Allen-Bradley

Bimetallic Overload Relay Specifications

Bulletin Number 193-K, 193-T1

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Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, http://www.ab.com	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at http://www.rockwellautomation.com/literature/. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Bulletin	**193-K**	**193-T1**
Type	Bimetallic Overload Relay	
Rated Current (Range)	0.1…12.5 A	0.1…90 A
Operating Voltage, Nominal	600V	
Overload Type	Bimetallic	
Trip Class (Fixed)	10	10
Ambient Temperature Compensated	✓	✓
Reset Type	Automatic and Manual	Automatic and Manual
Adjustment Range	1.5:1	1.5:1
Phase Loss	Normal Sensing	Normal Sensing
N.C. Trip Contact	✓	✓
N.O. Alarm Contact	✓	✓
Variable Frequency Drive (VFD) Compatible	✓	✓

Standards Compliance—193-K

IEC/EN 60947-1,-4-1,-5-1
UL 508
CSA 22.2. No. 14

Certifications—193-K

CE Marked
cULus Listed (File No. E33916, Guide NKCR, NKCR7)

Standards Compliance—193-T1

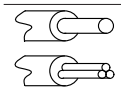
IEC/EN 60947-1, -4-1, -5-1
UL508
CSA C22.2 No.14

Certifications—193-T1

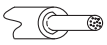
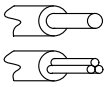
cULus (File No. E33916, Guide NKCR, NKCR7),
CE marked

Specifications

Main Circuits

		193-K
Rated Isolation Voltage U_i		690V
Rated Impulse Strength U_{imp}		6 kV
Rated Operating Voltage U_e	IEC/UL	690V AC / 600V AC
Wiring cross section **Terminal type**		
Terminal screws		M3.5
Fine stranded with ferrule	[mm²]	2 x (1.5…4)
 Solid or coarse stranded	[mm²] [AWG]	2 x (1.5…4) 2 x (16…12)
Recommended torque	[N•m] [lb•in]	1.2 10.6
Pozidriv screwdriver	Size	2
Slotted screwdriver	[mm]	1 x 6

Control Circuits

			193-K
Rated Isolation Voltage U_i			690V AC
Rated Impulse Strength U_{imp}			4 kV AC
Rated Operating Voltage U_e		IEC/UL	690V AC/600V AC
Rating Designation **Rated Operating Current** I_e			A600/Q300 **N.O./N.C.**
AC-15	24V	[A]	4
	240V	[A]	2
	400V	[A]	1.6
	690V	[A]	0.15
DC-13	24V	[A]	2
	110V	[A]	0.4
	220V	[A]	0.25
	440V	[A]	0.08
Thermal Current I_{the}		[A]	5
Short-circuit withstand, fuse gG		[A]	6
Contact Reliability			15V, 2 mA
Wiring cross section **Terminal type**			
Terminal screw			M 3.5
 Fine stranded with ferrule		[mm²]	2 x (1…4)
 Solid or coarse stranded		[mm²] [AWG]	2 x (1…4) 2 x (18…12)
Recommended torque		[N•m] [lb•in]	1.2 10.6
Pozidriv screwdriver		Size	2
Slotted screwdriver		[mm]	1 x 6

Environmental Ratings

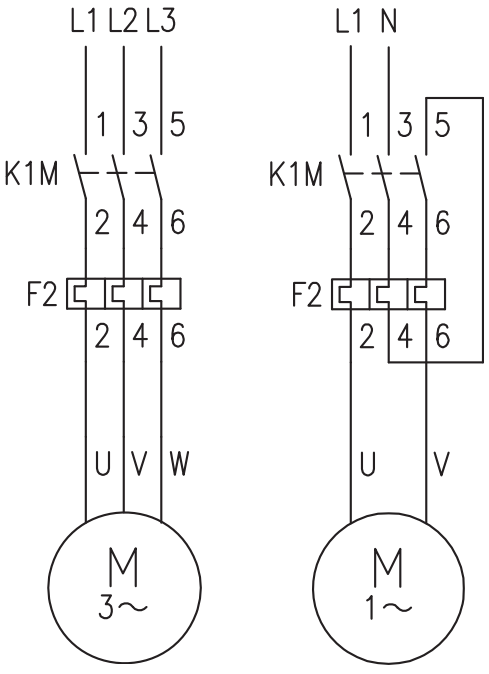
		193-K
Ambient Temperature	Storage Operating	-55…+80 °C (-67…+176 °F) -20…+60 °C (-4…+140 °F)
Humidity	Operating Damp Heat	5…95% Non-condensing per IEC/EN 60068-2-3 and IEC/EN 60068-2-30
Vibration (per IEC/EN 60068-2-6)		3 G
Shock (per IEC/EN 60068-2-27)		30 G
Max. Altitude		2000 m
Pollution Environment		Pollution Degree 3
Degree of Protection		IP2X
Protection		
Type of Relay		Ambient compensated, time delay, phase loss sensitive
Nature of Relay		Bimetallic overload relay
Trip Rating		120% FLA
Trip Class		IEC: 10A, UL 10
Reset Mode		Automatic or manual
Power dissipation	up to 0.4 A	7 W
	0.5…12.5 A	6 W

General Data

	193-K
Standards	IEC/EN 60947-1, -4-1, -5-1, UL 508, CSA 22.2. No. 14
Certifications	CE, cULus
Approximate Weights (unpackaged)	0.115 kg (0.25 lb)

