

Dry-Type Transformers General Information

Custom Transformers must be approved by TRC - Avery Creek

This is a custom-manufactured product. Once it is released for manufacturing, it cannot be cancelled. This product cannot be returned for credit.

- ☐ Custom Transformer Style Number: V46D28F4516TAFUCUDSSRTR
- ☐ Transformer Type: Medium Voltage
- ☐ Phase: 3
- ☐ kVA: 45
- ☐ Primary Volts: 4160
- ☐ Secondary Volts: 208Y/120
- ☐ Temperature Rise: 115C with 220C Insulation System
- ☐ Winding Material: Copper
- ☐ Enclosure Type: NEMA 3R
- ☐ Frequency (Hz): 60
- ☐ Double Copper Electrostatic Shield: Y

Standard Values

- ☐ K-Factor: 1
- ☐ TAPS: 2@+2.5%, 2@-2.5%
- ☐ Sound Reduction (dB): 0
- ☐ NEMA ST20 Sound Level (dB): 50
- ☐ DOE 10 CFR Part 431 (2016) Efficient: Y
- ☐ Infrared Viewing Window: None

Field-Installed Accessories Included

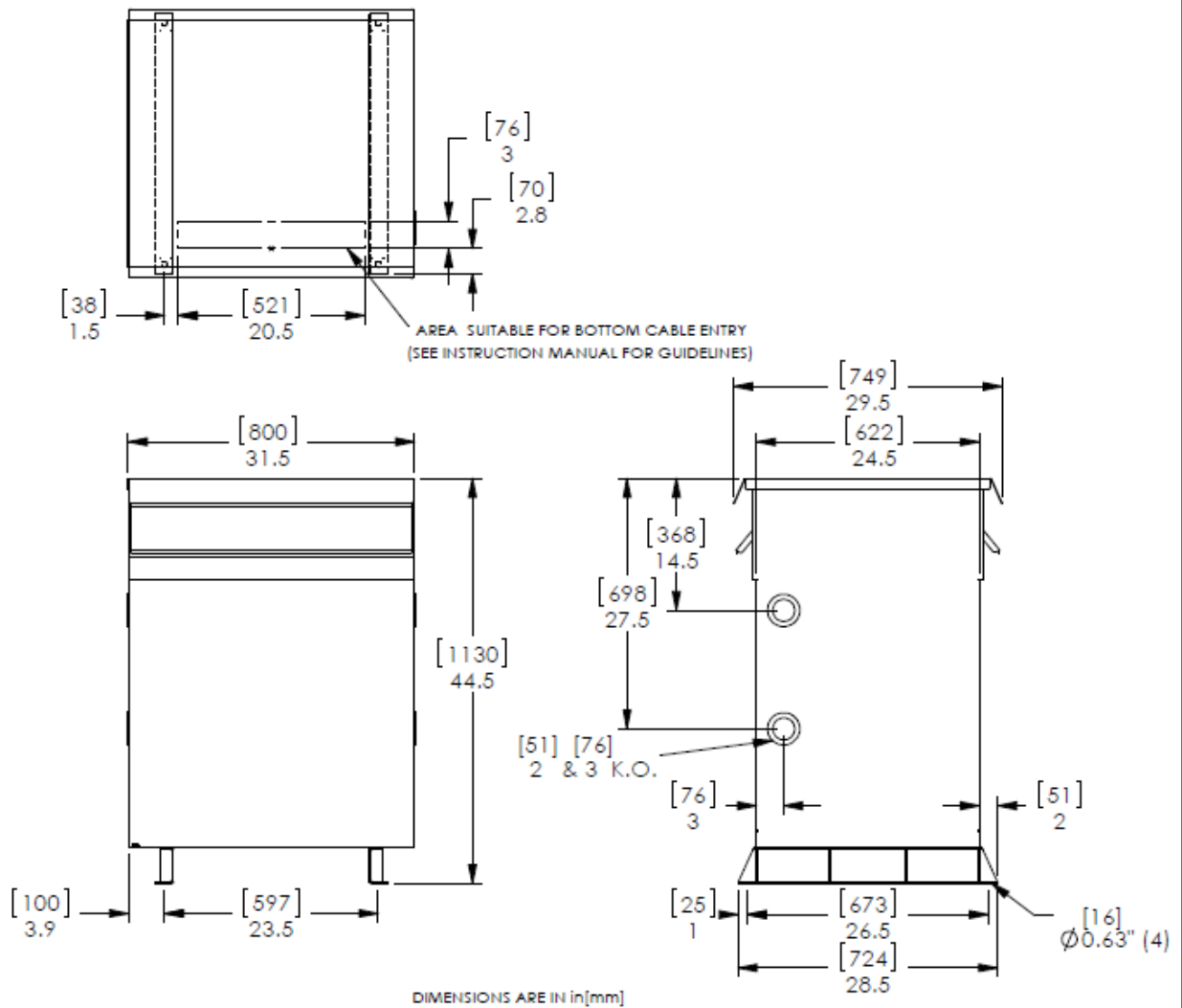
- ☐ Lug Kit: Not Included

Customized Values

- ☐ CUSTOM: Winding Material Copper
- ☐ CUSTOM: Double Copper Electrostatic Shield Y
- ☐ NEMA 3R
- ☐ CUSTOM: Nema Sound Level Test Y
- ☐ CUSTOM: Certified Test Report Y
- ☐ CUSTOM: Thermal Indicator Embedded in Coils Warning
- ☐ CUSTOM: Anti-Fungus Protection Y
- ☐ CUSTOM: Temperature Rise 115C with 220C Insulation System
- ☐ Y

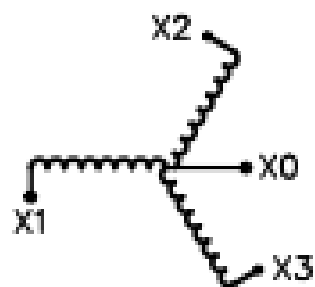
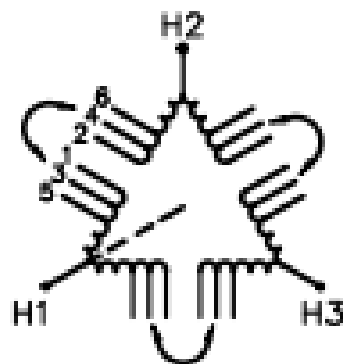
The information on this document is created by Eaton. It is disclosed in confidence and it is only to be used for the purpose in which it is supplied.	PREPARED BY MARK A TOWNSLEY		DATE 9/10/2021	Eaton		
	APPROVED BY		DATE	JOB NAME SFPUC WD-2825R Alameda Creek Recapture		
				DESIGNATION XFMR "T" 45 KVA		
NEG-ALT Number SF650106X1K1-0002	VERSION 1.0.0.4		TYPE Dry-Type Transformer		DRAWING TYPE Customer Appr.	
	REVISION 0	DWG SIZE A	G.O. MSF0010759	ITEM 003	SHEET 1 of 1	

DH4-3R Transformer Enclosure



GO/NEG-Alt-Date: MSF0010759-0002-9/10/2021		Job Name: SFPUC WD-2825R Alameda Creek Recapture
