Series CEP9 Electronic Overload Relays

The CEP9 Electronic Overload Relay is an advanced electronic overload from Sprecher + Schuh. Its modular design, communication options, diagnostic information, simplified wiring and integration into Logix make this the ideal overload for motor control applications in an automation system. The CEP9 Overload Relay provides flexibility, reduces engineering time, and maximizes uptime for important motor starter applications.

Choose Series CEP9 overloads for advanced communication and motor protection

Intelligent Motor Protection

Easy automation system integration
- Network Connectivity
- Native I/O
- DeviceLogix™ Technology Enabled
- Pre-programmed Operating Modes

Diagnostic Information

Monitor motor performance
- Voltage, Current and Energy
- Trip / Warning Histories
- % Thermal Capacity Utilization
- Time to Trip
- Time to Reset
- Operational Hours
- Number of Starts
- Snapshot Log

Modular Design

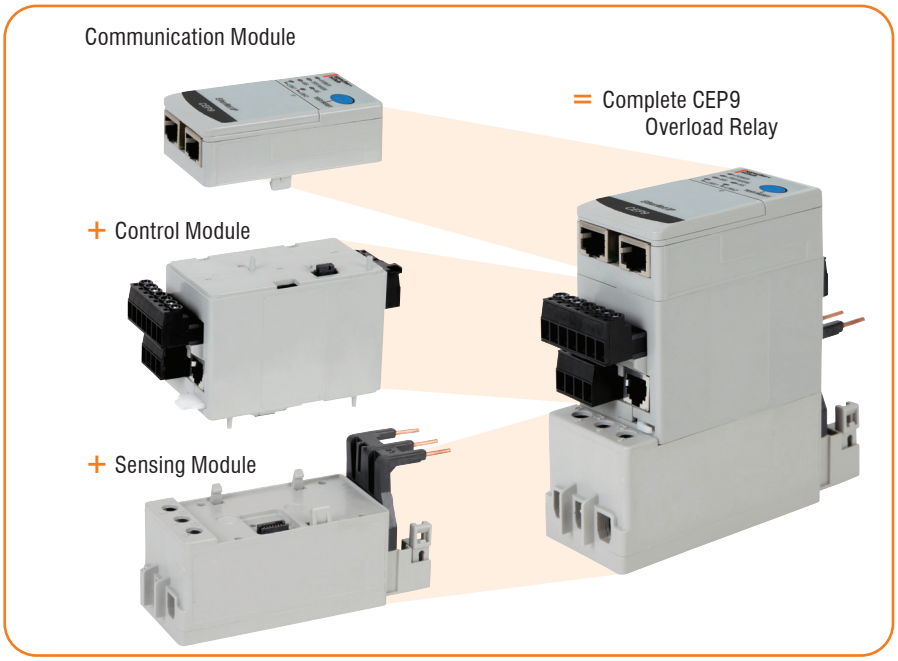
For exact application needs
- Wide Current Range
- Multiple Sensing Capabilities
- Expansion I/O
- Operator Interface

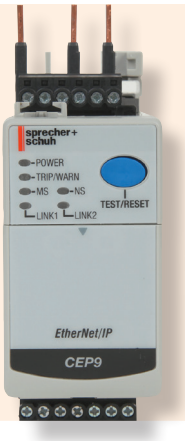
On Board Features

The CEP9 Overload Relay incorporates the newest technologies directly into the device to help simplify installation and configuration. Simplified wiring between the CEP9 overload relay and CA7 or CA9 contactor ensure easy installation.

On-device settings include network address configuration, restore factory default settings, and enable security settings. CEP9 overloads also include removable terminal blocks, I/O and Operator Station Dual Port EtherNet/IP, and it supports device level ring.

- Intelligent motor protection (EtherNet/IP enabled)
- Scalable solution
- Diagnostic Information
- Integrated I/O
- Adjustable trip class 5...30
- Wide current range
- Test/Reset button
- Programmable trip and warning settings
- True RMS current/voltage sensing (50/60 Hz)
- Protection for single- and three-phase motors





Expansion Modules

Diagnostic Station

Thermal Utilization

The CEP9 Electronic Overload Relay provides overload protection through true RMS current measurement of the individual phase currents of the connected motor. Based on this information, a thermal model that simulates the actual heating of the motor is calculated. Percent of thermal capacity utilization (%TCU) reports this calculated value and can be read via a communications network. An overload trip occurs when the value reaches 100%.

Adjustable Settings

Thermal overload protection setup is accomplished simply by programming the motor's full load current (FLC) rating and the desired trip class (5...30). Programming of the actual values through software programming ensures the accuracy of the protection.

Thermal Memory

The CEP9 Electronic Overload Relay includes a thermal memory circuit designed to approximate the thermal decay for a trip class 20 setting. This means that the thermal model of the connected motor is maintained at all times, even if the supply power is removed.

Reset Modes

This flexibility allows the end-user the ability to select between manual and automatic reset for an overload trip, allowing for broad application. The point of reset is user adjustable from 1...100% TCU.

Time to Trip

During an overload condition, the CEP9 Electronic Overload Relay provides an estimated time to trip that is accessible via a communications network. This allows corrective action to be taken so that production may continue uninterrupted.

Time to Reset

Following an overload trip, the CEP9 Electronic Overload Relay will not reset until the calculated percentage of thermal capacity utilization falls below the reset level. As this value decays, the time to reset, which is accessible via a communications network, is reported.

Thermal Warning

The CEP9 Electronic Overload Relay provides the capability to alert in the event of an impending overload trip. A thermal warning bit is set in the Warning Status when the calculated percentage of thermal capacity utilization exceeds the programmed thermal warning level, which has a setting range of 0...100% TCU.

Two-Speed Protection

The CEP9 Electronic Overload Relay offers a second FLA setting for 2-speed motor protection. What used to require two separate overload relays - one for each set of motor windings - can now be accomplished with one device. Improved protection is delivered as thermal utilization is maintained in one device during operation in both speeds.

Phase Loss

The CEP9 Electronic Overload Relay offers configurable phase loss protection, allowing the installer to enable or disable the function, plus set a time delay adjustable from 0.1...25.0 seconds. The trip level is factory-set at a current imbalance measurement of 100%.

Ground (Earth) Fault

The CEP9 Electronic Overload Relay incorporates zero sequence (core balance) sensing into its design for low level (arcing) ground fault detection. Trip and warning settings are adjustable from 20 mA...5.0 A. For devices rated greater than 200 A and for ground fault detection less than 1.0 A, the external core balance current transformer accessory is required. Class I protection is provided as defined by UL1053. The CEP9 Electronic Overload Relay provides a max. trip-inhibit setting, offering flexibility to prevent tripping when the ground fault current magnitude exceeds 6.5 A. This can be useful to guard against the opening of the controller when the fault current could potentially exceed the controller's interrupting capacity rating.

Note: The CEP9 Electronic Overload Relay is not a Ground Fault Circuit Interrupter for personnel protection as defined in article 100 of the U.S. National Electric Code.

Stall

"Stall" is defined as a condition where the motor is not able to reach full-speed operation in the appropriate amount of time required by the application. This can result in motor overheating as current draw is in excess of the motor's full load current rating. The CEP9 Electronic Overload Relay provides user-adjustable stall protection. The trip setting has a range of 100...600% FLA, and the enable time is adjustable up to 250 seconds.

Jam (Overcurrent)

The CEP9 Electronic Overload Relay can respond quickly to take a motor off-line in the event of a mechanical jam, thereby reducing the potential for damage to the motor and the power transmission components.

