1/8	19-1/8	575	1000	663	485	261	FR914B	283B	**WS33**	350.	**G48M28F45CU**	6,140.
75	2@+2.5%	4@-2.5%	KT	115	46-1/8	28	23	780	1171	712	585	354	FR916A	283B	**WS33**	350.	**G48M28F75CU**	8,680.
112.5	2@+2.5%	4@-2.5%	KT	115	56	31-1/4	24-1/4	1200	1422	793	616	545	FR917	283B	**WS34**	350.	**G48M28F12CU**	12,300.
150	2@+2.5%	4@-2.5%	KT	115	62-1/4	31-1/4	30-1/4	2150	1581	794	768	977	FR918A	283B	**WS34**	800.	**G48M28F49CU**	13,800.
225	2@+2.5%	4@-2.5%	KT	115	75	44-1/2	36	3100	1905	1130	914	1409	FR919	283B	**WS35**	800.	**G48M28F22CU**	18,800.
300	2@+2.5%	4@-2.5%	KT	115	75	44-1/2	36	3600	1905	1130	914	1636	FR920	292A	**WS35**	1,360.	**G48M28F33CU**	27,000.
500	2@+2.5%	4@-2.5%	KT	115	①	①	①	①	①	①	①	①	①	①	①	—	**G48M28F55CU** ②	46,000.
15	2@+2.5%	4@-2.5%	KT	80	30-1/8	20-1/8	14-1/8	370	765	511	358	168	FR912A	283B	**WS31**	350.	**G48M28B15CU**	3,480.
30	2@+2.5%	4@-2.5%	KT	80	39-3/8	26-1/8	19-1/8	575	1000	663	485	261	FR914B	283B	**WS31**	350.	**G48M28B30CU**	5,270.
45	2@+2.5%	4@-2.5%	KT	80	39-3/8	26-1/8	19-1/8	675	1000	663	485	306	FR915B	283B	**WS33**	350.	**G48M28B45CU**	6,740.
75	2@+2.5%	4@-2.5%	KT	80	46-1/8	28	23	860	1171	712	585	389	FR916A	283B	**WS33**	350.	**G48M28B75CU**	9,520.
112.5	2@+2.5%	4@-2.5%	KT	80	56	31-1/4	24-1/4	1200	1422	793	616	545	FR917	283B	**WS34**	350.	**G48M28B12CU**	14,050.
150	2@+2.5%	4@-2.5%	KT	80	62-1/4	31-1/4	30-1/4	2150	1581	794	768	977	FR918A	283B	**WS34**	800.	**G48M28B49CU**	15,780.
225	2@+2.5%	4@-2.5%	KT	80	75	44-1/2	36	3100	1905	1130	914	1409	FR919	292A	**WS35**	1,360.	**G48M28B22CU**	21,470.
300	2@+2.5%	4@-2.5%	KT	80	①	①	①	①	①	①	①	①	①	①	①	—	**G48M28B33CU** ②	29,650.

① Refer to your Cutler-Hammer sales office.
② Not Seismic Qualified.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

Note: For Energy Star labeled K factor transformers, contact your local Cutler-Hammer sales office.

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

Discount Symbol **DT-1**

Table 9-51. Type KT-4 — Transformers for Non-Sinusoidal Current Loads with K Factor Up to 4

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
208 Δ Volts to 208Y/120 Volts																		
15	2@+2.5%	4@-2.5%	KT	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283A	**WS31**	350.	**H29M28T15A**	2,590.
30	2@+2.5%	4@-2.5%	KT	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283A	**WS31**	350.	**H29M28T30A**	3,590.
45	2@+2.5%	4@-2.5%	KT	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	283A	**WS31**	350.	**H29M28T45A**	4,320.
75	2@+2.5%	4@-2.5%	KT	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	283A	**WS33**	350.	**H29M28T75A**	6,100.
112.5	1@+5%	2@-5%	KT	150	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	325A	**WS33**	350.	**H29R28T12A**	7,940.
150	1@+5%	2@-5%	KT	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	287A	**WS34**	800.	**H29R28T49A**	11,200.
225	1@+5%	2@-5%	KT	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	287A	**WS34**	800.	**H29R28T22A**	16,670.
300	—	2@-5%	KT	150	75	44-1/2	36	2400	1905	1130	914	1089	FR919	297B	**WS35**	1,360.	**H29G28T33A**	22,800.
15	2@+2.5%	4@-2.5%	KT	115	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283A	**WS31**	350.	**H29M28F15A**	2,850.
30	2@+2.5%	4@-2.5%	KT	115	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283A	**WS31**	350.	**H29M28F30A**	3,940.
45	2@+2.5%	4@-2.5%	KT	115	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	283A	**WS33**	350.	**H29M28F45A**	4,750.
75	2@+2.5%	4@-2.5%	KT	115	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	283A	**WS33**	350.	**H29M28F75A**	6,550.
112.5	1@+5%	2@-5%	KT	115	46-1/8	28	23	760	1171	712	585	345	FR916A	325A	**WS19**	350.	**H29R28F12A**	9,150.
150	1@+5%	2@-5%	KT	115	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	287A	**WS34**	800.	**H29R28F49A**	11,900.
225	1@+5%	2@-5%	KT	115	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	287A	**WS34**	800.	**H29R28F22A**	18,200.
300	—	2@-5%	KT	115	75	44-1/2	36	2400	1905	1130	914	1089	FR919	297B	**WS35**	1,360.	**H29G28F33A**	26,600.
15	2@+2.5%	4@-2.5%	KT	80	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283A	**WS31**	350.	**H29M28B15A**	3,290.
30	2@+2.5%	4@-2.5%	KT	80	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	283A	**WS31**	350.	**H29M28B30A**	4,150.
45	2@+2.5%	4@-2.5%	KT	80	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	283A	**WS33**	350.	**H29M28B45A**	6,260.
75	2@+2.5%	4@-2.5%	KT	80	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	283A	**WS33**	350.	**H29M28B75A**	7,950.
112.5	1@+5%	2@-5%	KT	80	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	287A	**WS34**	800.	**H29R28B12A**	11,100.
150	1@+5%	2@-5%	KT	80	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	287A	**WS34**	800.	**H29R28B49A**	16,300.
225	1@+5%	2@-5%	KT	80	75	44-1/2	36	2400	1905	1130	914	1089	FR919	297B	**WS35**	—	**H29R28B22A**	23,000.

Table 9-52. Type KT-13 — Transformers for Non-Sinusoidal Current Loads with K Factor Up to 13

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
208 Δ Volts to 208Y/120 Volts																		
15	2@+2.5%	4@-2.5%	KT	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283A	**WS31**	350.	**N29M28T15A**	2,760.
30	2@+2.5%	4@-2.5%	KT	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	283A	**WS31**	350.	**N29M28T30A**	3,980.
45	2@+2.5%	4@-2.5%	KT	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	283A	**WS33**	350.	**N29M28T45A**	4,720.
75	2@+2.5%	4@-2.5%	KT	150	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	283A	**WS33**	350.	**N29M28T75A**	6,520.
112.5	1@+5%	2@-5%	KT	150	46-1/8	28	23	820	1171	712	585	372	FR916A	287A	**WS19**	350.	**N29R28T12A**	9,150.
150	1@+5%	2@-5%	KT	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	287A	**WS34**	800.	**N29R28T49A**	12,300.
225	1@+5%	2@-5%	KT	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	287A	**WS34**	800.	**N29R28T22A**	17,000.
300	—	2@-5%	KT	150	75	44-1/2	36	2400	1905	1130	914	1089	FR919	297B	**WS35**	1,360.	**N29G28T33A**	25,000.
15	2@+2.5%	4@-2.5%	KT	115	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283A	**WS31**	350.	**N29M28F15A**	3,175.
30	2@+2.5%	4@-2.5%	KT	115	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	283A	**WS31**	350.	**N29M28F30A**	4,580.
45	2@+2.5%	4@-2.5%	KT	115	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	283A	**WS33**	350.	**N29M28F45A**	5,430.
75	2@+2.5%	4@-2.5%	KT	115	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	283A	**WS33**	350.	**N29M28F75A**	7,500.
112.5	1@+5%	2@-5%	KT	115	46-1/8	28	23	860	1171	712	585	389	FR916A	287A	**WS19**	350.	**N29R28F12A**	10,520.
150	1@+5%	2@-5%	KT	115	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	287A	**WS34**	800.	**N29R28F49A**	14,150.
225	1@+5%	2@-5%	KT	115	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	287A	**WS34**	800.	**N29R28F22A**	19,550.
300	—	2@-5%	KT	115	75	44-1/2	36	2400	1905	1130	914	1089	FR919	297B	**WS35**	1,360.	**N29G28F33A**	28,700.
15	2@+2.5%	4@-2.5%	KT	80	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283A	**WS31**	350.	**N29M28B15A**	3,720.
30	2@+2.5%	4@-2.5%	KT	80	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	283A	**WS31**	350.	**N29M28B30A**	5,370.
45	2@+2.5%	4@-2.5%	KT	80	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	283A	**WS33**	350.	**N29M28B45A**	6,370.
75	2@+2.5%	4@-2.5%	KT	80	46-1/8	28	23	820	1171	712	585	389	FR916A	283A	**WS33**	350.	**N29M28B75A**	8,800.
112.5	1@+5%	2@-5%	KT	80	56	31-1/4	24-1/4	1200	1422	794	616	544	FR917	287A	**WS34**	350.	**N29R28B12A**	12,350.
150	1@+5%	2@-5%	KT	80	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	287A	**WS34**	800.	**N29R28B49A**	16,600.
225	—	2@-5%	KT	80	75	44-1/2	36	2400	1905	1130	914	1089	FR919	297B	**WS35**	1,360.	**N29G28B22A**	22,900.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.
Note: For Energy Star labeled K factor transformers, contact your local Cutler-Hammer sales office.

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

Discount Symbol **DT-1**

Table 9-53. Type KT-4 — Transformers for Non-Sinusoidal Current Loads with K Factor Up to 4

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
480 Δ Volts to 480Y/277 Volts																		
15	2@+2.5%	4@-2.5%	KT	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283B	**WS31**	350.	**H48M47T15A**	2,220.
30	2@+2.5%	4@-2.5%	KT	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283B	**WS31**	350.	**H48M47T30A**	3,100.
45	2@+2.5%	4@-2.5%	KT	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	283B	**WS31**	350.	**H48M47T45A**	3,700.
75	2@+2.5%	4@-2.5%	KT	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	283B	**WS33**	350.	**H48M47T75A**	5,230.
112.5	2@+2.5%	4@-2.5%	KT	150	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	283B	**WS33**	350.	**H48M47T12A**	7,170.
150	2@+2.5%	4@-2.5%	KT	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	283B	**WS34**	800.	**H48M47T49A**	9,610.
225	2@+2.5%	4@-2.5%	KT	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	283B	**WS34**	800.	**H48M47T22A**	14,290.
300	2@+2.5%	4@-2.5%	KT	150	75	44-1/2	36	2400	1905	1130	914	1089	FR919	292A	**WS35**	1,360.	**H48M47T33A**	19,590.
15	2@+2.5%	4@-2.5%	KT	115	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283B	**WS31**	350.	**H48M47F15A**	2,550.
30	2@+2.5%	4@-2.5%	KT	115	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283B	**WS31**	350.	**H48M47F30A**	3,560.
45	2@+2.5%	4@-2.5%	KT	115	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	283B	**WS33**	350.	**H48M47F45A**	4,250.
75	2@+2.5%	4@-2.5%	KT	115	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	283B	**WS33**	350.	**H48M47F75A**	6,010.
112.5	2@+2.5%	4@-2.5%	KT	115	46-1/8	28	23	960	1171	712	585	434	FR916A	283B	**WS19**	350.	**H48M47F12A**	8,250.
150	2@+2.5%	4@-2.5%	KT	115	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	283B	**WS34**	800.	**H48M47F49A**	11,060.
225	2@+2.5%	4@-2.5%	KT	115	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	283B	**WS34**	800.	**H48M47F22A**	16,440.
300	2@+2.5%	4@-2.5%	KT	115	75	44-1/2	36	2400	1905	1130	914	1089	FR919	292A	**WS35**	1,360.	**H48M47F33A**	22,540.
15	2@+2.5%	4@-2.5%	KT	80	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283B	**WS31**	350.	**H48M47B15A**	2,995.
30	2@+2.5%	4@-2.5%	KT	80	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	283B	**WS31**	350.	**H48M47B30A**	4,185.
45	2@+2.5%	4@-2.5%	KT	80	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	283B	**WS33**	350.	**H48M47B45A**	4,990.
75	2@+2.5%	4@-2.5%	KT	80	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	283B	**WS33**	350.	**H48M47B75A**	7,050.
112.5	2@+2.5%	4@-2.5%	KT	80	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	283B	**WS34**	800.	**H48M47B12A**	9,680.
150	2@+2.5%	4@-2.5%	KT	80	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	283B	**WS34**	800.	**H48M47B49A**	12,970.
225	2@+2.5%	4@-2.5%	KT	80	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	283B	**WS34**	800.	**H48M47B22A**	19,290.
300	2@+2.5%	4@-2.5%	KT	80	75	44-1/2	36	2400	1905	1130	914	1089	FR919	292A	**WS35**	1,360.	**H48M47B33A**	26,440.

Table 9-54. Type KT-13 — Transformers for Non-Sinusoidal Current Loads with K Factor Up to 13

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
480 Δ Volts to 480Y/277 Volts																		
15	2@+2.5%	4@-2.5%	KT	150	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283B	**WS31**	350.	**N48M47T15A**	2,360.
30	2@+2.5%	4@-2.5%	KT	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	283B	**WS31**	350.	**N48M47T30A**	3,415.
45	2@+2.5%	4@-2.5%	KT	150	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	283B	**WS33**	350.	**N48M47T45A**	4,040.
75	2@+2.5%	4@-2.5%	KT	150	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	283B	**WS33**	350.	**N48M47T75A**	5,590.
112.5	2@+2.5%	4@-2.5%	KT	150	46-1/8	28	23	760	1171	712	585	345	FR916A	283B	**WS19**	350.	**N48M47T12A**	7,840.
150	2@+2.5%	4@-2.5%	KT	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	283B	**WS34**	800.	**N48M47T49A**	10,530.
225	2@+2.5%	4@-2.5%	KT	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	283B	**WS34**	800.	**N48M47T22A**	14,560.
300	2@+2.5%	4@-2.5%	KT	150	75	44-1/2	36	2400	1905	1130	914	1089	FR919	292A	**WS35**	1,360.	**N48M47T33A**	21,440.
15	2@+2.5%	4@-2.5%	KT	115	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283B	**WS31**	350.	**N48M47F15A**	2,715.
30	2@+2.5%	4@-2.5%	KT	115	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	283B	**WS31**	350.	**N48M47F30A**	3,930.
45	2@+2.5%	4@-2.5%	KT	115	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	283B	**WS33**	350.	**N48M47F45A**	4,650.
75	2@+2.5%	4@-2.5%	KT	115	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	283B	**WS33**	350.	**N48M47F75A**	6,430.
112.5	2@+2.5%	4@-2.5%	KT	115	46-1/8	28	23	760	1171	712	585	345	FR916A	283B	**WS19**	350.	**N48M47F12A**	9,020.
150	2@+2.5%	4@-2.5%	KT	115	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	283B	**WS34**	800.	**N48M47F49A**	12,120.
225	2@+2.5%	4@-2.5%	KT	115	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	283B	**WS34**	800.	**N48M47F22A**	16,750.
300	2@+2.5%	4@-2.5%	KT	115	75	44-1/2	36	2400	1905	1130	914	1089	FR919	292A	**WS35**	1,360.	**N48M47F33A**	24,670.
15	2@+2.5%	4@-2.5%	KT	80	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	283B	**WS31**	350.	**N48M47B15A**	3,180.
30	2@+2.5%	4@-2.5%	KT	80	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	283B	**WS31**	350.	**N48M47B30A**	4,600.
45	2@+2.5%	4@-2.5%	KT	80	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	283B	**WS33**	350.	**N48M47B45A**	5,450.
75	2@+2.5%	4@-2.5%	KT	80	46-1/8	28	23	760	1171	712	585	345	FR916A	283B	**WS33**	350.	**N48M47B75A**	7,540.
112.5	2@+2.5%	4@-2.5%	KT	80	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	283B	**WS34**	350.	**N48M47B12A**	10,580.
150	2@+2.5%	4@-2.5%	KT	80	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	283B	**WS34**	800.	**N48M47B49A**	14,200.
225	2@+2.5%	4@-2.5%	KT	80	75	44-1/2	36	2400	1905	1130	914	1089	FR919	292A	**WS35**	1,360.	**N48M47B22A**	19,650.
300	2@+2.5%	4@-2.5%	KT	80	75	44-1/2	36	3600	1905	1130	914	1636	FR919	292A	**WS35**	1,360.	**N48M47B33CU**	36,440.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.
Note: For Energy Star labeled K factor transformers, contact your local Cutler-Hammer sales office.

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

Discount Symbol **DT-1**

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Three-Phase, Type MD, 60 Hz

Type MD

Product Description

- Suitable for indoor or outdoor applications (with weathershield).
- Ventilated enclosures.
- 220°C Insulation system, 150°C Rise standard (self extinguishing).
- Available in ratings from 7.5 through 1500 kVA.

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

- UL listed.
- 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 grain oriented silicon steel are hand stacked to insure 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 to indicate that high temperatures (approximately 190°C) are present.
- 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 Cutler-Hammer manufactured dry-type distribution transformers by Eaton Corporation are seismically qualified, and exceed requirements of the Uniform Building Code (UBC) and California Code Title 24.

Options and Accessories

- Copper windings.
- Non-standard voltages.
- 50/60 Hz designs.
- Delta-delta configuration.
- 80°C or 115°C rise designs.
- Totally enclosed non-ventilated.
- Electrostatic shields.

Please refer to **Page 9-120**.

Product Specifications

Frequency

Cutler-Hammer 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:

Table 9-55. 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

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

Sound Levels

All Cutler-Hammer 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.

Table 9-56. Average Sound Levels

NEMA ST-20 Average Sound Level (dB)		
kVA	**Ventilated**	**Encapsulated**
0 – 9	40	45
10 – 50	45	50
51 – 150	50	55
151 – 300	55	57
301 – 500	60	59
501 – 700	62	61
701 – 1000	64	63
1001 – 1500	65	64

Winding Terminations

Primary and secondary windings are terminated in the wiring compartment. 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.** The Cutler-Hammer business recommends external cables be rated 75°C for ventilated designs.

Technical Data and Specifications

Please refer to **Page 9-122**.

Product Selection

Additional Product Selection information begins on **Page 9-136**.

Table 9-57. Drive Isolation Transformers

Hp	kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
		FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
208 Δ Volts to 230Y/133 Volts																			
5	7.5	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286L	**WS31**	350.	**MD075E85**	1,400.
7.5	11	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286L	**WS31**	350.	**MD11E85**	1,450.
10	14	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286L	**WS31**	350.	**MD14E85**	1,550.
15	20	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	358	104	FR910A	286L	**WS31**	350.	**MD20E85**	1,920.
20	27	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	358	104	FR910A	286L	**WS31**	350.	**MD27E85**	2,195.
25	34	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	358	140	FR912A	286L	**WS31**	350.	**MD34E85**	2,430.
30	40	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	358	140	FR912A	286L	**WS31**	350.	**MD40E85**	2,800.
40	51	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286L	**WS33**	350.	**MD51E85**	3,165.
50	63	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286L	**WS33**	350.	**MD63E85**	3,580.
60	75	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286L	**WS33**	350.	**MD75E85**	3,875.
75	93	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	663	485	272	FR915B	286L	**WS33**	350.	**MD93E85**	4,650.
100	118	1@+5%	1@-5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	286L	**WS19**	350.	**MD118E85**	5,440.
125	145	1@+5%	1@-5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	286L	**WS19**	350.	**MD145E85**	6,350.
150	175	1@+5%	1@-5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	286L	**WS34**	800.	**MD175E85**	8,030.
200	220	1@+5%	1@-5%	DT-3	150	56	31-1/4	24-1/4	1200	1422	793	616	499	FR917	286L	**WS34**	800.	**MD220E85**	9,300.
250	275	1@+5%	1@-5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	286L	**WS34**	800.	**MD275E85**	10,880.
300	330	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2200	1905	1130	914	1000	FR919	①	**WS35**	1,360.	**MD330E85**	12,925.
208 Δ Volts to 460Y/266 Volts																			
5	7.5	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286L	**WS31**	350.	**MD075E86**	1,400.
7.5	11	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286L	**WS31**	350.	**MD11E86**	1,450.
10	14	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286L	**WS31**	350.	**MD14E86**	1,550.
15	20	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	358	104	FR910A	286L	**WS31**	350.	**MD20E86**	1,920.
20	27	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	358	104	FR910A	286L	**WS31**	350.	**MD27E86**	2,195.
25	34	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	358	140	FR912A	286L	**WS31**	350.	**MD34E86**	2,430.
30	40	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	358	140	FR912A	286L	**WS31**	350.	**MD40E86**	2,800.
40	51	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286L	**WS33**	350.	**MD51E86**	3,165.
50	63	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286L	**WS33**	350.	**MD63E86**	3,580.
60	75	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286L	**WS33**	350.	**MD75E86**	3,875.
75	93	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	663	485	272	FR915B	286L	**WS33**	350.	**MD93E86**	4,650.
100	118	1@+5%	1@-5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	286L	**WS19**	350.	**MD118E86**	5,440.
125	145	1@+5%	1@-5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	286L	**WS19**	350.	**MD145E86**	6,350.
150	175	1@+5%	1@-5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	286L	**WS34**	800.	**MD175E86**	8,030.
200	220	1@+5%	1@-5%	DT-3	150	56	31-1/4	24-1/4	1200	1422	793	616	499	FR917	286L	**WS34**	800.	**MD220E86**	9,300.
250	275	1@+5%	1@-5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	286L	**WS34**	800.	**MD275E86**	10,880.
300	330	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2200	1905	1130	914	1000	FR919	①	**WS35**	1,360.	**MD330E86**	12,925.
230 Δ Volts to 230Y/133 Volts																			
5	7.5	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286A	**WS31**	350.	**MD075E88**	1,400.
7.5	11	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286A	**WS31**	350.	**MD11E88**	1,450.
10	14	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286A	**WS31**	350.	**MD14E88**	1,550.
15	20	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	358	104	FR910A	286A	**WS31**	350.	**MD20E88**	1,920.
20	27	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	358	104	FR910A	286A	**WS31**	350.	**MD27E88**	2,195.
25	34	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	358	140	FR912A	286A	**WS31**	350.	**MD34E88**	2,430.
30	40	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	358	140	FR912A	286A	**WS31**	350.	**MD40E88**	2,800.
40	51	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286A	**WS33**	350.	**MD51E88**	3,165.
50	63	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286A	**WS33**	350.	**MD63E88**	3,580.
60	75	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286A	**WS33**	350.	**MD75E88**	3,875.
75	93	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	663	485	272	FR915B	286A	**WS33**	350.	**MD93E88**	4,650.
100	118	1@+5%	1@-5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	286A	**WS19**	350.	**MD118E88**	5,440.
125	145	1@+5%	1@-5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	286A	**WS19**	350.	**MD145E88**	6,350.
150	175	1@+5%	1@-5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	286A	**WS34**	800.	**MD175E88**	8,030.
200	220	1@+5%	1@-5%	DT-3	150	56	31-1/4	24-1/4	1200	1422	793	616	499	FR917	286A	**WS34**	800.	**MD220E88**	9,300.
250	275	1@+5%	1@-5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	286A	**WS34**	800.	**MD275E88**	10,880.
300	330	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2200	1905	1130	914	1000	FR919	①	**WS35**	1,360.	**MD330E88**	12,925.
400	440	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD440E88** ②	18,900.
500	550	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD550E88** ②	22,800.
600	660	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD660E88** ②	27,600.
700	770	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD770E88** ②	34,400.
800	880	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD880E88** ②	39,300.

① Refer to your Cutler-Hammer sales office.

② Not Seismic Qualified.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Table 9-58. Drive Isolation Transformers

Hp	kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
		FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
230 Δ Volts to 460Y/266 Volts																			
5	7.5	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286A	**WS31**	350.	**MD075E89**	1,400.
7.5	11	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286A	**WS31**	350.	**MD11E89**	1,450.
10	14	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286A	**WS31**	350.	**MD14E89**	1,550.
15	20	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	358	104	FR910A	286A	**WS31**	350.	**MD20E89**	1,920.
20	27	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	358	104	FR910A	286A	**WS31**	350.	**MD27E89**	2,195.
25	34	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	358	140	FR912A	286A	**WS31**	350.	**MD34E89**	2,430.
30	40	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	358	140	FR912A	286A	**WS31**	350.	**MD40E89**	2,800.
40	51	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286A	**WS33**	350.	**MD51E89**	3,165.
50	63	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286A	**WS33**	350.	**MD63E89**	3,580.
60	75	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286A	**WS33**	350.	**MD75E89**	3,875.
75	93	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	663	485	272	FR915B	286A	**WS33**	350.	**MD93E89**	4,650.
100	118	1@+5%	1@-5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	286A	**WS33**	350.	**MD118E89**	5,440.
125	145	1@+5%	1@-5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	286A	**WS19**	350.	**MD145E89**	6,350.
150	175	1@+5%	1@-5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	286A	**WS34**	800.	**MD175E89**	8,030.
200	220	1@+5%	1@-5%	DT-3	150	56	31-1/4	24-1/4	1200	1422	793	616	499	FR917	286A	**WS34**	800.	**MD220E89**	9,300.
250	275	1@+5%	1@-5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	286A	**WS34**	800.	**MD275E89**	10,880.
300	330	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2200	1905	1130	914	1000	FR919	321A	**WS35**	1,360.	**MD330E89**	12,925.
400	440	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD440E89** ②	18,900.
500	550	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD550E89** ②	22,800.
600	660	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD660E89** ②	27,600.
700	770	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD770E89** ②	34,400.
800	880	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD880E89** ②	39,300.
230 Δ Volts to 575Y/332 Volts																			
5	7.5	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286A	**WS31**	350.	**MD075E90**	1,400.
7.5	11	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286A	**WS31**	350.	**MD11E90**	1,450.
10	14	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286A	**WS31**	350.	**MD14E90**	1,550.
15	20	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	358	104	FR910A	286A	**WS31**	350.	**MD20E90**	1,920.
20	27	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	358	104	FR910A	286A	**WS31**	350.	**MD27E90**	2,195.
25	34	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	358	140	FR912A	286A	**WS31**	350.	**MD34E90**	2,430.
30	40	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	358	140	FR912A	286A	**WS31**	350.	**MD40E90**	2,800.
40	51	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286A	**WS33**	350.	**MD51E90**	3,165.
50	63	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286A	**WS33**	350.	**MD63E90**	3,580.
60	75	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286A	**WS33**	350.	**MD75E90**	3,875.
75	93	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	663	485	272	FR915B	286A	**WS33**	350.	**MD93E90**	4,650.
100	118	1@+5%	1@-5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	286A	**WS19**	350.	**MD118E90**	5,440.
125	145	1@+5%	1@-5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	286A	**WS19**	350.	**MD145E90**	6,350.
150	175	1@+5%	1@-5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	286A	**WS34**	800.	**MD175E90**	8,030.
200	220	1@+5%	1@-5%	DT-3	150	56	31-1/4	24-1/4	1200	1422	793	616	499	FR917	286A	**WS34**	800.	**MD220E90**	9,300.
250	275	1@+5%	1@-5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	286A	**WS34**	800.	**MD275E90**	10,880.
300	330	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2200	1905	1130	914	1000	FR919	①	**WS35**	1,360.	**MD330E90**	12,925.
400	440	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD440E90** ②	18,900.
500	550	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD550E90** ②	22,800.
600	660	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD660E90** ②	27,600.
700	770	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD770E90** ②	34,400.

① Refer to your Cutler-Hammer sales office.

② Not Seismic Qualified.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Table 9-59. Drive Isolation Transformers

Hp	kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
		FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
460 Δ Volts to 230Y/133 Volts																			
5	7.5	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286D	**WS31**	350.	**MD075E91**	1,400.
7.5	11	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286D	**WS31**	350.	**MD11E91**	1,450.
10	14	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286D	**WS31**	350.	**MD14E91**	1,550.
15	20	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	358	104	FR910A	286D	**WS31**	350.	**MD20E91**	1,920.
20	27	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	358	104	FR910A	286D	**WS31**	350.	**MD27E91**	2,195.
25	34	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	358	140	FR912A	286D	**WS31**	350.	**MD34E91**	2,430.
30	40	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	358	140	FR912A	286D	**WS31**	350.	**MD40E91**	2,800.
40	51	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286D	**WS33**	350.	**MD51E91**	3,165.
50	63	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286D	**WS33**	350.	**MD63E91**	3,580.
60	75	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286D	**WS33**	350.	**MD75E91**	3,875.
75	93	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	663	485	272	FR915B	286D	**WS33**	350.	**MD93E91**	4,650.
100	118	1@+5%	1@-5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	286D	**WS19**	350.	**MD118E91**	5,440.
125	145	1@+5%	1@-5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	286D	**WS19**	350.	**MD145E91**	6,350.
150	175	1@+5%	1@-5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	286D	**WS34**	800.	**MD175E91**	8,030.
200	220	1@+5%	1@-5%	DT-3	150	56	31-1/4	24-1/4	1200	1422	793	616	499	FR917	286D	**WS34**	800.	**MD220E91**	9,300.
250	275	1@+5%	1@-5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	286D	**WS34**	800.	**MD275E91**	10,880.
300	330	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2200	1905	1130	914	1000	FR919	318E	**WS35**	1,360.	**MD330E91**	12,925.
400	440	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2200	1905	1130	914	1000	FR919	318E	**WS35**	1,360.	**MD440E91**	18,900.
500	550	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	318E	**WS35**	1,360.	**MD550E91**	22,800.
600	660	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	318E	**WS35**	1,360.	**MD660E91**	27,600.
700	770	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	318E	**WS35**	1,360.	**MD770E91**	34,400.
800	880	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD880E91** ②	39,300.
—	1000	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD1000E91** ②	42,570.
—	1250	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD1250E91** ②	49,500.
—	1500	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD1500E91** ②	78,600.
460 Δ Volts to 460Y/266 Volts																			
5	7.5	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286D	**WS31**	350.	**MD075E92**	1,400.
7.5	11	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286D	**WS31**	350.	**MD11E92**	1,450.
10	14	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286D	**WS31**	350.	**MD14E92**	1,550.
15	20	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	358	104	FR910A	286D	**WS31**	350.	**MD20E92**	1,920.
20	27	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	358	104	FR910A	286D	**WS31**	350.	**MD27E92**	2,195.
25	34	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	358	140	FR912A	286D	**WS31**	350.	**MD34E92**	2,430.
30	40	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	358	140	FR912A	286D	**WS31**	350.	**MD40E92**	2,800.
40	51	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286D	**WS33**	350.	**MD51E92**	3,165.
50	63	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286D	**WS33**	350.	**MD63E92**	3,580.
60	75	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286D	**WS33**	350.	**MD75E92**	3,875.
75	93	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	663	485	272	FR915B	286D	**WS33**	350.	**MD93E92**	4,650.
100	118	1@+5%	1@-5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	286D	**WS19**	350.	**MD118E92**	5,440.
125	145	1@+5%	1@-5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	286D	**WS19**	350.	**MD145E92**	6,350.
150	175	1@+5%	1@-5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	286D	**WS34**	800.	**MD175E92**	8,030.
200	220	1@+5%	1@-5%	DT-3	150	56	31-1/4	24-1/4	1200	1422	793	616	499	FR917	286D	**WS34**	800.	**MD220E92**	9,300.
250	275	1@+5%	1@-5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	286D	**WS34**	800.	**MD275E92**	10,880.
300	330	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2200	1905	1130	914	1000	FR919	318E	**WS35**	1,360.	**MD330E92**	12,925.
400	440	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2200	1905	1130	914	1000	FR919	318E	**WS35**	1,360.	**MD440E92**	18,900.
500	550	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR919	318E	**WS35**	1,360.	**MD550E92**	22,800.
600	660	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	318E	**WS35**	1,360.	**MD660E92**	27,600.
700	770	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	318E	**WS35**	1,360.	**MD770E92**	34,400.
800	880	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD880E92** ②	39,300.
—	1000	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD1000E92** ②	42,570.
—	1250	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD1250E92** ②	49,500.
—	1500	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD1500E92** ②	78,600.

① Refer to your Cutler-Hammer sales office.
② Not Seismic Qualified.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Table 9-60. Drive Isolation Transformers

Hp	kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
		FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
460 Δ Volts to 575Y/332 Volts																			
5	7.5	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286D	**WS31**	350.	**MD075E93**	1,400.
7.5	11	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286D	**WS31**	350.	**MD11E93**	1,450.
10	14	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286D	**WS31**	350.	**MD14E93**	1,550.
15	20	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	358	104	FR910A	286D	**WS31**	350.	**MD20E93**	1,920.
20	27	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	358	104	FR910A	286D	**WS31**	350.	**MD27E93**	2,195.
25	34	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	358	140	FR912A	286D	**WS31**	350.	**MD34E93**	2,430.
30	40	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	358	140	FR912A	286D	**WS31**	350.	**MD40E93**	2,800.
40	51	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286D	**WS33**	350.	**MD51E93**	3,165.
50	63	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286D	**WS33**	350.	**MD63E93**	3,580.
60	75	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286D	**WS33**	350.	**MD75E93**	3,875.
75	93	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	663	485	272	FR915B	286D	**WS33**	350.	**MD93E93**	4,650.
100	118	1@+5%	1@-5%	DT-3	150	46-1/8	28	20-1/8	760	1171	712	585	344	FR916A	286D	**WS19**	350.	**MD118E93**	5,440.
125	145	1@+5%	1@-5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	286D	**WS19**	350.	**MD145E93**	6,350.
150	175	1@+5%	1@-5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	286D	**WS34**	800.	**MD175E93**	8,030.
200	220	1@+5%	1@-5%	DT-3	150	56	31-1/4	24-1/4	1200	1422	793	616	499	FR917	286D	**WS34**	800.	**MD220E93**	9,300.
250	275	1@+5%	1@-5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	286D	**WS34**	800.	**MD275E93**	10,880.
300	330	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2200	1905	1130	914	1000	FR919	318E	**WS35**	1,360.	**MD330E93**	12,925.
400	440	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2200	1905	1130	914	1000	FR919	318E	**WS35**	1,360.	**MD440E93**	18,900.
500	550	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	318E	**WS35**	1,360.	**MD550E93**	22,800.
600	660	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	318E	**WS35**	1,360.	**MD660E93**	27,600.
700	770	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	318E	**WS35**	1,360.	**MD770E93**	34,400.
575 Δ Volts to 230Y/133 Volts																			
5	7.5	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286H	**WS31**	350.	**MD075E94**	1,400.
7.5	11	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286H	**WS31**	350.	**MD11E94**	1,450.
10	14	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286H	**WS31**	350.	**MD14E94**	1,550.
15	20	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	358	104	FR910A	286H	**WS31**	350.	**MD20E94**	1,920.
20	27	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	358	104	FR910A	286H	**WS31**	350.	**MD27E94**	2,195.
25	34	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	358	140	FR912A	286H	**WS31**	350.	**MD34E94**	2,430.
30	40	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	358	140	FR912A	286H	**WS31**	350.	**MD40E94**	2,800.
40	51	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286H	**WS33**	350.	**MD51E94**	3,165.
50	63	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286H	**WS33**	350.	**MD63E94**	3,580.
60	75	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286H	**WS33**	350.	**MD75E94**	3,875.
75	93	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	663	485	272	FR915B	286H	**WS33**	350.	**MD93E94**	4,650.
100	118	1@+5%	1@-5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	286H	**WS19**	350.	**MD118E94**	5,440.
125	145	1@+5%	1@-5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	286H	**WS19**	350.	**MD145E94**	6,350.
150	175	1@+5%	1@-5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	286H	**WS19**	350.	**MD175E94**	8,030.
200	220	1@+5%	1@-5%	DT-3	150	56	31-1/4	24-1/4	1200	1422	793	616	499	FR917	286H	**WS34**	800.	**MD220E94**	9,300.
250	275	1@+5%	1@-5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	286H	**WS34**	800.	**MD275E94**	10,880.
300	330	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2200	1905	1130	914	1000	FR919	①	**WS35**	1,360.	**MD330E94**	12,925.
400	440	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2200	1905	1130	914	1000	FR919	①	**WS35**	1,360.	**MD440E94**	18,900.
500	550	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	①	**WS35**	1,360.	**MD550E94**	22,800.
600	660	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	①	**WS35**	1,360.	**MD660E94**	27,600.
700	770	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	①	**WS35**	1,360.	**MD770E94**	34,400.
800	880	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD880E94** ②	39,300.
—	1000	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD1000E94** ②	42,570.
—	1250	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD1250E94** ②	49,500.
—	1500	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD1500E94** ②	78,600.

① Refer to your Cutler-Hammer sales office.
② Not Seismic Qualified.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Table 9-61. Drive Isolation Transformers

Hp	kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Weathershield		Style Number	Price U.S. $
		FCAN	FCBN			H	W	D		H	W	D				Catalog Number	Price U.S. $		
575 Δ Volts to 460Y/266 Volts																			
5	7.5	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286H	**WS31**	350.	**MD075E95**	1,400.
7.5	11	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286H	**WS31**	350.	**MD11E95**	1,450.
10	14	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286H	**WS31**	350.	**MD14E95**	1,550.
15	20	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	358	104	FR910A	286H	**WS31**	350.	**MD20E95**	1,920.
20	27	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	358	104	FR910A	286H	**WS31**	350.	**MD27E95**	2,195.
25	34	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	358	140	FR912A	286H	**WS31**	350.	**MD34E95**	2,430.
30	40	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	358	140	FR912A	286H	**WS31**	350.	**MD40E95**	2,800.
40	51	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286H	**WS33**	350.	**MD51E95**	3,165.
50	63	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286H	**WS33**	350.	**MD63E95**	3,580.
60	75	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286H	**WS33**	350.	**MD75E95**	3,875.
75	93	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	663	485	272	FR915B	286H	**WS33**	350.	**MD93E95**	4,650.
100	118	1@+5%	1@-5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	286H	**WS19**	350.	**MD118E95**	5,440.
125	145	1@+5%	1@-5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	286H	**WS19**	350.	**MD145E95**	6,350.
150	175	1@+5%	1@-5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	286H	**WS34**	800.	**MD175E95**	8,030.
200	220	1@+5%	1@-5%	DT-3	150	56	31-1/4	24-1/4	1200	1422	793	616	499	FR917	286H	**WS34**	800.	**MD220E95**	9,300.
250	275	1@+5%	1@-5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	286H	**WS34**	800.	**MD275E95**	10,880.
300	330	1@+5%	1@-5%	DT-3	150	75	44	36	2200	1905	1130	914	1000	FR919	318F	**WS35**	1,360.	**MD330E95**	12,925.
400	440	1@+5%	1@-5%	DT-3	150	75	44	36	2200	1905	1130	914	1000	FR919	318F	**WS35**	1,360.	**MD440E95**	18,900.
500	550	1@+5%	1@-5%	DT-3	150	75	44	36	2900	1905	1130	914	1315	FR920	318F	**WS35**	1,360.	**MD550E95**	22,800.
600	660	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	318F	**WS35**	1,360.	**MD660E95**	27,600.
700	770	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920	318F	**WS35**	1,360.	**MD770E95**	34,400.
800	880	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD880E95** ②	39,300.
—	1000	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD1000E95** ②	42,570.
—	1250	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD1250E95** ②	49,500.
—	1500	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD1500E95** ②	78,600.
575 Δ Volts to 575Y/332 Volts																			
5	7.5	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286H	**WS31**	350.	**MD075E96**	1,400.
7.5	11	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286H	**WS31**	350.	**MD11E96**	1,450.
10	14	1@+5%	1@-5%	DT-3	150	25	20-1/8	14-1/8	152	635	511	358	69	FR909	286H	**WS31**	350.	**MD14E96**	1,550.
15	20	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	358	104	FR910A	286H	**WS31**	350.	**MD20E96**	1,920.
20	27	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	358	104	FR910A	286H	**WS31**	350.	**MD27E96**	2,195.
25	34	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	358	140	FR912A	286H	**WS31**	350.	**MD34E96**	2,430.
30	40	1@+5%	1@-5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	358	140	FR912A	286H	**WS31**	350.	**MD40E96**	2,800.
40	51	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286H	**WS33**	350.	**MD51E96**	3,165.
50	63	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286H	**WS33**	350.	**MD63E96**	3,580.
60	75	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	480	1000	663	485	217	FR914B	286H	**WS33**	350.	**MD75E96**	3,875.
75	93	1@+5%	1@-5%	DT-3	150	39-3/8	26-1/8	19-1/8	600	1000	663	485	272	FR915B	286H	**WS33**	350.	**MD93E96**	4,650.
100	118	1@+5%	1@-5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	286H	**WS19**	350.	**MD118E96**	5,440.
125	145	1@+5%	1@-5%	DT-3	150	46-1/8	28	23	760	1171	712	585	344	FR916A	286H	**WS19**	350.	**MD145E96**	6,350.
150	175	1@+5%	1@-5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	793	616	499	FR917	286H	**WS34**	800.	**MD175E96**	8,030.
200	220	1@+5%	1@-5%	DT-3	150	56	31-1/4	24-1/4	1200	1422	793	616	499	FR917	286H	**WS34**	800.	**MD220E96**	9,300.
250	275	1@+5%	1@-5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	286H	**WS34**	800.	**MD275E96**	10,880.
300	330	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2200	1905	1130	914	1000	FR919	①	**WS35**	1,360.	**MD330E96** ②	12,925.
400	440	1@+5%	1@-5%	DT-3	150	75	44-1/2	36	2200	1905	1130	914	1000	FR919	①	**WS35**	1,360.	**MD440E96** ②	18,900.
500	550	1@+5%	1@-5%	DT-3	150	75	44-1/4	36	2900	1905	1130	914	1315	FR920	①	**WS35**	1,360.	**MD550E96** ②	22,800.
600	660	1@+5%	1@-5%	DT-3	150	75	44-1/4	36	2900	1905	1130	914	1315	FR920	①	**WS35**	1,360.	**MD660E96** ②	27,600.
700	770	1@+5%	1@-5%	DT-3	150	①	①	①	①	①	①	①	①	①	①	①	—	**MD770E96** ②	34,400.

① Refer to your Cutler-Hammer sales office.

② Not Seismic Qualified.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Mini-Power Centers

Three-Phase Mini-Power Center

Product Description

- Sand and Resin Encapsulated design.
- Suitable for indoor or outdoor applications.
- 185°C Insulation system, 115°C Rise standard.

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, 3-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.

Features, Benefits and Functions

- UL listed, CSA® certified.
- 60 Hz operation.
- Indoor-Outdoor, NEMA 3R.
- Primary main breaker.
- Secondary main breaker (Type BR feeder 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.
- Feeder circuits can be easily added or changed using Type BR plug-in breakers.
- Suitable for service entrance.
- Aluminum windings and loadcenter chassis standard.
- 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 by Eaton Corporation 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

Cutler-Hammer manufactured 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 9-120**.