Item Number: 003	Catalog Number: V46D28F4516TAFUDSSRTR	Designation: XFMR "T" 45 KVA

VOLTS	CURRENT COURANT	% RATED VOLTAGE % TENSION NOMINALE	CONNECTION EACH PHASE CONNEXION PAR PHASE
4368	5.9	105	1-2
4264	6.1	102.5	2-3
4160	6.2	100	3-4
4056	6.4	97.5	4-5
3952	6.6	95	5-6



GO/NEG-Alt-Date:
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Designation:
XFMR "T" 45 KVA



Powering Business Worldwide

Medium-Voltage Dry-Type Distribution Transformers

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Medium-Voltage Dry-Type Distribution Transformers

Product Description

Note: The following pages provide listings for most standard transformer ratings and catalog numbers. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Single- and Three-Phase

- Ventilated, NEMA 3R enclosure standard
- Suitable for indoor or outdoor applications
- Upright mounting only
- 220°C insulation system
- 150°C rise standard; 115°C or 80°C rise optional
- Available in single-phase ratings 15–333 kVA
- Available in three-phase ratings 15–1500 kVA

Application Description

DOE 2016 compliant energy-efficient transformers are specifically designed to meet the energy efficiency standards set forth in CFR Title 10 Chapter II Part 431, Appendix A of Subpart K 2016. Compliant transformers are optimized to offer maximum efficiency at 50% of nameplate rating.

Transformers that are currently specifically excluded from the scope of DOE 10 CFR Part 431 include:

- Liquid-filled transformers below 10 kVA
- Dry-type transformers below 15 kVA
- AC and DC drives transformers
- Rectifier transformers designed for high harmonics
- Autotransformers
- Non-distribution transformers, such as UPS transformers
- Special impedance or regulation transformers
- Regulating transformers
- Sealed and non-ventilated 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

DOE 2016 Efficiency Levels

Tables of Energy Efficiency
Medium-Voltage Dry-Type
Distribution Transformers—
20–45 kV BIL

