

# Overload Relay Choices for Motor Protection

Protecting your investment is critical to keeping your operations up and running. Prevent unwanted down time by choosing the right protection for your motor controls. Sprecher + Schuh is proud to offer several options in motor protection. From simple single purpose devices, to varying degrees of selection options and complete factory automation and communication, selecting the right protection is vital to ensuring motor life and longevity. Sprecher + Schuh is here to help protect your investment.

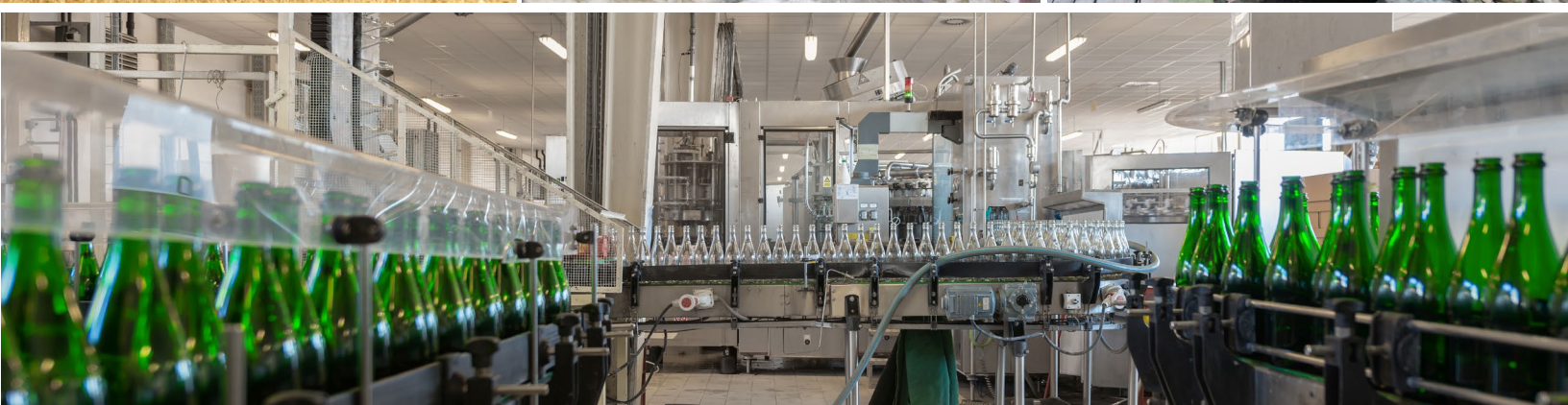
**Advanced Electronic  
Overload Relays  
Series CEP9**



**Bimetallic Overload Relays  
Series CT7N and CT8**



**Solid State Overload Relays  
Series CEP7**





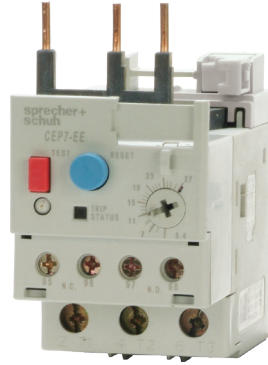
# Choices in Overload Relays



## CT7N/CT8 Thermal Bimetallic

Key Features:

- Ambient temperature compensation
- Rated for DC and variable frequent drive applications up to 400 Hz
- Optional remote reset solenoid and external reset accessories



## CEP7 Solid State

Key Features:

- Current measurement based protection
- Low energy consumption
- Side-mount expansion modules provide adjustable levels of protection and communication



## CEP9 Advanced Electronic

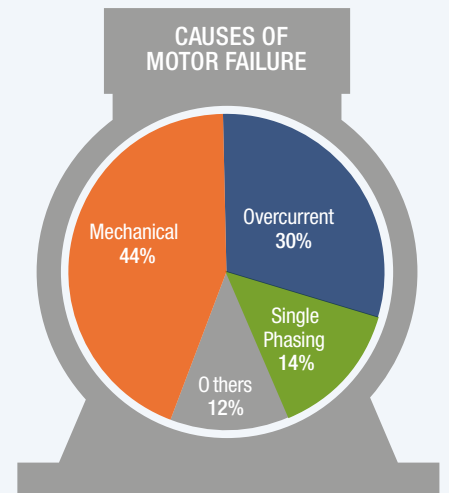
Key Features:

- Provides critical motor protection functions
- Communication and diagnostics provide detailed logs and control from relay to motor
- Can simplify control architecture

## Feature Comparison

	CT7N/CT8	CEP7-EE	CEP9
<b>Protection Features</b>			
Overload	✓	✓	✓
Phase Loss		✓	✓
Ground Fault		✓	✓
Current Imbalance	✓		✓
Jam		✓	✓
Over/under Voltage			✓
Voltage Imbalance			✓
Over/Under Power			✓
<b>Diagnostic Features</b>			
% Full Load Amperes		✓	✓
% Thermal Capacity Utilization		✓	✓
Voltage			✓
Power			✓
Energy			✓
<b>Communication Features</b>			
Profibus		✓	
Ethernet		✓	✓
DeviceNet			✓
Logix Integration			✓

**Most Motor Failures can be prevented with appropriate protection measures**

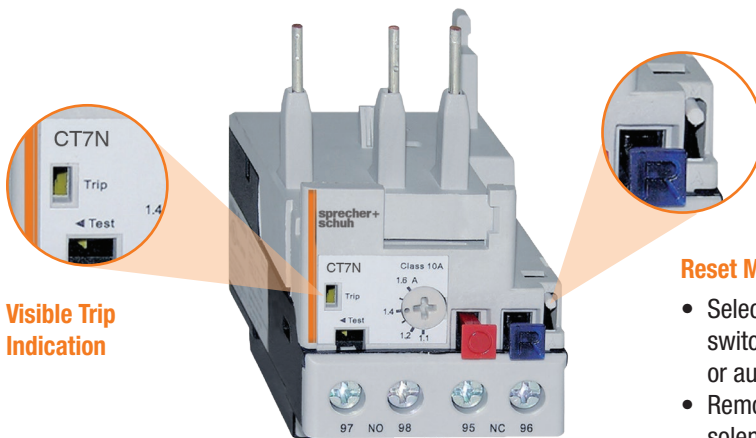




# Bimetallic Thermal Overload Protection

## Series CT7N & CT8

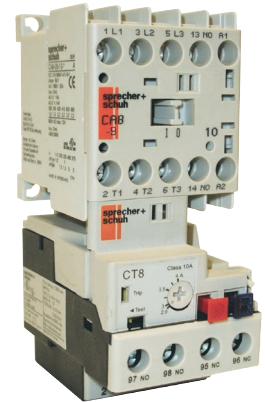
The bimetallic thermal overload relays compensate for ambient temperature while providing overload protection and phase-loss sensitivity. They are a cost-effective way to protect your electrical equipment investment.



**Visible Trip Indication**

### Reset Modes

- Selectable reset switch – manual or automatic
- Remote reset solenoid option



The CT7N bimetallic Class 10 overload relays are designed for use with the CA7 contactors and CAU7 reversing contactors

The CT8 bimetallic overload relays are designed for use with the CA8 miniature contactors and CAU8 miniature reversing contactors



### Ideal Applications

Ideal for light industry and low critical process

- Conveyors, Fans and Pumps
- VFD-controlled motors
- DC motors

## Causes of Motor Failure



*The most common causes of motor failure are:*

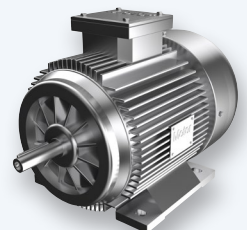
- *Overloading of the motor*
- *Unbalanced power or single-phasing*
- *Over- or undervoltage*
- *High ambient temperature*
- *Too many frequent starts*
- *Rotor/stator/bearing failure*
- *Contaminants*

## Impact of Motor Failure



*The most expenditures connected to motor failure:*

- *Equipment downtime*
- *Loss of production*
- *Collateral equipment damage*
- *Equipment replacement*
- *Work in progress scrappage*
- *Overtime for repair crews*
- *Safety hazard for personnel*



