Dry-Type Encapsulated Single-Phase Distribution Transformers

TF252795S

T2536171S

T2535183S

TF279740S

TF279746S

Acme Electric offers a complete range of Dry-type Distribution Transformers optimized to provide long life in general-purpose applications. Dry-type transformers are smaller and easier to maintain than liquid-filled transformers. These 600V class and below single-phase transformers are listed as Styles SR and ER.

Applications

- Healthcare facilities, educational facilities, theaters, stadiums, and entertainment venues
- Lighting
- Motors
- C&C equipment
- Power loads from power distribution systems

Agency Approvals

cULus (file no. E79947). Standard UL 506, listed in UL file as Style SR and ER for units 150VA and below.

CE (RoHS Directive 2011/65/EU and 2015/863/EU). Export models.

General Specifications

- Keyhole mounting slots for mounting bolts prior to installation.
- Mounting slots are accessible from the front.
- Flexible copper lead wire terminations for easy connections outside the front access wiring compartment.
- Frequency: 60Hz on standard models and 50/60 Hz on CE models.
- Winding material:
  - 5kVA and below - Cu
  - 7.5 kVA and above - Al

Features

- Lifting ears are included on 3 to 25 kVA units.
- Dual size knockouts in both sides and the bottom of the wiring compartment for greater wiring convenience and flexibility.
- UL and cUL listed and UL-3R enclosures meet or exceed all listing criteria, including NEMA, ANSI and OSHA standards.
- Shielded for cleaner power.
- Encapsulated and completely enclosed design electrical grade silica and resin compounds completely enclose the core and coil to seal out all moisture and air. UL Type 3R enclosure for indoor or outdoor service. Encapsulation eliminates corrosion and insulation deterioration.
- Quiet operation with sound levels well below NEMA standards.
- Long life UL class 155°C insulation system. 115°C rise through 0.750 kVa, 180°C insulation system, 115°C rise, 1kVa and above.

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How to Compute the kVA Required (Single-Phase Loads):

1. Determine electrical load

A. Voltage required by load.
B. Amperes or kVA capacity required by load.
C. Frequency in Hz (cycles per second).
D. Verify load is designed to operate on a single-phase supply.

The above information is standard data normally obtained from equipment nameplates or instruction manuals.

2. Determine supply voltage

A. Voltage of supply (source).
B. Frequency in Hz (cycles per second).

The frequency of the line supply and electrical load must be the same. Select single-phase transformer designed to operate at this frequency, having a primary (input) equal to the supply voltage and a secondary (output) equal to the voltage required by the load.

3. If the load nameplate expresses a rating in kVA, a transformer can be directly selected from the charts. Choose from a group of transformers with primary and secondary voltages matching those you have just determined.

A. Select a transformer with a standard kVA capacity equal to or greater than that needed to operate the load.
B. Primary taps are available on most models to compensate for line voltage variations.

Full Load Current (A) – Single-Phase Circuits

kVA	120V	208 V	240 V	277 V	380 V	440V	480 V	600V
0.25	2.0	1.2	1.0	0.9	0.6	0.5	0.5	0.4
0.50	4.2	2.4	2.1	1.8	1.3	1.1	1.0	0.8
0.75	6.3	3.6	3.1	2.7	2.0	1.7	1.6	1.3
1.0	8.3	4.8	4.2	3.6	2.6	2.3	2.1	1.7
1.5	12.5	7.2	6.2	5.4	3.9	3.4	3.1	2.5
2.0	16.7	9.6	8.3	7.2	5.2	4.5	4.2	3.3
3.0	25	14.4	12.5	10.8	7.9	6.8	6.2	5.0
5.0	41	24.0	20.8	18.0	13.1	11.3	10.4	8.3
7.5	62	36	31	27	19.7	17	15.6	12.5
10	83	48	41	36	26	22.7	20.8	16.7
15	125	72	62	54	39	34	31	25
25	208	120	104	90	65	57	52	41

Full Load Current (A) – Single-Phase AC Motors[1]

Horsepower	115V	208V	230V	Minimum Transformer kVa
1/6	4.4	2.4	2.2	0.53
1/4	5.8	3.2	2.9	0.70
1/3	7.2	4.0	3.6	0.87
1/2	9.8	5.4	4.9	1.18
3/4	13.8	7.6	6.9	1.66
1	16	8.8	8	1.92
1.5	20	11.0	10	2.40
2.0	24	13.2	12	2.88
3.0	34	18.7	17	4.10
5.0	56	30.8	28	6.72
7.5	80	44	40	9.6
10	100	55	50	12.0

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

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

$$\text{1 Phase kVA} = \frac{\text{Volts x Amps}}{1000}$$

C. When load ratings are given only in amperes, tables 1 and 2 or the following formulas may be used to determine proper kVA size for the required transformer.

