

# Industrial Control Transformers

Types MTE and MTK



## 7.1 Transformers

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CE Marked



Type AP



## Volume 7—Logic Control, Operator Interface and Connectivity Solutions, CA08100008E

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<b>Revision date</b>	<b>Section</b>	<b>Change page(s)</b>	<b>Description</b>
04/20/2017	7.1	V7-T7-10	Content edit
04/20/2017	7.1	V7-T7-21	Content edit



*Powering Business Worldwide*

### Industrial Control 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 File Number	CSA File Number	Insulation System Temp/°C	kVA Single-Phase	kVA Three-Phase	Applicable IEC Standard
<b>Industrial Control Transformer</b>									
MTE	5085	E46323	702X	—	—	105	0.025–1.5	N/A	61558
MTK	5085	E46323	702X	—	—	180	0.05–5	N/A	61558
<b>Encapsulated Transformer</b>									
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	EV157 ②	LR60545 ③	180	15–50	N/A	61558 ④ / 726 ⑤
EPT	5085	E10156	591H	—	LR60545	180	N/A	3–9	61558 ⑥ / 726 ⑦
EPT	1561	E78389	591H	EV157 ⑧	LR60545 ⑨	180	N/A	15–75	726
MPC	1062	E53449	591H	—	LR60546	180	3–25	15–30	—
<b>Ventilated Transformer</b>									
DS-3	1561	E78389	591H	—	—	220	15–167	N/A	60726
DT-3	1561	E78389	591H	—	—	220	N/A	15–750	60726
KT	1561	E78389	591H	—	—	220	N/A	9–500	N/A

#### Notes

- ① UL 5085 replaces UL 506.
- ② Applies to 25–50 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 30–75 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.

**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.

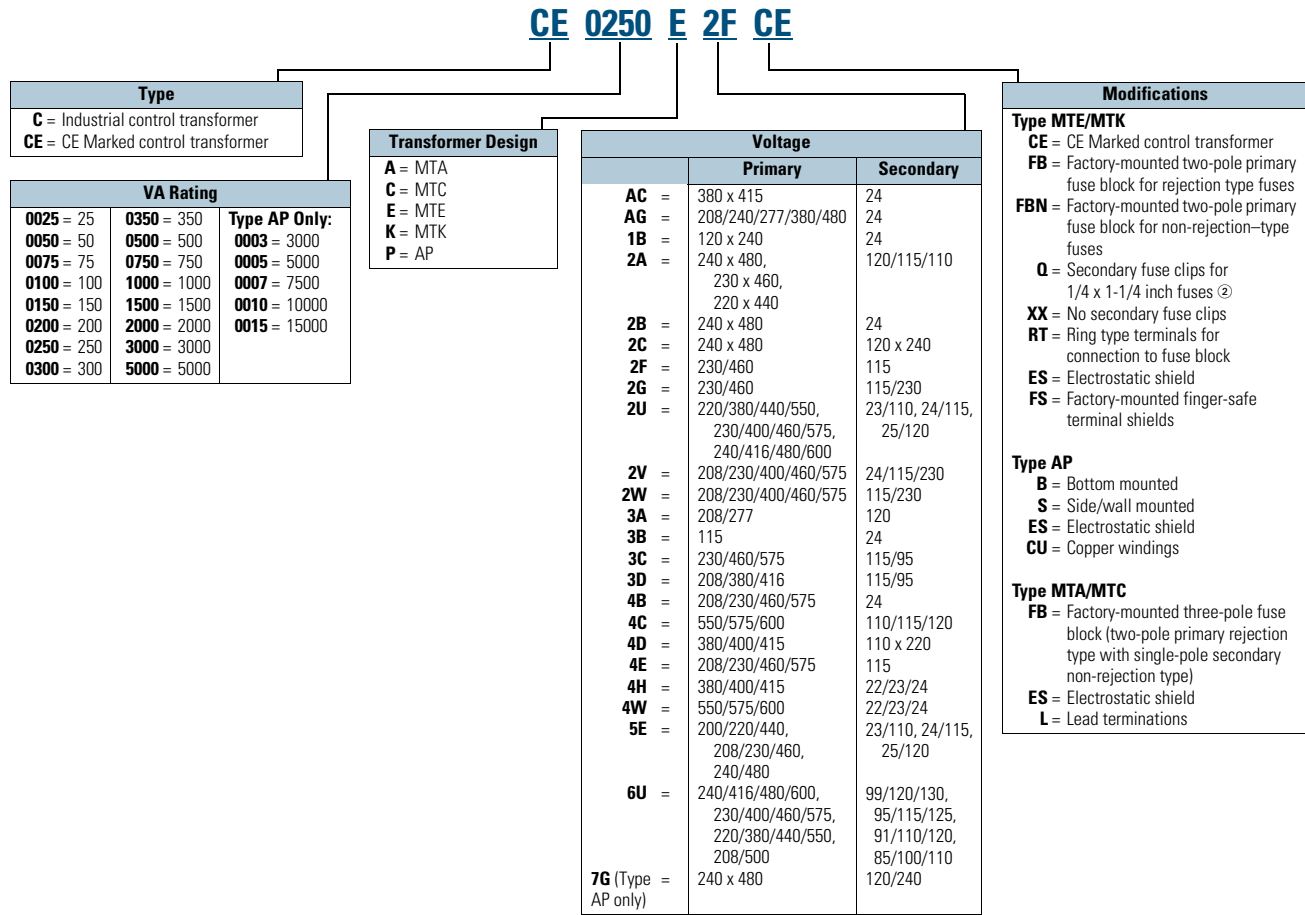
**CSA C22.2 No. 66:** Specialty Transformers.

**CSA 802-94:** Maximum Losses for Distribution, Power and Dry-Type Transformers.



### Catalog Number Selection

Industrial Control Transformers, CE Marked Control Transformers—Example: CE0250E2FCE <sup>①</sup>



**Notes**

<sup>①</sup> For Eaton's dry-type transformers catalog number selection, see Volume 2, CA08100003E.

<sup>②</sup> Fuse clip covers not available with this option.

Contact your local Eaton sales office for voltage combinations not shown. Use table for catalog number breakdown only. Do not use to create catalog numbers because all combinations may not be valid.

#### Type MTE Transformer



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### Type MTE

#### Product Description

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

- Epoxy-encapsulated coils

#### Application Description

Transformers provide stepped-down voltages to machine tool control devices, enabling control circuits to be isolated from all power and lighting circuits. This allows the use of grounded or ungrounded circuits that are independent of the power or lighting grounds; thus, greater safety is afforded the operator. The control transformer line is particularly adaptable on applications where compact construction is demanded.

**Note:** The MTG “open core-coil design” has been superseded by the epoxy-encapsulated core-coil design MTE with no change to dimensions or functionality.

#### Features, Benefits and Functions

- Epoxy encapsulated
- Laminations of high-quality silicon steel to minimize core losses and optimize performance
- Copper magnet wire for high-quality, efficient operation
- Secondary fuse clips where applicable
- Optional primary fusing
- Molded-in terminals
- 50/60 Hz operation
- 130°C insulation system standard
- Performance meets/exceeds requirements of ANSI/NEMA ST-1
- Regulation exceeds ANSI/NEMA requirements for all ratings
- 25–1500 VA ratings
- Molded-in terminals for maximum durability

#### Standards and Certifications

- UL listed
- cUL listed
- RoHS compliant



#### Industry Standards

All Eaton 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.

#### Catalog Number Selection

Please refer to **Page V7-T7-3**.

**Product Selection**

Additional Product Selection information is available in Volume 2, **CA08100003E**.

**Type MTE**

**Primary: 240 x 480, 230 x 460, 220 x 440 with Jumpers**  
**Secondary: 120/115/110 with Fuse Clips for**  
**13/32 x 1-1/2 Fuses**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
25	1	1.7 (0.8)	C0025E2A ②
50	1	2.6 (1.2)	C0050E2A ②
75	1	3.5 (1.6)	C0075E2A ②
100	1	4.2 (1.9)	C0100E2A ②
150	1	6.7 (3.0)	C0150E2A
200	1	8.5 (3.9)	C0200E2A
250	1	10.0 (4.5)	C0250E2A
300	1	11.3 (5.1)	C0300E2A
350	1	13.6 (6.2)	C0350E2A
500	1	19.2 (8.7)	C0500E2A
750	1	28.1 (12.8)	C0750E2A
1000	1	29.5 (13.4)	C1000E2A
1500	1	40.0 (18.1)	C1500E2A

**Primary: 240 x 480 with Jumpers**  
**Secondary: 24 with Fuse Clips for 13/32 x 1-1/2 Fuses**  
**(through 500 VA)**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
50	2	2.7 (1.2)	C0050E2B ②
75	2	3.5 (1.6)	C0075E2B ②
100	2	4.2 (1.9)	C0100E2B ②
150	2	6.7 (3.0)	C0150E2B
200	2	8.5 (3.9)	C0200E2B
250	2	10.1 (4.6)	C0250E2B
300	2	11.4 (5.2)	C0300E2B
350	2	13.4 (6.1)	C0350E2B
500	2	17.5 (7.9)	C0500E2B
750	2	28.1 (12.8)	C0750E2B

**Primary: 120 X 240 with Jumpers**  
**Secondary: 24 with Fuse Clips for 13/32 x 1-1/2 Fuses**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
50	3	2.6 (1.2)	C0050E1B ②
75	3	3.6 (1.6)	C0075E1B ②
100	3	4.4 (2.0)	C0100E1B ②
150	3	6.7 (3.0)	C0150E1B
200	3	8.3 (3.8)	C0200E1B
250	3	10.1 (4.6)	C0250E1B
300	3	11.2 (5.1)	C0300E1B
350	3	13.2 (6.0)	C0350E1B
500	3	17.5 (7.9)	C0500E1B

**Primary: 208/277**  
**Secondary: 120 with Fuse Clips for 13/32 x 1-1/2 Fuses**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
50	4	2.9 (1.3)	C0050E3A ②
75	4	3.8 (1.7)	C0075E3A ②
100	4	4.5 (2.0)	C0100E3A ②
150	4	6.9 (3.1)	C0150E3A
200	4	8.7 (3.9)	C0200E3A
250	4	10.2 (4.6)	C0250E3A
300	4	11.4 (5.2)	C0300E3A
350	4	13.7 (6.2)	C0350E3A
500	4	17.2 (7.8)	C0500E3A
750	4	25.7 (11.7)	C0750E3A

**Notes**

- ① See Page V7-T7-11 for wiring diagrams.  
 ② 105°C insulation system.

