# INSTRUCTIONS
FOR
# AC VOLTAGE RELAYS
# BE3-27T, BE3-59T, and BE3-27T/59T

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## 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 externally 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.

## ELECTRICAL SPECIFICATIONS

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

### INPUT

All units are self powered. Nominal line-to-line voltage - 120 Vac, 240 Vac, 380 Vac, 480 Vac. For other nominal voltages, contact Basler Electric

### Frequency

50 / 60 Hz or 400 Hz

### Burden

Less than 2.5 VA per phase on single units. Less than 3 VA per phase on combined units.

### Overload

1.5 times nominal continuously. 2 times nominal for 3 seconds.

### SETPOINT

| | |
|---|---|
| Range Undervoltage | Adjustable 75% to 100% of nominal |
| Range Overvoltage | Adjustable 100% to 125% of nominal |
| Repeatability | Better than 0.5% of full span |
| Time Delay | Adjustable 1 to 10 sec |
| Operating Time | 200 ms Typical |
| Differential | Fixed 1% of nominal |

### 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 |

## 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 Unit | 0.88 lbs. (0.4 kg) |
| Combined Unit | 1.32 lbs. (0.6 kg) |
| Size | |
| Single Unit | 2.17" wide (55 mm) |
| Combined Unit | 3.93" wide (100 mm) |
| Case Material | Complies with UL 94VO |

## 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, UNDER DELAY, OVER SET, 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% 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% 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 sec

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 input connections for the BE3-27T, BE3-59T, and BE3-27T/59T relays.

## CALIBRATION

The calibration marks on the face plate 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 counter-clockwise (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. Remove 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.
6. Adjust the DELAY and repeat steps 4 and 5 until you have the desired time delay.

UNDERVOLTAGE

1. Adjust the SET control fully CCW and the DELAY control fully CCW.
2. Decrease the applied sensing voltage from the nominal value until the desired tripping voltage is reached.
3. Slowly adjust the SET control CW until relay trips (allow for the 200 ms operating time).
4. Set the DELAY control to the desired time delay and apply nominal voltage to the relay.
5. Step down the applied voltage from nominal to a level just below the trip level set in Step 3 and measure the time delay.
6. 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.

## BE3 AC VOLTAGE RELAYS

Figure 2 shows the BE3 style number identification chart.

| Publication: | Rev | | First Printing | 02/98 | Copyright |
|---|---|---|---|---|---|
| 9 3195 00 990 | B | Basler Electric | Revised | 06/98 | 1998 |

