

# INSTRUCTIONS

FOR

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## MILLIAMP SENSING ALARM RELAYS BE3-74TD, BE3-74TH, and BE3-74TL

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### INTRODUCTION

BE3 milliamp sensing alarm relays monitor analog signals from transducers that measure current, voltage, watts, hertz, vars, or power factor. These transducers are used to indicate the status of a system or component. BE3-74T relays operate when the externally adjustable trip point is reached. An adjustable time delay is provided to avoid nuisance tripping due to transient changes in sensed current. All BE3 milliamp sensing alarm relays have a POWER LED to indicate the condition of the power supply. BE3-74TL and BE3-74TH relays have a RELAY LED to indicate the trip output status. The BE3-74TD relay has an OVER LED to indicate an overcurrent trip and an UNDER LED to indicate an undercurrent trip.

### ELECTRICAL SPECIFICATIONS

U.L. Listed, CSA Certified, C.E. Compliant

#### INPUT

Nominal current sensing input ranges are 0 to 1 mA, 4 to 20 mA, 0 to 20mA (specify nominal range). All units require external operating power. Nominal external operating power 45 to 65 hertz - 120 Vac, 240 Vac, 380 Vac, 480 Vac, ( $\pm 25\%$ ) and 24 Vdc ( $\pm 20\%$ , galvanically isolated).

#### Burden

Current input burden is 10 k $\Omega$ /volt. Voltage input burden is 2 VA for relays with ac external power and less than 3 W for relays with 24 Vdc external power.

#### Overload

Current input will withstand 2 times nominal continuously. 10 times nominal for 3 seconds.

#### SETPOINT

|                    |                                   |
|--------------------|-----------------------------------|
| Overcurrent Range  | Adjustable 40% to 120% of nominal |
| Undercurrent Range | Adjustable 0% to 80% of nominal   |
| Repeatability      | Better than 0.5% of full span     |
| Time Delay         | Adjustable 0 to 10 sec            |
| Differential       | Fixed at 5% of nominal            |
| Operating Time     | 200 ms typical                    |

#### OUTPUT

|                 |                                    |
|-----------------|------------------------------------|
| Relay Type      | D.P.D.T.                           |
| AC Rating       | 250 V, 5 A, non-resistive, 1200 VA |
| DC Rating       | 125 V, 1 A, resistive, 120 watts   |
| Mechanical Life | 5 million operations               |

### PHYSICAL SPECIFICATIONS

|                        |                                    |
|------------------------|------------------------------------|
| Operating Temperature  | 0° C (+32° F) to +60° C (+140° F)  |
| Functional Temperature | -25° C (-13° F) to +70° C (158° F) |
| Storage Temperature    | -40° C (-40° F) to +70° C (158° F) |

|                         |   |
|-------------------------|---|
| Temperature Coefficient | 0.03% per °C (200 ppm/°C)                 |
| Relative Humidity       | 95% noncondensing                         |
| Mounting                | DIN rail 1.38" by 0.29" (35 mm by 7.5 mm) |
| Case                    | Complies with IEC 529, DIN 40050, BS 5490 |
| Weight                  |   |
| Single Function         | 0.88 lbs. (0.4 kg)                        |
| Multiple Function       | 1.32 lbs. (0.6 kg)                        |
| Size                    |   |
| Single Function         | 2.17" wide (55 mm)                        |
| Multiple Function       | 3.93" wide (100 mm)                       |
| Case Material           | Complies with UL 94V0                     |

### OPERATION

BE3-74TH and BE3-74TL relays have two user adjustable controls marked SET and DELAY. The BE3-74TD relay has four controls: undercurrent SET, undercurrent DELAY, overcurrent SET, and overcurrent DELAY. The SET control adjusts the relay trip point. An overcurrent trip causes the relay output to energize when the current rises above the SET threshold. The overcurrent SET level is adjustable from 40% to 120% of nominal input ( $I_{nom}$ ). An undercurrent trip causes the relay output to de-energize when the current decreases below the SET threshold. The undercurrent SET level is adjustable from zero to 80% of  $I_{nom}$ . The DELAY control adjusts the time from when a fault is detected until the output contacts change state. The DELAY control is adjustable from zero to 10 seconds (200 milliseconds typical operating time).