(1) To determine kVA when volts and amps are known:

$$\text{kVA} = \frac{\text{Volts x Amps}}{1000}$$

(2) To determine Amperes when volts and amps are known:

$$\text{Amps} = \frac{\text{kVA x 1000}}{\text{Volts}}$$

Single-Phase Example

Select a transformer to meet the following conditions:

- Load is single-phase lighting using incandescent lamps.
- Each fixture requires 1.3 amps @ 120 volts, 1 phase, 60 Hz, power factor of unity.
- The installation requires a total of 52 100-watt fixtures.
- The desired circuit distributing power to the light fixtures is 120/240 volt, three wire, single-phase. The supply voltage is 460 volt, 3 phase.

To compute the kVA required:

$$\frac{\text{1.3 Amps x 120V}}{1000} = \text{0.156 kVA for each lighting fixture}$$

Always use amps x volts to compute VA; never use lamp wattage. 0.156 kVA/fixture x 52 fixtures = 8.11 kVA. The two sizes (kVA nearest 8.11 kVA) are 7.5 kVA and 10 kVA. Use the 10 kVA. This will not overload the transformer and allows some capacity (1.89 kVA) for future loads. Since the supply is 460V (not 480V), use the 456V tap. This will produce approximately 120V on output. If the tap is not used, the output will be 115V compared to the desired 120V. Note the transformer selected is single-phase, but the supply is 480V, three-phase. Single-phase is obtained by using any two wires of the three-phase supply.

For the latest prices, please check AutomationDirect.com.

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HUBBELL® Acme Electric®

Acme Dry-Type Encapsulated Single-Phase Distribution Transformers Selection Guide

Part Number	Price	kVA Rating	Primary (Volts)	Secondary (Volts)	Impedance %Z	Total Heat Dissipation (W)	Mounting Type	Weight lb [kg]	Wiring Diagram	Drawing
T253007S	$05dn6:	0.25	240X480 50/60 Hz	120/240	11.84%	154.50	Wall	10 (4.5)	A	PDF
T253008S	$05dn7:	0.50			8.74%	249.49		15 (6.8)	A	PDF
T253009S	$05dn8:	0.75			6.93%	326.77		19 (8.6)	A	PDF
T253010S	$05dn9:	1.0	240X480 60Hz	120/240	7.04%	367.85	Wall	24 (10.9)	A	PDF
T253011S	$05dna:	1.5			4.33%	419.71		30 (13.6)	A	PDF
T253012S	$05dnb:	2.0			4.00%	529.47		38 (17.2)	A	PDF
T2530134S	$05dnc:	3.0			3.74%	704.34		55 (24.9)	B	PDF
T2530144S	$05dnd:	5.0			2.61%	1023.12		75 (34.0)	B	PDF
T2535153S	$05dne:	7.5			2.16%	665.31		115 (52.2)	C	PDF
T2535163S	$;05dnf:	10			3.48%	1371.04		125 (56.7)	C	PDF
T2535173S	$;005dng:	15			3.29%	971.81		170 (77.1)	C	PDF
T2535183S	$;005dnh:	25			1.31%	1263.63		250 (113.0)	C	PDF
T253108S	$-05dni:	0.50	600 50/60 Hz	120/240	8.62%	248.12	Wall	15 (6.8)	D	PDF
T253109S	$-05dnj:	0.75			7.08%	330.86		19 (8.6)	D	PDF
T253110S	$05dnk:	1.0	600 60Hz	120/240	7.14%	371.98	Wall	24 (10.9)	D	PDF
T253111S	$-05dnl:	1.5			5.15%	471.47		30 (13.6)	D	PDF
T253112S	$05dnn:	2.0			4.05%	533.57		38 (17.2)	D	PDF
T2531131S	$05dno:	3.0			3.28%	659.44		55 (24.9)	E	PDF
T2531141S	$05dnp:	5.0			2.42%	1028.79		75 (34.0)	E	PDF
T2536151S	$;005dnq:	7.5			4.10%	642.00		115 (52.2)	E	PDF
T2536161S	$;005dns:	10			2.71%	727.64		125 (56.7)	E	PDF
T2536171S	$;;005dnt:	15			3.35%	911.31		170 (77.1)	E	PDF
T279740S	$05dnu:	1.0	120/208/240/277 60Hz	120/240	5.22%	317.32	Wall	23 (10.4)	G	PDF
T279741S	$05dnv:	1.5			3.83%	246.41		30 (13.6)	G	PDF
T279742S	$05dnx:	2.0			3.24%	527.53		37 (16.8)	G	PDF
T279743S	$05dny:	3.0			2.86%	613.24		55 (24.9)	G	PDF
T279744S	$05dnz:	5.0			2.27%	970.30		75 (34.0)	G	PDF
T279745S	$;;005dn]:	7.5			2.69%	483.00		105 (47.6)	H	PDF
T279746S	$;;005dn[:	10			1.78%	594.71		124 (56.2)	H	PDF