Trip adjustments include a trip setting adjustable from 50...600% FLA and a trip delay time with a range of 0.1...25.0 seconds. A separate warning setting is adjustable from 50...600% FLA.

Underload (Undercurrent)

A sudden drop in motor current can signal conditions such as:

- Pump cavitation
- Tool breakage
- Belt breakage

For these instances, rapid fault detection can help minimize damage and aid in reducing production downtime.

Additionally, monitoring for an underload event can provide enhanced protection for motors that are coded by the medium handled (e.g., submersible pumps that pump water). Such motors can become overheated despite being underloaded. This can result from an absence or an insufficient amount of the medium (due to clogged filters, closed valves, etc.).

The CEP9 Electronic Overload Relay offers underload trip and warning settings adjustable from 10...100% FLA. The trip function also includes a trip delay time with a range of 0.1...25.0 seconds.

Current Imbalance (Asymmetry)

The CEP9 Electronic Overload Relay offers current imbalance trip and warning settings adjustable from 10...100%. The trip function also includes a trip delay time with a range of 0.1...25.0 seconds.

Remote Trip

The remote trip function allows an external device (e.g., a vibration sensor) to induce the CEP9 Electronic Overload Relay to trip. External device relay contacts are wired to the CEP9 Electronic Overload Relay discrete inputs. These discrete inputs are configurable with an option for assigning the remote trip function.

Current Monitoring Functions

The CEP9 Electronic Overload Relay allows the user to monitor the following operational data over a communications network:

- Individual phase currents — in amperes
- Individual phase currents — as a percentage of motor FLC
- Average current — in amperes
- Average current — as a percentage of motor FLC
- Percentage of thermal capacity utilized
- Current imbalance percentage
- Ground fault current

Diagnostic Functions

The CEP9 Electronic Overload Relay allows the user to monitor the following diagnostic information over the Ethernet/IP network:

- Device status
- Trip status
- Warning status
- Time to an overload trip
- Time to reset after an overload
- History of past five trips
- History of positive warnings
- Hours of operation
- Number of starts
- Trip snapshot trip

Status Indicators

The CEP9 Electronic Overload Relay provides the following LED indicators:

- **Power** — This green/red LED indicates the status of the overload relay.
- **TRIP/WARN** — This LED flashes a yellow code under a warning condition and a red code when tripped.

Inputs/Outputs

Inputs allow the connection of such devices as contactor and disconnect auxiliary contacts, pilot devices, limit switches, and float switches. Input status can be monitored via the network and mapped to a controller's input image table. Inputs are rated 24V DC, 120V AC, or 240V AC and are current sinking. Power for the inputs is sourced separately with convenient customer sources at terminal A1. Relay contact outputs can be controlled via the network or DeviceLogix function blocks for performing such tasks as contactor operation.

Test/Reset Button

The Test/Reset button, located on the front of the CEP9 Electronic Overload Relay, allows the user to perform the following:

- **Test** — The trip relay contact will open if the CEP9 Electronic Overload Relay is in an untripped condition and the Test/Reset button is pressed for 2 seconds or longer.
- **Reset** — The trip relay contact will close if the CEP9 Electronic Overload Relay is in a tripped condition, supply voltage is present, and the Test/Reset button is pressed.

Single/Three-Phase Operation

The CEP9 Electronic Overload Relay can be applied to three-phase as well as single-phase applications. A programming parameter is provided for selection between single- and three-phase operation. Straight-through wiring is afforded in both cases.

EtherNet/IP Communications

The CEP9 EtherNet/IP communication module has two RJ45 ports that act as an Ethernet switch to support a star, linear, and ring topology and supports the following:

- 2 concurrent Class 1 connections [1 exclusive owner + (1 input only or 1 listen only)]
- 6 simultaneously Class 3 connections (explicit messaging)
- Embedded web server
- SMPT server for trip and warning events
- Embedded EDS file

Current Sensing Module

Description	Mounting Options	For Use With	Current Range [A]	Catalog Number
	IEC Contactors	CA7-9…23	0.5…30	**CEP9-ESM-I-23-30**
		CA7-30…55	0.5…30	**CEP9-ESM-I-55-30**
			6…60	**CEP9-ESM-I-55-60**
		CA7-60…97	10…100	**CEP9-ESM-I-97-100**
		CA6-115…180	20…200	**CEP9-ESM-I-180-200**
		CA9-116…146	20…200	**CEP9-ESM-I-146-200**
		CA9-190…205	20…200	**CEP9-ESM-I-205-200**
	DIN Rail Mount (to 60A) ❶	All contactors and external current transformers	0.5…30	**CEP9-ESM-I-T-30**
	DIN Rail Mount (10 to 200A) ❷	All contactors	6…60	**CEP9-ESM-I-T-60**
			10…100	**CEP9-ESM-I-T-100**
			20…200	**CEP9-ESM-I-T-200**
	DIN Rail / Panel Mount	All contactors and external current transformers	0.5…30	**CEP9-ESM-I-7T-30**
		All contactors	6…60	**CEP9-ESM-I-7T-60**
			10…100	**CEP9-ESM-I-7T-100**
	DIN Rail Mount Pass-thru (to 60A) ❶	All contactors and external current transformers	0.5…30	**CEP9-ESM-I-P-30**
	DIN Rail Mount Pass-thru (10 to 200A) ❷	All contactors	6…60	**CEP9-ESM-I-P-60**
			10…100	**CEP9-ESM-I-P-100**
			20…200	**CEP9-ESM-I-P-200**

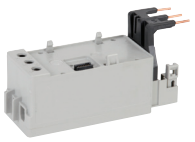
Current/Ground Fault Sensing Module

Description	Mounting Options	For Use With	Current Range[A]	Catalog Number
	IEC Contactors	CA7-9…23	0.5…30	**CEP9-ESM-IG-23-30**
		CA7-30…55	0.5…30	**CEP9-ESM-IG-55-30**
			6…60	**CEP9-ESM-IG-55-60**
		CA7-60…97	10…100	**CEP9-ESM-IG-97-100**
		CA6-115…180	20…200	**CEP9-ESM-IG-180-200**
		CA9-116…146	20…200	**CEP9-ESM-IG-146-200**
		CA9-190…205	20…200	**CEP9-ESM-IG-205-200**
	DIN Rail Mount (up to 60A) ❶	All contactors and external current transformers	0.5…30	**CEP9-ESM-IG-T-30**
	DIN Rail Mount (10 to 200A) ❷	All contactors	6…60	**CEP9-ESM-IG-T-60**
			10…100	**CEP9-ESM-IG-T-100**
			20…200	**CEP9-ESM-IG-T-200**
	DIN Rail / Panel Mount	All contactors and external current transformers	0.5…30	**CEP9-ESM-IG-7T-30**
		All contactors	6…60	**CEP9-ESM-IG-7T-60**
			10…100	**CEP9-ESM-IG-7T-100**
	DIN Rail Mount Pass-thru (to 60A) ❶	All contactors and external current transformers	0.5…30	**CEP9-ESM-IG-P-30**
	DIN Rail Mount Pass-thru (10 to 200A) ❷	All contactors	6…60	**CEP9-ESM-IG-P-60**
			10…100	**CEP9-ESM-IG-P-100**
			20…200	**CEP9-ESM-IG-P-200**

Items in Gray are discontinued

❶ For Panel Mount option use KT7-45-AS Screw Adaptor. See page F16.
❷ For Panel Mount option use CEP9-ESM-SA-100 Screw Adaptor. See page B33.