Single-Phase		Three-Phase	
kVA	Efficiency	kVA	Efficiency
15	98.10	15	97.50
25	98.33	30	97.90
37.5	98.49	45	98.10
50	98.60	75	98.33
75	98.73	112.5	98.52
100	98.82	150	98.65
167	98.96	225	98.82
250	99.07	300	98.93
333	99.14	500	99.09
—	—	750	99.21
—	—	1000	99.28
—	—	1500	99.37

Features, Benefits and Functions

- 60 Hz operation (except as noted)
- Short-term overload capability as required by ANSI
- Meet NEMA ST-20 sound levels
- Meet CFR Title 10 Chapter II Part 431, Appendix A of Subpart K 2016 energy efficiency requirements for dry-type transformers effective as of January 1, 2016

Standards and Certifications

- UL listed



Industry Standards

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

Seismically Qualified

Eaton manufactured dry-type distribution transformers are seismically qualified and exceed requirements of the International Building Code (IBC) and California Code Title 24.

Three-Phase—Medium-Voltage Distribution Transformers 60 Hz DOE 2016 Energy-Efficient— Copper Windings

4160 Delta Volts to 208Y/120 Volts

kVA	Temperature Rise °C	Frame	Wiring Diagram	Weight Lb (kg)	Type 3R WS Kit	Wallmount Bracket	Catalog Number
45	150	Contact local Eaton representative					V46D28T4516CU
75							V46D28T7516CU
112.5							V46D28T1216CU
150							V46D28T4916CU
225							V46D28T2216CU
300							V46D28T3316CU
500							V46D28T5516CU
750							V46D28T7716CU
45	115	Contact local Eaton representative					V46D28F4516CU
75							V46D28F7516CU
112.5							V46D28F1216CU
150							V46D28F4916CU
225							V46D28F2216CU
300							V46D28F3316CU
500							V46D28F5516CU
750							V46D28F7716CU
45	80	Contact local Eaton representative					V46D28B4516CU
75							V46D28B7516CU
112.5							V46D28B1216CU
150							V46D28B4916CU
225							V46D28B2216CU
300							V46D28B3316CU
500							V46D28B5516CU
750							V46D28B7716CU

Note

Contact your local Eaton sales office for CE Mark transformer requirements. For other ratings or catalog numbers not shown, or for special enclosure types (including stainless steel), refer to Eaton.

Dry-Type Distribution Transformers

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Standards and Certifications

Eaton dry-type distribution transformers are approved, listed, recognized or may comply with the following standards.

Engineering Standards

Catalog Product Name	UL Standard ①	UL/cUL File Number	UL Listed Control Number	cUL Energy Efficiency Verification File Number	CSA File Number	Insulation System Temp/°C	kVA Single-Phase	kVA Three-Phase	Applicable IEC Standard
Industrial Control Transformer									
MTE	5085	E46323	702X	—	—	105	0.025–1.5	N/A	61558
MTK	5085	E46323	702X	—	—	180	0.05–5	N/A	61558
Encapsulated Transformer									
AP	5085	E10156	591H	—	—	180	3–10	N/A	61558
AP	1561	E78389	591H	—	—	180	15	N/A	61558
EP	5085	E10156	591H	—	LR60545	180	0.05–10	N/A	61558
EP	1561	E78389	591H	—	LR60545 ③	180	15–37.5	N/A	61558 ④ / 726 ⑤
EPT	5085	E10156	591H	—	LR60545	180	N/A	3–9	61558 ⑥ / 726 ⑦
EPT	1561	E78389	591H	—	LR60545 ⑧	180	N/A	15–75	726
MPC	1062	E53449	591H	—	LR60546	180	3–25	15–30	—
Ventilated Transformer									
DS-3	1561	E78389	591H	EV33871 ②	—	220	7.5–167	N/A	60726
DT-3	1561	E78389	591H	EV33871 ⑥	—	220	N/A	7.5–750	60726
KT	1561	E78389	591H	EV33871 ⑥	—	220	N/A	7.5–500	N/A

Notes

- ① UL 5085 replaces UL 506.
- ② Applies to 15–167 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 15–300 kVA.
- ⑨ Applies to 30 kVA.

In addition to the above standards, Eaton dry-type distribution transformers are also manufactured in compliance with the applicable standards listed below.

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.

DOE 2016 Final Rule: CFR Title 10 Chapter II Part 431, Appendix A of Subpart K 2016.

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-1: Guide for Determining Energy Efficiency for Distribution Transformers (rescinded).

NEMA TP-2: Standard Test Method for Measuring the Energy Consumption of Distribution Transformers (rescinded).

NEMA TP-3: Standard for the Labeling of Distribution Transformer Efficiency (rescinded).