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**Primary: 240 x 480 with Jumpers**  
**Secondary: 120 x 240 with Jumpers,**  
**Secondary Fuse Clips Not Applicable**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
50	11	2.6 (1.2)	C0050E2CXX ②
75	11	3.5 (1.6)	C0075E2CXX ②
100	11	4.2 (1.9)	C0100E2CXX ②
150	11	6.7 (3.1)	C0150E2CXX
200	11	8.5 (3.9)	C0200E2CXX
250	11	10.0 (4.6)	C0250E2CXX
300	11	11.8 (5.4)	C0300E2CXX
350	11	13.6 (6.2)	C0350E2CXX
500	11	17.5 (8.0)	C0500E2CXX
750	11	26.4 (12.0)	C0750E2CXX

**Primary: 550/575/600**  
**Secondary: 110/115/120 with for 13/32 x 1-1/2 Fuses**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
50	10	2.7 (1.2)	C0050E4C ②
75	10	3.6 (1.6)	C0075E4C ②
100	10	4.2 (1.9)	C0100E4C ②
150	10	6.8 (3.1)	C0150E4C
200	10	8.4 (3.8)	C0200E4C
250	10	10.0 (4.6)	C0250E4C
300	10	11.3 (5.1)	C0300E4C
350	10	13.6 (6.2)	C0350E4C
500	10	16.8 (7.6)	C0500E4C
750	10	25.7 (11.7)	C0750E4C

**Primary: 380/400/415**  
**Secondary: 22/23/24 with Fuse Clips for 13/32 x 1-1/2 Fuses**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
50	13	2.5 (1.1)	C0050E4H ②
75	13	3.5 (1.6)	C0075E4H ②
100	13	4.0 (1.8)	C0100E4H ②
150	13	6.5 (3.0)	C0150E4H
200	13	8.2 (3.7)	C0200E4H
250	13	10.0 (4.5)	C0250E4H
300	13	11.0 (5.0)	C0300E4H
350	13	13.6 (6.2)	C0350E4H
500	13	17.7 (8.0)	C0500E4H

**Primary: 550/575/600**  
**Secondary: 22/23/24 with Fuse Clips for 13/32 x 1-1/2 Fuses**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
50	12	2.5 (1.1)	C0050E4W ②
75	12	3.5 (1.6)	C0075E4W ②
100	12	4.0 (1.8)	C0100E4W ②
150	12	6.5 (3.0)	C0150E4W
200	12	8.2 (3.7)	C0200E4W
250	12	10.0 (4.5)	C0250E4W
300	12	11.0 (5.0)	C0300E4W
350	12	13.6 (6.2)	C0350E4W
500	12	17.7 (8.0)	C0500E4W
750	12	28.0 (12.7)	C0750E4WXX ③

**Primary: 230/460/575**  
**Secondary: 115/95 with Fuse Clips for 13/32 x 1-1/2 Fuses**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
50	5	3.5 (1.6)	C0050E3C ②
75	5	4.5 (2.0)	C0075E3C ②
100	5	6.0 (2.7)	C0100E3C ②
150	5	7.7 (3.5)	C0150E3C
200	5	9.0 (4.1)	C0200E3C
250	5	9.7 (4.4)	C0250E3C
300	5	11.7 (5.3)	C0300E3C
350	5	16.5 (7.5)	C0350E3C
500	5	21.5 (9.8)	C0500E3C
750	5	28.0 (12.7)	C0750E3C

**Primary: 380/400/415**  
**Secondary: 110 x 220 with Jumpers;**  
**Fuse Clips Not Applicable**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
50	6	3.0 (1.4)	C0050E4D ②
75	6	4.0 (1.8)	C0075E4D ②
100	6	5.2 (2.4)	C0100E4D ②
150	6	7.0 (3.2)	C0150E4D
200	6	8.7 (3.9)	C0200E4D
250	6	10.2 (4.6)	C0250E4D
300	6	11.0 (5.0)	C0300E4D
350	6	13.0 (5.9)	C0350E4D
500	6	20.0 (9.1)	C0500E4D
750	6	28.0 (12.7)	C0750E4D

**Notes**

- ① See Page V7-T7-11 for wiring diagrams.
- ② 105°C insulation system.
- ③ Secondary fuse clips are not available on this catalog number.

**Primary: 200/220/440, 208/230/460, 240/480**  
**Secondary: 23/110, 24/115, 25/120 with Fuse Clips for 13/32 x 1-1/2 Fuses**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
50	7	3.4 (1.5)	C0050E5E ②
75	7	4.8 (2.2)	C0075E5E ②
100	7	5.9 (2.7)	C0100E5E ②
150	7	7.9 (3.6)	C0150E5E
200	7	10.6 (4.8)	C0200E5E
250	7	13.9 (6.3)	C0250E5E
300	7	15.5 (7.0)	C0300E5E
350	7	16.8 (7.6)	C0350E5E
500	7	23.4 (10.6)	C0500E5E

**Universal Design (MTE Epoxy Encapsulated)**

**Primary: 240/416/480/600, 230/400/460/575, 220/380/440/550, 208/500**  
**Secondary: 99/120/130, 95/115/125, 91/110/120, 85/100/110 with Fuse Clips for 13/32 x 1-1/2 Fuses**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
50	8	4.0 (1.8)	C0050E6U ②③
100	8	6.6 (3.0)	C0100E6U ②③
150	8	8.8 (4.0)	C0150E6U ②④
250	8	14.7 (6.7)	C0250E6U ②④
350	8	18.6 (8.4)	C0350E6U ②④
500	8	25.6 (11.6)	C0500E6U ②④
750	8	30.5 (13.8)	C0750E6U ②④

**Transformers with Primary Fuse Blocks**

**Primary: 240 x 480, 230 x 460, 220 x 440 with Jumpers and Two-Pole Primary Fuse Block for Rejection-Type Fuses**  
**Secondary: 120/115/110 with Fuse Clips for 13/32 x 1-1/2 Fuses**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
50	1	2.8 (1.3)	C0050E2AFB ②
75	1	3.7 (1.7)	C0075E2AFB ②
100	1	4.4 (2.0)	C0100E2AFB ②
150	1	6.9 (3.1)	C0150E2AFB
200	1	8.7 (3.9)	C0200E2AFB
250	1	10.2 (4.6)	C0250E2AFB
300	1	11.5 (5.2)	C0300E2AFB
350	1	13.8 (6.3)	C0350E2AFB
500	1	19.4 (8.8)	C0500E2AFB
750	1	28.3 (12.8)	C0750E2AFB
1000	1	29.7 (13.4)	C1000E2AFB
1500	1	40.2 (18.1)	C1500E2AFB

**Primary: 240 x 480 with Jumpers and Two-Pole Primary Fuse Block for Rejection-Type Fuses**  
**Secondary: 24 with Fuse Clips for 13/32 x 1-1/2 Fuses**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
50	2	2.8 (1.3)	C0050E2BFB ②
75	2	3.8 (1.7)	C0075E2BFB ②
100	2	4.4 (2.1)	C0100E2BFB ②
150	2	6.9 (3.1)	C0150E2BFB
200	2	8.7 (3.9)	C0200E2BFB
250	2	10.3 (4.7)	C0250E2BFB
300	2	11.6 (5.3)	C0300E2BFB
350	2	13.6 (6.2)	C0350E2BFB
500	2	17.7 (8.0)	C0500E2BFB

**Notes**

- ① See Page V7-T7-11 for wiring diagrams.
- ② 105°C insulation system.
- ③ Type MTG open core-coil universal design has been superseded by Type MTE epoxy encapsulated universal design with no changes to form, fit or function.
- ④ Type MTE epoxy encapsulated universal design.



