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C396 Electronic Overload Relay

Product Description

The C396 is a self-powered, robust electronic overload designed for integrated use with Freedom NEMA, *XT* IEC, and DP contactors. The overload can also be ordered as a stand-alone device that is designed for Panel-Mounting and for use on 35 mm DIN rail. The C396 has an FLA range of 0.1 – 150 Amps with internal CTs, and up to 1500 Amps using external CTs.

Features

- Standard Version: Selectable trip class (5, 10, 20, 30) with Selectable Manual or Auto Reset
- Broad 5:1 FLA range
- Self-Powered Design, will accept AC voltages from 12 – 690V 50/60 Hz
- Ambient Temperature Compensation
- Low Heat Generation
- Phase Loss Protection
- Phase Unbalance Protection
- Electrically isolated 1NO-1NC Contacts (Push-to-Test)
- Trip Status Indicator
- FLA range of 0.1 – 1500 Amps

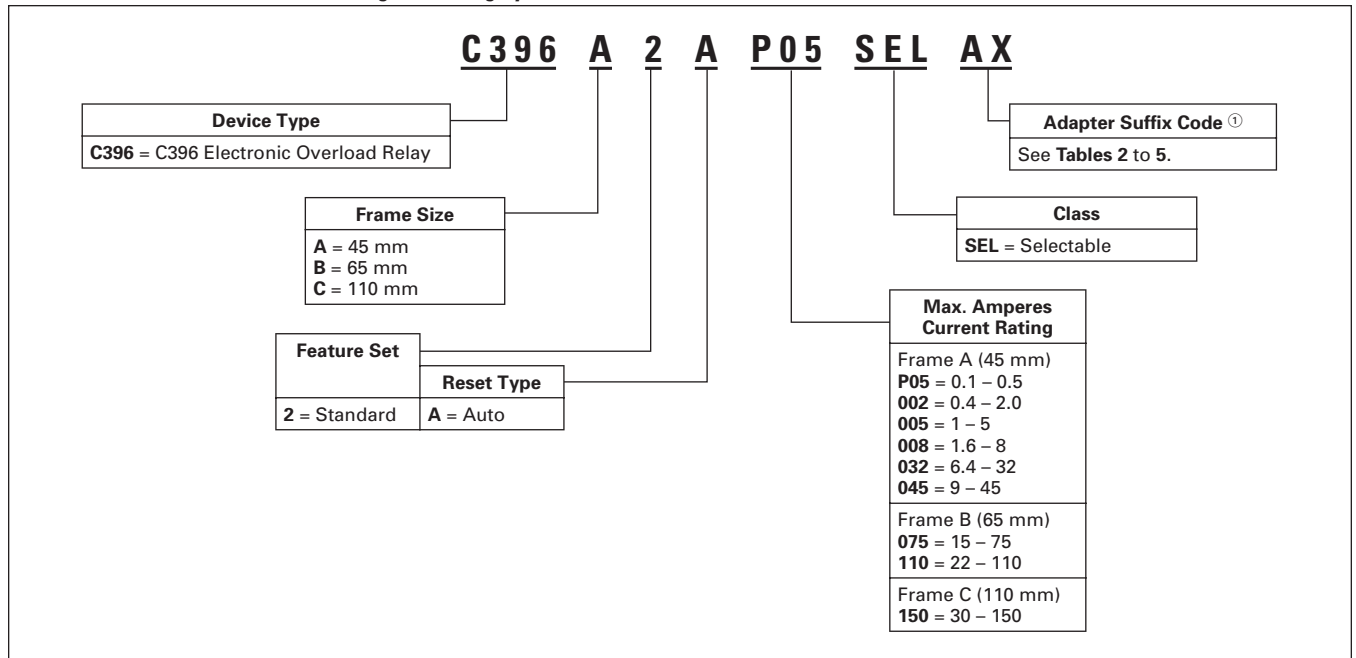
Standards and Certifications

- UL Listed Components: Stand-alone, starter-mounted devices and remote reset kit.
- CSA Certified Components: Stand-alone, starter-mounted devices and remote reset kit.
- IEC EN 60947-4-1, EN 60947-5-1
- CE
- CCC
- RoHS



Catalog Number Selection

Table 1. C396 Electronic Overload Catalog Numbering System



① Choose appropriate adapter based on application FLA range and contactor's frame size.

