**General Information**
The Electronic Overload Relay receives line current signals from an ammeter shunt and performs both the *inverse Time* as well as the *Instantaneous Trip* functions normally performed by two (2) separate electro-mechanical overload relays.

- Automatic Reset
- Instantaneous and Inverse Time in one (1) unit
- Green "Overload-on" indicator
- Yellow "Overload-Condition" indicator
- Negative or Positive Shunt applications
- Mill-Duty Design
- Double Break Contacts

- Selectable automatic or manual reset of the output relay.
- Latched red "Overload-Trip" indicators for Inverse Time and Instantaneous conditions.
- Manual reset of trip indicators.
- Optional 250 VDC isolation supply for adjustable voltage applications.
- Optional adapter for 100mv ammeter shunt applications.
- Optional ammeter shunt isolation module.

**Application**
Used with any dc motor that requires overload current protection. For applications such as crane control, mill auxiliary control, starters and adjustable speed drives.

**Description**
The Electronic Overload Relay consists of an Electronic Sensing Unit, and an output relay. The Electronic Sensing Unit receives line current signals from a 50 mv ammeter shunt and performs both the inverse time and instantaneous trip functions normally performed by two separate electromechanical overload relays.

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*EOL = Electronic OverLoad relay*
There are two basic configurations:

1) **Negative Shunt** - The ammeter shunt is placed in the negative power line of the controller to monitor the motor line currents. See Fig. 1A

2) **Positive Shunt** - The ammeter shunt is placed in the positive power line of the controller to monitor the motor line currents. See Fig. 2A

The selection of "Negative Shunt" or "Positive Shunt" electronic overload relay is determined by the configuration that best fits the protection requirements. The negative shunt configuration will monitor currents in the negative line but will not monitor positive line to ground leakage or fault currents. Similarly, the positive shunt configuration will monitor positive line currents but will not monitor negative line to ground leakage or fault currents. For this reason, negative ground systems are best protected by the positive shunt configuration, and positive ground systems are best protected by the negative shunt configuration.

Floating or ungrounded systems can be protected by either configuration, however, full fault protection can only be provided for line to line faults.

<table>
<thead>
<tr>
<th>Description</th>
<th>Negative Shunt Configuration Part Number</th>
<th>Positive Shunt Configuration Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostic Lights and Auto-Man Mode Selection</td>
<td>5370-48713-102</td>
<td>5370-48713-202</td>
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<tr>
<td>Overload Relay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shunt Isolation Module</td>
<td>5370-48764-101</td>
<td>5370-48764-102</td>
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<tr>
<td>250V D.C. Isolation Power Supply</td>
<td></td>
<td>5370-48732-101</td>
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<tr>
<td>Adapter for 100MV Ammeter Shunt Applications</td>
<td></td>
<td>5370-48742-101</td>
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</table>

**50姆 Shunt Selection Table:** (Fig. 3)

<table>
<thead>
<tr>
<th>HP</th>
<th>MOTOR FULL LOAD AMPS</th>
<th>SHUNTS FOR EOL* RELAY ONLY</th>
<th>SHUNTS FOR EOL* RELAY AND PANEL AMMETER</th>
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<tr>
<td></td>
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<td>AMP RATING</td>
<td>mv@ FULL LOAD</td>
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<tr>
<td>3</td>
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<tr>
<td>4</td>
<td>16</td>
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</tr>
<tr>
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<tr>
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<tr>
<td>300</td>
<td>1200</td>
<td>1200</td>
<td>50</td>
</tr>
</tbody>
</table>

* (Electronic Over Load relay)
† Double these 50mV shunt ratings for 100mV shunt applications.

Adapters (P/N 5370-48742-101) is needed for 100mV shunt applications.

P/N 48713-102 and -202 have latched trip indication and selectable automatic or manual reset for the output relay. These two versions contain the Green and Yellow indicators as well as two Red indicators which show the tripped condition (either instantaneous or inverse time). When the manual reset mode is selected, the output relay and the trip indicators are latched after an overload trip until the reset button is pressed. When the automatic reset mode is selected, the output relay will reset when the overload condition is removed, but the trip indicators will remain “On” until the reset button is pressed.

**How To Select and Set Relay**

*Example:*

1) The electronic overload relay is being used to protect a 20 HP 230V dc crane motor. The electrical system has the negative line grounded which calls for a positive shunt configuration.

2) From the Shunt Selection Table, Fig. 3, the motor’s full load current will produce a shunt signal of 40mV from a 50mV shunt.

3) The 40mV shunt signal requires a Dial Setting of 65 (refer to Fig. 4).
For precise settings, the two calibration (CAL) test points next to the potentiometer may be used. With the controller power "off" and using an ohmmeter set to read "0" to "100" ohms, connect the ohmmeter across the calibration test points. Adjust the calibration potentiometer until the ohmmeter reads 85 ohms.

**Inverse Time & Instantaneous Trip Points (Fig. 5)**

The curves are selected by moving the jumper plugs located on the front of the overload relay. For crane service, as indicated in the example, a typical setting for the instantaneous trip would be 250% of full load current and the inverse time would be set for 5 sec. These settings allow for normal acceleration current peaks and acceleration time.

In the event that the jumper plugs would be removed, the electronic overload will still function and provide protection. But it reverts to the 150% instantaneous trip and the 50 sec. inverse time curve.

Operation of the electronic overload relay can be verified by watching the green and yellow indicators on the front of the electronic module. The green indicator will be "On" when there is power connected to the overload. The yellow indicator will be "On" when the monitored current exceeds 120% - 125% of full load current. It is normal for the yellow light to wink on and off in response to the motor acceleration current peaks.
**Specifications**

**Dimensions (Do Not Use for Construction Purposes)**

- **Input Voltage**: 250V DC ±10% — 20%
- **Fuse Rating**: 1 Amp 250V
- **Signal Input**: 50* mv shunt
  - Sealing permits full load signals to range from 25mv to 58mv.
  - See "dial setting" graph, Fig. 4.
- **Instantaneous Trip Settings**: 150%, 200%, 250%, and 300% of Rated Motor Current Jumper Selectable ± 15%. See Overload Curves, Fig. 5.
- **Inverse Time Settings**: 2 sec., 5 sec., 16 sec., and 50 sec. at 260% current, Jumper selectable ± 20%. See Overload Curves, Fig. 5.
- **Temperature Stability**
  - **Instantaneous Trip Setting**: +3% — 0% over full temp. range.
  - **Inverse Time Setting**: +3% — 5% over full temp. range.
- **Relay Contacts Material**: Silver
- **Interrupting Rating**: 0.5A Inductive @ 250V DC
- **Temperature Range**: -40°C to +75°C

*(Optional Adapter Available for 100mv Shunt Signal)*

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**ISOLATION POWER SUPPLY**

**Specifications**

- **Input Voltage**: 120V 50/60 Hz (Terminals 1 to 4, Jumper 1 to 2 & 3 to 4, Jumper 2 to 3)
- **Output Voltage**: 250V DC
  - Terminal 5 is Negative
  - Terminal 6 is Positive
- **Temperature Range**: -40°C to +75°C
- **Isolation**: 1000 Volts

**SHUNT ISOLATION MODULE**

**Specifications**

- **Application**
  - The Shunt Isolation Module is required if electrical isolation is needed between the EOL power supply and the motor power supply, or if the ammeter shunt must be located at a point other than the motor positive or negative line.
- **Temperature Range**: -40°C to +75°C
- **Isolation**: 1500 Volts

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