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**Primary: 120 x 240 with Jumpers and Two-Pole Primary Fuse Block for Rejection-Type Fuses**  
**Secondary: 24 with Fuse Clips for 13/32 x 1-1/2 Fuses**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
50	3	2.8 (1.3)	C0050E1BFB ②
75	3	3.8 (1.7)	C0075E1BFB ②
100	3	4.6 (2.1)	C0100E1BFB ②
150	3	6.9 (3.1)	C0150E1BFB
200	3	8.5 (3.9)	C0200E1BFB
250	3	10.3 (4.7)	C0250E1BFB
300	3	11.4 (5.2)	C0300E1BFB
350	3	13.4 (6.1)	C0350E1BFB
500	3	17.7 (8.0)	C0500E1BFB

**Primary: 208/277 with Two-Pole Primary Fuse Block for Rejection-Type Fuses**  
**Secondary: 120 with Fuse Clips for 13/32 x 1-1/2 Fuses**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
50	4	3.1 (1.4)	C0050E3AFB ②
75	4	4.0 (1.8)	C0075E3AFB ②
100	4	4.7 (2.1)	C0100E3AFB ②
150	4	7.1 (3.2)	C0150E3AFB
200	4	8.9 (4.0)	C0200E3AFB
250	4	10.4 (4.7)	C0250E3AFB
300	4	11.6 (5.3)	C0300E3AFB
350	4	13.9 (6.3)	C0350E3AFB
500	4	17.4 (7.9)	C0500E3AFB

**Primary: 550/575/600 with Two-Pole Primary Fuse Block for Rejection-Type Fuses**  
**Secondary: 110/115/120 with Fuse Clips for 13/32 x 1-1/2 Fuses**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
50	10	2.9 (1.3)	C0050E4CFB ②
75	10	3.8 (1.7)	C0075E4CFB ②
100	10	4.4 (2.0)	C0100E4CFB ②
150	10	7.0 (3.2)	C0150E4CFB
200	10	8.6 (3.9)	C0200E4CFB
250	10	10.2 (4.6)	C0250E4CFB
300	10	11.5 (5.2)	C0300E4CFB
350	10	13.8 (6.3)	C0350E4CFB
500	10	17.0 (7.7)	C0500E4CFB
750	10	25.9 (11.8)	C0750E4CFB

**Primary: 380/400/415 with Two-Pole Primary Fuse Block for Rejection-Type Fuses**  
**Secondary: 22/23/24 with Fuse Clips for 13/32 x 1-1/2 Fuses**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
50	13	2.6 (1.2)	C0050E4HFB ②
75	13	3.7 (1.7)	C0075E4HFB ②
100	13	4.2 (1.9)	C0100E4HFB ②
150	13	6.7 (3.0)	C0150E4HFB
200	13	8.4 (3.8)	C0200E4HFB
250	13	10.2 (4.6)	C0250E4HFB

**Primary: 550/575/600 with Two-Pole Primary Fuse Block for Rejection-Type Fuses**  
**Secondary: 22/23/24 with Fuse Clips for 13/32 x 11/2 Fuses**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
50	12	2.7 (1.2)	C0050E4WFB ②
75	12	3.7 (1.7)	C0075E4WFB ②
100	12	4.2 (1.9)	C0100E4WFB ②
150	12	6.7 (3.0)	C0150E4WFB
200	12	8.4 (3.8)	C0200E4WFB
250	12	10.2 (4.6)	C0250E4WFB

**Primary: 230/460/575 with Two-Pole Primary Fuse Block for Rejection-Type Fuses**  
**Secondary: 115/95 with Fuse Clips for 13/32 x 1-1/2 Fuses**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
50	5	3.7 (1.7)	C0050E3CFB ②
75	5	4.7 (2.1)	C0075E3CFB ②
100	5	6.2 (2.8)	C0100E3CFB ②
150	5	7.9 (3.6)	C0150E3CFB
200	5	9.2 (4.2)	C0200E3CFB
250	5	9.9 (4.5)	C0250E3CFB
300	5	11.9 (5.4)	C0300E3CFB
350	5	16.7 (7.6)	C0350E3CFB
500	5	21.7 (9.9)	C0500E3CFB

**Notes**

- ① See Page V7-T7-11 for wiring diagrams.
- ② 105°C insulation system.

**Primary: 380/400/415 with Two-Pole Primary Fuse Block for Rejection-Type Fuses**  
**Secondary: 110 x 220 with Jumpers; Fuse Clips Not Available**

VA	Wiring Diagram <sup>①</sup>	Weight Lbs (kg)	Style Number
50	6	3.2 (1.5)	C0050E4DFB <sup>②</sup>
75	6	4.2 (1.9)	C0075E4DFB <sup>②</sup>
100	6	5.4 (2.5)	C0100E4DFB <sup>②</sup>
150	6	7.2 (3.3)	C0150E4DFB
200	6	8.9 (4.0)	C0200E4DFB
250	6	10.4 (4.7)	C0250E4DFB
300	6	11.2 (5.1)	C0300E4DFB
350	6	13.2 (6.0)	C0350E4DFB
500	6	20.2 (9.2)	C0500E4DFB

**Primary: 200/220/440, 208/230/460, 240/480 with Two-Pole Primary Fuse Block for Rejection-Type Fuses**  
**Secondary: 23/110, 24/115, 25/120 with Fuse Clips for 13/32 x 1-1/2 Fuses**

VA	Wiring Diagram <sup>①</sup>	Weight Lbs (kg)	Style Number
50	7	3.6 (1.6)	C0050E5EFB <sup>②</sup>
75	7	5.0 (2.3)	C0075E5EFB <sup>②</sup>
100	7	6.1 (2.8)	C0100E5EFB <sup>②</sup>
150	7	8.1 (3.7)	C0150E5EFB
200	7	10.8 (4.9)	C0200E5EFB
250	7	14.1 (6.4)	C0250E5EFB
300	7	15.7 (7.1)	C0300E5EFB
350	7	17.0 (7.7)	C0350E5EFB
500	7	23.6 (10.7)	C0500E5EFB

**Universal Design (MTE Epoxy Encapsulated)**  
**Primary: 240/416/480/600, 230/400/460/575, 220/380/440/550, 208/500 with Two-Pole Primary Fuse Block for Rejection-Type Fuses**  
**Secondary: 99/120/130, 95/115/125, 91/110/120, 85/100/110 with Fuse Clips for 13/32 x 1-1/2 Fuses**

VA	Wiring Diagram <sup>①</sup>	Weight Lbs (kg)	Style Number
50	8	4.2 (1.9)	C0050E6UFB <sup>②③</sup>
100	8	6.8 (3.1)	C0100E6UFB <sup>②③</sup>
150	8	9.0 (4.1)	C0150E6UFB <sup>②④</sup>
250	8	14.9 (6.8)	C0250E6UFB <sup>②④</sup>
350	8	18.8 (8.5)	C0350E6UFB <sup>②④</sup>
500	8	25.8 (11.7)	C0500E6UFB <sup>②④</sup>

#### Notes

- ① See Page V7-T7-11 for wiring diagrams.
- ② 105°C insulation system.
- ③ Type MTG open core-coil universal design has been superseded by Type MTE epoxy encapsulated universal design with no changes to form, fit or function.
- ④ Type MTE epoxy encapsulated universal design.

### Accessories

#### Primary Fuse Kit

The primary fuse kit includes a two-pole class CC fuse block, instructions, and all associated mounting and wiring hardware. Fuses are not included. When installed, the primary fuse kit will add a maximum of 11/16 inch to the transformer depth and 1-15/16 inches to the transformer height.



#### Primary Fuse Kit

Description	Catalog Number
Primary fuse kit	PFK1

#### Finger-Safe Terminal Covers (Optional)

- Fits CE Marked designs 50–750 VA
- Fits MTE designs 0.25–750 VA


#### Finger-Safe Terminal Covers

Description	Catalog Number
 <p>FSK4 Four terminal transformers</p>	FSK4
<p>Four terminal Series 2 transformers only</p>	FSK4S2
 <p>FSK6 Six terminal transformers</p>	FSK6

#### Finger-Safe Primary Fuse Block Covers

- Fits two-pole primary fuse blocks on MTE designs
- No fuse block covers are available for transformers with suffix "FBQ"

#### Finger-Safe Primary Fuse Block Covers

Description	Catalog Number
 <p>FSKFB Primary fuse block covers</p>	FSKFB

#### Secondary Fuse Clip

#### Secondary Fuse Clip

Description	Catalog Number
Fits 500 VA and smaller models	SFCS
Fits models greater than 500 VA	SFCL

### Technical Data and Specifications

#### Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

#### 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
25°C	135°C	20°C	180°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.

#### Series-Multiple Windings

Series-multiple windings consist of two similar coils in each winding that can be connected in series or parallel (multiple). Transformers with series-multiple windings are designated with an "x" or "/" between the voltage ratings, such as voltages of "120/240" or "240 x 480." If the series-multiple winding is designated by an "x," the winding can be connected only for a series or parallel. With the "/" designation, a mid-point also becomes available in addition to the series or parallel connection. As an example, a 120 x 240 winding can be connected for either 120 (parallel) or 240 (series), but a 120/240 winding can be connected for 120 (parallel), 240 (series) or 240 with a 120 mid-point.

For additional information, please refer to Volume 2, CA08100003E.