Thermal Overload Relays

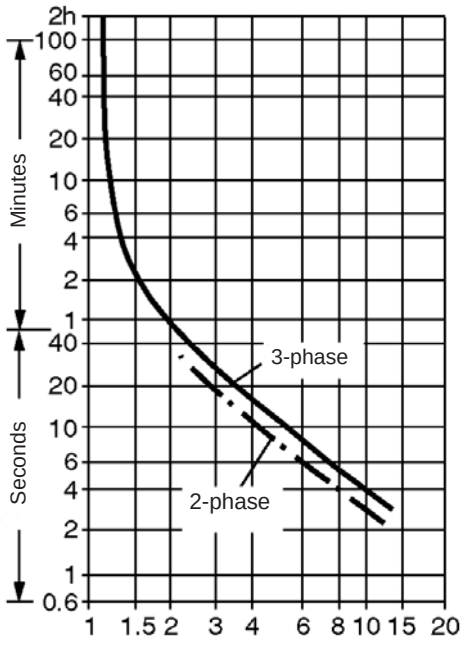
Circuit Diagrams



Trip Characteristics

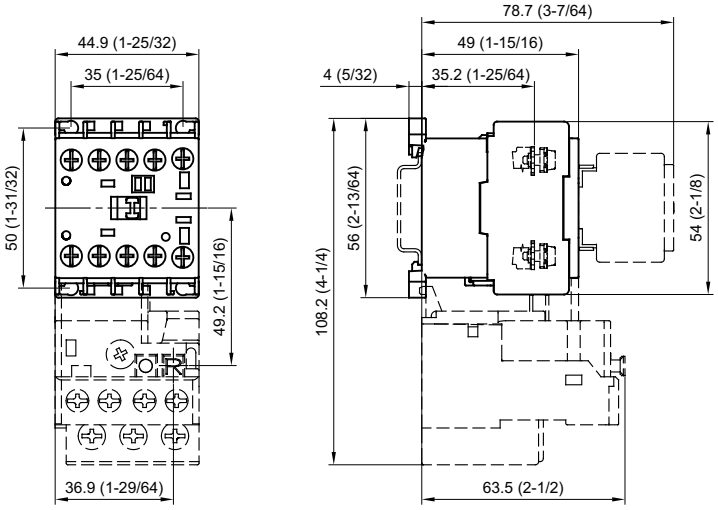
These trip characteristics refer to IEC 60947 and are average values from cold start at an ambient temperature of 20 °C. Trip time is pictured as a function of operating current. With the device at normal operating temperature, the trip time decreases to approximately 25% of the shown value.

Trip Class 10A



FLA Multiple

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



Thermal Overload Relays

Main Circuits

Cat. No.			193-T1…
Rated isolation voltage U_i			690V AC
Rated impulse withstand voltage U_{imp} (between main poles and between main poles and auxiliary circuits)			6kV AC
Rated impulse withstand voltage U_{imp} (between auxiliary circuits)			4kV AC
Rated operating voltage U_e		IEC	690V AC
			440V DC
		UL, CSA	600V AC
Rated frequencies		[Hz]	50/60
Operational frequencies			DC…400 Hz
Power dissipation	193-T1A, 193-T1B	up to 0.4 A	7 W
		0.5…36 A	6 W
		38 A	12 W
	193-T1C	25…47 A	12 W
	193-T1D	47…90 A	18 W

Control Circuits

Cat. No.			193-T1…
Rated operating current I_e			
AC-15	24V	[A]	4
	240V	[A]	2
	400V	[A]	1.6
	690V	[A]	0.15
DC-13	24V	[A]	2
	110V	[A]	0.4
	220V	[A]	0.25
	440V	[A]	0.08
Thermal Current I_{th}			5
Short-circuit withstand, Fuse	IEC, gL/gG	[A]	6
Short-circuit withstand, circuit breaker ≤ 1 kA prospective short-circuit-current		[A]	4
Min. contact load for reliable operation			15V, 2 mA
UL Rating			A600/Q300

Terminations

Cat. Nos.			Main Circuits						Control Circuits	Remote Reset
			193-T1A…	193-T1BC20… T1BC25	193-T1BC30… T1BC38	193-T1C…	193-T1D…	193-T1APM	193-T1… all	193-T1R…
Wiring cross section Terminal type										
Terminal screws			M4	M4	M4	M5	M6	M4	M3.5	M3.5
	Fine stranded with ferrule	1 conductor [mm²] 2 conductors [mm²]	1.5…4 1.5…4	1.5…4 1.5…4	2.5…10 -	2.5…16 -	10…35 -	1.5…10 -	1…4 1…4	1…2.5 -
	Solid or coarse stranded	1 conductor [mm²] 2 conductors [mm²]	1.5…6 1.5…6	1.5…6 1.5…6	2.5…16 -	2.5…25 -	10…35 -	1.5…16 -	1…4 1…4	1…2.5 -
		1 conductor [AWG] 2 conductors [AWG]	No. 16…10 No. 16…10	No. 14…10 No. 14…10	No. 10…6 -	No. 10…6 -	No. 8…1 -	No. 16…6 -	No. 18…12 No. 18…12	No. 16…12 -
Recommended torque		[N•m]	1.5 ... 2.2	1.5 ... 2.2	2.5 … 3.5	2.5 … 3.5	4.5 … 6	1.8…2.8	1.2	1.2
		[lb•in]	13 … 20	13 … 20	22 … 31	22 … 31	40 … 53	16…25	10.6	10.6
Pozidrive screwdriver No.		Size	2	2	2	2	-	2	2	2
Slotted screwdriver		[mm]	0.8 x 5.5	0.8 x 5.5	0.8 x 5.5	0.8 x 5.5	-	0.8 x 5.5	0.8 x 5.5	0.8 x 5.5
Hexagon socket screw		Size	-	-	-	-	4	-	-	-

