sprecher+schuh

CEP7 Solid-State Overload Relay

Quick Start Guide

(Cat. No. CEP7-…)

ATTENTION

This guide Does Not replace the User Manual, publication CEP7-UM002_-EN-P, and is intended for qualified service personnel responsible for setting up and servicing these devices. You must have previous experience with and a basic understanding of electrical terminology, configuration procedures, required equipment, and safety precautions. The user manual can be downloaded from http://literature.rockwellautomation.com.

Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of this control equipment must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes, and standards.

The illustrations, charts, sample programs and layout examples shown in this guide are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Rockwell Automation does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Rockwell Automation publication SGI-1.1, Safety Guidelines for the Application, Installation and Maintenance of Solid-State Control (available from your local Allen-Bradley distributor), describes some important differences between solid-state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.

General Precautions

In addition to the specific precautions listed throughout this manual, the following general statements must be observed.

IMPORTANT The purpose of this publication is to serve as a guide for proper installation. The National Electrical Code and any other governing regional or local code overrules the information in this publication.A hazard of personal injury/equipment damage exists if codes are ignored during installation. Rockwell Automation cannot assume responsibility for the compliance or proper installation of the CEP7 Overload Relay or associated equipment.

IMPORTANT Only personnel familiar with the CEP7 Overload Relay and associated machinery should plan to install, start up, and maintain the system. Failure to comply may result in personal injury/equipment damage.

IMPORTANT An incorrectly applied or installed CEP7 Overload Relay can result in damage to the components or reduction in product life. Wiring or application errors, such as incorrectly configuring the FLA Setting, supplying incorrect or inadequate DeviceNet supply voltage, connecting an external supply voltage to the input or thermistor terminals, or operating/storing in excessive ambient temperatures may result in malfunction of the CEP7 Overload Relay.

IMPORTANT The CEP7 Overload Relay contains ESD (electrostatic discharge) sensitive parts and assemblies. Static control precautions are required when installing, testing, servicing, or repairing this assembly. Component damage may result if ESD control procedures are not followed. If you are not familiar with static control procedures, refer to Sprecher + Schuh publication 8200-4.5.2, *Guarding Against Electrostatic Damage*, or any other applicable ESD protection handbook.

Introduction

Follow these steps to successfully commission the CEP7 Overload Relay:

Table 1: Commissioning Procedure

Step	Description
1	Hardware Installation
2	Wiring Installation – Typical Motor Connections – External Current Transformer Applications (CEP7-C_-CT-5000) – External Ground Fault Sensor Applications (CEP7-C3/C5)
3	DeviceNet Commissioning
4	Setup Requirements Setup for CEP7-C1/C2/C3/C5 Overload Relay – Protective Trip and Warning Summaries – Parameter Group Listing Setup for Cat. No. CEP7-C4 Current Monitor Relay – Trip and Warning Summaries – Parameter Group Listing

Hardware Installation

The following figures illustrate the starter assembly instructions.

Starter Assembly Instructions

Figure 1: CA7-9…CA7-43 Starter Assembly Instructions (for use with Cat. Nos. CEP7-C_23-_ _ and CEP7-C_43-_ _)

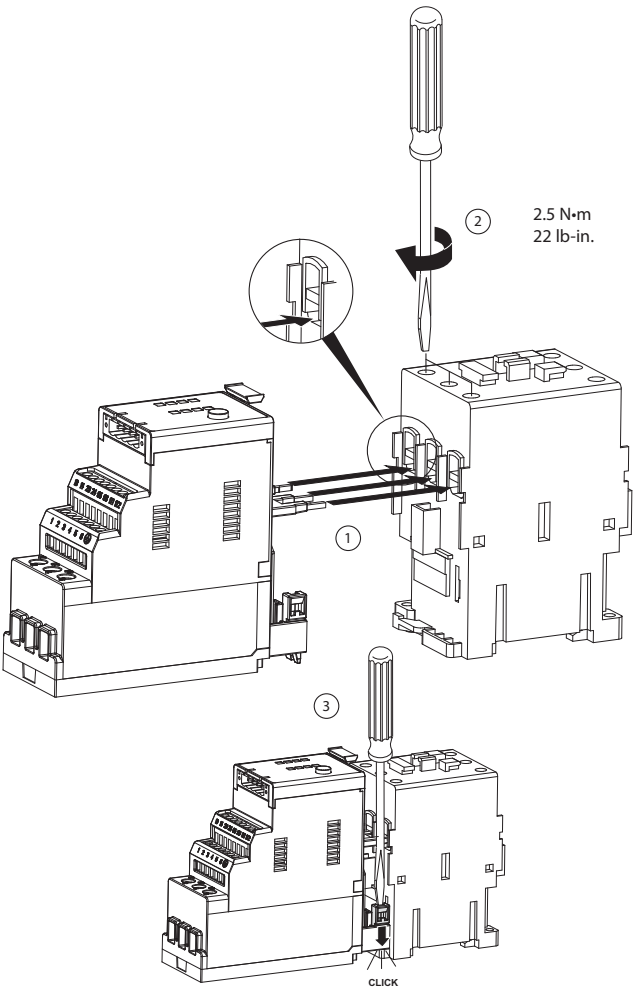


Figure 2: CA7-60…-85 Starter Assembly Instructions (for use with Cat. No. CEP7-C_-85_ _).

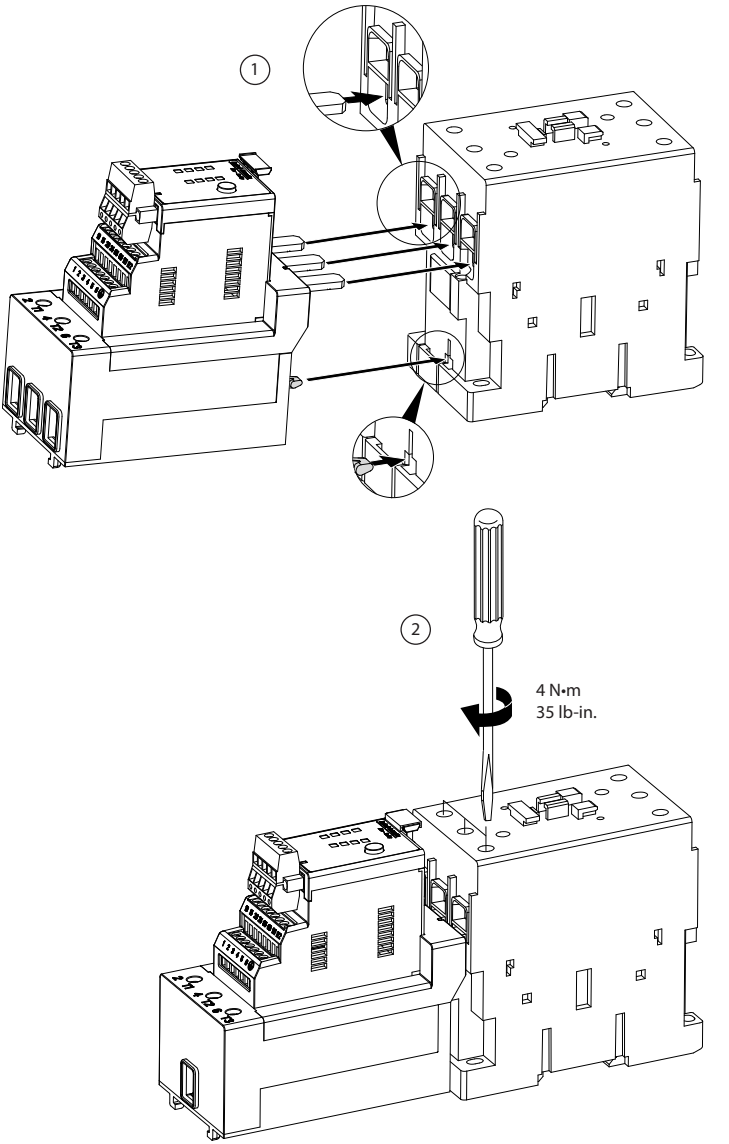
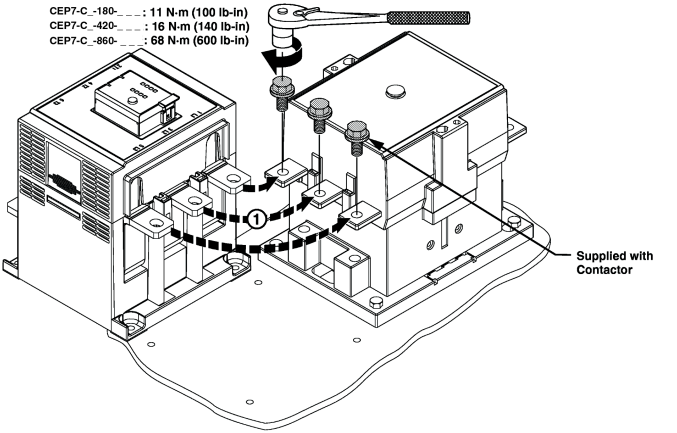