## Wiring Diagrams

Diagram 1

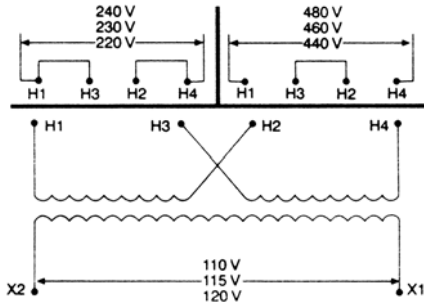


Diagram 5

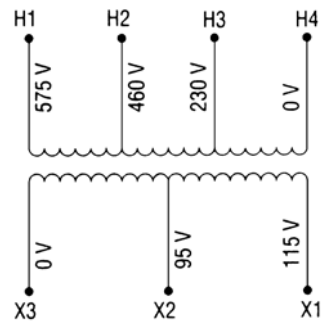


Diagram 2

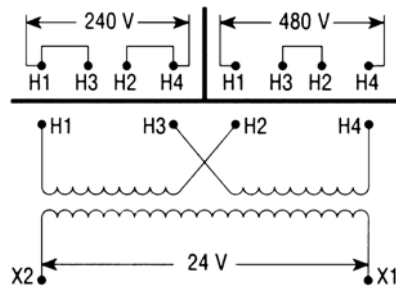


Diagram 6

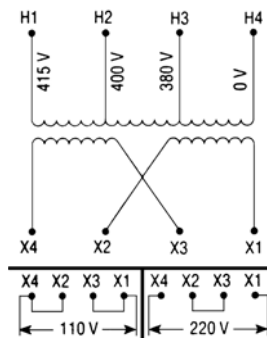


Diagram 3

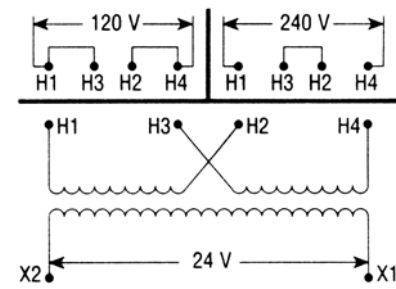


Diagram 7

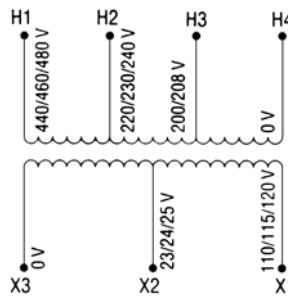


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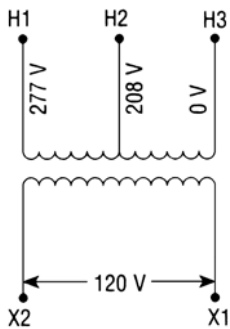
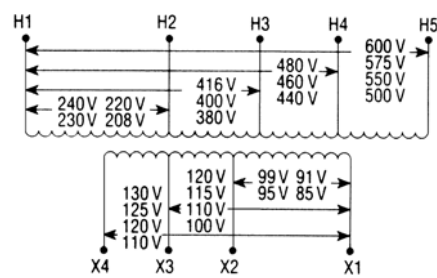


Diagram 8



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## Industrial Control Transformers

### Transformers

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Diagram 9

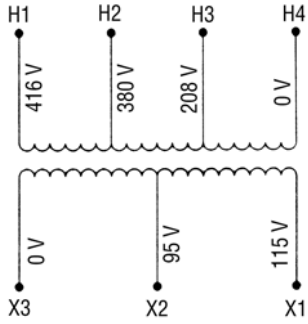


Diagram 13

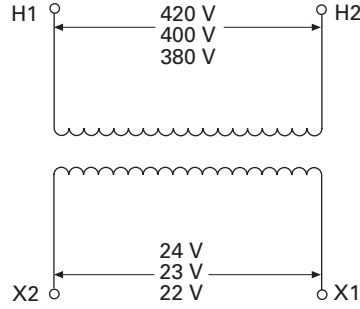


Diagram 10

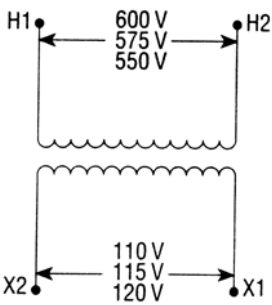


Diagram 14

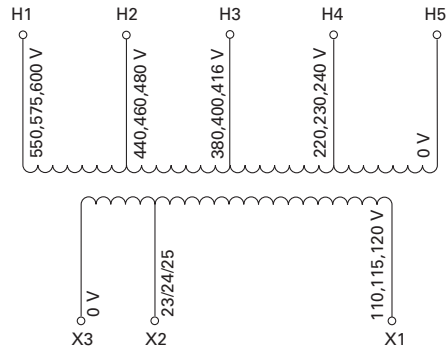


Diagram 11

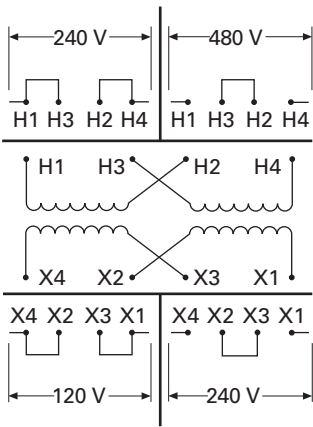


Diagram 15

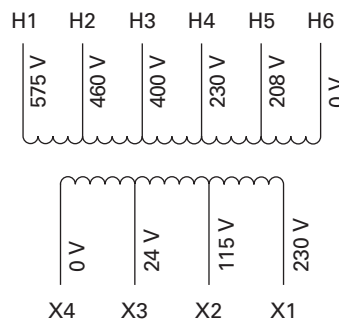


Diagram 12

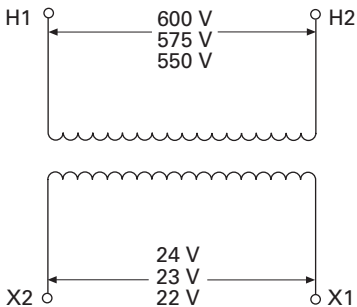
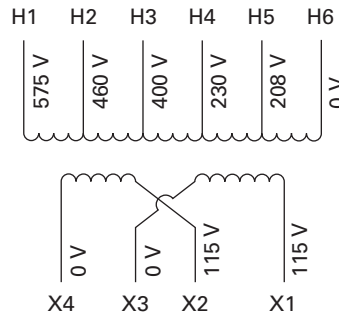


Diagram 16



**Type MTK Transformer**



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Type MTK	
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Type AP .....	<b>V7-T7-25</b>

**Type MTK**

**Product Description**

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

- Epoxy resin-impregnated coil
- Economical solution for high inrush applications

**Application Description**

Transformers provide stepped-down voltages to machine tool control devices, enabling control circuits to be isolated from all power and lighting circuits. This allows the use of grounded or ungrounded circuits that are independent of the power or lighting grounds; thus, greater safety is afforded the operator. The control transformer line is particularly adaptable on applications where compact construction is demanded.

**Features, Benefits and Functions**

- Epoxy resin impregnated coil design
- Copper magnet wire for high-quality, efficient operation
- 50/60 Hz operation
- 180°C insulation system
- Performance meets/exceeds requirements of ANSI/NEMA ST-1
- Regulation exceeds ANSI/NEMA requirements for all ratings
- 500–5000 VA ratings

**Standards and Certifications**

- UL listed
- cUL listed
- RoHS compliant



**Industry Standards**

All Eaton 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.

**Catalog Number Selection**

Please refer to **Page V7-T7-3**.

**Product Selection**

Additional Product Selection information is available in Volume 2, **CA08100003E**.

**Type MTK****Primary: 240 x 480, 230 x 460, 220 x 440  
Secondary: 120/115/110**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
500	1	13.0 (5.9)	C0500K2A
750	1	19.5 (8.9)	C0750K2A
1000	1	29.8 (13.6)	C1000K2A
1500	1	30.0 (13.6)	C1500K2A
2000	1	38.0 (17.3)	C2000K2A
3000	1	53.0 (24.1)	C3000K2A
5000	1	89.0 (40.5)	C5000K2A

**Primary: 208/277 Secondary: 120**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
1000	4	29.0 (13.1)	C1000K3A
1500	4	33.0 (15.0)	C1500K3A
2000	4	43.0 (19.5)	C2000K3A
3000	4	64.0 (29.0)	C3000K3A
5000	4	102.0 (46.3)	C5000K3A

**Primary: 230/460/575 Secondary: 115/95**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
1000	5	29.2 (13.3)	C1000K3C
1500	5	33.5 (15.2)	C1500K3C
2000	5	42.5 (19.3)	C2000K3C
3000	5	63.7 (29.0)	C3000K3C
5000	5	102.0 (46.4)	C5000K3C

**Primary: 208/380/416 Secondary: 115/95**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
1000	9	29.0 (13.1)	C1000K3D
1500	9	43.0 (19.5)	C1500K3D
2000	9	55.0 (25.0)	C2000K3D
3000	9	74.0 (33.5)	C3000K3D
5000	9	108.0 (49.0)	C5000K3D

**Primary: 550/575/600 Secondary: 110/115/120**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
1000	10	29.0 (13.1)	C1000K4C
1500	10	33.0 (15.0)	C1500K4C
2000	10	43.0 (19.5)	C2000K4C
3000	10	64.0 (29.0)	C3000K4C
5000	10	102.0 (46.3)	C5000K4C

**Primary: 380/400/415 Secondary: 110 x 220**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
1000	6	28.0 (12.7)	C1000K4D
1500	6	33.0 (15.0)	C1500K4D
2000	6	43.0 (19.5)	C2000K4D
3000	6	64.0 (29.0)	C3000K4D
5000	6	102.0 (46.3)	C5000K4D

**Primary: 240 x 480 with Jumpers  
Secondary: 120 x 240 with Jumpers,  
Secondary Fuse Clips Not Applicable**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
1000	11	26.4 (12.0)	C1000K2CXX
1500	11	31.0 (14.1)	C1500K2CXX
2000	11	40.0 (18.2)	C2000K2CXX
3000	11	56.0 (25.5)	C3000K2CXX
5000	11	85.5 (28.9)	C5000K2CXX

**Primary: 120 x 240 with Jumpers Secondary: 24**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
750	3	19.0 (8.6)	C0750K1B
1000	3	26.4 (12.0)	C1000K1B

**Primary: 240/416/480/600, 230/400/460/575,  
220/380/440/550, 208/500  
Secondary: 99/120/130, 95/115/125, 91/110/120, 85/100/110**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
1000	8	26.5 (12.0)	C1000K6U
1500	8	38.5 (17.5)	C1500K6U
2000	8	52.0 (23.6)	C2000K6U
3000	8	68.0 (30.9)	C3000K6U
5000	8	105.0 (47.7)	C5000K6U

**Note**

① See Page V7-T7-15 for wiring diagrams.