#### Setting Example

A BE3-74TD with a nominal input type of M (4 to 20 milliamperes) has the following settings:

|                    |             |
|--------------------|-------------|
| Undercurrent SET   | - 50%       |
| Undercurrent DELAY | - 5 seconds |
| Overcurrent SET    | - 100%      |
| Overcurrent DELAY  | - 5 seconds |

An undercurrent condition will be detected when the sensed current decreases to 10 milliamperes. The UNDER output will de-energize 5 seconds after the undercurrent condition is detected. An overcurrent condition will be detected when the sensed current increases to 20 milliamperes. The OVER output will energize 5 seconds after the overcurrent condition is detected.

### INSTALLATION

BE3 milliamp sensing alarm relays are designed for mounting on standard DIN rails that comply to DIN-EN 50022. Mounting involves hooking the top edge of the cutout on the base of the case over one edge of the DIN rail. The opposite side of the cutout containing the release clip is then pushed over the opposite side of the DIN rail. To remove or reposition the relay, lever the release clip and move the relay as required. BE3 relays should be installed in a dry, vibration free location

where the ambient temperature does not exceed the operating temperature range. Connections to the relay should be made using wire that meets applicable codes and is properly sized for the application. Figure 1 shows the terminal connections for the BE3-74TD, BE3-74TH, and BE3-74TL relays.

### CALIBRATION

The calibration marks on the face plate have a maximum error of 10% and are provided only as guides. Proper calibration requires inserting an accurate milliammeter in series with the input signal. Use the following procedure to calibrate your relay.

#### OVERCURRENT TRIP

1. Adjust the SET control fully clockwise and the DELAY control fully counterclockwise. Apply nominal external operating power to the relay.
2. Apply the desired trip current to the relay.
3. Slowly adjust the SET control counterclockwise until the relay trips.

#### OVERCURRENT DELAY

1. Set the DELAY control at the desired time setting. Apply nominal external operating power to the relay.
2. Apply a value of current that is just above the trip set-point. Measure the time from when the current is applied until the relay trips.
3. Compare the measured time to the desired time delay and adjust the DELAY control accordingly.
4. Repeat Steps 2 and 3 as required.

#### UNDERCURRENT TRIP

1. Adjust the SET control and DELAY control fully counterclockwise. Apply nominal external operating power to the relay.
2. Apply the desired trip current to the relay.
3. Slowly adjust the SET control clockwise until the relay trips.

#### UNDERCURRENT DELAY

1. Set the DELAY control at the desired time setting. Apply nominal external operating power to the relay.
2. Apply a value of current that is above the trip set-point. Remove the applied current. Measure the time from when the current is removed until the relay trips.
3. Compare the measured time to the desired time delay and adjust the DELAY control accordingly.
4. Repeat Steps 2 and 3 as required.

### MAINTENANCE

BE3 relays are solid-state devices that require no maintenance. In the event that your relay requires repair, contact Basler Electric, Highland, IL, USA for return authorization.

### BE3 MILLIAMP SENSING ALARM RELAYS

Figure 2 shows the BE3 milliamp sensing alarm relay style identification chart.

|                                      |                 |  |   |                          |
|--------------------------------------|-----------------|--|---|--------------------------|
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|--------------------------------------|-----------------|--|---|--------------------------|