Voltage/Current/Ground Fault Sensing Module

Description	Mounting Options	For Use With	Current Range[A]	Catalog Number
	IEC Contactors	CA7-9…23	0.5…30	**CEP9-ESM-VIG-23-30**
		CA7-30…55	0.5…30	**CEP9-ESM-VIG-55-30**
			6…60	**CEP9-ESM-VIG-55-60**
		CA7-60…97	10…100	**CEP9-ESM-VIG-97-100**
		CA6-115…180	20…200	**CEP9-ESM-VIG-180-200**
		CA9-116…146	20…200	**CEP9-ESM-VIG-146-200**
		CA9-190…205	20…200	**CEP9-ESM-VIG-205-200**
	DIN Rail Mount (up to 60A) ❶	All contactors	0.5…30	**CEP9-ESM-VIG-T-30**
			6…60	**CEP9-ESM-VIG-T-60**
	DIN Rail Mount (10 to 100A) ❷		10…100	**CEP9-ESM-VIG-T-100**
			20…200	**CEP9-ESM-VIG-T-200**
	DIN Rail / Panel Mount		0.5…30	**CEP9-ESM-VIG-7T-30**
			6…60	**CEP9-ESM-VIG-7T-60**
			10…100	**CEP9-ESM-VIG-7T-100**
	DIN Rail Mount Pass-thru ❶	All contactors and external current transformers	0.5…30	**CEP9-ESM-VIG-CT-30**

Items in Gray are discontinued

Control Module

Description		Rated Control Voltage [V]	No. of Inputs/Outputs	Catalog Number
	**I/O Module**	110…120V AC, 50/60 Hz	4 In/3 Out	**CEP9-EIO-43-120**
		220…240V AC, 50/60 Hz	4 In/3 Out	**CEP9-EIO-43-240**
		24V DC	6 In/3 Out	**CEP9-EIO-63-24D**
	Ground Fault & PTC I/O Module	110…120V AC, 50/60 Hz	2 In / 2 Out	**CEP9-EIOGP-22-120**
		220…240V AC, 50/60 Hz	2 In / 2 Out	**CEP9-EIOGP-22-240**
		24V DC	4 In / 2 Out	**CEP9-EIOGP-42-24D**

Communication Module

Description			Catalog Number
	**EtherNet/IP Communication ❸**	The EtherNet/IP communication module has two RJ45 ports that support a star, linear, and ring topology and supports the following: • 2 concurrent Class 1 connections [1 exclusive owner + (1 input only or 1 listen only)] • 6 simultaneous Class 3 connections (explicit messaging) • Embedded web server • SMTP server for trip and warning events (email and text messaging) • Embedded EDS files	**CEP9-ECM-ETR**
	**Parameter Configuration Module ❸**	The Parameter Configuration Module (PCM) has one Type B USB interface port and supports the following: • Stand-alone non-networked applications • Three rotary dails to set Full Load Amps (FLA) • 8-position DIP switch for trip class and feature selection	**CEP9-ECM-PCM**

❶ For Panel Mount option use KT7-45-AS Screw Adaptor. See page F16.
❷ For Panel Mount option use CEP9-ESM-SA-100 Screw Adaptor. See page B33.
❸ CEP9 communication modules require user configuration for full functionality.

Expansion Modules

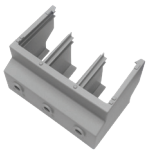
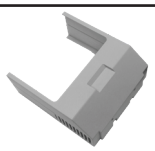
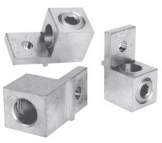
Description		Rated Control Voltage [V]	No. of Inputs/Outputs	Catalog Number
	**Analog Expansion Module (mA, V, RTD and Resistance)**	~	3 Universal In / 1 Out	**CEP9-EXP-AIO-31❶**
	**Digital Expansion 120V AC**	110…120V AC, 50/60 Hz	4 In / 2 Out	**CEP9-EXP-DIO-42-120**
	Digital Expansion 240V AC	220…240V AC, 50/60 Hz	4 In / 2 Out	**CEP9-EXP-DIO-42-240**
	Digital Expansion 24V DC	24V DC	4 In / 2 Out	**CEP9-EXP-DIO-42-24D**
	**Expansion Power Supply**	110…240V AC, 50/60 Hz	~	**CEP9-EXP-PS-AC**
		24V DC	~	**CEP9-EXP-PS-DC**

Accessories

Description		For Use With	Catalog Number
	**Starter Control Station with 3 meter cable**	~	**CEP9-EOS-SCS**
	**Starter Diagnostic Station with 3 meter cable**	~	**CEP9-EOS-SDS ❶**

❶ Module requires control module firmware v3.000 or higher.

Accessories

Description			For Use With	Catalog Number
	**Contactor Coil Module**		CA7-9...23 contactors	**CEP9-EIO-CM-23**
			CA7-30...55 contactors	**CEP9-EIO-CM-55**
			CA7-60...97 contactors	**CEP9-EIO-CM-97**
	**Expansion Module Cable**	**1 Meter**	~	**CEP9-EXP-CBL-1M**
		3 Meter	~	**CEP9-EXP-CBL-3M**
	**Replacement Connectors**		CEP9-EIOGP-22-_	**CEP9-NCIOGP-22-CNT**
			CEP9-EIO-43-	**CEP9-NCIO-43-CNT**
			CEP9-EIOGP-42-24D	**CEP9-NCIOGP-42-CNT**
			CEP9-EIO-63-24D	**CEP9-NCIO-63-CNT**
			CEP9-EXP-DIO-42-_	**CEP9-NCXP-DIO-CNT**
			CEP9-EXP-AIO-31	**CEP9-NCXP-AIO-CNT**
			CEP9-EXP-PS-_	**CEP9-NCXP-PS-CNT**
	**Panel Mount Screw Adapter**		CEP9-ESM-_-T-30	**KT7-45-AS**
			CEP9-ESM-_-T-60	
			CEP9-ESM-_-7T-30	
			CEP9-ESM-_-7T-60	
			CEP9-ESM-_-P-30	
			CEP9-ESM-_-P-60	
			CEP9-ESM-VIG-CT-30	
	**Panel Mount Screw Adaptor**		CEP9-ESM-_-100	**CEP9-ESM-SA-100** ❶
	**Line Side Terminal Cover**		CEP9-ESM-_-T-200	**CEP9-ESM-TCT-200**
	**Load Side Terminal Cover**		CEP9-ESM-_-180-200 CEP9-ESM-_-205-200 CEP9-ESM-_-T-200	**CEP9-ESM-TCT-200**
	**Contactor Terminal Cover** (in between contactor and overload relay)		CEP9-ESM-_-180-200	**CEP9-ESM-TC-180**
	**Screw Type Lugs -** • Single connections to each pole • Accepts round conductors only • Copper construction • Provided as a set of 3		CEP9-ESM...-205-200	**CA6-L180**

❶ Sold in multiples of 10. Minimum order is one package of 10. Price is each piece.