## Technical Data and Specifications

### Insulation System and Temperature Rise

Industry standards classify insulation systems and rise as shown below:

### 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
25°C	135°C	20°C	180°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.

### Series-Multiple Windings

Series-multiple windings consist of two similar coils in each winding that can be connected in series or parallel (multiple). Transformers with series-multiple windings are designated with an “x” or “/” between the voltage ratings, such as voltages of “120/240” or “240 x 480.” If the series-multiple winding is designated by an “x,” the winding can be connected only for a series or parallel. With the “/” designation, a mid-point also becomes available in addition to the series or parallel connection. As an example, a 120 x 240 winding can be connected for either 120 (parallel) or 240 (series), but a 120/240 winding can be connected for 120 (parallel), 240 (series) or 240 with a 120 mid-point.

For additional information, please refer to Volume 2, CA08100003E.

## Wiring Diagrams

Diagram 1

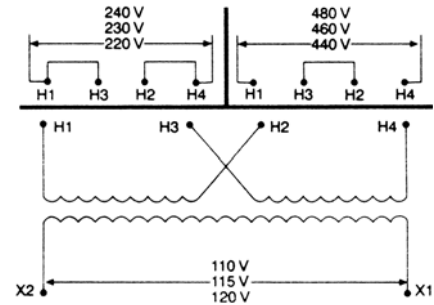


Diagram 2

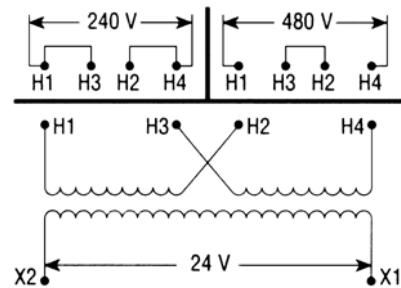


Diagram 3

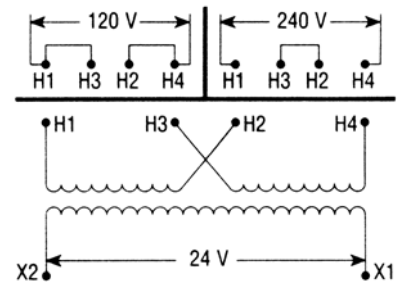
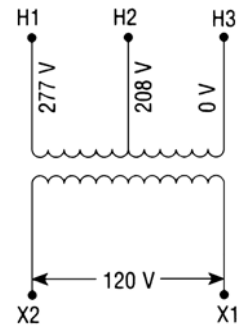


Diagram 4





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## Industrial Control Transformers

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Diagram 5

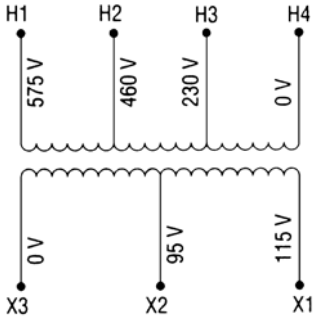


Diagram 9

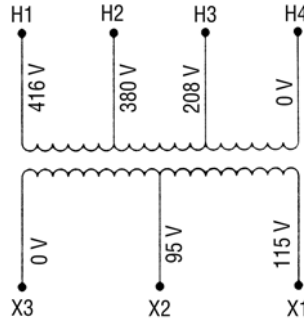


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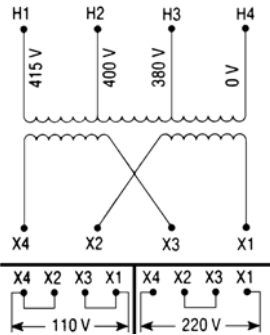


Diagram 10

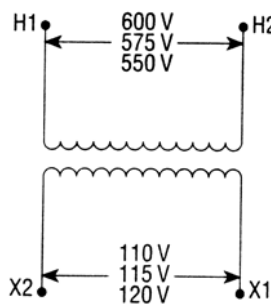


Diagram 7

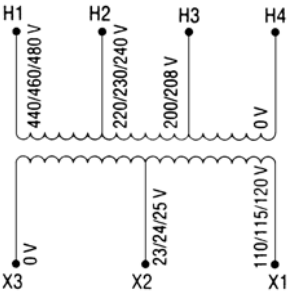


Diagram 11

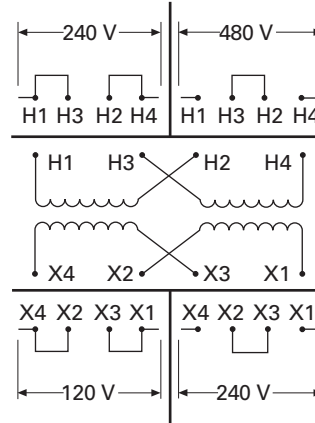


Diagram 8

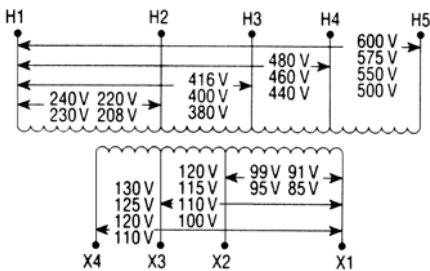
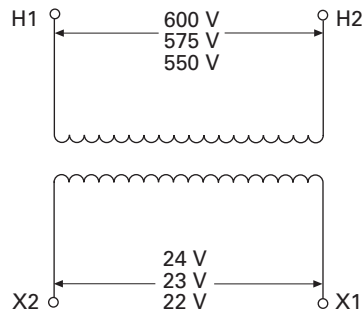
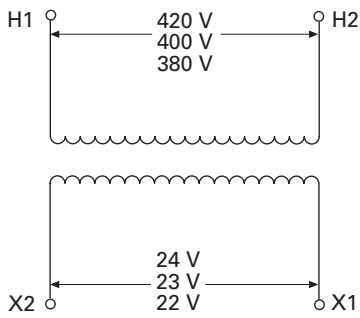


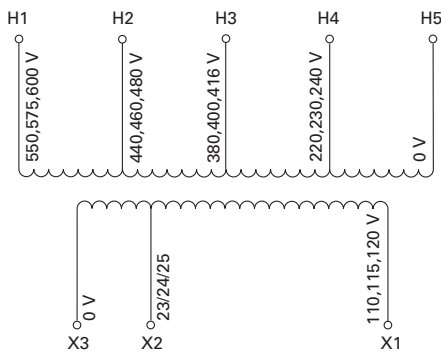
Diagram 12



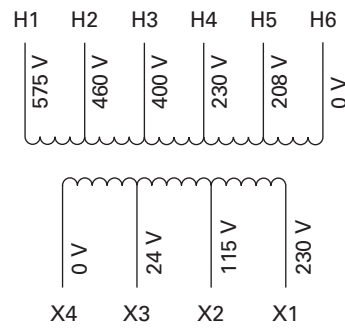
**Diagram 13**



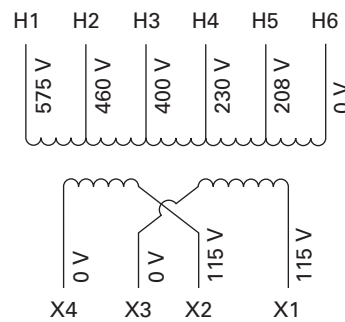
**Diagram 14**



**Diagram 15**



**Diagram 16**



Type MTE CE-Marked CPT



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### CE Marked

#### Product Description

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

#### Application Description

Transformers provide stepped-down voltages to machine tool control devices, enabling control circuits to be isolated from all power and lighting circuits. This allows the use of grounded or ungrounded circuits that are independent of the power or lighting grounds; thus, greater safety is afforded the operator. The control transformer line is particularly adaptable on applications where compact construction is demanded.

#### Features, Benefits and Functions

##### Type MTE

- Epoxy encapsulated coil design
- Copper magnet wire for high-quality, efficient operation
- Laminations of high-quality silicon steel to minimize core losses and optimize performance
- Molded-in terminals
- 50/60 Hz operation
- 130°C insulation system standard
- Performance meets/exceeds requirements of ANSI/NEMA ST-1
- Regulation exceeds ANSI/NEMA requirements for all ratings
- Non-short circuit-proof transformer, isolation type

##### Type MTK

- Epoxy resin-impregnated coil design
- Copper magnet wire for high-quality, efficient operation
- 50/60 Hz operation
- 180°C insulation system
- Performance meets/exceeds requirements of ANSI/NEMA ST-1
- Regulation exceeds ANSI/NEMA requirements for all ratings
- 500–5000 VA ratings

#### Standards and Certifications

- UL listed
- cUL listed
- CE Marked units comply with IEC EN-61558-2
- RoHS compliant



#### Industry Standards

All Eaton 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.