CE Marked Export Models Selection Guide

TF217437S	$05dn_:	1.0	190/200/208/220 x 380/400/416/440 50/60 Hz	120/240	8.08%	398.83	Wall	24 (10.9)	F	PDF
TF217439S	$05dn#:	2.0			4.67%	630.16		38 (17.2)	F	PDF
TF249873S	$;05dn!:	3.0			3.49%	748.83		55 (24.9)	F	PDF
TF252520S	$05dn?:	5.0			2.95%	1159.36		75 (34.0)	F	PDF
TF252794S	$;;005dn,:	7.5			2.86%	695.40		115 (52.2)	F	PDF
TF252795S	$;005do0:	10			3.01%	827.48		125 (56.7)	F	PDF

Note: A wall mounting bracket is included with each transformer. The bracket ships loose and is located in the wiring compartment.

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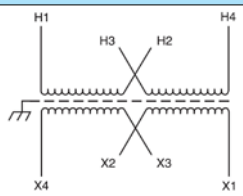
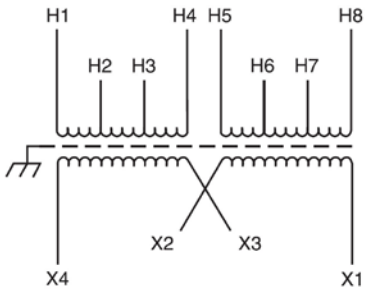
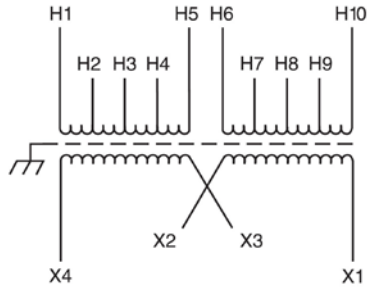
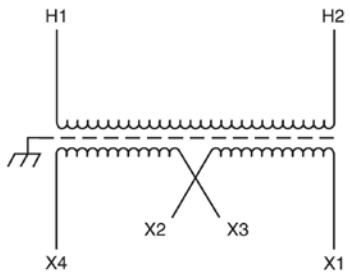
Wiring Diagrams

WIRING DIAGRAM A ***Primary: 240x480*** ***Secondary:120/240*** ***Taps: None***	***Primary Volts***	***Connect Primary Lines To***	***Inter-connect***	***Connect Secondary Lines To***
	480	H1-H4	H2 to H3	–
	240	H1-H3 & H2-H4	–	–
	***Secondary Volts***	***Connect Lines To***	***Inter-connect***	
	240	–	X2 to X3	X1-X4
	120/240	–	X2 to X3	X1-X2-X4
	120	–	X1 to X3, X2 to X4	X1-X4
WIRING DIAGRAM B ***Primary: 240x480*** ***Secondary: 120/240*** ***Taps: 2, 2.5% ANFC, 2, 2.5% BNFC***	***Primary Volts***	***Connect Lines To***	***Inter-connect***	
	252	H1-H8	H1 to H5, H4 to H8	–
	240	H1-H7	H1 to H5, H3 to H7	–
	228	H1-H6	H1 to H5,H2 to H6	–
	504	H1-H8	H4 to H5	–
	492	H1-H8	H3 to H5	–
	480	H1-H7	H3 to H5	–
	468	H1-H7	H2 to H5	–
	456	H1-H6	H2 to H5	–
	Secondary Volts	***Connect Lines To***	***Inter-connect***	
	240	–	X2 to X3	X1-X4
	120/240	–	X2 to X3	X1-X2-X4
	120	–	X1 to X3, X2 to X4	X1-X4
WIRING DIAGRAM C ***Primary: 240x480*** ***Secondary: 120/240*** ***Taps: 2, 2.5% ANFC, 4, 2.5% BNFC***	***Primary Volts***	***Connect Lines To***	***Inter-connect***	
	216	H1-H10	H1 to H9, H10 to H2	–
	228	H1-H10	H1 to H8, H10 to H3	–
	240	H1-H10	H1 to H7, H10 to H4	–
	252	H1-H10	H1 to H6, H10 to H5	–
	432	H1-H10	H2 to H9	–
	444	H1-H10	H3 to H9	–
	456	H1-H10	H3 to H8	–
	468	H1-H10	H4 to H8	–
	480	H1-H10	H4 to H7	–
	492	H1-H10	H5 to H7	–
	504	H1-H10	H5 to H6	–
	Secondary Volts	***Connect Lines To***	***Inter-connect***	
	240	–	X2 to X3	X1-X4
	120/240	–	X2 to X3	X1-X3-X4
	120	–	X1 to X3, X2 to X4	X1-X4
WIRING DIAGRAM D ***Primary: 600*** ***Secondary: 120/240*** ***Taps: None***	***Primary Volts***	***Connect Lines To***	***Inter-connect***	
	600	H1-H2	–	–
	Secondary Volts	***Connect Lines To***	***Inter-connect***	
	240	–	X2 to X3	X1-X4
	120/240	–	X2 to X3	X1-X2-X4
	120	–	X1 to X3, X2 to X4	X1-X4