Product Specifications

Frequency

Cutler-Hammer 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.

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

For all-copper and bolt-on-breaker designs, contact Eaton's Cutler-Hammer business.

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

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Table 9-62. 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.

Sound Levels

All Cutler-Hammer 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

The Cutler-Hammer business recommends external cables be rated 90°C (sized at 75°C ampacity) for encapsulated designs and 75°C for ventilated designs.

Technical Data and Specifications

Please refer to **Page 9-122**.

Product Selection

Additional Product Selection information begins on **Page 9-136**.

Table 9-63. Single-Phase — Mini-Power Centers

kVA	Full Cap. Taps FCBN	Dimensions (Inches) H	W	D	Wt. Lbs.	Dimensions (mm) H	W	D	Wt. kg	Frame	Wiring Diagram Number	Main Circuit Breaker Primary	Secondary	Feeder Breakers Max. Number 1-Pole	2-Pole	Max. Amp	Style Number	Price U.S. $
480 Volts to 120/240 Volts																		
3	2@-5%	27-1/2	12-9/16	9-3/4	105	698	319	248	47	FR283	97A3K	EHD2015	BR215	8	4	12	**P48G11S03P**	2,100.
5	2@-5%	29-1/2	12-9/16	9-3/4	110	749	319	248	50	FR284	110A5K	EHD2020	BR225	12	6	20	**P48G11S05P**	2,940.
7.5	2@-5%	29-1/2	12-9/16	9-3/4	125	749	319	248	56	FR284	109A7K	EHD2030	BR230	12	6	30	**P48G11S07P**	3,540.
10	2@-5%	38-1/8	13-1/2	11-7/8	180	968	342	301	82	FR285	108A10K	EHD2040	BR250	12	6	40	**P48G11S10P**	3,720.
15	2@-5%	38-1/8	13-1/2	11-7/8	215	968	342	301	98	FR286	107A15K	EHD2060	BR270	20	10	60	**P48G11S15P**	5,000.
25	2@-5%	43-7/8	16-3/8	14-5/8	373	1115	417	372	169	FR287	106A25K	EHD2100	BR2125	26	13	100	**P48G11S25P**	7,240.
600 Volts to 120/240 Volts																		
5	2@-5%	29-1/2	12-9/16	9-3/4	110	749	319	248	50	FR284	110B5K	FDB2015	BR225	12	6	20	**P60G11S05P**	3,785.
7.5	2@-5%	29-1/2	12-9/16	9-3/4	125	749	319	248	56	FR284	109B7K	FDB2030	BR230	12	6	30	**P60G11S07P**	4,040.
10	2@-5%	38-1/8	13-1/2	11-7/8	180	968	342	301	82	FR285	108B10K	FDB2040	BR250	12	6	40	**P60G11S10P**	4,240.
15	2@-5%	38-1/8	13-1/2	11-7/8	215	968	342	301	98	FR286	107B15K	FDB2060	BR270	20	10	60	**P60G11S15P**	5,640.
25	2@-5%	43-7/8	16-3/8	14-5/8	373	1115	417	372	169	FR287	106B25K	FDB2100	BR2125	26	13	100	**P60G11S25P**	8,310.

Table 9-64. Three-Phase — Mini-Power Centers

kVA	Full Cap. Taps FCBN	Dimensions (Inches) H	W	D	Wt. Lbs.	Dimensions (mm) H	W	D	Wt. kg	Frame	Wiring Diagram Number	Main Circuit Breaker ① Primary	Secondary	Feeder Breakers ②③ Max. Number 1-Pole	2-Pole	Max. Amp	Style Number	Price U.S. $
480 Δ Volts to 208Y/120 Volts																		
15	2@-5%	36-1/8	28-3/4	9-3/8	320	917	730	238	145	FR289A	105A15K	EHD3040	BR350	18	6	40	**P48G28T15P**	7,420.
22.5	2@-5%	40-7/8	29-7/8	13-5/8	565	1038	759	346	256	FR290A	103A21K	EHD3070	BR370	18	6	60	**P48G28T21P**	9,225.
30	2@-5%	41-7/8	29-7/8	13-5/8	635	1063	759	346	288	FR291A	104A30K	EHD3090	BR3100	24	8	80	**P48G28T30P**	11,750.
600 Δ Volts to 208Y/120 Volts																		
15	2@-5%	36-1/8	28-3/4	9-3/8	320	917	730	238	145	FR289A	105D15K	FDB3030	BR350	18	6	40	**P60G28T15P**	8,685.
22.5	2@-5%	40-7/8	29-7/8	13-5/8	565	1038	759	346	256	FR290A	103B21K	FDB3050	BR370	18	6	60	**P60G28T21P**	10,860.
30	2@-5%	41-7/8	29-7/8	13-5/8	635	1063	759	346	288	FR291A	104B30K	FDB3070	BR3100	24	8	80	**P60G28T30P**	15,150.

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 Feeder breakers not included, use Eaton's Cutler-Hammer Type BR.

Note: For 316 grade stainless steel enclosure replace 10th character of catalog number with an "SS" suffix, i.e., P48G11S03SS.

Note: For all-copper, bolt-on breaker designs, contact the Cutler-Hammer business.

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

Discount Symbol **DT-1**

November 2003
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Single- and Three-Phase, Types DS-3E, DT-3E, 60 Hz

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

Product Description

- Suitable for indoor or outdoor applications.
- Totally enclosed, non-ventilated enclosures.
- 220°C insulation system, 150°C rise standard.

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 which 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 where the transformer is subject to spray or washdown conditions.

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

Industry Standards

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

Seismically Qualified

Cutler-Hammer manufactured 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 9-120**.

Product Specifications

Frequency

Cutler-Hammer 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:

Table 9-65. 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 totally enclosed, non-ventilated transformers, Types DS-3E and DT-3E, utilize 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.** The Cutler-Hammer business recommends external cables be rated 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 9-122**.

Product Selection

Additional Product Selection information begins on **Page 9-136**.

Table 9-66. Single-Phase Selection Information — Type DS-3E, 60 Hz ①

kVA	Type	°C Temp. Rise	Dimensions (Inches)			Weight Lbs.	Dimensions (mm)			Weight kg	Frame	Wiring Diagram Number	Style Number	Price U.S. $
			H	W	D		H	W	D					
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.														
37.5	DS-3E	150	42-1/8	24	23-3/8	600	1070	610	594	274	FR820N	3XA	**T20P11S37NV**	4,330.
50	DS-3E	150	42-1/8	24	23-3/8	720	1070	610	594	329	FR820N	3XA	**T20P11S50NV**	5,400.

Table 9-67. Three-Phase Selection Information — Type DT-3E, 60 Hz ①②

kVA	Type	°C Temp. Rise	Dimensions (Inches)			Weight Lbs.	Dimensions (mm)			Weight kg	Frame	Wiring Diagram Number	Style Number	Price U.S. $
			H	W	D		H	W	D					
480 Δ Volts to 208Y/120 Volts +2 – 2.5% FCAN, 4 – 2.5% FCBN Taps														
30	DT-3E	150	39-1/4	26-1/8	19-1/8	480	995	663	486	217	FR914AN	280B	**V48M28T30NV**	3,080.
45	DT-3E	150	39-1/4	26-1/8	19-1/8	600	995	663	486	272	FR915AN	280B	**V48M28T45NV**	4,400.
75	DT-3E	150	46-1/2	28	23	760	1171	712	585	344	FR916AN	280B	**V48M28T75NV**	5,500.
112.5	DT-3E	150	56	31-1/4	24-1/2	1100	1422	793	622	499	FR917N	280B	**V48M28T12NV**	8,000.
150	DT-3E	150	56	31-1/4	24-1/2	1300	1422	793	622	589	FR918AN	280B	**V48M28T49NV**	10,100.
225	DT-3E	150	75	44-1/2	36	2400	1905	1130	914	1088	FR919N	275A	**V48M28T22NV**	16,000.
300	DT-3E	150	75	44-1/2	36	2900	1905	1130	914	1315	FR920N	275A	**V48M28T33NV**	26,000.

① Types DS-3 and DT-3 non-ventilated transformers are not UL listed.

② Transformers Type EPT 75 kVA and smaller three-phase, and Type EP 25 kVA and smaller single-phase, are furnished non-ventilated normally, as standard (and are UL listed). See General Purpose Transformers.

Note: Contact your local Cutler-Hammer sales office for availability of additional Totally Enclosed Non-Ventilated Transformers.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Single- and Three-Phase, Types EPZ, EPTZ, 60 Hz

Single-Phase Type EPZ Encapsulated

Product Description

- Sand and Resin Encapsulated design.
- Suitable for indoor or outdoor applications.
- Totally enclosed, non-ventilated enclosures.
- 185°C Insulation system, 115°C Rise standard.
- Mountable in any position indoors. Upright only outdoors.
- Available in ratings up to 600 volts primary, 37.5 kVA single-phase, 75 kVA three-phase.

Application Description

Type EPZ and EPTZ transformers are labeled as "Suitable for use in Class I, Division 2, Groups 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:

6. A location in which volatile flammable liquids or gases are handled, processed or used, but which 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.
7. Or, a location where ignitable concentrations of gases or vapors are normally prevented by positive mechanical ventilation and which might become hazardous through failure of the ventilation equipment.
8. 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 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.
- Long leads to ease wiring to junction box.

Standards and Certifications

Industry Standards

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

Seismically Qualified

Cutler-Hammer manufactured 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 9-120**.

Product Specifications

Frequency

Cutler-Hammer 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:

Table 9-68. 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 encapsulated transformers, Types EPZ and EPTZ, utilize a NEMA 3R rated enclosure.

Sound Levels

All Cutler-Hammer 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's Cutler-Hammer business recommends external cables be rated 90°C (sized at 75°C ampacity) for encapsulated designs and 75°C for ventilated designs.

Nominal and tap leads come out of the transformer through pipe elbows. Connections should be made to an adjacent explosion-proof junction box. Unused tap leads must be properly insulated prior to energization. EPZ and EPTZ transformers are not UL listed.

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 9-122**.

Product Selection

9

Additional Product Selection information begins on **Page 9-136**.

Table 9-69. Single-Phase Selection Information — Type EPZ, 60 Hz

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches) ①			Wt. Lbs.	Dimensions (mm) ①			Wt. kg	Frame	Wiring Diagram Number	Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D					
480 Volts to 120/240 Volts																
.05	—	—	EPZ	115	6-1/2	4-7/8	4-5/8	13	165	124	118	6	FR57H	524H	**Z48N11S51A**	510.
.75	—	—	EPZ	115	8-3/8	6	5-3/4	21	213	152	146	10	FR58AH	524H	**Z48N11S76A**	675.
1	—	—	EPZ	115	8-3/8	6	5-3/4	31	213	152	146	14	FR59AH	524H	**Z48N11S01A**	805.
1.5	—	—	EPZ	115	10-3/4	6-3/16	6-1/8	40	273	157	156	18	FR67H	524H	**Z48N11S16A**	975.
2	—	—	EPZ	115	10-3/4	6-3/16	6-1/8	40	273	157	156	18	FR68H	524H	**Z48N11S02A**	1,185.
3	—	—	EPZ	115	14-1/8	7-3/4	8	65	359	197	203	30	FR176H	524H	**Z48N11S03A**	1,370.
5	—	—	EPZ	115	16	10-3/8	9-7/8	113	406	264	232	51	FR177H	524H	**Z48N11S05A**	1,985.
7.5	—	—	EPZ	115	16	10-3/8	9-7/8	123	406	264	232	56	FR178H	524H	**Z48N11S07A**	2,375.
10	—	—	EPZ	115	19	13-3/8	10-1/2	193	483	340	267	88	FR179H	524H	**Z48N11S10A**	2,870.
15	—	—	EPZ	115	19	13-3/8	10-1/2	216	483	340	267	98	FR180H	524H	**Z48N11S15A**	3,530.
25	—	—	EPZ	115	22-3/8	16-3/8	14-1/2	375	567	416	359	170	FR182H	524H	**Z48N11S25A**	5,190.

① Dimensions do not include the conduit for cable entry and exit.
Note: For 316 grade stainless steel enclosure replace 10th character of catalog number with an "SS" suffix.

Table 9-70. Three-Phase Selection Information — Type EPTZ, 60 Hz

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches) ②			Wt. Lbs.	Dimensions (mm) ②			Wt. kg	Frame	Wiring Diagram Number	Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D					
480 Δ Volts to 208Y/120 Volts Three-Phase																
3	—	2@-5%	EPTZ	115	13-3/8	16	8-3/8	116	340	405	211	53	FR201H	70A	**Z48G28T03A**	2,645.
6	—	2@-5%	EPTZ	115	15-7/8	16-1/2	9-7/8	143	403	419	251	65	FR200H	70A	**Z48G28T06A**	3,085.
9	—	2@-5%	EPTZ	115	15-7/8	16-1/2	9-7/8	166	403	419	251	75	FR103H	70A	**Z48G28T09A**	3,825.
15	—	2@-5%	EPTZ	115	17-3/8	19-11/16	10-7/16	275	442	500	265	125	FR95H	70A	**Z48G28T15A**	5,470.
30	—	2@-5%	EPTZ	115	26-5/8	25-1/4	12-3/4	422	676	638	324	191	FR243H	66A	**Z48G28T30A**	9,720.
45	—	2@-5%	EPTZ	115	26-1/2	28-1/2	14-5/8	660	673	724	372	299	FR244H	66A	**Z48G28T45A**	11,130.
75	—	2@-5%	EPTZ	115	30-3/4	30-1/8	15-5/8	1275	781	765	397	580	FR245H	66A	**Z48G28T75A**	14,490.
480 Δ Volts to 240 Δ Volts with 120 Volt Lighting Tap on B Phase ③																
6	—	2@-5%	EPTZ	115	13-1/8	19-9/16	6-1/4	115	333	497	158	52	FR102H	95A	**Z48G22T06A**	3,395.
9	—	2@-5%	EPTZ	115	14-15/16	21-7/8	7-3/8	160	379	556	187	73	FR97H	95A	**Z48G22T09A**	4,205.
15	—	2@-5%	EPTZ	115	21-3/4	22-5/16	11-3/8	340	552	567	289	155	FR195H	95A	**Z48G22T15A**	6,010.
30	—	2@-5%	EPTZ	115	26-5/8	25-1/4	12-3/4	422	676	638	324	191	FR243H	95A	**Z48G22T30A**	10,690.
45	—	2@-5%	EPTZ	115	26-1/2	28-1/2	14-5/8	660	673	724	372	299	FR244H	95A	**Z48G22T45A**	12,230.

② Dimensions do not include the conduit for cable entry and exit.
③ Center Tap capacity limited to 5% of rated kVA.
Note: For 316 grade stainless steel enclosure replace 10th character of catalog number with an "SS" suffix.
Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Single- and Three-Phase, Types DS-3C, DT-3C, 60 Hz

Product Description

- 220°C insulation system, 150°C Rise standard.
- Aluminum windings (copper optional).

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.

Open core and coil assemblies are typically used by panel builders and equipment OEM customers who incorporate the entire transformer into their structures. A versatile option to purchasing a standard, enclosed transformer and discarding the unneeded enclosure parts.

Features, Benefits and Functions

- UL (UL recognized).
- 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 by Eaton Corporation are built and tested in accordance with applicable NEMA, ANSI, and IEEE Standards.

Seismically Qualified

All Cutler-Hammer manufactured 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 9-120**.

Product Specifications

Frequency

Cutler-Hammer 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:

Table 9-71. 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 following pages provide listings for most standard transformer ratings and styles.

For other ratings or styles not shown, refer to Eaton's Cutler-Hammer business.

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.

Sound Levels

All Cutler-Hammer 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.

Table 9-72. Average Sound Levels

NEMA ST-20 Average Sound Level (dB)		
kVA	Ventilated	Encapsulated
0 – 9	40	45
10 – 50	45	50
51 – 150	50	55
151 – 300	55	57
301 – 500	60	59
501 – 700	62	61
701 – 1000	64	63
1001 – 1500	65	64

Winding Terminations

Lugs are not supplied with these transformers. The Cutler-Hammer business 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 9-122**.

Product Selection

Additional Product Selection information begins on **Page 9-136**.

Table 9-73. Single-Phase Selection Information — Type DS-3C, 60 Hz

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D					
240 x 480 Volts to 120/240 Volts																
15	①	①	DS-3C	150	30-1/4	16-7/8	15-7/8	147	768	428	402	67	FR815C	3XA	**T20P11S15ZZ**	1,440.
25	①	①	DS-3C	150	31-1/4	22-5/8	17-1/2	212	793	574	445	96	FR816C	3XA	**T20P11S25ZZ**	1,870.
37.5	①	①	DS-3C	150	37-5/8	22-5/8	19-1/2	306	953	574	495	139	FR817C	3XA	**T20P11S37ZZ**	2,290.
50	①	①	DS-3C	150	37-5/8	22-5/8	19-1/2	340	953	574	495	154	FR818C	3XA	**T20P11S50ZZ**	2,780.

① 1@+5%, 2@–5% at 240 volts primary; 2@+2.5%, 4@–2.5% at 480 volts primary.

Table 9-74. Three-Phase Selection Information — Type DT-3C, 60 Hz

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Wt. Lbs.	Dimensions (mm)			Wt. kg	Frame	Wiring Diagram Number	Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D					
480 Δ Volts to 208Y/120 Volts																
15	2@+2.5%	4@-2.5%	DT-3C	150	20-5/16	20-1/8	14	128	516	511	356	58	FR909C	280B	**V48M28T15ZZ**	1,350.
30	2@+2.5%	4@-2.5%	DT-3C	150	23-13/16	20-1/8	14	195	605	511	356	89	FR910C	280B	**V48M28T30ZZ**	1,725.
45	2@+2.5%	4@-2.5%	DT-3C	150	24-3/4	20-1/8	14	250	629	511	356	114	FR912C	280B	**V48M28T45ZZ**	2,100.
75	2@+2.5%	4@-2.5%	DT-3C	150	29-3/8	25-5/16	19	395	746	643	483	180	FR914C	280B	**V48M28T75ZZ**	2,970.
112.5	2@+2.5%	4@-2.5%	DT-3C	150	31-3/8	25-5/16	19	530	797	643	483	241	FR915C	280B	**V48M28T12ZZ**	4,300.
150	2@+2.5%	4@-2.5%	DT-3C	150	41-7/16	25-5/16	20	656	1052	643	508	298	FR916C	280B	**V48M28T49ZZ**	5,400.

Note: Contact your local Cutler-Hammer sale offices for availability of additional Open Type Core and Coil Assemblies.
Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

For other ratings or styles not shown, refer to Eaton's Cutler-Hammer business.

Discount Symbol **DT-1**

Three-Phase, 60 Hz

Product Description

- Ventilated enclosures.
- Indoor applications standard.
- 220°C insulation system, 150°C rise standard.
- Aluminum windings (copper available as option).
- Electrostatic shield.
- Surge suppression providing protection from voltage surges and spikes.
- 120 dB common mode noise attenuation.
- 60 dB transverse mode noise attenuation.

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 by Eaton Corporation are built and tested in accordance with applicable NEMA, ANSI, and IEEE Standards. All 600 volt class transformers are UL listed unless otherwise noted.

Options and Accessories

Please refer to **Page 9-120**.

Product Specifications

Frequency

Cutler-Hammer 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:

Table 9-75. 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, Types DS-3, DT-3, MD, and KT, utilize a NEMA 2 rated (drip-proof) enclosure as standard, and are rated NEMA 3R with the addition of weathershields.

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 Eaton's Cutler-Hammer business.

Sound Levels

All Cutler-Hammer 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.

Table 9-76. Average 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 ventilated transformers only.

Winding Terminations

Primary and secondary windings are terminated in the wiring compartment. 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.** The Cutler-Hammer business recommends external cables be rated 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 9-122**.

Product Selection

Additional Product Selection information begins on **Page 9-136**.

Table 9-77. Filtered Noise Isolation Transformers ①

kVA	Full Cap. Taps		°C Temp. Rise	Dimensions (Inches)			Weight Lbs.	Dimensions (mm)			Weight kg	Style Number	Price U.S. $
	FCAN	FCBN		H	W	D		H	W	D			
480 Δ Volts to 208Y/120 Volts													
15	2@+2.5%	4@-2.5%	150	27-3/8	19	16-9/16	210	695	483	421	95	**F48M28T15A**	5,670.
30	2@+2.5%	4@-2.5%	150	32-1/4	24	18-1/16	320	819	610	459	145	**F48M28T30A**	6,950.
45	2@+2.5%	4@-2.5%	150	32-1/4	24	18-1/16	385	819	610	459	175	**F48M28T45A**	8,175.
75	2@+2.5%	4@-2.5%	150	35-3/4	32	23-11/16	555	908	813	602	252	**F48M28T75A**	10,400.
112.5	2@+2.5%	4@-2.5%	150	40	32	23-11/16	720	1016	813	602	327	**F48M28T12A**	11,700.
150	2@+2.5%	4@-2.5%	150	46	35	23-11/16	880	1168	889	602	400	**F48M28T49A**	16,060.
225	2@+2.5%	4@-2.5%	150	48	38-1/2	28-15/16	1120	1219	978	735	509	**F48M28T22A**	20,650.
208 Δ Volts to 208Y/120 Volts													
15	1@+5%	2@-5%	150	27-3/8	19	16-9/16	210	695	483	421	95	**F29R28T15A**	6,520.
30	1@+5%	2@-5%	150	32-1/4	24	18-1/16	320	819	610	459	145	**F29R28T30A**	8,800.
45	1@+5%	2@-5%	150	32-1/4	24	18-1/16	385	819	610	459	175	**F29R28T45A**	10,200.
75	1@+5%	2@-5%	150	35-3/4	32	23-11/16	555	908	813	602	252	**F29R28T75A**	13,400.
112.5	1@+5%	2@-5%	150	40	32	23-11/16	720	1016	813	602	327	**F29R28T12A**	15,850.
150	1@+5%	2@-5%	150	46	35	23-11/16	880	1168	889	602	400	**F29R28T49A**	23,500.
225	1@+5%	2@-5%	150	48	38-1/2	28-15/16	1120	1219	978	735	509	**F29R28T22A**	26,790.

① Not Seismic Qualified.

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

Discount Symbol **DT-1**

November 2003
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Single- and Three-Phase, 60 Hz

Type DT-3 Low Sound Transformer

Product Description

Types EP, 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.
- 185ºC Insulation System, 115ºC rise standard.
- Available in single-phase ratings through 37.5 kVA and 4160 volts primary (EP).
- Available in three-phase ratings through 75 kVA and 4160 volts primary (EPT).

Types DS-3, DT-3

- Ventilated, NEMA 2 enclosure standard.
- Suitable for indoor applications, outdoors when weathershields are also installed.
- Upright mounting only.
- 220ºC Insulation System, 150ºC rise 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).

Application Description

Low sound transformers are designed to have average sound levels 3 dB below NEMA ST-20 standards.

Note: Sound levels are measured in a sound room, not at the installation.

These quieter transformers are ideal for noise sensitive installations such as schools, hospitals, libraries, and offices. Proper installation procedures should be used to achieve maximum benefit.

Features, Benefits and Functions

- UL listed.
- 60 Hz operation.
- Short-term overload capability as required by ANSI.

Standards and Certifications

Industry Standards

All Cutler-Hammer dry-type distribution and control transformers by Eaton Corporation 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

Cutler-Hammer manufactured 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 9-120**.

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 Eaton's Cutler-Hammer business.

Product Specifications

Frequency

Cutler-Hammer 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:

Table 9-78. 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, Types DS-3, DT-3, MD, and KT, utilize a NEMA 2 rated (drip-proof) enclosure as standard, and are rated NEMA 3R with the addition of weathershields.

Sound Levels

All Eaton's Cutler-Hammer 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.

Table 9-79. Average Sound Levels

NEMA ST-20 Average Sound Level (dB)		
kVA	**Ventilated**	**Encapsulated**
0 – 9	40	45
10 – 50	45	50
51 – 150	50	55
151 – 300	55	57
301 – 500	60	59
501 – 700	62	61
701 – 1000	64	63
1001 – 1500	65	64

Winding Terminations

Primary and secondary windings are terminated in the wiring compartment. 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.** The Cutler-Hammer business recommends external cables be rated 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 9-122**.

Product Selection

Additional Product Selection information begins on **Page 9-136**.

Table 9-80. Low Sound Transformers Type DT-3, 60 Hz

kVA	Full Cap. Taps		Type	°C	Dimensions (Inches)			Wt.	Dimensions (mm)			Wt.	Frame	Wiring	Weathershield		Style	Price
	FCAN	FCBN		Temp. Rise	H	W	D	Lbs.	H	W	D	kg		Diagram Number	Catalog Number	Price U.S. $	Number	U.S. $
480 Δ Volts to 208Y/120 Volts — Aluminum Windings																		
15	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	230	765	511	359	69	FR910A	280B	**WS31**	350.	**V48M28T15LS42**	1,590.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280B	**WS31**	350.	**V48M28T30LS42**	2,050.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280B	**WS31**	350.	**V48M28T45LS42**	2,520.
75	2@+2.5%	4@-2.5%	DT-3	150	39-1/4	26-1/8	19-1/8	600	1000	664	486	273	FR915B	280B	**WS33**	350.	**V48M28T75LS47**	3,530.
112.5	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	760	1171	712	585	345	FR916A	280B	**WS19**	350.	**V48M28T12LS47**	5,075.
150	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280B	**WS34**	800.	**V48M28T49LS47**	6,370.
225	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280B	**WS34**	800.	**V48M28T22LS52**	9,325.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280B	**WS34**	800.	**V48M28T33LS52**	11,800.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	2400	1905	1130	914	1089	FR919	275A	**WS35**	1,360.	**V48M28T55LS57**	18,900.
15	2@+2.5%	4@-2.5%	DT-3	115	30-1/8	20-1/8	14-1/8	230	765	511	359	69	FR910A	280B	**WS31**	350.	**V48M28F15LS42**	1,890.
30	2@+2.5%	4@-2.5%	DT-3	115	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280B	**WS31**	350.	**V48M28F30LS42**	2,330.
45	2@+2.5%	4@-2.5%	DT-3	115	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280B	**WS33**	350.	**V48M28F45LS42**	2,840.
75	2@+2.5%	4@-2.5%	DT-3	115	39-3/8	26-1/8	19-1/8	600	1000	664	486	273	FR915B	280B	**WS33**	350.	**V48M28F75LS47**	4,010.
112.5	2@+2.5%	4@-2.5%	DT-3	115	46-1/8	28	23	760	1171	712	585	345	FR916A	280B	**WS19**	350.	**V48M28F12LS47**	5,805.
150	2@+2.5%	4@-2.5%	DT-3	115	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280B	**WS34**	800.	**V48M28F49LS47**	7,290.
225	2@+2.5%	4@-2.5%	DT-3	115	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280B	**WS34**	800.	**V48M28F22LS52**	10,660.
300	2@+2.5%	4@-2.5%	DT-3	115	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280B	**WS34**	800.	**V48M28F33LS52**	13,700.
500	2@+2.5%	4@-2.5%	DT-3	115	75	44-1/2	36	2400	1905	1130	914	1089	FR919	275A	**WS35**	1,360.	**V48M28F55LS57**	21,700.
15	2@+2.5%	4@-2.5%	DT-3	80	30-1/8	20-1/8	14-1/8	230	765	511	359	104	FR910A	280B	**WS31**	350.	**V48M28B15LS42**	2,160.
30	2@+2.5%	4@-2.5%	DT-3	80	30-1/8	20-1/8	14-1/8	310	765	511	359	141	FR912A	280B	**WS31**	350.	**V48M28B30LS42**	2,680.
45	2@+2.5%	4@-2.5%	DT-3	80	39-3/8	26-1/8	19-1/8	480	1000	664	486	218	FR914B	280B	**WS33**	350.	**V48M28B45LS42**	3,360.
75	2@+2.5%	4@-2.5%	DT-3	80	46-1/8	28	23	760	1171	712	585	345	FR916A	280B	**WS19**	350.	**V48M28B75LS47**	4,610.
112.5	2@+2.5%	4@-2.5%	DT-3	80	46-1/8	28	23	760	1171	712	585	345	FR916A	280B	**WS19**	350.	**V48M28B12LS47**	6,660.
150	2@+2.5%	4@-2.5%	DT-3	80	56	31-1/4	24-1/4	1100	1422	794	616	499	FR917	280B	**WS34**	800.	**V48M28B49LS47**	8,370.
225	2@+2.5%	4@-2.5%	DT-3	80	62-1/4	31-1/4	30-1/4	1600	1581	794	768	728	FR918A	280B	**WS34**	800.	**V48M28B22LS52**	12,245.
300	2@+2.5%	4@-2.5%	DT-3	80	75	44-1/2	36	2400	1905	1130	914	1089	FR919	275A	**WS35**	1,360.	**V48M28B33LS52**	16,000.
480 Δ Volts to 208Y/120 Volts — Copper Windings																		
15	2@+2.5%	4@-2.5%	DT-3	150	25	20-1/8	14-1/8	172	635	511	359	78	FR909	280B	**WS31**	350.	**V48M28T15CULS42**	3,000.
30	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	300	765	511	359	136	FR910A	280B	**WS31**	350.	**V48M28T30CULS42**	2,770.
45	2@+2.5%	4@-2.5%	DT-3	150	30-1/8	20-1/8	14-1/8	370	765	511	359	168	FR912A	280B	**WS31**	350.	**V48M28T45CULS42**	3,360.
75	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	550	1000	664	486	250	FR914B	280B	**WS33**	350.	**V48M28T75CULS47**	5,050.
112.5	2@+2.5%	4@-2.5%	DT-3	150	39-3/8	26-1/8	19-1/8	675	1000	664	486	361	FR915B	280B	**WS33**	350.	**V48M28T12CULS47**	6,900.
150	2@+2.5%	4@-2.5%	DT-3	150	46-1/8	28	23	850	1171	712	585	386	FR916A	280B	**WS19**	350.	**V48M28T49CULS47**	9,510.
225	2@+2.5%	4@-2.5%	DT-3	150	56	31-1/4	24-1/4	1200	1422	794	616	545	FR917	280B	**WS34**	800.	**V48M28T22CULS52**	12,690.
300	2@+2.5%	4@-2.5%	DT-3	150	62-1/4	31-1/4	30-1/4	2150	1581	794	768	977	FR918A	280B	**WS34**	800.	**V48M28T33CULS52**	16,000.
500	2@+2.5%	4@-2.5%	DT-3	150	75	44-1/2	36	3100	1905	1130	914	1409	FR919	275A	**WS35**	1,360.	**V48M28T55CULS57**	25,800.
15	2@+2.5%	4@-2.5%	DT-3	115	25	20-1/8	14-1/8	172	635	511	359	78	FR909	280B	**WS31**	350.	**V48M28F15CULS42**	2,600.
30	2@+2.5%	4@-2.5%	DT-3	115	30-1/8	20-1/8	14-1/8	300	765	511	359	136	FR910A	280B	**WS31**	350.	**V48M28F30CULS42**	3,150.
45	2@+2.5%	4@-2.5%	DT-3	115	30-1/8	20-1/8	14-1/8	370	765	511	359	168	FR912A	280B	**WS31**	350.	**V48M28F45CULS42**	3,800.
75	2@+2.5%	4@-2.5%	DT-3	115	39-3/8	26-1/8	19-1/8	550	1000	664	486	250	FR914B	280B	**WS33**	350.	**V48M28F75CULS47**	5,750.
112.5	2@+2.5%	4@-2.5%	DT-3	115	39-3/8	26-1/8	19-1/8	675	1000	664	486	361	FR915B	280B	**WS33**	350.	**V48M28F12CULS47**	7,860.
150	2@+2.5%	4@-2.5%	DT-3	115	46-1/8	28	23	850	1171	712	585	386	FR916A	280B	**WS19**	350.	**V48M28F49CULS47**	10,700.
225	2@+2.5%	4@-2.5%	DT-3	115	56	31-1/4	24-1/4	1200	1422	794	616	545	FR917	280B	**WS34**	800.	**V48M28F22CULS52**	14,340.
300	2@+2.5%	4@-2.5%	DT-3	115	62-1/4	31-1/4	30-1/4	2150	1581	794	768	977	FR918A	280B	**WS34**	800.	**V48M28F33CULS52**	18,000.
500	2@+2.5%	4@-2.5%	DT-3	115	75	44-1/2	36	3100	1905	1130	914	1409	FR919	275A	**WS35**	1,360.	**V48M28F55CULS57**	29,300.
15	2@+2.5%	4@-2.5%	DT-3	80	30-1/8	20-1/8	14-1/8	300	765	511	359	136	FR910A	280B	**WS31**	350.	**V48M28B15CULS42**	3,000.
30	2@+2.5%	4@-2.5%	DT-3	80	30-1/8	20-1/8	14-1/8	370	765	511	359	168	FR912A	280B	**WS31**	350.	**V48M28B30CULS42**	3,280.
45	2@+2.5%	4@-2.5%	DT-3	80	39-3/8	26-1/8	19-1/8	550	1000	664	486	250	FR914B	280B	**WS33**	350.	**V48M28B45CULS42**	4,370.
75	2@+2.5%	4@-2.5%	DT-3	80	46-1/8	28	23	850	1171	712	585	386	FR916A	280B	**WS19**	350.	**V48M28B75CULS47**	6,630.
112.5	2@+2.5%	4@-2.5%	DT-3	80	46-1/8	28	23	850	1171	712	585	386	FR916A	280B	**WS19**	350.	**V48M28B12CULS47**	9,090.
150	2@+2.5%	4@-2.5%	DT-3	80	56	31-1/4	24-1/4	1200	1422	794	616	545	FR917	280B	**WS34**	800.	**V48M28B49CULS47**	12,400.
225	2@+2.5%	4@-2.5%	DT-3	80	62-1/4	31-1/4	30-1/4	2150	1581	794	768	728	FR918A	280B	**WS34**	800.	**V48M28B22CULS52**	16,650.
300	2@+2.5%	4@-2.5%	DT-3	80	75	44-1/2	36	3100	1905	1130	914	1409	FR919	275A	**WS35**	1,360.	**V48M28B33CULS52**	20,950.

Note: Contact Cutler-Hammer for availability of lower sound level designs.

Note: Contact your local Cutler-Hammer sales office for CE Mark transformer requirements.

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

Discount Symbol **DT-1**

Single- and Three-Phase, Types EPM, DS-3M, EPTM, DT-3M, 60 Hz

Product Description

Types EP, 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.
- 185ºC Insulation System, 115ºC rise standard.
- Copper windings standard.
- Available in single-phase ratings through 37.5 kVA and 4160 volts primary (EP).
- Available in three-phase ratings through 75 kVA and 4160 volts primary (EPT).

Types DS-3, DT-3

- Ventilated, NEMA 2 enclosure standard.
- Suitable for indoor applications, outdoors when weathershields are also installed.
- Upright mounting only.
- 220ºC Insulation System, 115ºC rise standard.
- 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).

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.
- Meets IEEE-45 specifications.
- Meets Public Health Service Publication 393 (Rodent Protection).
- Meets ABS (American Bureau of Shipping) specification.
- 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

Industry Standards

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

Options and Accessories

Please refer to **Page 9-120**.

Product Specifications

Frequency

Cutler-Hammer 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:

Table 9-81. 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, Types DS-3M, DT-3M, utilize a NEMA 2 rated (drip-proof) enclosure as standard, and are rated NEMA 3R with the addition of weathershields. Cutler-Hammer encapsulated transformers, Types EPM, EPTM, utilize a NEMA 3R rated enclosure.

Sound Levels

All Cutler-Hammer 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.

Table 9-82. Average 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 ventilated 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. 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's Cutler-Hammer business 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 9-122**.

Product Selection

Additional Product Selection information begins on **Page 9-136**.

Table 9-83. Marine Duty Transformers Single-Phase Selection Information — Types EPM, DS-3M, 60 Hz ①
Per ABS Requirements, all Marine Duty Transformers are 115ºC and Copper Windings

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Weight Lbs.	Dimensions (mm)			Weight kg	Style Number	Price U.S. $
	FCAN	FCBN			Height	Width	Depth		Height	Width	Depth			
240 x 480 Volts to 120/240 Volts														
3	—	—	EPM	115	14-3/4	7	7	70	375	178	178	32	**Q20N11S03CU**	1,320.
5	—	—	EPM	115	15	8	7-1/2	100	381	203	191	45	**Q20N11S05CU**	1,450.
7.5	—	—	EPM	115	23	12-1/2	8	170	584	318	203	77	**Q20N11S07CU**	1,880.
10	—	—	EPM	115	23	12-1/2	8	180	584	318	203	82	**Q20N11S10CU**	2,280.
15	—	—	EPM	115	23	13	14	170	584	330	356	77	**Q20N11S15CU**	2,780.
25	②	②	DS-3M	115	31	16	19	270	787	406	483	122	**R20P11F25CU**	3,580.
37.5	②	②	DS-3M	115	35	19-1/2	21	420	889	495	533	191	**R20P11F37CU**	4,570.
50	②	②	DS-3M	115	35	19-1/2	21	490	889	495	533	222	**R20P11F50CU**	5,360.
75	②	②	DS-3M	115	39	24	25	650	991	610	635	295	**R20P11F75CU**	6,860.
100	②	②	DS-3M	115	50	32	28-1/2	920	1270	813	724	417	**R20P11F99CU**	9,130.
167	②	②	DS-3M	115	50	32	28-1/2	1160	1270	813	724	526	**R20P11F67CU**	14,900.

① Not seismic qualified.
② Taps 1 @ +5%, 2 @ –5% at 240 volts; 2 @ +2.5%, 4 @ 2.5% at 480 volts.

Table 9-84. Marine Duty Transformers Three-Phase Selection Information — Types EPTM, DT-3M, 60 Hz ③
Per ABS Requirements, all Marine Duty Transformers are 115ºC and Copper Windings

kVA	Full Cap. Taps		Type	°C Temp. Rise	Dimensions (Inches)			Weight Lbs.	Dimensions (mm)			Weight kg	Style Number	Price U.S. $
	FCAN	FCBN			H	W	D		H	W	D			
480 Δ Volts to 208Y/120 Volts														
3	2@+2.5%	2@-2.5%	EPTM	115	16-1/2	12-1/2	6	100	419	318	152	45	**L48D28T03CU**	2,230.
6	2@+2.5%	2@-2.5%	EPTM	115	19	16-1/2	6	190	483	419	152	86	**L48D28T06CU**	2,510.
9	2@+2.5%	2@-2.5%	EPTM	115	21-1/2	17-7/16	7	275	546	443	178	125	**L48D28T09CU**	2,720.
15	2@+2.5%	4@-2.5%	DT-3M	115	22	16-3/4	15	190	559	425	381	86	**M48M28F15CU**	3,085.
30	2@+2.5%	4@-2.5%	DT-3M	115	29	21-1/2	19-1/2	305	737	546	495	138	**M48M28F30CU**	3,950.
45	2@+2.5%	4@-2.5%	DT-3M	115	29	21-1/2	19-1/2	405	737	546	495	184	**M48M28F45CU**	5,350.
75	2@+2.5%	4@-2.5%	DT-3M	115	38	26	21	650	965	660	533	295	**M48M28F75CU**	7,010.
112.5	2@+2.5%	4@-2.5%	DT-3M	115	41	32	25-1/2	850	1041	813	648	386	**M48M28F12CU**	8,500.
150	2@+2.5%	4@-2.5%	DT-3M	115	41	32	25-1/2	1020	1041	813	648	463	**M48M28F49CU**	10,850.
225	2@+2.5%	4@-2.5%	DT-3M	115	51-1/2	39-1/2	34	1450	1308	1003	864	658	**M48M28F22CU**	14,830.
300	2@+2.5%	2@-2.5%	DT-3M	115	51-1/2	39-1/2	34	1680	1308	1003	864	762	**M48D28F33CU**	19,200.
500	2@+2.5%	2@-2.5%	DT-3M	115	59	48-1/2	38	2550	1499	1232	965	1157	**M48D28F55CU**	31,020.
480 Δ Volts to 240 Δ Volts														
6	2@+2.5%	2@-2.5%	EPTM	115	19	16-1/2	6	190	483	419	152	86	**L48D24T06CU**	2,510.
9	2@+2.5%	2@-2.5%	EPTM	115	21-1/2	17-7/16	7	275	546	443	178	125	**L48D24T09CU**	2,880.
15	2@+2.5%	4@-2.5%	DT-3M	115	22	16-3/4	15	190	559	425	318	86	**M48M24F15CU**	3,085.
30	2@+2.5%	4@-2.5%	DT-3M	115	29	21-1/2	19-1/2	305	737	546	495	138	**M48M24F30CU**	3,950.
45	2@+2.5%	4@-2.5%	DT-3M	115	29	21-1/2	19-1/2	405	737	546	495	184	**M48M24F45CU**	5,350.
75	2@+2.5%	4@-2.5%	DT-3M	115	38	26	21	650	965	660	533	295	**M48M24F75CU**	7,010.
112.5	2@+2.5%	4@-2.5%	DT-3M	115	41	32	25-1/2	850	1041	813	648	386	**M48M24F12CU**	8,500.
150	2@+2.5%	4@-2.5%	DT-3M	115	41	32	25-1/2	1020	1041	813	648	463	**M48M24F49CU**	10,850.
225	2@+2.5%	4@-2.5%	DT-3M	115	51-1/2	39-1/2	34	1450	1308	1003	864	658	**M48M24F22CU**	14,890.
300	2@+2.5%	2@-2.5%	DT-3M	115	51-1/2	39-1/2	34	1680	1308	1003	864	762	**M48D24F33CU**	19,200.
500	2@+2.5%	2@-2.5%	DT-3M	115	59	48-1/2	38	2550	1499	1232	965	1157	**M48D24F55CU**	32,775.

③ Not seismic qualified.

Discount Symbol **DT-1**

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Single- and Three-Phase Applications, 60 Hz

Type EP

9

Product Description

Types EP, 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.
- 185ºC Insulation System, 115ºC rise standard.
- Available in single-phase ratings through 37.5 kVA and 4160 volts primary (EP).
- Available in three-phase ratings through 75 kVA and 4160 volts primary (EPT).

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 utilizing 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.

Features, Benefits and Functions

- UL listed.
- 60 Hz operation.
- 600 volt class insulation.
- 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 by Eaton Corporation 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

Cutler-Hammer manufactured 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 9-120**.

Product Specifications

Frequency

Cutler-Hammer 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:

Table 9-85. 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 encapsulated buck-boost transformers utilize a NEMA 3R rated enclosure.

Sound Levels

All Cutler-Hammer 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.

Table 9-86. Average Sound Levels

NEMA ST-20 Average Sound Level (dB)		
kVA	Ventilated	Encapsulated
0 – 9	40	45
10 – 50	45	50
51 – 150	50	55
151 – 300	55	57
301 – 500	60	59
501 – 700	62	61
701 – 1000	64	63
1001 – 1500	65	64

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.** The Cutler-Hammer business recommends external cables be rated 90°C (sized at 75°C ampacity) for encapsulated 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 9-122**.