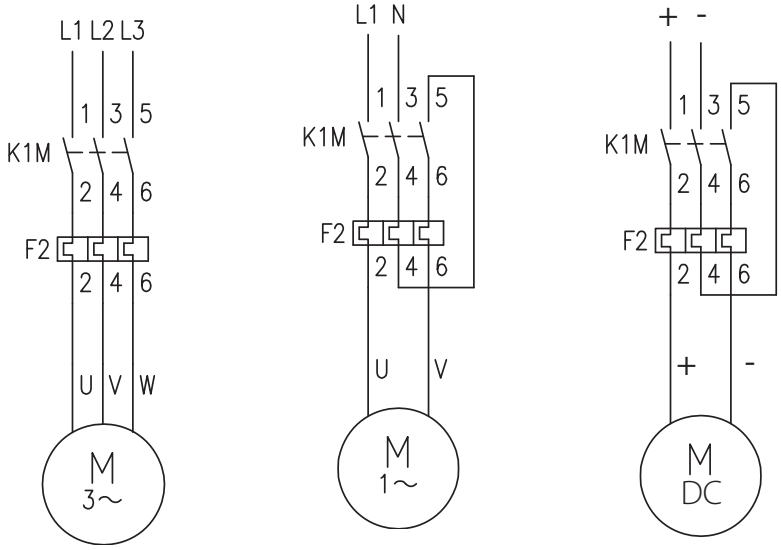
193-T1R Remote Reset

Operating Limits		
Maximum Command Impulse		5s
AC 50/60 Hz	Pick-up [x U_s]	0.8….1.1
	Drop-out [x U_s]	
DC	Pick-up [x U_s]	0.7….1.25
	Drop-out [x U_s]	
Coil Consumtion		
AC 50/60 Hz	Pick-up [VA/W]	
	Hold-in [VA/W]	
DC	Pick-up [W]	17 (24, 110, 125V) 25 (48V)
	Hold-in [W]	17 (24, 110, 125V) 25 (48V)

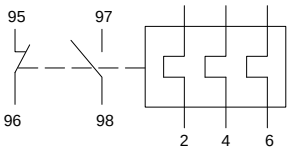
General

Cat. No.			193-T1…	
Type of Overload Relay			Bimetallic, Ambient Compensated, Phase Loss Sensitive	
Trip Rating (ultimate tripping current)			120% FLA	
Phase loss sensitivity: Trip rating at phase loss			115% FLA	
Trip Class			193-T1A/-T1B	193-T1C/-T1D
		IEC/EN 60947-4-1	10A	10
		UL	10	
Reset Mode			Automatic or Manual	
Test release			Manual release of auxiliary contacts	
Trip indication			By means of a flag visible through an opening in the relay front	
Compensation temperature range			-20…+60 °C (-4…+140 °F)	
Climatic Conditions	Release Tolerance at -20 °C		1.05…1.4 x I_n	
	Storage Temperature Range		-55…+80 °C (-67…+176 °F)	
	Operating Temperature Range		-20…+60 °C (-4…+140 °F)	
	Air moisture (Storage/Operating)		5…95% rel.humidity, non-condensing	
Vibration	(per IEC/EN 60068-2-6), service		3g	
	IEC/EN 61373 (vibration railways)		category 1, class B	
	IEC/EN 60092-504 (vibration ships), service		0.7 g, all axes, 2…200 Hz	
Shock	(per IEC/EN 68000-2-27), transport		30 g	
	IEC/EN 60068-2-27 (Shock half-sinus), service		11 ms > 5 g all axes	
	IEC/EN 61373 (shock railways)		category 1, class B, 5g 30 ms	
Max. Altitude			2000 m	
Pollution Degree			3	
Degree of Protection, with wires connected			IP2X	
Approximate Weight (unpackaged)	193-T1A, 193-T1B	0.16…25 A	0.115 kg	
	193-T1B	30…38 A	0.155 kg	
	193-T1C	25…47 A	0.330 kg	
	193-T1D	47…90 A	0.360 kg	
	193-T1….P	47…90 A	0.415 kg	
Standards			IEC/EN 60497-1, -4-1, -5-1, UL508, CSA C22.2 No.14	
Certifications			CE, cULus	

Circuit Diagrams



Wiring Schematic



Typical IEC Wiring Schematic

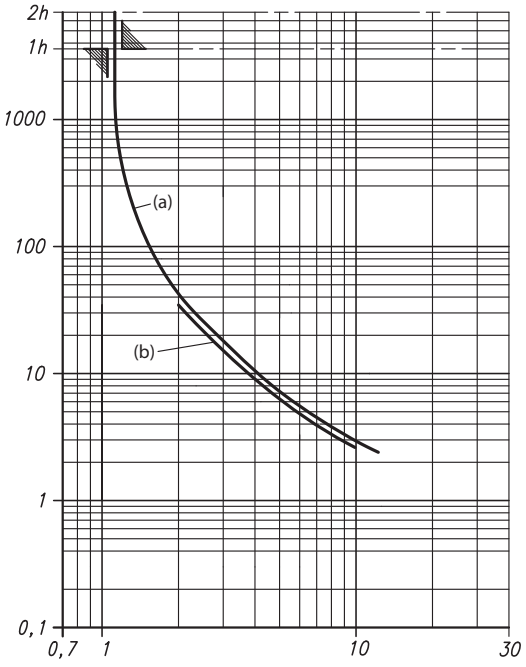
Trip Characteristics

These trip characteristics refer to IEC/EN 60947-4-1 and are average values from cold start at an ambient temperature of 20 °C. Trip time is pictured as a function of operating current. With the device at max. operating temperature, the trip time decreases to approximately 25% of the shown value.

