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Transformers

Dry Type Distribution 600 Volt Class^①

General

Siemens dry type distribution transformers are rated 600 volt class and are available in a wide variety of ratings to provide versatile electrical distribution for general purpose, lighting and power loads in commercial and industrial applications.

Ratings are available from 0.25 through 167 kVA single phase, and 3 through 1000 kVA 3-phase. A variety of primary and secondary voltage ratings are available to match the load requirements to the distribution system. All units meet applicable ANSI and NEMA standards. Standard designs are UL Listed. Transformers are designed, manufactured, and tested in accordance with ANSI, NEMA and IEEE Standards and are UL Listed. All units are fungus resistant. Fungus proof is not an option.



Encapsulated Transformer



Ventilated Transformer

Encapsulated

- The self-cooled kVA rating shall be suitable for 30°C average, 40°C maximum ambient temperature.
- Ratings from 0.25 kVA through 25 kVA, 1-phase, and from 3 kVA through 15 kVA 3-phase are available.
- Feature indoor/outdoor enclosures with integral wall mounting brackets, and either a 135°C rise, 180°C insulation system or a 95°C rise, 130°C insulation system.

Ventilated

- Ratings from 15 kVA through 167 kVA 1- phase, and from 15 kVA through 1000 kVA 3-phase are available.
- Indoor NEMA 1/3R enclosures with 150oC rise and 220oC insulation systems are standard. Many options are available.②
- Three phase designs 15 kVA through 75 kVA and single phase designs 15 kVA through 50 kVA include primary

and secondary terminal lugs. Refer to the lug table on page 8-8 for more information. Call customer support for confirmation.

- 1-phase up to 167 kVA and 3-phase up to 750kVA are Seismic certified for floor mounting. Call customer support for larger kVA certification or wall mounting applications.

DOE 2016 Efficiency Standards

- Department of Energy (DOE) 10 CFR 431 released efficiency standards which will take effect January 1, 2016.
- New efficiency standards apply to dry-type three-phase ventilated transformers, including Harmonic Mitigating Transformers from 15 kVA to 1000kVA
- New standards will surpass and supersede NEMA TP1 standards and will make NEMA Premium obsolete.
- DOE 2016 design typically contain higher grade steels and different styles of cores and possibly higher weights.
- Dry type, three phase ventilated transformers must be manufactured to DOE 2016 standards after January 1, 2016
- NEMA TP1 rated transformers will still be available for single phase transformers after January 1, 2016
- See accompanying chart for efficiency increases for DOE 2016 standards.

Comparison of 3-Phase LV Transformer Efficiency

kVA	TP1	NEMA Premium ^①	DOE 2016
15	97.00%	97.90%	97.89%
30	97.50%	98.25%	98.23%
45	97.70%	98.39%	98.40%
75	98.00%	98.60%	98.60%
112.5	98.20%	98.74%	98.74%
150	98.30%	98.81%	98.83%
225	98.50%	98.95%	98.94%
300	98.60%	99.02%	99.02%
500	98.70%	99.09%	99.14%
750	98.80%	99.16%	99.23%
1000	98.90%	99.23%	99.28%

①NEMA Premium will no longer be available after January 1, 2016 due to DOE 2016 requirements.

Distribution Dry Type Transformers

600 Volts Class — Single and Three Phase

Selection

600 Volts Class

Single Phase 0.25-167 kVA

Three Phase 3-1000 kVA

Features

- Standard units are UL listed and are designed in accordance with ANSI, NEMA (ST20) and IEEE standards

Encapsulated

- UL listed designs (UL 506)
- Totally enclosed, non-ventilated, heavy gauge steel enclosure
- Core and coil completely embedded within a resin compound for quiet, low temperature operation
- Encapsulation seals out moisture and air
- UL listed indoor/outdoor enclosure features integral wall mounting brackets
- Rugged design resists weather, dust, and corrosion
- Efficient, compact, lightweight, easy to install
- Flexible wiring leads that terminate within the bottom wiring compartment
- Large wiring compartment on the bottom with convenient knockouts
- High quality non-aging electrical grade core steel
- Precision wound coils

Ventilated

- UL listed designs (UL 1561)
- Designed for indoor NEMA 2 installations. NEMA 3R enclosures suitable for outdoor locations available as an option
- Core and coils are designed with UL listed high-temperature materials rated for 220°C; standard units feature 150°C winding temperature rise
- Optional low temperature rise of 115° C or 80° C winding temperature rise for increased efficiency and additional overload capability
- Rugged sheet steel enclosure per UL1561, UL506 standards with removable panels for access to the internal wiring area
- Neoprene noise dampening pads isolate the core and coil from the enclosure
- Optional drip shields/weathershield and wall brackets available

Ⓞ Temp rise and insulation system values shown are typical. Variation in these values may exist depending on size, design and series, but will comply with the requirements of UL506 and UL1561

Ⓞ 2014 NEMA ST20 allows addition of 3dB for 30 kVA and above ventilated units with K13 or K20 ratings. For totally enclosed (sealed):0-150 kVA add 5 dB, 151-300 kVA add 2dB, and above 300kVA minus 1dB.

