

INTRODUCTION

BE3 ac voltage relays provide voltage monitoring and protection in both single-phase and three-phase systems. They are used in applications such as utility mains failure, regulation of power supplies, and to protect voltage sensitive equipment. Undervoltage, overvoltage, and combined over/undervoltage units are available. BE3 ac voltage relays operate when the adjustable trip point is reached. An external time delay control is provided with an adjustment of 0 to 10 seconds (relay operating time is typically 200 milliseconds). This time delay may be used to prevent false tripping when there are slight variations in the voltage supply. On overvoltage units, the output relay energizes when the input signal exceeds the trip point. On undervoltage units, the output relay de-energizes when the input signal goes below the trip point. A red LED indicates the state of the relay. A green LED indicates the condition of the power supply.

SPECIFICATIONS

Inputs

All units are self powered.

Nominal Voltage:	120 Vac, 240 Vac, 380 Vac, or 480 Vac
Overload Withstand:	1.25 times nominal continuously. 2 times nominal for 3 s.
Frequency:	50, 60, or 400 Hz
Burden:	<2.5 VA per phase on single units and <3 VA on combined units

Setpoint

Undervoltage Range:	Adjustable 75 to 100% ($\pm 3\%$) of nominal
Overvoltage Range:	Adjustable 100 to 125% ($\pm 3\%$) of nominal
Repeatability:	Better than 0.5% of full span
Time Delay:	Adjustable 0 to 10 seconds
Operating Time:	200 ms typical
Differential:	Fixed 1% of nominal

Outputs

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
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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

Single Function:	0.88 lb (0.4 kg)
Multiple Function:	1.32 lb (0.6 kg)

Size

Single Function:	2.17" wide (55 mm)
Multiple Function:	3.93" wide (100 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

BE3-27T and BE3-59T ac voltage relays have two external, user-adjustable controls marked SET and DELAY. The BE3-27T/59T has four controls: UNDER SET, OVER SET, UNDER DELAY, and OVER DELAY. The SET control adjusts the relay trip point. An overvoltage trip causes the relay output to energize when the voltage rises above the SET threshold. The overvoltage SET level is adjustable from 100 to 125% ($\pm 3\%$) of nominal input (V_{nom}). An undervoltage trip causes the relay output to de-energize when the voltage decreases below the SET threshold. The undervoltage SET level is adjustable from 75 to 100% ($\pm 3\%$) of nominal input. Time delay is the amount of time that elapses after the trip point is reached and when the output relay operates.

Setting Example: a BE3-59T relay with a nominal input rating of 240 Vac has the following settings:

- SET - 120%
- DELAY - 4 seconds

A trip occurs when the sensing voltage rises above 288 Vac and 4 seconds elapses. Reset occurs when the voltage decreases below 285.6 Vac (1% of nominal below setpoint).

INSTALLATION

BE3 ac voltage 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 BE3-27T, BE3-59T, and BE3-27T/59T relays.

CALIBRATION

The calibration marks on the faceplate have a maximum error of 10% and are provided only as guides. Proper calibration requires using an accurate voltmeter in parallel with the input signal. Use the following procedure to calibrate your relay.

Overvoltage

1. Adjust the SET control fully clockwise (CW) and the DELAY control fully counterclockwise (CCW).
2. Apply the desired trip voltage to the relay.
3. Slowly (allow for the 200 ms operating time) adjust the SET control CCW until the relay trips.
4. Reduce the applied voltage (do not change the voltage level) and set the DELAY control to the desired time delay.
5. Apply the trip voltage to the relay and measure the time to trip.

- Adjust the DELAY and repeat Steps 4 and 5 until you have the desired time delay.

Undervoltage

- Adjust the SET and DELAY controls fully CCW.
- Decrease the applied sensing voltage from the nominal value until the desired tripping voltage is reached.
- Slowly adjust the SET control CW until the relay trips (allow for the 200 ms operating time).
- Set the DELAY control to the desired time delay and apply nominal voltage to the relay.

- Step down the applied voltage from nominal to a level just below the trip level set in Step 3 and measure the time delay.
- Adjust the DELAY and repeat Steps 4 and 5 until the desired time delay is achieved.

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 style number identification chart.