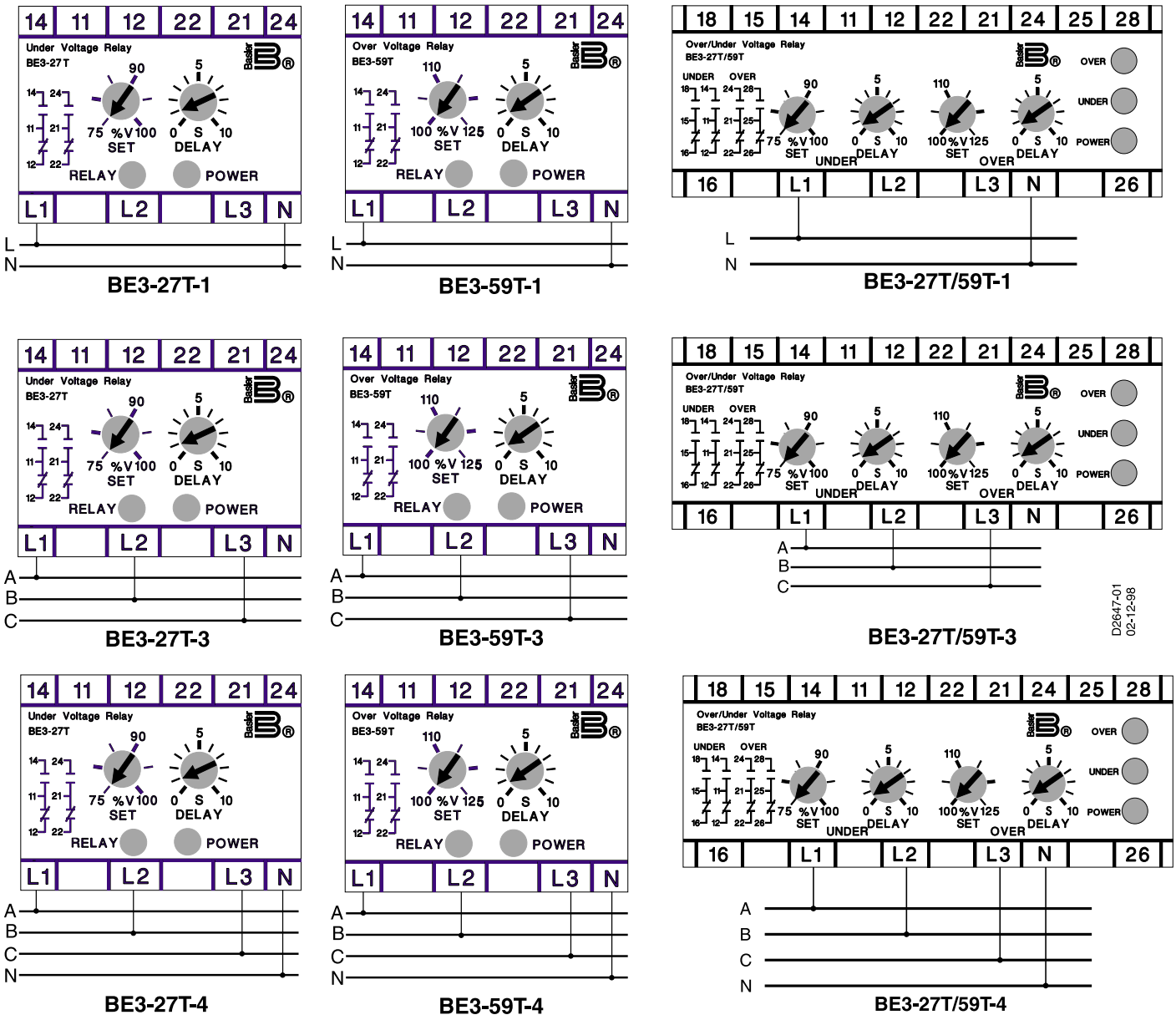


*Figure 1. BE3-27T, BE3-59T, BE3-27T/59T AC Voltage Connections*

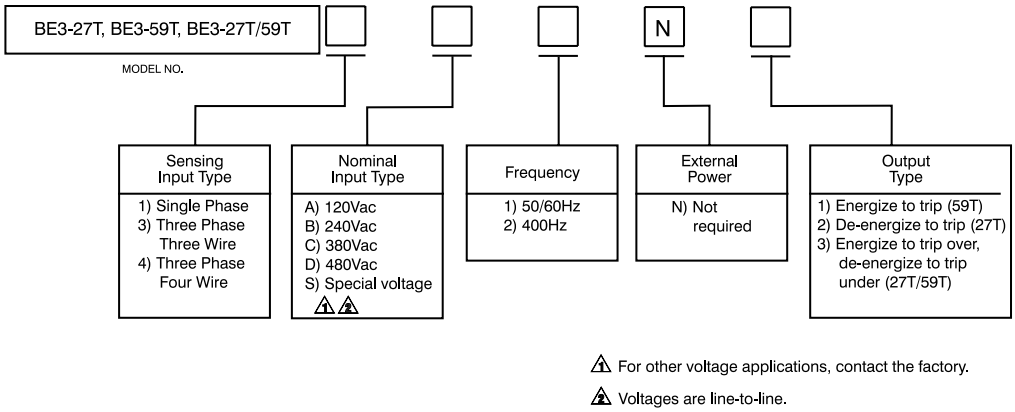


*Figure 2. BE3-27T, BE3-59T, BE3-27T/59T Style Number Identification Chart*