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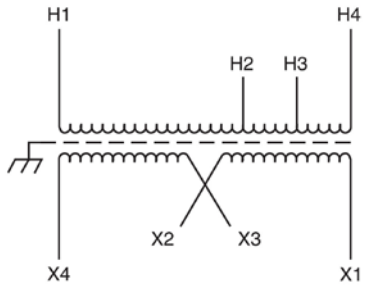
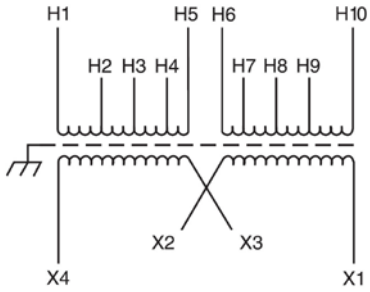
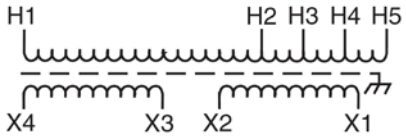
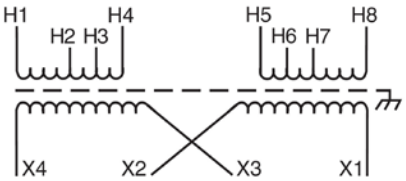
Wiring Diagrams (continued)

WIRING DIAGRAM E Primary: 600 Secondary:120/240 Taps: 2, 5% BNFC	Primary Volts	Connect Primary Lines To	Inter-connect	Connect Secondary Lines To
	600	H1-H4	–	–
	570	H1-H3	–	–
	540	H1-H2	–	–
	Secondary Volts	**Connect Lines To**	**Inter-connect**	
	240	–	X2 to X3	X1-X4
	120/240	–	X2 to X3	X1-X2-X4
	120	–	X1 to X3, X2 to X4	X1-X4

WIRING DIAGRAM F Primary: 190-220 x 380-440 Secondary: 120/240	Primary Volts	Connect Lines To	Inter-connect	
	190	H1 & H7	H1 to H6, H2 to H7	–
	200	H1 & H8	H1 to H6, H3 to H8	–
	208	H1 & H9	H1 to H6, H4 to H9	–
	220	H1 & H10	H1 to H6, H5 to H10	–
	380	H1 & H7	H2 & H6	–
	400	H1 & H8	H3 & H6	–
	416	H1 & H9	H4 & H6	–
	440	H1 & H10	H5 & H6	–
	Secondary Volts	**Connect Lines To**	**Inter-connect**	
	240	–	X2 to X3	X1-X4
	120/240	–	X2 to X3	X1-X2-X4
	120	–	X1 to X3, X2 to X4	X1-X4

WIRING DIAGRAM G Primary: 120/208/240/277 Secondary: 120/240	Primary Volts	Connect Lines To	Inter-connect	
	277	H1, H5	–	–
	240	H1, H4	–	–
	208	H1, H3	–	–
	120	H1, H2	–	–
	Secondary Volts	**Connect Lines To**	**Inter-connect**	
	120		X1 to X3, X2 to X4	X1-X4
	120/240		X2 to X3	X1-X2-X4
	240		X2 to X3	X1-X4

WIRING DIAGRAM H Primary: 120/208/240/277 Secondary: 120/240	Primary Volts	Connect Lines To	Inter-connect	
	120	H1 & H8	H1 to H6, H3 to H8	–
	208	H1 & H8	H2 to H7	–
	240	H1 & H8	H3 to H6	–
	277	H1 & H8	H4 to H5	–
	Secondary Volts	**Connect Lines To**	**Inter-connect**	
	240	–	X2 to X3	X1 & X4
	120/240	–	X2 to X3	X1, X3, X4
	120	–	X1 to X3, X2 to X4	X1 & X4