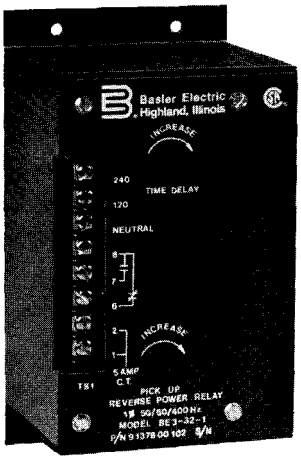
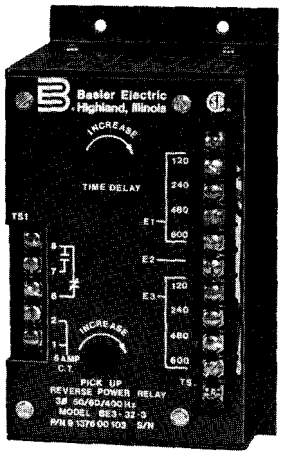
CLASS 300 EQUIPMENT
BE3-32
REVERSE POWER RELAY

DEVICE NUMBER: 32



BE3-32-1
(1 Phase)



BE3-32-3
(3 Phase)

APPLICATION:

The BE3-32 Reverse Power Relay is designed to protect the prime mover of a paralleled generator that has lost prime mover torque from a power reversal and subsequent “motoring”. The relay also protects against a power reversal caused by a frequency increase of the other paralleled power source. The relay is applicable to three phase, 50, 60 and 400 Hz power systems.

FEATURES:

- Reliable solid-state design.
- Adjustable pickup sensitivity.
- Adjustable time delay.
- Two models: for single phase sensing and three phase sensing. Both with either AC or DC output contacts.
- Designed for use on 50, 60 or 400 Hz systems.
- Can be used to monitor current flow.
- Automatic reset.
- Low input burden.
- Rugged construction.
- Available from stock.
- CSA certified, UL recognized.

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INSTRUCTION MANUAL
Reference Publication Number 9 1376 00 990

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DESCRIPTION:

The relay monitors the generator current and voltage to detect a reverse power condition, signified by an incorrect magnitude and phase angle between the current and voltage. When a power reversal exceeds a predetermined pickup level, and still exists after a preselected time period, an output relay is energized to open the generator circuit breaker or actuate an alarm. The inverse time delay characteristic curves of Figure 1 are used to determine the pickup point and time delay within the limits of the specified sensed nominal voltage. The relay provides an adjustable control with a pickup range of 0.10 to 1.67 amperes minimum at 180° phase angle between voltage and current, and an inverse time delay control with an adjustment range of .2 - 4 seconds at two times the pickup value. Both screwdriver controls are continuously variable over their full range and are front panel mounted for easy access. Reset of the relay is automatic following correction of the reverse power condition. The relay is solid state throughout (except for the output relay) and employs components selected for their reliability in order to ensure long life and trouble-free performance.

SPECIFICATIONS:

- **INPUT:**
  Voltage (BE3-32-1):
  1 phase, 50 Hz, nominal 100-133/220-240 Vac ±10%

  1 phase, 60/400 Hz, nominal 120-139/208-240-277 Vac ±10%

  Voltage (BE3-32-3):
  3 phase, 50 Hz, nominal 100-110-133/190-200-240/380-400-415/500 Vac ±10%

  3 phase, 60/400 Hz, nominal 120-139/208-240/416-450-480/600 Vac ±10%

  Voltage Burden: 10VA per phase

  Current (Max. Continuous): 6 amperes

  Current Burden: 0.10 ohm

  Overload Current: 12 amperes for 38 seconds, 65 amperes for 1 second, over the frequency range of 45-440 Hz.

