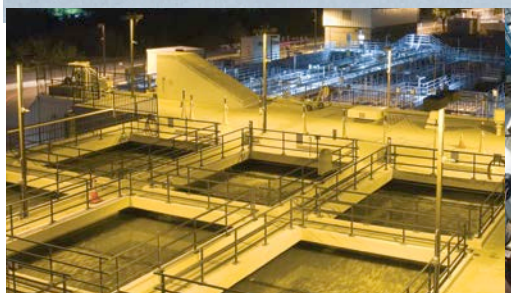
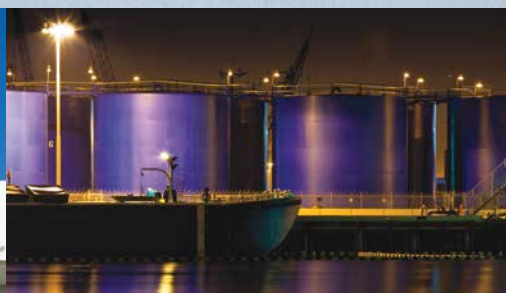
Low-voltage dry-type distribution transformers (DTDT)

Eaton's low-voltage dry-type distribution transformers

Built to meet the most demanding harsh and industrial environmental applications





Powering Business Worldwide

Eaton's harsh environment transformers

Eaton's harsh environment transformers combine the proven dry-type distribution transformer technology with NEMA® Type enclosures engineered and manufactured to perform through the most demanding conditions needed by chemical plants, food processing, petrochemical and wastewater treatment facilities. These exceptionally durable, corrosion-resistant enclosures (3RX and 4X) can withstand exposure to chemicals, water and other severe conditions.

The harsh environment transformers are available in a comprehensive range of kVA, enclosure type and voltage configurations for a multitude of applications. The specific enclosure types, applications, and the environmental conditions each transformer type is designed for are shown in the following table.

	Enclosure rating type			
	3R ❶	4	4X	12
	Encapsulated, Mini–power center & TENV	TENV	Encapsulated, Mini–power center & TENV	TENV
Locations	Indoor Outdoor	Indoor Outdoor	Indoor Outdoor	Indoor
Incidental contact with the enclosed equipment	■	■	■	■
Ingress of solid foreign objects (falling dirt)	■	■	■	■
Ingress of water (dripping and light splashing of non-corrosive liquids)	■	■	■	■
Ingress of water (rain, snow and sleet)	■	■	■	—
Ingress of solid foreign objects (circulating dust, lint, fibers and flyings ❷)	—	■	■	■
Ingress of solid foreign objects (settling airborne dust, lint, fibers, and flyings ❷)	—	■	■	■
Windblown dust	—	■	■	—
Ingress of water (hose-down and splashing water)	—	■	■	—
Oil and coolant seepage	—	—	—	■
Corrosive agents	❶	—	■	—

❶ Stainless steel option.

❷ These fibers and flyings are non-hazardous materials and are not considered Class III type ignitable fibers or combustible flying's. For Class III type ignitable fibers or combustible flying's, see the National Electrical Code, Article 500.

Note: Class I, Division 2 Hazardous Locations units are encapsulated transformers.

Totally enclosed non-ventilated transformers

Totally enclosed non-ventilated dry-type transformers are for special applications, where because of adverse atmospheric conditions or the specific application, it is desirable to use a dry-type non-ventilated transformer versus the ventilated standard unit, which has openings in its enclosure to allow air to flow directly over the core and coil.

Totally enclosed non-ventilated transformers are highly suited for applications where the atmosphere contains conductive, corrosive or combustible materials that might damage a transformer, or lint and dust that might block the ventilation passages. There are no openings in the enclosure, so heat is dissipated by radiating from the surface area of the enclosure.

NEMA 4X

Ratings

- Single-phase ratings 15–75 kVA
- Three-phase ratings 15–225 kVA
- Aluminum or copper windings
- 220°C insulation system
- 150°C winding temperature rise; 80°C and 115°C temperature rise available as an option
- Any voltage combination below 600 V
- Totally enclosed non-ventilated transformers are excluded from the scope of U.S. DOE energy efficiency requirements

Enclosure ratings

- NEMA 3R, suffix NV
- NEMA 4, suffix N4
- NEMA 4X, suffix 4X
- NEMA 12, suffix N12

Standards

- UL® listed per UL 1561
- UL 50 and UL 50E
- Meets applicable ANSI, NEMA® and IEEE® standards
- Include bonding/grounding bar in compliance with NEC 450.10(A)