#### Catalog Number Selection

Please refer to **Page V7-T7-3**.

**Product Selection**

Additional Product Selection information is available in Volume 2, **CA08100003E**.

**Type MTE CE Marked IP00**

**Primary: 240 x 480, 230 x 460, 220 x 440 with Jumpers**  
**Secondary: 120/115/110**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
50	1	3.5 (1.6)	CE0050E2ACE ②
75	1	4.8 (2.2)	CE0075E2ACE ②
100	1	5.9 (2.7)	CE0100E2ACE ②
150	1	8.5 (3.9)	CE0150E2ACE
200	1	10.6 (4.8)	CE0200E2ACE
250	1	11.3 (5.1)	CE0250E2ACE
300	1	13.2 (6.0)	CE0300E2ACE
350	1	14.9 (6.8)	CE0350E2ACE
500	1	21.0 (9.5)	CE0500E2ACE
750	1	29.8 (13.5)	CE0750E2ACE

**Primary: 550/575/600**  
**Secondary: 110/115/1204**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
50	10	3.5 (1.6)	CE0050E4CCE ②
75	10	4.8 (2.2)	CE0075E4CCE ②
100	10	5.9 (2.7)	CE0100E4CCE ②
150	10	8.5 (3.9)	CE0150E4CCE
200	10	10.6 (4.8)	CE0200E4CCE
250	10	11.3 (5.1)	CE0250E4CCE
300	10	13.2 (6.0)	CE0300E4CCE
350	10	14.9 (6.8)	CE0350E4CCE
500	10	21.0 (9.5)	CE0500E4CCE
750	10	29.8 (13.5)	CE0750E4CCE

**Primary: 240 x 480 with Jumpers**  
**Secondary: 24**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
50	2	3.4 (1.5)	CE0050E2BCE ②
75	2	4.2 (1.9)	CE0075E2BCE ②
100	2	5.9 (2.7)	CE0100E2BCE ②
150	2	8.5 (3.9)	CE0150E2BCE
200	2	10.6 (4.5)	CE0200E2BCE
250	2	11.3 (5.1)	CE0250E2BCE
300	2	13.2 (6.0)	CE0300E2BCE
350	2	14.9 (6.8)	CE0350E2BCE
500	2	19.2 (8.7)	CE0500E2BCE
750	2	28.1 (12.8)	CE0750E2BCE

**Primary: 380/400/415**  
**Secondary: 110 x 220 with Jumpers**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
50	6	3.5 (1.6)	CE0050E4DCE ②
75	6	4.8 (2.2)	CE0075E4DCE ②
100	6	5.9 (2.7)	CE0100E4DCE ②
150	6	8.5 (3.9)	CE0150E4DCE
200	6	10.6 (4.8)	CE0200E4DCE
250	6	11.3 (5.1)	CE0250E4DCE
300	6	13.2 (6.0)	CE0300E4DCE
350	6	15.2 (6.9)	CE0350E4DCE
500	6	21.0 (9.5)	CE0500E4DCE
750	6	29.8 (13.5)	CE0750E4DCE

**Primary: 120 x 240 with Jumpers**  
**Secondary: 24**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
50	3	3.4 (1.5)	CE0050E1BCE ②
75	3	4.2 (1.9)	CE0075E1BCE ②
100	3	5.9 (2.7)	CE0100E1BCE ②
150	3	8.5 (3.9)	CE0150E1BCE
200	3	10.6 (4.5)	CE0200E1BCE
250	3	11.3 (5.1)	CE0250E1BCE
300	3	13.2 (6.0)	CE0300E1BCE
350	3	14.9 (6.8)	CE0350E1BCE
500	3	19.2 (8.7)	CE0500E1BCE
750	3	29.8 (13.5)	CE0750E1BCE

**Primary: 200/220/440, 208/230/460, 240/480**  
**Secondary: 23/110, 24/115, 25/120**

VA	Wiring Diagram ①	Weight Lbs (kg)	Style Number
50	7	4.2 (1.9)	CE0050E5ECE ②
75	7	5.9 (2.7)	CE0075E5ECE ②
100	7	7.9 (3.6)	CE0100E5ECE ②
150	7	10.0 (4.5)	CE0150E5ECE
200	7	12.8 (5.8)	CE0200E5ECE
250	7	15.2 (6.9)	CE0250E5ECE
300	7	16.8 (7.6)	CE0300E5ECE
350	7	19.2 (8.7)	CE0350E5ECE
500	7	27.0 (12.3)	CE0500E5ECE

**Notes**

① See Page V7-T7-22 for wiring diagrams.

② 105°C insulation system.

Transformers are designed to operate in a maximum ambient of 40°C. Contact your local Eaton sales office for availability on additional CE Marked control transformers. For other ratings or styles not shown, refer to Eaton.

# 7.1

## Industrial Control Transformers

### Transformers

#### Type MTK CE Marked with Factory Mounted Finger-Safe Terminal Covers IP20

Primary: 240 x 480, 230 x 460, 220 x 440 with Jumpers  
Secondary: 120/115/110

VA	Terminal Type	Wiring Diagram ①	Weight Lbs (kg)	Style Number
250	A	1	8.8 (4.0)	CE0250K2ACEFS
300	A	1	11.0 (5.0)	CE0300K2ACEFS
350	A	1	11.2 (5.1)	CE0350K2ACEFS
500	A	1	14.8 (6.7)	CE0500K2ACEFS
750	A	1	18.0 (8.2)	CE0750K2ACEFS
1000	A	1	26.3 (11.9)	CE1000K2ACEFS
1500	C	1	40.0 (18.1)	CE1500K2ACEFS
2000	C	1	45.1 (20.5)	CE2000K2ACEFS
3000	C	1	65.2 (29.6)	CE3000K2ACEFS
5000	C	1	104.8 (47.5)	CE5000K2ACEFS

Primary: 240 x 480 with Jumpers  
Secondary: 24

VA	Terminal Type	Wiring Diagram ①	Weight Lbs (kg)	Style Number
250	C	2	8.2 (3.7)	CE0250K2BCEFS
300	C	2	9.5 (4.3)	CE0300K2BCEFS
350	C	2	12.2 (5.5)	CE0350K2BCEFS
500	C	2	14.4 (6.5)	CE0500K2BCEFS
750	C	2	19.5 (8.9)	CE0750K2BCEFS
1000	C	2	26.2 (11.9)	CE1000K2BCEFS

Primary: 120 x 240 with Jumpers  
Secondary: 24

VA	Terminal Type	Wiring Diagram ①	Weight Lbs (kg)	Style Number
250	C	3	8.3 (3.8)	CE0250K1BCEFS
300	C	3	9.3 (4.2)	CE0300K1BCEFS
350	C	3	12.0 (5.4)	CE0350K1BCEFS
500	C	3	14.4 (6.5)	CE0500K1BCEFS
750	C	3	19.5 (8.9)	CE0750K1BCEFS
1000	C	3	25.2 (11.4)	CE1000K1BCEFS

Primary: 200/220/440, 208/230/460, 240/480  
Secondary: 23/110, 24/115, 25/120

VA	Terminal Type	Wiring Diagram ①	Weight Lbs (kg)	Style Number
250	B	7	12.5 (5.7)	CE0250K5ECEFS
300	B	7	14.0 (6.3)	CE0300K5ECEFS
350	B	7	15.3 (6.9)	CE0350K5ECEFS
500	B	7	20.8 (9.4)	CE0500K5ECEFS
750	C	7	29.8 (13.5)	CE0750K5ECEFS
1000	C	7	30.2 (13.7)	CE1000K5ECEFS

Primary: 220/380/440/550, 230/400/460/575,  
240/416/480/600  
Secondary: 23/110, 24/115, 25/120

VA	Terminal Type	Wiring Diagram ①	Weight Lbs (kg)	Style Number
250	B	14	14.3 (6.5)	CE0250K2UCEFS
300	B	14	15.8 (7.2)	CE0300K2UCEFS
350	B	14	16.5 (7.5)	CE0350K2UCEFS
500	B	14	20.5 (9.3)	CE0500K2UCEFS
750	C	14	28.8 (13.1)	CE0750K2UCEFS
1000	C	14	39.4 (17.9)	CE1000K2UCEFS

Primary: 208/230/400/460/575  
Secondary: 24 ②/115/230

VA	Terminal Type	Wiring Diagram ①	Weight Lbs (kg)	Style Number
250	B	15	14.9 (6.8)	CE0250K2VCEFS
300	B	15	17.4 (7.9)	CE0300K2VCEFS
350	B	15	17.8 (8.1)	CE0350K2VCEFS
500	B	15	26.6 (12.1)	CE0500K2VCEFS
750	B	15	32.5 (14.7)	CE0750K2VCEFS
1000	C	15	44.0 (20.0)	CE1000K2VCEFS
1500	C	15	45.4 (20.6)	CE1500K2WCEFS
2000	C	16	58.6 (26.6)	CE2000K2WCEFS
3000	C	16	92.9 (42.1)	CE3000K2WCEFS
5000	C	16	127.4 (57.8)	CE5000K2WCEFS

Primary: 240/416/480/600, 230/400/460/575,  
220/380/440/550, 208/500  
Secondary: 99/120/130, 95/115/125, 91/110/120, 85/100/110

VA	Terminal Type	Wiring Diagram ①	Weight Lbs (kg)	Style Number
250	A	8	11.4 (5.2)	CE0250K6UCEFS
300	A	8	13.6 (6.2)	CE0300K6UCEFS
350	A	8	14.2 (6.4)	CE0350K6UCEFS
500	A	8	17.4 (7.9)	CE0500K6UCEFS
750	A	8	27.5 (12.5)	CE0750K6UCEFS
1000	A	8	27.9 (12.6)	CE1000K6UCEFS
1500	A	8	43.1 (19.5)	CE1500K6UCEFS
2000	B	8	56.0 (25.4)	CE2000K6UCEFS
3000	B	8	76.2 (34.6)	CE3000K6UCEFS

#### Notes

① See Page V7-T7-22 for wiring diagrams.