Single Phase Transformer Ampere Ratings

Single Phase Full Load Amperes (FLC)						
kVA	120V	208V	240V	277V	480V	600V
0.25	2.0	1.2	1.0	0.9	0.5	0.4
0.50	4.2	2.4	2.1	1.8	1.0	0.8
0.75	6.3	3.6	3.1	2.7	1.6	1.3
1	8.3	4.8	4.2	3.6	2.1	1.7
1.5	12.5	7.2	6.2	5.4	3.1	2.5
2	16.7	9.6	8.3	7.2	4.2	3.3
3	25	14.4	12.5	10.8	6.2	5
5	41	24	20.8	18.0	10.4	8.3
7.5	62	36	31	27	15.3	12.5
10	83	48	41	36	20.8	16.7
15	125	72	62	54	31	25
25	206	120	104	90	52	41
37.5	312	180	156	135	76	62
50	416	240	208	180	104	83
75	625	340	312	270	156	125
100	833	480	416	361	208	166
167	1391	803	695	603	347	278

Three Phase Transformer Ampere Ratings

Three Phase Full Load Amperes (FLC)				
kVA	208V	240V	480V	600V
3	8.3	7.2	3.6	2.9
6	16.6	14.4	7.2	5.8
9	25	21.6	10.8	8.6
15	41.7	36.1	18.0	14.4
30	83.4	72.3	36.1	28.9
45	124	108	54.2	43.4
75	208	180	90	72
112.5	312	270	135	108
150	416	360	180	144
225	624	541	270	216
300	832	721	360	288
500	1387	1202	601	481
750	2084	1806	903	723
1000	2779	2408	1204	963

Insulation Class and Temperature Rise[Ⓞ]

kVA		Insulation	
1-Phase	3-Phase	Temperature Class	Temperature Rise
0.25-1	N/A	130° C	95° C
1.5-25	3-15	180° C	135° C
15-167	15-1000	220° C	150° C

Sound Level in Decibels[Ⓞ] – 600V Class

kVA	Self Cooled Ventilated			kVA	Self Cooled Ventilated		Self Cooled Sealed
	K Factor: 1, 4, 9	K Factor: 13, 20	Self Cooled Sealed		K Factor: 1, 4, 9	K Factor: 13, 20	
NEMA Average DB				NEMA Average DB			
0-3.00	40	40	45	112.51-150.00	50	53	55
3.01-9.00	40	40	45	150.01-225.00	55	58	57
9.01-15.00	45	45	50	225.01-300.00	55	58	57
15.01-30.00	45	45	50	300.01-500.00	60	63	59
30.01-50.00	45	48	50	500.01-700.00	62	65	61
50.01-75.00	50	53	55	700.01-1000.00	64	67	63
75.01-112.50	50	53	55				

Transformers

Dry Type Distribution 600 Volt Class^①

Specifications

Standard Construction Features

Transformers rated 15 kVA and larger shall be a ventilated dry type with a UL Listed 220°C insulation system. Units shall be designed to operate with a rated maximum temperature rise of 150°C (Optional 115°C or 80°C rise can be specified).

Construction shall consist of aluminum windings and arranged to brace coil layers and provide maximum ventilation. (Optional copper windings can be specified). Cores shall be constructed of non-aging electrical grade steel with high magnetic permeability and low loss characteristics.

Core laminations shall be tightly assembled. The complete core and coil assembly shall be impregnated with non-hydroscopic thermo-setting varnish to provide a high dielectric, moisture resistant, flame retardant seal that is inherently fungus-resistant.

Core and coil assemblies shall be constructed to provide short circuit withstand capability as defined by ANSI and NEMA standards. The complete assembly shall be installed on vibration dampening pads to reduce noise and will be securely bolted to the enclosure base. A flexible grounding conductor shall be installed between the core and coil assembly and the transformer enclosure.

Enclosures shall be ventilated, heavy gauge steel construction finished with light gray paint. Front and rear covers shall be removable to provide access to the terminal compartment. Terminals shall be fully sized to carry the transformer full load current and shall be arranged to accept required UL-Listed cable connectors. Units installed outdoors shall have a UL-Listed type 3R outdoor enclosure, or shall be UL Listed with optional weathershields installed. Standard voltage ratings shall be supplied with NEMA standard taps for the high voltage windings. Unless specified otherwise, average sound levels (150°C rise) shall meet the NEMA ST20 standards.

Each transformer shall have a securely attached nameplate providing complete electrical ratings, wiring diagram, tap connections, and catalog number, as applicable.

K-Factor Rated for Non-Linear Loads

Siemens offers transformer designs which meet K-Factor ratings. K-Factor is a ratio between the additional losses due to harmonics and the eddy losses at 60Hz. It is used to specify transformers for non-linear loads. Note that K-Factor transformers do not eliminate harmonic distortion; they withstand the non-linear load condition without overheating.

K-Factor Features

- Designed to ANSI and NEMA Standards
- UL K-Factor Listed per UL 1561
- K-Factor Rating Designed to IEEE c57.110
- Aluminum Wound Coils
- Core, Conductors designed for Harmonics and Eddy Currents 150°C
- Rise, 220°C Insulation
- Electrostatic Shield to Attenuate Line Transients
- 200% Neutral Bar (2X Phase current)
- NEMA 3R Enclosure is standard

Transformers shall be designed, manufactured, and tested in accordance with ANSI, NEMA and IEEE Standards and shall be UL Listed. The self-cooled kVA rating shall be suitable for 30°C average, 40°C maximum ambient temperature. Non-Linear rated transformers shall be suitable for nonsinusoidal loads and harmonic distortion as indicated in IEEE C57.110, and shall be designed with the following K-Factor rating (choose one):

- K4 for 50% Non-Linear load
- K13 for 100% Non-Linear load
- K20 for 150% Non-Linear load
- K30 for 200% Non-Linear load

Non-Linear rated transformers shall be UL Listed and shall bear the UL marking on the nameplate along with the specified K-Factor rating. Non-Linear rated transformers shall include the following design features:

- a) Core designed to withstand voltage distortion and high frequency harmonic currents. Magnetic flux density designed to reduce eddy currents and prevent saturation or overheating of the core
- b) Primary and secondary coils designed to minimize stray losses, skin effect losses, and excessive heating from harmonic currents. Coils shall not exceed the specified winding temperature rise, the corresponding hot spot temperature rating, or the 220°C insulation rating while carrying the specified Non-Linear load.
- c) Neutral bus sized for 200% of rated current to withstand circulating currents and triplen harmonics.
- d) An Electrostatic Shield between the primary and secondary winding and grounded to a common point within the transformer enclosure. When properly grounded, the shield shall provide noise isolation and attenuate common mode and transverse mode noise transients under normal loading conditions.
- e) The design and materials used shall enable the transformers to comply with NEMA TP1 efficiency standards.

Options

- Special K-Factor ratings
- Special voltage ratings
- NEMA 3R Enclosure
- 80° or 115°C temperature rise
- Low noise designs
- Copper windings
- Drip Shields (when not provided as standard – see chart on page 8-8)
- Wall mounting brackets (15–75 kVA) (standard in most cases)
- NEMA Premium[®] Efficiencies until January 1, 2016

^①Temp rise and insulation system values shown are typical. Variation in these values may exist depending on size, design and series, but all will comply with the requirements of UL506 and UL1561.

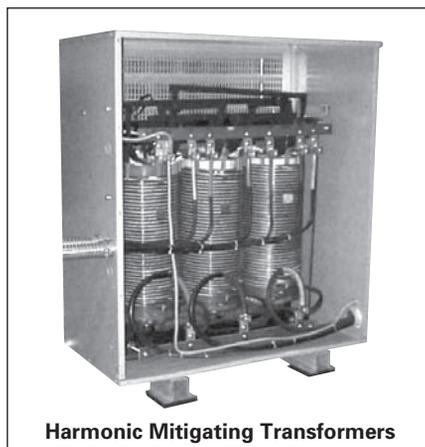
Distribution Dry Type Transformers

Overview of Transformer Offerings

Selection



Sentron Power Centers



Harmonic Mitigating Transformers



Buck-Boost Transformers

Single Phase Transformers

Siemens offers single phase transformers from 0.25 kVA to 167 kVA with aluminum windings. Common optional modifiers include Low Temperature Rise, Electrostatic Shield, Copper Windings, Wall Mounting Brackets and Drip Shields. See Page 8-10 for common single-phase transformer offerings.

Three Phase Transformers

Siemens offers three phase transformers from 3 kVA through 1000kVA with aluminum windings. Common optional modifiers include K factor, Low Temperature Rise, Electrostatic Shield, Copper Windings, Low Noise, Wall Mounting Brackets, and Drip Shields. All three phase dry-type ventilated transformers will be manufactured to DOE 2016 efficiency standards after January 1, 2016. See page 8-12 for common three-phase transformer offerings.

Motor Drive Isolation Transformers

Siemens Drive Isolation Transformers are designed to meet the rugged demands of AC and DC variable speed drives and to provide circuit isolation from SCR's. The separate primary and secondary windings provide isolation between the incoming line and the load, minimizing line disturbances, feedback and transients caused by SCR firing. Common optional modifiers include low temperature rise, electrostatic shields, copper windings, thermal switches, wall mounting brackets and drip shields. See page 8-16 for more details.

Sentron Power Centers

Siemens Sentron Power Center is a pre-wired combination of a primary breaker disconnect, dry type shielded transformer, secondary breaker disconnect and a secondary power panel all in one convenient package. You save time, space and money by not having to individually assemble, mount and wire these components. Simply add the branch breakers and you're ready to go. Both plug-on and bolt-on breaker panels are available. All Sentron Power Centers are UL-3R listed for indoor and outdoor use. See page 8-17 for more details.

Harmonic Mitigating Transformers

The Sentron Harmonic Mitigating Transformers (HMTs) are designed to meet the needs of modern power distribution systems that contain a large percentage of non-linear equipment that produces harmonics. The Sentron HMTs are specially designed to operate under high non-linear load conditions and have the additional benefit of improving the overall power system reliability. Siemens Sentron Harmonic Mitigating Transformers are only available in three-phase with either one or two secondaries (outputs). See page 8-20 for more details. DOE 2016 efficiency standards apply after January 1, 2016.

Buck-Boost Transformers

The Buck-Boost Transformer has four separate windings; two windings in the primary and two windings in the secondary. It can be used as either an insulating transformer or autotransformer. As an autotransformer, the unit can be corrected to Buck (decrease) or Boost (increase) a supply voltage. Since autotransformers may transmit line disturbances directly, they may be prohibited in some areas by local building codes. As insulating transformers, these units can accommodate a high voltage of 120, 240, or 480 volts. For units with two 12 volt secondaries, two 16 volt secondaries, or two 24 volt secondaries, the output can be wired for either secondary voltage, or for 3-wire secondary. The unit is rated (kVA) as any conventional unit. See Page 8-23 for more details.