Finish

- Types 3R, 4 and 12 enclosures have a washed and phosphate undercoat with ANSI 61 gray polyester powder inside and out
- Type 4X and 3RX stainless steel 304 as standard; 316 Grade stainless steel available as an option. Replace suffix "SS" with suffix "S6"

Options

- Electrostatic shield
- Reduced audible sound level
- 50/60 Hz operation
- Other options available through the Transformer Flex Center

480 V–208Y/120 V, 150°C rise three-phase Al wound; NEMA Type 4X

Style	kVA	Frame	Wiring diagram	Weight lb (kg)	Total losses at 170°C	% Z	Sound level dB	Practical inrush (amps)
V48M28T15SS4X	15	FR940NV	280B	552 (251)	573	1.88	45	142
V48M28T30SS4X	30	FR942NV	280B	715 (325)	910	2.09	50	244
V48M28T45SS4X	45	FR943NV	280B	887 (403)	1422	2.64	50	284
V48M28T75SS4X	75	FR943NV	280B	1151 (523)	2173	2.48	50	556
V48M28T12SS4X	112.5	FR945NV	280B	1622 (736)	3160	3.44	55	501
V48M28T49SS4X	150	FR945NV	280B	1945 (883)	3574	3.33	55	557
V48M28T22SS4X	225	FR945NV	280B	2750 (1249)	4103	4.19	55	786

480 V–208Y/120 V, 150°C rise three-phase Al wound; NEMA Type 4

Style	kVA	Frame	Wiring diagram	Weight lb (kg)	Total losses at 170°C	% Z	Sound level dB	Practical inrush (amps)
V48M28T15N4	15	FR940NV	280B	552 (251)	573	1.88	45	142
V48M28T30N4	30	FR942NV	280B	715 (325)	910	2.09	50	244
V48M28T45N4	45	FR943NV	280B	887 (403)	1422	2.64	50	284
V48M28T75N4	75	FR943NV	280B	1151 (523)	2173	2.48	50	556
V48M28T12N4	112.5	FR945NV	280B	1622 (736)	3160	3.44	55	501
V48M28T49N4	150	FR945NV	280B	1945 (883)	3574	3.33	55	557
V48M28T22N4	225	FR945NV	280B	2750 (1249)	4103	4.19	55	786

480 V–208Y/120 V, 150°C rise three-phase Al wound; NEMA Type 12

Style	kVA	Frame	Wiring diagram	Weight lb (kg)	Total losses at 170°C	% Z	Sound level dB	Practical inrush (amps)
V48M28T15N12	15	FR940NV	280B	552 (251)	573	1.88	45	142
V48M28T30N12	30	FR942NV	280B	715 (325)	910	2.09	50	244
V48M28T45N12	45	FR943NV	280B	887 (403)	1422	2.64	50	284
V48M28T75N12	75	FR943NV	280B	1151 (523)	2173	2.48	50	556
V48M28T12N12	112.5	FR945NV	280B	1622 (736)	3160	3.44	55	501
V48M28T49N12	150	FR945NV	280B	1945 (883)	3574	3.33	55	557
V48M28T22N12	225	FR945NV	280B	2750 (1249)	4103	4.19	55	786

General purpose NEMA 4X encapsulated transformers

Apply Eaton NEMA Type 4X transformer enclosures in environments where equipment can suffer damage from dust, wind, ice and water ingress. The Eaton NEMA Type 4X encapsulated dry-type transformer is designed to withstand tough environments and protect personnel from hazardous electrical parts.

In encapsulated transformers, the core-coil assembly is completely encased in a proportioned mixture of resin or epoxy, and aggregate to provide a moisture-proof, shock-resistant seal designed to completely seal out moisture and other contaminants.