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:

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

For Three-Phase:

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

Product Selection

For quick selection data, refer to the tables on 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 Cutler-Hammer 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 which follow will simplify the selection of the buck-boost transformers. There are no calculations needed; simply follow these 5 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 9-91**.
2. Select the available line voltage across the top of the chart which 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 S10N06A01N.
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 1-phase connections and 3-phase open delta connections, inputs and outputs may be reversed. kVA capacity remains constant.

Additional Product Selection information begins on **Page 9-136**.

Wiring Diagrams

Diagram A

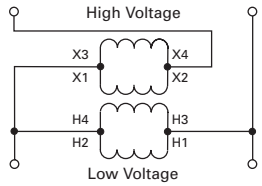


Diagram B

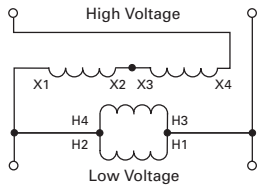


Diagram C

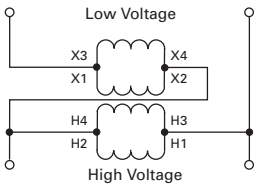


Diagram D

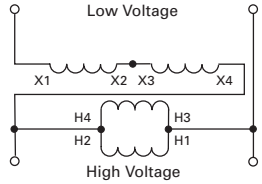


Diagram E

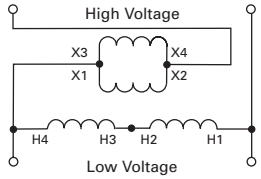


Diagram F

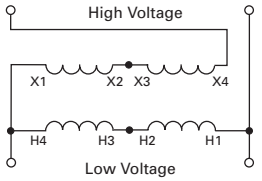


Diagram G

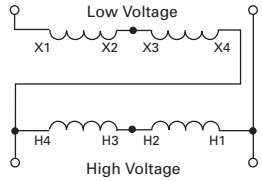


Diagram H

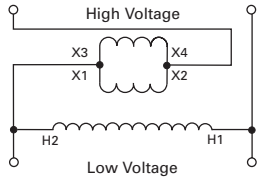


Diagram I

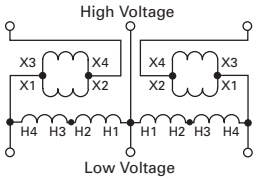


Diagram J

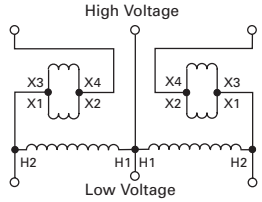


Diagram K

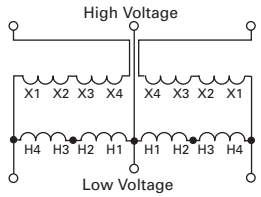


Diagram L

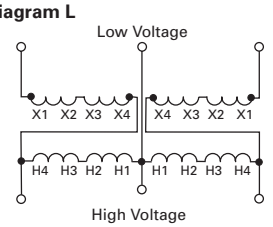


Diagram M ①

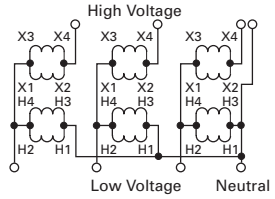


Diagram N ①

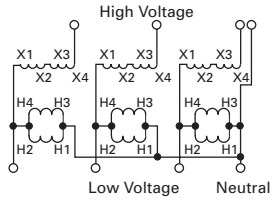


Diagram O ①

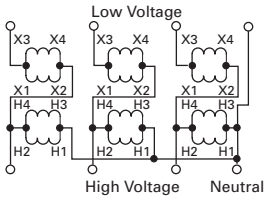


Diagram P ①

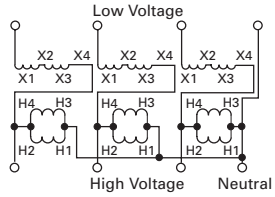


Diagram Q ①

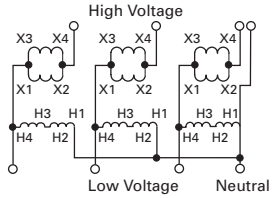


Diagram R ①

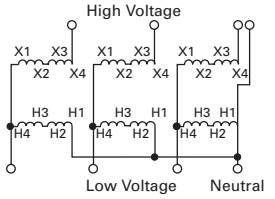


Diagram S ①

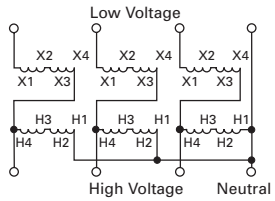


Diagram T

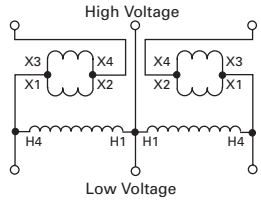


Diagram U

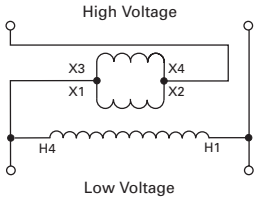


Figure 9-2. Buck-Boost Transformers Wiring Diagrams

① **WARNING!** If input is 3-wire, "neutral" connection must be isolated and insulated! When used to supply a 3-phase, 4-wire load, the source must be 3-phase, 4-wire wye.

Table 9-87. Selection Information

kVA	°C Temp. Rise	Dimensions (Inches)			Weight Lbs.	Dimensions (mm)			Weight kg	Frame	Style Number	Price U.S. $
		Height	Width	Depth		Height	Width	Depth				
120 x 240 Volts to 12/24 Volts												
.05	115	6-1/2	3-7/8	3-1/2	7	165	98	89	3	FR52	**S10N04A81N**	100.
.10	115	6-1/2	3-7/8	3-1/2	7	165	98	89	3	FR54	**S10N04A82N**	105.
.15	115	6-1/2	3-7/8	3-1/2	8	165	98	89	4	FR55	**S10N04A83N**	115.
.25	115	6-1/2	4-7/8	3-7/8	12	165	124	98	5	FR56	**S10N04A26N**	150.
.50	115	6-1/2	4-7/8	4-5/8	13	165	124	117	5	FR57	**S10N04A51N**	175.
.75	115	8-3/8	6	5-3/4	21	213	152	146	10	FR58A	**S10N04A76N**	230.
1	115	8-3/8	6	5-3/4	31	213	152	146	14	FR59A	**S10N04A01N**	270.
1.5	115	10-3/4	6-3/16	6-1/8	40	273	157	156	18	FR67	**S10N04A16N**	360.
2	115	10-3/4	6-3/16	6-1/8	40	273	157	156	18	FR68	**S10N04A02N**	470.
3	115	14-1/8	7-11/16	8	65	359	195	203	29	FR176	**S10N04A03N**	635.
5	115	16	10-3/8	9-7/8	113	406	263	251	51	FR177	**S10N04A05N**	1,180.
7.5	115	16	10-3/8	9-7/8	123	406	263	251	55	FR178	**S10N04A07N**	1,650.
120 x 240 Volts to 16/32 Volts												
.05	115	6-1/2	3-7/8	3-1/2	7	165	98	89	3	FR52	**S10N06A81N**	100.
.10	115	6-1/2	3-7/8	3-1/2	7	165	98	89	3	FR54	**S10N06A82N**	105.
.15	115	6-1/2	3-7/8	3-1/2	8	165	98	89	4	FR55	**S10N06A83N**	115.
.25	115	6-1/2	4-7/8	3-7/8	12	165	124	98	5	FR56	**S10N06A26N**	150.
.50	115	6-1/2	4-7/8	4-5/8	13	165	124	117	5	FR57	**S10N06A51N**	175.
.75	115	8-3/8	6	5-3/4	21	213	152	146	10	FR58A	**S10N06A76N**	230.
1	115	8-3/8	6	5-3/4	31	213	152	146	14	FR59A	**S10N06A01N**	270.
1.5	115	10-3/4	6-3/16	6-1/8	40	273	157	156	18	FR67	**S10N06A16N**	360.
2	115	10-3/4	6-3/16	6-1/8	40	273	157	156	18	FR68	**S10N06A02N**	470.
3	115	14-1/8	7-11/16	8	65	359	195	203	29	FR176	**S10N06A03N**	635.
5	115	16	10-3/8	9-7/8	113	406	263	251	51	FR177	**S10N06A05N**	1,180.
7.5	115	16	10-3/8	9-7/8	123	406	263	251	55	FR178	**S10N06A07N**	1,650.
240 x 480 Volts to 24/48 Volts												
.05	115	6-1/2	3-7/8	3-1/2	7	165	98	89	3	FR52	**S20N08A81N**	110.
.10	115	6-1/2	3-7/8	3-1/2	7	165	98	89	3	FR54	**S20N08A82N**	125.
.15	115	6-1/2	3-7/8	3-1/2	8	165	98	89	4	FR55	**S20N08A83N**	135.
.25	115	6-1/2	4-7/8	3-7/8	12	165	124	98	5	FR56	**S20N08A26N**	165.
.50	115	6-1/2	4-7/8	4-5/8	13	165	124	117	5	FR57	**S20N08A51N**	210.
.75	115	8-3/8	6	5-3/4	21	213	152	146	10	FR58A	**S20N08A76N**	270.
1	115	8-3/8	6	5-3/4	31	213	152	146	14	FR59A	**S20N08A01N**	310.
1.5	115	10-3/4	6-3/16	6-1/8	40	273	157	156	18	FR67	**S20N08A16N**	420.
2	115	10-3/4	6-3/16	6-1/8	40	273	157	156	18	FR68	**S20N08A02N**	570.
3	115	14-1/8	7-11/16	8	65	359	195	203	29	FR176	**S20N08A03N**	740.
5	115	16	10-3/8	9-7/8	113	406	263	251	51	FR177	**S20N08A05N**	1,290.
7.5	115	16	10-3/8	9-7/8	123	406	263	251	55	FR178	**S20N08A07N**	2,000.

Discount Symbol **DT-1**

Table 9-88. Single-Phase 115 Volt Output Required, 60 Hz

Units Required ①	Unit kVA	Input Available Voltage										Style Number	Price U.S. $
		84		91		96		100		102			
		Output		Output		Output		Output		Output			
		kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps		
1	.05	—	—	—	—	.24	2.09	—	—	—	—	S10N04A81N	100.
1	.05	.13	1.14	.18	1.56	—	—	.31	2.70	.36	3.13	S10N06A81N	100.
1	.10	—	—	—	—	.48	4.17	—	—	—	—	S10N04A82N	105.
1	.10	.26	2.29	.36	3.12	—	—	.62	5.41	.72	6.25	S10N06A82N	105.
1	.15	—	—	—	—	.72	6.25	—	—	—	—	S10N04A83N	115.
1	.15	.39	3.44	.54	4.69	—	—	.93	8.12	1.08	9.37	S10N06A83N	115.
1	.25	—	—	—	—	1.2	10.4	—	—	—	—	S10N04A26N	150.
1	.25	.659	5.73	.899	7.81	—	—	1.56	13.5	1.8	15.6	S10N06A26N	150.
1	.50	—	—	—	—	2.4	20.8	—	—	—	—	S10N04A51N	175.
1	.50	1.32	11.5	1.8	15.6	—	—	3.11	27.1	3.59	31.2	S10N06A51N	175.
1	.75	—	—	—	—	3.6	31.2	—	—	—	—	S10N04A76N	230.
1	.75	1.98	17.2	2.7	23.4	—	—	4.67	40.6	5.39	46.8	S10N06A76N	230.
1	1	—	—	—	—	4.79	41.7	—	—	—	—	S10N04A01N	270.
1	1	2.64	22.9	3.59	31.2	—	—	6.23	54.1	7.19	62.5	S10N06A01N	270.
1	1.5	—	—	—	—	7.2	62.5	—	—	—	—	S10N04A16N	360.
1	1.5	3.95	34.4	5.39	46.9	—	—	9.34	81.2	10.8	93.7	S10N06A16N	360.
1	2	—	—	—	—	9.58	83.3	—	—	—	—	S10N04A02N	470.
1	2	5.27	45.8	7.19	62.5	—	—	12.5	108	14.4	125	S10N06A02N	470.
1	3	—	—	—	—	14.37	125.1	—	—	—	—	S10N04A03N	635.
1	3	7.92	68.7	10.77	93.6	—	—	18.69	162.3	21.57	187.5	S10N06A03N	635.
1	5	—	—	—	—	23.95	208.5	—	—	—	—	S10N04A05N	1,180.
1	5	13.2	115	18	156	—	—	31.15	270.5	35.95	312.5	S10N06A05N	1,180.
1	7.5	—	—	—	—	36	312	—	—	—	—	S10N04A07N	1,650.
1	7.5	19.8	172	27	234	—	—	46.7	406	53.9	468	S10N06A07N	1,650.
Connection Diagram ②		D		B		B		C		A			

Units Required ①	Unit kVA	Input Available Voltage										Style Number	Price U.S. $
		105		127		130		138		146			
		Output		Output		Output		Output		Output			
		kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps		
1	.05	.48	4.17	.54	4.58	—	—	.29	2.5	—	—	S10N04A81N	100.
1	.05	—	—	—	—	.41	3.54	—	—	.23	1.98	S10N06A81N	100.
1	.10	.96	8.33	1.1	9.17	—	—	.58	5.0	—	—	S10N04A82N	105.
1	.10	—	—	—	—	.82	7.08	—	—	.46	3.95	S10N06A82N	105.
1	.15	1.44	12.5	1.6	13.7	—	—	.87	7.5	—	—	S10N04A83N	115.
1	.15	—	—	—	—	1.3	10.6	—	—	.69	5.93	S10N06A83N	115.
1	.25	2.39	20.8	2.63	22.9	—	—	1.44	12.5	—	—	S10N04A26N	150.
1	.25	—	—	—	—	2.03	17.7	—	—	1.14	9.88	S10N06A26N	150.
1	.50	4.79	41.6	5.27	45.8	—	—	2.87	25	—	—	S10N04A51N	175.
1	.50	—	—	—	—	4.07	35.4	—	—	2.27	19.8	S10N06A51N	175.
1	.75	7.19	62.4	7.9	68.7	—	—	4.31	37.5	—	—	S10N04A76N	230.
1	.75	—	—	—	—	6.1	53.1	—	—	3.41	29.6	S10N06A76N	230.
1	1	9.58	83.3	10.5	91.7	—	—	5.75	50	—	—	S10N04A01N	270.
1	1	—	—	—	—	8.14	70.8	—	—	4.55	39.5	S10N06A01N	270.
1	1.5	14.4	125	15.8	137	—	—	8.62	75	—	—	S10N04A16N	360.
1	1.5	—	—	—	—	12.2	106	—	—	6.82	59.3	S10N06A16N	360.
1	2	19.2	16.7	21.1	183	—	—	11.5	100	—	—	S10N04A02N	470.
1	2	—	—	—	—	16.3	142	—	—	9.10	79.2	S10N06A02N	470.
1	3	28.7	249.9	31.5	275.1	—	—	17.3	150	—	—	S10N04A03N	635.
1	3	—	—	—	—	24.4	212.4	—	—	13.6	118.5	S10N06A03N	635.
1	5	47.9	416.5	52.5	458.5	—	—	28.7	250	—	—	S10N04A05N	1,180.
1	5	—	—	—	—	40.7	354	—	—	22.7	197.5	S10N06A05N	1,180.
1	7.5	71.9	624	79	687	—	—	43.1	357	—	—	S10N04A07N	1,650.
1	7.5	—	—	—	—	61	531	—	—	34.1	296	S10N06A07N	1,650.
Connection Diagram ②		A		A		A		B		B			

① Additional wiring trough may be required.

② Refer to **Page 9-74** for Buck-Boost wiring diagrams.

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

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

Discount Symbol **DT-1**

Table 9-89. Single-Phase 120 Volt Output Required, 60 Hz

Units Required ①	Unit kVA	Input Available Voltage										Style Number	Price U.S. $
		88		95		100		104		106			
		Output		Output		Output		Output		Output			
		kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps		
1	.05	—	—	—	—	.25	2.09	—	—	—	—	S10N04A81N	100.
1	.05	.14	1.15	.19	1.56	—	—	.33	2.70	.38	3.13	S10N06A81N	100.
1	.10	—	—	—	—	.50	4.17	—	—	—	—	S10N04A82N	105.
1	.10	.28	2.29	.38	3.12	—	—	.65	5.41	.75	6.25	S10N06A82N	105.
1	.15	—	—	—	—	.75	6.25	—	—	—	—	S10N04A83N	115.
1	.15	.41	3.44	.56	4.69	—	—	.98	8.12	1.12	9.37	S10N06A83N	115.
1	.25	—	—	—	—	1.25	10.4	—	—	—	—	S10N04A26N	150.
1	.25	.687	5.73	.937	7.81	—	—	1.62	13.5	1.87	15.6	S10N06A26N	150.
1	.50	—	—	—	—	2.5	20.8	—	—	—	—	S10N04A51N	175.
1	.50	1.37	11.5	1.87	15.6	—	—	3.25	27.1	3.75	31.2	S10N06A51N	175.
1	.75	—	—	—	—	3.75	31.2	—	—	—	—	S10N04A76N	230.
1	.75	2.06	17.2	2.82	23.4	—	—	4.87	40.6	5.62	46.8	S10N06A76N	230.
1	1	—	—	—	—	5	41.7	—	—	—	—	S10N04A01N	270.
1	1	2.75	22.9	3.75	31.2	—	—	6.5	54.1	7.5	62.5	S10N06A01N	270.
1	1.5	—	—	—	—	7.5	62.5	—	—	—	—	S10N04A16N	360.
1	1.5	4.12	34.4	5.62	46.9	—	—	9.75	81.2	11.2	93.7	S10N06A16N	360.
1	2	—	—	—	—	10	83.3	—	—	—	—	S10N04A02N	470.
1	2	5.5	45.8	7.5	62.5	—	—	13	108	15	125	S10N06A02N	470.
1	3	—	—	—	—	15	125.1	—	—	—	—	S10N04A03N	635.
1	3	8.25	68.7	11.25	93.6	—	—	19.5	162.3	22.5	187.5	S10N06A03N	635.
1	5	—	—	—	—	25	208.5	—	—	—	—	S10N04A05N	1,180.
1	5	13.75	114.5	18.75	156	—	—	32.5	270.5	37.5	312.5	S10N06A05N	1,180.
1	7.5	—	—	—	—	37.5	312	—	—	—	—	S10N04A07N	1,650.
1	7.5	20.6	172	28.2	234	—	—	48.7	406	56.2	468	S10N06A07N	1,650.
Connection Diagram ②		D		B		B		C		A			

Units Required ①	Unit kVA	Input Available Voltage										Style Number	Price U.S. $
		109		132		136		144		152			
		Output		Output		Output		Output		Output			
		kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps		
1	.05	.5	4.17	.55	4.58	—	—	.3	2.5	—	—	S10N04A81N	100.
1	.05	—	—	—	—	.43	3.54	—	—	.24	1.98	S10N06A81N	100.
1	.10	1.0	8.33	1.1	9.17	—	—	.6	5.0	—	—	S10N04A82N	105.
1	.10	—	—	—	—	.85	7.08	—	—	.48	3.95	S10N06A82N	105.
1	.15	1.5	12.5	1.6	13.7	—	—	.9	7.5	—	—	S10N04A83N	115.
1	.15	—	—	—	—	1.27	10.6	—	—	.71	5.93	S10N06A83N	115.
1	.25	2.5	20.8	2.75	22.9	—	—	1.5	12.5	—	—	S10N04A26N	150.
1	.25	—	—	—	—	2.12	17.7	—	—	1.19	9.88	S10N06A26N	150.
1	.50	5	41.6	5.5	45.8	—	—	3	25	—	—	S10N04A51N	175.
1	.50	—	—	—	—	4.25	35.4	—	—	2.37	19.8	S10N06A51N	175.
1	.75	7.5	62.4	8.25	68.7	—	—	4.5	37.5	—	—	S10N04A76N	230.
1	.75	—	—	—	—	6.37	53.1	—	—	3.56	29.6	S10N06A76N	230.
1	1	10	83.3	11	91.7	—	—	6	50	—	—	S10N04A01N	270.
1	1	—	—	—	—	8.5	70.8	—	—	4.75	39.5	S10N06A01N	270.
1	1.5	15	125	16.5	137	—	—	9	75	—	—	S10N04A16N	360.
1	1.5	—	—	—	—	12.7	106	—	—	7.12	59.3	S10N06A16N	360.
1	2	20	167	22	183	—	—	12	100	—	—	S10N04A02N	470.
1	2	—	—	—	—	17	142	—	—	9.5	79.2	S10N06A02N	470.
1	3	30	249.9	33	275.1	—	—	18	150	—	—	S10N04A03N	635.
1	3	—	—	—	—	25.5	212.4	—	—	14.25	118.5	S10N06A03N	635.
1	5	50	416.5	55	458.5	—	—	30	250	—	—	S10N04A05N	1,180.
1	5	—	—	—	—	42.5	354	—	—	23.7	197.5	S10N06A05N	1,180.
1	7.5	75	624	82.5	687	—	—	45	375	—	—	S10N04A07N	1,650.
1	7.5	—	—	—	—	63.7	531	—	—	35.6	296	S10N06A07N	1,650.
Connection Diagram ②		A		A		A		B		B			

① Additional wiring trough may be required.

② Refer to **Page 9-74** for Buck-Boost wiring diagrams.

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

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

Discount Symbol..... **DT-1**

Table 9-90. Single-Phase 230 Volt Output Required, 60 Hz

Units Required ①	Unit kVA	Input Available Voltage										Style Number	Price U.S. $
		199		203		207		209		216			
		Output		Output		Output		Output		Output			
		kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps		
1	.05	—	—	—	—	.43	1.88	.48	2.08	—	—	S10N04A81N	100.
1	.05	.31	1.36	.36	1.56	—	—	—	—	.72	3.12	S10N06A81N	100.
1	.10	—	—	—	—	.86	3.75	.96	4.17	—	—	S10N04A82N	105.
1	.10	.62	2.71	.72	3.12	—	—	—	—	1.44	6.25	S10N06A82N	105.
1	.15	—	—	—	—	1.29	5.62	1.44	6.25	—	—	S10N04A83N	115.
1	.15	.93	4.06	1.08	4.69	—	—	—	—	2.16	9.37	S10N06A83N	115.
1	.25	—	—	—	—	2.15	9.37	2.39	10.4	—	—	S10N04A26N	150.
1	.25	1.55	6.77	1.8	7.81	—	—	—	—	3.59	15.6	S10N06A26N	150.
1	.50	—	—	—	—	4.31	18.7	4.79	20.8	—	—	S10N04A51N	175.
1	.50	3.11	13.5	3.6	15.6	—	—	—	—	7.19	31.2	S10N06A51N	175.
1	.75	—	—	—	—	6.46	28.2	7.19	31.2	—	—	S10N04A76N	230.
1	.75	4.66	20.3	5.4	23.4	—	—	—	—	10.8	46.8	S10N06A76N	230.
1	1	—	—	—	—	8.62	37.5	9.58	41.7	—	—	S10N04A01N	270.
1	1	6.23	27.1	7.2	31.2	—	—	—	—	14.4	62.5	S10N06A01N	270.
1	1.5	—	—	—	—	12.9	56.2	14.4	62.5	—	—	S10N04A16N	360.
1	1.5	9.34	40.6	10.8	46.9	—	—	—	—	21.6	93.7	S10N06A16N	360.
1	2	—	—	—	—	17.2	75	19.2	83.3	—	—	S10N04A02N	470.
1	2	12.5	54.2	14.4	62.5	—	—	—	—	28.7	125	S10N06A02N	470.
1	3	—	—	—	—	25.8	112.5	28.7	125.1	—	—	S10N04A03N	635.
1	3	18.6	81.3	21.6	93.6	—	—	—	—	43.2	187.5	S10N06A03N	635.
1	5	—	—	—	—	43.1	187.5	47.9	208.5	—	—	S10N04A05N	1,180.
1	5	31.1	135.5	36	156	—	—	—	—	72	312.5	S10N06A05N	1,180.
1	7.5	—	—	—	—	64.6	282	71.9	312	—	—	S10N04A07N	1,650.
1	7.5	46.6	203	54	234	—	—	—	—	108	468	S10N06A07N	1,650.
Connection Diagram ②		G		F		G		F		E			

Units Required ①	Unit kVA	Input Available Voltage										Style Number	Price U.S. $
		219		242		246		253		260			
		Output		Output		Output		Output		Output			
		kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps		
1	.05	.96	4.16	1.0	4.38	—	—	.53	2.29	—	—	S10N04A81N	100.
1	.05	—	—	—	—	.77	3.34	—	—	.41	1.77	S10N06A81N	100.
1	.10	1.92	8.33	2.01	8.75	—	—	1.05	4.58	—	—	S10N04A82N	105.
1	.10	—	—	—	—	1.53	6.67	—	—	.82	3.54	S10N06A82N	105.
1	.15	2.87	12.5	3.02	13.1	—	—	1.58	6.87	—	—	S10N04A83N	115.
1	.15	—	—	—	—	2.3	10.0	—	—	1.22	5.31	S10N06A83N	115.
1	.25	4.79	20.8	5.03	21.9	—	—	2.63	11.5	—	—	S10N04A26N	150.
1	.25	—	—	—	—	3.83	16.7	—	—	2.04	8.85	S10N06A26N	150.
1	.50	9.58	41.6	10.1	43.7	—	—	5.27	22.9	—	—	S10N04A51N	175.
1	.50	—	—	—	—	7.67	33.3	—	—	4.07	17.7	S10N06A51N	175.
1	.75	14.4	62.4	15.1	65.6	—	—	7.9	34.4	—	—	S10N04A76N	230.
1	.75	—	—	—	—	11.5	50	—	—	6.11	26.6	S10N06A76N	230.
1	1	19.2	83.3	20.1	87.5	—	—	10.5	45.8	—	—	S10N04A01N	270.
1	1	—	—	—	—	15.3	66.7	—	—	8.15	35.4	S10N06A01N	270.
1	1.5	28.7	125	30.2	131	—	—	15.8	68.7	—	—	S10N04A16N	360.
1	1.5	—	—	—	—	23	100	—	—	12.2	53.1	S10N06A16N	360.
1	2	38.3	167	40.2	175	—	—	21.1	91.7	—	—	S10N04A02N	470.
1	2	—	—	—	—	30.7	133	—	—	16.3	70.8	S10N06A02N	470.
1	3	57.6	249.9	60.3	262.5	—	—	31.5	137.4	—	—	S10N04A03N	635.
1	3	—	—	—	—	45.9	200.1	—	—	24.4	106.2	S10N06A03N	635.
1	5	96	416.5	100.5	437.5	—	—	52.5	229	—	—	S10N04A05N	1,180.
1	5	—	—	—	—	76.5	333.5	—	—	40.7	177	S10N06A05N	1,180.
1	7.5	144	624	151	656	—	—	79	344	—	—	S10N04A07N	1,650.
1	7.5	—	—	—	—	115	500	—	—	61.1	266	S10N06A07N	1,650.
Connection Diagram ②		E		E		E		F		F			

① Additional wiring trough may be required.

② Refer to **Page 9-74** for Buck-Boost wiring diagrams.

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

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

Discount Symbol..... **DT-1**

Table 9-91. Single-Phase 240 Volt Output Required, 60 Hz

Units Required ①	Unit kVA	Input Available Voltage										Style Number	Price U.S. $
		208		212		216		218		225			
		Output		Output		Output		Output		Output			
		kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps		
1	.05	—	—	—	—	.45	1.88	.5	2.08	—	—	S10N04A81N	100.
1	.05	.32	1.35	.38	1.56	—	—	—	—	.75	3.12	S10N06A81N	100.
1	.10	—	—	—	—	.9	3.75	1.0	4.17	—	—	S10N04A82N	105.
1	.10	.65	2.71	.75	3.12	—	—	—	—	1.5	6.25	S10N06A82N	105.
1	.15	—	—	—	—	1.35	5.62	1.5	6.25	—	—	S10N04A83N	115.
1	.15	.98	4.06	1.12	4.69	—	—	—	—	2.25	9.37	S10N06A83N	115.
1	.25	—	—	—	—	2.25	9.37	2.5	10.4	—	—	S10N04A26N	150.
1	.25	1.62	6.77	1.87	7.81	—	—	—	—	3.75	15.6	S10N06A26N	150.
1	.50	—	—	—	—	4.5	18.7	5	20.8	—	—	S10N04A51N	175.
1	.50	3.25	13.5	3.75	15.6	—	—	—	—	7.5	31.2	S10N06A51N	175.
1	.75	—	—	—	—	6.75	28.2	7.5	31.2	—	—	S10N04A76N	230.
1	.75	4.87	20.3	5.62	23.4	—	—	—	—	11.2	46.8	S10N06A76N	230.
1	1	—	—	—	—	9	37.5	10	41.7	—	—	S10N04A01N	270.
1	1	6.5	27.1	7.5	31.2	—	—	—	—	15	62.5	S10N06A01N	270.
1	1.5	—	—	—	—	13.5	56.2	15	62.5	—	—	S10N04A16N	360.
1	1.5	9.75	40.6	11.2	46.9	—	—	—	—	22.5	93.7	S10N06A16N	360.
1	2	—	—	—	—	18	75	20	83.3	—	—	S10N04A02N	470.
1	2	13	54.2	15	62.5	—	—	—	—	30	125	S10N06A02N	470.
1	3	—	—	—	—	27	112.5	30	125.1	—	—	S10N04A03N	635.
1	3	19.5	81.3	22.5	93.6	—	—	—	—	45	187.5	S10N06A03N	635.
1	5	—	—	—	—	45	187	50	208	—	—	S10N04A05N	1,180.
1	5	32.5	135	37.5	156	—	—	—	—	75	312	S10N06A05N	1,180.
1	7.5	—	—	—	—	67.5	282	75	312	—	—	S10N04A07N	1,650.
1	7.5	48.7	203	56.2	234	—	—	—	—	112	468	S10N06A07N	1,650.
Connection Diagram ②		G		F		G		F		E			

Units Required ①	Unit kVA	Input Available Voltage										Style Number	Price U.S. $
		229		252		256		264		272			
		Output		Output		Output		Output		Output			
		kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps		
1	.05	1.0	4.16	1.05	4.38	—	—	.55	2.29	—	—	S10N04A81N	100.
1	.05	—	—	—	—	.8	3.33	—	—	.42	1.77	S10N06A81N	100.
1	.10	2.0	8.33	2.1	8.75	—	—	1.1	4.58	—	—	S10N04A82N	105.
1	.10	—	—	—	—	1.6	6.67	—	—	.85	3.54	S10N06A82N	105.
1	.15	3.0	12.5	3.15	13.1	—	—	1.65	6.87	—	—	S10N04A83N	115.
1	.15	—	—	—	—	2.4	10.0	—	—	1.27	5.31	S10N06A83N	115.
1	.25	5	20.8	5.25	21.9	—	—	2.75	11.5	—	—	S10N04A26N	150.
1	.25	—	—	—	—	4	16.7	—	—	2.12	8.85	S10N06A26N	150.
1	.50	10	41.6	10.5	43.7	—	—	5.5	22.9	—	—	S10N04A51N	175.
1	.50	—	—	—	—	8	33.3	—	—	4.25	17.7	S10N06A51N	175.
1	.75	15	62.4	15.7	65.6	—	—	8.25	34.4	—	—	S10N04A76N	230.
1	.75	—	—	—	—	12	50	—	—	6.37	26.6	S10N06A76N	230.
1	1	20	83.3	21	87.5	—	—	11	45.8	—	—	S10N04A01N	270.
1	1	—	—	—	—	16	66.7	—	—	8.5	35.4	S10N06A01N	270.
1	1.5	30	125	31.5	131	—	—	16.5	68.7	—	—	S10N04A16N	360.
1	1.5	—	—	—	—	24	100	—	—	12.7	53.1	S10N06A16N	360.
1	2	40	167	42	175	—	—	22	91.7	—	—	S10N04A02N	470.
1	2	—	—	—	—	32	133	—	—	17	70.8	S10N06A02N	470.
1	3	60	249.9	63	262.5	—	—	33	137.4	—	—	S10N04A03N	635.
1	3	—	—	—	—	48	200.1	—	—	25.5	106.2	S10N06A03N	635.
1	5	100	416.5	105	437.5	—	—	55	229	—	—	S10N04A05N	1,180.
1	5	—	—	—	—	80	333	—	—	42.5	177	S10N06A05N	1,180.
1	7.5	150	624	157	656	—	—	82.5	344	—	—	S10N04A07N	1,650.
1	7.5	—	—	—	—	120	500	—	—	63.7	266	S10N06A07N	1,650.
Connection Diagram ②		E		E		E		F		F			

① Additional wiring trough may be required.

② Refer to **Page 9-74** for Buck-Boost wiring diagrams.

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

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

Discount Symbol **DT-1**

Table 9-92. Three-Phase Open Delta Connection 230 Volt Output Required, 60 Hz

Units Required ①	Unit kVA	Input Available Voltage										Style Number	Price U.S. $
		199		203		207		209		216			
		Output		Output		Output		Output		Output			
		kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps		
2	.05	—	—	—	—	.75	1.87	.83	2.08	—	—	S10N04A81N	100.
2	.05	.54	1.35	.62	1.56	—	—	—	—	1.24	3.12	S10N06A81N	100.
2	.10	—	—	—	—	1.49	3.75	1.66	4.17	—	—	S10N04A82N	105.
2	.10	1.08	2.71	1.24	3.12	—	—	—	—	2.49	6.25	S10N06A82N	105.
2	.15	—	—	—	—	2.24	5.62	2.49	6.25	—	—	S10N04A83N	115.
2	.15	1.62	4.06	1.87	4.69	—	—	—	—	3.73	9.37	S10N06A83N	115.
2	.25	—	—	—	—	3.3	9.37	4.15	10.4	—	—	S10N04A26N	150.
2	.25	2.7	6.77	3.11	7.81	—	—	—	—	6.22	15.6	S10N06A26N	150.
2	.50	—	—	—	—	7.47	18.7	8.3	20.8	—	—	S10N04A51N	175.
2	.50	5.39	13.5	6.22	15.6	—	—	—	—	12.4	31.2	S10N06A51N	175.
2	.75	—	—	—	—	11.2	28.2	12.4	31.2	—	—	S10N04A76N	230.
2	.75	8.09	20.3	9.33	23.4	—	—	—	—	18.7	46.8	S10N06A76N	230.
2	1	—	—	—	—	14.9	37.5	16.6	41.7	—	—	S10N04A01N	270.
2	1	10.8	27.1	12.4	31.2	—	—	—	—	24.9	62.5	S10N06A01N	270.
2	1.5	—	—	—	—	22.4	56.2	24.9	62.5	—	—	S10N04A16N	360.
2	1.5	16.2	40.6	18.7	46.9	—	—	—	—	37.3	93.7	S10N06A16N	360.
2	2	—	—	—	—	29.9	75	33.2	83.3	—	—	S10N04A02N	470.
2	2	21.6	54.2	24.9	62.5	—	—	—	—	49.8	125	S10N06A02N	470.
2	3	—	—	—	—	44.7	112.5	49.8	125.1	—	—	S10N04A03N	635.
2	3	32.4	81.3	32.7	93.6	—	—	—	—	74.7	187.5	S10N06A03N	635.
2	5	—	—	—	—	74.7	187	83	208	—	—	S10N04A05N	1,180.
2	5	53.9	135	62.2	156	—	—	—	—	124	312.5	S10N06A05N	1,180.
2	7.5	—	—	—	—	112	282	124	312	—	—	S10N04A07N	1,650.
2	7.5	80.9	203	93.3	234	—	—	—	—	187	468	S10N06A07N	1,650.
Connection Diagram ②		L		K		L		K		I			

Units Required ①	Unit kVA	Input Available Voltage										Style Number	Price U.S. $
		219		242		246		253		260			
		Output		Output		Output		Output		Output			
		kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps		
2	.05	1.66	4.17	1.74	4.37	—	—	.91	2.29	—	—	S10N04A81N	100.
2	.05	—	—	—	—	1.33	3.33	—	—	.70	1.77	S10N06A81N	100.
2	.10	3.32	8.33	3.48	8.75	—	—	1.83	4.58	—	—	S10N04A82N	105.
2	.10	—	—	—	—	2.65	6.67	—	—	1.41	3.54	S10N06A82N	105.
2	.15	4.98	12.5	5.23	13.1	—	—	2.74	6.87	—	—	S10N04A83N	115.
2	.15	—	—	—	—	3.98	10.0	—	—	2.12	5.13	S10N06A83N	115.
2	.25	8.3	20.8	8.71	21.9	—	—	4.56	11.5	—	—	S10N04A26N	150.
2	.25	—	—	—	—	6.64	16.7	—	—	3.52	8.85	S10N06A26N	150.
2	.50	16.6	41.7	17.4	43.7	—	—	9.73	22.9	—	—	S10N04A51N	175.
2	.50	—	—	—	—	13.3	33.3	—	—	7.05	17.7	S10N06A51N	175.
2	.75	24.9	62.4	26.1	65.6	—	—	13.7	34.4	—	—	S10N04A76N	230.
2	.75	—	—	—	—	19.9	50	—	—	10.6	26.6	S10N06A76N	230.
2	1	33.2	83.3	34.8	87.5	—	—	18.3	45.8	—	—	S10N04A01N	270.
2	1	—	—	—	—	26.5	66.7	—	—	14.1	35.4	S10N06A01N	270.
2	1.5	49.8	125	52.3	131	—	—	27.4	68.7	—	—	S10N04A16N	360.
2	1.5	—	—	—	—	39.8	100	—	—	21.2	53.1	S10N06A16N	360.
2	2	66.4	167	69.7	175	—	—	36.5	91.7	—	—	S10N04A02N	470.
2	2	—	—	—	—	53.1	133	—	—	28.2	70.8	S10N06A02N	470.
2	3	99.6	249.9	104.4	262.5	—	—	54.9	137.4	—	—	S10N04A03N	635.
2	3	—	—	—	—	79.5	200	—	—	42.3	106.2	S10N06A03N	635.
2	5	166	417	174	437	—	—	91.3	229	—	—	S10N04A05N	1,180.
2	5	—	—	—	—	133	333	—	—	70.5	177	S10N06A05N	1,180.
2	7.5	249	624	261	656	—	—	137	344	—	—	S10N04A07N	1,650.
2	7.5	—	—	—	—	199	500	—	—	106	266	S10N06A07N	1,650.
Connection Diagram ②		I		I		I		K		K			

① Additional wiring trough may be required.

② Refer to **Page 9-74** for Buck-Boost wiring diagrams.

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

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

Discount Symbol **DT-1**

Table 9-93. Three-Phase Open Delta Connection 240 Volt Output Required, 60 Hz

Units Required ①	Unit kVA	Input Available Voltage										Style Number	Price U.S. $
		208		212		216		218		225			
		Output		Output		Output		Output		Output			
		kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps		
2	.05	—	—	—	—	.73	1.87	.87	2.08	—	—	**S10N04A81N**	100.
2	.05	.56	1.35	.65	1.56	—	—	—	—	1.3	3.12	**S10N06A81N**	100.
2	.10	—	—	—	—	1.56	3.75	1.73	4.17	—	—	**S10N04A82N**	105.
2	.10	1.13	2.71	1.3	3.12	—	—	—	—	2.6	6.25	**S10N06A82N**	105.
2	.15	—	—	—	—	2.34	5.62	2.6	6.25	—	—	**S10N04A83N**	115.
2	.15	1.69	4.06	1.95	4.69	—	—	—	—	3.9	9.37	**S10N06A83N**	115.
2	.25	—	—	—	—	3.9	9.37	4.33	10.4	—	—	**S10N04A26N**	150.
2	.25	2.81	6.77	3.25	7.81	—	—	—	—	6.49	15.6	**S10N06A26N**	150.
2	.50	—	—	—	—	7.79	18.7	8.66	20.8	—	—	**S10N04A51N**	175.
2	.50	5.63	13.5	6.5	15.6	—	—	—	—	13	31.2	**S10N06A51N**	175.
2	.75	—	—	—	—	11.7	28.2	13	31.2	—	—	**S10N04A76N**	230.
2	.75	8.44	20.3	9.75	23.4	—	—	—	—	19.5	46.8	**S10N06A76N**	230.
2	1	—	—	—	—	15.6	37.5	17.3	41.7	—	—	**S10N04A01N**	270.
2	1	11.3	27.1	13	31.2	—	—	—	—	26	62.5	**S10N06A01N**	270.
2	1.5	—	—	—	—	23.4	56.2	26	62.5	—	—	**S10N04A16N**	360.
2	1.5	16.9	40.6	19.5	46.9	—	—	—	—	39	93.7	**S10N06A16N**	360.
2	2	—	—	—	—	31.2	75	34.6	83.3	—	—	**S10N04A02N**	470.
2	2	22.5	54.2	26	62.5	—	—	—	—	52	125	**S10N06A02N**	470.
2	3	—	—	—	—	46.8	112.5	51.9	125.1	—	—	**S10N04A03N**	635.
2	3	33.9	81.3	39	93.6	—	—	—	—	78	187.5	**S10N06A03N**	635.
2	5	—	—	—	—	77.9	187	86.6	208	—	—	**S10N04A05N**	1,180.
2	5	56.3	135	65	156	—	—	—	—	130	312	**S10N06A05N**	1,180.
2	7.5	—	—	—	—	117	282	130	312	—	—	**S10N04A07N**	1,650.
2	7.5	84.4	203	97.5	234	—	—	—	—	195	468	**S10N06A07N**	1,650.
Connection Diagram ②		L		K		L		K		I			

Units Required ①	Unit kVA	Input Available Voltage										Style Number	Price U.S. $
		229		252		256		264		272			
		Output		Output		Output		Output		Output			
		kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps		
2	.05	1.73	4.16	1.82	4.37	—	—	.95	2.29	—	—	**S10N04A81N**	100.
2	.05	—	—	—	—	1.38	3.33	—	—	.74	1.77	**S10N06A81N**	100.
2	.10	3.46	8.33	3.64	8.75	—	—	1.91	4.58	—	—	**S10N04A82N**	105.
2	.10	—	—	—	—	2.77	6.67	—	—	1.47	3.54	**S10N06A82N**	105.
2	.15	5.19	12.5	5.45	13.1	—	—	2.86	6.87	—	—	**S10N04A83N**	115.
2	.15	—	—	—	—	4.15	10.0	—	—	2.21	5.31	**S10N06A83N**	115.
2	.25	8.66	20.8	9.09	21.9	—	—	4.76	11.5	—	—	**S10N04A26N**	150.
2	.25	—	—	—	—	6.92	16.7	—	—	3.68	8.85	**S10N06A26N**	150.
2	.50	17.3	41.6	18.2	43.7	—	—	9.53	22.9	—	—	**S10N04A51N**	175.
2	.50	—	—	—	—	13.8	33.3	—	—	7.36	17.7	**S10N06A51N**	175.
2	.75	26	62.4	27.3	65.6	—	—	14.3	34.4	—	—	**S10N04A76N**	230.
2	.75	—	—	—	—	20.8	50	—	—	11	26.6	**S10N06A76N**	230.
2	1	34.6	83.3	36.4	87.5	—	—	19.1	45.8	—	—	**S10N04A01N**	270.
2	1	—	—	—	—	27.7	66.7	—	—	14.7	35.4	**S10N06A01N**	270.
2	1.5	51.9	125	54.5	131	—	—	28.6	68.7	—	—	**S10N04A16N**	360.
2	1.5	—	—	—	—	41.5	100	—	—	22.1	53.1	**S10N06A16N**	360.
2	2	69.3	167	72.7	175	—	—	38.1	91.7	—	—	**S10N04A02N**	470.
2	2	—	—	—	—	55.4	133	—	—	29.4	70.8	**S10N06A02N**	470.
2	3	103.8	249.9	109.2	262.5	—	—	57.3	137.4	—	—	**S10N04A03N**	635.
2	3	—	—	—	—	83.1	200	—	—	44.1	106.2	**S10N06A03N**	635.
2	5	173	416	182	437	—	—	95.3	229	—	—	**S10N04A05N**	1,180.
2	5	—	—	—	—	138	333	—	—	73.6	177	**S10N06A05N**	1,180.
2	7.5	260	624	273	656	—	—	143	344	—	—	**S10N04A07N**	1,650.
2	7.5	—	—	—	—	208	500	—	—	110	266	**S10N06A07N**	1,650.
Connection Diagram ②		I		I		I		K		K			

① Additional wiring trough may be required.
② Refer to **Page 9-74** for Buck-Boost wiring diagrams.