Distribution Dry Type Transformers

• Revised •
10/20/15

Catalog Number Coding System for Transformers

Selection

Basic Rating Information

(The first five options are dedicated to Basic Rating Information and are the beginning of all Transformer part numbers)

Primary and Secondary terminal lugs are included on certain ventilated transformers. See chart on page 8-8 for lug information

Phase	Suffix
1-Phase	1
3-Phase	3

Primary Voltage	Configuration	Suffix
240x120 V	1Ph	A
208 V	3Ph Delta	B
240 V	3Ph Delta	C
480x240 V	1Ph	D
277 V	1Ph	E
480 V	3Ph Delta	F
600 V	3Ph Delta	G
190/200/208/220x380	400/416/440	H
190/208/220/240x380	416/440/480	X

Secondary Voltage ^①	Suffix
240D/1Ph 120V ^②	1
240	2
208Y/120	3
480D	4
480Y/277	5
280Y/219	6
230Y/133	7
220D/1Ph 110V ^②	8
400Y/231	9
416Y/240	0

Taps ^③	Suffix
None	N
2-5% FCBN	R
2-5% (1 FCAN, 1 FCBN)	S
4-2.5% (2 FCAN, 2 FCBN)	T
2-2.5% FCBN	U
4-2.5% FCBN	X
6-2.5% (2 FCAN, 4 FCBN)	Y
4-3.1% (2 FCAN, 2 FCBN)	J
2-3.5% (1 FCAN, 1 FCBN)	K
3-5% (1 FCAN, 2 FCBN)	M

① 380V Delta secondary is available by special quote.
② Includes center tap on one phase often referred to as a lighting tap.

③ Taps are determined by transformer design and are not selectable on standard catalog units.

Optional Modifiers (If applicable, add suffix to part number in this order, from left to right)

3 F 3 Y 150 K13 F ES C LN3 Z4 TE TEE TP1 LZ

Basic Rating Information

kVA	Suffix
0.25	205
0.5	505
0.75	705
1	001
1.5	105
2	002
3	003
5	005
6	006
7.5	007
9	009
10	010
15	015
25	025
30	030
37.5	037
45	045
50	050
75	075
100	100
112.5	112
150	150
167	167
225	225
300	300
500	500
750	750
1000	000

Optional Modifiers

(To create a Transformer part number, add applicable suffixes after Basic Rating Information in the order shown here and on next page)

Modifier	Suffix	Description
K-Factor	K4	K-Factor of 1 is standard for all and is not shown as part of part number. Addition of K-Factor options 4-through 30 include Electrostatic Shield (ES) option and 200% neutral
	K13	
	K20	
	K30	
Low Temperature Rise	150C temperature rise with 220 insulation class is standard, no suffix code is needed	
	B	B=80C (80° C temp rise, can tolerate 30% continuous overload) ^④
	F	F=115C (115° C temp rise, can tolerate 15% continuous overload) ^④
Electrostatic Shield	G	G=130C
	ES	Electrostatic shield (full width copper foil) for added noise attenuation and reduction of high frequency disturbances.
		ES is standard with K4-K30 options, so it is not included in catalog number with K4-K30 options. Common mode attenuation is either 50dB (Series J) or 60dB (Series H). Transverse mode Attenuation is either 10dB (Series H) or 30dB (Series J).
Copper Wound	ES2	ES2=dual (only applicable to HD1). Series H only.
	C	C=Copper Windings. Aluminum windings are standard, no suffix code needed.
Low Noise	LN3	LN3=3dB below NEMA ST20
	LN5	LN5=5dB below NEMA ST20
	LN()	()=dB below NEMA ST20. Contact sales office for levels other than LN3 & LN5.
Seismic rated	Z4	See chart on page 8-8 for available seismic ratings, not part of catalog number when standard.
Totally Enclosed (Non-Ventilated)	TE	TE for Series H is NEMA 4 as a standard. TE for Series J is NEMA 3R as a standard. Other NEMA types available. TE option not available with D16.
Totally Enclosed Encapsulated	TEE	Same as TE except encapsulated. TEE not available with D16.
Energy Efficient	D16	D16=DOE 2016 standards. DOE 2016 standards will replace TP1 For 3 Phase Ventilated Dry Type Transformers for 15 kVA-1000kVA starting Jan. 1, 2016
	TP1	Still valid for single phase and all non ventilated transformers after Jan. 1, 2016
Frequency	LZ	Standard is 60 Hertz. LZ option is 50/60 Hz. Not available with TP1 and D16.

Note 1: If the catalog number will not completely describe the product, it will be identified as SPC-- -kVA-XFMR. Note 2: "JST" suffix has been removed. Standard units are in stock for immediate shipment in many cases. Contact customer support. ^④ With continuous overloads these units will be operating at 150 C rise designs.

Distribution Dry Type Transformers

Catalog Number Coding System for Transformers

• Revised •
10/20/15

Selection

Optional Modifiers (continued)

Modifier	Suffix	Description
Harmonic Mitigation		HD1 for DOE 2016 standard 3 phase dry type ventilated transformers only. Series H only.
	HD1	HD1=1 secondary/single output
"NEMA Premium"	NP	Surpasses NEMA-TP1 (Combine NP with available combined options as shown: "TP1...NP", "HM1...NP", "HM2...NP"). DOE 2016 standards surpass NP. NP not available after January 1, 2016 for DOE 2016 3 phase ventilated dry type transformers (15kVA-1000kVA). NP 1-phase will continue to be available after this date.
		Only to be used with suffix code HD1
Phase Shift for HD1	0	0 degree lagging
	30	30 degree lagging

Optional Product Offerings

1. For non-standard or non-cataloged voltages or non-cataloged primary taps refer to sales office.
2. Non-standard application, 50/60 Hz, special impedance, voltage, etc.- consult sales office.
3. Auto transformers (A)- see page 8-11.
4. Non-standard paint color-contact sales office.
5. Harmonic mitigating transformers-see page 8-15.
6. Transformer and panel combinations- see page 8-13 & 8-14.