240 X 480 V–120/240 V, 115°C rise single-phase encapsulated; NEMA Type 4X

Style number	kVA	Frame	Diagram number	Weight lb (kg)	FCAN	FCBN	Mounting type
S20N11S82SS4X	0.100	FR544X	3A	7 (3)	—	—	Wall
S20N11S83SS4X	0.015	FR554X	3A	9 (4)	—	—	Wall
S20N11P26SS4X	0.250	FR57P4X	3A	15 (7)	—	—	Wall
S20N11P51SS4X	0.500	FR57P4X	3A	14 (6)	—	—	Wall
S20N11P76SS4X	0.750	FR58AP4X	3A	22 (10)	—	—	Wall
S20N11P01SS4X	1	FR67P4X	3A	30 (14)	—	—	Wall
S20N11P16SS4X	1.5	FR67P4X	3A	41 (19)	—	—	Wall
S20N11P02SS4X	2	FR68P4X	3A	41 (19)	—	—	Wall
S20N11S03SS4X	3	FR1764X	3A	75 (34)	—	—	Wall
S20K11S03SS4X	3	FR1764X	9A	75 (34)	❶	❶	Wall
S20N11S05SS4X	5	FR1774X	3A	107 (49)	—	—	Wall
S20K11S05SS4X	5	FR1774X	9A	105 (48)	❶	❶	Wall
S20N11S07SS4X	7.5	FR1784X	3A	136 (62)	—	—	Wall
S20K11S07SS4X	7.5	FR1784X	9A	130 (59)	❶	❶	Wall
S20N11S10SS4X	10	FR1794X	3A	196 (89)	—	—	Wall
S20K11S10SS4X	10	FR1794X	9A	198 (90)	❶	❶	Wall
S20N11S15SS4X	15	FR1804X	3A	215 (98	—	—	Wall
S20L11S15SS4X	15	FR1804X	23A	215 (98)	❶	❶	Wall
S20N11S25SS4X	25	FR1824X	3A	393 (178)	—	—	Wall
S20L11S25SS4X	25	FR1824X	23A	453 (206)	❷	❷	Wall
S20L11S37SS4X	37.5	FR300A4X	248A	735 (334)	❷	❷	Floor

❶ 1 at +10% FCBN at 240 volts; 2 at +5% FCBN at 480 volts.

❷ 2 at +5% FCBN at 240 volts; 4 at +2.5% FCBN at 480 volts.

480 V–208Y/120 V, 115°C rise three-phase Al wound; NEMA Type 4X

Style number	kVA	Frame	Diagram number	Weight lb (kg)	FCAN	FCBN	Mounting type
Y48G28T03SS4X	3	FR2014X	70A ❶	125 (57)	—	2 at –5%	Wall
Y48G28T06SS4X	6	FR2004X	70A ❶	165 (75)	—	2 at –5%	Wall
Y48D28T06SS4X	6	FR2004X	72B ❶	171 (78	2 at +2.5%	2 at –2.5%	Wall
Y48G28T09SS4X	9	FR1034X	70A ❶	180 (82)	—	2 at –5%	Wall
Y48J28T09SS4X	9	FR1034X	503A ❶	192 (87)	—	4 at –2.5%	Wall
Y48D28T09SS4X	9	FR1034X	72B ❶	196 (89)	2 at +2.5%	2 at –2.5%	Wall
Y48D28T15SS4X	15	FR954X	72B ❶	281 (128)	—	2 at –2.5%	Wall
Y48G28T15SS4X	15	FR954X	70A ❶	269 (122)	—	2 at –5%	Wall
Y48J28T15SS4X	15	FR954X	503A ❶	268 (121)	—	4 at –2.5%	Wall
Y48M28T30SS4X	30	FR2434X	84A	539 (245)	2 at +2.5%	4 at –2.5%	Wall/Floor
Y48M28T45SS4X	45	FR2444X	84A	723 (328)	2 at +2.5%	4 at –2.5%	Wall/Floor
Y48M28T75SS4X	75	FR2454X	84A	1277 (580)	—	4 at –2.5%	Floor

❶ T-T connected (Scott T) winding configuration.

Ratings

- Single-phase ratings 100 VA–37.5 kVA
- Three-phase ratings 3–75 kVA
- Aluminum or copper windings
- 180°C insulation system
- 115°C winding temperature rise; 80°C temperature rise available as an option
- Any voltage combination below 600 V
- Low-voltage encapsulated transformers are excluded from the scope of U.S. DOE energy efficiency requirements

Enclosure ratings

- NEMA 4X

Standards

- UL listed per UL 1561 or UL 5085
- UL 50 and UL 50E
- Meets applicable ANSI, NEMA and IEEE standards
- cUL® Listed per CSA® C22.2

Finish

- Grade 304 stainless steel standard; Grade 316 stainless steel available as an option. Replace suffix "SS" with suffix "S6"

Options

- Electrostatic shield
- Reduced audible sound level
- 50/60 Hz operation
- Other options available through the Transformer Flex Center
- Class I, Division 2 Hazardous Locations

Mini–power centers NEMA 4X

Mini–power center combines three individual components into one NEMA enclosure, rated either NEMA 3R, or for harsh environments (corrosion, dust, hose-directed water) NEMA 4X: a primary main circuit breaker, an encapsulated single-phase or three-phase dry-type transformer, and a secondary distribution loadcenter with main breaker.

Interconnecting wiring is completed at the factory.
A mini–power center is delivered ready for installation.

