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

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

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

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

<table>
<thead>
<tr>
<th>CSA</th>
<th>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))</th>
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<tbody>
<tr>
<td>RCM</td>
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<tr>
<td>UL</td>
<td>UL Recognized (UL 60947-4-1, UL 1053, UL 60079-15 (RTD module only))</td>
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</tbody>
</table>

Accessories

- Phase Current Transformers
  Phase CTs are required to detect phase currents.

- 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.

- MPS-RTD Temperature Input Module
  Optional module provides 8 inputs to connect Pt100, Ni100, Ni120, and Cu10 RTDs.

Ordering Information

<table>
<thead>
<tr>
<th>ORDERING NUMBER</th>
<th>COMMUNICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPS-CTU-01-00</td>
<td>RS-485</td>
</tr>
<tr>
<td>MPS-CTU-02-00</td>
<td>RS-485 &amp; DeviceNet™</td>
</tr>
<tr>
<td>MPS-CTU-04-00</td>
<td>RS-485 &amp; EtherNet/IP &amp; Modbus® TCP</td>
</tr>
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Motor and Pump Protection Relays
MPS Series

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<td>MPS-OPI-01-00</td>
<td>Recommended</td>
</tr>
<tr>
<td>Phase CTs</td>
<td>Required</td>
</tr>
<tr>
<td>Ground-Fault CT</td>
<td>Recommended</td>
</tr>
<tr>
<td>MPS-RTD-01-00</td>
<td>Optional</td>
</tr>
</tbody>
</table>

Simplified Wiring Diagram

Simplified Circuit Diagram

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