

# Motor and Pump Protection Relays

## MPS Series

### Motor Protection System



### Description

The MPS Motor Protection System monitors voltage, current, and temperature to provide a comprehensive package of 22 protective functions. The MPS is a modular system with integrated protection, motor control, metering, and data-logging functions. This system is typically used to provide protection for three-phase low- and medium-voltage, medium- to high-horsepower induction motors.

#### 1 Operator Interface (MPS-OPI)

- Large, bright, 4 x 20 vacuum-fluorescent display
- Display metered values
- Access set points
- Powered by Control Unit
- Panel mount or attach directly to Control Unit
- Remote mounting (1.2 km or 4000 ft maximum loop length)
- ½ DIN size
- Hazardous-location certified

#### 2 Control Unit (MPS-CTU)

- Current inputs—5-A or 1-A secondary phase current transformers
- Voltage inputs—up to 600 V without PTs
- Earth-leakage input—5-A or 1-A secondary or sensitive transformer
- Tachometer (high-speed pulse) input
- 8 digital inputs, 5 relay outputs, 1 analog input and output
- 24-Vdc supply for OPI and RTD modules, and for digital inputs
- IRIG-B time-code input
- ½ DIN size, surface mount
- RS-485 network communications (Standard)
- DeviceNet™, Profibus®, or Ethernet communications available

### Features & Benefits

FEATURES	IEEE #	BENEFITS
<b>Overload</b>	49, 51	Extends motor life and prevents insulation failures and fires
<b>Current unbalance/Phase loss/Phase reverse</b>	46	Prevents overheating and extends motor life
<b>Overcurrent/Jam</b>	50, 51	Prevents catastrophic failures and fires and extends motor life
<b>Ground fault</b>	37	Detects low-level or no-load conditions
<b>RTD temperature</b>	50G/N, 51G/N	Prevents catastrophic failures and fires
<b>Overvoltage</b>	38, 49	Optional RTD temperature protection (MPS-RTD module) for high ambient or loss of ventilation protection
<b>Undervoltage</b>	59	Prevents stress to insulation
<b>Voltage unbalance</b>	27	Prevents a start attempt when it will damage the motor
<b>Phase differential</b>	47	Detects unhealthy supply voltage
<b>Dynamic thermal model</b>	87	Provides sensitive protection for high-resistance winding faults
<b>Reduced overcurrent model</b>		Provides protection through starting, running, overload, and cooling cycles
<b>Starter control</b>		Minimizes arc-flash hazards during maintenance

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### Applications

- Motor protection

### Specifications

#### Protective Functions (IEEE Device Numbers)

Overload (49, 51), Phase reverse (current) (46), Overfrequency (81), Overcurrent (50, 51), Jam, Underfrequency (81), Ground fault (50G/N, 51G/N), Undercurrent (37), Unbalance (voltage) (47), Failure to accelerate, RTD temperature (38, 49), Unbalance (current) (46), Underspeed (14), Starts per hour (66), Phase loss (voltage) (47), Overvoltage (59), Differential (87), Phase loss (current) (46), Undervoltage (27), Phase reverse (voltage) (47), Power factor (55)

#### Input Voltage

65-265 Vac, 25 VA; 80-275 Vdc, 25 W

#### Power-Up Time

800 ms at 120 Vac

#### Ride-Through Time

100 ms minimum

#### 24-Vdc Source

100 mA maximum

#### AC Measurements

True RMS and DFT, Peak, 16 samples/cycle, and positive and negative sequence of fundamental

#### Frequency

50, 60 Hz or ASD

#### Inputs

Phase current, Earth-leakage current, Phase voltage, 7 digital, tachometer, 1 analog

#### Output Contacts

5 contacts — See Product Manual

#### Communications

Allen-Bradley® DFI and Modbus® RTU (Standard); DeviceNet™, Ethernet (Optional)

#### Conformally Coated

Standard feature

#### Warranty

10 years

#### Control Unit Mounting

Surface

#### Operator Interface Mounting

Panel, Control-Unit mounted

### Certification & Compliance

<b>CSA</b>	CSA Certified (CSA C22.2 No. 14, CSA C22.2 No. 213-M1987 (OPI and RTD modules only), CSA E60079-15:02 (RTD module only))
<b>RCM</b>	RCM
<b>UL</b>	UL Recognized (UL 60947-4-1, UL 1053, UL 60079-15 (RTD module only))

### Accessories

#### A Phase Current Transformers

Phase CTs are required to detect phase currents.

#### B Ground-Fault Current Transformer

Required zero-sequence current transformer detects ground-fault current. Available with 5-A and 30-A primary ratings for low-level pickup.

#### C MPS-RTD Temperature Input Module

Optional module provides 8 inputs to connect Pt100, Ni100, Ni120, and Cu10 RTDs.

### Ordering Information

ORDERING NUMBER	COMMUNICATIONS
MPS-CTU-01-00	RS-485
MPS-CTU-02-00	RS-485 & DeviceNet™
MPS-CTU-04-00	RS-485 & EtherNet/IP™ & Modbus® TCP

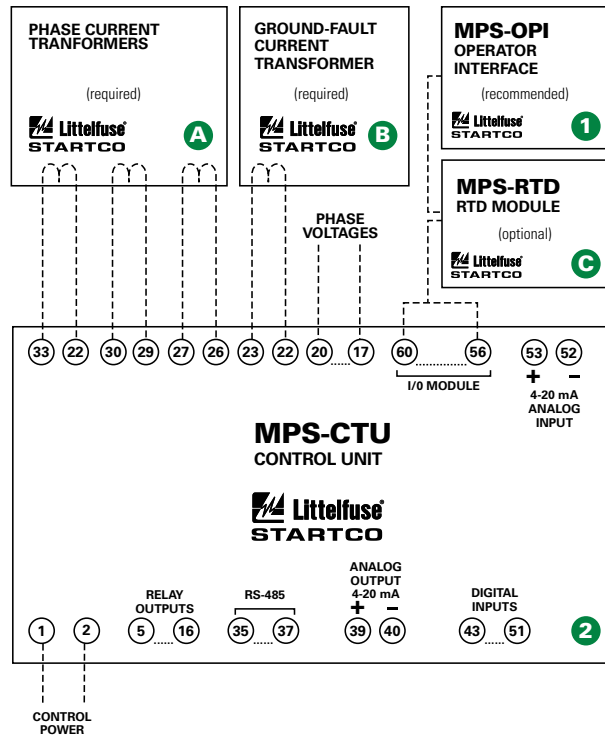
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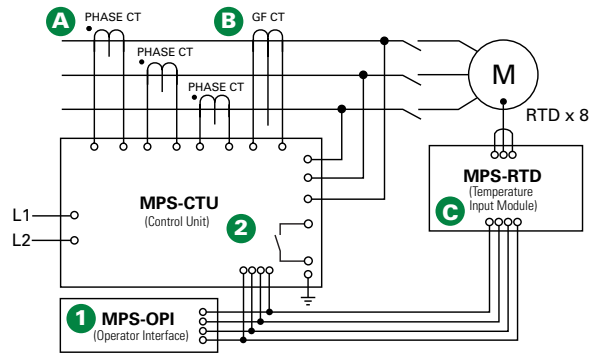
### Ordering Information

ACCESSORIES	REQUIREMENT
MPS-OPI-01-00	Recommended
Phase CTs	Required
Ground-Fault CT	Recommended
MPS-RTD-01-00	Optional

### Simplified Wiring Diagram



### Simplified Circuit Diagram



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