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

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

Discount Symbol **DT-1**

Table 9-94. Three-Phase Wye Connection 208 Volt Output Required, 60 Hz

Note: WARNING! Three-phase autotransformers should never be used to obtain 4-wire output with 3-wire input. 4-wire output requires 4-wire wye input.

Units Required ①	Unit kVA	Input Available Voltage										Style Number	Price U.S. $
		152		164		173		180		184			
		Output		Output		Output		Output		Output			
		kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps		
3	.05	—	—	—	—	.75	2.08	—	—	—	—	S10N04A81N	100.
3	.05	.41	1.15	.56	1.56	—	—	.98	2.71	1.12	3.12	S10N06A81N	100.
3	.10	—	—	—	—	1.50	4.17	—	—	—	—	S10N04A82N	105.
3	.10	.82	2.29	1.12	3.12	—	—	1.95	5.41	2.25	6.25	S10N06A82N	105.
3	.15	—	—	—	—	2.25	6.25	—	—	—	—	S10N04A83N	115.
3	.15	1.24	3.44	1.69	4.69	—	—	2.92	8.12	3.73	9.37	S10N06A83N	115.
3	.25	—	—	—	—	3.75	10.4	—	—	—	—	S10N04A26N	150.
3	.25	2.06	5.73	2.81	7.81	—	—	4.87	13.5	5.62	15.6	S10N06A26N	150.
3	.50	—	—	—	—	7.5	20.8	—	—	—	—	S10N04A51N	175.
3	.50	4.12	11.5	5.62	15.6	—	—	9.75	27.1	11.2	31.2	S10N06A51N	175.
3	.75	—	—	—	—	11.2	31.2	—	—	—	—	S10N04A76N	230.
3	.75	6.19	17.2	8.44	23.4	—	—	14.6	40.6	16.8	46.8	S10N06A76N	230.
3	1	—	—	—	—	15	41.7	—	—	—	—	S10N04A01N	270.
3	1	8.25	22.9	11.2	31.2	—	—	19.5	54.1	22.5	62.5	S10N06A01N	270.
3	1.5	—	—	—	—	22.5	62.5	—	—	—	—	S10N04A16N	360.
3	1.5	12.4	34.4	16.9	46.9	—	—	29.2	81.2	33.7	93.7	S10N06A16N	360.
3	2	—	—	—	—	30	83.3	—	—	—	—	S10N04A02N	470.
3	2	16.5	45.8	22.5	62.5	—	—	39	108	45	125	S10N06A02N	470.
3	3	—	—	—	—	45	125	—	—	—	—	S10N04A03N	635.
3	3	24.7	68.7	33.6	93.6	—	—	58.5	162.3	67.5	187.5	S10N06A03N	635.
3	5	—	—	—	—	75	208	—	—	—	—	S10N04A05N	1,180.
3	5	41.2	115	56.2	156	—	—	97.5	271	112	312	S10N06A05N	1,180.
3	7.5	—	—	—	—	112	312	—	—	—	—	S10N04A07N	1,650.
3	7.5	61.9	172	84.4	234	—	—	146	406	168	468	S10N06A07N	1,650.
Connection Diagram ②		P		N		N		O		M			

Units Required ①	Unit kVA	Input Available Voltage										Style Number	Price U.S. $
		189		229		236		250		264			
		Output		Output		Output		Output		Output			
		kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps		
3	.05	1.5	4.16	1.65	4.58	—	—	.9	2.5	—	—	S10N04A81N	100.
3	.05	—	—	—	—	1.27	3.54	—	—	.71	1.98	S10N06A81N	100.
3	.10	3.0	8.33	3.3	9.17	—	—	1.8	5.0	—	—	S10N04A82N	105.
3	.10	—	—	—	—	2.55	7.08	—	—	1.42	3.95	S10N06A82N	105.
3	.15	4.5	12.5	4.95	13.7	—	—	2.7	7.5	—	—	S10N04A83N	115.
3	.15	—	—	—	—	3.82	10.6	—	—	2.14	5.93	S10N06A83N	115.
3	.25	7.5	20.8	8.25	22.9	—	—	4.5	12.5	—	—	S10N04A26N	150.
3	.25	—	—	—	—	6.35	17.7	—	—	3.56	9.88	S10N06A26N	150.
3	.50	15	41.6	16.5	45.8	—	—	9	25	—	—	S10N04A51N	175.
3	.50	—	—	—	—	12.7	35.4	—	—	7.12	19.3	S10N06A51N	175.
3	.75	22.5	62.4	24.7	68.7	—	—	13.5	37.5	—	—	S10N04A76N	230.
3	.75	—	—	—	—	19	53.1	—	—	10.7	29.3	S10N06A76N	230.
3	1	30	83.3	33	91.7	—	—	18	50	—	—	S10N04A01N	270.
3	1	—	—	—	—	25.5	70.8	—	—	14.2	39.5	S10N06A01N	270.
3	1.5	45	125	49.5	137	—	—	27	75	—	—	S10N04A16N	360.
3	1.5	—	—	—	—	38.2	106	—	—	21.4	59.3	S10N06A16N	360.
3	2	60	167	66	183	—	—	361	100	—	—	S10N04A02N	470.
3	2	—	—	—	—	51	142	—	—	28.5	79.2	S10N06A02N	470.
3	3	90	249.9	99	275.1	—	—	54	150	—	—	S10N04A03N	635.
3	3	—	—	—	—	76.5	212.4	—	—	46.2	118.5	S10N06A03N	635.
3	5	150	416	165	458	—	—	90	250	—	—	S10N04A05N	1,180.
3	5	—	—	—	—	127	354	—	—	71.2	198	S10N06A05N	1,180.
3	7.5	225	624	274	687	—	—	135	375	—	—	S10N04A07N	1,650.
3	7.5	—	—	—	—	190	531	—	—	107	293	S10N06A07N	1,650.
Connection Diagram ②		M		M		M		N		N			

① Additional wiring trough may be required.

② Refer to **Page 9-74** for Buck-Boost wiring diagrams.

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

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

Discount Symbol **DT-1**

Table 9-95. Three-Phase Wye Connection 230 Volt Output Required, 60 Hz

Note: WARNING! Three-phase autotransformers should never be used to obtain 4-wire output with 3-wire input. 4-wire output requires 4-wire wye input.

Units Required ①	Unit kVA	Input Available Voltage										Style Number	Price U.S. $
		183		192		199		208		218			
		Output		Output		Output		Output		Output			
		kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps		
3	.05	—	—	.83	2.08	—	—	1.65	4.58	1.66	4.17	S10N04A81N	100.
3	.05	.62	1.56	—	—	.54	1.35	—	—	—	—	S10N06A81N	100.
3	.10	—	—	1.66	4.17	—	—	3.3	9.17	3.32	8.35	S10N04A82N	105.
3	.10	1.25	3.12	—	—	1.08	2.71	—	—	—	—	S10N06A82N	105.
3	.15	—	—	2.49	6.25	—	—	4.95	13.7	4.98	12.5	S10N04A83N	115.
3	.15	1.87	4.69	—	—	1.62	4.06	—	—	—	—	S10N06A83N	115.
3	.25	—	—	4.15	10.4	—	—	8.2	22.9	8.3	20.9	S10N04A26N	150.
3	.25	3.11	7.81	—	—	2.70	6.77	—	—	—	—	S10N06A26N	150.
3	.50	—	—	8.3	20.8	—	—	16.5	45.8	16.6	41.7	S10N04A51N	175.
3	.50	6.22	15.6	—	—	5.39	13.5	—	—	—	—	S10N06A51N	175.
3	.75	—	—	12.4	31.2	—	—	24.7	68.8	24.9	62.6	S10N04A76N	230.
3	.75	9.33	23.4	—	—	8.09	20.3	—	—	—	—	S10N06A76N	230.
3	1	—	—	16.6	41.7	—	—	33	91.7	33.2	83.5	S10N04A01N	270.
3	1	12.5	31.2	—	—	10.8	27.1	—	—	—	—	S10N06A01N	270.
3	1.5	—	—	24.9	62.5	—	—	49.5	137	49.8	125	S10N04A16N	360.
3	1.5	18.7	46.9	—	—	16.2	40.6	—	—	—	—	S10N06A16N	360.
3	2	—	—	33.2	83.3	—	—	66	183	66.4	167	S10N04A02N	470.
3	2	24.9	62.5	—	—	21.6	54.2	—	—	—	—	S10N06A02N	470.
3	3	—	—	49.8	125.1	—	—	99	275	99.6	250.5	S10N04A03N	635.
3	3	37.5	93.6	—	—	32.4	81.3	—	—	—	—	S10N06A03N	635.
3	5	—	—	83	208	—	—	165	458	166	417	S10N04A05N	1,180.
3	5	62.2	156	—	—	53.9	135	—	—	—	—	S10N06A05N	1,180.
3	7.5	—	—	124	312	—	—	247	688	249	626	S10N04A07N	1,650.
3	7.5	93.3	234	—	—	80.9	203	—	—	—	—	S10N06A07N	1,650.
Connection Diagram ②		N		N		S		M		Q			

Units Required ①	Unit kVA	Input Available Voltage										Style Number	Price U.S. $
		242		245		253		260		265			
		Output		Output		Output		Output		Output			
		kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps		
3	.05	1.74	4.37	—	—	.91	2.29	—	—	—	—	S10N04A81N	100.
3	.05	—	—	1.33	3.33	—	—	.70	1.77	.62	1.56	S10N06A81N	100.
3	.10	3.48	8.75	—	—	1.83	4.58	—	—	—	—	S10N04A82N	105.
3	.10	—	—	2.65	6.67	—	—	1.41	3.54	1.25	3.12	S10N06A82N	105.
3	.15	5.23	13.1	—	—	2.74	6.87	—	—	—	—	S10N04A83N	115.
3	.15	—	—	3.98	10.0	—	—	2.12	5.31	1.87	4.69	S10N06A83N	115.
3	.25	8.71	21.9	—	—	4.56	11.5	—	—	—	—	S10N04A26N	150.
3	.25	—	—	6.63	16.7	—	—	3.52	8.85	3.11	7.81	S10N06A26N	150.
3	.50	17.4	43.7	—	—	9.31	22.9	—	—	—	—	S10N04A51N	175.
3	.50	—	—	13.3	33.3	—	—	7.05	17.7	6.22	15.6	S10N06A51N	175.
3	.75	26.1	65.6	—	—	13.7	34.4	—	—	—	—	S10N04A76N	230.
3	.75	—	—	19.9	50	—	—	10.6	26.6	9.33	23.4	S10N06A76N	230.
3	1	34.8	87.5	—	—	18.3	45.8	—	—	—	—	S10N04A01N	270.
3	1	—	—	26.5	66.7	—	—	14.1	35.4	12.5	31.2	S10N06A01N	270.
3	1.5	52.3	131	—	—	27.4	68.7	—	—	—	—	S10N04A16N	360.
3	1.5	—	—	39.8	100	—	—	21.2	53.1	18.7	46.9	S10N06A16N	360.
3	2	69.7	175	—	—	36.6	91.6	—	—	—	—	S10N04A02N	470.
3	2	—	—	53.1	133	—	—	28.2	70.8	24.9	62.5	S10N06A02N	470.
3	3	104.4	262.5	—	—	54.9	137.4	—	—	—	—	S10N04A03N	635.
3	3	—	—	79.5	200	—	—	42.3	106.2	37.5	93.6	S10N06A03N	635.
3	5	174	437	—	—	91.3	229	—	—	—	—	S10N04A05N	1,180.
3	5	—	—	133	333	—	—	70.5	177	62.2	156	S10N06A05N	1,180.
3	7.5	261	656	—	—	137	344	—	—	—	—	S10N04A07N	1,650.
3	7.5	—	—	199	500	—	—	106	266	93.3	234	S10N06A07N	1,650.
Connection Diagram ②		Q		Q		R		R		S			

① Additional wiring trough may be required.

② Refer to **Page 9-74** for Buck-Boost wiring diagrams.

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

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

Discount Symbol **DT-1**

Table 9-96. Three-Phase Wye Connection 240 Volt Output Required, 60 Hz

Note: WARNING! Three-phase autotransformers should never be used to obtain 4-wire output with 3-wire input. 4-wire output requires 4-wire wye input.

Units Required ①	Unit kVA	Input Available Voltage										Style Number	Price U.S. $
		190		200		208		218		228			
		Output		Output		Output		Output		Output			
		kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps		
3	.05	—	—	.86	2.08	—	—	.86	2.08	1.73	4.17	S10N04A81N	100.
3	.05	.65	1.65	—	—	1.27	3.05	—	—	—	—	S10N06A81N	100.
3	.10	—	—	1.73	4.17	—	—	1.73	4.17	3.46	8.34	S10N04A82N	105.
3	.10	1.3	3.12	—	—	2.55	6.12	—	—	—	—	S10N06A82N	105.
3	.15	—	—	2.59	6.25	—	—	2.59	6.25	5.20	12.5	S10N04A83N	115.
3	.15	1.95	4.69	—	—	3.82	9.16	—	—	—	—	S10N06A83N	115.
3	.25	—	—	4.32	10.4	—	—	4.32	10.4	8.66	20.9	S10N04A26N	150.
3	.25	3.25	7.81	—	—	6.3	15.1	—	—	—	—	S10N06A26N	150.
3	.50	—	—	8.65	20.8	—	—	8.65	20.8	17.3	41.7	S10N04A51N	175.
3	.50	6.5	15.6	—	—	12.7	30.4	—	—	—	—	S10N06A51N	175.
3	.75	—	—	13	31.2	—	—	13	31.2	26	62.6	S10N04A76N	230.
3	.75	9.75	23.4	—	—	19.2	46	—	—	—	—	S10N06A76N	230.
3	1	—	—	17.3	41.7	—	—	17.3	41.7	34.6	83.4	S10N04A01N	270.
3	1	13	31.2	—	—	25.5	61.2	—	—	—	—	S10N06A01N	270.
3	1.5	—	—	25.9	62.5	—	—	25.9	62.5	52	125	S10N04A16N	360.
3	1.5	19.5	46.9	—	—	38.2	91.6	—	—	—	—	S10N06A16N	360.
3	2	—	—	34.6	83.3	—	—	34.6	83.3	69.3	167	S10N04A02N	470.
3	2	26	62.5	—	—	51	122.4	—	—	—	—	S10N06A02N	470.
3	3	—	—	51.9	125.1	—	—	51.9	125.1	103.8	250.2	S10N04A03N	635.
3	3	39	93.6	—	—	76.5	183.6	—	—	—	—	S10N06A03N	635.
3	5	—	—	86.5	208	—	—	86.5	208	173	417	S10N04A05N	1,180.
3	5	65	156	—	—	127.2	305.2	—	—	—	—	S10N06A05N	1,180.
3	7.5	—	—	130	312	—	—	130	312	260	626	S10N04A07N	1,650.
3	7.5	97.5	234	—	—	192	460	—	—	—	—	S10N06A07N	1,650.
Connection Diagram ②		N		N		M		R		Q			

Units Required ①	Unit kVA	Input Available Voltage										Style Number	Price U.S. $
		252		256		264		272		277			
		Output		Output		Output		Output		Output			
		kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps		
3	.05	1.85	4.37	—	—	.95	2.29	—	—	—	—	S10N04A81N	100.
3	.05	—	—	1.39	3.33	—	—	.74	1.77	.65	1.56	S10N06A81N	100.
3	.10	3.64	8.75	—	—	1.91	4.58	—	—	—	—	S10N04A82N	105.
3	.10	—	—	2.77	6.67	—	—	1.47	3.54	1.3	3.12	S10N06A82N	105.
3	.15	5.46	13.1	—	—	2.86	6.87	—	—	—	—	S10N04A83N	115.
3	.15	—	—	4.16	10.0	—	—	2.21	5.31	1.95	4.69	S10N06A83N	115.
3	.25	9.09	21.9	—	—	4.76	11.5	—	—	—	—	S10N04A26N	150.
3	.25	—	—	6.93	16.7	—	—	3.68	8.85	3.25	7.81	S10N06A26N	150.
3	.50	18.2	43.7	—	—	9.53	22.9	—	—	—	—	S10N04A51N	175.
3	.50	—	—	13.9	33.3	—	—	7.36	17.7	6.5	15.6	S10N06A51N	175.
3	.75	27.3	65.6	—	—	14.3	34.4	—	—	—	—	S10N04A76N	230.
3	.75	—	—	20.8	50	—	—	11	26.6	9.75	23.4	S10N06A76N	230.
3	1	36.4	87.5	—	—	19.1	45.8	—	—	—	—	S10N04A01N	270.
3	1	—	—	27.7	66.7	—	—	14.7	35.4	13	31.2	S10N06A01N	270.
3	1.5	54.6	131	—	—	28.6	68.7	—	—	—	—	S10N04A16N	360.
3	1.5	—	—	41.6	100	—	—	22.1	53.1	19.5	46.9	S10N06A16N	360.
3	2	72.8	175	—	—	38.1	91.7	—	—	—	—	S10N04A02N	470.
3	2	—	—	55.4	133	—	—	29.5	70.8	26	62.5	S10N06A02N	470.
3	3	109.2	262.5	—	—	57.3	137.4	—	—	—	—	S10N04A03N	635.
3	3	—	—	83.1	200	—	—	44.1	106.2	39	93.6	S10N06A03N	635.
3	5	182	437	—	—	95.3	229	—	—	—	—	S10N04A05N	1,180.
3	5	—	—	139	333	—	—	73.6	177	65	156	S10N06A05N	1,180.
3	7.5	273	656	—	—	143	344	—	—	—	—	S10N04A07N	1,650.
3	7.5	—	—	208	500	—	—	110	266	97.5	234	S10N06A07N	1,650.
Connection Diagram ②		Q		Q		R		R		S			

① Additional wiring trough may be required.

② Refer to **Page 9-74** for Buck-Boost wiring diagrams.

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

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

Discount Symbol **DT-1**

Table 9-97. Three-Phase Wye Connection 460 Volt Output Required, 60 Hz

Note: WARNING! Three-phase autotransformers should never be used to obtain 4-wire output with 3-wire input. 4-wire output requires 4-wire wye input.

Units Required ①	Unit kVA	Input Available Voltage														Style Number	Price U.S. $
		406		418		432		438		424		436		450			
		Output		Output		Output		Output		Output		Output		Output			
		kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps		
3	.05	—	—	1.66	2.08	—	—	3.22	4.04	—	1.7	2.1	—	—	—	**S10N04A81N**	100.
3	.05	1.25	1.57	—	—	2.49	3.12	—	—	1.3	1.56	—	—	2.6	3.13	**S10N06A81N**	100.
3	.10	—	—	3.31	4.15	—	—	6.62	8.31	—	—	3.5	4.2	—	—	**S10N04A82N**	105.
3	.10	2.49	3.12	—	—	4.97	6.24	—	—	2.6	3.12	—	—	5.2	6.25	**S10N06A82N**	105.
3	.15	—	—	4.97	6.24	—	—	9.94	12.48	—	—	5.2	6.25	—	—	**S10N04A83N**	115.
3	.15	3.73	4.68	—	—	7.46	9.36	—	—	3.9	4.68	—	—	7.8	9.38	**S10N06A83N**	115.
3	.25	—	—	8.28	10.39	—	—	16.6	20.84	—	—	8.7	10.4	—	—	**S10N04A26N**	150.
3	.25	6.22	7.81	—	—	12.4	15.56	—	—	6.5	7.82	—	—	13	15.6	**S10N06A26N**	150.
3	.50	—	—	16.6	20.84	—	—	33.2	41.67	—	—	17.4	20.9	—	—	**S10N04A51N**	175.
3	.50	12.5	15.69	—	—	24.69	31.25	—	—	13	15.6	—	—	26	31.2	**S10N06A51N**	175.
3	.75	—	—	24.8	31.12	—	—	49.6	62.25	—	—	26	31.2	—	—	**S10N04A76N**	230.
3	.75	18.7	23.47	—	—	37.3	46.82	—	—	19.5	23.4	—	—	39	46.9	**S10N06A76N**	230.
3	1	—	—	33.1	41.54	—	—	66.2	83.09	—	—	35	42	—	—	**S10N04A01N**	270.
3	1	24.9	31.25	—	—	49.7	62.38	—	—	26	31.2	—	—	52	62.5	**S10N06A01N**	270.
3	1.5	—	—	49.7	62.38	—	—	99.4	124.75	—	—	52	62.5	—	—	**S10N04A16N**	360.
3	1.5	37.3	46.94	—	—	74.6	93.63	—	—	39	46.8	—	—	78	93.8	**S10N06A16N**	360.
3	2	—	—	66.3	83.22	—	—	133	166.93	—	—	69	82.9	—	—	**S10N04A02N**	470.
3	2	49.7	62.38	—	—	99.5	124.88	—	—	52	62.5	—	—	104	125	**S10N06A02N**	470.
3	3	—	—	99.3	124.64	—	—	198.6	249.27	—	—	104	125	—	—	**S10N04A03N**	635.
3	3	74.6	93.63	—	—	149	187.01	—	—	78	93.8	—	—	156	187.6	**S10N06A03N**	635.
3	5	—	—	166	208.35	—	—	322	404.16	—	—	174	209.2	—	—	**S10N04A05N**	1,180.
3	5	125	156.89	—	—	249	312.53	—	—	130	156.3	—	—	260	312.7	**S10N06A05N**	1,180.
3	7.5	—	—	248	311	—	—	496	622	—	—	260	312	—	—	**S10N04A07N**	1,650.
3	7.5	187	235	—	—	373	468	—	—	195	234	—	—	390	469	**S10N06A07N**	1,650.
Connection Diagram ②		R		R		Q		Q		R		R		Q			

① Additional wiring trough may be required.

② Refer to **Page 9-74** for Buck-Boost wiring diagrams.

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

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

Discount Symbol **DT-1**

Table 9-98. Single-Phase Required, 60 Hz

Units Required ①	Unit kVA	Input Available Voltage/Output Voltage												Style Number	Price U.S. $
		200/240		230/277		346/380		362/380		378/416		416/457			
		Output		Output		Output		Output		Output		Output			
		kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps		
1	.25	1.25	5.2	1.44	5.2	1.98	5.2	3.95	10.4	2.16	5.2	2.38	5.2	**S20N08A26N**	165.
1	.50	2.50	10.4	2.88	10.4	3.95	10.4	7.90	20.8	4.33	10.4	4.76	10.4	**S20N08A51N**	210.
1	.75	3.75	15.6	4.32	15.6	5.93	15.6	11.9	31.2	6.49	15.6	7.14	15.6	**S20N08A76N**	270.
1	1	5.00	20.8	5.76	20.8	7.90	20.8	15.8	41.6	8.65	20.8	9.52	20.8	**S20N08A01N**	310.
1	1.5	7.50	31.2	8.64	31.2	11.9	31.2	23.8	62.5	13.0	31.2	14.3	31.2	**S20N08A16N**	420.
1	2	10.00	41.6	11.5	41.6	15.8	41.6	31.6	83.3	17.3	41.6	19.0	41.6	**S20N08A02N**	570.
1	3	15.0	62.5	17.3	62.5	23.8	62.5	47.5	125.0	26.0	62.5	28.6	62.5	**S20N08A03N**	740.
1	5	25.0	104.0	28.8	104.0	39.5	104.0	79.0	208.0	43.3	104.0	47.6	104.0	**S20N08A05N**	1,290.
1	7.5	37.5	156.0	43.2	156.0	59.3	156.0	118.6	312.0	64.9	156.0	71.4	156.0	**S20N08A07N**	2,000.
Connection Diagram ②		B		B		F		E		F		F			

Units Required ①	Unit kVA	Input Available Voltage/Output Voltage												Style Number	Price U.S. $
		436/480		458/480		277/230		480/456		504/480		528/480			
		Output		Output		Output		Output		Output		Output			
		kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps		
1	.25	2.50	5.2	4.99	10.4	1.44	6.26	5.23	11.4	5.47	11.4	2.75	5.72	**S20N08A26N**	165.
1	.50	4.99	10.4	9.98	20.8	2.88	12.5	10.4	22.8	10.9	22.8	5.49	11.4	**S20N08A51N**	210.
1	.75	7.49	15.6	15.0	31.2	4.33	18.8	15.7	34.2	16.4	34.2	8.24	17.2	**S20N08A76N**	270.
1	1	9.98	20.8	20.0	41.6	5.76	25.0	20.9	45.6	21.8	45.6	11.0	22.9	**S20N08A01N**	310.
1	1.5	15.0	31.2	30.0	62.5	8.64	37.6	31.3	68.4	32.8	68.4	16.5	34.3	**S20N08A16N**	420.
1	2	20.0	41.6	40.0	83.3	11.5	50.1	41.8	91.2	43.7	91.2	22.0	45.8	**S20N08A02N**	570.
1	3	30.0	62.5	60.0	125.0	17.3	75.3	62.7	136.0	65.2	136.0	33.0	68.8	**S20N08A03N**	740.
1	5	49.9	104.0	99.8	208.0	28.8	125.3	104.5	227.0	108.0	227.0	54.9	114.4	**S20N08A05N**	1,290.
1	7.5	74.9	156.0	149.8	312.0	43.2	187.9	156.8	341.0	163.0	341.0	82.4	171.6	**S20N08A07N**	2,000.
Connection Diagram ②		F		E		B		E		E		F			

① Additional wiring trough may be required.

② Refer to **Page 9-74** for Buck-Boost wiring diagrams.

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

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

Discount Symbol **DT-1**

Table 9-99. Three-Phase Required, 60 Hz

Unit kVA	Input Available Voltage/Output Voltage										Style Number	Price U.S. $
	362/380		346/416		430/473		400/480		436/480			
	Output		Output		Output		Output		Output			
	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps		
.25	6.52	10.4	3.75	5.2	4.26	5.2	4.33	5.2	4.33	5.2	**S20N08A26N**	165.
.50	13.0	20.8	7.50	10.4	8.52	10.4	8.65	10.4	8.65	10.4	**S20N08A51N**	210.
.75	19.6	31.2	11.2	15.6	12.8	15.6	13.0	15.6	13.0	15.6	**S20N08A76N**	270.
1	26.1	41.6	15.0	20.8	17.0	20.8	17.3	20.8	17.3	20.8	**S20N08A01N**	310.
1.5	39.1	62.4	22.5	31.2	25.5	31.2	26.0	31.2	26.0	31.2	**S20N08A16N**	420.
2	52.2	83.2	30.0	41.6	34.1	41.6	34.6	41.6	34.6	41.6	**S20N08A02N**	570.
3	78.4	125.0	45.0	62.5	51.2	62.5	52.0	62.5	52.0	62.5	**S20N08A03N**	740.
5	130.4	208.0	75.1	104.0	85.2	104.0	86.6	104.0	86.6	104.0	**S20N08A05N**	1,290.
7.5	195.6	312.0	112.6	156.0	127.8	156.0	129.9	156.0	129.9	156.0	**S20N08A07N**	2,000.
Connection Diagram ①	I		N		K		N		K			
Units Required ②	2		3		2		3		2			

Unit kVA	Input Available Voltage/Output Voltage								Style Number	Price U.S. $
	460/483		457/380		504/480		528/480			
	Output		Output		Output		Output			
	kVA	Amps	kVA	Amps	kVA	Amps	kVA	Amps		
.25	8.7	10.4	4.12	6.25	9.08	10.9	4.76	5.72	**S20N08A26N**	165.
.50	17.4	20.8	8.23	12.5	18.2	21.8	9.51	11.4	**S20N08A51N**	210.
.75	26.1	31.2	12.3	18.8	27.2	32.8	14.3	17.2	**S20N08A76N**	270.
1	34.8	41.6	16.5	25.0	36.3	43.7	19.0	22.9	**S20N08A01N**	310.
1.5	52.2	62.4	24.7	37.5	54.5	65.5	28.5	34.3	**S20N08A16N**	420.
2	69.6	83.2	32.9	50.0	72.6	87.4	38.0	45.8	**S20N08A02N**	570.
3	104.6	125.0	49.5	75.2	109.7	131.3	57.2	68.8	**S20N08A03N**	740.
5	174.0	208.0	82.3	125.1	181.6	218.4	95.1	114.4	**S20N08A05N**	1,290.
7.5	261.0	312.0	123.5	187.6	272.4	327.6	142.7	171.6	**S20N08A07N**	2,000.
Connection Diagram ①	I		N		I		K			
Units Required ②	2		3		2		2			

① Refer to **Page 9-74** for Buck-Boost wiring diagrams.
② Additional wiring trough may be required.

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

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

Discount Symbol **DT-1**

Table 9-100. Three-Phase Open Delta Connection 480 Volt Output Required, 60 Hz

Units Required ①	Input Available Voltage						Style Number ②	Price U.S.
	600		575		575			
	Output		Output		Output			
	kVA	Amps	kVA	Amps	kVA	Amps		
2	4.3	5.1	—	—	—	—	**S20N11S51N**	170.
2	—	—	—	—	4.1	4.9	**S60G11S51N**	255.
2	6.5	7.8	—	—	—	—	**S20N11S76N**	220.
2	—	—	—	—	6.2	7.4	**S60G11S76N**	330.
2	8.6	10.3	—	—	—	—	**S20N11S01N**	260.
2	—	—	—	—	8.3	9.9	**S60G11S01N**	390.
2	13.0	15.6	—	—	—	—	**S20N11S16N**	320.
2	—	—	—	—	12.4	14.9	**S60G11S16N**	475.
2	17.2	20.6	—	—	—	—	**S20N11S02N**	410.
2	—	—	—	—	16.5	19.8	**S60G11S02N**	610.
2	25.8	31	—	—	—	—	**S20N11S03N**	500.
2	—	—	—	—	24.8	29.8	**S60G11S03N**	740.
2	43.2	51.9	—	—	—	—	**S20N11S05N**	740.
2	—	—	—	—	41	49.3	**S60G11S05N**	1,110.
2	65	78.1	—	—	—	—	**S20N11S07N**	980.
2	—	—	—	—	62	74.5	**S60G11S07N**	1,460.
2	86	103.4	—	—	—	—	**S20N11S10N**	1,180.
2	—	—	83	99.8	—	—	**S60G11S10N**	1,760.
2	130	156.3	—	—	—	—	**S20N11S15N**	1,540.
2	—	—	124	149.1	—	—	**S60N11S15N**	2,400.
2	216	259.8	—	—	—	—	**T20P11S25**	1,870.
2	—	—	207	248.9	—	—	**S60J11S25N**	2,825.
2	324	389.7	—	—	—	—	**T20P11S37**	2,290.
2	432	519.6	—	—	—	—	**T20P11S50**	3,220.
Connection Diagram ③	I		J		T			

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 9-74** for Buck-Boost wiring diagrams.

Table 9-101. Single-Phase 480 Volt Output Required, 60 Hz

Units Required ④	Input Available Voltage						Style Number ⑤	Price U.S.
	600		575		575			
	Output		Output		Output			
	kVA	Amps	kVA	Amps	kVA	Amps		
1	2.5	5.2	—	—	—	—	**S20N11S51N**	170.
1	—	—	—	—	2.4	5	**S60G11S51N**	255.
1	3.7	7.7	—	—	—	—	**S20N11S76N**	220.
1	—	—	—	—	3.6	7.5	**S60G11S76N**	330.
1	5.0	10.4	—	—	—	—	**S20N11S01N**	260.
1	—	—	—	—	4.8	10	**S60G11S01N**	390.
1	7.5	15.6	—	—	—	—	**S20N11S16N**	320.
1	—	—	—	—	7.2	15	**S60G11S16N**	475.
1	10	20.8	—	—	—	—	**S20N11S02N**	410.
1	—	—	—	—	9.6	20	**S60G11S02N**	610.
1	15	31.2	—	—	—	—	**S20N11S03N**	500.
1	—	—	—	—	14.3	29.7	**S60G11S03N**	740.
1	25	52	—	—	—	—	**S20N11S05N**	740.
1	—	—	—	—	24	50	**S60G11S05N**	1,110.
1	37.5	78.1	—	—	—	—	**S20N11S07N**	980.
1	—	—	—	—	36	75	**S60G11S07N**	1,460.
1	50	104.1	—	—	—	—	**S20N11S10N**	1,180.
1	—	—	43	100	—	—	**S60G11S10N**	1,760.
1	75	156.2	—	—	—	—	**S20N11S15N**	1,540.
1	—	—	72	150	—	—	**S60N11S15N**	2,400.
1	125	260.4	—	—	—	—	**T20P11S25**	1,870.
1	—	—	120	250	—	—	**S60J11S25N**	2,825.
1	187	389.6	—	—	—	—	**T20P11S37**	2,290.
1	250	520.8	—	—	—	—	**T20P11S50**	3,220.
Connection Diagram ⑥	E		H		U			

④ Additional wiring trough may be required.
⑤ On transformers supplied with standard taps, taps must be placed at nominal settings.
⑥ Refer to **Page 9-74** for Buck-Boost wiring diagrams.

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

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

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

Discount Symbol **DT-1**

Type MTA

Type MTA Transformer

Product Description

- Varnish impregnated core and coil design.
- Suitable for indoor applications.
- Open core and coil design.

Application Description

Machine Tool and Industrial Control Transformers provide stepped-down voltages to machine tool control devices enabling control circuits to be isolated from all power and lighting circuits. This allows the use of grounded or ungrounded circuits that are independent of the power or lighting grounds; greater safety is afforded the operator. The control transformer line is particularly adaptable on applications where compact construction is demanded.

Features, Benefits and Functions

- UL recognized component for units rated 1000 VA and below.
- CSA certified for units rated 1000 VA and below.
- 55ºC rise, 105ºC insulation system.
- 60 Hz operation standard.
- 100% tested to verify product quality.
- Performance equals or exceeds requirements of ANSI/NEMA ST-1.
- Regulation exceeds ANSI/NEMA requirements for all ratings.
- Each unit must pass rigid tests for turns ratio, insulation, continuity, and over potential.
- 50 – 5000 VA ratings.

Standards and Certifications

Industry Standards

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

Product Specifications

Frequency

Cutler-Hammer Type MTA control transformers are designed for 60 Hertz operation. Transformers required for other frequencies are available and must be specifically designed.

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Table 9-102. 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.

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 9-122**.

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

For other ratings or styles not shown, refer to Eaton's Cutler-Hammer business.

Overcurrent Protection Tables

Overcurrent protection on both the primary and secondary sides of transformers are specified in UL 508 and the National Electrical Code. The maximum acceptable ratings are shown below. Due to high inrush currents present when a transformer is initially energized, it is recommended that the primary fuse be time delay to prevent nuisance trips during startup.

Table 9-103. Maximum Acceptable Rating of Primary Overcurrent Protection

Primary Voltage	VA Rating																
	25	50	75	100	150	200	250	300	350	500	750	1000	1500	2000	3000	5000	7000
115	6/10 (1)	1-1/4 (2)	1-8/10 (3-2/10)	2-1/2 (4)	3-1/2 (6-1/4)	5 (8)	4	5	5	8	10	15	20	25	—	—	—
120	6/10 (1)	1-1/4 (2)	1-8/10 (3)	2-1/4 (4)	3-1/2 (6-1/4)	5 (8)	4	5	5	8	10	15	15	20	—	—	—
200	3/10 (6/10)	3/4 (1-1/4)	1-1/8 (1-8/10)	1-1/2 (2-1/2)	2-1/4 (3-1/2)	3 (5)	3-1/2 (6-1/4)	4-1/2 (7-1/2)	5 (8)	4-1/2	7	9	15	15	20	—	—
208	3/10 (6/10)	6/10 (1-1/8)	1 (1-8/10)	1-4/10 (2-1/4)	2 (3-1/2)	2-8/10 (4-1/2)	3-1/2 (6)	4 (7)	5 (8)	4	6	8	12	15	20	30	—
220	3/10 (1/2)	6/10 (1-1/8)	1 (1-6/10)	1-1/4 (2-1/4)	2 (3-2/10)	2-1/2 (4-1/2)	3-2/10 (5-6/10)	4 (6-1/4)	4-1/2 (7-1/2)	4	6	8	12	15	20	30	—
230	3/10 (1/2)	6/10 (1)	8/10 (1-6/10)	1-1/4 (2)	1-8/10 (3-2/10)	2-1/2 (4)	3-2/10 (5)	3-1/2 (6-1/4)	4-1/2 (7-1/2)	4	6	8	10	15	20	30	—
240	3/10 (1/2)	6/10 (1)	8/10 (1-1/2)	1-1/4 (2)	1-8/10 (3)	2-1/4 (4)	3 (5)	3-1/2 (6-1/4)	4 (7)	3-1/2	5	7	10	15	20	30	—
277	1/4 (4/10)	1/2 (8/10)	8/10 (1-1/4)	1 (1-8/10)	1-6/10 (2-1/2)	2 (3-1/2)	2-1/2 (4-1/2)	3-2/10 (5)	3-1/2 (6-1/4)	5 (9)	5	6	9	12	15	25	—
380	3/16 (3/10)	3/10 (6/10)	1/2 (8/10)	3/4 (1-1/4)	1-1/8 (1-8/10)	1-1/2 (2-1/2)	1-8/10 (3-2/10)	2-1/4 (3-1/2)	2-1/2 (4-1/2)	3-1/2 (6-1/4)	5-6/10 (9)	4-1/2	6-1/4	9	15	20	25
400	3/16 (3/10)	3/10 (6/10)	1/2 (8/10)	3/4 (1-1/4)	1-1/8 (1-8/10)	1-1/2 (2-1/2)	1-8/10 (3)	2-1/4 (3-1/2)	2-1/2 (4)	3-1/2 (6-1/4)	5-6/10 (9)	4-1/2	6-1/4	9	12	15	20
416	15/100 (3/10)	3/10 (6/10)	1/2 (8/10)	6/10 (1-1/8)	1 (1-8/10)	1-4/10 (2-1/4)	1-8/10 (3)	2 (3-1/2)	2-1/2 (4)	3-1/2 (6)	5 (9)	4	6	8	12	15	20
440	15/100 (1/4)	3/10 (1/2)	1/2 (8/10)	6/10 (1-1/8)	1 (1-6/10)	1-1/4 (2-1/4)	1-6/10 (2-8/10)	2 (3-2/10)	2-1/4 (3-1/2)	3-2/10 (5)	5 (8)	4	6	8	12	15	20
460	15/100 (1/4)	3/10 (1/2)	4/10 (8/10)	6/10 (1)	8/10 (1-1/2)	1-1/4 (2)	1-6/10 (2-1/2)	1-8/10 (3-2/10)	2-1/4 (3-2/10)	3-2/10 (5)	4-1/2 (8)	3-1/2	6	8	12	15	20
480	15/100 (1/4)	3/10 (1/2)	4/10 (3/4)	6/10 (1)	8/10 (1-1/2)	1-1/4 (2)	1-1/2 (2-1/2)	1-8/10 (3)	2 (3-1/2)	3 (5)	4-1/2 (7-1/2)	3-1/2	5	7	10	15	20
550	1/8 (2/10)	1/4 (4/10)	4/10 (6/10)	1/2 (8/10)	8/10 (1-1/4)	1 (1-8/10)	1-1/4 (2-1/4)	1-6/10 (2-1/2)	1-8/10 (3)	2-1/2 (4-1/2)	4 (6-1/4)	5	4-1/2	6	9	15	15
575	1/8 (2/10)	1/4 (4/10)	3/10 (6/10)	1/2 (8/10)	3/4 (1-1/4)	1 (1-6/10)	1-1/4 (2)	1-1/2 (2-1/2)	1-8/10 (3)	2-1/2 (4)	3 (6-1/4)	5	4-1/2	6	9	15	15
600	1/8 (2/10)	2/10 (4/10)	3/10 (6/10)	1/2 (8/10)	3/4 (1-1/4)	8/10 (1-6/10)	1-1/4 (2)	1-1/2 (2-1/2)	1-6/10 (2-8/10)	2-1/4 (4)	3-1/2 (6-1/4)	5	4	6	9	15	15

Note: If the rated primary current is less than 2 amperes, the maximum rating of the overcurrent device is 300% for power circuits, shown above, or 500% for control circuits, shown above (in brackets). If the rated primary current is 2 amperes or more, the maximum rating of the overcurrent device is 250%. All figures assume secondary overcurrent protection per NEC/UL.
References: NEC 430-72 (c) exception 2, 450-3 (b) 1 & 2, UL 508 32.7, UL 845 11.16 and 11.17.

Table 9-104. Maximum Acceptable Rating of Secondary Overcurrent Protection

Secondary Voltage	VA Rating															
	25	50	75	100	150	200	250	300	350	500	750	1000	1500	2000	3000	5000
12	3-1/2	7	10	15	20	30	—	—	—	—	—	—	—	—	—	—
24	1-6/10	3-2/10	5	6-1/4	10	12	15	20	20	30	—	—	—	—	—	—
90	4/10	8/10	1-1/4	1-8/10	2-1/2	3-1/2	4-1/2	5	6-1/4	9	12	15	30	30	—	—
95	4/10	8/10	1-1/4	1-6/10	2-1/2	3-1/2	4	5	6	8	12	15	20	30	—	—
100	4/10	8/10	1-1/4	1-6/10	2-1/2	3-2/10	4	5	5-6/10	8	12	15	20	30	—	—
110	3/10	3/4	1-1/8	1-1/2	2-1/4	3	3-1/2	4-1/2	5	7-1/2	10	15	20	30	—	—
115	3/10	6/10	1	1-4/10	2	2-8/10	3-1/2	4	5	7	10	15	20	30	—	—
120	3/10	6/10	1	1-1/4	2	2-1/2	3-2/10	4	4-1/2	6-1/4	10	15	20	20	—	—
220	15/100	3/10	1/2	3/4	1-1/8	1-1/2	1-8/10	2-1/4	2-1/2	3-1/2	5-6/10	7	9	15	20	30
230	15/100	3/10	1/2	6/10	1	1-4/10	1-8/10	2	2-1/2	3-1/2	5	7	8	15	20	30
240	15/100	3/10	1/2	6/10	1	1-1/4	1-6/10	2	2-1/2	3-2/10	5	7	8	12	20	30

Note: If the rated secondary current is less than 9 amperes, the maximum rating of the overcurrent device is 167%; 9 amperes or more, the maximum rating of the overcurrent device is 125%. If 125% does not correspond to a standard fuse rating, the next highest standard rating may be used.
References: NEC 430-72 (c) exception 2, 450-3 (b) 1 & 2, UL 508 32.7, UL 845 11.16 and 11.17.