Electrical Specifications

Motor/Load Ratings

Terminals	1/L1, 3/L2, 5/L3, 2/T1, 4/T2, 6/T3
Rated Insulation Voltage (Ui)	690V AC
Rated Operating Voltage (Ue)	IEC: 690V AC
	UL: 600V AC
Rated Impulse Voltage (Uimp)	6 kV
Rated Operating Current (Ie)	See Catalog Number Explanation
Rated Frequency	45...65 Hz ❶
Short Circuit Ratings	See user manual
Number of Poles	3
Application	Single-phase or Three-phase

Power Supply Ratings

Rated Supply Voltage (Us)	120V AC	240V AC
Operating Range	85…132V AC	159…265V AC
Maximum Inrush Current	6 A	
Maximum Power Consumption		
CEP9:	6 W	
CEP9 with expansion:	8 W	
Maximum Power Interruption Time		
Vmin:	10 ms	10 ms
Vmax:	10 ms	10 ms

Output Relay Ratings (Control Module and Expansion Digital Module)

Terminals	Relay 0:	R03/R04
	Relay 1:	R13/R14
	Relay 2:	R23/R24
Type of Contacts		Form A SPST - NO
Rated Thermal Current (Ithe)	5 A	
Rated Insulation Voltage (Ui)	300V AC	
Rated Operating Voltage (Ue)	250V AC	
Rated Operating Current (Ie)	3 A (@120V AC), 1.5 A (@240V AC)	
	0.25 A (@110V DC), 0.1 A (@220V DC)	
Minimum Operating Current	10 mA @ 5V DC	
Rating Designation	B300	
Utilization Category	AC-15	
Resistive Load Rating (p.f. = 1.0)	5 A, 250V AC 5 A, 30V DC	
Inductive Load Rating (p.f. = 0.4) (L/R = 7 ms)	2 A, 250V AC 2 A, 30V DC	
Short Circuit Current Rating	1,000 A	
Recommended Control Circuit Fuse	KTK-R-6 (6 A, 600 V)	
Rated Number of Operations Relay 0, Relay 1, and Relay 2:		
with CA7-09…CA7-55	5,000,000	
with CA7-60…CA7-97	2,500,000	

Input Ratings (Control Module and Expansion Digital Module)

Terminals

Input 0:	IN0
Input 1:	IN1
Input 2:	IN2
Input 3:	IN3
Input 4:	IN4
Input 5:	IN5

Supply Voltage	24V DC	120V AC	240V AC
Type of Inputs	Current Sinking	~	~
On-State Voltage	11V DC	74V AC	159V AC
On-State Current (turn-on)	2 mA	5 mA	5 mA
Off-State Voltage	5V DC	20V AC	40V AC
Off-State Current	1.5 mA	2.5 mA	2.5 mA
Transition Voltage	5...11V DC	20…74V AC	40…159V AC
Transition Current	1.5...2.0 mA	2.5…5 mA	2.5…5 mA

Low Voltage Directive

The CEP9 Electronic Overload Relay expansion digital modules are tested to comply with EN60947-5-1 Low-voltage switchgear and controlgear Part 5-1: Control circuit devices and switching elements.

Expansion Digital I/O Modules

Expansion Digital I/O Modules	CEP9-EXP-DIO-42		
	-24D	-120	-240
Digital Output Rated Operational Voltage (Ue):	250V AC	250V AC	250V AC
Digital Output Rated Insulation Voltage (Ui):	2000Vrms for 1s	2000Vrms for 1s	2000Vrms for 1s
Rated Impulse Withstand Voltage (Uimp):	~	~	~
Conditional Short Circuit Current:	1000 A	1000 A	1000 A
Recommended Control Circuit Fuse:	KTK-R (6 A, 600V)	KTK-R (6 A, 600V)	KTK-R (6 A, 600V)
Utilization Category:	AC15, DC13	AC15, DC13	AC15, DC13
Pollution Degree:	3	3	3

Expansion Power Supply Modules

Expansion Power Supply Modules	CEP9-EXP-PS-AC
Rated Operational Voltage (Ue):	100…250V AC
Rated Insulation Voltage (Ui):	2640Vrms for 1s
Rated Impulse Withstand Voltage (Uimp):	4 kV
Conditional Short Circuit Current:	~
Protection Against Short Circuits:	~
Utilization Category:	~
Pollution Degree:	3

❶ Exception: Any CEP9 Overload Relay that uses an external ground fault sensor is limited to 50/60 Hz detection.

Environmental Specifications

Ambient Temperature ❶		
Storage		–40…+85 °C (–40…+185 °F)
Operating	(Open)	–20…+55 °C (–4…+131 °F)
	(Enclosed)	–20…+40 °C (–4…+104 °F)
Humidity		
Operating		5…95% Non-condensing
Damp Heat – Steady State (per IEC 68-2-3)		92% r.h., 40 °C (104 °F), 56 days
Damp Heat – Cyclic (per IEC 68-2-30)		93% r.h., 25 °C/40 °C (77 °F/104 °F), 21 Cycles
Cooling Method		Natural Convection
Vibration (per IEC 68-2-6)		2.5G operating, 5 G non-operating
Shock (per IEC 68-2-27)		30 G
Maximum Altitude		2000 m ❷
Pollution Environment Pollution Degree		3
Terminal Marking		EN 50012
Degree of Protection		IP20

Electromagnetic Compatibility Specifications

Electrostatic Discharge Immunity	
Test Level:	8kV Air Discharge 6kV Contact Discharge
Performance Criteria:	1 ❸❹
RF Immunity	
Test Level:	10V/m
Performance Criteria:	1 ❸❹
Electrical Fast Transient/Burst Immunity	
Test Level:	4kV (Power) 2kV (Control & Comm)
Performance Criteria:	1 ❸❹
Surge Immunity	
Test Level:	2kV (L-E) 1kV (L-L)
Performance Criteria:	1 ❸❹
Radiated Emissions	Class A
Conducted Emissions	Class A

Torque and Wire Size Specifications

		Torque		Wire Size	
CEP9 Sensing Module		30A/60A	100A	30A/60A	100A
Stranded/Solid [AWG]	Single	22 lb-in	35 lb-in	#14…6 AWG	#12…1 AWG
	Multiple	30 lb-in	30 lb-in	#10…6 AWG	#6…2 AWG
Flexible-Stranded w/Ferrule	Single	2.5 N-m	4 N-m	2.5…16mm²	4…35 mm²
	Multiple	3.4 N-m	4 N-m	6…10mm²	4…25 mm²
Course-Stranded/ Solid Metric	Single	2.5 N-m	4 N-m	2.5…25mm²	4…50 mm²
	Multiple	3.4 N-m	4 N-m	6…16mm²	4…35 mm²

CEP9 Control Module		Torque	Wire Size
Stranded/Solid [AWG]	Single	4 lb-in	#24…12 AWG
	Multiple	4 lb-in	#24…16 AWG
Flexible-Stranded w/Ferrule	Single	0.45 N-m	0.25…2.5 mm²
	Multiple	0.45 N-m	0.5…0.75 mm²
Course-Stranded/ Solid Metric	Single	0.45 N-m	0.2…2.5 mm²
	Multiple	0.45 N-m	0.2…1.5 mm²

Protection

	Trip	Warning
Overload	Yes	Yes
Phase Loss	Yes	No
Ground Fault	Yes	Yes
Stall	Yes	No
Jam	Yes	Yes
Underload	Yes	Yes
Thermistor (PTC)	Yes	Yes
Current Imbalance	Yes	Yes
Communication Fault	Yes	Yes
Communication Idle	Yes	Yes
Remote Trip	Yes	No
Blocked Start/Start Inhibit	Yes	No
Under Voltage L-L	Yes	Yes
Over Voltage L-L	Yes	Yes
Voltage Unbalance	Yes	Yes
Phase Rotation	Yes	Yes

Overload Protection

Type of Relay	Ambient Compensated Time-Delay Phase Loss Sensitive
Nature of Relay	Solid-State
FLA Setting	See user manual
Trip Rating	120% FLA
Trip Class	5…30
Reset Mode	Automatic or Manual
Overload Reset Level	1…100% TCU