Figure 3: CA6-95...CA6-860 Starter Assembly Instructions (for use with Cat. Nos. CEP7-C_-180-_ _ _, CEP7-C_-420-_ _ _, and CEP7-C_-860-_ _ _).

1 ⚠ **ATTENTION:** Do not lift or handle product by cover alone.



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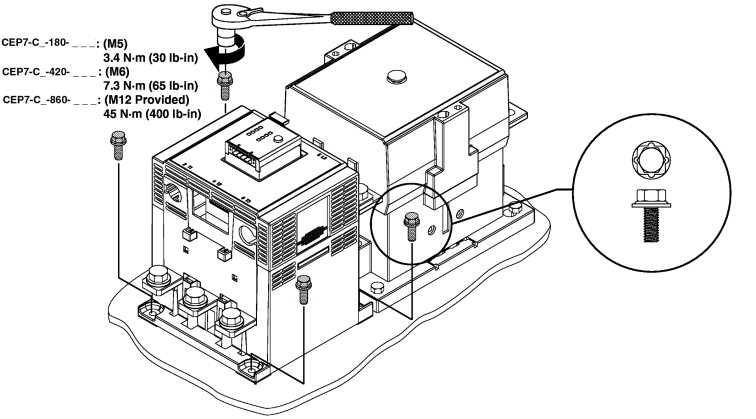


Wiring Installation

Typical Motor Connections

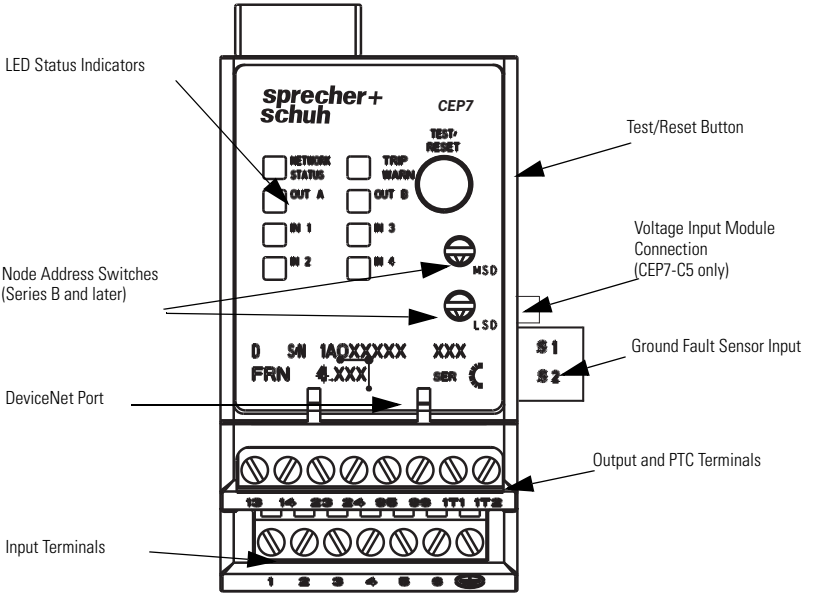
Refer to the product nameplate or user manual for power lug termination information including:

- Terminal wire size and torque specifications
- Maximum wire lengths
- Lug kit catalog numbers (108…1250 A)

For reliable input signal processing, input wiring should be routed in raceways separate from power cabling.

Terminal Designations

Figure 4: CEP7 Feature Overview



Control Terminals

The following table defines the CEP7 Overload Relay control terminal designations.

Table 2: Control Terminal Designation

Terminal Designation	Reference	Description
1	IN 1	General-purpose sinking input number 1
2	IN 2	General-purpose sinking input number 2
3	IN 3	General-purpose sinking input number 3 ❶❷
4	IN 4	General-purpose sinking input number 4 ❶❷
5	V+	+24V DC supply for inputs
6	V+	
7	IN 5	General-purpose sinking input number 5 ❷
8	IN 6	General-purpose sinking input number 6 ❷
⏚	End	Earth Ground ❸
13/14	OUT A	Output A
23/24	OUT B	Output B ❶❷
95/96	Trip Relay	Trip Relay
IT1/IT2	PTC	Thermistor (PTC) input ❶❹
S1/S2	—	External ground fault sensor input ❷❺

❶ Features are available only with the CEP7 Overload Relay (cat. nos. CEP7-C2and CEP7-C3).
❷ Available only on cat. nos. CEP7-C5_ _-_ _.
❸ An earth ground connection to this terminal will assist in obtaining compliance with electromagnetic compatibility requirements.
❹ The use of shielded cable is recommended for the positive PTC thermistor circuit to assist in obtaining compliance with electromagnetic compatibility requirements.
❺ Available only on cat. nos. CEP7-C3_ _-_ _ and CEP7-C4_ _-_ _.

DeviceNet Terminals

The following table defines the DeviceNet connector terminal designations.