- **OUTPUT:** SPDT relay contacts

Voltage	BE3-32-1A BE3-32-3A	BE3-32-1D BE3-32-3D
120 Vac	10A	---
28 Vdc	5A	10A, Resistive
125 Vdc	---	1A, Resistive

- **REVERSE POWER MEASUREMENT:** Current magnitude and phase angle with respect to sensing input voltage (I cosϕ).

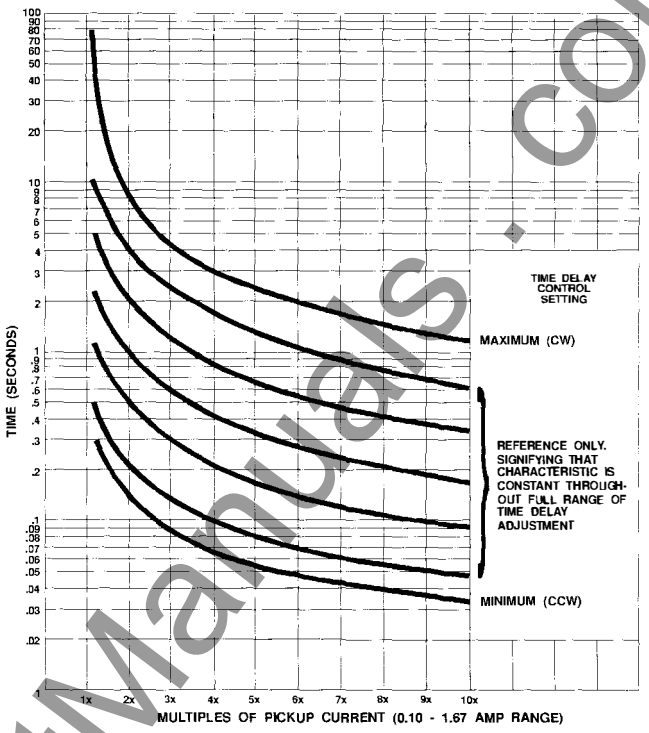

FIGURE 1. INVERSE TIME DELAY CHARACTERISTIC CURVES

- **PICKUP ADJUST LIMITS:** 0.10 to 1.67 amperes minimum with a 180° phase angle between voltage and current, and within the limits of the specified sensed nominal voltage.

- **TIME DELAY ADJUST LIMITS:** Within limits of inverse time delay characteristics shown in Figure 1.

- **SHOCK:** Withstand 15 Gs in each direction.

- **VIBRATION WITHSTAND CAPABILITY:**

Frequency	Acceleration
5-26 Hz	1.36G
26-52 Hz	0.036 in. displacement
52-260 Hz	5G

- **OPERATING TEMPERATURE:** -40°C to +50°C* (-40°F to +122°F).

- **STORAGE TEMPERATURE:** -65°C to +85°C (-85°F to +185°F).

- **DIMENSIONS:**
  BE3-32-1: 8.00" (203.19mm) x 4.25" (107.95mm) x 4.125" (104.77mm)
  BE3-32-3: 8.00" (203.19mm) x 4.25" (107.95mm) x 4.750" (120.65mm)

- **FINISH:** Dark grey, lusterless, textured, baked enamel.

- **WEIGHT:** (BE3-32-1) 3.5 lbs. net, 4.5 lbs. shipping; (BE3-32-3) 5.25 lbs. net, 6.25 lbs. shipping.

* Maximum operating temperature is 70°C (+158°F) without UL recognition.

HOW TO ORDER:

WHEN THE RELAY IS TO BE USED WITH:	ORDER:
SINGLE PHASE SENSING	BE3-32-1DC OR BE3-32-1AC
THREE PHASE SENSING	BE3-32-3DC OR BE3-32-3AC

SAMPLE SPECIFICATION:

Protection from damage, caused by reverse power into the generator of the three phase power generating system, shall be accomplished by the use of a Reverse Power Relay. The relay shall incorporate single phase sensing to detect the power reversal and remove the generator from the bus. The relay shall be capable of operation on a nominal 120 volt (or 139, 240 or 277) single phase, 60 hertz power source. It shall be easily mounted directly on the generator and be capable of withstanding 5 Gs at 60 hertz. The relay shall provide adjustable pickup sensitivity between 0.10 and 1.67 amperes and an adjustable time delay between 0.2 and 4.0 seconds at twice the pickup input value. It shall include an automatic reset. The output contacts shall be rated at 10 amperes at 120 Vac.