Optional Modifiers—continued (If applicable, add suffix to part number in this order, from left to right)

HD1	NP	30	TS7	TV	TB	SS	SSN4X	I3	CC	W	VG	DS
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Optional Modifiers (continued)

Modifier	Suffix	Description
Thermal Switches		Typical Thermal Switch is 2.5 A and 250V max, typical installation is one TS per coil with wires brought to a modular screw terminal block on top of the transformer. Customer must specify NO or NC contacts. Contact customer support for special requirements.
	TS7 ()	170C () =no value: 1 switch
	TS8 ()	180C () = 2: 2 switches
	TS0 ()	200C () = 6: 6 switches
TVSS/SPD	TV	Filter Capacitors Secondary Side with Surge Suppression. Available for Series H only. Must specify 100kA or 200kA surge rating.
Terminal Block	TB	Contact customer support for standard terminal block availability. If special terminating requirements please advise
Stainless Steel Enclosure	SS	304 stainless (NEMA 3R if no NEMA type qualifier is specified)
	SS316	316 stainless (NEMA 3R if no NEMA type qualifier is specified)
Enclosure Types		304 stainless is standard. Stainless steel 316 available with a special quote.
	SSN4X	Non-Metallic NEMA 4X option not available.
		Standard is grey painted steel. 304 is standard for stainless steel option and 316 Stainless steel is available with a special quote.
	N12	NEMA 12 (SSN12 with 304 stainless) 316 available with special quote
	N4	NEMA 4 (SSN4 with 304 stainless) 316 available with special quote
Special Impedance		I2.5 to I6.5 typical. Contact customer service for special requirements
	I2.5	I2.5=2.5% max
	I3	I3=3% max
	I4	I4=4% max
Core and Coil Assembly	CC	Name plate is displayed on frame bracket. Product may be shipped with or without enclosure.
Wall Mounting Brackets	W [Ⓞ]	Some DOE 2016 3 Phase Dry Type Ventilating Transformers include Wall Brackets. See chart on next page for non-DOE availability and DOE 2016 details.
Vent Guard	VG	Vent Guard is a Mesh screen to prevent vent opening access.
Drip Shields (weathershields)	DS [Ⓞ]	Most DOE 2016 Dry Type Ventilating Transformers include Drip Shields from 15kVA to 1000kVA. See chart on next page for availability. Also see non-DOE availability.

Ⓞ The W and DS codes are not always part of the catalog number. Only shown as reference when it is not a standard feature of the device.

Distribution Dry Type Transformers

Catalog Number Coding System for Transformers

Selection

Seismic Rated:

All others not listed below are not seismic rated
(contact customer support for Wall Mounting Ratings if needed)

Phase	Encapsulated	Ventilated	
	Series J	Series J	Series H
1	1-25kVA (Wall Mounted)	1-167 kVA (Floor Mounted)	15-167kVA (Floor Mounted Only)
3	3-75kVA (Floor Mounted)	1-1000kVA (Floor Mounted)	15-750kVA (Floor Mounted Only) ^①
DOE 2016 3 Phase Ventilated			
3	NA	1-1000kVA (Floor Mounted)	15-750kVA (Floor Mounted Only)

① Seismic labels are standard up to 225kVA with 150C temperature rise. To get seismic label with 225kVA at other temperature rises or above 225kVA, include Z4 option in catalog number and contact MAP for special quote.

Wall Mounting Brackets and Drip Shields

1 Phase Dry Type Wall Brackets/Drip Shields				
kVA	Wall Mounting Brackets (W)		Drip Shields (DS)	
	Series J	Series H	Series J	Series H
0.25-25 Encapsulated	Wall Mount only	NA	NA	NA
All items below are Ventilated				
15, 25	Optional*	Standard	Optional*	Standard
37.5	Optional*	See Note 1	Optional*	Standard
50	Optional*	See Note 2	Optional*	Standard
75	NA	See Note 3	Optional*	Standard
100-500	NA		Optional*	Standard
3 Phase Dry Type Ventilated DOE 2016 Wall Brackets/Drip Shields				
kVA	Wall Mounting Brackets (W)		Drip Shields (DS)	
	Series J	Series H	Series J	Series H
15, 30	Optional**	Standard	Standard	Standard
45	Optional**	See Note 1	Standard	Standard
75	See Note 4	See Note 3	Standard	Standard
112.5-1000	N/A	See Note 5	Standard	Standard
3 Phase Dry Type Encapsulated				
kVA	Wall Mounting Brackets (W)		Drip Shields (DS)	
	Series J	Series H	Series J	Series H
3-15	Standard	Standard	N/A	N/A

1. Standard except with options B, K13, K 20. Kits are available with these options. 75kVA wall bracket kit#TWB75H may be used for some exceptions. Contact customer support.
2. Standard except with options B and F. 75kVA wall bracket kit #TWB75H may be used for some exceptions. Contact customer support.
3. Not included with standard. Kit #TWB75H is available except with options B, F, K4, K13, K20.
4. Optional except with copper windings or options B, K13, K20. See table page 8-26.
5. Available for 112.5 with 150 deg C Temperature Rise only; no other rise option. Can include K4 but no higher K-rating. Wall bracket kit not available above 112.5kVA.

* Included at no extra charge when ordered with transformer.
**For DOE 2016, cost of transformer will not include wall brackets.
Wall brackets will be an additional charge.