FIGURES

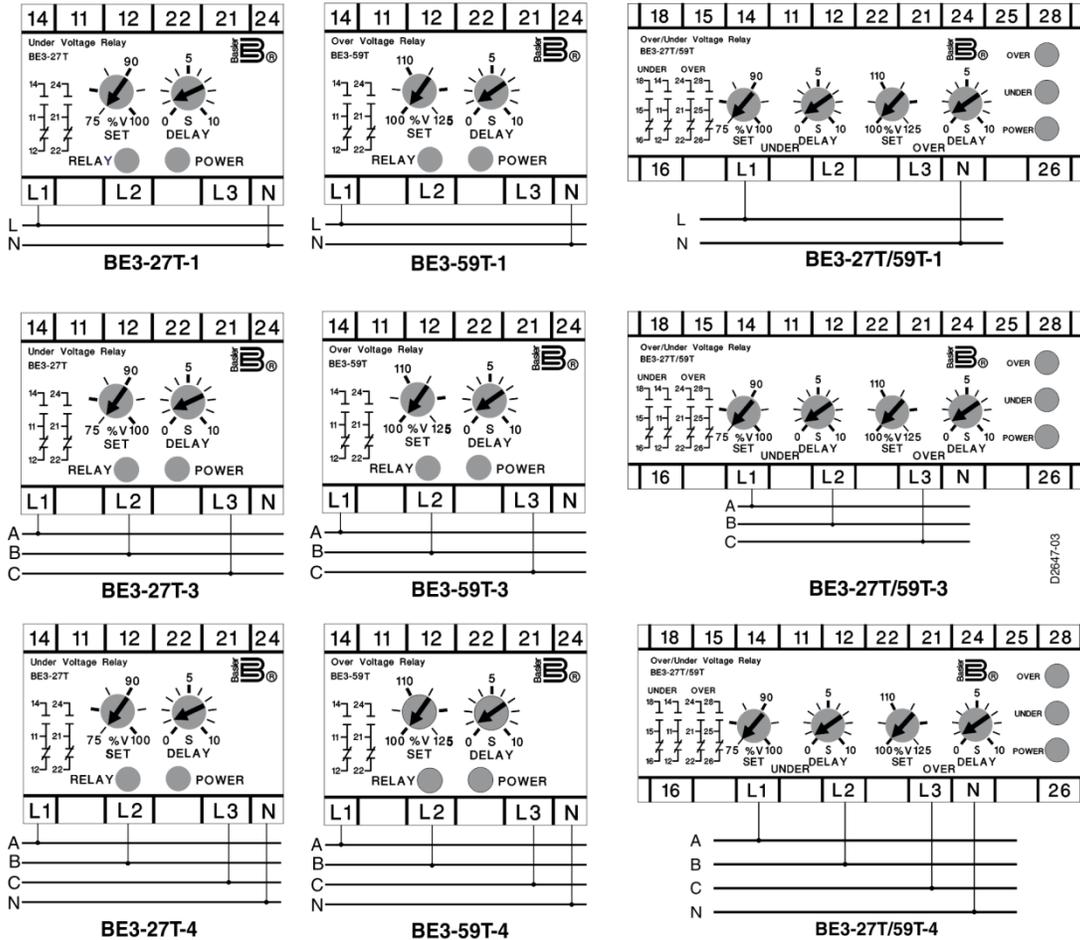


Figure 1. BE3-27, BE3-59, BE3-27/59 AC Voltage Connections

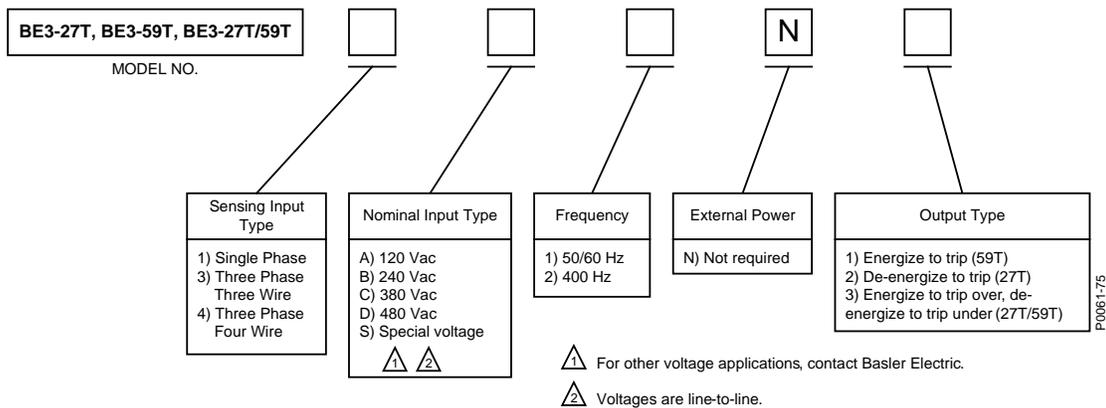


Figure 2. BE3-27, BE3-59, BE3-27/59 Style Number Identification Chart