

INTRODUCTION

BE3 thermocouple temperature relays monitor remote temperatures using thermocouple transducers. The relay operates when the monitored temperature exceeds the preset limit. The BE3-49TH provides overtemperature protection and the BE3-49TL provides undertemperature protection. Type J or K thermocouple inputs are available. These inputs cover a wide range of temperatures.

SPECIFICATIONS

Operating Power

All units require external operating power.

AC Operating Power

Nominal Voltage: 120 Vac, 240 Vac, or 480 Vac
Frequency: 45 to 65 Hz
Burden: 2 VA maximum

DC Operating Power

Nominal Voltage: 24 Vdc
Burden: <3 W

Thermocouple Input

The thermocouple input accommodates type J and type K thermocouples and is thermocouple-break protected.

Type J

Minimum Range: 0 to 185°C (10 mV span)
Maximum Range: 0 to 870°C (50 mV span)

Type K

Minimum Range: 0 to 245°C (10 mV span)
Maximum Range: 0 to 1,230°C (50 mV span)

Cold Junction Compensation

Automatic over the range of 0 to 50°C

Overload

10 x continuous

Setpoint

Overtemperature Range: Adjustable 40 to 120% ($\pm 3\%$)
Undertemperature Range: Adjustable 0 to 80% ($\pm 3\%$)
Repeatability: Greater than 0.5% of full span
Time Delay: Adjustable from 0 to 10 s
Differential: Fixed at 2%

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 W
Mechanical Life: 5 million operations

Temperature

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 (300 ppm/°C)

Humidity

Relative Humidity: 95% non-condensing

Physical

Mounting: DIN rail 1.38" by 0.29" (35 mm by 7.5 mm)
Case: Complies with IEC 529, DIN 40050, BS 5490
Case Material: Complies with UL 94V0
Weight: 0.88 lb (0.4 kg)
Size: 2.17" wide (55 mm)

Agency

cULus listed to UL 508 and CSA C22.2 No. 14
CE compliant
GOST-R certified per the relevant standards of Gosstandart of Russia

OPERATION

BE3 thermocouple temperature relays have two user-adjustable controls: SET and DELAY. The SET control adjusts the relay trip point. The BE3-49TL trips when the monitored temperature decreases below the SET threshold. The undertemperature SET level is adjustable from 0 to 80% ($\pm 3\%$) of the rated thermocouple temperature. The BE3-49TH trips when the monitored temperature increases above the SET threshold. The overtemperature SET level is adjustable from 40 to 120% ($\pm 3\%$) of the rated thermocouple temperature. The DELAY control adjusts the time from when a fault is detected until the output contacts change state. The DELAY control is adjustable from 0 to 10 seconds. All BE3 thermocouple temperature relays have a green POWER LED to indicate the condition of the power supply. A red RELAY LED indicates the state of the output relay.

Setting Example

A BE3-49TH rated for a J type thermocouple with a maximum temperature of 185°C has the following settings:

- SET - 80%
- DELAY - 5 s

An overtemperature condition is detected when the sensed temperature increases to 148°C. The output trips 5 seconds after the overtemperature condition is detected. If the sensed temperature falls below 144.3°C (2% of nominal fixed differential) before timeout, the relay resets.

INSTALLATION

BE3 thermocouple temperature 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 BE3-49TH and BE3-49TL relays.

CALIBRATION

The calibration marks on the faceplate have a maximum error of 10% and are provided only as guides. Proper calibration requires using a thermocouple table and a millivoltmeter connected in parallel with a stable low-voltage source. Use the following procedure to calibrate your relay.

Trip

1. Adjust the SET control fully clockwise (BE3-49TL) or fully counterclockwise (BE3-49TH). Adjust the DELAY control fully counterclockwise. Apply nominal external operating power to the relay.
2. Apply a value of millivolts that corresponds to the desired temperature trip level.
3. Slowly adjust the SET control until the relay trips.

Overtemperature Delay

1. Set the DELAY control at the desired time setting. Apply nominal external operating power to the relay.
2. Apply a value of voltage that is just above the trip setpoint. Measure the time from when the voltage is applied until the relay trips.

3. Compare the measured time delay to the desired time delay and adjust the DELAY control accordingly.
4. Repeat Steps 2 and 3 as required.

Undertemperature Delay

1. Set the DELAY control at the desired time setting. Apply nominal external operating power to the relay.
2. Apply a value of voltage that is above the trip setpoint. Remove the applied voltage and measure the time from when the voltage is removed until the relay trips.
3. Compare the measured time delay 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.

ORDERING INFORMATION

Figure 2 shows the BE3 thermocouple temperature relay style chart.

- BE3-49TH - Overtemperature
- BE3-49TL - Undertemperature

FIGURES

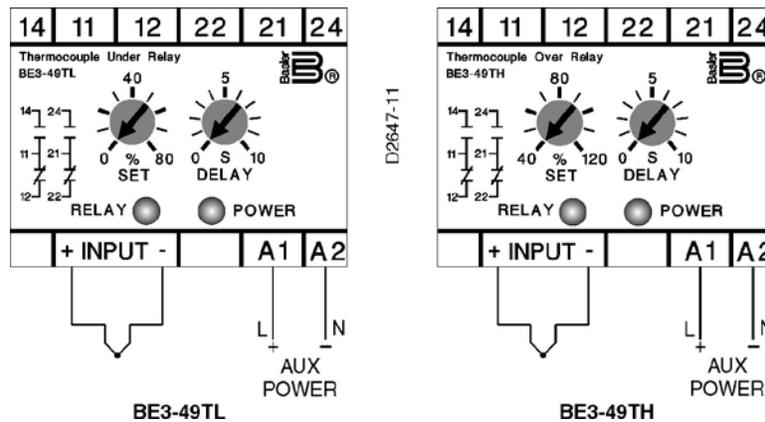


Figure 1. BE3-49TL and BE3-49TH Thermocouple Temperature Relay Connections

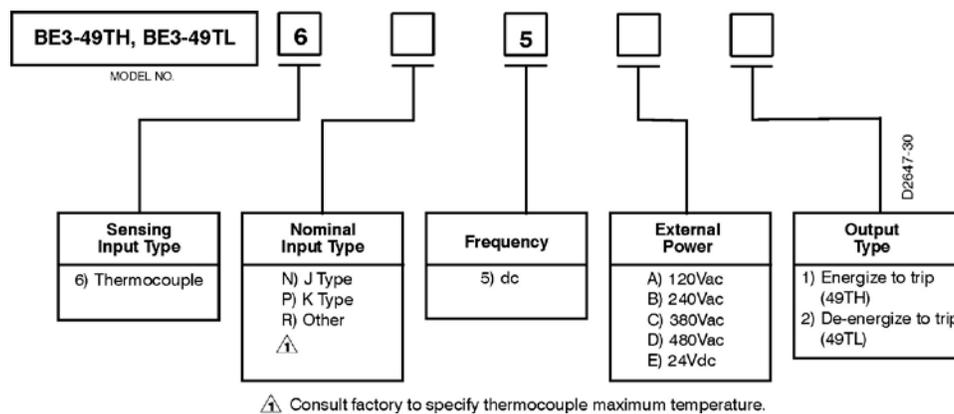


Figure 2. BE3-49TH and BE3-49TL Style Number Identification Chart