② 24 volt secondary only available through 1000 VA.

### Accessories



#### Protection Index IP00

When terminal covers are installed on primary and secondary, and fuse block covers are used, the protection index is IP20.

#### Finger-Safe Terminal Covers (Optional)

- Fits CE Marked designs 50–750 VA
- Fits MTE designs 0.25–750 VA


#### Finger-Safe Terminal Covers

	Description	Catalog Number
	Four terminal transformers	<b>FSK4</b>
	Four terminal Series 2 transformers only	<b>FSK4S2</b>
	Six terminal transformers	<b>FSK6</b>

#### Finger-Safe Primary Fuse Block Covers

- Fits two-pole primary fuse blocks on MTE designs

#### Finger-Safe Primary Fuse Block Covers

	Description	Catalog Number
	Primary fuse block covers	<b>FSKFB</b>

#### Secondary Fuse Clip

#### Secondary Fuse Clip

Description	Catalog Number
Fits 500 VA and smaller models	<b>SFCS</b>
Fits models greater than 500 VA	<b>SFCL</b>

### Technical Data and Specifications

#### Overload Capability

Short-term overload is designed into transformers as required by ANSI. Basically, 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:

#### 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
25°C	135°C	20°C	180°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.

#### Series-Multiple Windings

Series-multiple windings consist of two similar coils in each winding that can be connected in series or parallel (multiple). Transformers with series-multiple windings are designated with an “x” or “/” between the voltage ratings, such as voltages of “120/240” or “240 x 480.” If the series-multiple winding is designated by an “x,” the winding can be connected only for a series or parallel. With the “/” designation, a mid-point also becomes available in addition to the series or parallel connection. As an example, a 120 x 240 winding can be connected for either 120 (parallel) or 240 (series), but a 120/240 winding can be connected for 120 (parallel), 240 (series) or 240 with a 120 mid-point.

For additional information, please refer to Volume 2, **CA08100003E**.

# 7.1

## Industrial Control Transformers

### Transformers

#### Wiring Diagrams

Diagram 1

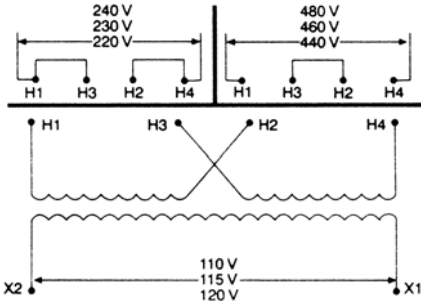


Diagram 5

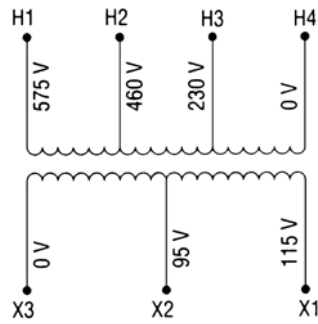


Diagram 2

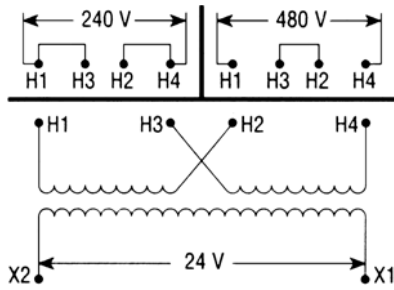


Diagram 6

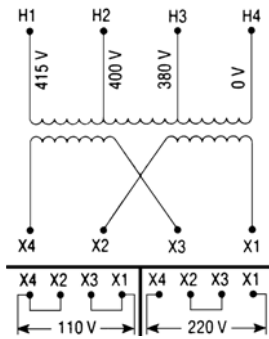


Diagram 3

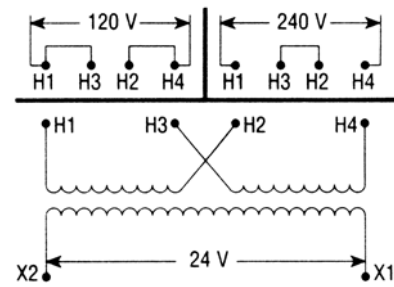


Diagram 7

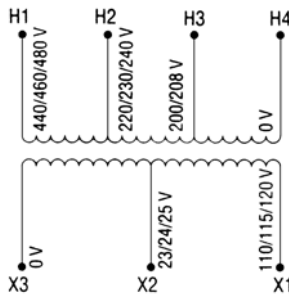


Diagram 4

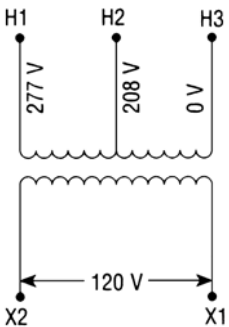
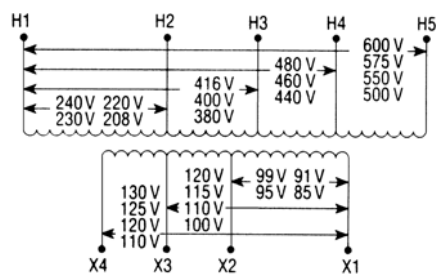
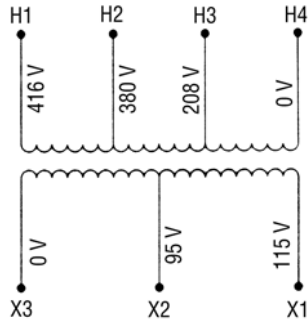


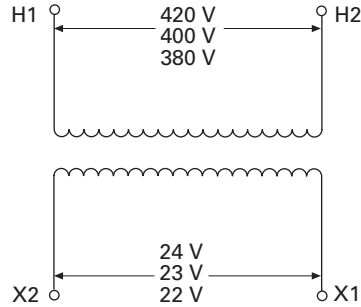
Diagram 8



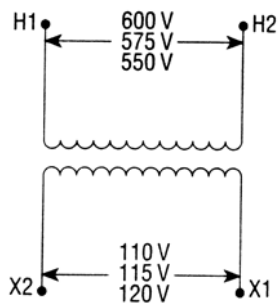
**Diagram 9**



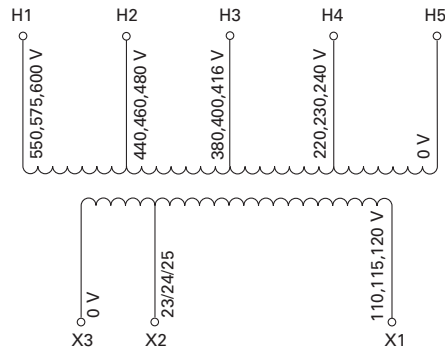
**Diagram 13**



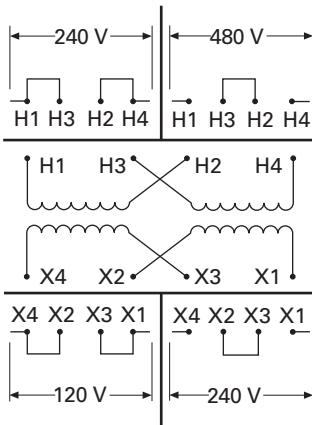
**Diagram 10**



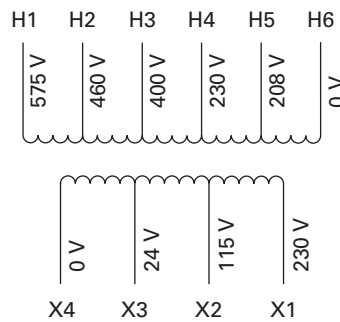
**Diagram 14**



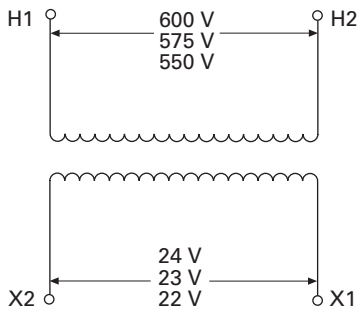
**Diagram 11**



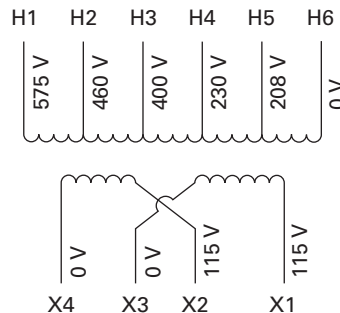
**Diagram 15**



**Diagram 12**



**Diagram 16**





#### Acceptable Rating of Primary Overcurrent Protection for CE Marked Control Transformers <sup>①</sup>

Fuses 13/32 x 1-1/2 Inches (10 x 38 mm) Timelag (IEC 269)