Ground Fault Protection (External Ground Fault Module)

Type	Core Balanced
Intended Use	Equipment Protection
Classification (Per UL 1053)	Class I
Protection Range	20…100 mA 100…500 mA 200 mA…1.0 A 1.0…5.0 A
Trip & Warning Time Delay	0.1…25.0 s
Protection Inhibit Time	0…250 s

Accuracy

Metering

The CEP9 Electronic Overload Relay metering accuracy is listed below:

Current	±2% of Sensing Module Current

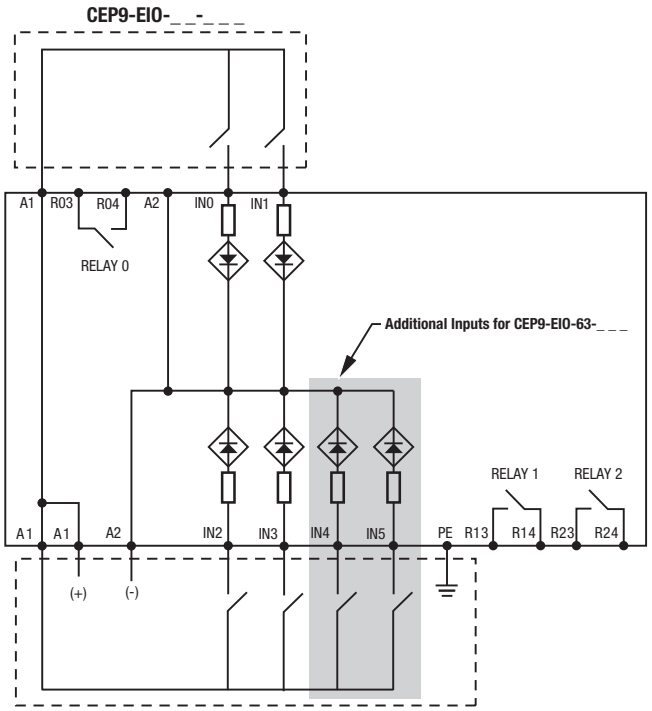
Range

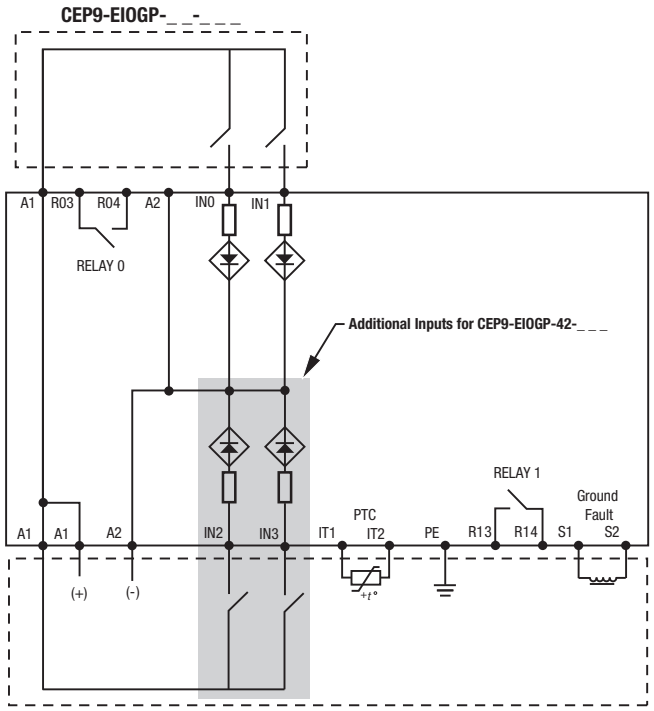
Protection Timers

All CEP9 Electronic Overload Relay trip timers have a resolution of ±0.1 s or 0.1 s/25 s (whichever is greater).

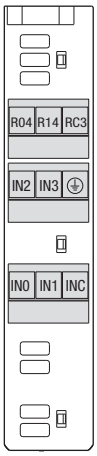
❶ The CEP9 Electronic Overload Relay expansion power supplies (CEP9-EXP-PS-AC and CEP9-EXP-PS-DC) surrounding air temperature must not exceed 55 °C (131 °F).
❷ Any CEP9 Overload Relay that uses an external ground fault sensor is limited to 50/60 Hz detection.
❸ Performance Criteria 1 requires the DUT to experience no degradation or loss of performance.
❹ Environment 2.

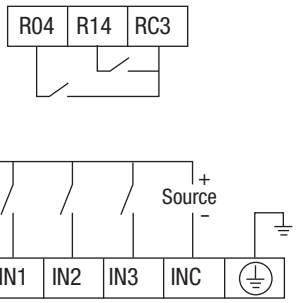
CEP9 Control Module



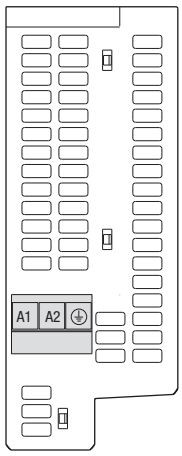


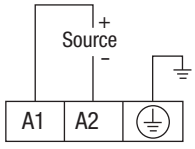
Expansion Digital I/O Modules (CEP9-EXP-DIO-_)





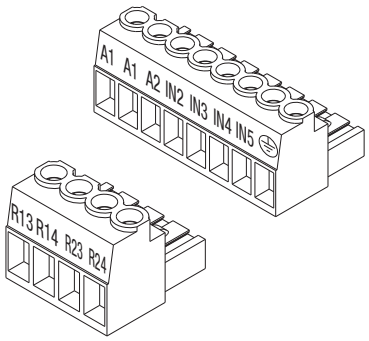
Expansion Power Supplies (CEP9-EXP-PS-_)



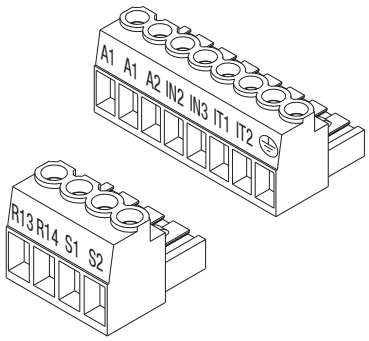


CEP9 Control Module Terminal Designations

CEP9-EIO-63- _ _ _



CEP9-EIOGP-42- _ _ _



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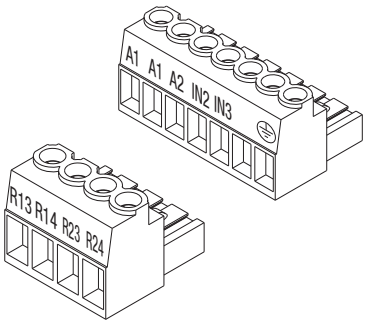