Table 3: DeviceNet Terminal Designation

Terminal	Signal	Function	Color
1	V-	Common	Black
2	CAN_L	Signal Low	Blue
3	Drain	Shield	Non-insulated
4	CAN_H	Signal High	White
5	V+	Power Supply	Red

Grounding

The following grounding recommendations are provided to ensure electromagnetic compatibility compliance during installation:

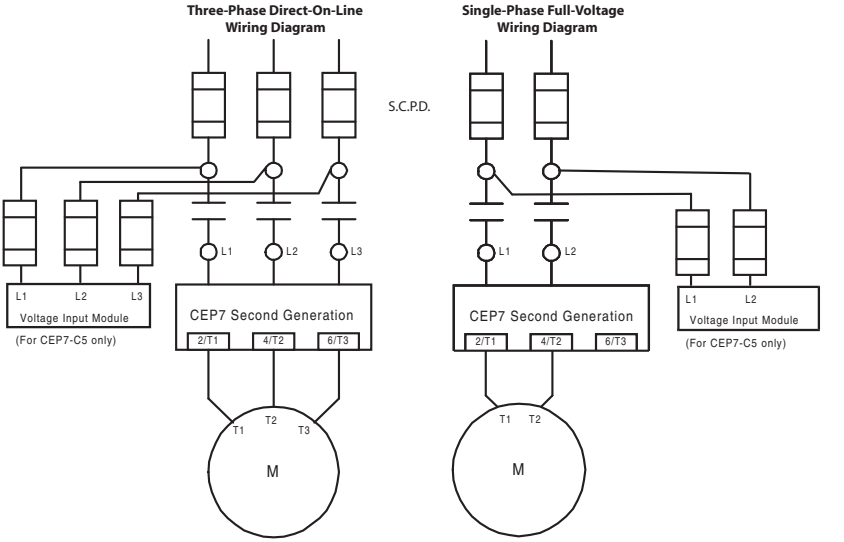
- The earth ground terminal of the CEP7 Overload Relay shall be connected to a solid earth ground via a low-impedance connection
- Installations employing an external ground fault sensor shall ground the cable shield at the sensor with no connection made at the CEP7 Overload Relay
- The PTC thermistor cable shield shall be grounded at the CEP7 Overload Relay with no connection made at the opposite end

Wiring Diagrams

ATTENTION

When working on energized circuits, do not rely on the voltage and current information provided by the CEP7 Overload Relay for personal safety. Always use a portable voltage or current measurement device and measure the signal locally.

Figure 5: Three-Phase D.O.L & Single-Phase Wiring Diagrams



IMPORTANT Parameter 27, *Single/Three Ph*, should be set to single-phase for single-phase devices and three-phase for three-phase devices.

IMPORTANT In single-phase devices, traditional single-phase wiring (connecting T2 to L3) will result in a vector imbalance of current flowing through the CEP7 Overload Relay. This will result in inaccurate ground fault reporting and protection.

External Current Transformer Application (Cat. No. CEP7-C_ -CT-5000)

CEP7 Overload Relays (Cat. No. CEP7-C_-CT-5000) are designed for use with separately mounted, customer-supplied current transformers (CTs) as required in higher-current applications. The FLA setting range is 9…5000 A for these units, with a legal setting range per the user's manual. Parameter 78, *CT Ratio*, is provided for setting the current transformer ratio to be installed.

Current Transformer Specifications

The CEP7-C_-CT-5000 Overload Relays are intended for use with a CT having a secondary current rating of 5 A. The installer shall provide one CT for each motor phase and shall connect the CT secondary leads to the appropriate CEP7 Overload Relay power terminals as shown in Figure 7: on page 13. The CT shall have an appropriate ratio rating as detailed in the user's manual. Additionally, the CT shall be selected to be capable of providing the required VA to the secondary load, which includes the CEP7 Overload Relay burden of 0.1 VA at the rated secondary current and the wiring burden.

Finally, the CT shall be rated for *protective relaying* to accommodate the high inrush currents associated with motor startup and shall have an accuracy of ≤±2% over its normal operating range.

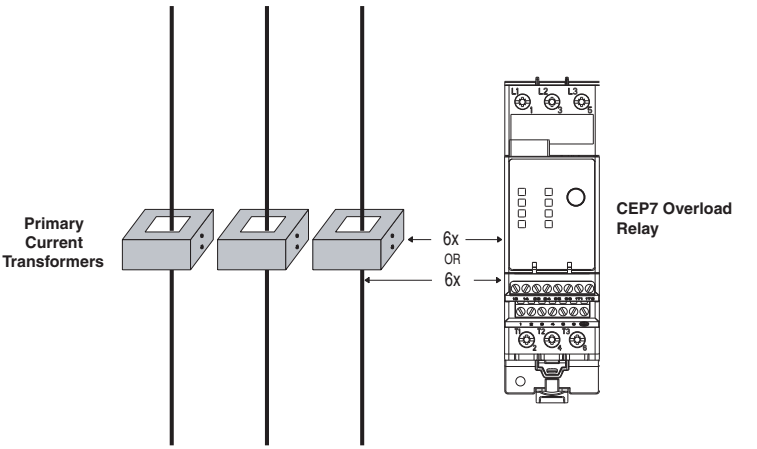
ANSI (USA)	Class C5 B0.1
CSA (Canada)	Class 10L5
IEC (Europe)	5 VA Class 5P10

IMPORTANT The improper selection of a current transformer can result in the CEP7 Overload Relay reporting inaccurate motor operational data and possible motor damage. The selected current transformer must be rated for protective relaying applications.

Installation Instructions

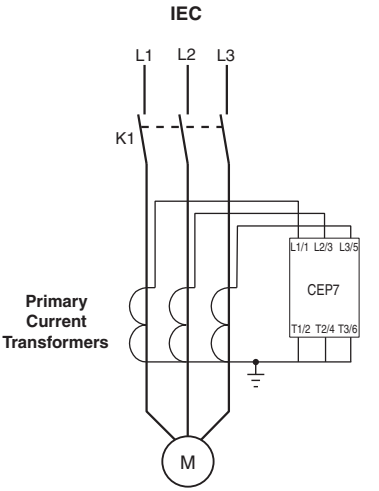
Cat. No. CEP7-C_-CT-5000 Overload Relays are designed to be installed in cat. no. CEP7-ECPM2 panel mount adapters and connected to separately mounted current transformers. For a panel mount adapter assembly, refer to the instructions included with the panel mount adapter. The CEP7 Overload Relay must be mounted a distance equal to, or greater than, six times the cable diameter (including insulation) from the nearest current-carrying conductor or current transformer. For applications employing multiple conductors per phase, the diameter of each cable should be added and multiplied by six to determine the proper placement distance for the CEP7 Overload Relay.

Figure 6: Cat. No. CEP7-C_ -CT-5000 Overload Relay Mounting Placement



IMPORTANT Placement of the CEP7 Overload Relay closer than the recommended distance of six times the cable diameter may compromise its current reporting and protection capabilities.

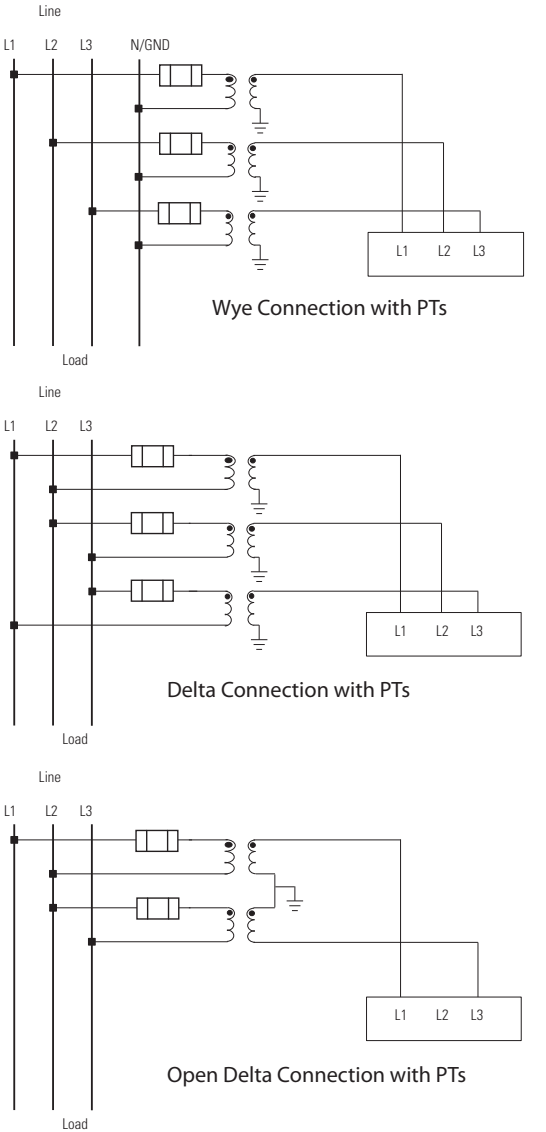
Figure 7: External CT Connection Diagrams