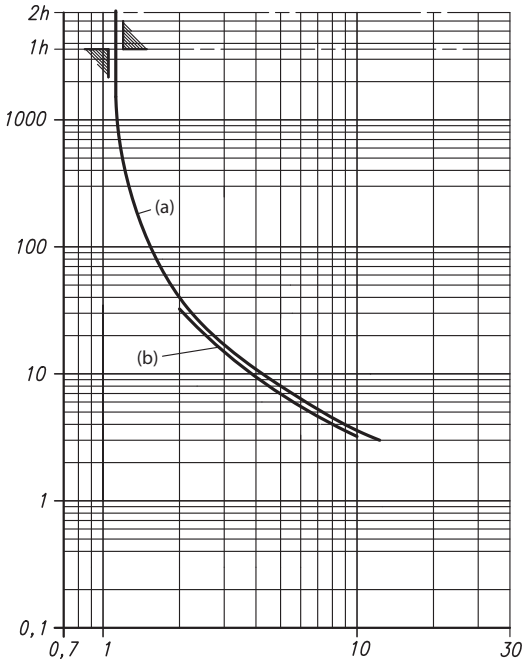
(a) Tripping characteristics 3-poles from the cold state

(b) Tripping characteristics 2-poles from the cold state

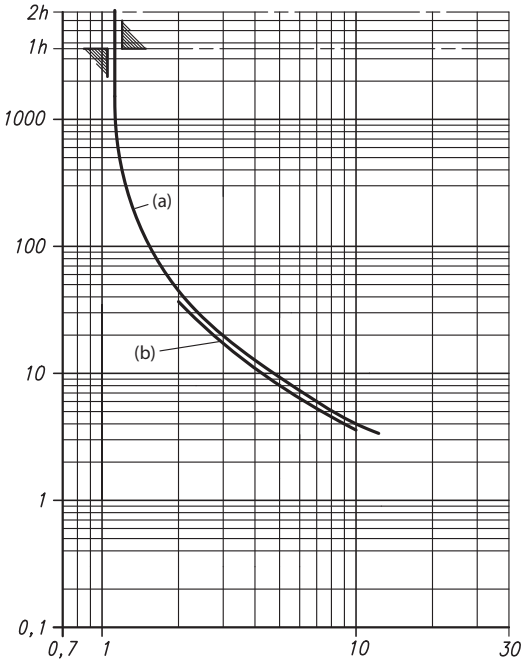
Cat. Nos. 193-T1AA16…AA40 Overload Relays



Cat. Nos. 193-T1AA50…AB40 Overload Relays

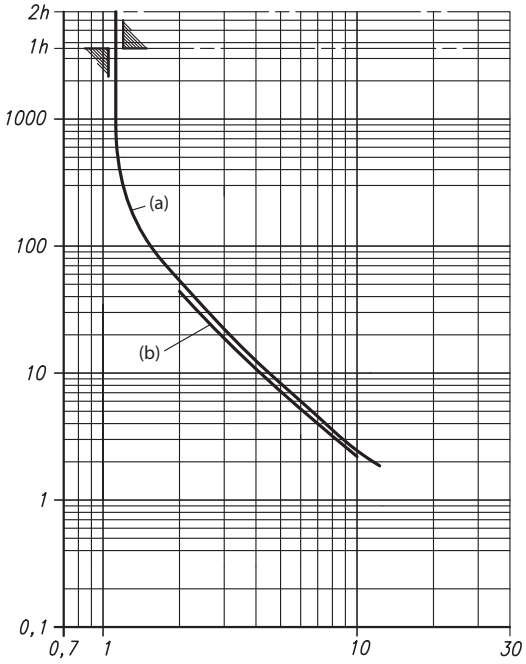


Cat. Nos. 193-T1AB48…AC25 Overload Relays

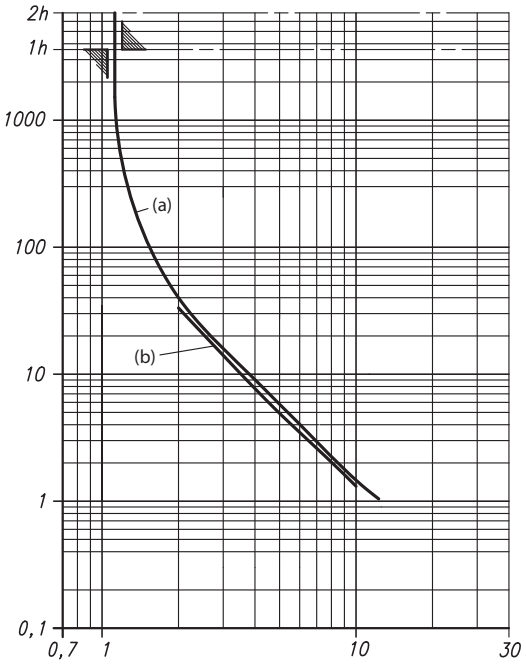


Tripping Time [s]
Multiple of the set current [I_e]

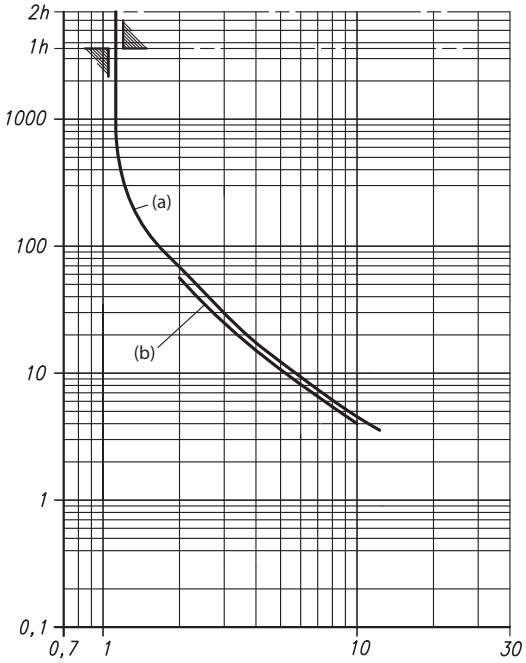
Cat. Nos. 193-T1BC20…BC25 Overload Relays