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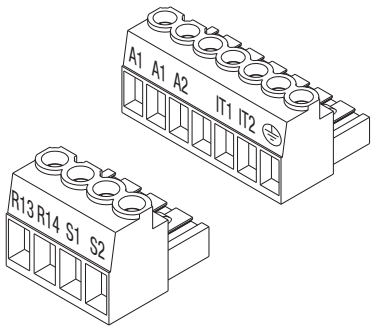
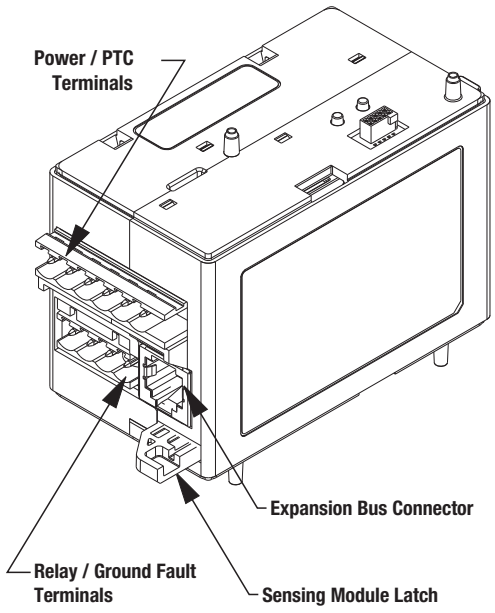
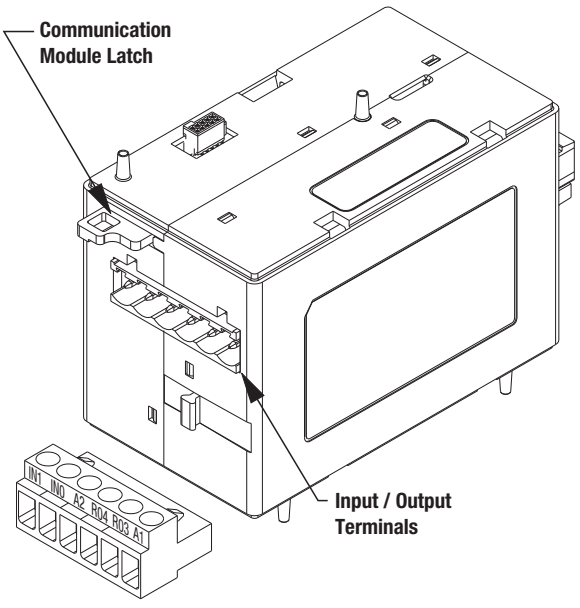
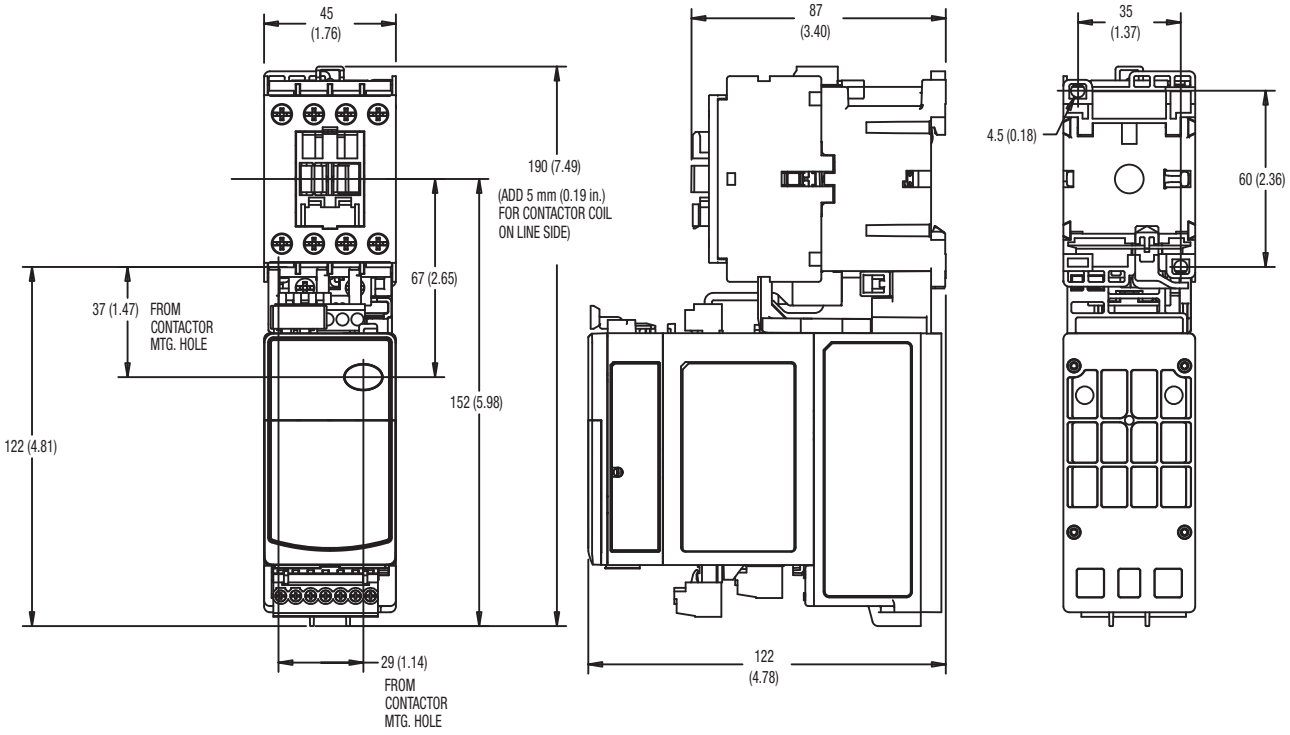