Standard Terminal Lug Offerings^②

(Primary and Secondary) for Ventilated Transformers

1-Phase					3-Phase				
kVA	120/240V	208V	480V	600V	kVA	120/240V	208V	480V	600V
0-15	Contact customer support				0-15	Contact customer support			
15	#2/0-6	#14-2	#14-2	#14-2	15	#14-2	#14-2	#14-2	#14-2
25	250MCM-6	250MCM-6	#14-2	#14-2	30	#2/0-6	#2/0-6	#14-2	#14-2
37.5	350MCM-6	350MCM-6	#14-2	#14-2	45	250MCM-6	250MCM-6	#14-2	#14-2
50	600MCM-2	600MCM-2	#2/0-6	#2/0-6	75	600MCM-2	350MCM-6	#2/0-6	#2/0-6
>50	Contact customer support				>75	Contact customer support			

② Values listed above are for standard configurations.
There may be slight variations depending on requirements.
Contact Customer Support for special requirements

Distribution Dry Type Transformers

Single Phase

Selection

kVA	Catalog Number	Taps ^①	Temperature Rise	Insulation	Mounting Type ^{②③}	Drip Shield Required ^③	Enclosure Style ^④	Optional Modifications
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208 Volts Primary, 120/240 Volts Secondary

1	1B1N001	N	95° C	130° C	Wall	No	Encapsulated	1, 2, 3
2	1B1N002	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
3	1B1N003	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
5	1B1N005	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
7.5	1B1N007	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
10	1B1N010	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	1B1N015	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	1B1Y015TP1	Y	150° C	220° C	Floor & Wall ^⑤	Yes ^⑤	Ventilated	1, 2, 3, 4, 5
25	1B1Y025TP1	Y	150° C	220° C	Floor & Wall ^⑤	Yes ^⑤	Ventilated	1, 2, 3, 4, 5
37.5	1B1Y037TP1	Y	150° C	220° C	Floor & Wall ^⑤	Yes ^⑤	Ventilated	1, 2, 3, 4, 5
50	1B1Y050TP1	Y	150° C	220° C	Floor & Wall ^⑤	Yes ^⑤	Ventilated	1, 2, 3, 4, 5
75	1B1Y075TP1	Y	150° C	220° C	Floor	Yes ^⑤	Ventilated	1, 2, 3, 5
100	1B1Y100TP1	Y	150° C	220° C	Floor	Yes ^⑤	Ventilated	1, 2, 3, 5
167	1B1Y167TP1	Y	150° C	220° C	Floor	Yes ^⑤	Ventilated	1, 2, 3, 5

240 × 480 Volts Primary, 120/240 Volts Secondary

.25	1D1N205	N	95° C	130° C	Wall	No	Encapsulated	1, 2, 3
.50	1D1N505	N	95° C	130° C	Wall	No	Encapsulated	1, 2, 3
.75	1D1N705	N	95° C	130° C	Wall	No	Encapsulated	1, 2, 3
1.0	1D1N001	N	95° C	130° C	Wall	No	Encapsulated	1, 2, 3
1.5	1D1N105	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
2.0	1D1N002	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
3.0	1D1N003	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
5.0	1D1N005	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
7.5	1D1N007	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
10.0	1D1N010	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	1D1N015	N	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	1D1Y015TP1	Y	150° C	220° C	Floor & Wall ^⑤	Yes ^⑤	Ventilated	1, 2, 3, 4, 5
25	1D1Y025TP1	Y	150° C	220° C	Floor & Wall ^⑤	Yes ^⑤	Ventilated	1, 2, 3, 4, 5
37.5	1D1Y037TP1	Y	150° C	220° C	Floor & Wall ^⑤	Yes ^⑤	Ventilated	1, 2, 3, 4, 5
50	1D1Y050TP1	Y	150° C	220° C	Floor & Wall ^⑤	Yes ^⑤	Ventilated	1, 2, 3, 4, 5
75	1D1Y075TP1	Y	150° C	220° C	Floor & Wall ^⑤	Yes ^⑤	Ventilated	1, 2, 3, 5
100	1D1Y100TP1	Y	150° C	220° C	Floor	Yes ^⑤	Ventilated	1, 2, 3, 5
167	1D1Y167TP1	Y	150° C	220° C	Floor	Yes ^⑤	Ventilated	1, 2, 3, 5

277 Volts Primary, 120/240 Volts Secondary

3	1E1U003	U	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
5	1E1U005	U	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
7.5	1E1U007	U	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
10	1E1U010	U	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	1E1U015	U	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
25	1E1U025	U	135° C	180° C	Wall	No	Encapsulated	1, 2, 3

480 Volts Primary, 120/240 Volts Secondary

3	1F1R003	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
5	1F1R005	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
7.5	1F1R007	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
10	1F1R010	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	1F1R015	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
25	1F1R025	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3

Optional Modifications Table (Contact Sales office for List Price)

Optional (commonly used) Modifications	Catalog Suffix Code
1a. 115° C Rise	F
1b. 80° C Rise	B
2. Electrostatic Shield	ES
3. Copper Windings	C
4. Wall Mounting Brackets	W ^⑥
5. Drip Shields	DS ^⑥

Taps

Description	Designation
None	N
2-5% FCBN	R
2-5% (1 FCAN, 1 FCBN)	S
2-2.5% FCBN	U
6-2.5% (2 FCAN, 4 FCBN)	Y

①Actual taps may vary based on volts/turn ratio.
②Wall designations for units having standard features.
③For outdoor application. Ventilated transformers requiring drip shields/weathershields are UL listed

for outdoor use. No charge when requested at time of initial project order.
④Encapsulated transformers are UL listed for indoor/outdoor use.
⑤No charge when requested at time of initial project order.