External Potential (Voltage) Transformer Application (Cat. No. CEP7-C5_ _-_ _)

The CEP7 Overload Relay Catalog Number CEP7-C5_ _-_ _ can be used with external step-down potential transformers (PTs). The PT ratio is programmed into the CEP7 by entering the primary winding rating into Parameter 289, *PT Pri*, and the secondary winding rating into Parameter 290, *PT Sec*. The voltage mode is also programmed into the CEP7 by selecting the appropriate mode in Parameter 156, *Volt Mode*. The CEP7 will support Wye, Delta, and Open Delta voltage modes with potential transformers.

Figure 8: External PT Connection Diagrams



External Ground Fault Sensor Application (Cat. Nos. CEP7-C3_ _-_ _, CEP7-C4_ _-_ _, and CEP7-C5_ _-_ _)

Cat. Nos. CEP7-C3_ _-_ _, CEP7-C4_ _-_ _, and CEP7-C5_ _-_ _ CEP7 Overload Relays are intended to provide ground fault protection when used with the cat. no. CEP7-CBCT_ external ground fault (core balance) sensor. The ground fault sensor mounts separately from the CEP7 Overload Relay and must be placed within three meters of the relay. The customer-supplied cable for wiring the ground fault sensor to the CEP7 Overload Relay should meet the specifications outlined in Table 1.9 on page 15.

Table 1.9 Ground Fault Sensor Terminals (S1 and S2)

Wire type	Shielded, twisted pair
Cross section	0.2…4.0 mm^2 (#24…12 AWG)
Torque	0.55 N•m (5 lb-in.)

Power Cable Installation Instructions

1. All power cables (including the neutral when used) must pass through the sensor window. The equipment ground conductor (the conductor used to carry the non-current-carrying metal parts of equipment, as defined by Article 100 of the NEC), must **not** pass through the sensor window.

2. The power cables through the sensor window should be straight, tightly bundled, centered in the window, and perpendicular to the sensor for a length equal to, or greater than, six times the cable diameter (including insulation) from the sensor.

3. All other conductors with available currents in excess of 1,000 A should be placed a distance equal to, or greater than, six times the cable diameter (including insulation) from the sensor.

4. The power cables of the branch circuit to be protected by the CEP7 Overload Relay must not be grounded on the load side of the ground fault sensor.

5. If the power cables are enclosed in a conducting jacket, the jacket must be grounded on the line side of the sensor. The jacket must not pass through the sensor window, but must be cut at the window and joined with a conductor that passes outside the sensor window.

6. The power system may be solidly grounded or grounded through an impedance at its source as long as the impedance allows a magnitude of fault current to flow that is within the 1…5 A operational range of the CEP7 Overload Relay (CEP7-C2_ _-_ _) or the 20 mA…5 A operational range of the CEP7 Overload Relay (CEP7-C3_ _-_ _, CEP7-C4_ _-_ _, and CEP7-C5_ _-_ _).

Figure 10: Ground Fault Sensor Mounting Placement

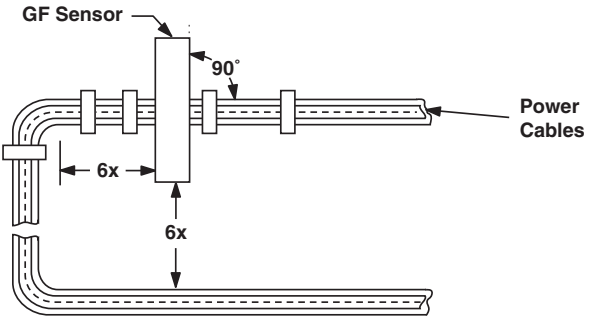
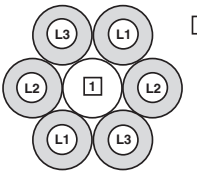
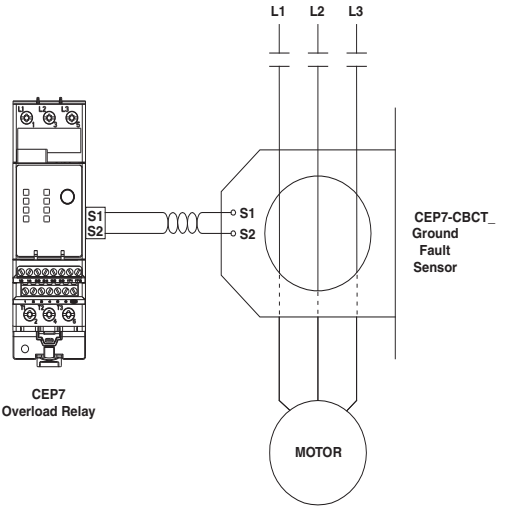


Figure 11: Power Cable Configuration — Two Cables per Phase



1 The spacer is a short (approximately 10 times the cable diameter in length) piece of cable with no connections to any terminal.

Figure 12: Ground Fault Sensor Wiring to the CEP7 Overload Relay



IMPORTANT The shield of the twisted pair cable must be connected to earth ground at the sensor, with no connection made at the CEP7 Overload Relay.

DeviceNet Node Commissioning

Overview

CEP7 Overload Relays are shipped with a default software node address (MAC ID) setting of 63 and the data rate set to Autobaud. Each device on a DeviceNet network must have a unique node address which can be set to a value from 0…63.

Keep in mind, most DeviceNet systems use address 0 for the master device (scanner) and node address 63 should be left vacant for introduction of new slave devices. The node address and data rate for series B or later, CEP7 Overload Relays can be changed using software or by setting the hardware switches that reside on the front of each unit. While both methods yield the same result, it is good practice to choose one method and deploy it throughout the system.

IMPORTANT

The following recommendations are intended to ensure a trouble-free startup and operation:

1. Use the node commissioning tool in RSNetWorx or the DeviceNet configuration terminal (cat. no. CEP7-DNCT) when modifying the E3 node address. Do not use the *General* tab found in the product window in RSNetWorx. The node commissioning tool ensures the device goes through a hard reset and requires the user to upload the most current parameter information from the device prior to making configuration changes.

2. Ensure you have the most current configuration information prior to saving an RSNetWorx configuration file.

3. If you intend to employ the ADR function of the DeviceNet scanner, ensure the device configuration is as you intend it BEFORE saving it to memory.

4. Be aware the *Restore Device Defaults* button in RSNetWorx will reset the CEP7 Overload Relay node address setting to 63. For Series B or later devices, the hardware node address switches take precedence over the software node address setting.

Figure 13: Node Address Switches

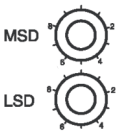


Table 2: Node Address Setting

Switch Settings	Description
0…63	The node address setting is determined by the switch values when set in this range.
64…99	For switch settings in this range, the node address setting is determined by the software setting using the RSNetWorx for DeviceNet configuration tool.
99	Factory default setting.

Note: For node address switch values in the range of 0…63, cycle power to the CEP7 Overload Relay to initialize the new setting.