# Solid State Overload Protection

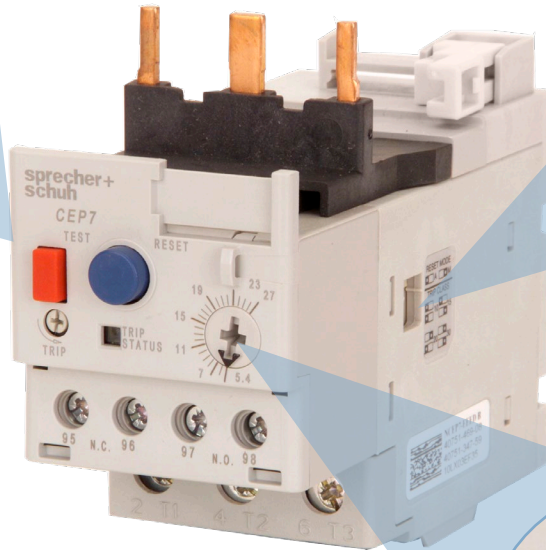
## Series CEP7

The solid state design of the CEP7 overload relay, offered in two models, provides ambient temperature compensation, thermal and phase loss protection and a wide 5:1 adjustment range. The CEP7-ED1 model provides fixed protection while the CEP7(S)-EE models provide selectable and expandable protection.

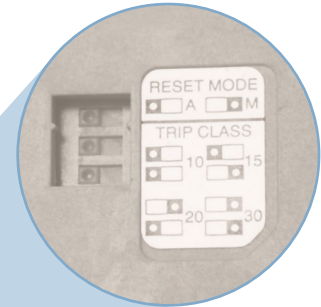


### Side Mount Module Connections on EE models

- Communication
- Protection
  - Jam
  - Ground fault
  - Thermistor
- Remote Reset

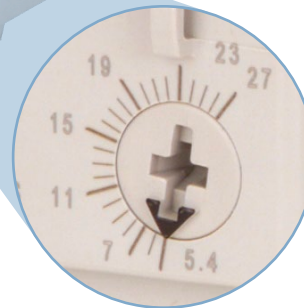


CEP7-EE model shown



### Selectable Trip Class & Reset Mode

- Selectable manual or auto-manual reset modes
- Up to 4 trip class options



### 5:1 Current Range

- Wide FLA Range

## Model Specifications

CEP7-ED1_ Models	
Current Range	0.1...45 A
Trip Class	10 Fixed
Reset Mode	Manual Only
Side Mount Modules	~
CEP7(S)-EE_ Models	
Current Range	0.1...200 A
Trip Class	10, 15, 20, 30 Adjustable
Reset Mode	Automatic and Manual
Side Mount Modules	Communication, Protection, Reset



## Side Mount Modules

### Customizable

The optional side mount modules for the CEP7(S)-EE overload relays allow you to customize the device to your application's specific needs.

### Protection and Remote Reset

For motor starters with Remote Reset *plus*

- Jam protection (CEP7-EJM)
- Ground fault protection (CEP7-EGF)
- Ground and Jam protection (CEP7-EGJ)
- or Thermistor PTC Relay (CEP7-EPT)



CEP7-EJM

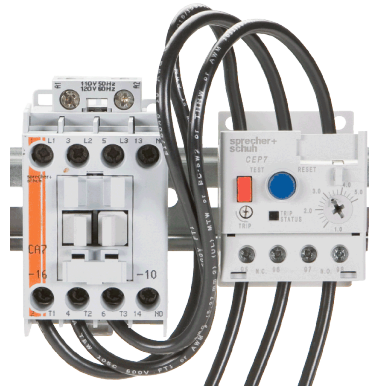


CEP7-EGF/EGJ



CEP7-EPT

## Mounting Options



### DIN-Rail / Separate Mount

- Pass-thru model CE7(S)-\_P
- Or with DIN-Rail/Panel Adapter

### Direct Connect

- CA7 Contactors
- CAN7 NEMA Contactors

### Connection Modules

- Enhanced Features for Motor Controllers
- Direct mount to busbar modules



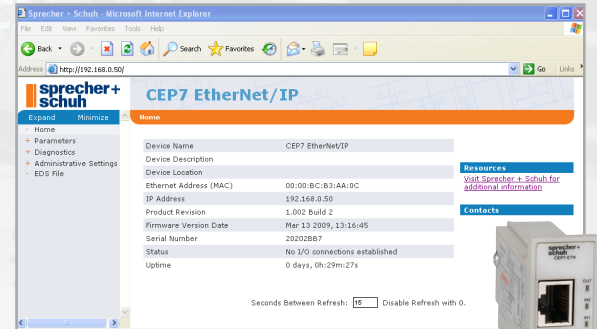
## Diagnostic Capabilities

The CE7(S)-EE with communication side-mount modules provide a cost-effective transformation of real-time data into your control architecture.