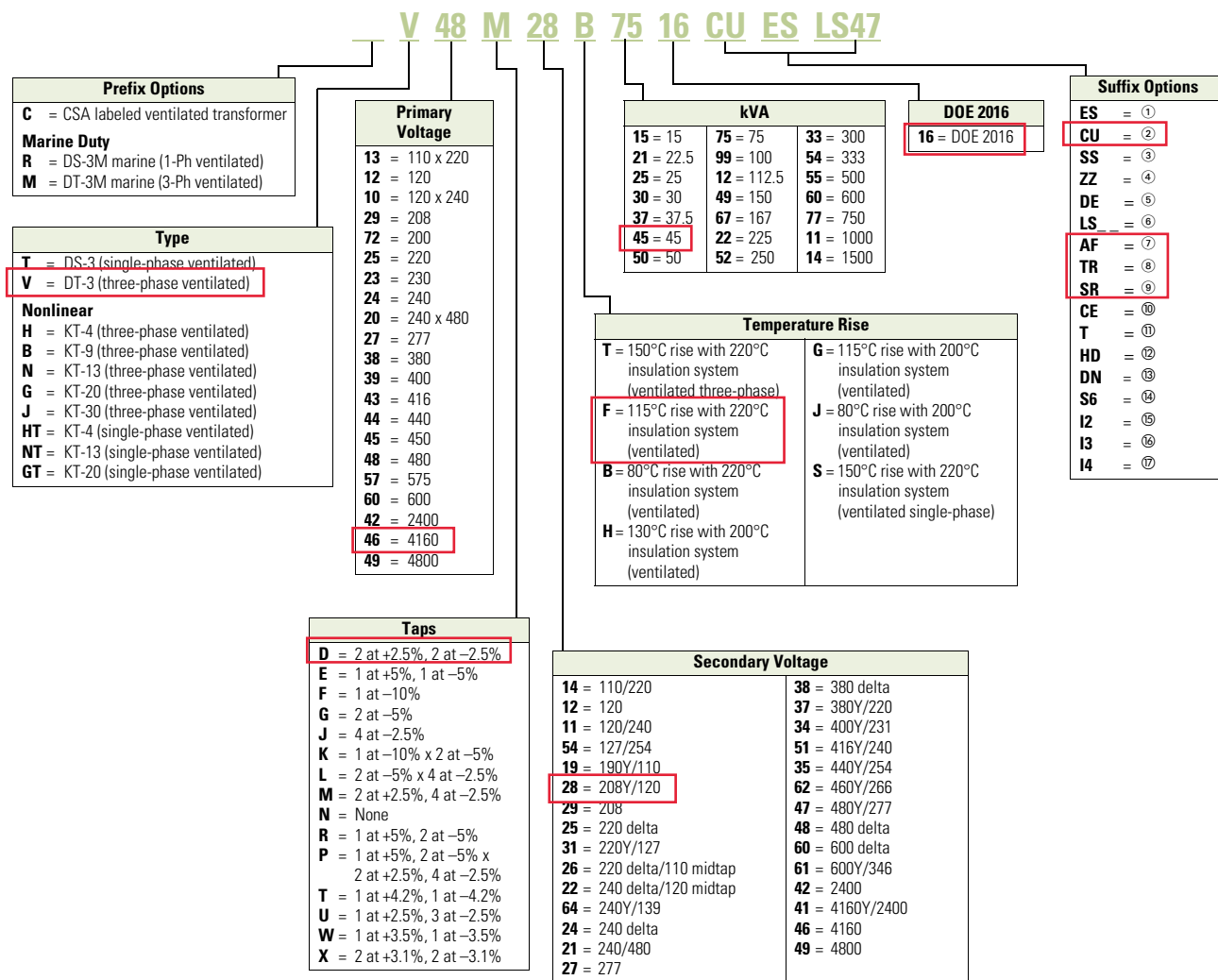
Catalog Number Selection

Use table for catalog number breakdown only.

Do not use to create catalog numbers because all combinations may not be valid.

DOE 2016 Efficient Transformers, Shielded Isolation, Nonlinear K-Factor, Marine Duty Transformers—Example: V48M28B7516CUESLS47

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Notes

- ① Electrostatic shield.
- ② Copper windings.
- ③ Grade 304 stainless steel enclosure (does not imply a NEMA 4X rating).
- ④ Open type core and coil assembly.
- ⑤ Double aluminum electrostatic shield.
- ⑥ Low sound design. LS47 indicates low sound equal to 47 dB; LS42 indicates 42 dB.
- ⑦ Fungus proof.
- ⑧ Certified test report of standard production tests for the specific serial number to be shipped.

For Eaton's industrial control transformers catalog number selection, see Volume 7—Logic Control, Operator Interface and Connectivity Solutions, **CA08100008E**, Tab 7.

Contact your local Eaton sales office for voltage combinations not shown.