Plug-in mini–power center (aluminum-wound transformer and loadcenter chassis)

480 V–120/240 V, 115°C rise single-phase; NEMA Type 4X

Style	kVA	Weight lb (kg)	Frame	Main breaker		Feeder breakers			Max. amp
				Primary	Secondary	Single-pole	Two-pole	Three-pole	
P48G11S0312S64X	3	306 (139)	FR2854X	EHD2015	BR215	12	6	Not applicable	12
P48G11S0512S64X	5	306 (139)	FR2854X	EHD2020	BR225	12	6	Not applicable	20
P48G11S0712S64X	7.5	306 (139)	FR2854X	EHD2030	BR230	12	6	Not applicable	30
P48G11S1020S64X	10	546 (248)	FR2874X	EHD2040	BR250	20	10	Not applicable	40
P48G11S1526S64X	15	546 (248)	FR2874X	EHD2060	BR270	26	13	Not applicable	60
P48G11S2526S64X	25	546 (248)	FR2874X	EHD2100	BR2125	26	13	Not applicable	100

600 V–120/240 V, 115°C rise single-phase; NEMA Type 4X

Style	kVA	Weight lb (kg)	Frame	Main breaker		Feeder breakers			Max. amp
				Primary	Secondary	Single-pole	Two-pole	Three-pole	
P60G11S0512S64X	5	306 (139)	FR2854X	FDB2015	BR225	12	6	Not applicable	20
P60G11S0712S64X	7.5	306 (139)	FR2854X	FDB2030	BR230	12	6	Not applicable	30
P60G11S1020S64X	10	306 (139)	FR2874X	FDB2040	BR250	20	10	Not applicable	40
P60G11S1526S64X	15	546 (248)	FR2874X	FDB2060	BR270	26	13	Not applicable	60
P60G11S2526S64X	25	546 (248)	FR2874X	FDB2100	BR2125	26	13	Not applicable	100

480 V–208Y/120 V, 115°C rise three-phase; NEMA Type 4X

Style	kVA	Weight lb (kg)	Frame	Main breaker		Feeder breakers			Max. amp
				Primary	Secondary	Single-pole	Two-pole	Three-pole	
P48G28T1524S64X	15	728 (330)	FR2914X	EHD3040	EHD3050	24	12	8	40
P48G28T2124S64X	22.5	728 (330)	FR2914X	EHD3070	EHD3070	24	12	8	60
P48G28T3024S64X	30	728 (330)	FR2914X	EHD3090	EHD3100	24	12	8	80

600 V–208Y/120 V, 115°C rise three-phase; NEMA Type 4X

Style	kVA	Weight lb (kg)	Frame	Main breaker		Feeder breakers			Max. amp
				Primary	Secondary	Single-pole	Two-pole	Three-pole	
P60G28T1524S64X	15	728 (330)	FR2914X	FDB3030	EHD3050	24	12	8	40
P60G28T2124S64X	22.5	728 (330)	FR2914X	FDB3050	EHD3070	24	12	8	60
P60G28T3024S64X	30	728 (330)	FR2914X	FDB3070	EHD3100	24	12	8	80

Ratings

- Single-phase ratings 3–25 kVA
- Three-phase ratings 15–30 kVA
- Aluminum or copper windings
- Aluminum chassis standard for plug-in Type BR feeder breakers
- Copper chassis available for bolt-on Type BAB feeder breakers
- 180°C insulation system
- 115°C winding temperature rise; 80°C temperature rise available as an option
- Sand and resin encapsulated core-coil assembly

Enclosure ratings

- NEMA 3R stainless steel, suffix SS
- NEMA 4X, suffix S64X

Standards

- UL listed per UL 1062
- UL 50 and UL 50E
- Meets applicable ANSI, NEMA and IEEE standards
- CSA C22.2

Features, benefits and functions

- Secondary main breaker (Type BR plug-in and Type BAB bolt-on branch breakers not included)
- Neutral bar is grounded to the enclosure
- Tin-plated copper and aluminum chassis
  - Silver-plated copper chassis available on bolt-on three-phase units as an option
- Space for up to 26 feeder breakers on aluminum chassis and 30 feeder breakers for copper chassis
- Custom options available through the Transformer Flex Center

Finish

- NEMA 4X, Grade 316 stainless steel standard
- NEMA 3R, Grade 304 stainless steel standard; Grade 316 stainless steel available as an option. Replace suffix "SS" with suffix "S6"

Bolt-on mini–power center (copper-wound transformer and loadcenter chassis)