Table 2. Stand-Alone Overload Relay Suffix Code

FLA Range	Frame Size	Suffix
All	N/A	AX

Table 3. XTIEC Adapter Suffix Code

Contacting Frame Size	FLA Range (Amps)	Suffix
IEC Frame B	0.1 – 0.5 0.4 – 2.0 1 – 5 1.6 – 8 6.4 – 32	XB
IEC Frame C	0.1 – 0.5 0.4 – 2.0 1 – 5 1.6 – 8 6.4 – 32	XC
IEC Frame D	6.4 – 32 9 – 45 15 – 75	XD
IEC Frame F – G	22 – 110	XF

Table 4. Freedom NEMA Adapter Suffix Code

FLA Range (Amps)	Contacting Frame Size	Suffix
0.1 – 0.5	NEMA Size 00 NEMA Size 0 NEMA Size 1	FD
0.4 – 2.0	NEMA Size 00 NEMA Size 0 NEMA Size 1	FD
1 – 5	NEMA Size 00 NEMA Size 0 NEMA Size 1	FD
1.6 – 8	NEMA Size 00 NEMA Size 0 NEMA Size 1 NEMA Size 2	FG
6.4 – 32	NEMA Size 0 NEMA Size 1	FB FD
9 – 45	NEMA Size 2	FG
22 – 110	NEMA Size 3	FK

Table 5. DP Contactor Adapter Suffix Code

FLA Range (Amps)	Contacting Frame Size	Suffix
0.1 – 0.5 0.4 – 2.0 1 – 5	15, 25, 30A	DC
1.6 – 8	15, 25, 30, 40A	DE
6.4 – 32	15, 25, 30, 40, 50A	DF
9 – 45	40, 50A	DF
15 – 75	60, 75A	DG

Product Selection



Cat. No.
C396B2A110SELFK



Cat. No.
C396C3A150SELAX

Table 6. C396 Stand-Alone Overload Relay ^①

FLA Range (Amps)	Description	Standard Class 5/10/20/30	
		Catalog Number	Price U.S. \$
45 mm Overload Frame Size			
0.1 – 0.5	—	C396A2AP05SELAX	118.
0.4 – 2.0	—	C396A2A002SELAX	118.
1 – 5	—	C396A2A005SELAX	118.
1.6 – 8	—	C396A2A008SELAX	118.
6.4 – 32	—	C396A2A032SELAX	130.
9 – 45	—	C396A2A045SELAX	183.
65 mm Overload Frame Size			
15 – 75	—	C396B2A075SELAX	212.
22 – 110	—	C396B2A110SELAX	242.
110 mm Overload Frame Size			
30 – 150	—	C396C2A150SELAX	449.
45 mm Overload with External Current Transformer			
Overload Relay			
1 – 5	—	C396A2A005SELAX	118.
Current Transformer Kits			
60 – 300	300: 5 CT Kit for use with 45 mm 1 – 5A C396 Overload (includes CT, Bus Bars, Lugs and Hardware to mount C396)	C396CTK300	450.
120 – 600	600: 5 CT Kit for use with 45 mm 1 – 5A C396 Overload (includes CT, Bus Bars, Lugs and Hardware to mount C396)	C396CTK600	525.
200 – 1000	1000: 5 CT Kit for use with 45 mm 1 – 5A C396 Overload (includes CT and Hardware to mount C396)	C396CTK1000	630.
300 – 1500	1500: 5 CT Kit for use with 45 mm 1 – 5A C396 Overload (includes CT and Hardware to mount C396)	C396CTK1500	730.

^① Product available May 2007.

Table 7. C396 Overload for Integrated Use with XTIEC Contactors ^②

FLA Range (Amps)	XTIEC Contactor Frame Size / Width	Standard Class 5/10/20/30	
		Catalog Number	Price U.S. \$
45 mm Overload Frame Size			
0.1 – 0.5	B / 45 mm	C396A2AP05SELXB	95.
0.4 – 2.0	B / 45 mm	C396A2A002SELXB	95.
1 – 5	B / 45 mm	C396A2A005SELXB	95.
1.6 – 8	B / 45 mm	C396A2A008SELXB	95.
6.4 – 32	B / 45 mm	C396A2A032SELXB	107.
0.1 – 0.5	C / 45 mm	C396A2AP05SELXC	95.
0.4 – 2.0	C / 45 mm	C396A2A002SELXC	95.
1 – 5	C / 45 mm	C396A2A005SELXC	95.
1.6 – 8	C / 45 mm	C396A2A008SELXC	95.
6.4 – 32	C / 45 mm	C396A2A032SELXC	107.
6.4 – 32	D / 55 mm	C396A2A032SELXD	140.
9 – 45	D / 55 mm	C396A2A045SELXD	150.
65 mm Overload Frame Size			
15 – 75	D / 55 mm	C396B2A075SELXD	180.
22 – 110	F – G / 90 mm	C396B2A110SELXF	210.
110 mm Overload Frame Size — Stand-Alone or Direct to XT Contactor with Indicated Kit			
30 – 150	G / 90 mm	C396C2A150SELAX ^③	449.
110 mm XT Bus Bar Kit ^②		C396CBARXT	105.

^② Product available May 2007.

