INSTRUCTIONS
FOR
FREQUENCY RELAYS
BE3-81OT, BE3-81UT, and BE3-81OT/UT

Basler Electric
Phone 618 654-2341
Route 143 Box 269
Highland IL 62249 USA

Power Systems Group
Fax 618 654-2351
http://www.basler.com
info@basler.com

INTRODUCTION

BE3 frequency relays provide frequency 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 generators against over or under speeds. Underfrequency, overfrequency and combined over/underfrequency units are available. BE3 frequency 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 over-frequency units, the output relay energizes when the input signal exceeds the trip point. On underfrequency 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 voltage - 120 Vac, 240 Vac, 380 Vac, 480 Vac. For other nominal voltages, contact Basler Electric

Frequency

50 Hz, 60 Hz, or 400 Hz

Burden

Less than 2.5 VA per phase.

Overload

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

SETPOINT

Range Overfrequency	
50 Hz Nominal	Adjustable 40 to 60 Hz
60 Hz Nominal	Adjustable 50 to 70 Hz
400 Hz Nominal	Adjustable 360 to 440 Hz
Range Underfrequency	
50 Hz Nominal	Adjustable 40 to 60 Hz
60 Hz Nominal	Adjustable 50 to 70 Hz
400 Hz Nominal	Adjustable 360 to 440 Hz
Time Delay	Adjustable 0 to 10 sec
Repeatability	Better than 0.5% of full span
Differential	Fixed 1% 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 94VO

OPERATION

BE3-81O and BE3-81U, frequency relays have two external, user adjustable controls marked SET and DELAY. The BE3-81O/U has four controls: UNDER SET, OVER SET, UNDER DELAY, and OVER DELAY. Each SET control adjusts a relay trip point. An overfrequency trip causes the relay output to energize when the frequency rises above the SET threshold. An underfrequency trip causes the relay output to de-energize when the frequency decreases below the SET threshold. Refer to the *SETPOINT* specifications for overfrequency and underfrequency adjustment ranges. Time delay is the amount of time that elapses after the trip point is reached and when the output relay operates.

Setting Example

A BE3-81OT relay with a nominal input rating of 60 hertz has the following settings:

SET - 65 Hz
DELAY - 2 sec

A trip will occur when the sensed frequency rises above 65 hertz and 2 seconds elapse. The relay will reset when the frequency decreases below 64.4 hertz (1% of nominal below the setpoint).

INSTALLATION

BE3 frequency 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 BE3-81OT, BE3-81UT, and BE3-81OT/UT 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 frequency meter in parallel with the input signal. Use the following procedure to calibrate your relay.

OVERFREQUENCY

1. Adjust the SET control fully clockwise and the DELAY control fully counterclockwise.
2. Apply the desired trip frequency to the relay.
3. Slowly (allow for the 200 ms operating time) adjust the SET control counterclockwise until the relay trips.
4. Set the DELAY control to the desired time delay and apply nominal frequency to the relay.
5. Apply trip frequency to the relay and measure the time to trip.
6. Adjust the DELAY and repeat steps 4 and 5 until the desired time delay is achieved.

UNDERFREQUENCY

1. Adjust the SET and DELAY controls fully counterclockwise.
2. Decrease the applied frequency from the nominal value until the desired tripping frequency is reached.
3. Slowly adjust the SET control clockwise until the relay trips.
4. Set the DELAY control to the desired time delay and apply nominal frequency 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 FREQUENCY RELAYS

Figure 2 shows the BE3 style number identification chart.