⑥Items marked floor and wall can be wall mounted with optional wall bracket that may be identified with "W" suffix on catalog number. See table on page 8-8 for available kits.

Distribution Dry Type Transformers

Single Phase

Selection

kVA	Catalog Number	Taps ^①	Temperature Rise	Insulation	Mounting Type ^{②③}	Drip Shield Required ^③	Enclosure Style ^④	Optional Modifications
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600 Volts Primary, 120/240 Volts Secondary

3	1G1R003	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
5	1G1R005	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
7.5	1G1R007	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
10	1G1R010	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	1G1R015	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
25	1G1R025	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
25	1G1Y025TP1	Y	150° C	220° C	Floor & Wall ^⑤	Yes ^⑤	Ventilated	1, 2, 3, 4, 5
37.5	1G1Y037TP1	Y	150° C	220° C	Floor & Wall ^⑤	Yes ^⑤	Ventilated	1, 2, 3, 4, 5
50	1G1Y050TP1	Y	150° C	220° C	Floor & Wall ^⑤	Yes ^⑤	Ventilated	1, 2, 3, 4, 5
75	1G1Y075TP1	Y	150° C	220° C	Floor	Yes ^⑤	Ventilated	2, 3, 5
100	1G1Y100TP1	Y	150° C	220° C	Floor	Yes ^⑤	Ventilated	2, 3, 5
167	1G1Y167TP1	Y	150° C	220° C	Floor	Yes ^⑤	Ventilated	2, 3, 5

Overseas Model 190/200/208/220 x 380/400/416/440 Volts Primary, 120/240 Volts Secondary—1Ø, 50/60 Hz

1	1H1N001	N	95° C	130° C	Wall	No	Encapsulated	2, 3
2	1H1N002	N	135° C	180° C	Wall	No	Encapsulated	2, 3
3	1H1N003	N	135° C	180° C	Wall	No	Encapsulated	2, 3
5	1H1N005	N	135° C	180° C	Wall	No	Encapsulated	2, 3
7.5	1H1N007	N	135° C	180° C	Wall	No	Encapsulated	2, 3
10	1H1N010	N	135° C	180° C	Wall	No	Encapsulated	2, 3
15	1H1N015	N	135° C	180° C	Wall	No	Encapsulated	2, 3
25	1H1N025	N	135° C	180° C	Wall	No	Encapsulated	2, 3

Overseas Model 190/208/220/240 x 380/416/440/480 Volts Primary, 120/240 Volts Secondary—1Ø, 50/60 Hz

1	1X1N001	N	95° C	130° C	Wall	No	Encapsulated	2, 3
2	1X1N002	N	135° C	180° C	Wall	No	Encapsulated	2, 3
3	1X1N003	N	135° C	180° C	Wall	No	Encapsulated	2, 3
5	1X1N005	N	135° C	180° C	Wall	No	Encapsulated	2, 3
7.5	1X1N007	N	135° C	180° C	Wall	No	Encapsulated	2, 3
10	1X1N010	N	135° C	180° C	Wall	No	Encapsulated	2, 3
15	1X1N015	N	135° C	180° C	Wall	No	Encapsulated	2, 3
25	1X1N025	N	135° C	180° C	Wall	No	Encapsulated	2, 3

Overseas Model 190/200/208/220 x 380/400/416/440 Volts Primary, 110/220 Volts Secondary—1Ø, 50/60 Hz

1	1H8N001	N	95° C	130° C	Wall	No	Encapsulated	2, 3
2	1H8N002	N	135° C	180° C	Wall	No	Encapsulated	2, 3
3	1H8N003	N	135° C	180° C	Wall	No	Encapsulated	2, 3
5	1H8N005	N	135° C	180° C	Wall	No	Encapsulated	2, 3
7.5	1H8N007	N	135° C	180° C	Wall	No	Encapsulated	2, 3

Notice: CE mark is included on all overseas models.

Optional Modifications Table (Contact Sales office for List Price)

Optional (commonly used) Modifications	Catalog Suffix Code
1a. 115° C Rise	F
1b. 80° C Rise	B
2. Electrostatic Shield	ES
3. Copper Windings	C
4. Wall Mounting Brackets	W ^⑥
5. Drip Shields	DS ^⑥

Taps

Description	Designation
None	N
2-5% FCBN	R
2-5% (1 FCAN, 1 FCBN)	S
2-2.5% FCBN	U
6-2.5% (2 FCAN, 4 FCBN)	Y

①Actual taps may vary based on volts/turn ratio.
②Wall designations for units having standard features.
③For outdoor application. Ventilated transformers requiring drip shields/weathershields are UL listed

for outdoor use. No charge when requested at time of initial project order.

④Encapsulated transformers are UL listed for indoor/outdoor use.

⑤No charge when requested at time of initial project order.

⑥Items marked floor and wall can be wall mounted with optional wall bracket that may be identified with "W" suffix on catalog number. See table on page 8-8 for available kits.