Wiring Diagrams

Type MTA and MTC Control Transformers

Table 9-105. Wiring for Diagram 1

Volts		Connect	Lines
A	B		
460	—	H2 to H3	H1-H4
230	—	H1 to H3 and H2 to H4	H1-H4
115	—	—	X1-X2

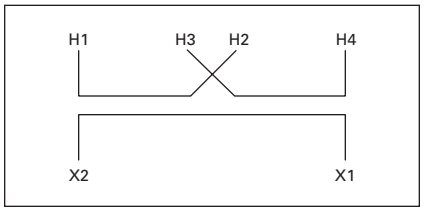


Figure 9-3. Diagram 1

Table 9-106. Wiring for Diagram 2

Volts		Connect	Lines
A	B		
575	416	H2 to H3	H1-H5
460	380	H2 to H3	H1-H4
230	—	H1 to H3 and H2 to H4	H1-H4
—	208	H1 to H3 and H2 to H5	H1-H5
115	115	—	X1-X3
95	95	—	X1-X2

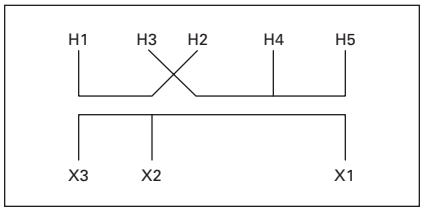


Figure 9-4. Diagram 2

Table 9-107. Wiring for Diagram 3

Volts		Connect	Lines
A	B		
460	—	H2 to H3	H1-H4
230	—	H1 to H3 and H2 to H4	H1-H4
230	—	X2 to X3	X1-X4
115	—	X1 to X3 and X2 to X4	X1-X4

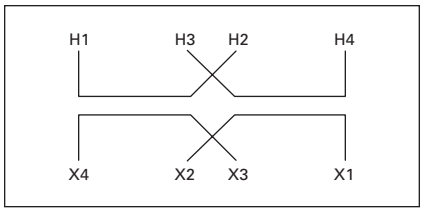


Figure 9-5. Diagram 3

Table 9-108. Wiring for Diagram 4

Volts		Connect	Lines
A	B		
115	115	—	H1-H2
12	24	—	X1-X2

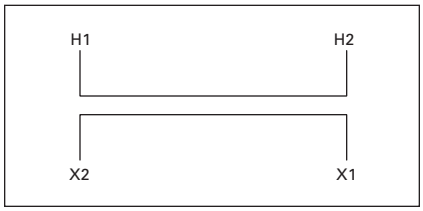


Figure 9-6. Diagram 4

Type AP Control Transformers

Table 9-109. Wiring for Diagram 5

Volts		Connect	Lines
A	B		
480	—	H2 to H3	H1-H4
240	—	H1 to H3 and H2 to H4	H1-H4
240	—	X2 to X3	X1-X4
115	—	X1 to X3 and X2 to X4	X1-X4

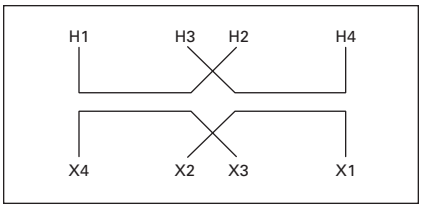


Figure 9-7. Diagram 5

9

Product Selection

Additional Product Selection information begins on **Page 9-136**.

Table 9-110. Type MTA

VA	Dimensions (Inches)			Weight Lbs.	Dimensions (mm)			Weight kg	Frame	Wiring Diagram ①	Style Number	Price U.S.
	Height	Width	Depth		Height	Width	Depth					
230/460 Volts to 115 Volts, 60 Hz												
50	(Use Type MTC – C0050C2A)											
75	3-3/16	3-3/4	3-3/4	3	80	95	95	1.4	FR1510	1	**C0075A2F**	74.00
100	3-3/16	3-3/4	4	4	80	95	102	1.8	FR1512	1	**C0100A2F**	76.50
150	3-3/16	3-3/4	4-3/4	6	80	95	95	2.7	FR1520	1	**C0150A2F**	88.00
200	3-13/16	4-1/2	4-1/2	7	96	114	114	3.2	FR1714	1	**C0200A2F**	110.00
250	3-13/16	4-1/2	5	8	96	114	127	3.6	FR1717	1	**C0250A2F**	131.00
300	3-13/16	4-1/2	5-1/2	10	96	114	139	4.5	FR1723	1	**C0300A2F**	143.00
350	3-13/16	4-1/2	6	12	96	114	152	5.4	FR1727	1	**C0350A2F**	154.00
500	4-3/8	5-1/4	5-5/8	15	111	133	143	6.8	FR1923	1	**C0500A2F**	189.00
750	4-3/8	5-1/4	6-1/8	19	111	133	155	8.6	FR1931	1	**C0750A2F**	249.00
1000	5-1/4	6-1/8	6-3/4	19	133	155	171	8.6	FRC613	1	**C1000A2F**	396.00
1500	6	6-7/8	7-1/2	27	152	174	190	12.3	FRC614	1	**C1500A2F**	521.00
2000	5-7/8	6-7/8	8-1/2	36	149	174	215	16.3	FRC827	1	**C2000A2F**	624.00
3000	6-1/2	8-3/16	8-3/4	52	165	207	222	23.6	FRC828	1	**C3000A2F**	835.00
5000	7-5/8	8-15/16	10-1/4	79	193	227	260	35.8	FRC829	1	**C5000A2F**	1,320.00
230/460 Volts to 115/230 Volts, 60 Hz												
50	2-19/32	3	3-1/4	2	65	76	82	.9	FR1310	3	**C0050A2G**	94.00
75	3-3/16	3-3/4	3-3/4	3	80	95	95	1.4	FR1510	3	**C0075A2G**	102.00
100	3-3/16	3-3/4	4	4	80	95	102	1.8	FR1512	3	**C0100A2G**	110.00
150	3-3/16	3-3/4	4-3/4	6	80	95	95	2.7	FR1520	3	**C0150A2G**	121.00
200	3-13/16	4-1/2	4-1/2	7	96	114	114	3.2	FR1714	3	**C0200A2G**	137.00
250	3-13/16	4-1/2	5	8	96	114	127	3.6	FR1717	3	**C0250A2G**	154.00
300	3-13/16	4-1/2	6	10	96	114	152	4.5	FR1727	3	**C0300A2G**	165.00
350	3-13/16	4-1/2	6	12	96	114	152	5.4	FR1727	3	**C0350A2G**	177.00
500	4-3/8	5-1/4	6-1/4	15	111	133	158	6.8	FR1930	3	**C0500A2G**	210.00
750	5-1/4	6-1/8	6-3/4	19	133	155	171	8.6	FRC613	3	**C0750A2G**	269.00
1000	5-1/4	6-1/8	6-3/4	19	133	155	171	8.6	FRC613	3	**C1000A2G**	409.00
1500	6	6-7/8	7-1/2	27	152	174	190	12.3	FRC614	3	**C1500A2G**	542.00
2000	5-7/8	6-7/8	8-1/2	36	149	174	215	16.3	FRC827	3	**C2000A2G**	650.00
3000	6-1/2	8-3/16	8-3/4	52	165	207	222	23.6	FRC828	3	**C3000A2G**	865.00
5000	5-5/8	8-15/16	10-1/4	79	193	227	260	35.8	FRC829	3	**C5000A2G**	1,390.00

① See **Page 9-91** for Wiring Diagrams.

Note: For additional information refer to the Cutler-Hammer Industrial Control Transformer Binder B1228A.

For other ratings or styles not shown, refer to Eaton's Cutler-Hammer business.

Discount Symbol **DT-1**

Table 9-111. Type MTA

VA	Dimensions (Inches)			Weight Lbs.	Dimensions (mm)			Weight kg	Frame	Wiring Diagram ①	Style Number	Price U.S.
	Height	Width	Depth		Height	Width	Depth					
230/460/575 Volts to 115/95 Volts, 50/60 Hz												
50	2-19/32	3	3-3/4	2	98	76	95	1.5	FR1314	2A	**C0050A3C**	94.
75	3-3/16	3-3/4	4	4	80	95	102	1.8	FR1512	2A	**C0075A3C**	102.
100	3-3/16	3-3/4	4 3/4	5	80	95	120	2.7	FR1517	2A	**C0100A3C**	110.
150	3-13/16	4-1/2	4-1/2	7	96	114	114	3.2	FR1714	2A	**C0150A3C**	121.
200	3-13/16	4-1/2	5	8	96	114	127	3.6	FR1717	2A	**C0200A3C**	137.
250	3-13/16	4-1/2	5-1/2	10	96	114	139	4.5	FR1723	2A	**C0250A3C**	169.
300	3-13/16	4-1/2	6	12	96	114	152	5.4	FR1730	2A	**C0300A3C**	176.
350	4-3/8	5-1/4	5-5/8	14	111	133	143	6.8	FR1923	2A	**C0350A3C**	194.
500	4-3/8	5-1/4	6-1/8	17	111	133	155	8.6	FR1931	2A	**C0500A3C**	246.
750	4-3/8	5-1/4	7-3/4	27	111	133	196	12.3	FR1943	2A	**C0750A3C**	280.
1000	6	6-7/8	7-1/2	24	152	174	190	10.9	FRC614	2A	**C1000A3C**	568.
1500	5-7/8	6-7/8	8-1/2	34	149	174	215	15.4	FRC827	2A	**C1500A3C**	753.
115 Volts to 24 Volts, 50/60 Hz												
50	2-19/32	3	3-3/4	2	65	76	82	.9	FR1310	4B	**C0050A3B**	97.
100	3-3/16	3-3/4	4-1/8	5	80	95	104	2.3	FR1513	4B	**C0100A3B**	116.
200	3-13/16	4-1/2	4-1/2	7	96	114	114	3.2	FR1714	4B	**C0200A3B**	137.
208/380/416 Volts to 115/95 Volts, 50/60 Hz												
50	2-19/32	3	3-3/4	3	98	76	95	1.5	FR1314	2B	**C0050A3D**	94.
100	3-3/16	3-3/4	4-3/4	5	80	95	120	2.3	FR1516	2B	**C0100A3D**	110.
150	3-13/16	4-1/2	4-1/2	7	96	114	114	3.2	FR1714	2B	**C0150A3D**	121.
200	3-13/16	4-1/2	5	8	96	114	127	3.6	FR1717	2B	**C0200A3D**	137.
250	3-13/16	4-1/2	5-1/2	10	96	114	139	4.5	FR1723	2B	**C0250A3D**	169.
300	3-13/16	4-1/2	6	13	96	114	152	5.4	FR1730	2B	**C0300A3D**	176.
500	4-3/8	5-1/4	6-1/8	18	111	133	155	8.6	FR1931	2B	**C0500A3D**	246.
750	4-3/8	5-1/4	7-3/4	27	111	133	196	12.3	FR1943	2B	**C0750A3D**	280.
1000	6	6-7/8	7-1/2	25	152	174	190	10.9	FRC614	2B	**C1000A3D**	555.
1500	5-7/8	6-7/8	8-1/2	33	149	174	215	15.4	FRC827	2B	**C1500A3D**	753.

① See **Page 9-91** for Wiring Diagrams.

Note: For additional information refer to the Cutler-Hammer Industrial Control Transformer Binder B1228A.

For other ratings or styles not shown, refer to Eaton's Cutler-Hammer business.

Discount Symbol **DT-1**

Type MTC

Type MTC Transformers

Product Description

- Varnish impregnated core and coil design.
- Suitable for indoor applications.

Application Description

Transformers provide stepped down voltages to machine tool control devices enabling control circuits to be isolated from all power and lighting circuits. This allows the use of grounded or ungrounded circuits that are independent of the power or lighting grounds; greater safety is afforded the operator. The control transformer line is particularly adaptable on applications where compact construction is demanded. The MTC line is similar to the MTA line except it provides increased regulation.

Features, Benefits and Functions

- Designed specifically for loads requiring extremely good regulation — 10% – 200% better regulation than Type MTA.
- UL recognized component for units rated 1000 VA and below.
- CSA certified for units rated 1000 VA and below.
- 50/60 Hz operation standard.
- 100% tested to verify product quality.
- Each unit must pass rigid tests for turns ratio, insulation, continuity, and over potential.
- Performance equals or exceeds requirements of ANSI/NEMA ST-1.
- Regulation exceeds ANSI/NEMA requirements for all ratings.
- 50 – 5000 VA ratings.
- 55ºC rise, 105ºC insulation system.

Standards and Certifications

Industry Standards

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

Product Specifications

Frequency

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

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Table 9-112. 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.

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 9-122**.

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

For other ratings or styles not shown, refer to Eaton’s Cutler-Hammer business.

Product Selection

Additional Product Selection information begins on **Page 9-136**.

Table 9-113. Type MTC

VA	Dimensions (Inches)			Weight Lbs.	Dimensions (mm)			Weight kg	Frame	Wiring Diagram ①	Style Number	Price U.S.
	Height	Width	Depth		Height	Width	Depth					
240/480 Volts to 120 Volts, 60 Hz 230/460 Volts to 115 Volts, 50/60 Hz 220/440 Volts to 110 Volts, 50/60 Hz												
50	2-19/32	3	3-3/4	2	66	76	95	.9	FR1310	1	**C0050C2A**	67.00
75	2-19/32	3	3-3/4	3	66	76	95	1.4	FR1314	1	**C0075C2A**	78.50
100	2-7/8	3-3/8	4	3	73	86	102	1.4	FR1413	1	**C0100C2A**	84.00
150	3-3/16	3-3/4	4-3/4	6	81	95	121	2.7	FR1517	1	**C0150C2A**	100.00
200	3-13/16	4-1/2	4-1/2	7	97	114	114	3.2	FR1714	1	**C0200C2A**	116.00
250	3-13/16	4-1/2	5	8	97	114	127	3.6	FR1717	1	**C0250C2A**	144.00
300	3-13/16	4-1/2	5-3/8	10	97	114	137	4.5	FR1722	1	**C0300C2A**	154.00
350	3-13/16	4-1/2	6	11	97	114	152	5.0	FR1726	1	**C0350C2A**	169.00
500	4-3/8	5-1/4	6-1/8	20	111	133	156	9.1	FR1931	1	**C0500C2A**	206.00
750	4-3/8	5-1/4	7-3/4	28	111	133	197	12.7	FR1934	1	**C0750C2A**	272.00
1000	5-7/16	6-3/8	7-1/2	34	138	162	191	15.4	FR2236	1	**C1000C2A**	402.00
1500	6-1/8	6-7/8	8-3/8	35	156	175	213	15.9	FRC822	1	**C1500C2A**	564.00
2000	6	6-3/4	8-1/2	38	152	171	216	17.3	FRC823	1	**C2000C2A**	676.00
3000	7-3/8	8-7/16	8-3/4	53	187	214	222	24.1	FRC824	1	**C3000C2A**	934.00
5000	7-7/8	8-11/16	11	82	200	221	279	37.2	FRC825	1	**C5000C2A**	1,445.00

① See **Page 9-91** for Wiring Diagrams.

Note: For additional information refer to the Cutler-Hammer Industrial Control Transformer Binder B1228A.

Table 9-114. Type MTC with Integrally Mounted 30 Amperes, 600 volt Class with 2-Pole Primary Fuse Block for Rejection Type Fuses (Fuses Not Included)

VA	Dimensions (Inches)			Weight Lbs.	Dimensions (mm)			Weight kg	Frame	Wiring Diagram ②	Style Number	Price U.S.
	Height	Width	Depth		Height	Width	Depth					
240/480 Volts to 120 Volts, 60 Hz 230/460 Volts to 115 Volts, 50/60 Hz 220/440 Volts to 110 Volts, 50/60 Hz												
50	3-7/8	3	3-3/4	2.2	98	76	83	1.0	FR1310	1	**C0050C2AFB**	88.00
75	3-7/8	3	3-3/4	3.2	98	76	95	1.5	FR1314	1	**C0075C2AFB**	101.00
100	4-5/32	3-3/8	4	3.2	106	86	102	1.5	FR1413	1	**C0100C2AFB**	106.00
150	4-15/32	3-3/4	4-3/4	6.2	114	95	121	2.8	FR1517	1	**C0150C2AFB**	123.00
200	5-3/32	4-1/2	4-1/2	7.2	129	114	114	3.3	FR1714	1	**C0200C2AFB**	138.00
250	5-3/32	4-1/2	5	8.2	129	114	127	3.7	FR1717	1	**C0250C2AFB**	166.00
300	5-3/32	4-1/2	5-3/8	10.2	129	114	137	4.7	FR1722	1	**C0300C2AFB**	176.00
350	5-3/32	4-1/2	6	11.2	129	114	152	5.1	FR1726	1	**C0350C2AFB**	191.00
500	5-21/32	5-1/4	6-1/8	20.2	144	133	156	9.2	FR1931	1	**C0500C2AFB**	227.00
750	5-21/32	5-1/4	7-3/4	28.2	144	133	197	12.8	FR1934	1	**C0750C2AFB**	294.00
1000	6-23/32	6-3/8	7-1/2	34.2	171	162	191	15.5	FR2236	1	**C1000C2AFB**	424.00
1500	7-13/32	6-7/8	8-3/8	35.2	188	175	213	16.0	FRC822	1	**C1500C2AFB**	585.00
2000	7-9/32	6-3/4	8-1/2	38.2	185	171	216	17.4	FRC823	1	**C2000C2AFB**	697.00

② See **Page 9-91** for Wiring Diagrams.

Note: For additional information refer to the Cutler-Hammer Industrial Control Transformer Binder B1228A.

Discount Symbol **DT-1**

Type MTE

Type MTE Transformers

9

Product Description

- Epoxy-encapsulated coils.

Application Description

Transformers provide stepped down voltages to machine tool control devices enabling control circuits to be isolated from all power and lighting circuits. This allows the use of grounded or ungrounded circuits that are independent of the power or lighting grounds; greater safety is afforded the operator. The control transformer line is particularly adaptable on applications where compact construction is demanded.

Note: The MTG, "open core-coil design" has been superseded by the epoxy-encapsulated core-coil design MTE with no change to dimensions or functionality.

Features, Benefits and Functions

- UL listed.
- CSA certified.
- Epoxy encapsulated.
- Laminations of high quality silicon steel to minimize core losses and optimize performance.
- Copper magnet wire for high quality, efficient operation.
- Secondary fuse clips where applicable.
- Optional primary fusing.
- Molded in terminals.
- 50/60 Hz operation.
- 55°C rise, 105°C insulation system.
- Performance meets/exceeds requirements of ANSI/NEMA ST-1.
- Regulation exceeds ANSI/NEMA requirements for all ratings.
- 25 – 1500 VA ratings.
- Molded-in terminals for maximum durability.

Standards and Certifications

Industry Standards

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

Options and Accessories

Primary Fuse Kit

The primary fuse kit includes a 2-pole class CC fuse block, instructions, and all associated mounting and wiring hardware. Fuses are not included. When installed, the primary fuse kit will add a maximum of 11/16 inch to the transformer depth and 1-15/16 inches to the transformer height.

Table 9-115. Primary Fuse Kit

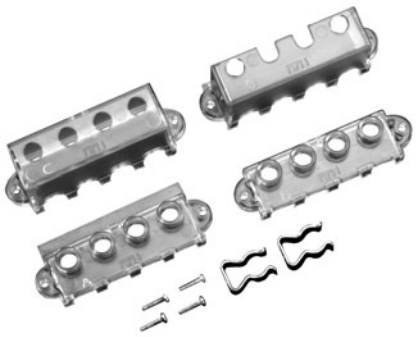
Description	Catalog Number	Price U.S. $
Primary Fuse Kit	**PFK1**	26.

Finger-Safe Terminal Covers (Optional)

- Fits CE marked designs 50 – 750 VA.
- Fits MTE designs. 25 – 750 VA.

Table 9-116. Finger-Safe Terminal Covers

Description	Catalog Number	Price U.S. $
4 Terminal Transformers	**FSK4**	24.
6 Terminal Transformers	**FSK6**	25.



Finger-Safe Terminal Covers — FSK4

Finger-Safe Terminal Covers — FSK6

Finger-Safe Primary Fuse Block Covers

- Fits 2-pole primary fuse blocks on MTE designs.

Table 9-117. Finger-Safe Primary Fuse Block Covers

Description	Catalog Number	Price U.S. $
Primary Fuse Block Covers	**FSKFB**	38.

Finger-Safe Primary Fuse Block Covers

Discount Symbol **DT-1**

Product Specifications

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Table 9-118. 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.

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 9-122**.

Wiring Diagrams

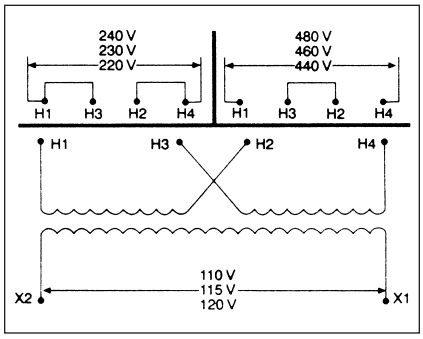


Figure 9-8. Diagram 1

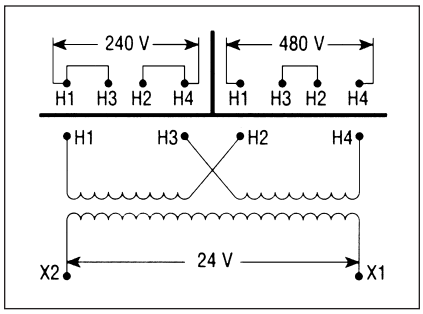


Figure 9-9. Diagram 2

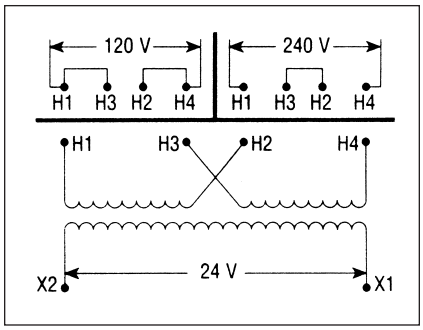


Figure 9-10. Diagram 3

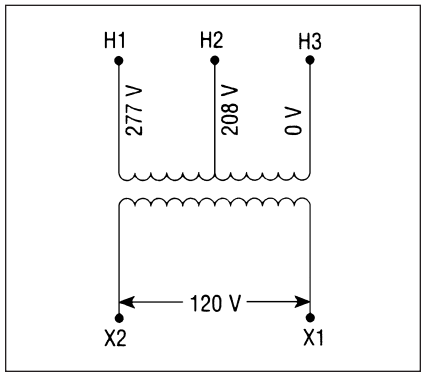


Figure 9-11. Diagram 4

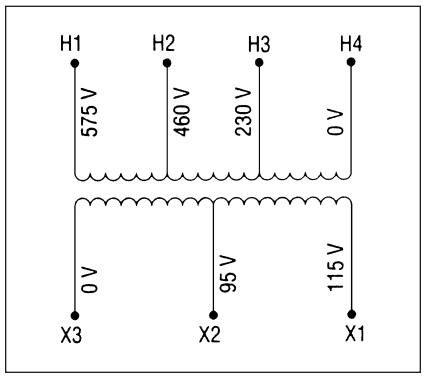


Figure 9-12. Diagram 5

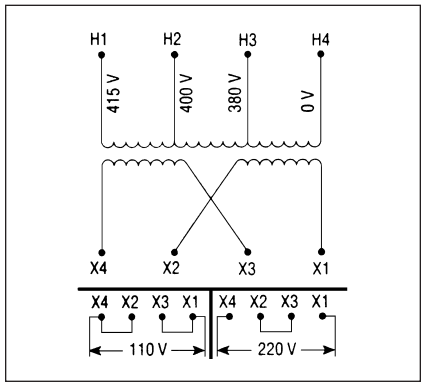


Figure 9-13. Diagram 6

Wiring Diagrams

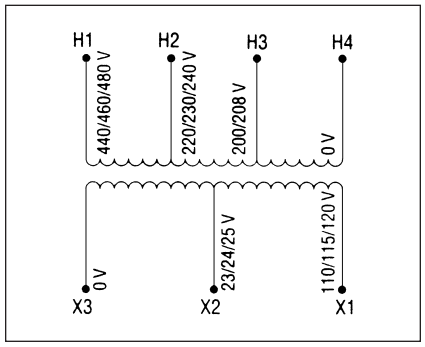


Figure 9-14. Diagram 7

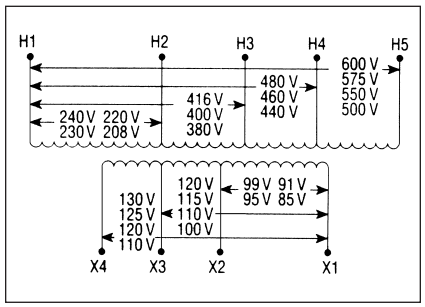


Figure 9-15. Diagram 8

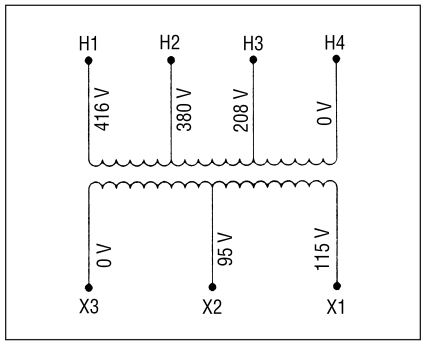


Figure 9-16. Diagram 9

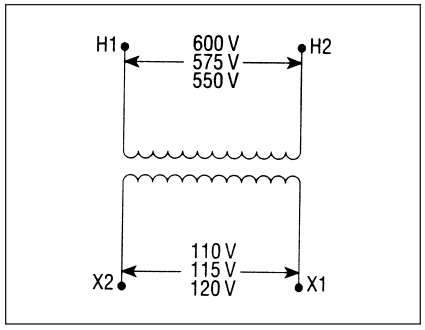


Figure 9-17. Diagram 10

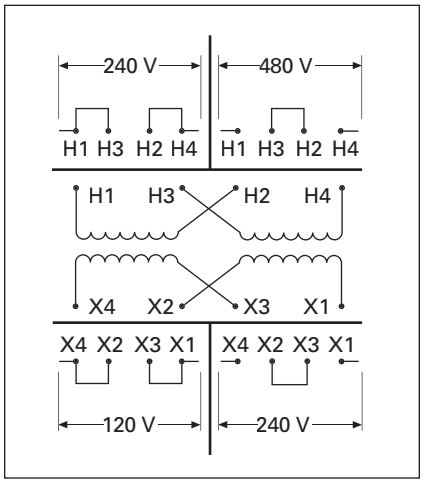


Figure 9-18. Diagram 11

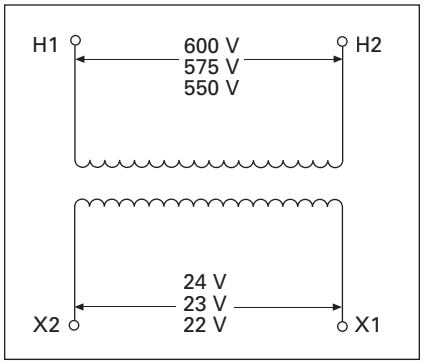


Figure 9-19. Diagram 12

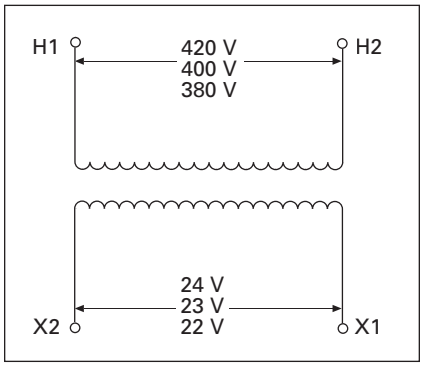


Figure 9-20. Diagram 13

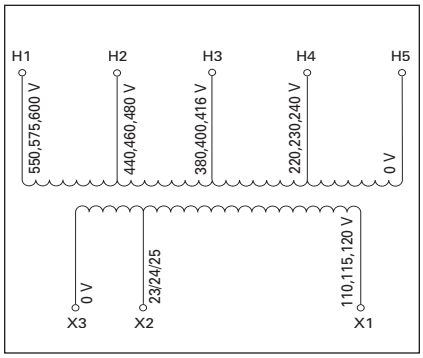


Figure 9-21. Diagram 14

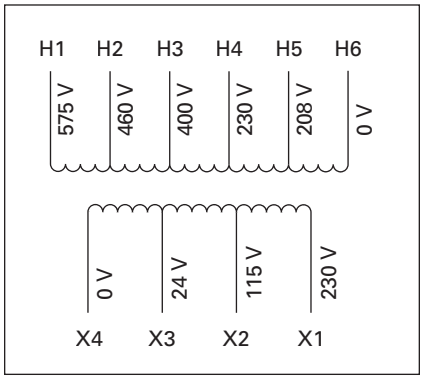


Figure 9-22. Diagram 15

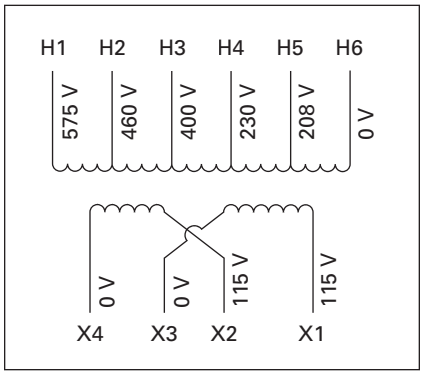


Figure 9-23. Diagram 16

Product Selection

Additional Product Selection information begins on **Page 9-136**.

Table 9-119. Type MTE — Product Selection

VA	Dimensions (Inches)			Weight Lbs.	Dimensions (mm)			Weight kg	Wiring Diagram ①	Style Number	Price U.S. $
	Height	Width	Depth		Height	Width	Depth				
Primary: 240 x 480, 230 x 460, 220 x 440 with Jumpers Secondary: 120/115/110 with Fuse Clips for 13/32 x 1-1/2 Fuses											
25	2-9/16	3	2-1/2	1.7	65	76	64	.8	1	**C0025E2A**	72.00
50	2-9/16	3	3	2.6	65	76	76	1.2	1	**C0050E2A**	53.50
75	2-9/16	3	3-1/2	3.5	65	76	89	1.6	1	**C0075E2A**	64.00
100	2-7/8	3-3/8	3-3/8	4.2	73	86	86	1.9	1	**C0100E2A**	69.00
150	3-3/16	3-3/4	4	6.7	81	95	102	3.0	1	**C0150E2A**	82.00
200	3-13/16	4-1/2	4	8.5	97	114	102	3.9	1	**C0200E2A**	101.00
250	3-13/16	4-1/2	4-3/8	10.0	97	114	111	4.5	1	**C0250E2A**	117.00
300	3-13/16	4-1/2	4-3/4	11.3	97	114	121	5.1	1	**C0300E2A**	126.00
350	3-13/16	4-1/2	5-1/4	13.6	97	114	133	6.2	1	**C0350E2A**	138.00
500	4-3/4	5-1/4	5-1/2	19.2	121	133	140	8.7	1	**C0500E2A**	173.00
750	4-3/4	5-1/4	7	28.1	121	133	178	12.8	1	**C0750E2A**	238.00
1000	5-11/16	6-3/4	6-7/16	29.5	144	171	164	13.4	1	**C1000E2A**	634.00
1500	6-3/8	7-1/2	7-3/8	40.0	162	191	187	18.1	1	**C1500E2A**	851.00
Primary: 240 x 480 with Jumpers Secondary: 24 with Fuse Clips for 13/32 x 1-1/2 Fuses (through 500 VA)											
50	2-9/16	3	3	2.7	65	76	76	1.2	2	**C0050E2B**	62.00
75	2-9/16	3	3-1/2	3.5	65	76	89	1.6	2	**C0075E2B**	73.00
100	2-7/8	3-3/8	3-3/8	4.2	73	86	86	1.9	2	**C0100E2B**	82.00
150	3-3/16	3-3/4	4	6.7	81	95	102	3.0	2	**C0150E2B**	107.00
200	3-13/16	4-1/2	4	8.5	97	114	102	3.9	2	**C0200E2B**	129.00
250	3-13/16	4-1/2	4-3/8	10.1	97	114	111	4.6	2	**C0250E2B**	147.00
300	3-13/16	4-1/2	4-3/4	11.4	97	114	121	5.2	2	**C0300E2B**	161.00
350	3-13/16	4-1/2	5-1/4	13.4	97	114	133	6.1	2	**C0350E2B**	174.00
500	4-3/4	5-1/4	5-5/8	17.5	121	133	143	7.9	2	**C0500E2B**	203.00
750	4-3/4	5-1/4	7	28.1	121	133	178	12.8	2	**C0750E2B**	263.00
Primary: 120 x 240 with Jumpers Secondary: 24 with Fuse Clips for 13/32 x 1-1/2 Fuses											
50	2-9/16	3	3	2.6	65	76	76	1.2	3	**C0050E1B**	62.00
75	2-9/16	3	3-1/2	3.6	65	76	89	1.6	3	**C0075E1B**	72.50
100	2-7/8	3-3/8	3-3/8	4.4	73	86	56	2.0	3	**C0100E1B**	82.00
150	3-3/16	3-3/4	4	6.7	81	95	102	3.0	3	**C0150E1B**	107.00
200	3-13/16	4-1/2	4	8.3	97	114	102	3.8	3	**C0200E1B**	129.00
250	3-13/16	4-1/2	4-3/8	10.1	97	114	111	4.6	3	**C0250E1B**	147.00
300	3-13/16	4-1/2	4-3/4	11.2	97	114	121	5.1	3	**C0300E1B**	161.00
350	3-13/16	4-1/2	5-1/4	13.2	97	114	133	6.0	3	**C0350E1B**	174.00
500	4-3/4	5-1/4	5-5/8	17.5	121	133	143	7.9	3	**C0500E1B**	203.00
Primary: 208/277 Secondary: 120 with Fuse Clips for 13/32 x 1-1/2 Fuses											
50	2-9/16	3	3	2.9	65	76	76	1.3	4	**C0050E3A**	60.50
75	2-9/16	3	3-1/2	3.8	65	76	89	1.7	4	**C0075E3A**	71.50
100	2-7/8	3-3/8	3-3/8	4.5	73	86	86	2.0	4	**C0100E3A**	81.50
150	3-3/16	3-3/4	4	6.9	81	95	102	3.1	4	**C0150E3A**	104.00
200	3-13/16	4-1/2	4	8.7	97	114	102	3.9	4	**C0200E3A**	127.00
250	3-13/16	4-1/2	4-3/8	10.2	97	114	111	4.6	4	**C0250E3A**	144.00
300	3-13/16	4-1/2	4-3/4	11.4	97	114	121	5.2	4	**C0300E3A**	158.00
350	3-13/16	4-1/2	5-1/4	13.7	97	114	133	6.2	4	**C0350E3A**	171.00
500	4-3/4	5-1/4	5-3/8	17.2	121	133	136	7.8	4	**C0500E3A**	196.00
750	4-3/4	5-1/4	7	25.7	121	133	178	11.7	4	**C0750E3A**	263.00

① See **Page 9-97** for Wiring Diagrams.

Note: For additional information refer to the Cutler-Hammer Industrial Control Transformer Binder B1228A.

For other ratings or styles not shown, refer to Eaton's Cutler-Hammer business.

Discount Symbol **DT-1**

Table 9-120. Type MTE — Product Selection

VA	Dimensions (Inches)			Weight Lbs.	Dimensions (mm)			Weight kg	Wiring Diagram ①	Style Number	Price U.S. $
	Height	Width	Depth		Height	Width	Depth				
Primary: 240 x 480 with Jumpers **Secondary: 120 x 240 with Jumpers, Secondary Fuse Clips not Applicable**											
50	2-9/16	3	3	2.6	65	76	76	1.2	11	**C0050E2CXX**	68.
75	2-9/16	3	3-1/2	3.5	65	76	89	1.6	11	**C0075E2CXX**	75.
100	2-7/8	3-3/8	3-3/8	4.2	73	86	86	1.9	11	**C0100E2CXX**	82.
150	3-3/16	3-3/4	4	6.7	81	95	102	3.1	11	**C0150E2CXX**	107.
200	3-13/16	4-1/2	4	8.5	97	114	102	3.9	11	**C0200E2CXX**	129.
250	3-13/16	4-1/2	4-3/8	10.0	97	114	111	4.6	11	**C0250E2CXX**	144.
300	3-13/16	4-1/2	4-7/8	11.8	97	114	124	5.4	11	**C0300E2CXX**	158.
350	3-13/16	4-1/2	5-1/4	13.6	97	114	133	6.2	11	**C0350E2CXX**	171.
500	4-3/4	5-1/4	5-1/4	17.5	121	133	133	8.0	11	**C0500E2CXX**	196.
750	4-3/4	5-1/4	7	26.4	121	133	178	12.0	11	**C0750E2CXX**	263.
Primary: 550/575/600 **Secondary: 110/115/120 with for 13/32 x 1-1/2 Fuses**											
50	2-9/16	3	3	2.7	65	76	76	1.2	10	**C0050E4C**	85.
75	2-9/16	3	3-1/2	3.6	65	76	89	1.6	10	**C0075E4C**	92.
100	2-7/8	3-3/8	3-3/8	4.2	73	86	86	1.9	10	**C0100E4C**	101.
150	3-3/16	3-3/4	4	6.8	81	95	102	3.1	10	**C0150E4C**	117.
200	3-13/16	4-1/2	4	8.4	97	114	102	3.8	10	**C0200E4C**	129.
250	3-13/16	4-1/2	4-3/8	10.0	97	114	111	4.6	10	**C0250E4C**	158.
300	3-13/16	4-1/2	4-3/4	11.3	97	114	121	5.1	10	**C0300E4C**	171.
350	3-13/16	4-1/2	5-1/4	13.6	97	114	133	6.2	10	**C0350E4C**	186.
500	4-3/4	5-1/4	5-3/8	16.8	121	133	137	7.6	10	**C0500E4C**	200.
750	4-3/4	5-1/4	7	25.7	121	133	178	11.7	10	**C0750E4C**	267.
Primary: 380/400/415 **Secondary: 22/23/24 with Fuse Clips for 13/32 x 1-1/2 Fuses**											
50	2-9/16	3	3	2.5	65	76	76	1.1	13	**C0050E4H**	92.
75	2-9/16	3	3-1/2	3.5	65	76	89	1.6	13	**C0075E4H**	98.
100	2-7/8	3-3/8	3-3/8	4.0	73	86	86	1.8	13	**C0100E4H**	107.
150	3-3/16	3-3/4	4	6.5	81	95	102	3.0	13	**C0150E4H**	124.
200	3-13/16	4-1/2	4	8.2	97	114	102	3.7	13	**C0200E4H**	134.
250	3-13/16	4-1/2	4-3/8	10.0	97	114	111	4.5	13	**C0250E4H**	163.
300	3-13/16	4-1/2	4-3/4	11.0	97	114	121	5.0	13	**C0300E4H**	178.
350	3-13/16	4-1/2	5-1/4	13.6	97	114	133	6.2	13	**C0350E4H**	192.
500	4-3/4	5-1/4	5-1/2	17.7	121	133	140	8.0	13	**C0500E4H**	208.
Primary: 550/575/600 **Secondary: 22/23/24 with Fuse Clips for 13/32 x 1-1/2 Fuses**											
50	2-9/16	3	3	2.5	65	76	76	1.1	12	**C0050E4W**	92.
75	2-9/16	3	3-1/2	3.5	65	76	89	1.6	12	**C0075E4W**	98.
100	2-7/8	3-3/8	3 3/8	4.0	73	86	86	1.8	12	**C0100E4W**	107.
150	3-3/16	3-3/4	4	6.5	81	95	102	3.0	12	**C0150E4W**	117.
200	3-13/16	4-1/2	4	8.2	97	114	102	3.7	12	**C0200E4W**	131.
250	3-13/16	4-1/2	4-3/8	10.0	97	114	111	4.5	12	**C0250E4W**	159.
300	3-13/16	4-1/2	4-3/4	11.0	97	114	121	5.0	12	**C0300E4W**	173.
350	3-13/16	4-1/2	5-1/4	13.6	97	114	133	6.2	12	**C0350E4W**	188.
500	4-3/4	5-1/4	5-1/2	17.7	121	133	140	8.0	12	**C0500E4W**	203.
750	4-1/2	5-1/4	7-3//8	28.0	114	133	187	12.7	12	**C0750E4WXX** ②	270.

① See **Page 9-98** for Wiring Diagrams.

② Secondary fuse clips are not available on this catalog number.

Note: For additional information refer to the Cutler-Hammer Industrial Control Transformer Binder B1228A.

For other ratings or styles not shown, refer to Eaton's Cutler-Hammer business.