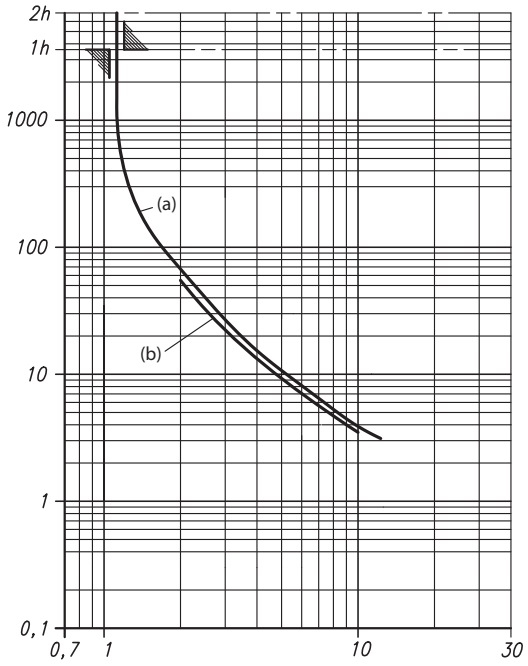
Cat. Nos. 193-T1BC30…BC38 Overload Relays



Cat. Nos. 193-T1CC25…CC47 Overload Relays

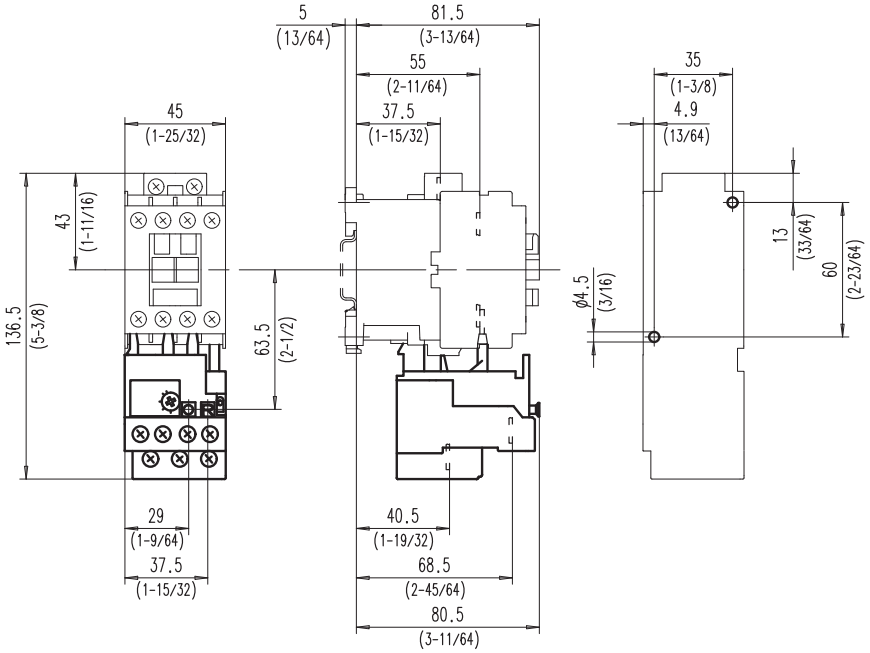


Cat. Nos. 193-T1DC47…DC90 Overload Relays