Setup Requirements

Setup for Cat. Nos. CEP7-C1/C2/C3/C5 Overload Relays

After the CEP7 Overload Relay is installed according to the guidelines specified in this manual, apply power to the overload relay's DeviceNet connector. After applying power, the following sequence should occur:

1. The Trip relay should close 2.35 seconds later and the TRIP/WARN LED will not flash (unless a Non-Volatile Fault previously existed or a fault condition is present).

2. At the same time, the NETWORK STATUS LED should flash green for approximately two seconds, then red for a 1/4 second. If autobaud is enabled and the CEP7 Overload Relay is connected to an active network, the green LED will continue to flash once the baud rate has been determined. If the CEP7 Overload Relay is not connected to an active network, the LED will not continue to flash.

3. Once the CEP7 Overload Relay has been allocated by a master, the NETWORK STATUS LED will turn solid green.

After being powered up, use the DeviceNet Configuration Terminal (Cat. No. CEP7-DNCT) in order to set up the parameters. There are five basic parameters that need to be established before using the protective functions. These parameters are listed under the OVERLOAD SETUP menu and include: Single/Three Phase, Full Load Current (FLA) Setting, Trip Class, Overload/PTC Reset mode, and Overload Reset Level. (Note: You will need to program additional parameters when customer-supplied CTs are used.)

Once these parameters are set, the CEP7 Overload Relay is functional. Use the ADVANCED SETUP menu to set other parameters per the specific application requirements.

Protective Trip/Warning Summaries & Parameter Group Listing (Cat. Nos. CEP7-C1/C2/C3/C5)

Table 3: Trip Summary

Trip Function	Trip Enable Factory Default	Trip Level Settings		Trip Delay Settings		Inhibit Time Settings ❶	
		Range	Default	Range	Default	Range	Default
Overload	Enabled	❷	❷	Trip Class 5…30	Trip Class 10	—	—
Phase Loss	Enabled	❸	❸	0.1…25.0 s	1.0 s	0…250 s	0 s
Ground Fault (CEP7-C2)	Disabled	Internal 1…5 A	2.5 A	0.0…25.0 s	0.5 s	0…250 s	10 s
Ground Fault (CEP7-C3)	Disabled	External 0.02…5 A ❹	2.5 A	0.0…25.0 s	0.5 s	0…250 s	10 s
Stall	Disabled	100…600% ❺	600% ❺	0…250 s ❺	10 s❺	—	—
Jam	Disabled	50…600%	250%	0.1…25.0 s	5.0 s	0…250 s	10 s
Underload	Disabled	10…100% FLA ❻	50%	0.1…25.0 s	5.0 s	0…250 s	10 s
PTC	Disabled	—	—	—	—	—	—
Current Imbalance	Disabled	10…100%	35%	0.1…25.0 s	5.0 s	0…250 s	10 s
Comm Fault	Enabled	—	—	—	—	—	—
Comm Idle	Disabled	—	—	—	—	—	—
Remote Trip	Disabled	—	—	—	—	—	—
Voltage Input Module Hardware Fault ❼	Disabled	—	—	—	—	—	—
Undervoltage L-L ❼	Disabled	0...65535	100	0.1…25.0 s	1.0 s	0…250 s	10 s
Overvoltage L-L ❼	Disabled	0...65535	500	0.1…25.0 s	1.0 s	0…250 s	10 s
Voltage Unbalance ❼	Disabled	0…100	75	0.1…25.0 s	1.0 s	0…250 s	10 s
Phase Rotation ❼	Disabled	1…2	1	—	—	0…250 s	10 s
Under Frequency ❼	Disabled	0…250	57	0.1…25.0 s	1.0 s	0…250 s	10 s
Over Frequency ❼	Disabled	0…250	63	0.1…25.0 s	1.0 s	0…250 s	10 s
Under Real Power ❼	Disabled	0…32767		0.1…25.0 s	1.0 s	0…250 s	10 s
Over Real Power ❼	Disabled	0…32767		0.1…25.0 s	1.0 s	0…250 s	10 s

Table 3: Trip Summary

Trip Function	Trip Enable Factory Default	Trip Level Settings		Trip Delay Settings		Inhibit Time Settings ❶	
		Range	Default	Range	Default	Range	Default
Under Consumed kVAR ❼	Disabled	0…32767		0.1…25.0 s	1.0 s	0…250 s	10 s
Over Consumed kVAR ❼	Disabled	0…32767		0.1…25.0 s	1.0 s	0…250 s	10 s
Under Generated kVAR ❼	Disabled	-32767…0		0.1…25.0 s	1.0 s	0…250 s	10 s
Over Generated kVAR ❼	Disabled	-32767…0		0.1…25.0 s	1.0 s	0…250 s	10 s
Under Power kVA ❼	Disabled	0…32767		0.1…25.0 s	1.0 s	0…250 s	10 s
Over Power kVA ❼	Disabled	0…32767		0.1…25.0 s	1.0 s	0…250 s	10 s
Under Power Factor Lagging ❼	Disabled	-100…0	-90	0.1…25.0 s	1.0 s	0…250 s	10 s
Over Power Factor Lagging ❼	Disabled	-100…0	-95	0.1…25.0 s	1.0 s	0…250 s	10 s
Under Power Factor Leading ❼	Disabled	0...100	90	0.1…25.0 s	1.0 s	0…250 s	10 s
Over Power Factor Leading ❼	Disabled	0...100	95	0.1…25.0 s	1.0 s	0…250 s	10 s

❶ The inhibit time setting parameters are applicable to both the trip and warning functions.
❷ FLA Setting range and default values are dependent upon the current rating of the product. See the user manual for more information.
❸ Phase loss trip level is factory-set at a current imbalance greater than or equal to 100% and is not user-adjustable.
❹ Must use Ground Fault Sensors (Cat. No. CEP7-CBCT_).
❺ Stall protection is only applicable during the motor starting sequence. If any phase of current falls below the programmed Stall Trip Level, stall protection is disabled.
❻ 50…100% for devices with FRN 1.003 and earlier.
❼ Available on CEP7-C5 only.

Table 4: Warning Summary

Warning Function	Warning Enable Factory Default	Warning Level Settings		Inhibit Time Settings ❶	
		Range	Default	Range	Default
Overload	Disabled	0…100%❷	85%	—	—
Phase Loss	—	—	—	—	—
Ground Fault (CEP7-C2)	Disabled	Internal 1…5 A	2.0 A	0…250 s	10 s
Ground Fault (CEP7-C3)	Disabled	External 0.02…5 A ❸	2.0 A	0…250 s	10 s
Stall	—	—	—	—	—
Jam	Disabled	50…600%	150%	0…250 s	10 s
Underload	Disabled	10…100%❹	70%	0…250 s	10 s
Thermistor (PTC)	Disabled	—	—	—	—
Current Imbalance	Disabled	10…100%	20%	0…250 s	10 s
Comm Fault	Disabled	—	—	—	—
Comm Idle	Disabled	—	—	—	—
Voltage Input Module Hardware Fault ❺	Enabled	—	—	—	—
Under Voltage L-L ❺	Disabled	0...65535	400	0…250 s	10 s
Over Voltage L-L ❺	Disabled	0...65535	490	0…250 s	10 s
Voltage Unbalance ❺	Disabled	0…100	85	0…250 s	10 s
Phase Rotation ❺	Disabled	1…2	1	0…250 s	10 s
Under Frequency ❺	Disabled	0…250	58	0…250 s	10 s
Over Frequency ❺	Disabled	0…250	62	0…250 s	10 s
Under Real Power ❺	Disabled	0…32767		0…250 s	10 s
Over Real Power ❺	Disabled	0…32767		0…250 s	10 s
Under Consumed kVAR ❺	Disabled	0…32767		0…250 s	10 s
Over Consumed kVAR ❺	Disabled	0…32767		0…250 s	10 s
Under Generated kVAR ❺	Disabled	-32767…0		0…250 s	10 s
Over Generated kVAR ❺	Disabled	-32767…0		0…250 s	10 s
Under Power kVA ❺	Disabled	0…32767		0…250 s	10 s
Over Power kVA ❺	Disabled	0…32767		0…250 s	10 s
Under Power Factor Lagging ❺	Disabled	-100…0	-95	0…250 s	10 s
Over Power Factor Lagging ❺	Disabled	-100…0	-90	0…250 s	10 s
Under Power Factor Leading ❺	Disabled	0...100	95	0…250 s	10 s
Over Power Factor Leading ❺	Disabled	0...100	90	0…250 s	10 s