^③ Catalog Number shown is for Stand-Alone C396 Overload Relay. For direct connection to Frame G contactor, order additional 110 mm XT Bus Bar Kit, C396CBARXT, shown in Tables 7 and 10.

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 Discount Symbol 1CD7

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Table 8. C396 Overload for Integrated Use with Freedom NEMA Contactors ①②

FLA Range (Amps)	NEMA Contactor Frame Size	Description	Standard Class 5/10/20/30	
			Catalog Number	Price U.S. \$
45 mm Overload Frame Size				
0.1 – 0.5	00, 0, 1	—	C396A2AP05SELFDC	170.
0.4 – 2.0	00, 0, 1	—	C396A2A002SELFDC	170.
1 – 5	00, 0, 1	—	C396A2A005SELFDC	170.
1.6 – 8	00, 0, 1, 2	—	C396A2A008SELFG	170.
6.4 – 32	0 1	—	C396A2A032SELFB C396A2A032SELFDC	170. 245.
9 – 45	2	—	C396A2A045SELFG	257.
65 mm Overload Frame Size				
22 – 110	3	—	C396B2A110SELFK	342.
110 mm Overload Frame Size — Stand-Alone				
30 – 150	4	—	C396C2A150SELAX ③	449.
45 mm Overload with External Current Transformer				
Overload Relay				
1 – 5	5 – 8	—	C396A2A005SELAX ③	118.
Current Transformer Kits				
60 – 300	—	300: 5 CT Kit for use with 45 mm 1 – 5A C396 Overload (includes CT, Bus Bars, Lugs and Hardware to mount C396)	C396CTK300 ③	450.
120 – 600	—	600: 5 CT Kit for use with 45 mm 1 – 5A C396 Overload (includes CT, Bus Bars, Lugs and Hardware to mount C396)	C396CTK600 ③	525.
200 – 1000	—	1000: 5 CT Kit for use with 45 mm 1 – 5A C396 Overload (includes CT and Hardware to mount C396)	C396CTK1000 ③	630.
300 – 1500	—	1500: 5 CT Kit for use with 45 mm 1 – 5A C396 Overload (includes CT and Hardware to mount C396)	C396CTK1500 ③	730.

- ① Product available May 2007.
- ② Discount Symbol **1CD1**.
- ③ Discount Symbol **1CD7**.

Table 9. C396 Overload for Integrated Use with DP Contactors by Feature Set ④⑤

FLA Range (Amps)	DP Contactor Rating	Standard Class 5/10/20/30	
		Catalog Number	Price U.S. \$
45 mm Overload Frame Size			
0.1 – 0.5	15, 25, 30	C396A2AP05SELDC	152.
0.4 – 2.0	15, 25, 30	C396A2A002SELDC	152.
1 – 5	15, 25, 30	C396A2A005SELDC	152.
1.6 – 8	15, 25, 30, 40	C396A2A008SELDE	152.
6.4 – 32	15, 25, 30, 40, 50	C396A2A032SELDF	152.
9 – 45	40, 50	C396A2A045SELDF	229.
65 mm Overload Frame Size			
15 – 75	60, 75	C396B2B075SELDG	265.

- ④ Product available June 2007.
- ⑤ Discount Symbol **1CD-5C**.

Accessories

Table 10. C396 Electronic Overload Accessories ⑥

Description	Catalog Number	Price U.S. \$
Reset Bar Kit ⑦	C396ARST	16.
110 mm Lug Kit ⑦⑧	C396CLUG	66.
110 mm Bus Bar Kit ⑦⑧	C396CBAR	115.
110 mm XT Bus Bar Kit ⑦	C396CBARXT	105.
Remote Reset 24V DC ⑨	C396RR024DC	—
Remote Reset 24V AC ⑨	C396RR024AC	—
Remote Reset 120V AC ⑨	C396RR120AC	—
Remote Reset 240V AC ⑨	C396RR240AC	—

- ⑥ Discount Symbol **1CD7**.
- ⑦ Product available May 2007.
- ⑧ Set of 3 lugs and hardware, 2 sets are required to wire line and load sides. Bus Bar Kit is needed to use the Lug Kit.
- ⑨ Contact local sales office for pricing and availability.