Sec. Voltage	50	75	100	150	200	250	300	350	500	750
115	2.0	2.0	4.0	4.0	6.0	6.0	8.0	10.0	12.0	20.0
120	2.0	2.0	4.0	4.0	6.0	6.0	8.0	10.0	12.0	20.0
200	1.0	2.0	2.0	4.0	4.0	4.0	4.0	6.0	8.0	12.0
208	1.0	2.0	2.0	4.0	4.0	4.0	4.0	6.0	8.0	12.0
220	1.0	1.0	2.0	4.0	4.0	4.0	4.0	6.0	6.0	10.0
230	1.0	1.0	2.0	4.0	4.0	4.0	4.0	6.0	6.0	10.0
240	1.0	1.0	2.0	4.0	4.0	4.0	4.0	4.0	6.0	10.0
277	0.5	1.0	1.0	2.0	4.0	4.0	4.0	4.0	6.0	8.0
380	0.5	1.0	1.0	2.0	2.0	4.0	4.0	4.0	6.0	6.0
400	0.5	0.5	1.0	2.0	2.0	4.0	4.0	4.0	4.0	6.0
415	0.5	0.5	1.0	1.0	2.0	4.0	4.0	4.0	4.0	6.0
440	0.5	0.5	1.0	1.0	2.0	2.0	4.0	4.0	4.0	6.0
460	0.5	0.5	1.0	1.0	2.0	2.0	4.0	4.0	4.0	6.0
480	0.5	0.5	0.5	1.0	2.0	2.0	4.0	4.0	4.0	6.0
550	0.5	0.5	0.5	1.0	1.0	2.0	2.0	4.0	4.0	4.0
575	0.5	0.5	0.5	1.0	1.0	2.0	2.0	4.0	4.0	4.0
600	0.5	0.5	0.5	1.0	2.0	2.0	2.0	4.0	4.0	4.0

#### Acceptable Maximum Rating of Secondary Overcurrent Protection <sup>①</sup>

Miniature Fuses 5 x 20 mm Timelag (IEC 127-2/III)

Sec. Voltage	50	75	100	150	200	250	300	350	500	750
23	2.50	4.00	5.00	8.00	10.0	12.00	16.00	16.00	25.00	—
24	2.50	4.00	5.00	8.00	10.0	12.00	16.00	16.00	25.00	32.00
25	2.50	4.00	5.00	8.00	10.0	12.00	16.00	16.00	25.00	32.00
90	0.63	1.00	1.25	2.00	2.50	3.15	4.00	4.00	6.30	10.00
95	0.63	0.80	1.25	1.60	2.50	3.15	4.00	4.00	6.30	8.00
100	0.50	0.80	1.00	1.60	2.00	2.50	3.15	4.00	5.00	8.00
110	0.50	0.80	1.00	1.60	2.00	2.50	3.15	4.00	5.00	8.00
115	0.50	0.80	1.00	1.60	2.00	2.50	3.15	3.15	5.00	8.00
120	0.50	0.63	1.00	1.25	2.00	2.50	2.50	3.15	5.00	6.30
220	0.25	0.40	0.50	0.80	1.00	1.25	1.60	1.60	2.50	4.00
230	0.25	0.40	0.50	0.80	1.00	1.25	1.60	1.60	2.50	4.00
240	0.25	0.32	0.50	0.63	1.00	1.25	1.25	1.60	2.50	3.15

#### Regulation Data Chart

Transformer VA Rating	Inrush VA at 20% Power Factor		
	NEMA/IEC 95% Sec. Voltage	NEMA/IEC 90% Sec. Voltage	NEMA/IEC 85% Sec. Voltage
25 <sup>②</sup>	100/—	130/—	150/—
50 <sup>②</sup>	170/190	200/220	240/270
75 <sup>②</sup>	310/350	410/460	450/600
100 <sup>②</sup>	370/410	540/600	730/810
150 <sup>③</sup>	780/850	930/1030	1150/1270
200 <sup>③</sup>	810/900	1150/1270	1450/1600
250 <sup>③</sup>	1400/1540	1900/2090	2300/2530
300 <sup>③</sup>	1900/2090	2700/2970	3850/4240
350 <sup>③</sup>	3100/3410	3650/4020	4800/5280
500 <sup>③</sup>	4000/4400	5300/5830	7000/7700
750 <sup>③</sup>	8300/9130	11,000/12,100	14,000/15,400
1000 <sup>③</sup>	15,000/16,500	21,000/23,000	27,000/29,500
1000 <sup>④</sup>	9000/9900	13,000/14,300	18,500/20,300
1500 <sup>④</sup>	10,500/11,500	15,000/16,500	20,500/22,500
2000 <sup>④</sup>	17,000/18,900	25,500/27,300	34,000/36,400
3000 <sup>④</sup>	24,000/25,700	36,000/38,500	47,500/50,200
5000 <sup>④</sup>	55,000/58,800	92,500/98,900	115,000/122,000

#### Notes

<sup>①</sup> For values over 6.3A, use 10 x 38 mm timelag (IEC - 269-3-1). T<sub>a</sub> = 40°C control type.

<sup>②</sup> For units with Class 105°C insulation system.

<sup>③</sup> For units with Class 130°C insulation system.

<sup>④</sup> For units with Class 180°C insulation system.

To comply with NEMA standards that require all magnetic devices to operate successfully at 85% of rated voltage, the 90% secondary column is most often used in selecting a transformer. No comparable requirement is available for IEC.

Type AP Transformer



### Contents

<i>Description</i>	<i>Page</i>
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Type MTK .....	V7-T7-13
CE Marked .....	V7-T7-18
Type AP	
Catalog Number Selection .....	V7-T7-26
Product Selection .....	V7-T7-26
Technical Data and Specifications .....	V7-T7-26

## Type AP

### Product Description

- Encapsulated designs

### Application Description

Transformers provide stepped-down voltages to machine tool control devices, enabling control circuits to be isolated from all power and lighting circuits. This allows the use of grounded or ungrounded circuits that are independent of the power or lighting grounds; thus, greater safety is afforded the operator. The control transformer line is particularly adaptable on applications where compact construction is demanded.

### Features, Benefits and Functions

- Resin encapsulated
- 60 Hz operation
- 180°C insulation system
- 115°C rise standard; 80°C rise optional
- Convenient screw-type terminal board
- Bottom or side/wall-mounting designs
- Performance meets/exceeds requirements of ANSI/NEMA ST-1
- Regulation exceeds ANSI/NEMA requirements for all ratings

### Standards and Certifications

- UL recognized



### Industry Standards

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

**Catalog Number Selection**

Please refer to **Page V7-T7-3**.

**Product Selection**

Additional Product Selection information is available in Volume 2, **CA08100003E**.

**240/480 Volts to 120/240 Volts, 60 Hz**

kVA	Mounting	Frame	Wiring Diagram ①	Weight Lbs (kg)	Style Number
3	Bottom	FR133	5	65 (29.5)	<b>C0003P7GB</b>
5	Bottom	FR99	5	104 (47.2)	<b>C0005P7GB</b>
7.5	Bottom	FR100	5	129 (58.6)	<b>C0007P7GB</b>
10	Bottom	FR101	5	148 (67.2)	<b>C0010P7GB</b>
15	Bottom	FR134	5	197 (89.4)	<b>C0015P7GB</b>
3	Side/Wall	FR292	5	65 (29.5)	<b>C0003P7GS</b>
5	Side/Wall	FR256	5	104 (47.2)	<b>C0005P7GS</b>
7.5	Side/Wall	FR257	5	129 (58.6)	<b>C0007P7GS</b>
10	Side/Wall	FR258	5	148 (67.2)	<b>C0010P7GS</b>
15	Side/Wall	FR259	5	197 (89.4)	<b>C0015P7GS</b>

**Technical Data and Specifications****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:

**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
25°C	135°C	20°C	180°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.

**Sound Levels**

All Eaton 600 volt class general-purpose dry-type distribution transformers are designed to meet NEMA ST-20 levels.

**Winding Terminations**

Eaton recommends external cables be rated 90°C (sized at 75°C ampacity) for encapsulated designs.

**Series-Multiple Windings**

Series-multiple windings consist of two similar coils in each winding that can be connected in series or parallel (multiple). Transformers with series-multiple windings are designated with an “x” or “/” between the voltage ratings, such as voltages of “120/240” or “240 x 480.” If the series-multiple winding is designated by an “x,” the winding can be connected only for a series or parallel.

With the “/” designation, a mid-point also becomes available in addition to the series or parallel connection. As an example, a 120 x 240 winding can be connected for either 120 (parallel) or 240 (series), but a 120/240 winding can be connected for 120 (parallel), 240 (series) or 240 with a 120 mid-point.

For additional information, please refer to Volume 2, **CA08100003E**.

**Note:** For additional information, refer to Eaton’s Industrial Control Transformer Binder B1228A. For other ratings or styles not shown, or for special enclosure types (including stainless steel), refer to Eaton.

**Note**

① See **Page V7-T7-22** for wiring diagrams.