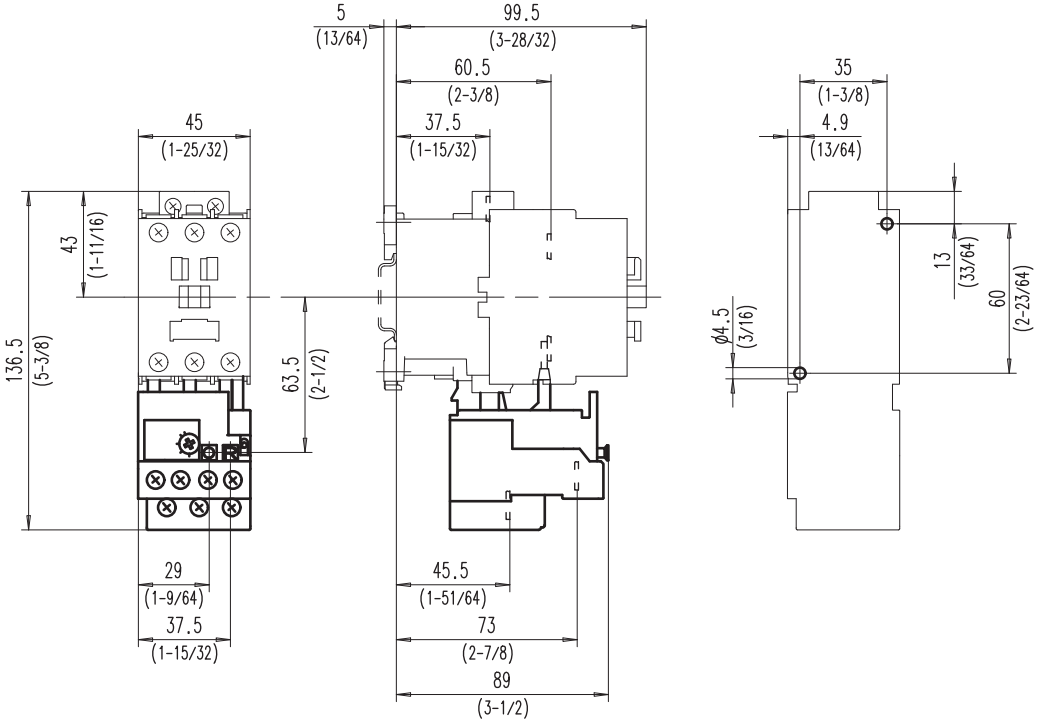


Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

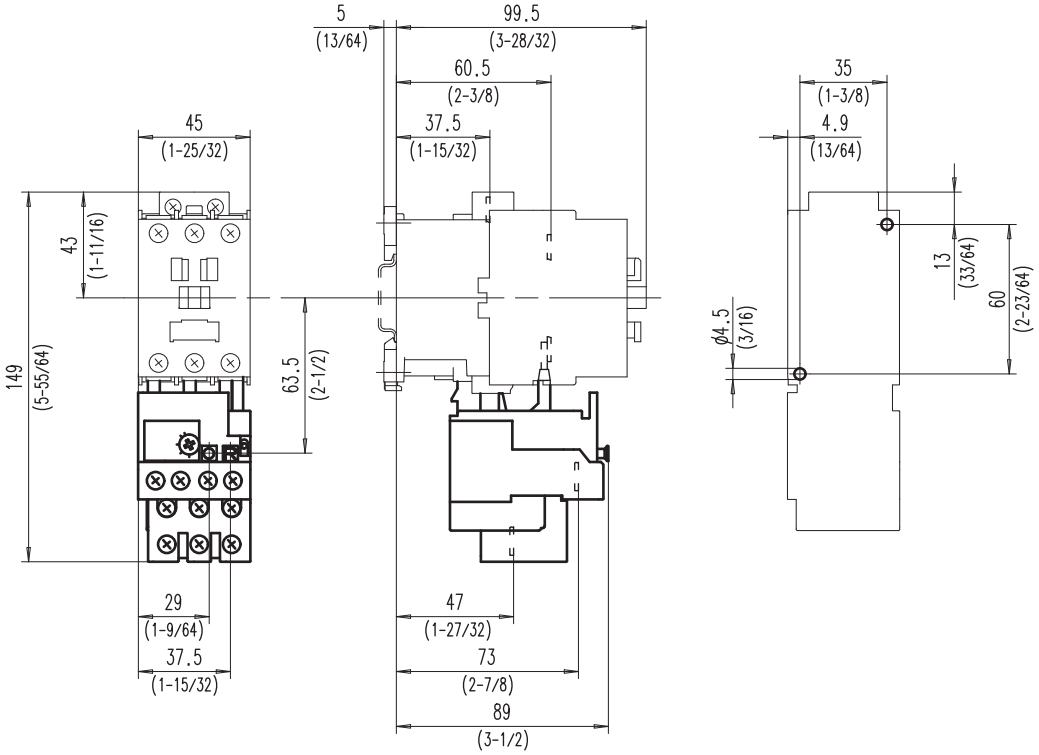
Cat. Nos. 193-T1AA16…AC25 Overload Relays