Technical Data and Specifications

Table 11. Overload Relay Specifications

General Description	C396_2_ Standard
Protection	
Thermal	1.05 x FLA: Does not trip 1.25 x FLA: Overload trip
Phase Loss	1 Phase = 0, Trip time = 3s (Hot Status)
Phase Imbalance	Max - Min / Max > 40%, Trip time = 3s (Hot Status)
Inrush Current	> 8 x Max FLA, Trip time is 0.3s (Cold Status)
Trip Class	
Class 5, 10, 20, 30	Selectable
Reset	
M / M-O A / A-O	Manual / Manual + Stop Auto / Auto + Stop Auto Reset Time = 165s
Indications	
Test Indicator	Yellow
Trip Indicator	Yellow
PCBA	
Power Sensing	3 phase
Instant Reset by Power ON	CPU reset by Power ON after 2 – 3s
Thermal memory	< 3 min.
Cold and Hot Trip Curves	Power ON > 20 min. is Hot Status
Power Consumption	< 300 mW
Options	
Safety Cover	Covers FLA dial, DIP switches
Remote Reset	24V DC, 24V AC, 120V AC, 240V AC

Table 11. Overload Relay Specifications (Continued)

General Description	C396_2_ Standard
Climate Considerations	
Ambient Temperature (Operating)	-25° to 65°C (-13° to 149°F) inside enclosure
Ambient Temperature (Storage / Transportation)	-40° to 80°C (-40° to 176°F)
Humidity	UL991 (H3): 20 – 95% non-condensing
Altitude (Operating)	NEMA ICS1: 2000 meters max above sea level
Pollution (Operating — External)	Pollution degree 3
Mechanical Shock Resistance (IEC/EN 68-2-17)	15g
Vibration (Lloyd's Register of Shipping, Vibration Test 2)	6g
Temperature Compensation	Continuous
Voltages	
Control Voltage	12 – 690V AC, 50/60 Hz
Insulation Voltage (Ui) — Main Circuit	1000V AC
Insulation Voltage (Ui) — Control Circuit	690V AC
Impulse Withstand Voltage (Uimp) VAC	6000
FLA Range	
45 mm Frame: C396A_	0.1 – 45A
65 mm Frame: C396B_	15 – 110A
110 mm Frame: C396C_	30 – 150A
Safety	
Degree of Protection	IP20 (Stand-Alone Version Only)
Capacity	
Control Terminal Capacity	18 – 14 AWG
Control Terminal Tightening Torque in Nm (lb-in)	0.79 (7)
Load Terminal Capacity	
45 mm Frame: C396A_	14 – 6 AWG
65 mm Frame: C396B_	10 – 1 AWG
110 mm Frame: C396C_	6 AWG – 250 mcm
Load Terminal Tightening Torque in Nm (lb-in)	
45 mm Frame: C396A_	3.2 (28)
65 mm Frame: C396B_	9.0 (80)
110 mm Frame: C396C_	22.6 (200)

Dimensions

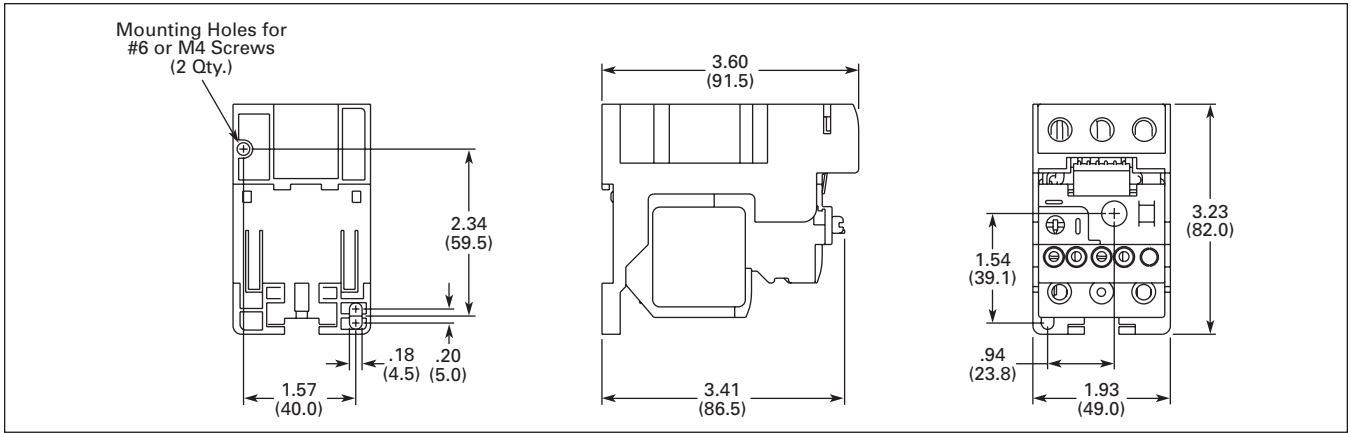


Figure 1. 45 mm Stand-Alone C396 Electronic Overload Relay — Approximate Dimensions in Inches (mm)