❶ The inhibit time setting parameters are applicable to both the trip and warning functions.
❷ Overload warning setting is entered as a percentage of the thermal capacity utilized.
❸ Must use Ground Fault Sensors (Cat. No. CEP7-CBCT_).
❹ 50…100% for devices with FRN 1.003 and earlier.
❺ Available on CEP7-C5 only.

Table 5: Parameter Group Listing

Monitor Params	Overload Setup	Reset/Lock	Advanced Setup	DeviceNet Setup	Output Setup	DeviceLogix
1 L1 Current	**27** Single/ Three Ph	**26** Trip Reset	**24** Trip Enable	**55** AutoBaudEnable	**65** OutA Pr FltState	**79** Comm Override
2 L2 Current	**28** FLA Setting	**53** Program Lock	**25** Warning Enable	**56** NonVol Baud Rate	**66** OutA Pr FltValue	**80** Network Override
3 L3 Current	**29** Trip Class	**54** Set to Defaults	**27** Single/Three Ph	**58** COS Mask	**67** OutA DN FltState	**81** Net outputs
4 Average Current	**30** OL/PTC ResetMode	**103** Test Enable*	**28** FLA Setting	**59** Output Assembly	**68** OutA DN FltValue	**82** Net Out COS Mask
5 L1 % FLA	**31** OL Reset Level	**104** Clear Queue*	**29** Trip Class	**60** Input Assembly	**69** OutA DN IdlState	
6 L2 % FLA	**78** CT Ratio		**30** OL/PTC ResetMode	**61** Assy Word0 Param	**70** OutA DN IdlValue	
7 L3 % FLA			**31** OL Reset Level	**62** Assy Word1 Param	**71** OutB Pr FltState	
8 Average % FLA			**32** OL Warning Level	**63** Assy Word2 Param	**72** OutB Pr FltValue	
9 % Therm Utilized			**33** PL Inhibit Time	**64** Assy Word3 Param	**73** OutB DN FltState	
10 GF Current			**34** PL Trip Delay		**74** OutB DN FltValue	
11 Current Imbal			**35** GF Inhibit Time		**75** OutB DN IdlState	
12 OL Time To Trip			**36** GF Trip Delay		**76** OutB DN IdlValue	
13 OL Time To Reset			**37** GF Trip Level			
14 Trip Status			**38** GF Warn Level			
15 Warning Status			**39** Stall Enbld Time			
16 Trip Log 0			**40** Stall Trip Level			
17 Trip Log 1			**41** Jam Inhibit Time			
18 Trip Log 2			**42** Jam Trip Delay			
19 Trip Log 3			**43** Jam Trip Level			
20 Trip Log 4			**44** Jam Warn Level			
21 Device Status			**45** UL Inhibit Time			
22 Firmware			**46** UL Trip Delay			
23 Dev Config			**47** UL Trip Level			
90 Warn Log 0❶			**48** UL Warn Level			
91 Warn Log 1❶			**49** CI Inhibit Time			
92 Warn Log 2❶			**50** CI Trip Delay			
93 Warn Log 3❶			**51** CI Trip Level			
94 Warn Log 4❶			**52** CI Warn Level			
95 Elapsed Time❶			**78** CT Ratio			
96 Starts Counter❶			**83** IN 1 Assignment			
97 Starts Available❶			**84** IN 2 Assignment			
98 Time To Start❶			**85** IN 3 Assignment			
			86 IN 4 Assignment			
			87 2-Spd Net Enable			
			88 2-Speed FLA Set			
			89 GF Trip Inhibit			
			99 Starts/Hour❶			
			100 Starts Interval❶			
			101 PM - # Starts❶			
			102 PM - Oper. Hours❶			
			105 GF Warn Delay❶			
			106 GF Sensing Range❶			

❶ Series C (FRN 4.00 and higher)