Distribution Dry Type Transformers

Three Phase

Selection

kVA	Catalog Number	Taps ^①	Temperature Rise	Insulation	Mounting Type ^{②③}	Drip Shield Provided ^③	Enclosure Style ^④	Optional Modifications
480 Volts Δ Primary, 240 Volts Δ Secondary With 120 Volt Tap On B Phase^⑤								
15	3F1Y015D16	Y	150° C	220° C	Floor & Wall ^⑥	Yes	Ventilated	1, 2, 3, 4
30	3F1Y030D16	Y	150° C	220° C	Floor & Wall ^⑥	Yes	Ventilated	1, 2, 3, 4
45	3F1Y045D16	Y	150° C	220° C	Floor & Wall ^⑥	Yes	Ventilated	1, 2, 3, 4
75	3F1Y075D16	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 4
112.5	3F1Y112D16	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 4
150	3F1Y150D16	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3
225	3F1Y225D16	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3
300	3F1Y300D16	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3
500	3F1Y500D16	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3
750	3F1Y750D16	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3

480 Volts Δ Primary, 240 Volts Δ Secondary								
3	3F2R003 ^⑦	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
6	3F2R006 ^⑦	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
9	3F2R009 ^⑦	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	3F2R015 ^⑦	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3

480 Volts Δ Primary, 208Y/120 Volts Secondary								
3	3F3R003	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
6	3F3R006	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
9	3F3R009	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	3F3R015	R	135° C	180° C	Wall	No	Encapsulated	1, 2, 3
15	3F3Y015D16	Y	150° C	220° C	Floor & Wall ^⑥	Yes	Ventilated	1, 2, 3, 4, 6
30	3F3Y030D16	Y	150° C	220° C	Floor & Wall ^⑥	Yes	Ventilated	1, 2, 3, 4, 6
45	3F3Y045D16	Y	150° C	220° C	Floor & Wall ^⑥	Yes	Ventilated	1, 2, 3, 4, 6
75	3F3Y075D16	Y	150° C	220° C	Floor & Wall ^⑥	Yes	Ventilated	1, 2, 3, 4, 6
112.5	3F3Y112D16	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 6
150	3F3Y150D16	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 6
225	3F3Y225D16	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 6
300	3F3Y300D16	Y	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 6
500	3F3Y500D16	Y, T	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 6
750	3F3Y750D16	Y, T	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 6
1000	3F3S000D16	Y, T	150° C	220° C	Floor	Yes	Ventilated	1, 2, 3, 6

kVA	Catalog Number	Taps ^①	Temperature Rise	Insulation	Mounting Type	Drip Shield Required	Optional Modifications	Avg. Sound Level
Totally Enclosed Transformers, Indoor/Outdoor Use 480 Volts Δ Primary, 208Y/120 Volts Secondary^⑧								
15	3F3Y015TE	Y	150° C	220° C	Floor	No	1, 2, 3	50dB
30	3F3Y030TE	Y	150° C	220° C	Floor	No	1, 2, 3	50dB
45	3F3Y045TE	Y	150° C	220° C	Floor	No	1, 2, 3	50dB
75	3F3Y075TE	Y	150° C	220° C	Floor	No	1, 2, 3	55dB
112.5	3F3Y112TE	Y	150° C	220° C	Floor	No	1, 2, 3	55dB
150	3F3Y150TE	Y	150° C	220° C	Floor	No	1, 2, 3	55dB
225	3F3Y225TE	Y	150° C	220° C	Floor	No	1, 2, 3	57dB
300	3F3Y300TE	Y	150° C	220° C	Floor	No	1a, 2, 3	57dB

480 Volts Δ Primary, 240 Volts Δ Secondary with 120V Lighting Tap on B Phase^⑤								
15	3F1Y015TE	Y	150° C	220° C	Floor	No	1, 2, 3	50dB
30	3F1Y030TE	Y	150° C	220° C	Floor	No	1, 2, 3	50dB
45	3F1Y045TE	Y	150° C	220° C	Floor	No	1, 2, 3	50dB
75	3F1Y075TE	Y	150° C	220° C	Floor	No	1, 2, 3	55dB
112.5	3F1Y112TE	Y	150° C	220° C	Floor	No	1, 2, 3	55dB
150	3F1Y150TE	Y	150° C	220° C	Floor	No	1, 2, 3	55dB
225	3F1Y225TE	Y	150° C	220° C	Floor	No	1, 2, 3	57dB
300	3F1Y300TE	Y	150° C	220° C	Floor	No	1a, 2, 3	57dB

Optional Modifications Table (Contact Sales office for List Price)

Optional (commonly used) Modifications	Catalog Suffix Code
1a. 115°C Rise	F
1b. 80°C Rise	B
2. Electrostatic Shield	ES
3. Copper Windings	C
4. Wall Mounting Brackets	W
6. Low noise—XdB below std.	LNx

Taps

Description	Designation
None	N
2–5% FCBN	R
2–5% (1 FCAN, 1 FCBN)	S
2–2.5% FCBN	U
6–2.5% (2 FCAN, 4 FCBN)	Y

① Actual taps may vary based on volts/turn ratio.
 ② Wall designations for units having standard features.
 ③ Ventilated transformers drip shields are UL listed for outdoor use.
 ④ Encapsulated transformers are UL listed for indoor/outdoor use (2.5% on each side of lighting tap).
 ⑤ Reduced capacity 1-phase tap—When utilizing 1-phase

tap at 5%, the 3-phase load is reduced to 85% max. (5% reduction on 3 coils). 10% of rated kVA absolute maximum (evenly balanced on each side of lighting tap).
 When utilizing 1-phase tap at 10%, the 3-phase load is reduced to 70% max. (10% reduction on 3 coils).
 ⑥ 240 volt secondary (3F2) is available in 3-phase 3 to 15kVA only.

⑦ TE units will have inrush equal to 2 sizes larger than rated kVA.
 ⑧ Items marked floor and wall can be wall mounted with optional wall bracket that can be identified with "W" suffix on catalog number. See table on page 8-8 for available kits.
 ⑨ Wall mounting for 150°C temperature rise.