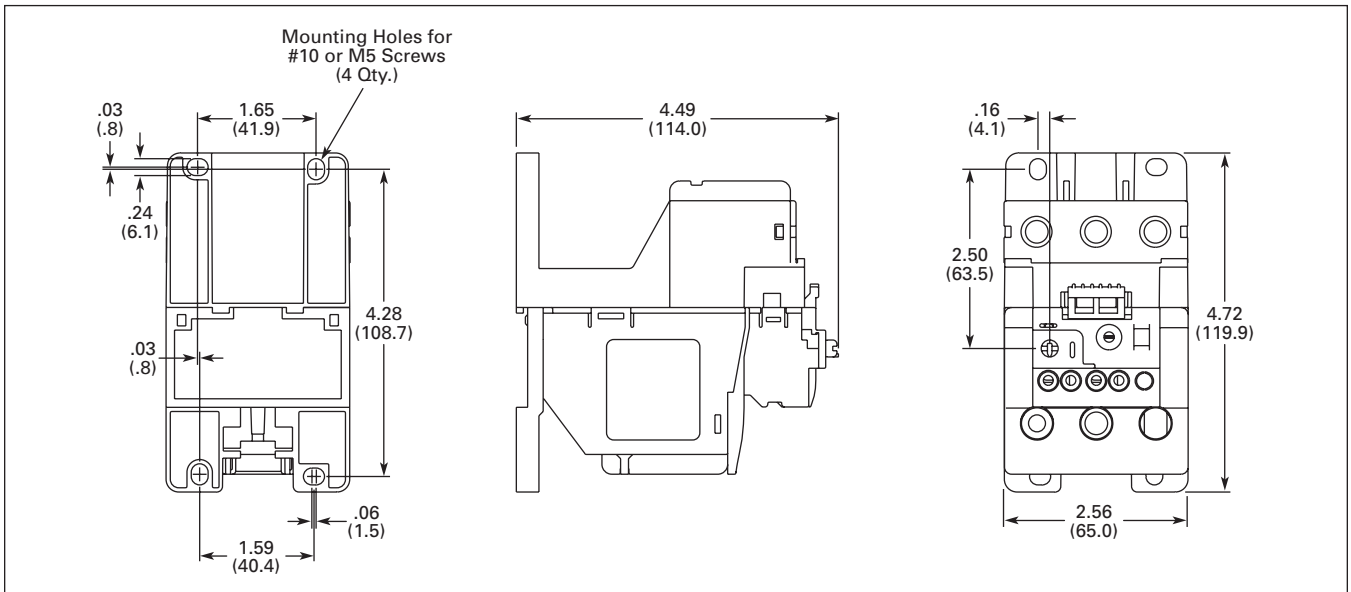


Figure 2. 65 mm Stand-Alone C396 Electronic Overload Relay — Approximate Dimensions in Inches (mm)

