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		Catalog 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	52	3A	Indoor-	—	**S20N11S81N**	107.
.075	—	—	EP	115	6-1/2	3-7/8	3-1/2	7	165	98	89	3	53	3A	Outdoor	—	**S20N11S85N**	123.
.100	—	—	EP	115	6-1/2	3-7/8	3-1/2	7	165	98	89	3	54	3A		—	**S20N11S82N**	131.
.150	—	—	EP	115	6-1/2	3-7/8	3-1/2	8	165	98	89	4	55	3A	Indoor-	—	**S20N11S83N**	152.
.25	—	—	EP	115	6-1/2	4-7/8	3-7/8	12	165	124	98	5	56	3A	Outdoor	—	**S20N11S26N**	183.
.5	—	—	EP	115	6-1/2	4-7/8	4-5/8	13	165	124	117	6	57	3A		—	**S20N11S51N**	225.
.75	—	—	EP	115	8-3/8	6	5-3/4	21	213	152	146	10	58A	3A	Indoor-	—	**S20N11S76N**	298.
1	—	—	EP	115	8-3/8	6	5-3/4	31	213	152	146	14	59A	3A	Outdoor	—	**S20N11S01N**	347.
1.5	—	—	EP	115	10-3/4	6-3/16	6-1/8	40	273	157	156	18	67	3A		—	**S20N11S16N**	426.
2	—	—	EP	115	10-3/4	6-3/16	6-1/8	40	273	157	156	18	68	3A	Indoor-	—	**S20N11S02N**	510.
3	—	—	EP	115	14-1/8	7-3/4	8	65	359	197	203	29	176	3A	Outdoor	—	**S20N11S03N**	620.
3	①	①	EP	115	14-1/8	7-3/4	8	65	359	197	203	29	176	9A		—	**S20K11S03N**	640.
5	—	—	EP	115	16	10-3/8	9-7/8	113	406	263	251	51	177	3A	Indoor-	—	**S20N11S05N**	955.
5	①	①	EP	115	16	10-3/8	9-7/8	113	406	263	251	51	177	9A	Outdoor	—	**S20K11S05N**	980.
7.5	—	—	EP	115	16	10-3/8	9-7/8	123	406	263	251	55	178	3A		—	**S20N11S07N**	1,300.
7.5	①	①	EP	115	16	10-3/8	9-7/8	123	406	263	251	55	178	9A	Indoor-	—	**S20K11S07N**	1,335.
10	—	—	EP	115	19	13-3/8	10-1/2	193	482	339	266	87	179	3A	Outdoor	—	**S20N11S10N**	1,575.
10	①	①	EP	115	19	13-3/8	10-1/2	193	482	339	266	87	179	9A		—	**S20K11S10N**	1,625.
15	—	—	EP	115	19	13-3/8	10-1/2	216	482	339	266	98	180	3A	Indoor-	—	**S20N11S15N**	1,940.
15	②	②	EP	115	19	13-3/8	10-1/2	216	482	339	266	98	180	23A	Outdoor	—	**S20L11S15N**	2,050.
25	—	—	EP	115	22-3/8	16-3/8	14-1/2	375	568	416	368	170	182	3A		—	**S20N11S25N**	2,840.
25	②	②	EP	115	22-3/8	16-3/8	14-1/2	375	568	416	368	170	182	23A	Indoor-	—	**S20L11S25N**	2,870.
37.5	②	②	EP	115	28-1/4	20-9/16	13	775	717	522	330	352	300	23A	Outdoor	—	**S20L11S37CU** ③	7,780.
15	④	④	DS-3	150	30-1/4	16-7/8	15-7/8	147	768	428	402	67	815	3XA	**WS15**	303.	**T20P11S15**	1,860.
25	④	④	DS-3	150	31-1/4	22-5/8	17-1/2	212	793	574	445	96	816	3XA	**WS11**	303.	**T20P11S25**	2,485.
37.5	④	④	DS-3	150	37-5/8	22-5/8	19-1/2	306	956	574	495	139	817	3XA	**WS11**	303.	**T20P11S37**	3,170.
50	④	④	DS-3	150	37-5/8	22-5/8	19-1/2	340	956	574	495	154	818	3XA	**WS11**	303.	**T20P11S50**	3,940.
75	④	④	DS-3	150	42-1/8	24	23-3/8	510	1070	610	594	232	819	3XA	**WS16**	688.	**T20P11S75**	4,770.
100	④	④	DS-3	150	42-1/8	24	23-3/8	600	1070	610	594	272	820	3XA	**WS16**	688.	**T20P11S99**	6,430.

① 1 – 10% FCBN at 240V; 2 – 5% FCBN at 480V.
② 2 – 5% FCBN at 240V; 4 – 2.5% FCBN at 480V.
③ Available with copper windings only.
④ +1 – 5%, -2 – 5% at 240V primary; +2 – 2.5%, -4 – 2-5% at 480V 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 Cutler-Hammer.

Discount Symbol **DT-1**

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

Type EP 3-25 kVA

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

Seismic Qualified

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

Options and Accessories

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

Product Specifications

Frequency

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

Overload Capability

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

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

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 levels listed here. Lower sound levels are available and must be specially designed.

Table 9-2. Sound Levels

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

① Applies to general purpose transformers only.

Catalog Numbering System

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

S 20 N 11 S 05 A

Type

S = EP
Y = EPT
T = DS-3
V = DT-3
P = Mini-Power Center

Non-Linear
H = KT-4
B = KT-9
N = KT-13
G = KT-20
J = KT-30
A = KT-40
K = KT-50

Q = EPM Marine
L = EPTM Marine
R = DS-3M Marine
M = DT-3M Marine
Z = Class 1 Division 2 Groups C and D

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%

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

Phase

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

kVA

81 = .05
85 = .075
82 = .10
83 = .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

Model ⑩

A...Z
CU ①
SS ②
ZZ ③
NV ④
X ⑤
LS_ _ ⑥
AF ⑦
TR ⑧
SR ⑨

① Copper Windings.
② Stainless Steel (utilizes 316 stainless steel, does not imply a NEMA 4X rating).
③ Open Type Core and Coil Assembly.
④ Totally Enclosed Non-Ventilated DS-3 or DT-3.
⑤ 50/60 Hz.
⑥ Low Sound Design.
⑦ Fungus Proof.
⑧ Certified test report of standard production tests.
⑨ Certified sound level report.
⑩ Model number is not used on newly designed/redesigned transformers.

Note: For the Cutler-Hammer Industrial Control Transformers Catalog Numbering System see **Page 9-124.**
Note: Contact your local Cutler-Hammer sales office for voltage combinations not shown. Use table for catalog number breakdown only.