- EtherNet/IP

## Advantages

- Includes integrated I/O
  - Provides convenient local termination of motor-related inputs (2) and outputs (1), simplifying the control architecture
- Provides operational and diagnostic data
  - Average motor current
  - Percentage of thermal capacity usage
  - Device status
  - Trip and warning identification
  - Trip history (5 previous trips)
- Expands protective functions
  - Overload warning
  - Jam protection
  - Underload warning



## CEP7-ETN Integrated Web and E-mail server

The CEP7-ETN contains a web server to allow users to read information and configure parameters via the web. Uses a simple mail transfer protocol (SMTP) server to send e-mail or text messages in the event of a warning or trip condition.



CEP7-ETN

## Ideal Applications

Ideal for light to medium industry processes

- Pump and Fan motors
- Sawmills
- Mixers
- Conveyors

### Remote Reset Only

Operate and diagnose problems remotely with

- Remote Reset module (CEP7-ERR) and
- Intelli-button (CEP7-ERID) for quick status indication (IP65/66 Type 4/4X/12/13)



Snap-in terminals and 22mm Panel Mounting



### Communication

Seamless development of motor starters for communications architectures based on

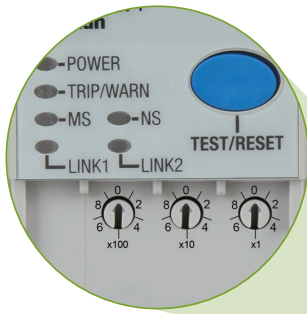
- Ethernet/IP (CEP7-ETN)



# Advanced Electronic Overload Protection

## Series CEP9

The CEP9 Advanced Electronic Overload Relay provides a flexible design and advanced intelligence. Real-time diagnostics are transformed into actionable information – maximizing your up-time and protecting your assets.



### On-Device Settings

- Network address configuration
- Restore factory default settings
- Enable security settings

### Dual Port EtherNet/IP

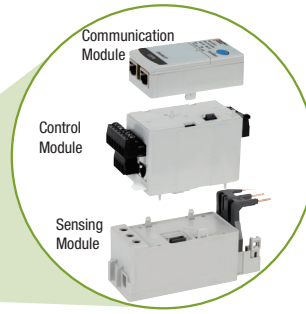
Supports device level ring



**Removable Terminal Blocks**

### Expansion Port

Expansion I/O  
Operator Station



### Modular Design

The modular design of the CEP9 overload relay allows customers to tailor the device for their application's exact needs.

### Communication Module

- EtherNet/IP
- DeviceNet
- Parameter Configuration

### Control Module

Control Voltage	I/O		I/O and Protection	
	Inputs	Relay Outputs	Inputs	Relay Outputs
110-120VAC 50/60Hz	4	3	2	2
220-240VAC 50/60 Hz	4	3	2	2
24VDC	6	3	4	2

### Sensing Module

Sensing Options	Current Range
• Voltage / Current / Ground Fault	• 0.5 - 30A
• Current / Ground Fault	• 6 - 60A
• Current	• 10 - 100A
	• 20 - 200A

## Expansion Modules

### Customizable

The optional expansion modules for the CEP9 overload relays allow you to customize the device to your application's specific needs.