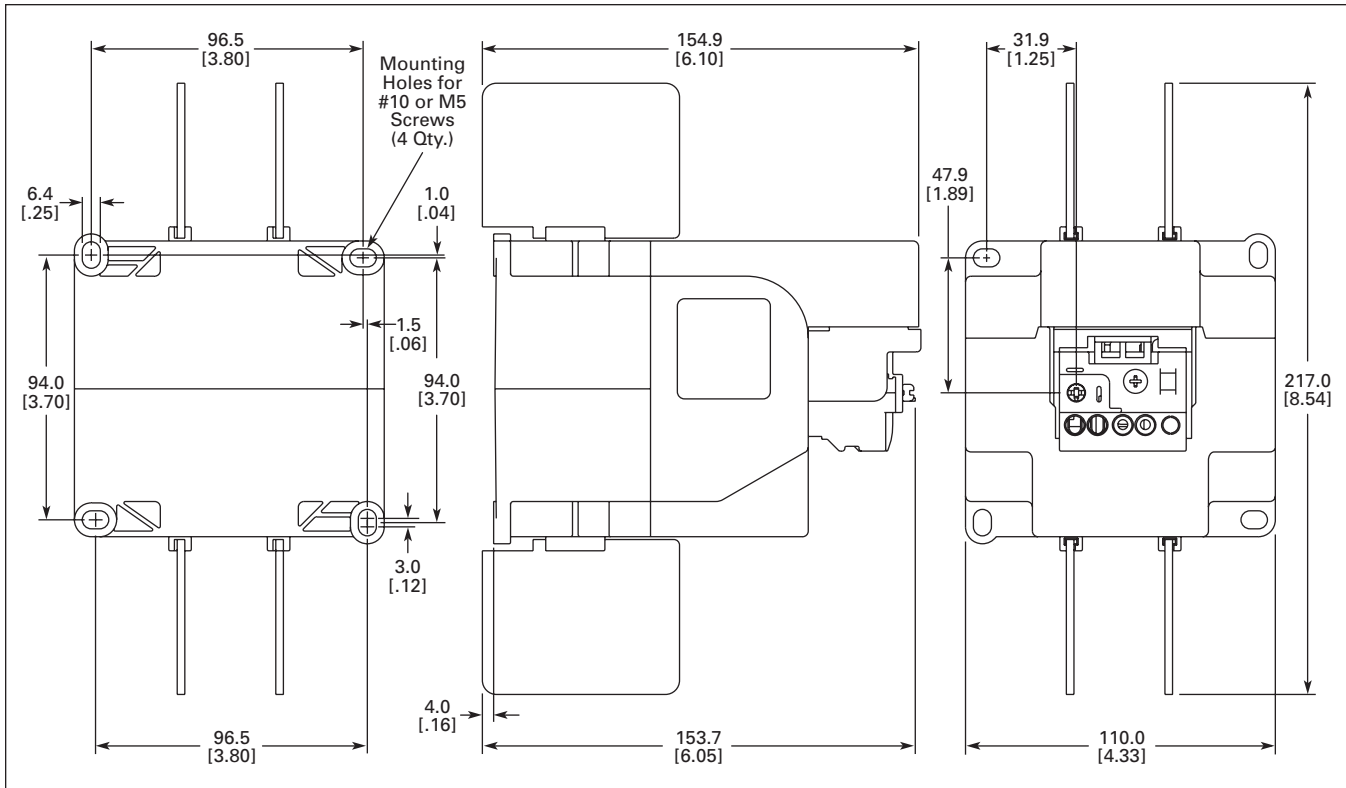


Figure 3. 110 mm Stand-Alone C396 Electronic Overload Relay — Approximate Dimensions in mm [in]

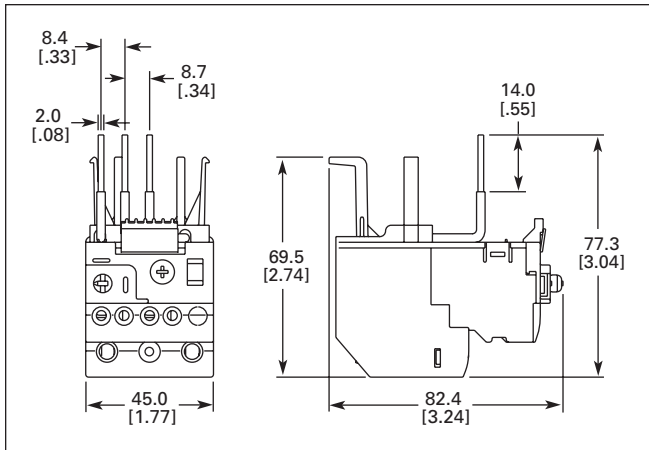


Figure 4. 45 mm C396 (0.1 – 8A) Direct Connect to XT Frame B Contactor — Approximate Dimensions in mm [in]

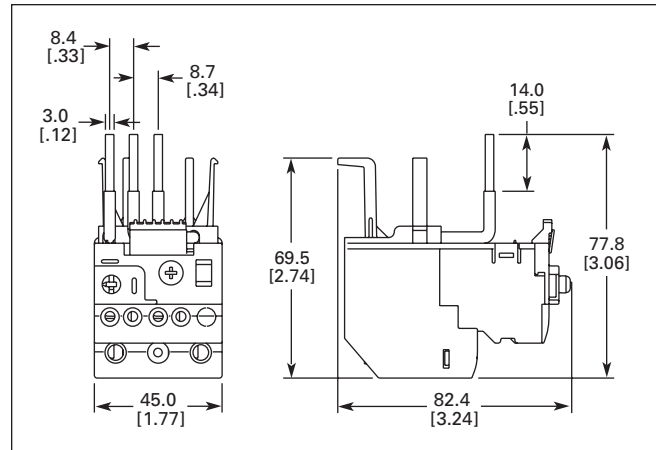


Figure 5. 45 mm C396 (6.4 – 32A) Direct Connect to XT Frame B Contactor — Approximate Dimensions in mm [in]

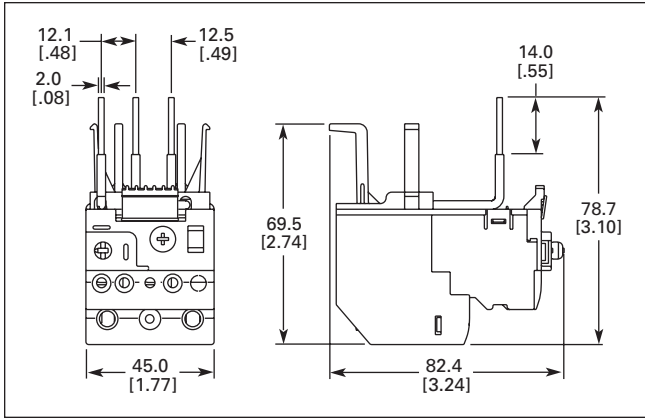


Figure 6. 45 mm C396 (0.1 – 8A) Direct Connect to XT Frame C Contactor — Approximate Dimensions in mm [in]