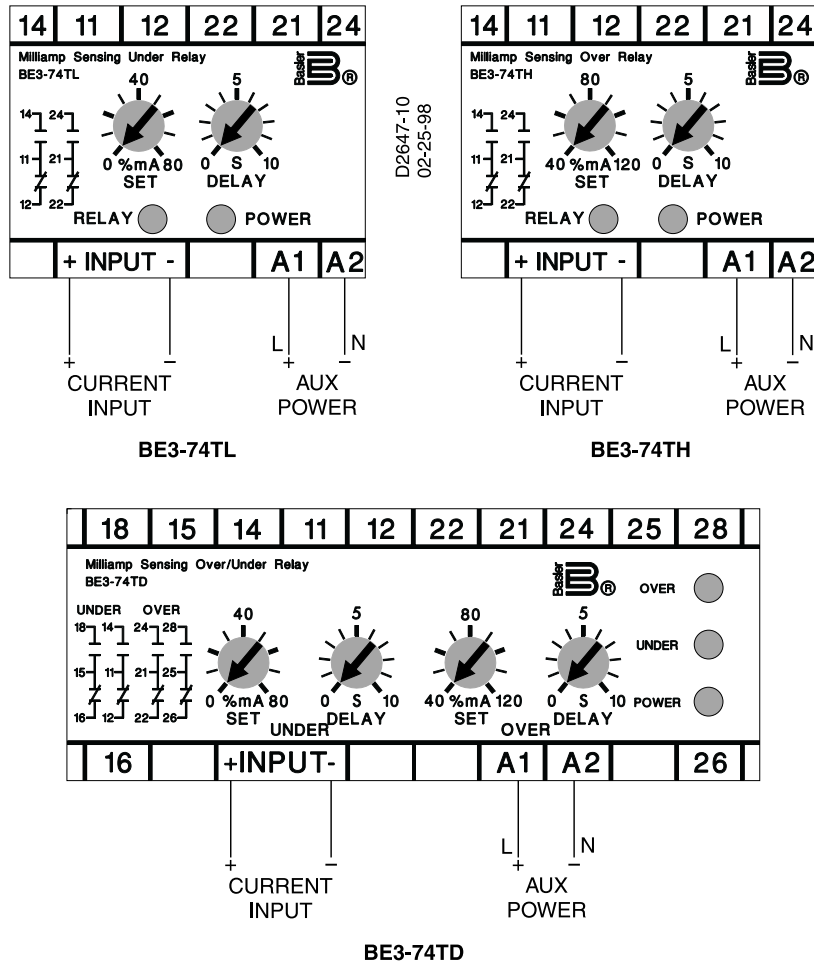


Figure 1. BE3-74TL, BE3-74TH, BE3-74TD Milliamp Sensing Alarm Relay Connections

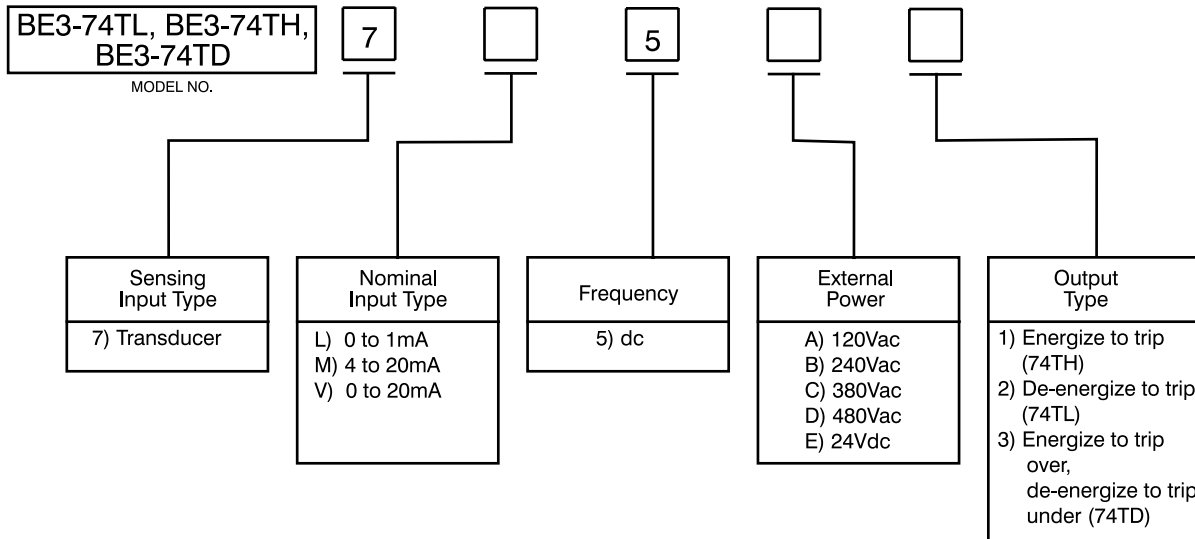


Figure 2. BE3-74TL, BE3-74TH, BE3-74TD Style Number Identification Chart