### Expansion Power Supply

- 120/240V AC
- 24V DC



### Expansion Analog Module

- 3 universal inputs/1 output
- 4 – 20 mA
- 0 – 10V
- RTD
- NTC



### Expansion Digital Modules

- 3 universal inputs/1 output
- 4 – 20 mA
- 0 – 10V
- RTD
- NTC

## Mounting Options

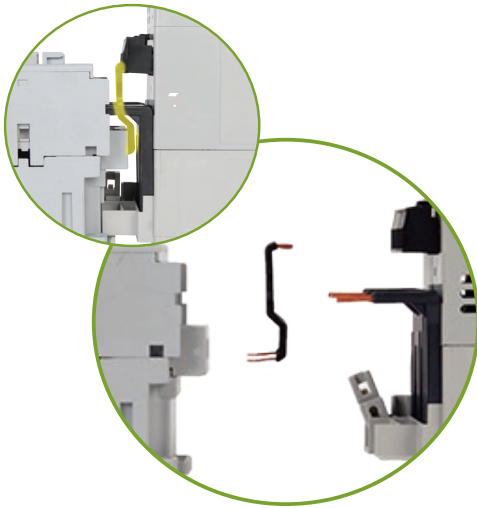


DIN-Rail / Separate Mount



### Direct Connect

- CA7 Contactors
- CAN7 NEMA Contactors



### Simplified Wiring

Between CEP9 overload relay and CA7 contactor

## Ideal Applications

Ideal for industrial and critical processes requiring

- Power, voltage and/or current management
- Advanced motor protection and diagnostics
- Communications
  - Integrated and expandable I/O
  - Multiple communication types
- Underload detection and control, such as
  - Submersible pumps; dry run
  - Conveyors; transmission loss



## Diagnostic Capabilities

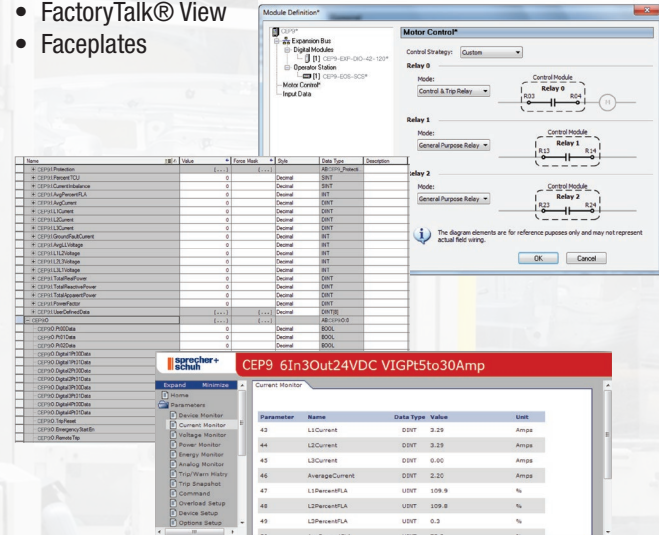
The CEP9 advanced electronic overload relay provides real-time motor diagnostic information to proactively indicate when a motor is having a problem allowing you to efficiently troubleshoot. This information includes:

- Current
- Ground fault current
- Voltage
- Power
- Energy
- % Thermal capacity utilization
- Time to trip
- Time to reset
- Trip history
- Trip snapshot

## CEP9 Integrated Web and E-mail server

The communication options of the CEP9 allows users to view this diagnostic information using the following methods:

- Logix add-on profile
- Web browser
- FactoryTalk® View
- Faceplates



## Expansion Operator Station

Operate and diagnose problems remotely with

- Diagnostic Station
- Control Station
- IP65 Type 4



22mm Panel Mounting

## Simplified Logix Integration

With simple tools such as Add-On Profiles, Add-On Instructions and Faceplates, users can integrate the CEP9 Overload Relay into Integrated Architecture with ease. Download the pre-programmed and pre-tested tools, copy and paste the desired portions into your project and configure the properties for your specific application.

# Usability Comparison



## Bimetallic Series CT7N/CT8

- Selectable reset mode
- Built-in test/reset button
- Manual trip



## Solid State Series CEP7

- Multiple trip class options
- Selectable reset modes
- Wide current range
- Additional modules for communications and protection

\* CEP7(S)-EE models



## Advanced Electronic Series CEP9

- Wide current range
- Advanced performance and diagnostics
- Embedded communications
- Modularity
- Multiple expansion options

**Prevent motor failures by  
protecting your investment**



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