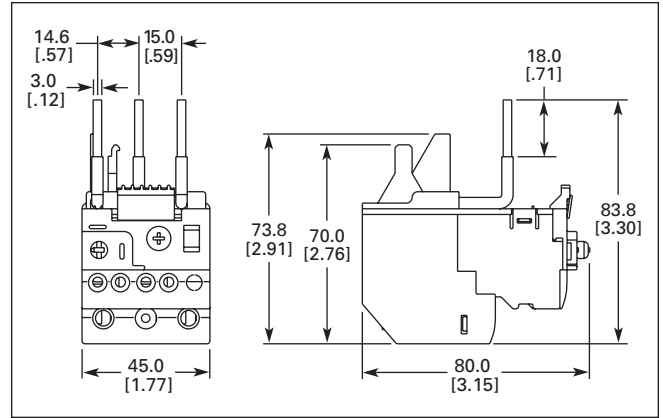


Figure 8. 45 mm C396 (6.4 – 45A) Direct Connect to XT Frame D Contactor — Approximate Dimensions in mm [in]

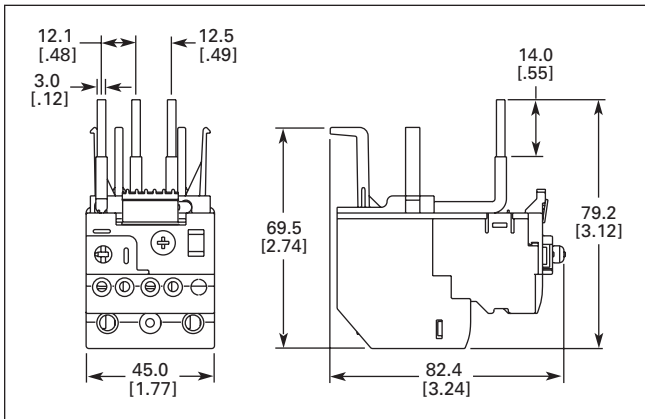


Figure 7. 45 mm C396 (6.4 – 32A) Direct Connect to XT Frame C Contactor — Approximate Dimensions in mm [in]

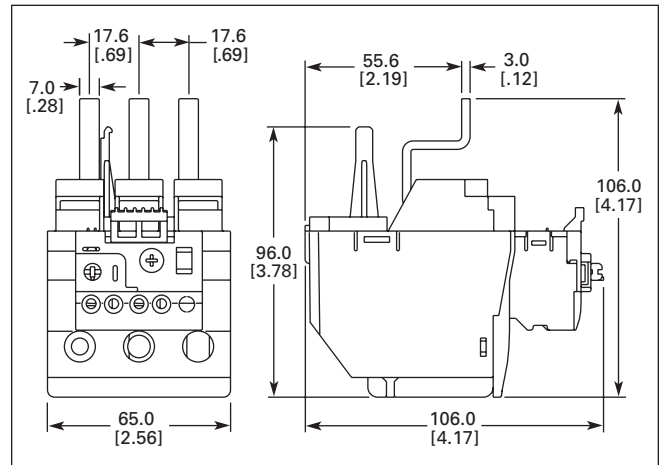


Figure 9. 65 mm C396 (15 – 75A) Direct Connect to XT Frame D Contactor — Approximate Dimensions in mm [in]