Discount Symbol **DT-1**

Table 9-121. Types MTE — Product Selection

VA	Dimensions (Inches)			Weight Lbs.	Dimensions (mm)			Weight kg	Wiring Diagram ①	Style Number	Price U.S. $
	Height	Width	Depth		Height	Width	Depth				
Primary: 230/460/575 **Secondary: 115/95 with Fuse Clips for 13/32 x 1-1/2 Fuses**											
50	2-9/16	3	3	3.5	65	76	76	1.6	5	**C0050E3C**	85.50
75	2-7/8	3-3/8	3-3/8	4.5	73	86	86	2.0	5	**C0075E3C**	92.50
100	2-7/8	3-3/8	3-7/8	6.0	73	86	98	2.7	5	**C0100E3C**	102.00
150	3-3/16	3-3/4	4-1/4	7.7	81	95	108	3.5	5	**C0150E3C**	118.00
200	3-13/16	4-1/2	4-1/4	9.0	97	114	108	4.1	5	**C0200E3C**	131.00
250	3-13/16	4-1/2	4-3/4	9.7	97	114	121	4.4	5	**C0250E3C**	161.00
300	3-13/16	4-1/2	5-1/8	11.7	97	114	130	5.3	5	**C0300E3C**	174.00
350	4-3/4	5-1/4	5	16.5	121	133	127	7.5	5	**C0350E3C**	189.00
500	4-3/4	5-1/4	5-5/8	21.5	121	133	143	9.8	5	**C0500E3C**	203.00
750	4-3/4	5-1/4	7	28.0	121	133	178	12.7	5	**C0750E3C**	271.00
Primary: 380/400/415 **Secondary: 110 x 220 with Jumpers; Fuse Clips not Applicable**											
50	2-9/16	3	3	3.0	65	76	76	1.4	6	**C0050E4D**	85.00
75	2-9/16	3	3-1/2	4.0	65	76	89	1.8	6	**C0075E4D**	92.00
100	2-7/8	3-3/8	3-9/16	5.2	73	86	90	2.4	6	**C0100E4D**	101.00
150	3-3/16	3-3/4	4	7.0	81	95	102	3.2	6	**C0150E4D**	117.00
200	3-13/16	4-1/2	4	8.7	97	114	102	3.9	6	**C0200E4D**	129.00
250	3-13/16	4-1/2	4-3/8	10.2	97	114	111	4.6	6	**C0250E4D**	158.00
300	3-13/16	4-1/2	4-3/4	11.0	97	114	121	5.0	6	**C0300E4D**	171.00
350	3-13/16	4-1/2	5-1/4	13.0	97	114	133	5.9	6	**C0350E4D**	186.00
500	4-3/4	5-1/4	5-3/8	20.0	121	133	136	9.1	6	**C0500E4D**	200.00
750	4-3/4	5-1/4	7	28.0	121	133	178	12.7	6	**C0750E4D**	267.00
Primary: 200/220/440, 208/230/460, 240/480 **Secondary: 23/110, 24/115, 25/120 with Fuse Clips for 13/32 x 1-1/2 Fuses**											
50	2-9/16	3	3-1/4	3.4	65	76	83	1.5	7	**C0050E5E**	76.50
75	2-7/8	3-3/8	3-1/2	4.8	73	86	89	2.2	7	**C0075E5E**	83.00
100	3-3/16	3-3/4	5-5/8	5.9	81	95	143	2.7	7	**C0100E5E**	92.50
150	3-3/16	3-3/4	4-3/8	7.9	81	95	111	3.6	7	**C0150E5E**	117.00
200	3-13/16	4-1/2	4-1/2	10.6	97	114	114	4.8	7	**C0200E5E**	139.00
250	3-13/16	4-1/2	5-1/4	13.9	97	114	133	6.3	7	**C0250E5E**	161.00
300	4-3/4	5-1/4	5-1/8	15.5	121	133	130	7.0	7	**C0300E5E**	177.00
350	4-3/4	5-1/4	5-3/8	16.8	121	133	136	7.6	7	**C0350E5E**	184.00
500	4-3/4	5-1/4	6-7/8	23.4	121	133	175	10.6	7	**C0500E5E**	222.00
Universal Design (MTE Epoxy Encapsulated) **Primary: 240/416/480/600, 230/400/460/575, 220/380/440/550, 208/500** **Secondary: 99/120/130, 95/115/125, 91/110/120, 85/100/110 with Fuse Clips for 13/32 x 1-1/2 Fuses**											
50	2-7/8	3-3/8	4	4.0	73	86	102	1.8	8	**C0050E6U** ②	150.00
100	3-3/16	3-3/4	4-5/8	6.6	81	95	117	3.0	8	**C0100E6U** ②	159.00
150	3-13/16	4-1/2	4-7/16	8.8	97	114	113	4.0	8	**C0150E6U** ③	165.00
250	3-13/16	4-1/2	5-7/8	14.7	97	114	149	6.7	8	**C0250E6U** ③	197.00
350	4-7/16	5-1/4	5-5/8	18.6	113	133	143	8.4	8	**C0350E6U** ③	228.00
500	4-7/16	5-1/4	7	25.6	113	133	178	11.6	8	**C0500E6U** ③	287.00
750	5-3/4	6-3/4	5-11/16	30.5	146	171	144	13.8	8	**C0750E6U** ③	332.00

① See **Pages 9-97** and **9-98** for Wiring Diagrams.

② Type MTG Open Core-Coil Universal Design has been superseded by Type MTE Epoxy Encapsulated Universal Design with no changes to form, fit or function.

③ Type MTE Epoxy Encapsulated Universal Design.

Note: For additional information refer to the Cutler-Hammer Industrial Control Transformer Binder B1228A.

For other ratings or styles not shown, refer to Eaton's Cutler-Hammer business.

Discount Symbol **DT-1**

Table 9-122. Transformers with Primary Fuse Blocks — Product Selection

VA	Dimensions (Inches)			Weight Lbs.	Dimensions (mm)			Weight kg	Wiring Diagram ①	Style Number	Price U.S. $
	Height	Width	Depth		Height	Width	Depth				
Primary: 240 x 480, 230 x 460, 220 x 440 with Jumpers and Two-Pole Primary Fuse Block for Rejection Type Fuses Secondary: 120/115/110 with Fuse Clips for 13/32 x 1-1/2 Fuses											
50	3-15/16	3	3	2.8	100	76	76	1.3	1	**C0050E2AFB**	71.00
75	3-15/16	3	3-1/2	3.7	100	76	89	1.7	1	**C0075E2AFB**	82.00
100	4-1/4	3-3/8	3-3/8	4.4	108	86	86	2.0	1	**C0100E2AFB**	87.00
150	4-9/16	3-3/4	4	6.9	116	95	102	3.1	1	**C0150E2AFB**	101.00
200	5-3/16	4-1/2	4	8.7	132	114	102	3.9	1	**C0200E2AFB**	119.00
250	5-3/16	4-1/2	4-3/8	10.2	132	114	111	4.6	1	**C0250E2AFB**	136.00
300	5-3/16	4-1/2	4-3/4	11.5	132	114	121	5.2	1	**C0300E2AFB**	143.00
350	5-3/16	4-1/2	5-1/4	13.8	132	114	133	6.3	1	**C0350E2AFB**	156.00
500	6-1/8	5-1/4	5-1/2	19.4	156	133	140	8.8	1	**C0500E2AFB**	191.00
750	6-1/8	5-1/4	7	28.3	156	133	178	12.8	1	**C0750E2AFB**	256.00
1000	7-1/16	6-3/4	6-7/16	29.7	179	171	164	13.4	1	**C1000E2AFB**	651.00
1500	7-3/4	7-1/2	7-3/8	40.2	197	191	187	18.1	1	**C1500E2AFB**	868.00
Primary: 240 x 480 with Jumpers and Two-Pole Primary Fuse Block for Rejection Type Fuses Secondary: 24 with Fuse Clips for 13/32 x 1-1/2 Fuses											
50	3-15/16	3	3	2.8	100	76	76	1.3	2	**C0050E2BFB**	80.00
75	3-15/16	3	3-1/2	3.8	100	76	89	1.7	2	**C0075E2BFB**	90.50
100	4-1/4	3-3/8	3-3/8	4.4	108	86	86	2.1	2	**C0100E2BFB**	101.00
150	4-9/16	3-3/4	4	6.9	116	95	102	3.1	2	**C0150E2BFB**	125.00
200	5-3/16	4-1/2	4	8.7	132	114	102	3.9	2	**C0200E2BFB**	147.00
250	5-3/16	4-1/2	4-3/8	10.3	132	114	111	4.7	2	**C0250E2BFB**	164.00
300	5-3/16	4-1/2	4-3/4	11.6	132	114	121	5.3	2	**C0300E2BFB**	179.00
350	5-3/16	4-1/2	5-1/4	13.6	132	114	133	6.2	2	**C0350E2BFB**	192.00
500	6-1/8	5-1/4	5-5/8	17.7	156	133	143	8.0	2	**C0500E2BFB**	222.00
Primary: 120 x 240 with Jumpers and Two-Pole Primary Fuse Block for Rejection Type Fuses Secondary: 24 with Fuse Clips for 13/32 x 1-1/2 Fuses											
50	3-15/16	3	3	2.8	100	76	76	1.3	3	**C0050E1BFB**	80.00
75	3-15/16	3	3 1/2	3.8	100	76	89	1.7	3	**C0075E1BFB**	90.50
100	4-1/4	3-3/8	3 3/8	4.6	108	86	86	2.1	3	**C0100E1BFB**	101.00
150	4-9/16	3-3/4	4	6.9	116	95	102	3.1	3	**C0150E1BFB**	125.00
200	5-3/16	4-1/2	4	8.5	132	114	102	3.9	3	**C0200E1BFB**	147.00
250	5-3/16	4-1/2	4 3/8	10.3	132	114	111	4.7	3	**C0250E1BFB**	164.00
300	5-3/16	4-1/2	4 3/4	11.4	132	114	121	5.2	3	**C0300E1BFB**	180.00
350	5-3/16	4-1/2	5 1/4	13.4	132	114	133	6.1	3	**C0350E1BFB**	192.00
500	6-1/8	5-1/4	5 5/8	17.7	156	133	143	8.0	3	**C0500E1BFB**	222.00
Primary: 208/277 with Two-Pole Primary Fuse Block for Rejection Type Fuses Secondary: 120 with Fuse Clips for 13/32 x 1-1/2 Fuses											
50	3-15/16	3	3	3.1	100	76	76	1.4	4	**C0050E3AFB**	78.50
75	3-15/16	3	3-1/2	4.0	100	76	89	1.8	4	**C0075E3AFB**	90.00
100	4-1/4	3-3/8	3-3/8	4.7	108	86	86	2.1	4	**C0100E3AFB**	100.00
150	4-9/16	3-3/4	4	7.1	116	95	102	3.2	4	**C0150E3AFB**	122.00
200	5-3/16	4-1/2	4	8.9	132	114	102	4.0	4	**C0200E3AFB**	145.00
250	5-3/16	4-1/2	4-3/8	10.4	132	114	111	4.7	4	**C0250E3AFB**	162.00
300	5-3/16	4-1/2	4-3/4	11.6	132	114	121	5.3	4	**C0300E3AFB**	176.00
350	5-3/16	4-1/2	5-1/4	13.9	132	114	133	6.3	4	**C0350E3AFB**	188.00
500	6-1/8	5-1/4	5-3/8	17.4	156	133	143	7.9	4	**C0500E3AFB**	213.00

① See **Page 9-97** for Wiring Diagrams.

Note: For additional information refer to the Cutler-Hammer Industrial Control Transformer Binder B1228A.

For other ratings or styles not shown, refer to Eaton's Cutler-Hammer business.

Discount Symbol **DT-1**

Table 9-123. Transformers with Primary Fuse Blocks — Product Selection

VA	Dimensions (Inches)			Weight Lbs.	Dimensions (mm)			Weight kg	Wiring Diagram ①	Style Number	Price U.S. $
	Height	Width	Depth		Height	Width	Depth				
Primary: 550/575/600 with Two-Pole Primary Fuse Block for Rejection Type Fuses Secondary: 110/115/120 with Fuse Clips for 13/32 x 1-1/2 Fuses											
50	3-15/16	3	3	2.9	100	76	76	1.3	10	**C0050E4CFB**	103.
75	3-15/16	3	3-1/2	3.8	100	76	89	1.7	10	**C0075E4CFB**	110.
100	4-1/4	3 -3/8	3 3/8	4.4	108	86	86	2.0	10	**C0100E4CFB**	119.
150	4-9/16	3-3/4	4	7.0	116	95	102	3.2	10	**C0150E4CFB**	135.
200	5-3/16	4-1/2	4	8.6	132	114	102	3.9	10	**C0200E4CFB**	147.
250	5-3/16	4-1/2	4 3/8	10.2	132	114	111	4.6	10	**C0250E4CFB**	176.
300	5-3/16	4-1/2	4 3/4	11.5	132	114	121	5.2	10	**C0300E4CFB**	188.
350	5-3/16	4-1/2	5 1/4	13.8	132	114	133	6.3	10	**C0350E4CFB**	204.
500	6-1/8	5-1/4	5 3/8	17.0	156	133	137	7.7	10	**C0500E4CFB**	218.
750	6-1/8	5-1/4	7	25.9	156	133	178	11.8	10	**C0750E4CFB**	285.
Primary: 380/400/415 with Two-Pole Primary Fuse Block for Rejection Type Fuses Secondary: 22/23/24 with Fuse Clips for 13/32 x 1-1/2 Fuses											
50	2-9/16	3	3	2.6	65	76	76	1.2	13	**C0050E4HFB**	110.
75	2-9/16	3	3-1/2	3.7	65	76	89	1.7	13	**C0075E4HFB**	115.
100	2-7/8	3-3/8	3-3/8	4.2	73	86	86	1.9	13	**C0100E4HFB**	125.
150	3-3/16	3-3/4	4	6.7	81	95	102	3.0	13	**C0150E4HFB**	142.
200	3-13/16	4-1/2	4	8.4	97	114	102	3.8	13	**C0200E4HFB**	152.
250	3-13/16	4-1/2	4-3/8	10.2	97	114	111	4.6	13	**C0250E4HFB**	181.
Primary: 550/575/600 with Two-Pole Primary Fuse Block for Rejection Type Fuses Secondary: 22/23/24 with Fuse Clips for 13/32 x 1-1/2 Fuses											
50	2-9/16	3	3	2.7	65	76	76	1.2	12	**C0050E4WFB**	110.
75	2-9/16	3	3-1/2	3.7	65	76	89	1.7	12	**C0075E4WFB**	115.
100	2-7/8	3-3/8	3-3/8	4.2	73	86	86	1.9	12	**C0100E4WFB**	125.
150	3-3/16	3-3/4	4	6.7	81	95	102	3.0	12	**C0150E4WFB**	135.
200	3-13/16	4-1/2	4	8.4	97	114	102	3.8	12	**C0200E4WFB**	150.
250	3-13/16	4-1/2	4-3/8	10.2	97	114	111	4.6	12	**C0250E4WFB**	178.

① See **Page 9-98** for Wiring Diagrams.

Note: For additional information refer to the Cutler-Hammer Industrial Control Transformer Binder B1228A.

For other ratings or styles not shown, refer to Eaton's Cutler-Hammer business.

Discount Symbol **DT-1**

Table 9-124. Transformers with Primary Fuse Blocks — Product Selection

VA	Dimensions (Inches)			Weight Lbs.	Dimensions (mm)			Weight kg	Wiring Diagram ①	Style Number	Price U.S. $
	Height	Width	Depth		Height	Width	Depth				
Primary: 230/460/575 with Two-Pole Primary Fuse Block for Rejection Type Fuses Secondary: 115/95 with Fuse Clips for 13/32 x 1-1/2 Fuses											
50	3-13/16	3	3	3.7	97	76	76	1.7	5	**C0050E3CFB**	104.
75	4-1/4	3-3/8	3-3/8	4.7	108	86	86	2.1	5	**C0075E3CFB**	111.
100	4-1/4	3-3/8	3-7/8	6.2	108	86	98	2.8	5	**C0100E3CFB**	119.
150	4-9/16	3-3/4	4-1/4	7.9	116	95	108	3.6	5	**C0150E3CFB**	136.
200	5-3/16	4-1/2	4-1/4	9.2	132	114	108	4.2	5	**C0200E3CFB**	150.
250	5-3/16	4-1/2	4-3/4	9.9	132	114	121	4.5	5	**C0250E3CFB**	179.
300	5-3/16	4-1/2	5-1/8	11.9	132	114	130	5.4	5	**C0300E3CFB**	192.
350	6-1/8	5-1/4	5	16.7	156	133	127	7.6	5	**C0350E3CFB**	206.
500	6-1/8	5-1/4	5-7/8	21.7	156	133	149	9.9	5	**C0500E3CFB**	221.
Primary: 380/400/415 with Two-Pole Primary Fuse Block for Rejection Type Fuses Secondary: 110 x 220 with Jumpers; Fuse Clips Not Available											
50	3-15/16	3	3	3.2	100	76	76	1.5	6	**C0050E4DFB**	103.
75	3-15/16	3	3-1/2	4.2	100	76	89	1.9	6	**C0075E4DFB**	110.
100	4-1/4	3-3/8	3-9/16	5.4	108	86	90	2.5	6	**C0100E4DFB**	119.
150	4-9/16	3-3/4	4	7.2	116	95	102	3.3	6	**C0150E4DFB**	135.
200	5-3/16	4-1/2	4	8.9	132	114	102	4.0	6	**C0200E4DFB**	147.
250	5-3/16	4-1/2	4-3/8	10.4	132	114	111	4.7	6	**C0250E4DFB**	176.
300	5-3/16	4-1/2	4-3/4	11.2	132	114	121	5.1	6	**C0300E4DFB**	188.
350	5-3/16	4-1/2	5-1/4	13.2	132	114	133	6.0	6	**C0350E4DFB**	204.
500	6-1/8	5-1/4	5-5/8	20.2	156	133	143	9.2	6	**C0500E4DFB**	218.
Primary: 200/220/440, 208/230/460, 240/480 with Two-Pole Primary Fuse Block for Rejection Type Fuses Secondary: 23/110, 24/115, 25/120 with Fuse Clips for 13/32 x 1-1/2 Fuses											
50	3-15/16	3	3-1/4	3.6	100	76	83	1.6	7	**C0050E5EFB**	94.
75	4-1/4	3-3/8	3-1/2	5.0	108	86	89	2.3	7	**C0075E5EFB**	101.
100	4-9/16	3-3/4	3-5/8	6.1	116	95	92	2.8	7	**C0100E5EFB**	111.
150	4-9/16	3-3/4	4-3/8	8.1	116	95	111	3.7	7	**C0150E5EFB**	135.
200	5-3/16	4-1/2	4-1/2	10.8	132	114	114	4.9	7	**C0200E5EFB**	157.
250	5-3/16	4-1/2	5-1/4	14.1	132	114	133	6.4	7	**C0250E5EFB**	180.
300	6-1/8	5-1/4	5-1/8	15.7	156	133	130	7.1	7	**C0300E5EFB**	195.
350	6-1/8	5-1/4	5-3/8	17.0	156	133	136	7.7	7	**C0350E5EFB**	202.
500	6-1/8	5-1/4	6-7/8	23.6	156	133	175	10.7	7	**C0500E5EFB**	239.
Universal Design (MTE Epoxy Encapsulated) Primary: 240/416/480/600, 230/400/460/575, 220/380/440/550, 208/500 with Two-Pole Primary Fuse Block for Rejection Type Fuses Secondary: 99/120/130, 95/115/125, 91/110/120, 85/100/110 with Fuse Clips for 13/32 x 1-1/2 Fuses											
50	4-1/4	3-3/8	4	4.2	108	86	102	1.9	8	**C0050E6UFB** ②	167.
100	4-9/16	3-3/4	4-5/8	6.8	116	95	117	3.1	8	**C0100E6UFB** ②	178.
150	5-3/16	4-1/2	4-7/16	9.0	132	114	113	4.1	8	**C0150E6UFB** ③	183.
250	5-3/16	4-1/2	5-7/8	14.9	132	114	149	6.8	8	**C0250E6UFB** ③	215.
350	5-13/16	5-1/4	5-5/8	18.8	148	133	143	8.5	8	**C0350E6UFB** ③	246.
500	5-13/16	5-1/4	7	25.8	148	133	178	11.7	8	**C0500E6UFB** ③	306.

① See **Pages 9-97** and **9-98** for Wiring Diagrams.

② Type MTG Open Core-Coil Universal Design has been superseded by Type MTE Epoxy Encapsulated Universal Design with no changes to form, fit or function.

③ Type MTE Epoxy Encapsulated Universal Design.

Note: For additional information refer to the Cutler-Hammer Industrial Control Transformer Binder B1228A.

For other ratings or styles not shown, refer to Eaton's Cutler-Hammer business.

Discount Symbol **DT-1**

Type MTK

Type MTK Transformers

Product Description

- Epoxy resin-impregnated coil.
- Economical solution for high inrush applications.

Application Description

Transformers provide stepped down voltages to machine tool control devices enabling control circuits to be isolated from all power and lighting circuits. This allows the use of grounded or ungrounded circuits that are independent of the power or lighting grounds; greater safety is afforded the operator. The control transformer line is particularly adaptable on applications where compact construction is demanded.

Features, Benefits and Functions

- UL listed.
- CSA certified.
- Epoxy resin impregnated coil design.
- Copper magnet wire for high quality, efficient operation.
- 50/60 Hz operation.
- 115°C rise, 180°C insulation system.
- Performance meets/exceeds requirements of ANSI/NEMA ST-1.
- Regulation exceeds ANSI/NEMA requirements for all ratings.
- 500 – 5000 VA ratings.

Standards and Certifications

Industry Standards

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

Product Specifications

Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

Table 9-125. 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.

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 9-122**.

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

For other ratings or styles not shown, refer to Eaton's Cutler-Hammer business.

Wiring Diagrams

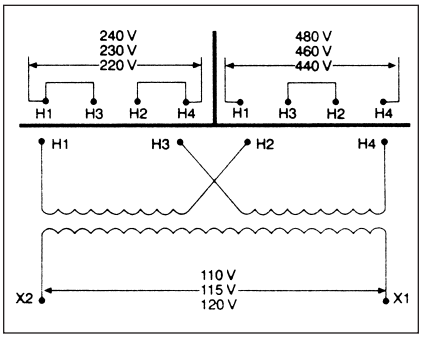


Figure 9-24. Diagram 1

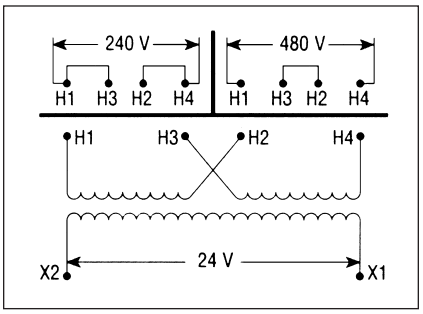


Figure 9-25. Diagram 2

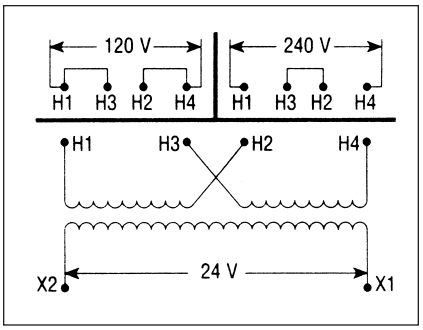


Figure 9-26. Diagram 3

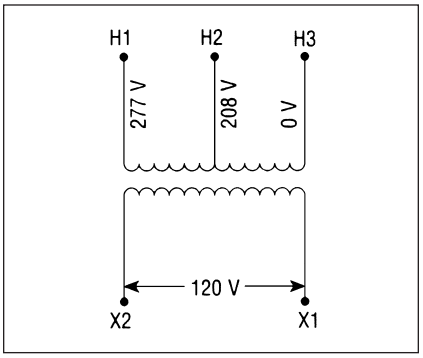


Figure 9-27. Diagram 4

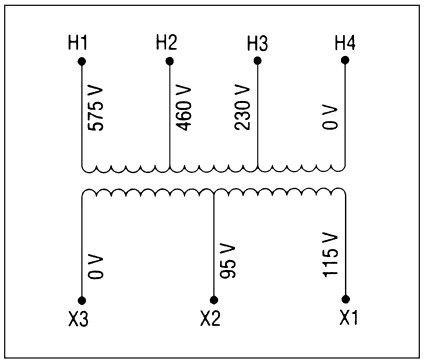


Figure 9-28. Diagram 5

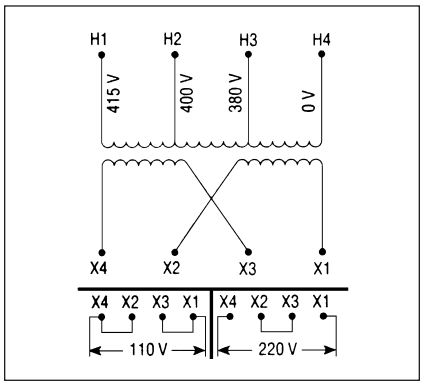


Figure 9-29. Diagram 6

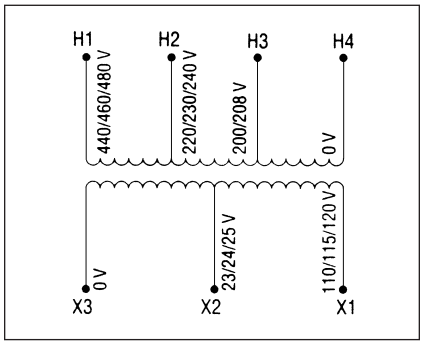


Figure 9-30. Diagram 7

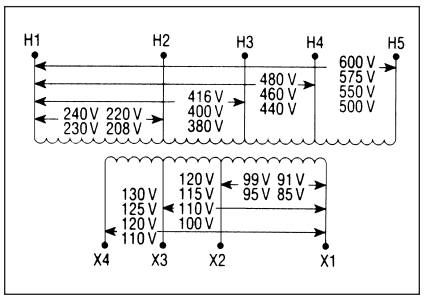


Figure 9-31. Diagram 8

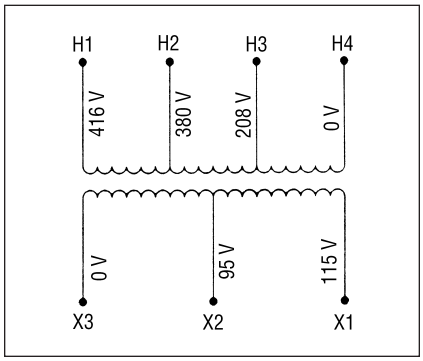


Figure 9-32. Diagram 9

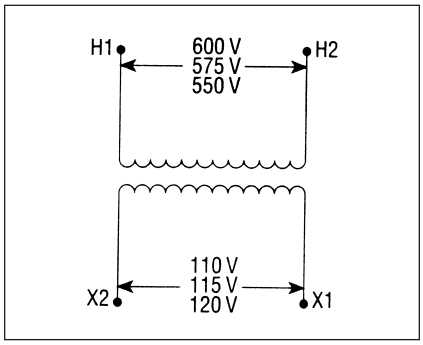


Figure 9-33. Diagram 10

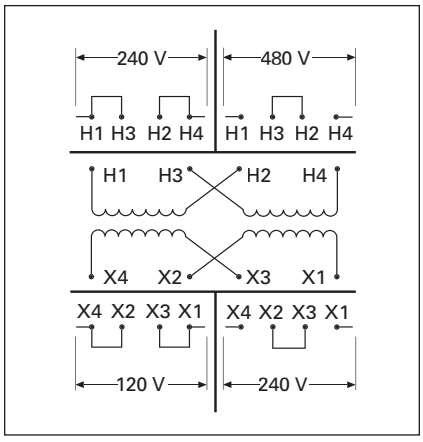


Figure 9-34. Diagram 11

Wiring Diagrams

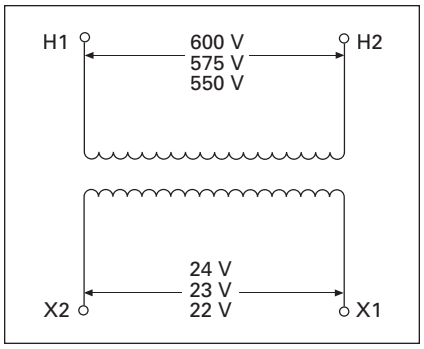


Figure 9-35. Diagram 12

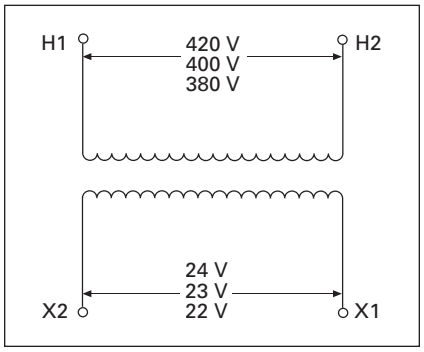


Figure 9-36. Diagram 13

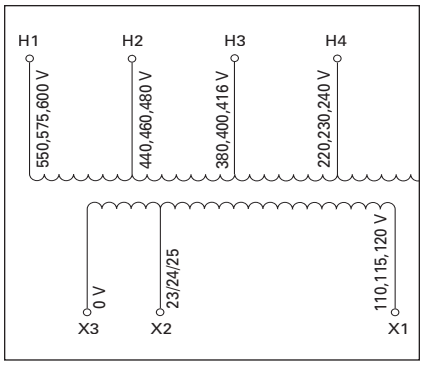


Figure 9-37. Diagram 14

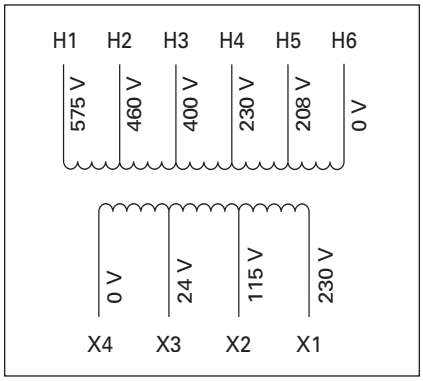


Figure 9-38. Diagram 15

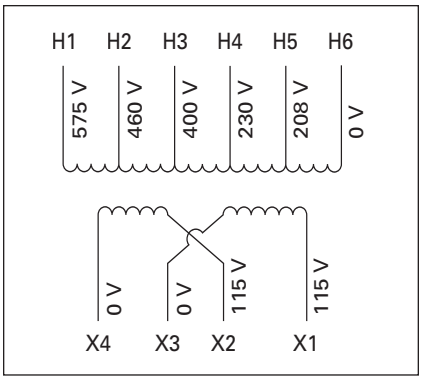


Figure 9-39. Diagram 16

9

Product Selection

Additional Product Selection information begins on **Page 9-136**.

Table 9-126. Type MTK — Product Selection

VA	Dimensions (Inches)			Weight Lbs.	Dimensions (mm)			Weight kg	Wiring Diagram ①	Style Number	Price U.S. $
	Height	Width	Depth		Height	Width	Depth				
Primary: 240 x 480, 230 x 460, 220 x 440 Secondary: 120/115/110											
500	3-13/16	4-1/2	6	13.0	97	114	152	5.9	1	**C0500K2A**	154.
750	4-7/16	5-1/2	6-1/2	19.5	113	133	165	8.9	1	**C0750K2A**	215.
1000	4-7/16	5-1/4	7-7/8	29.8	113	133	200	13.6	1	**C1000K2A**	298.
1500	5-11/16	6-3/4	6-3/4	30.0	144	171	171	13.6	1	**C1500K2A**	413.
2000	5-11/16	6-3/4	7	38.0	144	171	178	17.3	1	**C2000K2A**	452.
3000	7-9/16	9	7-1/2	53.0	192	229	191	24.1	1	**C3000K2A**	700.
5000	7-9/16	9	7-3/4	89.0	192	229	197	40.5	1	**C5000K2A**	1,160.
Primary: 208/277 Secondary: 120											
1000	5-3/8	6-3/8	7-1/8	29.0	137	162	181	13.1	4	**C1000K3A**	329.
1500	5-11/16	6-3/4	7-1/2	33.0	144	171	191	15.0	4	**C1500K3A**	452.
2000	5-11/16	6-3/4	8-1/4	43.0	144	171	210	19.5	4	**C2000K3A**	497.
3000	7-5/8	9	8-1/4	64.0	194	229	210	29.0	4	**C3000K3A**	770.
5000	10-3/16	9	10-1/2	102.0	259	229	267	46.3	4	**C5000K3A**	1,270.
Primary: 230/460/575 Secondary: 115/95											
1000	5-3/8	6-3/8	7-1/8	29.2	137	162	184	13.3	5	**C1000K3C**	339.
1500	5-11/16	6-3/4	8-1/4	33.5	144	171	210	15.2	5	**C1500K3C**	462.
2000	7-9/16	9	7-9/16	42.5	192	229	192	19.3	5	**C2000K3C**	511.
3000	7-9/16	9	8-5/8	63.7	192	229	219	29.0	5	**C3000K3C**	798.
5000	7-3/16	9	13-1/2	102.0	259	229	343	46.4	5	**C5000K3C**	1,310.
Primary: 208/380/416 Secondary: 115/95											
1000	5-3/8	6-3/8	7-1/8	29.0	137	162	181	13.1	9	**C1000K3D**	339.
1500	5-11/16	6-3/4	8-1/4	43.0	144	171	210	19.5	9	**C1500K3D**	462.
2000	5-11/16	6-3/4	9-1/4	55.0	144	171	235	25.0	9	**C2000K3D**	511.
3000	7-5/8	9	8-5/8	74.0	194	229	219	33.5	9	**C3000K3D**	798.
5000	10-3/16	9	11	108.0	259	229	279	49.0	9	**C5000K3D**	1,310.
Primary: 550/575/600 Secondary: 110/115/120											
1000	5-3/8	6-3/8	7-1/8	29.0	137	162	181	13.1	10	**C1000K4C**	339.
1500	5-11/16	6-3/4	7-1/2	33.0	144	171	191	15.0	10	**C1500K4C**	462.
2000	5-11/16	6-3/4	8-1/4	43.0	144	171	210	19.5	10	**C2000K4C**	511.
3000	7-5/8	9	8-1/4	64.0	194	229	210	29.0	10	**C3000K4C**	798.
5000	10-3/16	9	10-1/2	102.0	259	229	267	46.3	10	**C5000K4C**	1,310.
Primary: 380/400/415 Secondary: 110 x 220											
1000	5-11/16	6-3/4	6-1/2	28.0	144	171	165	12.7	6	**C1000K4D**	332.
1500	5-11/16	6-3/4	7-1/2	33.0	144	171	191	15.0	6	**C1500K4D**	455.
2000	5-11/16	6-3/4	8-1/4	43.0	144	171	210	19.5	6	**C2000K4D**	504.
3000	7-5/8	9	8-1/4	64.0	194	229	210	29.0	6	**C3000K4D**	784.
5000	10-3/16	9	10-1/2	102.0	259	229	267	46.3	6	**C5000K4D**	1,280.

① See **Page 9-106** and for Wiring Diagrams.

Note: For additional information refer to the Cutler-Hammer Industrial Control Transformer Binder B1228A.

For other ratings or styles not shown, refer to Eaton's Cutler-Hammer business.

Discount Symbol **DT-1**

Table 9-127. Type MTK — Product Selection

VA	Dimensions (Inches)			Weight Lbs.	Dimensions (mm)			Weight kg	Wiring Diagram ①	Style Number	Price U.S. $
	Height	Width	Depth		Height	Width	Depth				
Primary: 240 x 480 with Jumpers **Secondary: 120 x 240 with Jumpers, Secondary Fuse Clips Not Applicable**											
1000	4-7/16	5-1/4	7-7/8	26.4	113	133	200	12.0	11	**C1000K2CXX**	329.
1500	5-11/16	6-3/4	7-1/4	31.0	144	171	184	14.1	11	**C1500K2CXX**	462.
2000	5-3/4	6-3/4	8	40.0	146	171	203	18.2	11	**C2000K2CXX**	599.
3000	7-5/8	9	7-1/2	56.0	194	229	191	25.5	11	**C3000K2CXX**	770.
5000	7-5/8	9	9-1/4	85.5	194	229	235	28.9	11	**C5000K2CXX**	1,270.
Primary: 120 x 240 with Jumpers **Secondary: 24**											
750	4-1/2	5-1/4	6-3/4	19.0	114	133	171	8.6	3	**C0750K1B**	276.
1000	4-1/2	5-1/4	8-3/4	26.4	114	133	222	12.0	3	**C1000K1B**	413.
Primary: 240/416/480/600, 230/400/460/575, 220/380/440/550, 208/500 **Secondary: 99/120/130, 95/115/125, 91/110/120, 85/100/110**											
1000	5-3/4	6-3/4	6-1/2	26.5	146	171	165	12.0	8	**C1000K6U**	511.
1500	5-3/4	6-3/4	7-7/8	38.5	146	171	200	17.5	8	**C1500K6U**	746.
2000	5-3/4	6-3/4	9-3/16	52.0	146	171	233	23.6	8	**C2000K6U**	928.
3000	7-3/4	9	7-1/2	68.0	197	229	191	30.9	8	**C3000K6U**	1,305.
5000	9-7/8	9	10-1/2	105.0	248	229	267	47.7	8	**C5000K6U**	1,700.

① See **Page 9-106** for Wiring Diagrams.

Note: For additional information refer to the Cutler-Hammer Industrial Control Transformer Binder B1228A.

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For other ratings or styles not shown, refer to Eaton's Cutler-Hammer business.

Discount Symbol **DT-1**

CE Marked

Terminal Type A

Application Description

Transformers provide stepped down voltages to machine tool control devices enabling control circuits to be isolated from all power and lighting circuits. This allows the use of grounded or ungrounded circuits that are independent of the power or lighting grounds; greater safety is afforded the operator. The control transformer line is particularly adaptable on applications where compact construction is demanded.

Features, Benefits and Functions

Type MTE

- UL listed.
- CSA certified.
- Epoxy encapsulated coil design.
- Copper magnet wire for high quality, efficient operation.
- Laminations of high quality silicon steel to minimize core losses and optimize performance.
- Molded-in terminals.
- 50/60 Hz operation.
- 55°C rise, class 105 insulation.
- Performance meets/exceeds requirements of ANSI/NEMA ST-1.
- Regulation exceeds ANSI/NEMA requirements for all ratings.
- Non-short circuit proof transformer, isolation type.

Type MTK

- UL listed.
- CSA certified.
- Epoxy resin-impregnated coil design.
- Copper magnet wire for high quality, efficient operation.
- 50/60 Hz operation.
- 115°C rise, 180°C insulation system.
- Performance meets/exceeds requirements of ANSI/NEMA ST-1.
- Regulation exceeds ANSI/NEMA requirements for all ratings.
- 500 – 5000 VA ratings.

Standards and Certifications

Industry Standards

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

Options and Accessories

Protection Index IP00

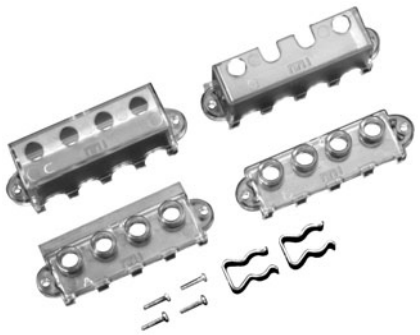
When terminal covers are installed on primary and secondary, and fuse block covers are used, the Protection Index is IP20.

Finger-Safe Terminal Covers (Optional)

- Fits CE marked designs 50 – 750 VA.
- Fits MTE designs 25 – 750 VA.

Table 9-128. Finger-Safe Terminal Covers

Description	Catalog Number	Price U.S. $
4 Terminal Transformers	**FSK4**	24.
6 Terminal Transformers	**FSK6**	25.



Finger-Safe Terminal Covers — FSK4

Finger-Safe Terminal Covers — FSK6

Finger-Safe Primary Fuse Block Covers

- Fits 2-pole primary fuse blocks on MTE designs.

Table 9-129. Finger-Safe Primary Fuse Block Covers

Description	Catalog Number	Price U.S. $
Primary Fuse Block Covers	**FSKFB**	38.

Finger-Safe Primary Fuse Block Covers

Discount Symbol **DT-1**

Product Specifications

Overload Capability

Short-term overload is designed into transformers as required by ANSI. Basically, 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:

Table 9-130. 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.

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 9-122**.