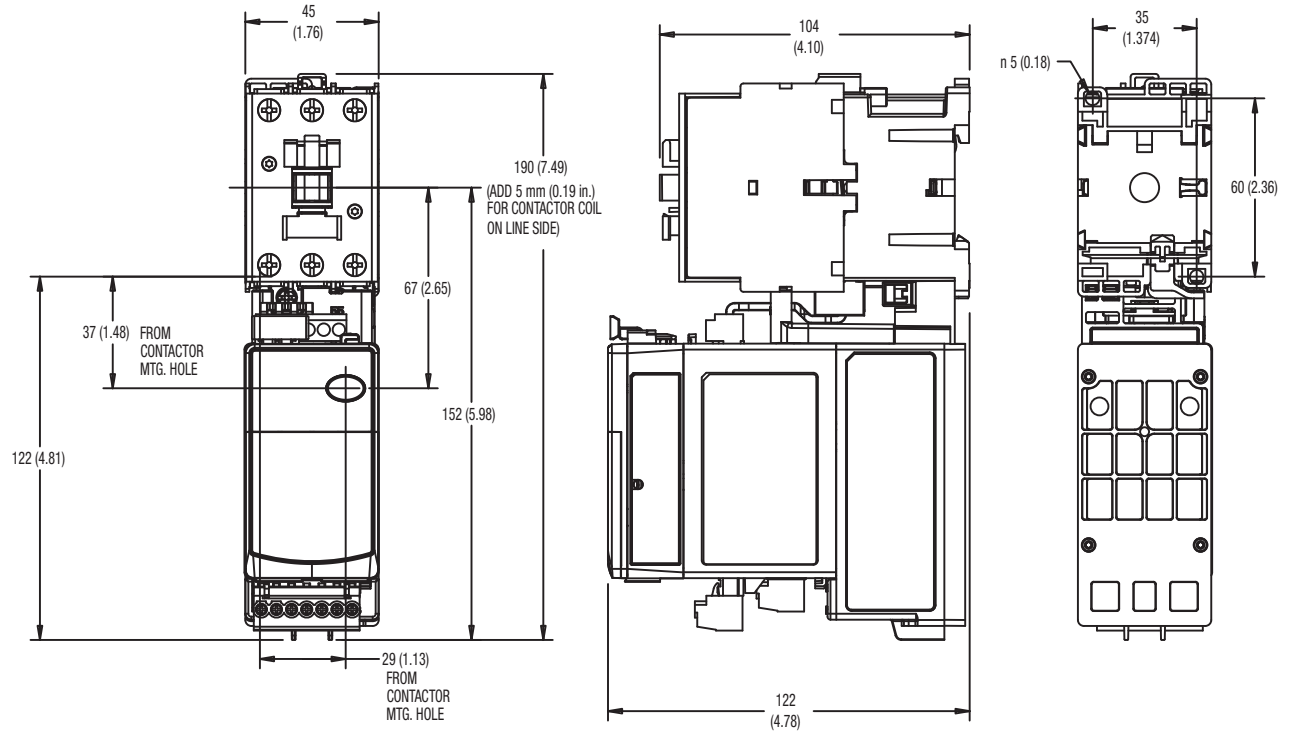


CEP9 Overload Relay Mounted on CA7-9…23 Contactor

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

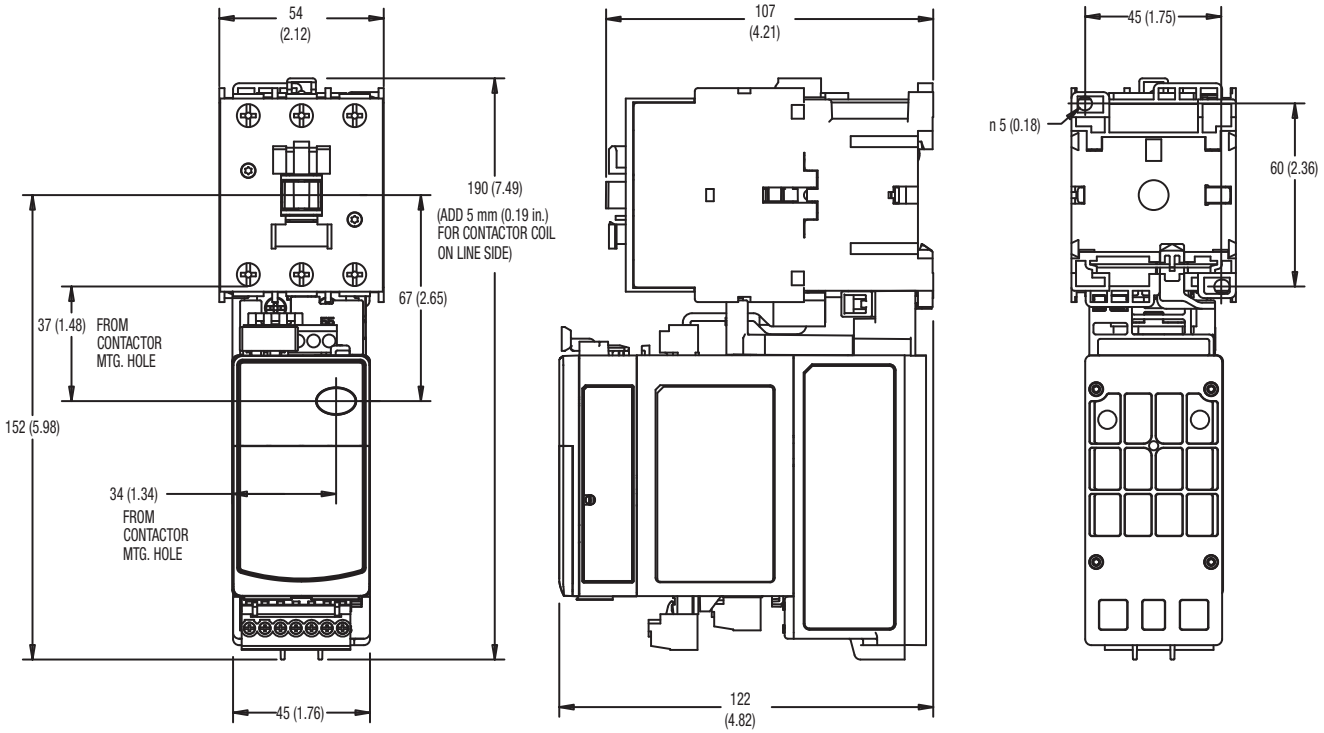


CEP9 Overload Relay Mounted on CA7-30…37 Contactor

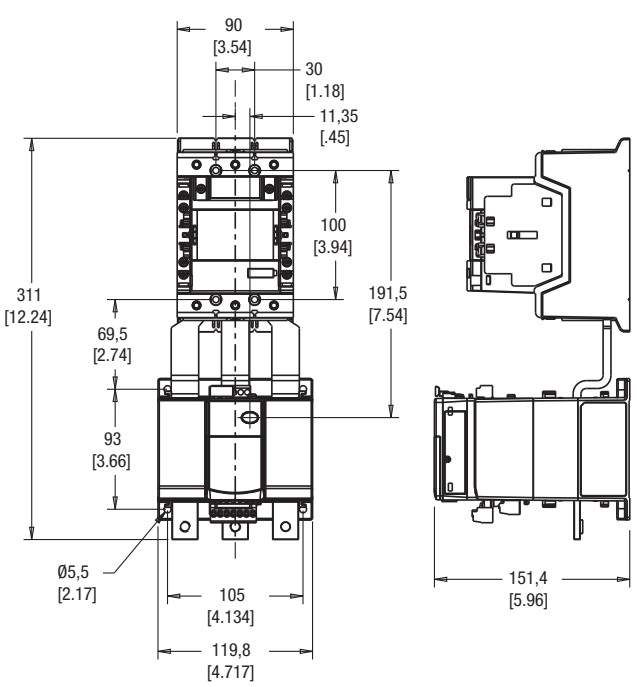


CEP9 Overload Relay Mounted on CA7-43…55 Contactor

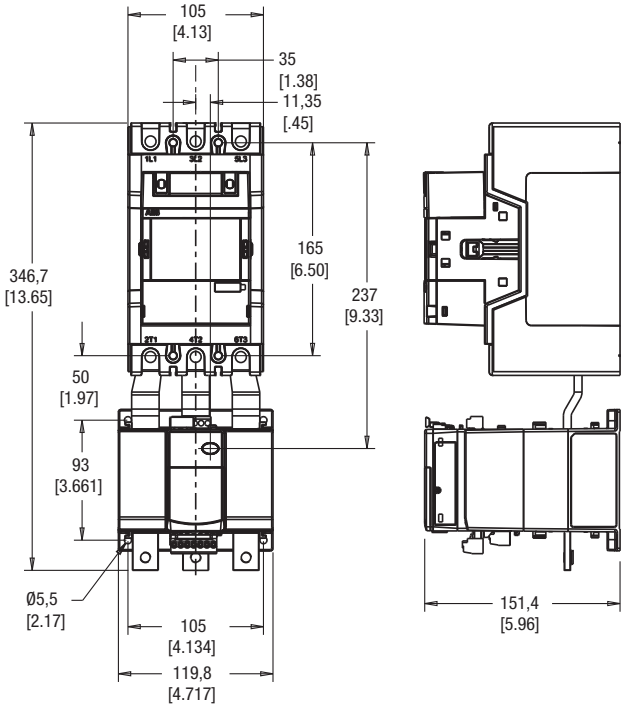
Dimensions are in millimeters (inches). Dimensions not intended for manufacturing purposes.