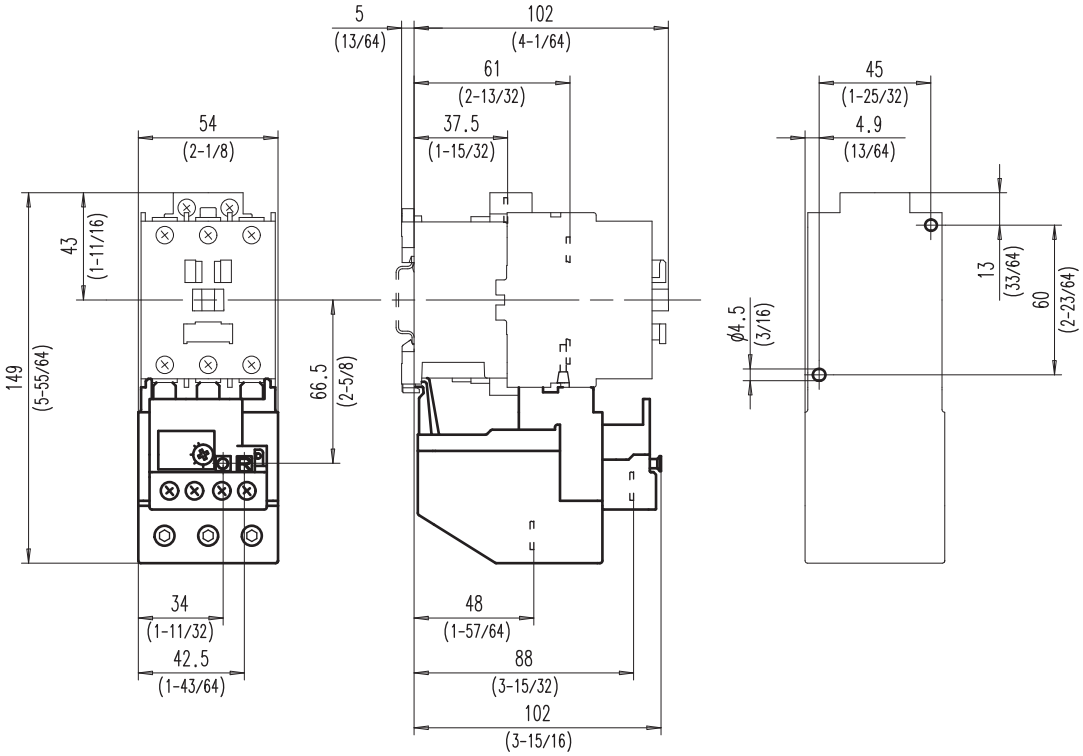
Cat. Nos. 193-T1BC20…25 Overload Relays



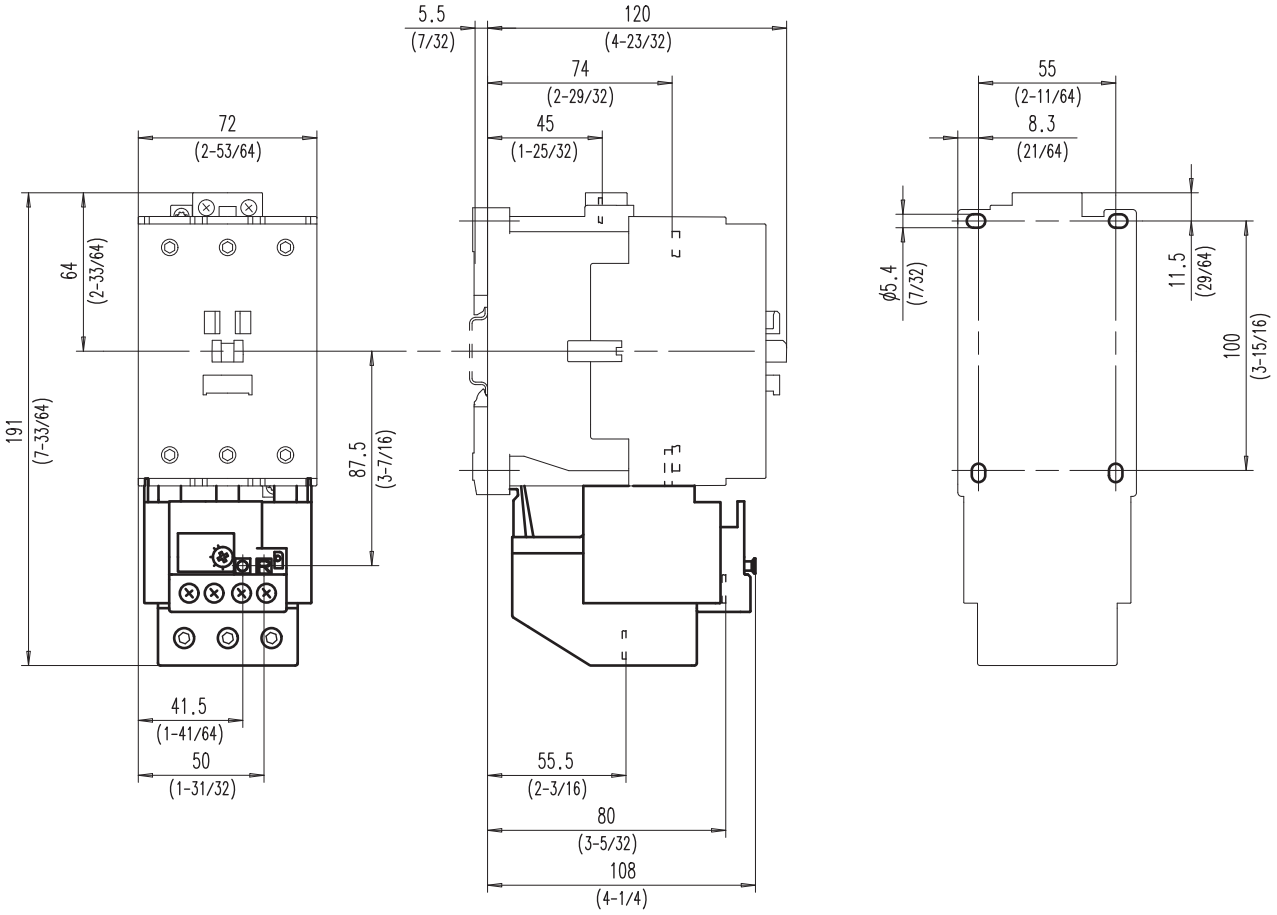
Cat. Nos. 193-T1BC30…38 Overload Relays



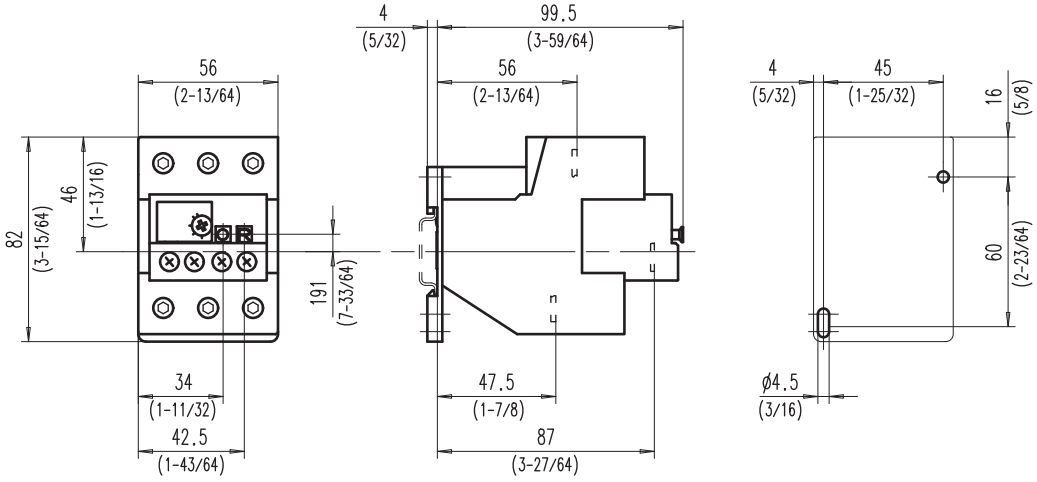
Cat. Nos. 193-T1CC25…47 Overload Relays



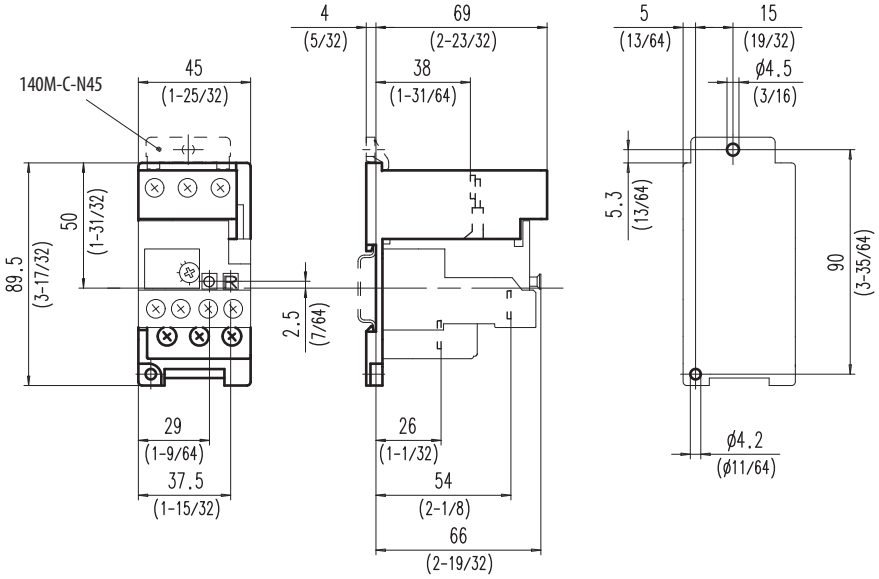
Cat. Nos. 193-T1DC47…90 Overload Relays



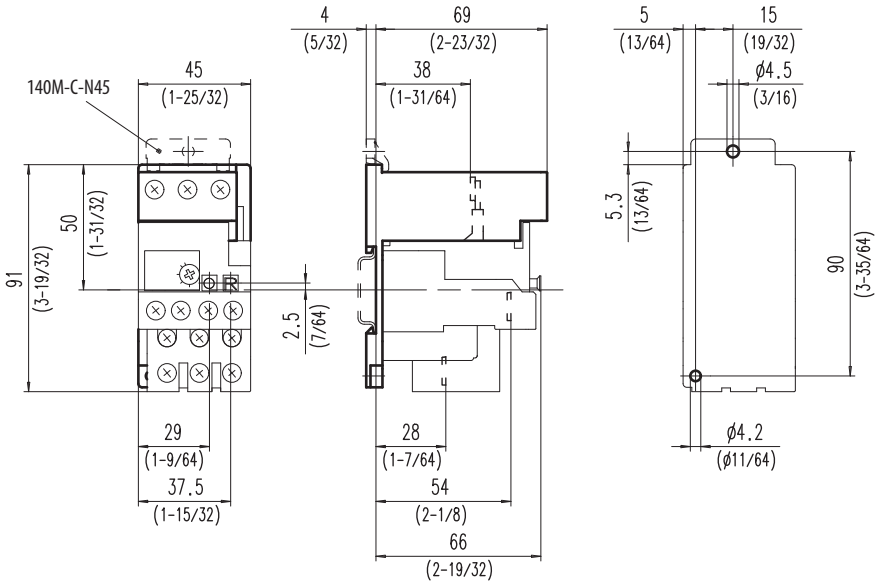
Cat. Nos. 193-T1DC47P…90P Overload Relays



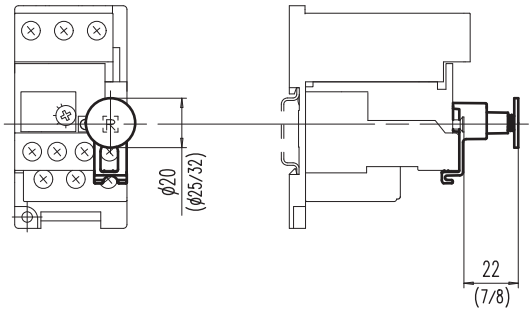