Wiring Diagrams

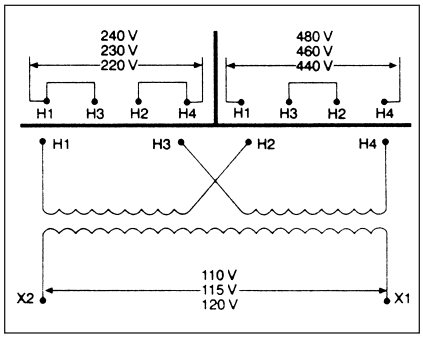


Figure 9-40. Diagram 1

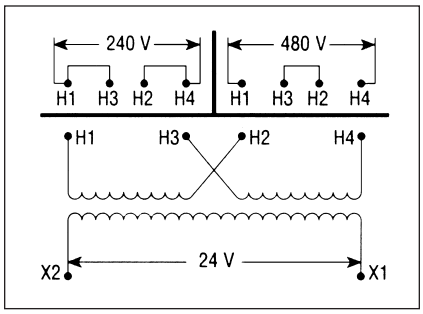


Figure 9-41. Diagram 2

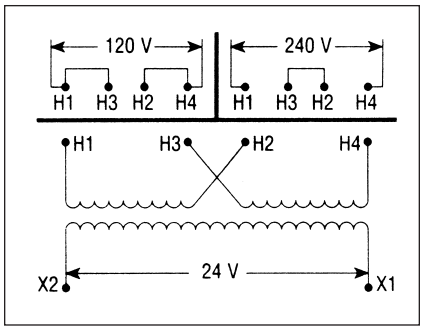


Figure 9-42. Diagram 3

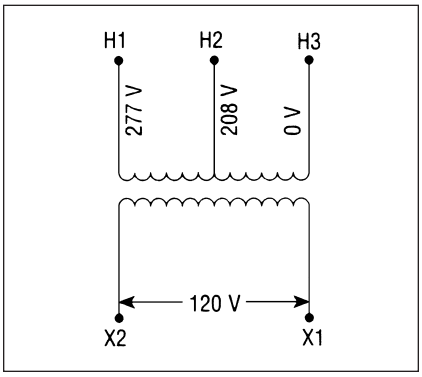


Figure 9-43. Diagram 4

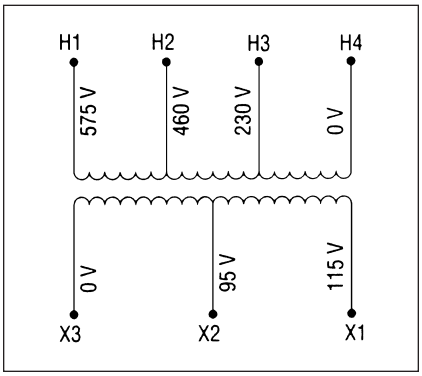


Figure 9-44. Diagram 5

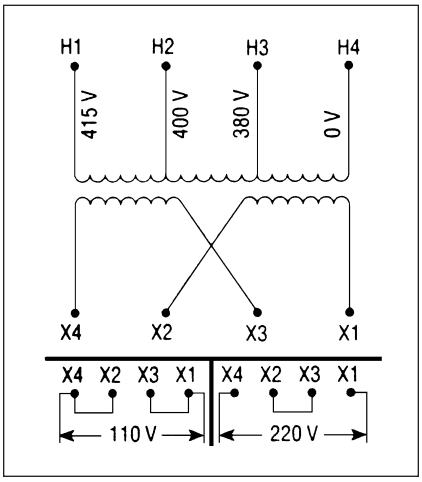


Figure 9-45. Diagram 6

Wiring Diagrams

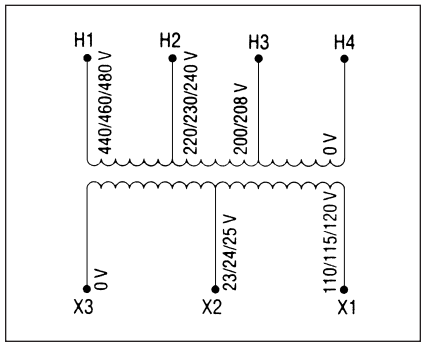


Figure 9-46. Diagram 7

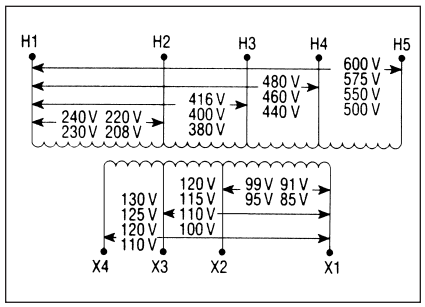


Figure 9-47. Diagram 8

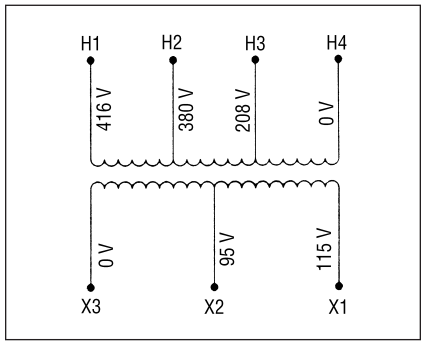


Figure 9-48. Diagram 9

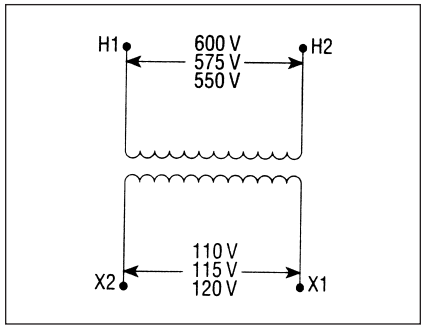


Figure 9-49. Diagram 10

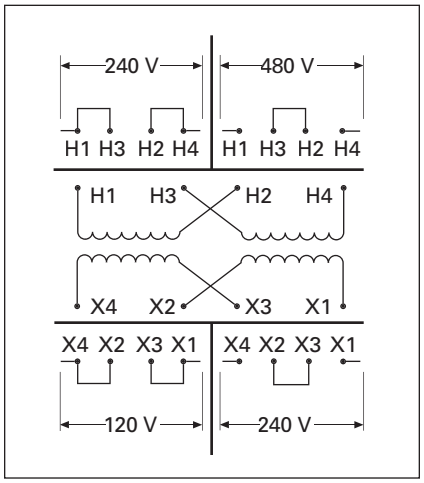


Figure 9-50. Diagram 11

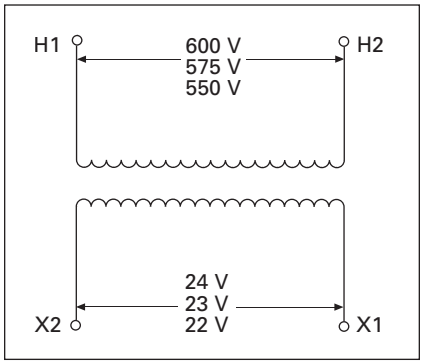


Figure 9-51. Diagram 12

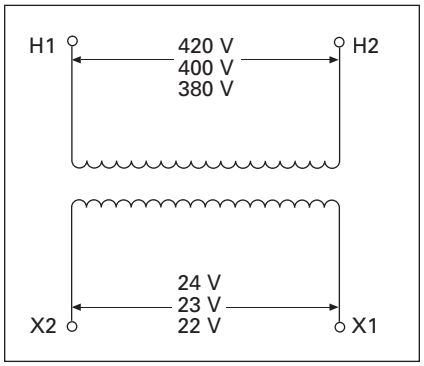


Figure 9-52. Diagram 13

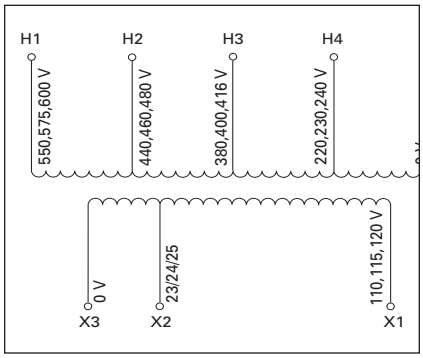


Figure 9-53. Diagram 14

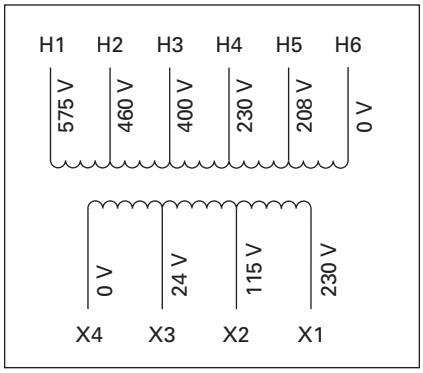


Figure 9-54. Diagram 15

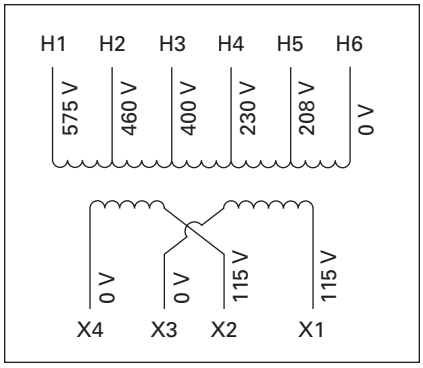


Figure 9-55. Diagram 16

Product Selection

Additional Product Selection information begins on **Page 9-136**.

Table 9-131. Type MTE CE Marked IP00

VA	Dimensions (Inches)			Weight Lbs.	Dimensions (mm)			Weight kg	Wiring Diagram ①	Style Number	Price U.S. $
	Height	Width	Depth		Height	Width	Depth				
Primary: 240 x 480, 230 x 460, 220 x 440 with Jumpers Secondary: 120/115/110											
50	2-9/16	3	3-3/8	3.5	65	76	86	1.6	1	**CE0050E2A**	98.
75	2-7/8	3-3/8	3-1/2	4.8	73	86	89	2.2	1	**CE0075E2A**	110.
100	3-3/16	3-3/4	3-5/8	5.9	81	95	92	2.7	1	**CE0100E2A**	122.
150	3-13/16	4-1/2	4	8.5	97	114	102	3.9	1	**CE0150E2A**	149.
200	3-13/16	4-1/2	4-1/2	10.6	97	114	114	4.8	1	**CE0200E2A**	159.
250	3-13/16	4-1/2	4-3/4	11.3	97	114	121	5.1	1	**CE0250E2A**	206.
300	3-13/16	4-1/2	5-1/4	13.2	97	114	133	6.0	1	**CE0300E2A**	217.
350	4-3/4	5-1/4	5	14.9	121	133	127	6.8	1	**CE0350E2A**	252.
500	4-3/4	5-1/4	6	21.0	121	133	152	9.5	1	**CE0500E2A**	274.
750	4-3/4	5-1/4	7-3/8	29.8	121	133	187	13.5	1	**CE0750E2A**	406.
Primary: 240 x 480 with Jumpers Secondary: 24											
50	2-9/16	3	3-1/4	3.4	65	76	83	1.5	2	**CE0050E2B**	109.
75	2-7/8	3-3/8	3-1/4	4.2	73	86	83	1.9	2	**CE0075E2B**	119.
100	3-3/16	3-3/4	3-5/8	5.9	81	95	92	2.7	2	**CE0100E2B**	135.
150	3-13/16	4-1/2	4	8.5	97	114	102	3.9	2	**CE0150E2B**	168.
200	3-13/16	4-1/2	4-1/4	10.6	97	114	108	4.5	2	**CE0200E2B**	179.
250	3-13/16	4-1/2	4-3/4	11.3	97	114	121	5.1	2	**CE0250E2B**	227.
300	3-13/16	4-1/2	5-1/4	13.2	97	114	133	6.0	2	**CE0300E2B**	246.
350	4-3/4	5-1/4	5	14.9	121	133	127	6.8	2	**CE0350E2B**	276.
500	4-3/4	5-1/4	5-1/2	19.2	121	133	140	8.7	2	**CE0500E2B**	301.
750	4-3/4	5-1/4	7	28.1	121	133	178	12.8	2	**CE0750E2B**	441.
Primary: 120 x 240 with Jumpers Secondary: 24											
50	2-9/16	3	3-1/4	3.4	65	76	83	1.5	3	**CE0050E1B**	109.
75	2-7/8	3-3/8	3-1/4	4.2	73	86	83	1.9	3	**CE0075E1B**	119.
100	3-3/16	3-3/4	3-5/8	5.9	81	95	92	2.7	3	**CE0100E1B**	135.
150	3-13/16	4-1/2	4	8.5	97	114	102	3.9	3	**CE0150E1B**	168.
200	3-13/16	4-1/2	4-1/4	10.6	97	114	108	4.5	3	**CE0200E1B**	179.
250	3-13/16	4-1/2	4-3/4	11.3	97	114	121	5.1	3	**CE0250E1B**	227.
300	3-13/16	4-1/2	5-1/4	13.2	97	114	133	6.0	3	**CE0300E1B**	246.
350	4-3/4	5-1/4	5	14.9	121	133	127	6.8	3	**CE0350E1B**	276.
500	4-3/4	5-1/4	5-1/2	19.2	121	133	140	8.7	3	**CE0500E1B**	301.
750	4-3/4	5-1/4	7-3/8	29.8	121	133	187	13.5	3	**CE0750E1B**	441.
Primary: 550/575/600 Secondary: 110/115/120											
50	2-9/16	3	3-3/8	3.5	65	76	86	1.6	10	**CE0050E4C**	107.
75	2-7/8	3-3/8	3-1/2	4.8	73	86	89	2.2	10	**CE0075E4C**	118.
100	3-3/16	3-3/4	3-5/8	5.9	81	95	92	2.7	10	**CE0100E4C**	133.
150	3-13/16	4-1/2	4	8.5	97	114	102	3.9	10	**CE0150E4C**	166.
200	3-13/16	4-1/2	4-1/2	10.6	97	114	114	4.8	10	**CE0200E4C**	177.
250	3-13/16	4-1/2	4-3/4	11.3	97	114	121	5.1	10	**CE0250E4C**	224.
300	3-13/16	4-1/2	5-1/4	13.2	97	114	133	6.0	10	**CE0300E4C**	243.
350	4-3/4	5-1/4	5	14.9	121	133	127	6.8	10	**CE0350E4C**	273.
500	4-3/4	5-1/4	6	21.0	121	133	152	9.5	10	**CE0500E4C**	298.
750	4-3/4	5-1/4	7-3/8	29.8	121	133	187	13.5	10	**CE0750E4C**	438.

① See **Pages 9-111** and **9-112** for Wiring Diagrams.

Note: Transformers are designed to operate in a maximum ambient of 40°C.
Contact your local Cutler-Hammer sales office for availability on additional CE Marked control transformers.

For other ratings or styles not shown, refer to Eaton's Cutler-Hammer business.

Discount Symbol **DT-1**

Table 9-132. Type MTE CE Marked IP00

VA	Dimensions (Inches)			Weight Lbs.	Dimensions (mm)			Weight kg	Wiring Diagram ①	Style Number	Price U.S. $
	Height	Width	Depth		Height	Width	Depth				
Primary: 380/400/415 Secondary: 110 x 220 with Jumpers											
50	2-9/16	3	3-1/2	3.5	65	76	89	1.6	6	**CE0050E4D**	143.
75	2-7/8	3-3/8	3-1/2	4.8	73	86	89	2.2	6	**CE0075E4D**	154.
100	3-3/16	3-3/4	3-5/8	5.9	81	95	92	2.7	6	**CE0100E4D**	166.
150	3-13/16	4-1/2	4	8.5	97	114	102	3.9	6	**CE0150E4D**	194.
200	3-13/16	4-1/2	4-1/2	10.6	97	114	114	4.8	6	**CE0200E4D**	206.
250	3-13/16	4-1/2	4-3/4	11.3	97	114	121	5.1	6	**CE0250E4D**	268.
300	3-13/16	4-1/2	5-1/4	13.2	97	114	133	6.0	6	**CE0300E4D**	281.
350	3-13/16	4-1/2	5-1/2	15.2	97	114	140	6.9	6	**CE0350E4D**	327.
500	4-3/4	5-1/4	6	21.0	121	133	152	9.5	6	**CE0500E4D**	357.
750	4-3/4	5-1/4	7-3/8	29.8	121	133	187	13.5	6	**CE0750E4D**	630.
Primary: 200/220/440, 208/230/460, 240/480 Secondary: 23/110, 24/115, 25/120											
50	2-7/8	3-3/8	3-1/4	4.2	65	86	83	1.9	7	**CE0050E5E**	133.
75	3-3/16	3-3/4	3-5/8	5.9	81	95	92	2.7	7	**CE0075E5E**	147.
100	3-3/16	3-3/4	4-3/8	7.9	81	95	111	3.6	7	**CE0100E5E**	165.
150	3-13/16	4-1/2	4-1/4	10.0	97	114	108	4.5	7	**CE0150E5E**	201.
200	3-13/16	4-1/2	5	12.8	97	114	127	5.8	7	**CE0200E5E**	214.
250	3-13/16	4-1/2	5-1/2	15.2	97	114	140	6.9	7	**CE0250E5E**	278.
300	4-3/4	5-1/4	5-3/8	16.8	121	133	137	7.6	7	**CE0300E5E**	300.
350	4-3/4	5-1/4	5-1/2	19.2	121	133	140	8.7	7	**CE0350E5E**	339.
500	4-3/4	5-1/4	7-1/4	27.0	121	133	184	12.3	7	**CE0500E5E**	375.

① See **Pages 9-111** and **9-112** for Wiring Diagrams.

Note: Transformers are designed to operate in a maximum ambient of 40°C.
Contact your local Cutler-Hammer sales office for availability on additional CE Marked control transformers.

For other ratings or styles not shown, refer to Eaton's Cutler-Hammer business.

Discount Symbol **DT-1**

Factory Mounted Finger-Safe Terminal Covers

Terminal Type A

Terminal Type B

Terminal Type C

Table 9-133. Type MTK CE Marked with Factory Mounted Finger-Safe Terminal Covers IP20

VA	Dimensions (Inches)			Weight Lbs.	Dimensions (mm)			Weight kg	Terminal Type	Wiring Diagram ①	Style Number	Price U.S. $
	Height	Width	Depth		Height	Width	Depth					
Primary: 240 x 480, 230 x 460, 220 x 440 with Jumpers **Secondary: 120/115/110**												
250	4	4-1/2	4-5/16	8.8	102	114	110	4.0	A	1	**CE0250K2AFS**	206.
300	4	4-1/2	4-7/8	11.0	102	114	124	5.0	A	1	**CE0300K2AFS**	218.
350	4	4-1/2	5-3/16	11.2	102	114	132	5.1	A	1	**CE0350K2AFS**	227.
500	4	4-1/2	5-5/8	14.8	102	114	143	6.7	A	1	**CE0500K2AFS**	234.
750	4-1/2	5-1/4	5-15/16	18.0	114	133	151	8.2	A	1	**CE0750K2AFS**	320.
1000	5-5/16	6-3/8	5-5/16	26.3	135	162	135	11.9	A	1	**CE1000K2AFS**	497.
1500	7-1/2	6-3/4	6-1/8	40.0	191	172	156	18.1	C	1	**CE1500K2AFS**	686.
2000	7-1/2	6-3/4	6-7/16	45.1	191	172	164	20.5	C	1	**CE2000K2AFS**	753.
3000	9-3/8	9	6-1/4	65.2	238	229	159	29.6	C	1	**CE3000K2AFS**	1,115.
5000	9-3/8	9	8-3/4	104.8	238	229	222	47.5	C	1	**CE5000K2AFS**	1,595.
Primary: 240 x 480 with Jumpers **Secondary: 24**												
250	5-5/8	4-1/2	3-1/4	8.2	143	114	83	3.7	C	2	**CE0250K2BFS**	260.
300	5-5/8	4-1/2	3-5/8	9.5	143	114	92	4.3	C	2	**CE0300K2BFS**	276.
350	5-5/8	4-1/2	4-3/16	12.2	143	114	106	5.5	C	2	**CE0350K2BFS**	293.
500	5-5/8	4-1/2	4-11/16	14.4	143	114	119	6.5	C	2	**CE0500K2BFS**	313.
750	6-1/2	5-1/4	5-15/16	19.5	165	133	151	8.9	C	2	**CE0750K2BFS**	368.
1000	7-3/16	6-3/8	5-9/16	26.2	183	162	141	11.9	C	2	**CE1000K2BFS**	543.
Primary: 120 x 240 with Jumpers **Secondary: 24**												
250	5-5/8	4-1/2	3-1/4	8.3	143	114	83	3.8	C	3	**CE0250K1BFS**	260.
300	5-5/8	4-1/2	3-5/8	9.3	143	114	92	4.2	C	3	**CE0300K1BFS**	276.
350	5-5/8	4-1/2	4-3/16	12.0	143	114	106	5.4	C	3	**CE0350K1BFS**	293.
500	5-5/8	4-1/2	4-13/16	14.4	143	114	122	6.5	C	3	**CE0500K1BFS**	313.
750	6-1/2	5-1/4	5-15/16	19.5	165	133	151	8.9	C	3	**CE0750K1BFS**	368.
1000	7-3/16	6-3/8	5-9/16	25.2	183	162	141	11.4	C	3	**CE1000K1BFS**	543.
Primary: 200/220/440, 208/230/460, 240/480 **Secondary: 23/110, 24/115, 25/120**												
250	3-7/8	4-1/2	4-7/16	12.5	98	114	113	5.7	B	7	**CE0250K5EFS**	267.
300	3-7/8	4-1/2	4-3/4	14.0	98	114	121	6.3	B	7	**CE0300K5EFS**	287.
350	3-7/8	4-1/2	5-3/16	15.3	98	114	140	6.9	B	7	**CE0350K5EFS**	328.
500	5-1/16	5-1/4	6-1/4	20.8	129	133	159	9.4	B	7	**CE0500K5EFS**	345.
750	7-3/16	6-3/8	5-13/16	29.8	183	162	148	13.5	C	7	**CE0750K5EFS**	595.
1000	7-3/16	6-3/8	6-3/16	30.2	183	162	157	13.7	C	7	**CE1000K5EFS**	665.
Primary: 220/380/440/550, 230/400/460/575, 240/416/480/600 **Secondary: 23/110, 24/115, 25/120**												
250	3 7/8	4 1/2	5 3/8	14.3	98	114	137	6.5	B	14	**CE0250K2UFS**	400.
300	3-7/8	4-1/2	5-11/16	15.8	98	114	144	7.2	B	14	**CE0300K2UFS**	413.
350	4-7/16	5-1/4	5-1/2	16.5	113	133	140	7.5	B	14	**CE0350K2UFS**	452.
500	5-1/16	5-1/4	6-3/16	20.5	129	133	157	9.3	B	14	**CE0500K2UFS**	539.
750	7-3/16	6-3/8	5-11/16	28.8	183	162	144	13.1	C	14	**CE0750K2UFS**	606.
1000	7-3/16	6-3/8	6-7/8	39.4	183	162	175	17.9	C	14	**CE1000K2UFS**	693.

① See **Pages 9-111** and **9-112** for Wiring Diagrams.

Note: For additional information refer to the Cutler-Hammer Industrial Control Transformer Binder B1228A.
Contact your local Cutler-Hammer sales office for availability on additional CE Marked control transformers.

Discount Symbol **DT-1**

Table 9-134. Type MTK CE Marked with Factory Mounted Finger-Safe Terminal Covers IP20

VA	Dimensions (Inches)			Weight Lbs.	Dimensions (mm)			Weight kg	Terminal Type	Wiring Diagram ①	Style Number	Pricing U.S. $
	Height	Width	Depth		Height	Width	Depth					
Primary: 208/230/400/460/575 Secondary: 24 ②/115/230												
250	3-7/8	4-1/2	5-1/2	14.9	98	114	140	6.8	B	15	**CE0250K2VFS**	424.
300	3-7/8	4-1/2	6-1/16	17.4	98	114	154	7.9	B	15	**CE0300K2VFS**	452.
350	4-7/16	5-1/4	5-3/4	17.8	113	133	146	8.1	B	15	**CE0350K2VFS**	487.
500	4-7/16	5-1/4	7-5/16	26.6	113	133	186	12.1	B	15	**CE0500K2VFS**	546.
750	5-15/16	6-3/8	6-3/16	32.5	151	162	157	14.7	B	15	**CE0750K2VFS**	753.
1000	7-1/2	6-3/4	6-7/8	44.0	191	172	175	20.0	C	15	**CE1000K2VFS**	840.
1500	7-1/2	6-3/4	6-3/4	45.4	191	172	172	20.6	C	16	**CE1500K2WFS**	865.
2000	9-3/8	9	6-1/4	58.6	238	229	159	26.6	C	16	**CE2000K2WFS**	1,020.
3000	9-3/8	9	8-1/8	92.9	238	229	206	42.1	C	16	**CE3000K2WFS**	1,295.
5000	9-3/8	9	9-15/16	127.4	238	229	252	57.8	C	16	**CE5000K2WFS**	1,585.
Primary: 240/416/480/600, 230/400/460/575, 220/380/440/550, 208/500 Secondary: 99/120/130, 95/115/125, 91/110/120, 85/100/110												
250	4	4-1/2	5-1/16	11.4	102	114	135	5.2	A	8	**CE0250K6UFS**	410.
300	4	4-1/2	5-1/2	13.6	102	114	140	6.2	A	8	**CE0300K6UFS**	424.
350	4	4-1/2	5-1/2	14.2	102	114	140	6.4	A	8	**CE0350K6UFS**	455.
500	4-1/2	5-1/4	5-5/8	17.4	114	133	143	7.9	A	8	**CE0500K6UFS**	539.
750	4-1/2	5-1/4	5-5/8	27.5	114	133	187	12.5	A	8	**CE0750K6UFS**	634.
1000	5-1/4	6-3/8	6-1/16	27.9	133	162	154	12.6	A	8	**CE1000K6UFS**	711.
1500	5-13/16	6-3/4	6-5/16	43.1	148	172	160	19.5	A	8	**CE1500K6UFS**	847.
2000	7-5/8	9	5-3/4	56.0	194	229	146	25.4	B	8	**CE2000K6UFS**	991.
3000	8-1/4	9	6-9/16	76.2	210	229	167	34.6	B	8	**CE3000K6UFS**	1,265.

① See **Pages 9-111** and **9-112** for Wiring Diagrams.
② 24 volt secondary only available through 1000 VA.

Note: For additional information refer to the Cutler-Hammer Industrial Control Transformer Binder B1228A.
Contact your local Cutler-Hammer sales office for availability on additional CE Marked control transformers.

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Discount Symbol **DT-1**

Table 9-135. Acceptable Rating of Primary Overcurrent Protection for CE Marked Control Transformers

Fuses 10 x 38 mm (13/32" x 1-1/2") Time-lag (IEC 269)										
Sec. Voltage	**50**	**75**	**100**	**150**	**200**	**250**	**300**	**350**	**500**	**750**
115	2.0	2.0	4.0	4.0	6.0	6.0	8.0	10.0	12.0	20.0
120	2.0	2.0	4.0	4.0	6.0	6.0	8.0	10.0	12.0	20.0
200	1.0	2.0	2.0	4.0	4.0	4.0	4.0	6.0	8.0	12.0
208	1.0	2.0	2.0	4.0	4.0	4.0	4.0	6.0	8.0	12.0
220	1.0	1.0	2.0	4.0	4.0	4.0	4.0	6.0	6.0	10.0
230	1.0	1.0	2.0	4.0	4.0	4.0	4.0	6.0	6.0	10.0
240	1.0	1.0	2.0	4.0	4.0	4.0	4.0	4.0	6.0	10.0
277	.5	1.0	1.0	2.0	4.0	4.0	4.0	4.0	6.0	8.0
380	.5	1.0	1.0	2.0	2.0	4.0	4.0	4.0	6.0	6.0
400	.5	.5	1.0	2.0	2.0	4.0	4.0	4.0	4.0	6.0
415	.5	.5	1.0	1.0	2.0	4.0	4.0	4.0	4.0	6.0
440	.5	.5	1.0	1.0	2.0	2.0	4.0	4.0	4.0	6.0
460	.5	.5	1.0	1.0	2.0	2.0	4.0	4.0	4.0	6.0
480	.5	.5	.5	1.0	2.0	2.0	4.0	4.0	4.0	6.0
550	.5	.5	.5	1.0	1.0	2.0	2.0	4.0	4.0	4.0
575	.5	.5	.5	1.0	1.0	2.0	2.0	4.0	4.0	4.0
600	.5	.5	.5	1.0	2.0	2.0	2.0	4.0	4.0	4.0

Table 9-136. Acceptable Maximum Rating of Secondary Overcurrent Protection

Miniature Fuses 5 x 20 mm Time-lag (IEC 127-2/III)										
Sec. Voltage	**50**	**75**	**100**	**150**	**200**	**250**	**300**	**350**	**500**	**750**
23	2.50	4.00	5.00	8.00	10.0	12.00	16.00	16.00	25.00	—
24	2.50	4.00	5.00	8.00	10.0	12.00	16.00	16.00	25.00	32.00
25	2.50	4.00	5.00	8.00	10.0	12.00	16.00	16.00	25.00	32.00
90	.63	1.00	1.25	2.00	2.50	3.15	4.00	4.00	6.30	10.00
95	.63	.80	1.25	1.60	2.50	3.15	4.00	4.00	6.30	8.00
100	.50	.80	1.00	1.60	2.00	2.50	3.15	4.00	5.00	8.00
110	.50	.80	1.00	1.60	2.00	2.50	3.15	4.00	5.00	8.00
115	.50	.80	1.00	1.60	2.00	2.50	3.15	3.15	5.00	8.00
120	.50	.63	1.00	1.25	2.00	2.50	2.50	3.15	5.00	6.30
220	.25	.40	.50	.80	1.00	1.25	1.60	1.60	2.50	4.00
230	.25	.40	.50	.80	1.00	1.25	1.60	1.60	2.50	4.00
240	.25	.315	.50	.63	1.00	1.25	1.25	1.60	2.50	3.15

Note: For values over 6.3A use 10 x 38 mm time-lag (IEC - 269-3-1). T_a = 40°C Control Type

Type AP

Type AP Transformer

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Product Description

- Sand and resin encapsulated designs.

Application Description

Transformers provide stepped down voltages to machine tool control devices enabling control circuits to be isolated from all power and lighting circuits. This allows the use of grounded or ungrounded circuits that are independent of the power or lighting grounds; greater safety is afforded the operator. The control transformer line is particularly adaptable on applications where compact construction is demanded.

Features, Benefits and Functions

- UL recognized.
- Resin encapsulated.
- 60 Hz operation.
- 115°C winding rise.
- Convenient screw-type terminal board.
- Bottom or side/wall mounting designs.
- Performance meets/exceeds requirements of ANSI/NEMA ST-1.
- Regulation exceeds ANSI/NEMA requirements for all ratings.

Standards and Certifications

Industry Standards

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

Product Specifications

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:

Table 9-137. 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.

Sound Levels

All Cutler-Hammer 600 volt class general purpose dry-type distribution transformers are designed to meet NEMA ST-20 levels.

Winding Terminations

Cutler-Hammer business recommends external cables be rated 90°C (sized at 75°C ampacity) for encapsulated 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 9-122**.

Product Selection

Additional Product Selection information begins on **Page 9-136**.

Table 9-138. Type AP

kVA	Mounting	Dimensions (Inches)			Weight Lbs.	Dimensions (mm)			Weight kg	Frame	Wiring Diagram ①	Style Number	Price U.S. $
		Height	Width	Depth		Height	Width	Depth					
240/480 Volts to 120/240 Volts, 60 Hz													
3	Bottom	8-5/16	9-9/16	8-13/16	65	227	243	224	29.5	FR133	5	**C0003P7GB**	1,375.
5	Bottom	10-3/4	10-3/4	8 -11/16	104	273	273	221	47.2	FR99	5	**C0005P7GB**	1,710.
7.5	Bottom	10-3/4	10-3/4	10-3/16	129	273	273	259	58.6	FR100	5	**C0007P7GB**	2,350.
10	Bottom	10-3/4	10-3/4	11-3/8	148	273	273	289	67.2	FR101	5	**C0010P7GB**	2,930.
15	Bottom	12	13-3/16	10-7/16	197	305	335	265	89.4	FR134	5	**C0015P7GB**	3,970.
3	Side/Wall	9-3/4	8-13/16	9-9/16	65	248	224	243	29.5	FR292	5	**C0003P7GS**	1,375.
5	Side/Wall	11-5/8	8-11/16	10-3/4	104	295	221	273	47.2	FR256	5	**C0005P7GS**	1,710.
7.5	Side/Wall	11-5/8	10-13/16	10-3/4	129	295	275	273	58.6	FR257	5	**C0007P7GS**	2,350.
10	Side/Wall	11-5/8	11-3/8	10-3/4	148	295	289	273	67.2	FR258	5	**C0010P7GS**	2,930.
15	Side/Wall	12-7/8	10-7/16	13-3/16	197	327	265	335	89.4	FR259	5	**C0015P7GS**	3,970.

① See **Page 9-91** for Wiring Diagrams.

Note: For additional information refer to the Cutler-Hammer Industrial Control Transformer Binder B1228A.

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

Discount Symbol **DT-1**

Options and Accessories

(Order Separately)

Weathershield Kit

Note: For 316 grade stainless steel add the suffix 'S' to the catalog number.

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.

Table 9-139. Weathershield Kit

Fits Frame ① Size(s)	Catalog ② Number	Price U.S. $
809, 810, 811, 816, 817, 818	**WS11**	350.
814	**WS13**	800.
819, 820	**WS16**	800.
808, 909, 910, 911, 912, 910A, 911A, 912A	**WS31**	350.
812, 813, 913A, 913B, 914A, 915A, 916, 914B, 915B	**WS33**	350.
916A	**WS19**	350.
917, 918, 918A	**WS34**	800.
919, 920	**WS35**	1,360.
922	**WS36**	1,360.
815	**WS15**	350.00

① Effective June 1, 2001 frame numbers will have a prefix of FR, i.e., **FR819**. Dimensions, accessories, etc. are still applicable as if the FR did not exist.

② For stainless steel weathershields, add the suffix "S" to a catalog number, i.e., **WS31S**.

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's Cutler-Hammer business recommends a minimum of 6-inch clearance from the wall to maintain proper ventilation.

Table 9-140. Terminal Extension Kit

Fits Frame ③ Size(s)	Bus Material	Catalog Number	Price U.S. $
919	Aluminum	**EXT55AL**	500.
919	Copper	**EXT55CU**	750.
920	Aluminum	**EXT77AL**	500.
920	Copper	**EXT77CU**	750.

③ Effective June 1, 2001 frame numbers will have a prefix of FR, i.e., **FR819**. Dimensions, accessories, etc. are still applicable as if the FR did not exist.

Wall Mounting Bracket

Wall Mounting Bracket

Wall mounting brackets are used to wall mount most 15 through 75 kVA and some 100 and 112.5 kVA Type DS-3 and DT-3 transformers. See availability guide. This bracket allows for 6-inch clearance from the wall as recommended by the Cutler-Hammer business.

Wall mounting brackets fit the following frames.

Table 9-141. Availability Guide — Wall Mounting Bracket WMB01

Frame ④ Sizes	Catalog Number	Price U.S. $
Type DS-3 (Single-Phase Compatible)		
809, 810, 811, 812, 813, 815, 816, 817, 818, 819, 820, 835, 836, 837, 814A	**WMB01**	275.
Type DT-3, K-Factor, Drive Isolation (Three-Phase Compatible)		
909, 910, 911, 912, 910A, 911A, 912A, 913A, 913B, 914A, 914B, 915A, 915B	**WMB01**	275.

④ Effective June 1, 2001 frame numbers will have a prefix of FR, i.e., **FR819**. Dimensions, accessories, etc. are still applicable as if the FR did not exist.

Discount Symbol **DT-1**

Table 9-142. Terminal Lug Kits for Type DT-3 Transformers

Typical Sizing	Terminal Lugs		Hardware		Catalog Number	Price U.S. $
	Cable Range	Quantity	Bolt Size	Quantity		
15 – 37.5 kVA Single-Phase 15 – 45 kVA Three-Phase	#14 – #2 #6 – 250 kcmil	8 4	1/4-20 x 3/4	8	**LKS1**	95.
50 – 75 kVA Single-Phase 75 – 112.5 kVA Three-Phase	#6 – 250 kcmil	12	1/4-20 x 3/4 1/4-20 x 1-3/4	8 8	**LKS2**	190.
100 – 167 kVA Single-Phase 150 – 300 kVA Three-Phase	#6 – 250 kcmil #2 – 600 kcmil	3 22	1/4-20 x 3/4 3/8-16 x 2	3 16	**LKS3**	740.
500 kVA Three-Phase	#2 – 600 kcmil	29	3/8-16 x 2	18	**LKS4**	900.

Table 9-143. Rodent Screens

Description	Frame Size(s) ①	Catalog Number	Price U.S. $
Rodent screens are used to discourage entry by birds or rodents	909 910A, 911, 912 913B, 914B, 915B	**RS01** **RS02** **RS03**	350. 350. 350.
	916 917, 918, 918A 919, 920 916A 922	**RS04** **RS05** **RS06** **RS07** **RS08**	800. 800. 1,360. 800. 1,360.

① Effective June 1, 2001 frame numbers will have a prefix of FR, i.e. **FR819**. Dimensions, accessories, etc. are still applicable as if the FR did not exist.

Table 9-144. Replacement Parts for Mini-Power Centers

Frame	Deadfront Cover (Breaker Cover)	Front Cover
283 284 285 286 287	47-37503 47-37503-2 47-37503-3 47-37503-4 47-37503-5	7074C98H04 7074C98H01 7074C98H02 7074C98H02 7074C98H03
289 290 291	47-37459 47-37459-2 47-37459-3	7074C44H01 7074C44H02 7074C44H03
289A 290A 291A	47-42072-1 47-42072-2 47-42072-3	7074C44H01 7074C44H02 7074C44H03

Table 9-145. Case Parts for Ventilated Units

Frame(s) ②	Panels			Top Cover
	Front or Back	Side (2 required per transformer)	Bottom	
	Part Number			Part Number
Three-Phase, 600 Volt Class				
909 910, 911, 912 913A, 914A, 915A 916 917, 918	7073C37P01 1714C46P01 1714C47P03 1714C60P01 1714C65P01	1714C44P03 1714C44P01 1714C44P07 1714C56P01 1714C64P01	7073C20P05 7073C20P01 7073C20P02 7073C20P03 7073C20P04	1714C45P01 1714C45P01 1714C45P02 1714C58P01 1714C67P01
919, 920	2D46331P03 (Upper Panel) 2D46331P04 (Lower Panel)	2D46332P01 2D46331P01 (Cutout Cover Plate)	— —	2D46331P02
922	2D46391H03 (Back Upper Panel) 2D46391H06 (Front Upper Panel) 2D46391H08 (Lower Panel)	2D46392H01	— — —	2D46391H02
918A	47-41801	47-41800	47-41799	47-41802
910A, 911A, 912A 913B, 914B, 915B 916A	47-40592 47-40580 47-41790	47-40591 47-40578 47-41789	47-40589 47-41792 47-41788	1714C45P01 1714C45P02 47-41791
Single-Phase, 600 Volt Class				
809 810, 811, 835 812, 813, 836, 837, 838 814	7073C16P03 7073C16P01 7073C16P02 7073C54P01	7073C18P04 7073C18P01 7073C18P02 7073C18P05	7073C14P03 7073C14P01 7073C14P02 7073C14P04	7073C17P01 7073C17P01 7073C17P02 7073C17P03
815 816 817, 818 819, 820	47-39433 47-40452 47-40457 47-40574	47-39430 47-40451 47-40456 47-40573	47-39429 47-40449 47-40454 47-40459	47-39431 47-40453 47-40458 47-40575

② Effective June 1, 2001 frame numbers will have a prefix of FR, i.e., **FR819**. Dimensions, accessories, etc. are still applicable as if the FR did not exist.

Note: Parts listed are for standard catalog listed transformers. Units with modifications may require different parts. (Frame No. from transformer nameplate required).

Note: Transformer nameplate and UL label are not field replaceable.

Discount Symbol **DT-1**

Technical Data and Specifications

General Purpose — EP Sand and Resin Encapsulated

EP Sand and Resin Encapsulated

Cutler-Hammer EP general purpose transformers by Eaton Corporation 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 4160 volts 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 weather-shields). 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 4160 volts 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 4160 volts. 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.

Shielded Isolation

Shielded Isolation Transformer

"Sensitive" loads such as input circuits of computers, hospital operating rooms, microprocessors, require additional protection from electrical disturbances. The Cutler-Hammer Shielded Isolation transformer by Eaton Corporation uses an electrostatic shield grounded to the transformer case to attenuate electrical disturbances on the line from being transmitted to the load. Shielded Isolation units are similar in design and ratings to the EP, EPT, DS-3, and DT-3.

ac Adjustable Frequency Drive and dc Motor Drive Isolation

Drive Isolation Transformer

Drive Isolation transformers are designed especially for 3-phase SCR controlled, variable speed motor drives. Sized by hp and common motor voltages, the Drive Isolation transformer is braced to withstand the mechanical stresses associated with a motor drive. Drive Isolation units are available in ventilated designs (150°C rise) 5 – 800+ hp (through 1500 kVA). Epoxy encapsulated designs (115°C rise) are available in 5 – 20 hp designs by custom order.

Mini-Power Center

Mini-Power Center

The Mini-Power Center replaces 3 individual components — a main breaker, transformer, and panelboard — by combining all 3 into one unit. All interconnecting wiring is performed at the factory. Eaton's Cutler-Hammer Mini-Power Centers are available with primary main breakers rated up to 600 volts, 100 amperes; encapsulated EP or EPT transformers through 30 kVA; and secondary panelboards with main breakers and provisions for up to 24 one-pole feeder breakers. NEMA 3R enclosure is standard.

Buck-Boost Transformer

Buck-Boost Transformer

Buck-Boost transformers have 120 x 240 or 240 x 480 volt primaries with 12/24, 16/32, or 24/48 volt secondaries. Their primary use is as auto-transformers for slight upward ("boost") or downward ("buck") adjustments in voltages. Eaton's Cutler-Hammer Buck-Boost transformers are encapsulated designs with totally-enclosed non-ventilated enclosures. Units are 1-phase, but can be installed as a 3-phase bank.

Customer-Furnished Connecting Cables

Eaton's Cutler-Hammer recommends 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's Cutler-Hammer 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 2 similar coils in each winding which 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), or 240 (series), or 240 with a 120 midpoint.

Enclosures

Eaton's Cutler-Hammer ventilated transformers, Types DS-3, DT-3, MD, and KT, utilize a NEMA 2 rated (drip-proof) enclosure as standard, and are rated NEMA 3R with the addition of weathershields. Cutler-Hammer encapsulated (Types EP, EPT, EPZ, and EPTZ) and totally enclosed, non-ventilated (Types DS-3E and DT-3E) transformers utilize 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 together. 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.

Non-Linear 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 specified temperature rise.

Table 9-146. Non-Linear 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	.7%	3.0%
13th	.5%	1.0%
15th	.3%	.7%
17th	.3%	.6%

Sound Levels

All Cutler-Hammer 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.

Table 9-147. Average Sound Levels

NEMA ST-20 Average Sound Level (dB)		
kVA	Ventilated	Encapsulated
0 – 9	40	45
10 – 50	45	50
51 – 150	50	55
151 – 300	55	57
301 – 500	60	59
501 – 700	62	61
701 – 1000	64	63
1001 – 1500	65	64

All Cutler-Hammer 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 wall or ceilings. For installation which 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 (Cutler-Hammer encapsulated EP/EPT designs utilize 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.