CEP9 Overload Relay Mounted on CA9-116...205 Contactor



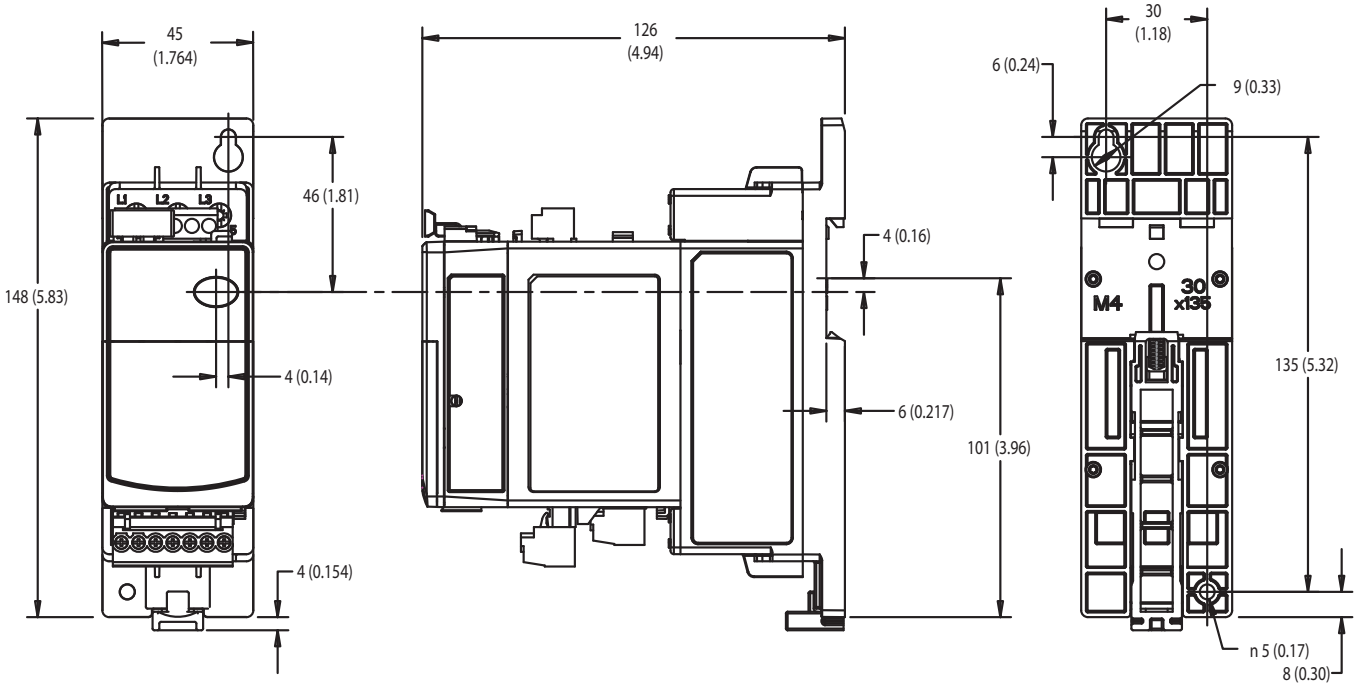
CA9-116 AND CA9-146 CONTACTORS SHOWN



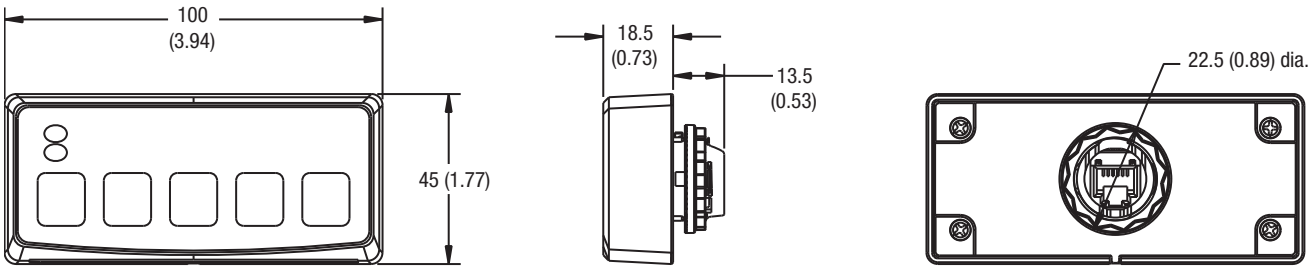
CA9-190 AND CA9-205 CONTACTORS SHOWN

CEP9 Overload Relay DIN Rail/Panel Mounted

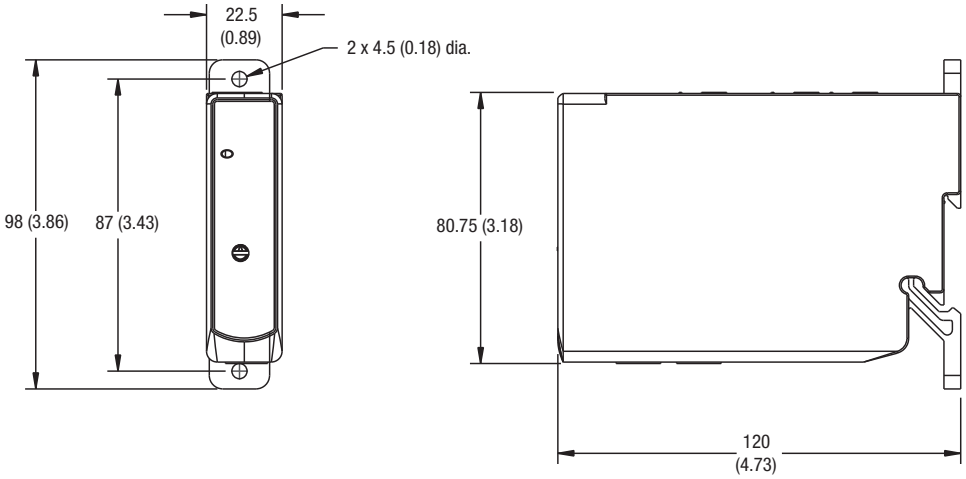
Dimensions are in millimeters (inches). Dimensions not intended for manufacturing purposes.



CEP9 Starter Control Station (CEP9-EOS-SCS)

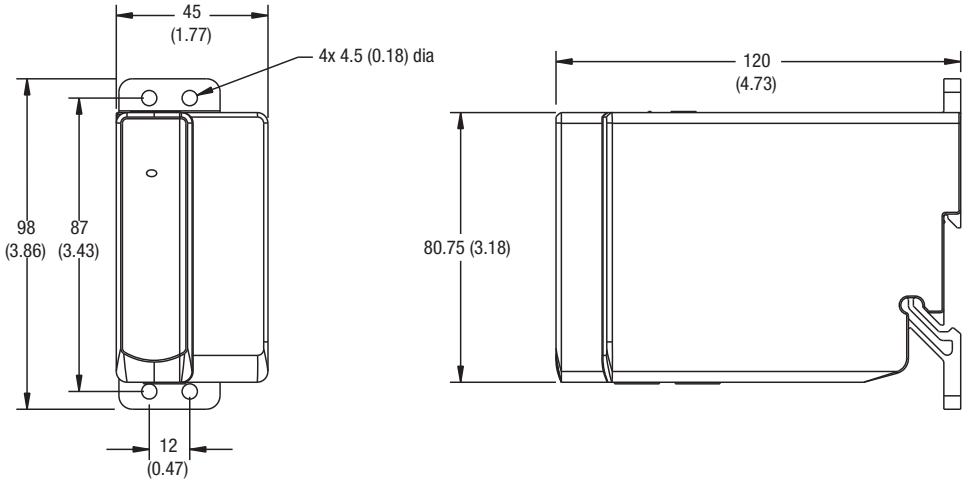


CEP9 Digital Expansion Module (CEP9-EXP-DIO-_)



CEP9 Digital Expansion Power Supply (CEP9-EXP-PS-_)

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



Notes