Cat. No. 193-T1APM DIN Rail/Panel Mounting Adapter (for use with Cat. Nos. 193-T1AA16…AC25 and 193-T1BC20…25 Overload Relays)



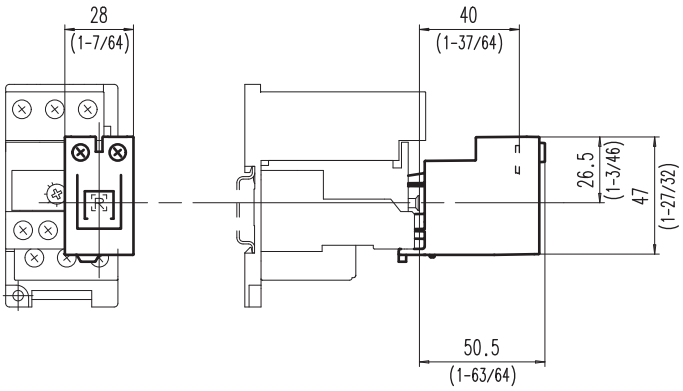
Cat. No. 193-T1APM DIN Rail/Panel Mounting Adapter (for use with Cat. No. 193-T1BC30…38 Overload Relays)



Cat. No. 193-RA3 Reset Adapter



Cat. No. 193-T1R⊗ Remote Reset Solenoid



Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

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