480 V–120/240 V, 115°C rise single-phase; NEMA Type 4X

				Main breaker		Feeder breakers			
Style	kVA	Weight lb (kg)	Frame	Primary	Secondary	Single-pole	Two-pole	Three-pole	Max. amp
P48G11S0318CUBS64X	3	340 (154)	FR2854X	EHD2015	BAB2015	18	9	Not applicable	12
P48G11S0518CUBS64X	5	340 (154)	FR2874X	EHD2020	BAB2025	18	9	Not applicable	20
P48G11S0718CUBS64X	7.5	340 (154)	FR2874X	EHD2030	BAB2030	18	9	Not applicable	30
P48G11S1024CUBS64X	10	340 (154)	FR2874X	EHD2040	BAB2050	24	12	Not applicable	40
P48G11S1530CUBS64X	15	650 (295)	FR2914X	EHD2060	BAB2070	30	15	Not applicable	60
P48G11S2530CUBS64X	25	650 (295)	FR2914X	EHD2100	BAB2125	30	15	Not applicable	100

600 V–120/240 V, 115°C rise single-phase; NEMA Type 4X

				Main breaker		Feeder breakers			
Style	kVA	Weight lb (kg)	Frame	Primary	Secondary	Single-pole	Two-pole	Three-pole	Max. amp
P60G11S0318CUBS64X	3	340 (154)	FR2854X	FDB2015	BAB2015	18	9	Not applicable	12
P60G11S0518CUBS64X	5	340 (154)	FR2874X	FDB2020	BAB2025	18	9	Not applicable	20
P60G11S0718CUBS64X	7.5	340 (154)	FR2874X	FDB2030	BAB2030	18	9	Not applicable	30
P60G11S1024CUBS64X	10	340 (154)	FR2874X	FDB2040	BAB2050	24	12	Not applicable	40
P60G11S1530CUBS64X	15	650 (295)	FR2914X	FDB2060	BAB2070	30	15	Not applicable	60
P60G11S2530CUBS64X	25	650 (295)	FR2914X	FDB2100	BAB2125	30	15	Not applicable	100

480 V–208Y/120 V, 115°C rise three-phase; NEMA Type 4X

				Main breaker		Feeder breakers			
Style	kVA	Weight lb (kg)	Frame	Primary	Secondary	Single-pole	Two-pole	Three-pole	Max. amp
P48G28T1524CUBS64X	15	898 (407)	FR2914X	EHD3040	BAB3050H	24	12	8	40
P48G28T2124CUBS64X	22.5	898 (407)	FR2914X	EHD3070	BAB3070H	24	12	8	60
P48G28T3024CUBS64X	30	898 (407)	FR2914X	EHD3090	BAB3100H	24	12	8	80

600 V–208Y/120 V, 115°C rise three-phase; NEMA Type 4X

				Main breaker		Feeder breakers			
Style	kVA	Weight lb (kg)	Frame	Primary	Secondary	Single-pole	Two-pole	Three-pole	Max. amp
P60G28T1524CUBS64X	15	898 (407)	FR2914X	FDB3030	BAB3050H	24	12	8	40
P60G28T2124CUBS64X	22.5	898 (407)	FR2914X	FDB3050	BAB3070H	24	12	8	60
P60G28T3024CUBS64X	30	898 (407)	FR2914X	FDB3070	BAB3100H	24	12	8	80

When you need more than 'off the shelf'

Eaton's Dry-Type Distribution Transformer Flex Center can help.

Customer-driven specs

- Custom-painted enclosures
- Special labeling
- Tailor-made dimensions and configurations
- Custom efficiency, sound, altitude, operating ambient, impedance and temperature rise

Safer designs

- Compliance with industry and regional standards
- Infrared viewing windows to ease diagnostics
- Hinged front cover to simplify maintenance and testing
- Integrated breakers on secondary side to reduce arc-flash hazard

Harsh environments

- NEMA® 4X, 304 or 316 stainless steel enclosures
- NEMA 12 totally enclosed, non-ventilated
- Hazardous location ratings with Class I, Division 2 encapsulated transformers

Packaged solutions

- Configurations with quick connectors (military grade)
- Pre-terminated cable for ease of installation
- Primary or secondary breakers and ventilated transformer in a single component

What are your unique needs?

Providing transformers to meet unique customer requirements for more than 25 years—custom solutions are our specialty.

Transformer Flex Center solutions

The Transformer Flex Center is designed specifically to help customers meet unique general purpose and distribution transformer needs that cannot be met with standard offerings.

With the ability to engineer or modify transformers to meet nearly any application requirement, our expert team is a valuable resource for solving your most critical application challenges.

Transformer Flex Center

Switching Devices Flex Center

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