Table 6: Parameter Group Listing, Continued

Device Logix	TripWarn History ❷	Trip Snapshot ❷	Voltage Monitor ❸	Voltage Setup ❸	Power Monitor ❸	Power Setup ❸
79 Comm Override	**132** Trip History 0	**144** SS L1 Current	**160** V Trip Status	**156** Volt Mode	**173** L1 Real Power	**157** Power Scale
80 Network Override	**133** Trip History 1	**145** SS L2 Current	**161** V Warn Status	**158** V Trip Enable	**174** L2 Real Power	**225** PW Trip Enable
81 Net outputs	**134** Trip History 2	**146** SS L3 Current	**162** L1-L2 Voltage	**159** V Warn Enable	**175** L3 Real Power	**226** PW Warn Enable
82 Net Out COS Mask	**135** Trip History 3	**147** SS %TCU	**163** L2-L3 Voltage	**215** UV Inhibit Time	**176** Total Real Power	**241** UW Inhibit Time
	136 Trip History 4	**148** SS GF Current	**164** L3-L1 Voltage	**216** UV Trip Delay	**177** L1 Reactive Power	**242** UW Trip Delay
	137 Warn History 0	**149** SS L1-L2 Voltage	**165** Ave Voltage L-L	**217** UV Trip Level	**178** L2 Reactive Power	**243** UW Trip Level
	138 Warn History 1	**150** SS L2-L3 Voltage	**166** L1-N Voltage	**218** UV Warn Level	**179** L3 Reactive Power	**244** UW Warn Level
	139 Warn History 2	**151** SS L3-L1 Voltage	**167** L2-N Voltage	**219** OV Inhibit Time	**180** Tot Reactive Power	**245** OW Inhibit Time
	140 Warn History 3	**152** SS Tot Real Pwr	**168** L3-N Voltage	**220** OV Trip Delay	**181** L1 Apparent Power	**246** OW Trip Delay
	141 Warn History 4	**153** SS Tot kVAR	**169** Ave Voltage L-N	**221** OV Triip Level	**182** L2 Apparent Power	**247** OW Trip Level
	142 TripHistory Mask	**154** SS Tot kVA	**170** Volt Unbalance	**222** OV Warn Level	**183** L3 Apparent Power	**248** OW Warn Level
	143 WarnHistory Mask	**155** SS Total PF	**171** Volt Frequency	**223** Ph Rot Inhib Time	**184** Tot Apparent Power	**249** UVARC Inhibit Time
	299 V TripHist Mask		**172** V Phase Rot	**224** Ph Rot Trip	**185** L1 PF	**250** UVARC Trip Delay
	300 V WarnHist Mask			**229** V UnhalInhib Time	**186** L2 PF	**251** UVARC Trip Level
	301 PW TripHist Mask			**230** V UnbalTripDelay	**187** L3 PF	**252** UVARC Warn Level
	302 PW WarnHist Mask			**231** V UnbalTrip Level	**188** Total PF	**253** OVARC Inhibit Time
				232 V UnbalWarnLevel	**189** kWh 10E6	**254** OVARC Trip Delay
				233 UF Inhibit Time	**190** kWh 10E3	**255** OVARC Trip Level
				234 UF Trip Delay	**191** kWh 10E0	**256** OVARC Warn Level
				235 UF Trip Level	**192** kWh 10E-3	**257** UVARG Inhibit Time
				236 UF Warn Level	**193** kVARh Con 10E6	**258** UVARG Trip Delay
				237 OF Inhibit Time	**194** kVARh Con 10E3	**259** UVARG Trip Level
				238 OF Trip Delay	**195** kVARh Con 10E0	**260** UVARG Warn Level
				239 OF Trip Level	**196** kVARh Con 10E-3	**261** OVARG Inhibit Time
				240 OF Warn Level	**197** kVARh Gen 10E6	**262** OVARG Trip Delay
				289 PT Pri	**198** kVARh Gen 10E3	**263** OVARG Trip Level
				290 PT Sec	**199** kVARh Gen 10E0	**264** OVARG Warn Level
					200 kVARh Gen 10E-3	**265** UVA Inhibit Time
					201 kVARh Net 10E6	**266** UVA Trip Delay
					202 kVARh Net 10E3	**267** UVA Trip Level
					203 kVARh Net 10E0	**268** UVA Warn Level
					204 kVARh Net 10E-3	**269** OVA Inhibit Time
					205 kVAh 10E6	**270** OVA Trip Delay
					206 kVAh 10E3	**271** OVA Trip Level
					207 kVAh 10E0	**272** OVA Warn Level
					208 kVAh 10E-3	**273** UPFLG Inhibit Time
					209 kW Demand	**274** UPFLG Trip Delay
					210 Max kW Demand	**275** UPFLG Trip Level
					211 VAR Demand	**276** UPFLG Warn Level
					212 Max VAR Demand	**277** OPFLG Inhibit Time
					213 VA Demand	**278** OPFLG Trip Delay
					214 Max VA Demand	**279** OPFLG Trip Level
					227 PW Trip Status	**280** OPFLG Warn Level
					228 PW Warnn Status	**281** UPFLD Inhibit Time
						282 UPFLD Trip Delay
						283 UPFLD Trip Level
						284 UPFLD Warn Level
						285 OPFLD Inhibit Time
						286 OPFLD Trip Delay
						287 OPFLD Trip Level
						288 OPFLD Warn Level
						291 Demand Period
						292 Num of Periods

❷ Series C (FRN 5.00 and Higher)
❸ CEP7-C5 Only

Setup for Cat. No. CEP7-C4 Current Monitor Relay

After the CEP7 Current Monitor Relay is installed according to the guidelines specified in this manual, apply power to the relay's DeviceNet connector. After applying power, the following sequence should occur:

1. The Trip relay should close 2.35 seconds later and the TRIP/WARN LED will not flash (unless a Non-Volatile Fault previously existed or a fault condition is present).

2. At the same time, the NETWORK STATUS LED should flash green for approximately two seconds, then red for a 1/4 second. If autobaud is enabled and the CEP7 Current Monitor Relay is connected to an active network, the green LED will continue to flash once the baud rate has been determined. If the CEP7 Current Monitor Relay is not connected to an active network, the LED will not continue to flash.

3. Once the CEP7 Current Monitor Relay has been allocated by a master, the NETWORK STATUS LED will turn solid green.

After being powered up, use the DeviceNet Configuration Terminal (Cat. No. CEP7-DNCT) in order to set up the parameters. There are six basic parameters that need to be established before using the trip functions. These parameters are listed under the ADVANCED SETUP menu and include: L1 UC Trip Level, L2 UC Trip Level, L3 UC Trip Level, L1 OC Trip Level, L2 OC Trip Level, and L3 OC Trip Level. After the parameters have been configured, enable the specific trip bit as described in Table 7: for Parameter 24 (*Trip Enable*) to energize the relay when conditions are met.

Once these parameters are set, the CEP7 Current Monitor Relay is functional. Use the ADVANCED SETUP menu to set other parameters per the specific application requirements.

Protective Trip/Warning Summaries & Parameter Group Listing (Cat. No. CEP7-C4)

Table 7: Trip Summary

Trip Function	Trip Enable Factory Default	Trip Level Settings		Trip Delay Settings		Inhibit Time Settings	
		Range	Default	Range	Default	Range	Default
Ground Fault	Disabled	0.02…5 A	2.5 A	0.0…25 s	0.5 s	0…250 s	10 s
L1 Undercurrent	Disabled	0.2…45 A	—	0.1…25 s	1.0 s	0…250 s	1.0 s
L2 Undercurrent	Disabled	0.2…45 A	—	0.1…25 s	1.0 s	0…250 s	1.0 s
L3 Undercurrent	Disabled	0.2…45 A	—	0.1…25 s	1.0 s	0…250 s	1.0 s
L1 Overcurrent	Disabled	0.4…270 A	—	0.1…25 s	1.0 s	0…250 s	1.0 s
L2 Overcurrent	Disabled	0.4…270 A	—	0.1…25 s	1.0 s	0…250 s	1.0 s
L3 Overcurrent	Disabled	0.4…270 A	—	0.1…25 s	1.0 s	0…250 s	1.0 s
L1 Loss	Disabled	—	—	0.5…25 s	0.5 s	0…250 s	1.0 s
L2 Loss	Disabled	—	—	0.5…25 s	0.5 s	0…250 s	1.0 s
L3 Loss	Disabled	—	—	0.5…25 s	0.5 s	0…250 s	1.0 s
Comm Fault	Disabled	—	—	—	—	—	—
Comm Idle	Disabled	—	—	—	—	—	—
Remote Trip	Disabled	—	—	—	—	—	—

Table 8: Warning Summary

Warning Function	Warning Enable Factory Default	Warning Level Settings		Warning Delay Settings		Inhibit Time Settings	
		Range	Default	Range	Default	Range	Default
Ground Fault	Disabled	0.02…5 A	2.0 A	0.0…25 s	0.0 s	0…250 s	10 s
L1 Undercurrent	Disabled	0.2…45 A	—	—	—	0…250 s	1.0 s
L2 Undercurrent	Disabled	0.2…45 A	—	—	—	0…250 s	1.0 s
L3 Undercurrent	Disabled	0.2…45 A	—	—	—	0…250 s	1.0 s
L1 Overcurrent	Disabled	0.4…270 A	—	—	—	0…250 s	1.0 s
L2 Overcurrent	Disabled	0.4…270 A	—	—	—	0…250 s	1.0 s
L3 Overcurrent	Disabled	0.4…270 A	—	—	—	0…250 s	1.0 s
L1 Loss	Disabled	—	—	—	—	0…250 s	1.0 s
L2 Loss	Disabled	—	—	—	—	0…250 s	1.0 s
L3 Loss	Disabled	—	—	—	—	0…250 s	1.0 s
Comm Fault	Disabled	—	—	—	—	—	—
Comm Idle	Disabled	—	—	—	—	—	—
Remote Trip	Disabled	—	—	—	—	—	—