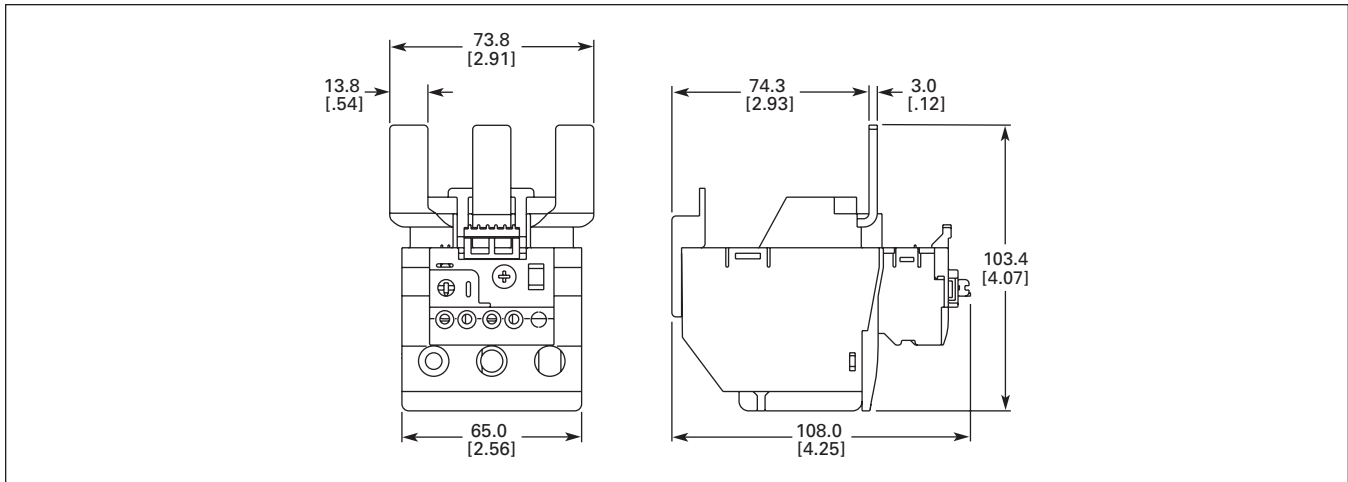


Figure 10. 65 mm C396 (22 – 110A) Direct Connect to XT Frame F – G Contactor — Approximate Dimensions in mm [in]

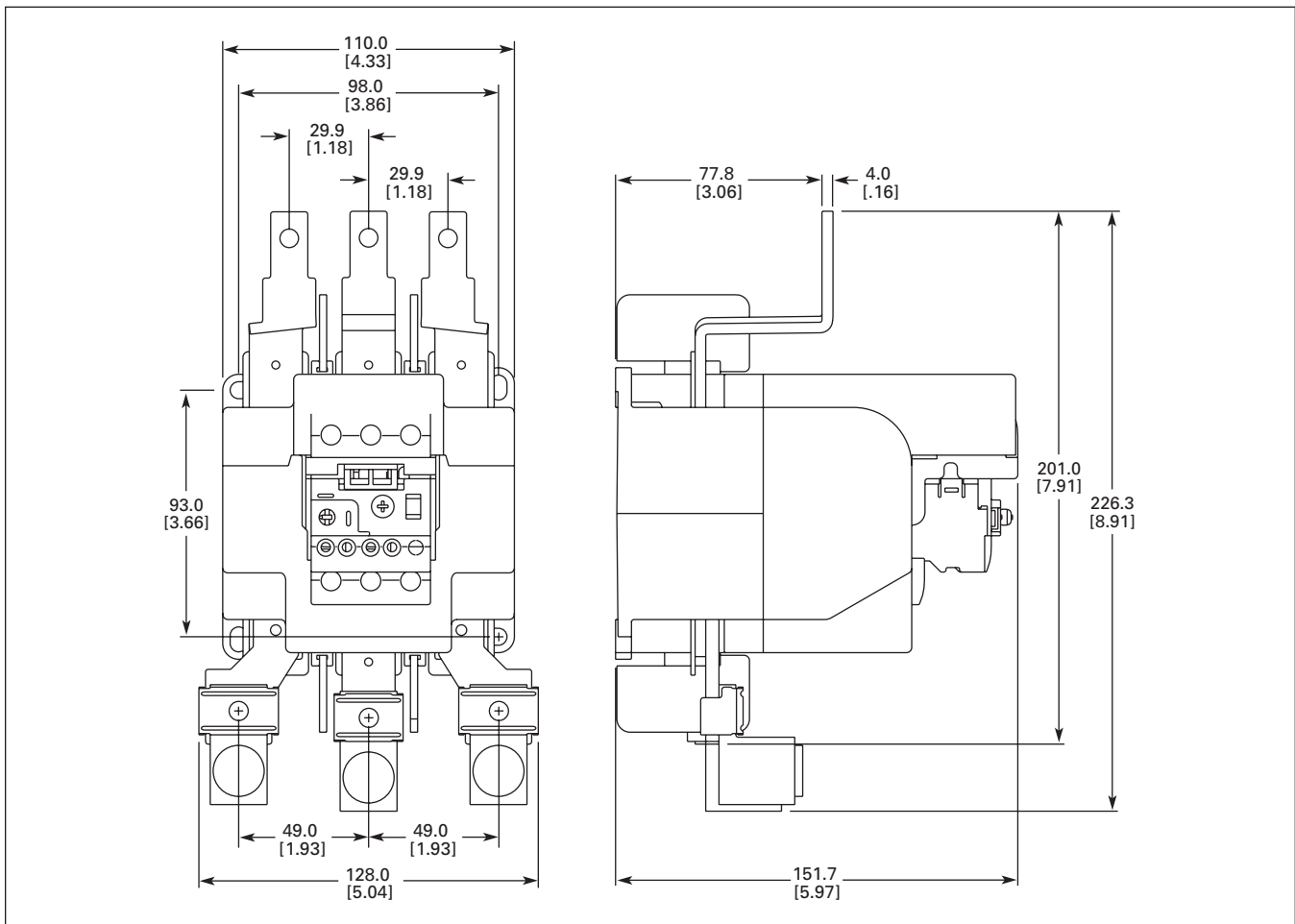


Figure 11. 110 mm C396 (30 – 150A) + C396CBARXT Direct Connect to XT Frame G Contactor — Approximate Dimensions in mm [in]