Table 9-148. Rated Line Amperes for kVA and Voltages of Single-Phase Transformers

Amperes for kVA	Voltage								
	120	208	220	240	277	480	600	2400	4160
.25	2.0	1.2	1.1	1.0	.9	.5	.4	.10	.06
.50	4.2	2.4	2.3	2.1	1.8	1.0	.8	.21	.12
.75	6.3	3.6	3.4	3.1	2.7	1.6	1.3	.31	.18
1	8.3	4.8	4.5	4.2	3.6	2.1	1.7	.42	.24
1.5	12.5	7.2	6.8	6.2	5.4	3.1	2.5	.63	.36
2	16.7	9.6	9.1	8.3	7.2	4.2	3.3	.83	.48
3	25	14.4	13.6	12.5	10.8	6.2	5.0	1.2	.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

Note: Line Current = (kVA x 1000)/Line Voltage

Table 9-149. Rated Line Amperes for kVA and Voltages of Three-Phase Transformers

Amperes for kVA	Voltage						
	208	240	380	480	600	2400	4160
3	8.3	7.2	4.6	3.6	2.9	.72	.42
6	16.6	14.4	9.1	7.2	5.8	1.4	.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

Note: Three-Phase Line Current = (kVA x 1000)/(Line Voltage x 1.732)

Typical Dimensions and Technical Data

Table 9-150. Typical Data for 600-Volt Class General Purpose dry-type Transformers ①

Type	kVA	Dimensions (Inches)			Weight Lbs.		Losses in Watts		Efficiency				% Regulation			Sound Level dB
		Height	Width	Depth ②	Al	Cu	N.L.	Total	1/4 Load	1/2 Load	3/4 Load	Full Load	100% P.F.	80% P.F.	% Imp. ③	
EP 115°C Rise	.05 .075 .10 .15	6-1/2 6-1/2 6-1/2 6-1/2	3-7/8 3-7/8 3-7/8 3-7/8	3-1/2 3-1/2 3-1/2 3-1/2	— — — —	7 7 7 8	6 7 5 7	9 14 15 20	65.3 66.0 82.4 83.4	79.6 79.0 86.9 88.2	84.3 82.5 87.7 88.9	85.6 82.8 86.5 87.8	5.9 9.4 10.3 9.0	6.4 9.2 10.6 9.6	6.5 9.8 11.0 9.8	45 45 45 45
	.25 .5 .75 1	6-1/2 6-1/2 8-3/8 8-3/8	4-7/8 4-7/8 6 6	3-7/8 4-5/8 5-1/2 5-1/2	— — — —	12 13 20 30	14 20 29 24	29 47 57 60	79.0 85.1 86.0 90.8	87.2 90.3 91.3 93.9	89.5 91.4 92.7 94.5	89.6 91.4 92.9 94.4	5.9 5.5 3.9 3.8	7.5 7.0 5.0 4.9	7.5 6.9 5.0 4.9	45 45 45 45
	1.5 2 3 5	10-1/2 10-1/2 14-1/4 16	6-3/8 6-3/8 71-1/16 10-3/8	6-1/8 6-1/8 8 9-7/8	65 113 — —	40 40 69 120	30 30 61 104	90 100 135 215	92.5 94.2 92.0 91.8	94.7 95.7 95.0 95.0	95.0 95.8 95.7 95.8	94.6 95.4 95.7 95.9	4.1 3.6 2.5 2.3	5.2 4.7 3.5 3.3	5.2 4.7 3.5 3.4	45 45 45 45
	7.5 10 15 25	16 19 19 22-5/16	10-3/8 13-3/8 13-3/8 16-3/8	9-7/8 10-1/2 10-1/2 14-1/8	123 193 216 385	133 208 235 414	129 153 209 191	250 295 435 440	93.2 93.9 94.4 96.8	96.0 96.3 96.6 98.0	96.7 97.0 97.1 98.3	95.9 97.2 97.2 98.4	1.5 1.5 1.6 1.1	2.4 2.5 2.8 2.5	2.5 2.8 3.0 3.1	45 50 50 50
EPT ④ 115°C Rise	3 6 9 15	13-3/8 15-7/8 15-7/8 17-3/8	15-15/16 16-1/2 16-1/2 19-11/16	8-5/16 9-7/8 9-7/8 10-7/16	116 143 166 275	123 153 178 300	110 145 195 265	165 275 375 545	87.3 90.9 91.6 93.0	92.6 94.5 95.0 95.7	94.3 95.5 95.9 96.5	94.9 95.7 96.1 96.6	2.1 2.2 2.0 1.9	6.1 3.1 2.8 3.1	7.9 3.7 3.0 3.3	45 45 45 50
	30 45 75	26-5/8 26-1/2 30-3/4	25-1/8 28-1/2 30-1/8	12-3/4 14-5/8 15-5/8	422 660 1275	504 745 1450	250 300 400	665 740 945	96.5 97.2 97.7	97.7 98.2 98.6	98.0 98.4 98.8	97.9 98.5 98.8	1.5 1.0 .8	2.5 2.1 1.6	2.7 2.4 1.9	50 50 55
DS-3 150°C Rise	15 25 37.5 50	30-1/4 31-1/4 37-5/8 37-5/8	16-7/8 22-5/8 22-5/8 22-5/8	15-7/8 17-1/2 19-1/2 19-1/2	147 212 306 340	165 237 343 381	200 200 250 250	465 790 1160 1595	94.7 97.1 97.4 97.3	96.6 97.7 97.8 97.7	97.1 97.5 97.5 97.4	97.1 97.2 97.2 96.9	1.9 2.5 2.6 2.9	3.4 4.2 4.3 5.7	3.7 4.5 4.6 6.5	45 45 45 45
	75 100 167	42-1/8 42-1/8 62-7/8	24 24 30	23-3/8 23-3/8 34	510 560 1200	570 620 1350	350 400 650	2175 2825 3270	97.4 97.8 98.0	97.8 98.0 98.4	97.6 97.7 98.3	97.2 97.3 98.3	2.6 2.7 1.8	5.5 6.0 5.2	6.4 7.3 6.8	50 50 55
DT-3 150°C Rise	15 30 45 75	25 30-1/8 30-1/8 39-3/8	20-1/8 20-1/8 20-1/8 26-1/8	14-1/8 14-1/8 14-1/8 19-1/8	152 230 310 480	172 300 370 550	155 250 300 400	665 1795 1685 2535	95.2 95.5 97.2 97.2	96.4 95.9 98.2 97.6	96.3 95.3 98.4 97.2	95.8 94.4 98.5 96.7	3.5 5.3 1.1 3.0	5.2 7.8 3.7 4.8	5.3 7.9 5.0 5.1	45 45 45 50
	112.5 150 225 300	39-3/8 46-5/8 56 62-1/4	26-1/8 28 31-1/4 31-1/4	19-1/8 23 24-1/4 30-1/4	600 785 1100 1600	675 870 1200 2150	600 700 900 1100	3830 4430 5795 7065	96.9 97.5 97.9 98.0	97.3 97.8 98.1 98.3	97.0 97.6 97.9 98.1	96.5 97.2 97.5 97.7	3.4 2.7 2.4 2.2	5.8 5.2 5.4 5.3	6.2 5.8 6.4 6.5	50 50 55 55
	500 750 1000	75 75 76	44-1/2 44-1/2 60	36 36 50	2400 2900 4530	3100 3600 5400	1500 2100 ⑤	6875 10090 ⑤	98.6 98.5 ⑤	98.9 98.9 ⑤	98.8 98.8 ⑤	98.7 98.7 ⑤	1.2 1.3 ⑤	3.7 4.6 ⑤	4.9 6.3 ⑤	60 64 64
DT-3 115°C Rise	15 30 45 75	25 30-1/8 30-1/8 39-3/8	20-1/8 20-1/8 20-1/8 26-1/8	14-1/8 14-1/8 14-1/8 19-1/8	152 230 310 480	172 300 370 550	155 250 300 400	655 1460 1475 2060	95.3 95.7 96.7 97.1	96.4 96.3 97.4 97.7	96.3 95.8 97.2 97.6	95.9 95.0 96.9 97.3	3.4 4.6 2.7 2.3	4.8 6.3 4.1 3.9	4.8 6.4 4.2 4.2	45 45 45 50
	112.5 150 225 300	39-3/8 46-5/8 56 62-1/4	26-1/8 28 31-1/4 31-1/4	19-1/8 23 24-1/4 30-1/4	600 785 1100 1600	675 870 1200 2150	600 700 900 1100	3220 4340 5640 5950	97.4 97.5 97.8 98.0	97.8 97.8 98.1 98.2	97.6 97.6 97.9 98.0	97.3 97.2 97.6 97.7	2.5 2.6 2.4 2.2	4.6 5.1 5.8 5.5	5.1 5.8 7.2 6.8	50 50 55 55
	500 750	75 76	44-1/2 60	36 50	2400 4530	3100 5400	1500 ⑤	5955 ⑤	98.5 ⑤	98.9 ⑤	99.0 ⑤	98.8 ⑤	1.0 ⑤	4.0 ⑤	5.5 ⑤	60 64
DT-3 80°C Rise	15 30 45	30-1/8 30-1/8 39-3/8	20-1/8 20-1/8 26-1/8	14-1/8 14-1/8 19-1/8	230 310 480	300 370 550	250 300 400	505 810 1135	93.3 95.8 96.1	95.9 97.2 97.4	96.6 97.5 97.6	96.7 97.4 97.5	1.7 1.8 1.7	2.5 2.7 2.8	2.5 2.7 2.9	45 45 45
	75 112.5 150	39-3/8 46-5/8 56	26-1/8 28 31-1/4	19-1/8 23 24-1/4	600 785 1100	675 870 1200	600 700 900	1855 2930 2170	96.5 97.2 97.4	97.6 97.8 98.4	97.7 97.8 98.6	97.6 97.5 98.6	1.8 2.1 .9	3.4 3.9 2.5	3.8 4.3 3.0	50 50 50
	225 300 500	62-1/4 75 76	31-1/4 44-1/2 60	30-1/4 36 50	1600 2400 4190	2150 3100 4650	1100 1500 ⑤	4425 3940 ⑤	97.7 97.8 ⑤	98.3 98.6 ⑤	98.3 98.7 ⑤	98.1 98.7 ⑤	1.6 .9 ⑤	3.9 2.6 ⑤	4.7 3.3 ⑤	55 55 60

① Typical values for aluminum windings. Contact Eaton's Cutler-Hammer business for values of copper windings.
② For Types DS-3 and DT-3 transformers and all K-factor transformers, allow 6-inch (152.4 mm) clearance between rear of transformer and wall.
③ Actual impedance may be ± 7.5%.
④ Type EPT transformers 3-15 kVA are T-T connected.
⑤ Refer to the Cutler-Hammer business.

Note: 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.

Note: Refer to the Cutler-Hammer business for 5 kV class information. All data is subject to future revision.

Typical Dimensions and Technical Data

Table 9-151. Typical Data for 600-Volt Class NEMA TP-1 and Non-linear Transformers ①

Type	kVA	Dimensions (Inches)			Weight Lbs.		Losses in Watts		Efficiency				% Regulation			Sound Level dB
		Height	Width	Depth ②	Al	Cu	N.L.	Total	1/4 Load	1/2 Load	3/4 Load	Full Load	100% P.F.	80% P.F.	% Imp. ③	
DT-3 150°C Rise NEMA TP-1	15	25	20-1/8	14-1/8	152	172	80	822	98.6	96.3	95.4	94.3	3.3	4.8	6.4	45
	30	30-1/8	20-1/8	14-1/8	230	300	100	1674	97.3	96.7	95.6	94.4	3.6	5.1	7	45
	45	30-1/8	20-1/8	14-1/8	310	370	170	1885	97.5	97.2	96.5	95.6	2.7	4.4	5.9	45
	75	39-3/8	26-1/8	19-1/8	480	550	230	2534	98	97.7	97.1	96.4	2.1	4.3	5.7	50
	112.5	39-3/8	26-1/8	19-1/8	600	675	360	3290	98	97.9	97.4	96.9	2.3	4.6	5.9	50
	150	46-1/2	28	23	800	1000	480	3552	98.2	98.2	97.8	97.4	1.6	3.8	5.3	50
	225	56	31-1/4	24-1/4	1250	1800	565	6783	98.3	98	97.5	96.8	2.3	6.4	8.4	55
	300	62-1/4	31-1/4	30-1/4	1600	2150	730	7477	98.4	98.3	97.9	97.3	1.9	5.7	7.6	55
	500	75	44-1/2	36	2400	3100	1350	8031	98.5	98.7	98.5	98.2	1.4	4.9	6.4	60
K-4 150°C Rise	15	30-1/8	20-1/8	14-1/8	230	300	250	1090	92.2	93.5	92.9	91.8	3.5	5.1	5.2	45
	30	30-1/8	20-1/8	14-1/8	230	300	250	1990	95.2	95.3	94.3	93.0	3.7	6.0	6.3	45
	45	30-1/8	20-1/8	14-1/8	310	370	300	2110	96.3	96.5	95.8	94.9	2.6	4.3	4.5	45
	75	39-3/8	26-1/8	19-1/8	480	675	400	2840	97.0	97.1	96.6	95.9	2.3	4.3	4.8	50
	112.5	39-3/8	26-1/8	19-1/8	600	675	600	3870	97.1	97.3	96.8	96.2	2.8	5.5	6.2	50
	150	56	31-1/4	24-1/4	1100	1200	900	5250	96.8	97.1	96.7	96.1	2.2	4.2	4.7	55
	225	56	31-1/4	24-1/4	1100	1200	900	7270	97.6	97.6	97.1	96.5	1.1	4.1	5.3	55
	300	75	44-1/2	36	2400	3100	1100	8420	97.9	97.9	97.5	96.9	1.6	5.6	7.7	55
	500	75	44-1/2	36	2800	3600	1500	9620	98.5	98.8	98.7	98.5	.7	3.7	5.5	60
K-4 115°C Rise	15	30-1/8	20-1/8	14-1/8	230	300	250	950	92.4	93.9	93.5	92.6	3.3	4.4	4.4	45
	30	30-1/8	20-1/8	14-1/8	230	300	250	1840	95.4	95.5	94.6	93.5	3.6	5.7	5.9	45
	45	39-3/8	26-1/8	19-1/8	480	575	400	2090	95.8	96.7	96.4	95.9	1.9	3.1	3.2	45
	75	39-3/8	26-1/8	19-1/8	600	675	600	2360	96.2	96.9	96.7	96.2	2.1	3.8	4.2	50
	112.5	46-5/8	28	23	785	870	700	3760	96.8	97.2	96.8	96.2	2.8	4.9	5.4	50
	150	56	31-1/4	24-1/4	1100	1200	900	4260	97.0	97.4	97.2	96.7	1.9	3.9	4.5	50
	225	62-1/4	31-1/4	30-1/4	1600	2150	1100	4620	97.6	98.1	98.0	97.7	1.4	4.1	5.3	55
	300	75	44-1/2	36	2400	3100	1500	4980	97.8	98.5	98.5	98.4	.8	2.4	3.0	55
	500	90	69	42	4500	③	2600	5360	97.7	98.4	98.5	98.4	.7	4.1	6.1	60
K-4 80°C Rise	15	30-1/8	20-1/8	14-1/8	230	300	250	670	92.8	94.7	94.7	94.2	2.0	3.1	3.1	45
	30	30-1/8	20-1/8	14-1/8	310	370	300	990	95.4	96.5	96.3	95.9	1.8	2.7	2.8	45
	45	39-3/8	26-1/8	19-1/8	480	575	400	1170	96.0	97.0	97.0	96.6	3.1	3.2	3.3	45
	75	39-3/8	26-1/8	19-1/8	600	675	600	2290	96.2	97.0	96.8	96.3	1.8	3.5	3.9	50
	112.5	56	31-1/4	24-1/4	1100	1200	900	2610	96.4	97.3	97.3	97.0	1.4	2.9	3.3	50
	150	56	31-1/4	24-1/4	1100	1200	900	3090	97.2	97.8	97.7	97.4	1.4	3.7	4.6	50
	225	62-1/4	31-1/4	30-1/4	1600	2150	1100	4320	97.6	98.1	98.0	97.6	1.7	4.6	5.9	55
	300	75	44-1/2	36	2400	3100	1500	5060	97.8	98.5	98.6	98.6	.7	2.4	3.2	55
	500	④	④	④	④	④	④	④	④	④	④	④	④	④	④	60
K-13 150°C Rise	15	30-1/8	20-1/8	14-1/8	230	300	250	900	92.5	94.1	93.7	92.9	2.5	3.9	4.1	45
	30	30-1/8	20-1/8	14-1/8	310	370	300	1370	95.1	95.9	95.5	94.7	2.3	3.6	3.7	45
	45	39-3/8	26-1/8	19-1/8	480	575	400	1730	95.7	96.4	96.1	95.5	2.0	3.1	3.2	45
	75	39-3/8	26-1/8	19-1/8	600	675	600	2270	96.2	97.0	96.8	96.3	3.5	4.0	4.0	50
	112.5	46-5/8	28	23	785	870	700	3370	96.9	97.3	97.0	96.5	2.5	4.6	5.1	50
	150	56	31-1/4	24-1/4	1100	1200	900	4270	97.0	97.4	97.1	96.7	1.8	3.8	4.4	50
	225	62-1/4	31-1/4	30-1/4	1600	2150	1100	5080	97.5	97.9	97.7	97.3	1.7	4.2	5.2	55
	300	75	44-1/2	36	2400	3100	1500	5310	97.7	98.4	98.4	98.3	.9	2.5	3.2	55
	500	90	69	42	4500	③	2600	5625	97.7	98.4	98.5	98.4	.6	3.3	4.7	60
K-13 115°C Rise	15	30-1/8	20-1/8	14-1/8	230	300	250	790	92.6	94.4	94.2	93.5	2.4	3.5	3.6	45
	30	30-1/8	20-1/8	14-1/8	310	370	300	1070	95.3	96.4	96.1	95.6	1.8	2.4	2.4	45
	45	39-3/8	26-1/8	19-1/8	480	575	400	1300	95.9	96.9	96.8	96.4	1.6	3.0	3.3	45
	75	39-3/8	26-1/8	19-1/8	600	675	600	1960	96.3	97.2	97.1	96.7	1.8	3.3	3.6	50
	112.5	46-5/8	28	23	785	870	700	3140	96.9	97.4	97.2	96.7	1.7	3.5	4.8	50
	150	56	31-1/4	24-1/4	1100	1200	900	3480	97.1	97.7	97.5	97.2	1.5	3.8	4.6	50
	225	62-1/4	31-1/4	30-1/4	1600	2150	1100	4200	97.6	98.1	98.0	97.7	1.6	4.2	5.3	55
	300	75	44-1/2	36	2400	3100	1500	4780	97.8	98.5	98.5	98.4	.8	2.4	3.1	55
	500	90	69	42	4500	③	2600	5360	97.7	98.4	98.5	98.4	.7	3.3	4.7	60
K-13 80°C Rise	15	30-1/8	20-1/8	14-1/8	230	300	250	690	92.7	94.7	94.6	94.1	2.3	3.3	3.4	45
	30	30-1/8	20-1/8	14-1/8	310	370	300	990	95.4	96.5	96.3	95.9	1.8	2.7	2.8	45
	45	39-3/8	26-1/8	19-1/8	480	575	400	1120	96.0	97.1	97.0	96.7	1.4	2.7	3.0	45
	75	46-5/8	28	23	785	870	700	1800	95.8	97.0	97.0	96.8	1.6	3.0	3.3	50
	112.5	56	31-1/4	24-1/4	1100	1200	900	2210	96.4	97.5	97.5	97.3	1.1	2.7	3.4	50
	150	62-1/4	31-1/4	30-1/4	1600	2150	1100	2350	96.8	97.8	97.9	97.8	.9	2.6	3.4	50
	225	75	44-1/2	36	2400	3100	1500	2470	97.1	98.2	98.3	98.3	.6	2.0	2.5	55
	300	75	44-1/2	36	—	3600	2100	2860	97.1	98.2	98.4	98.4	.7	2.8	3.8	55

① Typical values for aluminum windings. Contact Eaton's Cutler-Hammer business for values of copper windings.
② For Type DT-3 transformers and all K Factor transformers, allow 6-inch (152.4 mm) clearance between rear of transformer and wall.
③ Actual impedance may be ± 7.5%.
④ Refer to the Cutler-Hammer business.

Note: 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.

Note: Performance Data is based on a 480 delta primary and a 208Y/120 secondary. All data is subject to future revision.

Typical Specifications — General Purpose (1000 kVA and Below)

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's Cutler-Hammer business.

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 24 hours a day, 365 days a year operation, 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: 185°C insulation system.
- **Type DS-3 or DT-3:** 15 kVA and above: 220°C (Class R) 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.

Cutler-Hammer Family of Dry-Type Distribution Transformers

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 and aggregate to provide a moistureproof, 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 impregnated with non-hygroscopic, thermosetting varnish and cured to reduce hot spots and seal out moisture. The assembly shall be installed on 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 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. **To ensure proper ventilation, locate the unit at least 6 inches (152.4 mm) from the adjacent wall or structure**.

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.

Table 9-152. Average Sound Levels

NEMA ST-20 Average Sound Level (dB)		
kVA	**Ventilated**	**Encapsulated**
0 – 9	40	45
10 – 50	45	50
51 – 150	50	55
151 – 300	55	57
301 – 500	60	59
501 – 700	62	61
701 – 1000	64	63
1001 – 1500	65	64

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.

Typical Specifications — Dry-Type Transformers for Non-Linear 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's Cutler-Hammer business.

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 (Class R) 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 impregnated with non-hygroscopic, thermosetting varnish and cured to reduce hot spots and seal out moisture. The assembly shall be installed on vibration-absorbing pads.

The neutral conductor shall be rated to carry 200% of normal phase current.

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.

Table 9-153. Average Sound Levels

NEMA ST-20 Average Sound Level (dB)		
kVA	**Ventilated**	**Encapsulated**
0 – 9	40	45
10 – 50	45	50
51 – 150	50	55
151 – 300	55	57
301 – 500	60	59
501 – 700	62	61
701 – 1000	64	63
1001 – 1500	65	64

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.**

Non-Linear 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.

Table 9-154. Non-Linear 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	.7%	3.0%
13th	.5%	1.0%
15th	.3%	.7%
17th	.3%	.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.

Further Information **B.36B.01.S.E**
For a complete product specification in CSI format, see the Cutler-Hammer Product Specification Guide ..... **Section 16462**

Typical Specifications — Low Temperature Rise Energy Efficient

General

Furnish and install, three-phase low temperature rise energy efficient dry-type transformers of the two-winding type, self-cooled, with ratings (kVA) as indicated on the drawings. Transformers shall be manufactured by Eaton's Cutler-Hammer business.

Transformers shall be designed, manufactured, and tested in accordance with all applicable ANSI/NEMA and IEEE standards, and shall be listed by Underwriters Laboratories, Inc. and bear the UL label.

Transformers 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.

Insulation System and Temperature Rise

Transformers shall be insulated with a 220°C (Class R) insulation system. Transformers shall be 115°C rise (80°C rise) and shall be capable of carrying a 15% continuous overload, (80°C rise transformers a continuous 30% 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 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 impregnated with non-hygroscopic, thermosetting varnish and cured to reduce hot spots and seal out moisture. The assembly shall be installed on 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 polymer 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.

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.

Table 9-155. Average Sound Levels

NEMA ST-20 Average Sound Level (dB)		
kVA	**Ventilated**	**Encapsulated**
0 – 9	40	45
10 – 50	45	50
51 – 150	50	55
151 – 300	55	57
301 – 500	60	59
501 – 700	62	61
701 – 1000	64	63
1001 – 1500	65	64

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.

For a complete product specification in CSI format, see the Cutler-Hammer Product Specification Guide ..... **Section 16461**

Typical Specifications — Isolation Transformers with Electrostatic Shielding

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's Cutler-Hammer business.

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 24 hours a day, 365 days a year operation, 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: 185°C insulation system which superseded Class F, based on 115°C rise.
- **Type DS-3 or DT-3:**
  15 kVA and above: 220°C (Class R) insulation system which superseded Class H, based on 150°C rise.

Required performance shall be obtained without exceeding the above indicated temperature rise in a 40°C maximum ambient.

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 and continuous wound construction. An electrostatic shield consisting of a single turn of [aluminum] [copper] 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.

On 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 and aggregate to provide a moistureproof, shock resistant seal. The core and coil encapsulation system shall minimize the sound level.

On units rated [15 kVA and above] [30 kVA and above] [112.5 kVA and above] the core and coil assembly shall be impregnated with non-hygroscopic, thermosetting varnish and cured to reduce hot spots and seal out moisture. The assembly shall be installed on 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 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. **To ensure proper ventilation, locate the unit at least 6 inches (152.4 mm) from the adjacent wall or structure.**

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.

Table 9-156. Average Sound Levels

NEMA ST-20 Average Sound Level (dB)		
kVA	**Ventilated**	**Encapsulated**
0 – 9	40	45
10 – 50	45	50
51 – 150	50	55
151 – 300	55	57
301 – 500	60	59
501 – 700	62	61
701 – 1000	64	63
1001 – 1500	65	64

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.

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's Cutler-Hammer business.

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 24 hours a day, 365 days a year operation, with normal life expectancy as defined in ANSI C57.96.

Insulation Systems

Transformers shall be insulated with a UL recognized 220°C (Class R) 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 impregnated with non-hygroscopic, thermosetting varnish and cured to reduce hot spots and seal out moisture. The assembly shall be installed on 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 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.

Table 9-157. Average Sound Levels

NEMA ST-20 Average Sound Level (dB)		
kVA	**Ventilated**	**Encapsulated**
0 – 9	40	45
10 – 50	45	50
51 – 150	50	55
151 – 300	55	57
301 – 500	60	59
501 – 700	62	61
701 – 1000	64	63
1001 – 1500	65	64

The following table lists the recommended kVA size of the drive isolation transformer for a specific horsepower requirement.

Table 9-158. 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

For a complete product specification in CSI format, see the Cutler-Hammer Product Specification Guide ..... **Section 16461**

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's Cutler-Hammer business.

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 operation, 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.

a. 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 feeder breakers shall be enclosed with a padlockable hinged door.

b. The secondary distribution section shall accommodate one inch, plug-in breakers with 10 kA interrupting capacity.

Insulation System

Transformers shall be insulated with a 185°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.

Mini-Power Center

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 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 and aggregate to provide a moistureproof, 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 utilizing 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.

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.

Table 9-159. Average Sound Levels

kVA	NEMA Average Sound Level in dB
0 – 9	45
10 – 30	50

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.

Typical Specification —— NEMA TP-1-1996 Compliant Energy Efficient Transformers

General

Furnish and install, three-phase energy efficient dry-type transformers that comply with NEMA Standard TP-1-1996. 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 bear the Energy Star® label and be manufactured by Eaton's Cutler-Hammer business.

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 (Class R) 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 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 impregnated with non-hygroscopic, thermosetting varnish and cured to reduce hot spots and seal out moisture. The assembly shall be installed on vibration-absorbing pads.

Efficiency

Transformers shall be energy efficient with minimum efficiencies as set forth per NEMA TP-1-1996 when operated at 35% of full load capacity.

Table 9-160. NEMA TP-1-1996 Efficiency Levels

Tables of Energy Efficiency NEMA Class 1 Efficiency Levels dry-type Distribution Transformers — Low Voltage			
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

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.

Sound Levels

Transformer average sound levels shall not exceed the following ANSI and NEMA levels for self-cooled ratings.

Table 9-161. Average Sound Levels

NEMA ST-20 Average Sound Level (dB)		
kVA	**Ventilated**	**Encapsulated**
0 – 9	40	45
10 – 50	45	50
51 – 150	50	55
151 – 300	55	57
301 – 500	60	59
501 – 700	62	61
701 – 1000	64	63
1001 – 1500	65	64

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.

Standards and Certification

Cutler-Hammer Dry-Type Distribution Transformers by Eaton Corporation are approved, listed, recognized or may comply with the following standards.

Table 9-162. Engineering Standards

Catalog Product Name	UL Standard	UL/cUL File Number	UL Listed Control Number	cUL Energy Efficiency File Number	CSA File Number	Insulation System Temp/°C	kVA Single-Phase	kVA Three-Phase	Applicable IEC Standard
Industrial Control Transformer									
MTA	506	E10156	591H	—	LR60545 ①	105	.05 – 5	N/A	61558
MTC	506	E10156	591H	—	LR60545 ①	105	.05 – 5	N/A	61558
MTE	506	E46323	702X	—	LR27533	105	.025 – 1.5	N/A	61558
MTG	506	E46323	702X	—	LR27533	105	.05 – 1.0	N/A	61558
MTK	506	E46323	702X	—	LR27533	180	.05 – 5	N/A	61558
Encapsulated Transformer									
AP	506	E10156	591H	—	—	180	3 – 10	N/A	61558
AP	1561	E78389	591H	—	—	180	15	N/A	61558
EP	506	E10156	591H	—	LR60545	180	.05 – 10	N/A	61558
EP	1561	E78389	591H	EV157 ②	LR60545 ③	180	15 – 50	N/A	61558 ④/726 ⑤
EPT	506	E10156	591H	—	LR60545	180	N/A	3 – 9	61558 ⑥/726 ⑦
EPT	1561	E78389	591H	EV157 ⑧	LR60545 ⑨	180	N/A	15 – 75	726
MPC	506 ⑩/1561 ⑪	E53449	591H	—	LR60546	180	3 – 25	15 – 30	—
Ventilated Transformer									
DS-3	1561	E78389	591H	EV157 ⑫	LR60545 ⑫	220	15 – 167	N/A	60726
DT-3	1561	E78389	591H	EV157 ⑬	LR60545 ⑬	220	N/A	15 – 750	60726
KT	1561	E78389	591H	EV157 ⑭	—	220	N/A	9 – 500	N/A

① Applies to .05 – 1 kVA.
② Applies to 25 – 50 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 30 – 75 kVA.
⑨ Applies to 30 kVA.
⑩ Applies to 3 – 10 kVA.
⑪ Applies to 15 – 30 kVA.
⑫ Applies to 25 – 167 kVA.
⑬ Applies to 30 – 750 kVA.
⑭ Applies to 30 – 500 kVA.

In addition to the above standards, Cutler-Hammer Dry-Type Distribution transformers are also manufactured in compliance with the applicable standards listed below.

Note: 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.
- **NEMA TP-1:** Guide for Determining Energy Efficiency for Distribution Transformers.
- **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-2**: Standard Test Method for Measuring the Energy Consumption of Distribution Transformers.

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 below chart. 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.

Table 9-163. 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	.53
1/4	5.8	3.2	3.0	2.9	.70
1/3	7.2	4.0	3.8	3.6	.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

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

Note: 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%.

Table 9-164. Full Load Current in Amperes — Single-Phase Circuits

kVA	Voltage								
	120	208	220	240	277	480	600	2400	4160
.25	2.0	1.2	1.1	1.0	.9	.5	.4	.10	.06
.50	4.2	2.4	2.3	2.1	1.8	1.0	.8	.21	.12
.75	6.3	3.6	3.4	3.1	2.7	1.6	1.3	.31	.18
1	8.3	4.8	4.5	4.2	3.6	2.1	1.7	.42	.24
1.5	12.5	7.2	6.8	6.2	5.4	3.1	2.5	.63	.36
2	16.7	9.6	9.1	8.3	7.2	4.2	3.3	.83	.48
3	25	14.4	13.6	12.5	10.8	6.2	5.0	1.2	.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

Three-Phase Transformers

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 below chart. 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.

Table 9-165. Three-Phase ac Motors

Horsepower	Full Load Amperes					Minimum Transformer kVA ①
	208 Volts	230 Volts	380 Volts	460 Volts	575 Volts	
1/2	2.2	2.0	1.2	1.0	.8	.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
1-1/2	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
7-1/2	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

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

Note: 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%.

Table 9-166. 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	.72	.42
6	16.6	14.4	9.1	7.2	5.8	1.4	.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

Catalog Numbering System

Note: Contact your local Cutler-Hammer sales office for voltage combinations not shown. Use table for catalog number breakdown only. Do not use to create catalog numbers since all combinations may not be valid.

Table 9-167. 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

Type
S = EP (1-Ph encapsulated)
Y = EPT (3-Ph encapsulated)
T = DS-3 (1-Ph ventilated)
V = DT-3 (3-Ph ventilated)
P = Mini-Power Center
Z = Class 1 Division 2 Groups C and D
X = Harmonic Mitigating (3-ph ventilated)
Non-Linear
H = KT-4 (3-Ph ventilated)
B = KT-9 (3-Ph ventilated)
N = KT-13 (3-Ph ventilated)
G = KT-20 (3-Ph ventilated)
J = KT-30 (3-Ph ventilated)
A = KT-40 (3-Ph ventilated)
K = KT-50 (3-Ph ventilated)
HT = KT-4 (1-Ph ventilated)
NT = KT-13 (1-Ph ventilated)
GT = KT-20 (1-Ph ventilated)
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)

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@-2.5%
M = 2@+2.5%, 4@-2.5%
N = None
R = 1@+5%, 2@-5%
P = 1@+5%, 2@-5% x 2@+2.5%, 4@-2.5%
T = 1@+4.2%, 1@-4.2%
U = 1@+2.5%, 3@-2.5%
W = 1@+3.5%, 1@-3.5%
X = 2@+3.1%, 2 @-3.1%

Phase
A = Buck and Boost
B = 80°C Rise
F = 115°C Rise
E = Electrostatic Shield
S = Single
T = Three

Secondary Voltage
04 = 12/24
06 = 16/32
08 = 24/48
14 = 110/220
12 = 120
10 = 120 x 240
11 = 120/240
54 = 127/254
19 = 190Y/110
28 = 208Y/120
29 = 208
25 = 220 Delta
31 = 220Y/127
26 = 220Δ/110 Midtap
22 = 240Δ/120 Midtap
64 = 240Y139
24 = 240 Delta
20 = 240 x 480
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

kVA
81 = .05
85 = .075
82 = .10
83 s= .15
26 = .25
51 = .50
76 = .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

Suffix Options
A...Z = ①
CU = ②
SS = ③
ZZ = ④
NV = ⑤
X = ⑥
LS_ _ = ⑦
AF = ⑧
TR = ⑨
SR = ⑩
CE = ⑪
T = ⑫
EE = ⑬
NON = ⑭
POS = ⑮
NEG = ⑯

① Model number is not used on newly designed/redesigned transformers.
② Copper windings.
③ Stainless steel (utilizes 316 stainless steel, 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.
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 NEMA TP-1 Energy Star Energy Efficient.
⑭ 0° phase-shift
⑮ +15° phase-shift
⑯ -15° phase-shift

Note: For the Cutler-Hammer Industrial Control Transformers Catalog Numbering System see **Page 9-140**.

Catalog Numbering System

Note: Contact your local Cutler-Hammer sales office for voltage combinations not shown. Use table for catalog number breakdown only. Do not use to create catalog numbers since all combinations may not be valid.

Table 9-168. Motor Drive Isolation Transformers — Example: MD145E89B

MD 145 E 89 B

Type
MD = DT-3
HD = KT-4
ND = KT-13

kVA	
075	= 7.5
11	= 11
14	= 14
20	= 20
27	= 27
34	= 34
40	= 40
51	= 51
63	= 63
75	= 75
93	= 93
118	= 118
145	= 145
175	= 175
220	= 220
275	= 275
330	= 330
440	= 440
550	= 550
660	= 660
770	= 770
880	= 880
1000	= 1000
1250	= 1250
1500	= 1500

Taps ①
D = 2@+2.5%, 2@-2.5%
E = 1@+5%, 1@-5%

Voltage		
	Primary	**Secondary**
82 =	230Δ	208Y/120
83 =	208Δ	208Y/120
84 =	240Δ	480Δ
85 =	208Δ	230Y/133
86 =	208Δ	460Y/266
87 =	208Δ	480Δ
88 =	230Δ	230Y/133
89 =	230Δ	460Y/266
90 =	230Δ	575Y/332
91 =	460Δ	230Y/133
92 =	460Δ	460Y/266
93 =	460Δ	575Y/332
94 =	575Δ	230Y/133
95 =	575Δ	460Y/266
96 =	575Δ	575Y/332
97 =	575Δ	480Δ
98 =	600Δ	480Δ

Suffix Options	
Y	= Encapsulated (Type EPT) design
ES	= Electrostatic Shield
CU	= Copper Windings
F	= 115°C Rise
B	= 80°C Rise
X	= 50/60 Hz

① For other tap combinations, contact your local Cutler-Hammer sales office.

Catalog Numbering System

Note: Contact your local Cutler-Hammer sales office for voltage combinations not shown. Use table for catalog number breakdown only. Do not use to create catalog numbers since all combinations may not be valid.

Table 9-169. Industrial Control Transformers, CE Marked Control Transformers — Example: CE0250G2FES

CE 0250 G 2F ES

Type
C = Industrial Control Transformer
CE = CE Marked Control Transformer

VA Rating
0025 = 25
0050 = 50
0075 = 75
0100 = 100
0150 = 150
0200 = 200
0250 = 250
0300 = 300
0350 = 350
0500 = 500
0750 = 750
1000 = 1000
1500 = 1500
2000 = 2000
3000 = 3000
5000 = 5000
Type AP Only:
0003 = 3000
0005 = 5000
0007 = 7500
0010 = 10000
0015 = 15000

Transformer Design
A = MTA
C = MTC
E = MTE
G = MTG
K = MTK
P = AP

Voltage

	Primary	Secondary
AC =	380 x 415	24
AG =	208/240/277/380/480	24
1B =	120 x 240	24
2A =	240 x 480, 230 x 460, 220 x 440	120/115/110
2B =	240 x 480	24
2C =	240 x 480	120 x 240
2F =	230/460	115
2G =	230/460	115/230
2U =	220/380/440/550, 230/400/460/575, 240/416/480/600	23/110, 24/115, 25/120
2V =	208/230/400/460/575	24/115/230
2W =	208/230/400/460/575	115/230
3A =	208/277	120
3B =	115	24
3C =	230/460/575	115/95
3D =	208/380/416	115/95
4B =	208/230/460/575	24
4C =	550/575/600	110/115/120
4D =	380/400/415	110 x 220
4E =	208/230/460/575	115
4H =	380/400/415	22/23/24
4W =	550/575/600	22/23/24
5E =	200/220/440, 208/230/460, 240/480	23/110, 24/115, 25/120
6U =	240/416/480/600, 230/400/460/575, 220/380/440/550, 208/500	99/120/130, 95/115/125, 91/110/120, 85/100/110
7G = (Type AP Only)	240 x 480	120/240

Modifications
Type MTE/MTG/MTK
FB = Factory mounted 2-pole primary fuse block for rejection type fuses
FBN = Factory mounted 2-pole primary fuse block for non-rejection type fuses
Q = Secondary fuse clips for 1/4 x 1-1/4 inch fuses
XX = No Secondary fuse clips
RT = Ring type terminals for connection to fuse block
ES = Electrostatic shield
FS = Factory mounted finger safe terminal shields
Type AP
B = Bottom mounted
S = Side/wall mounted
ES = Electrostatic shield
CU = Copper windings
Type MTA/MTC
FB = Factory mounted 3-pole fuse block (2-pole primary rejection type with 1-pole secondary non-rejection type)
ES = Electrostatic shield
L = Lead terminations

Note: For the Cutler-Hammer dry-type Transformers Catalog Numbering System see **Page 9-138** and **9-139.**

Modifications to General Purpose Units NOT Registered in VISTA

Note: These rules apply only to list prices and not to net priced standard transformers. Prior to applying these pricing rules, verify that the style number you require is not already registered in VISTA with a valid list price. List prices in VISTA take precedence over all manually calculated list prices. List price additions for special transformers are intended to be applied to the "base design" nearest to your application. "Base design" is typically a standard 150°C rise, aluminum wound transformer with the same electrical configuration as the special unit you require, i.e., delta-delta connected, or delta-wye connected.

List Price Additions

Rule 1. Special Primary/Secondary Voltages

If either one or both are non-standard (not listed in the catalog section for that particular transformer type), **add 10%**.

Rule 2. Copper Windings

The standard winding material is aluminum. For copper windings, **add 35%.**

Note: For units rated 1000 kVA and above, refer to the Eaton's Cutler-Hammer business.

Rule 3. Temperature Rise

For 115°C rise, when 150°C rise is standard, on units rated 750 kVA and below, **add 15%**.

For 80°C rise, when 150°C rise is standard, on units rated 500 kVA and below, **add 35%.**

For 80°C rise, when 115°C rise encapsulated is standard, on units rated 45 kVA and below, **add 25%.**

Rule 4. Electrostatic Shields

For electrostatic shields, which form a ground plane between the high and low voltage windings, **add 10%**.

Rule 5. Stainless Steel

For transformers with stainless steel enclosures, **add 30%**.

Rule 6. 50 Hertz

The standard frequency is 60 Hertz. For 50 Hertz, **add 25%.**

Note: For units rated 1000 kVA and above, refer to the Cutler-Hammer business.

Rule 7. Special Sound Levels

When sound levels below NEMA standard ST-20 are required, **add 5%** per decibel below NEMA standard levels. This rule cannot be applied to K Factor nonlinear transformers. Contact your Cutler-Hammer representative for special sound requirements, such as low sound K-factor nonlinear products and requirements for sound levels exceeding 5 dB below NEMA standards.

Rule 8. Fungus Proofing

Fungus proofing consists of spraying all equipment within the wiring compartment with a fungicidal varnish. Add suffix **AF** to style number if this treatment is required. **List price additions** are:

Encapsulated design **$250.00/unit**

Ventilated design **$500.00/unit**

Rule 9. Non-Standard Taps

Standard high voltage taps are listed in this catalog. When more than the listed taps are required, **refer to Division**. Additional taps are available in 2.5% steps only, up to a maximum of 6 taps.

Rule 10. Double Neutral

For three-phase applications where a 200% neutral is required, **add 5%**.

Rule 11. Lighting Tap

A lighting tap is available on the secondary (delta only) winding of a three-phase unit rated 30 through 300 kVA.

Tap is limited to 5% rated kVA.

For a 120 V single-phase tap, **add 15%**.

Rule 12. NEMA TP-1 Energy Efficient

For ventilated transformers that meet the NEMA TP-1 and Energy Star energy efficiency standards, **add 40%**.

Rule 13. CE Marked

For single-phase encapsulated, or ventilated transformers that comply with European standards and have a CE Mark, **add 10%**.

Rule 14. CSA Labeled

For transformers that are CSA labeled, **add 10%**.

Rule 15. Thermal Indicators

Thermal indicators are included as standard in Cutler-Hammer Type MD Motor Drive Isolation transformers. Thermal indicators are set to activate at a temperature of 190°C.

The Cutler-Hammer standard is to install one indicator in the center coil. To have thermal indicators installed in transformers other than Motor Drive Isolation, **add $500.00 List Price/Set**.

Rule 16. Certified Test Reports

Factory certified test reports are available only when they are requested at the time of order entry. The following Certified Test Reports are available:

A. Certified Report of Standard Production Tests:

Suffix TR $500.00/unit
List Price addition

B. Certified Report of NEMA Sound Level Tests:

Suffix SR $1,500.00/unit
List Price addition

Add the appropriate Suffix from above to the style number when requesting these Certified Test Reports.

Net Price Additions

Note: Apply after all list price modifications and discounts are calculated.

Rule 1. Special Drawings

When paper print factory drawings are required, **add $25.00 net per item**.

When sepia paper reproducible factory drawings are required, **add $100.00 net per item**.

When aperture cards are required, **add $50.00 net per item.**

Glossary of Transformer Terms

Air Cooled: A transformer which is cooled by the natural circulation of air around, or through, the core and coils

Ambient Noise Level: The existing noise level of the area surrounding the transformer, prior to energizing the transformer.

Ambient Temperature: The temperature of the air surrounding the transformer into which the heat of the transformer is dissipated.

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 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's Cutler-Hammer 600V-class transformers have a 10 kV BIL rating.

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.

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 which are incidental to carrying a load: coil resistance, stray loss due to stray fluxes in the windings, core clamps, etc., as well as circulating currents (if any) in parallel windings. Also called load losses.

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.

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 3-wire.

Dielectric Tests: Tests which 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.

Dry-Type Transformer: A transformer in which the core and coils are not immersed in a liquid.

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.

Encapsulated Transformer: A transformer with its coils either dipped or cast in an epoxy resin or other encapsulating substance.

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 Normal" 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 Normal" 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.

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.

Harmonic: A sinusoidal waveform with a frequency that is an integral multiple of the fundamental frequency (60 Hz).

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.

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.

Insulation: Material with a high electrical resistance.

Insulation Materials: Those materials used to insulate the transformer's electrical windings from each other and ground.

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.

1000 VA = 1 kVA

Load Losses: I^2R losses in windings. Also see Conductor Losses

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.

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 which 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.

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 2- or 3-wire, or three-phase 3- or 4-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.

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 utilizes only two sets of coils.

Star Connection: Same as a wye connection.

Step-down Transformer: A transformer where the input voltage is higher than the output voltage.

Step-up Transformer: A transformer where the input voltage is less than the output voltage.

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.

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 (Underwriter's Laboratories): An independent safety testing organization.

Universal Taps: A combination of six primary voltage taps consisting of 2@+2-1/2% FCAN and 4@-2-1/2% FCBN.

Wye Connection: A standard 3-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 3-phase 4-wire. To obtain the line-to-neutral voltage, divide the line voltage by $\sqrt{3}$ (1.732).

Frequently Asked Questions About Transformers

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 3-wire or three-phase 4-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 at high altitudes?

At altitudes greater than 3,300 feet (1,000 meters), the density of the air is lesser 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 3,300 feet above sea level, it is necessary to derate the nameplate kVA by 0.3% for each 330 feet (100 meters) in excess of 3,300 feet.

What considerations need to be taken into account when operating transformers where the ambient temperature is high?

Eaton's Cutler-Hammer 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), the normal life expectancy of a transformer 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 3,300 feet (1,000 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.

Table 9-170. 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. Cutler-Hammer 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, (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 a Cutler-Hammer 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:

$$\text{Maximum Short Circuit Load Current (Amps)} = \frac{\text{Full Load Current (Amps)}}{\text{Transformer Impedence}}$$

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:

$$\frac{\text{Nameplate Volt-Amps}}{\text{Load (output) Volts} \times \sqrt{3}}$$

Example: For a standard three-phase, 75 kVA transformer, rated 480 volt delta primary and 208Y/120 volt secondary (catalog number V48M28T75J) 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:

$$\frac{208.2 \text{ A}}{.051} = 4{,}082.4 \text{ A}$$

The circuit breaker or fuse on the secondary side of this transformer would have to have a minimum interrupting capacity of 4,083 amperes at 208 volts. NEMA ST-20 (1992).

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 of a transformer with ventilation openings and any wall or obstruction. In compliance with NEC 450-9, Eaton's Cutler-Hammer 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.

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