Table 9: Parameter Group Listing (Cat. No. CEP7-C4)

Monitor Params	Reset / Lock	Advanced Setupt	DeviceNet Setup	Output Setup	DeviceLogix
1 L1 Current	**26** Trip Reset	**24** Trip Enable	**55** AutoBaudEnable	**65** OutA Pr FltState	**79** Comm Override
2 L2 Current	**53** Program Lock	**25** Warning Enable	**56** NonVol Baud Rate	**66** OutA Pr FltValue	**80** Network Override
3 L3 Current	**54** Set to Defaults	**35** GF Inhibit Time	**58** COS Mask	**67** OutA DN FltState	**81** Net Outputs
10 GF Current	**103** Test Enable	**36** GF Trip Delay	**59** Output Assembly	**68** OutA DN FltValue	**82** Net Out COS Mask
14 Trip Status	**104** Clear Queue	**37** GF Trip Level	**60** Input Assembly	**69** OutA DN IdlState	
15 Warning Status		**38** GF Warn Level	**61** Assy Word0 Param	**70** OutA DN IdlValue	
16 Trip Log 0		**83** IN 1 Assignment	**62** Assy Word1 Param	**71** OutB Pr FltState	
17 Trip Log 1		**84** IN 2 Assignment	**63** Assy Word2 Param	**72** OutB Pr FltValue	
18 Trip Log 2		**85** IN 3 Assignment	**64** Assy Word3 Param	**73** OutB DN FltState	
19 Trip Log 3		**86** IN 4 Assignment		**74** OutB DN FltValue	
20 Trip Log 4		**89** GF Trip Inhibit		**75** OutB DN IdlState	
21 Device Status		**101** # of Starts		**76** OutB DN IdlValue	
22 Firmware		**102** Operating Hours			
23 Dev Config		**105** GF Warn Delay			
90 Warn Log 0		**106** GF Sensing Range			
91 Warn Log 1		**107** UC Inhibit Time			
92 Warn Log 2		**108** L1 UC Trip Level			
93 Warn Log 3		**109** L1 UC Trip Delay			
94 Warn Log 4		**110** L1 UC Warn Level			
95 Elapsed Time		**111** L2 UC Trip Level			
96 Starts Counter		**112** L2 UC Trip Delay			
		113 L2 UC Warn Level			
		114 L3 UC Trip Level			
		115 L3 UC Trip Delay			
		116 L3 UC Warn Level			
		117 OC Inhibit Time			
		118 L1 OC Trip Level			
		119 L1 OC Trip Delay			
		120 L1 OC Warn Level			
		121 L2 OC Trip Level			
		122 L2 OC Trip Delay			
		123 L2 OC Warn Level			
		124 L3 OC Trip Level			
		125 L3 OC Trip Delay			
		126 L3 OC Warn Level			
		127 LL Inhibit Time			
		128 L1 Loss Trip Delay			
		129 L2 Loss Trip Delay			
		130 L3 Loss Trip Delay			

Table 10: Parameter Group Listing (Cat. No. CEP7-C4), Continued

TripWarn History ❶	Trip Snapshot ❶
132 Trip History 0	**144** SS L1 Current
133 Trip History 1	**145** SS L2 Current
134 Trip History 2	**146** SS L3 Current
135 Trip History 3	**148** SS GF Current
136 Trip History 4	
137 Warn History 0	
138 Warn History 1	
139 Warn History 2	
140 Warn History 3	
141 Warn History 4	
142 TripHistory Mask	
143 WarnHistory Mask	

❶ Series C (FRN 5.00 and Higher)

Short-Circuit Ratings

ATTENTION

To prevent electrical shock, disconnect from power source before installing or servicing

ATTENTION

Select the motor branch circuit protection that complies with the National Electrical Code and any other governing regional and local codes

The CEP7 Overload Relay is suitable for use on circuits capable of delivering not more than the RMS symmetrical amperes listed in the following tables:

Table 11: Standard Fault Short-Circuit Ratings per UL 508 and CSA 22.2, No. 14

Cat. No.	Max. Available Fault Current [A]	Max. Voltage [V]
CEP7-C5-23-_	5000	600
CEP7-C5-43-_	5000	
CEP7-C5-85-_	10000	
CEP7-C5-180-_	10000	
CEP7-C5-420-_	18000	
CEP7-C5-860-_	42000	
CEP7-C5-CT-5000, CEP7-NRC5-CT-5000	5000	

Table 12: IFC Short-Circuit Ratings per EN60947-4-1

Cat. No.	Prospective Short-Circuit Current I_r [A]	Conditional Short-Circuit Current I_q [A]	Max. Voltage [V]
CEP7-C5-23-_	1000	100000	690
CEP7-C5-43-_	3000		
CEP7-C5-85-_	5000		
CEP7-C5-180-_	10000		
CEP7-C5-420-_	18000		
CEP7-C5-860-_	30000		
CEP7-C5-CT-5000, CEP7-NRC5-CT-5000	1000		

Table 13: High Fault Short-Circuit Ratings per UL 508 and CSA 22.2, No. 14 with Bulletin 100-C and 100-D contactors

Cat. No.		Contactor	Max. Starter FLC [A]	Max. Available Fault Current [A]	Max. Voltage [V]	Max. Class J or CC Fuse [A]
CEP7-C1 CEP7-C2 CEP7-C3 CEP7-C4 CEP7-C5	_B	100-C09	9	100000	600	20
		100-C12	12			20
		100-C16	16			30
		100-C23	23			30
	_D	100-C30	30			50
		100-C37	37			50
		100-C43	43			70
	_E	100-C60	60			80
		100-C72	72			100
		100-C85	85			150
	FF, ZZ	100-D95	95			200
	FF, ZZ	100-D110	110			200
	FF, ZZ	100-D140	140			250
	GF, ZZ	100-D180	180			300
	GG, ZZ	100-D210	210			400
		100-D250	250			400
		100-D300	300			500
	HG, ZZ	100-D210	210			400
		100-D250	250			400
		100-D300	300			500
	JG, ZZ	100-D300	300			500
		100-D420	420			600

Fuse Coordination

Table 14: IEC Type 1 and Type II Fuse Coordination with Bulletin 100-C and 100-D Contactors per EN60947-4-1

Cat. No.		Contactor	Max. Starter FLC [A]	Prospective Short-Circuit Current I_r [A]	Conditional Short-Circuit Current I_q [A]	Max. Voltage [V]	Type I with Class J Fuse [A]	Type II with Class J Fuse [A]
CEP7-C1 CEP7-C2 CEP7-C3 CEP7-C4 CEP7-C5	_B	100-C09	9	1000	100000	600	20	15
		100-C12	12				20	20
		100-C16	16				30	30
		100-C23	23				40	40
	_D	100-C30	30	3000			50	50
		100-C37	37				50	50
		100-C43	43				70	70
	_E	100-C60	60				80	80
		100-C72	72				100	100
		100-C85	85	5000			150	150
	FF, ZZ	100-D95	95	10000			200	200
	FF, ZZ	100-D110	110				200	200
	FF, ZZ	100-D140	140				250	250
	GF, ZZ	100-D180	180				300	300
	GG, ZZ	100-D210	210				400	400
		100-D250	250				400	400
		100-D300	300				500	500
	HG, ZZ	100-D210	210				400	400
		100-D250	250				400	400
		100-D300	300				500	500
	JG, ZZ	100-D300	300				500	500
		100-D420	420				600	600

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