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9 3218 00 990	A	Basler Electric	Revised	04/98	1998

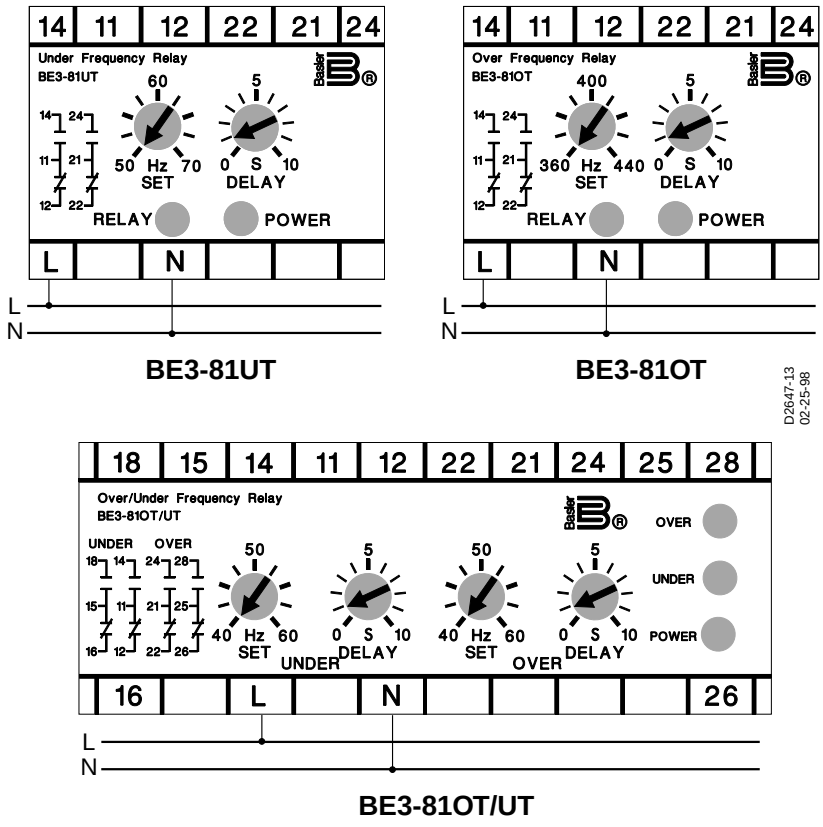

Figure 1. BE3-81OT, BE3-81UT, And BE3-81OT/UT Input Connections

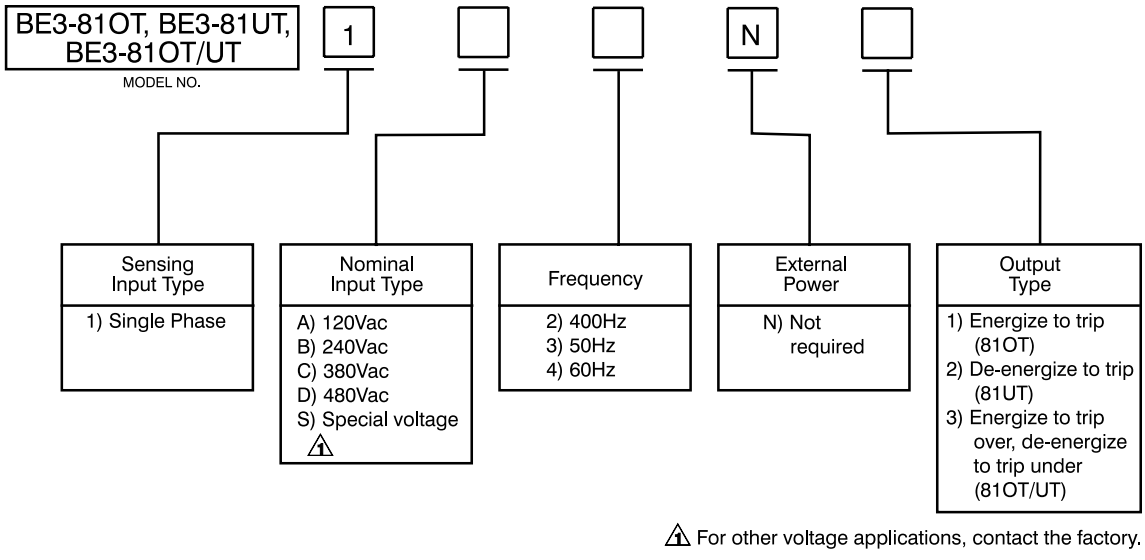

Figure 2. BE3-81OT, BE3-81UT, And BE3-81OT/UT Style Number Identification Chart