The Reverse Power relay shall be Basler Electric Company Model BE3-32-1AC Reverse Power relay, part number 9 1376 00 102.

NOTE:
1 INPUT CONNECTIONS

FREQ (HZ)	NOM. V. ±10% (VAC)	TERMINAL
50	100 - 133	120
	220 - 240	240
60/400	120 - 139	120
	208 - 240 - 277	240

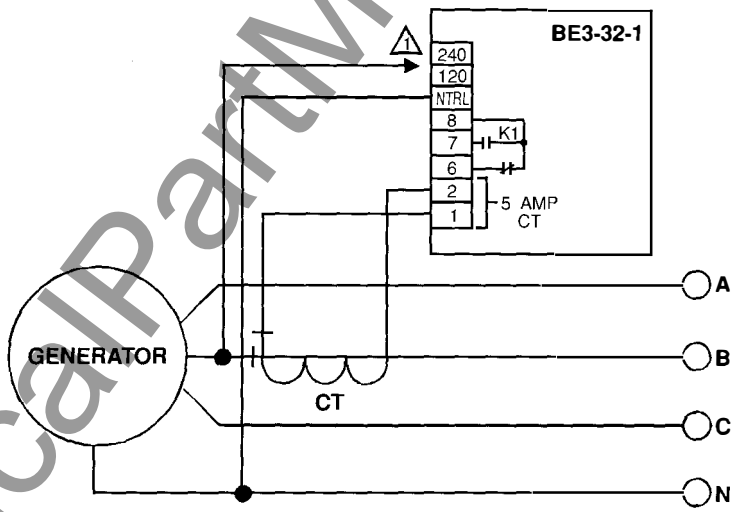

FIGURE 2. SINGLE PHASE, LINE-TO-NEUTRAL, SENSING (BE3-32-1) INTERCONNECTION DIAGRAM

NOTE:
1 INPUT CONNECTIONS

FREQ (HZ)	NOM. V. ±10% (VAC)	TERMINAL
50	100 - 110 - 133	120
	190 - 200 - 240	240
	380 - 400 - 415	480
	500	600
60/400	120 - 139	120
	208 - 240	240
	416 - 450 - 480	480
	600	600

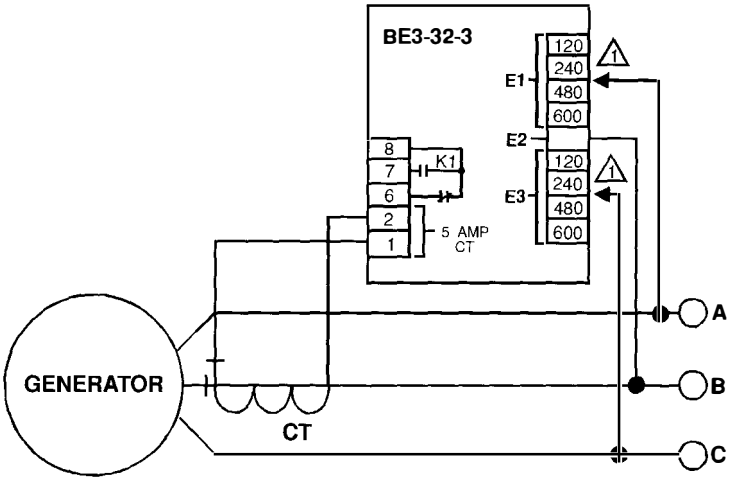

FIGURE 3. THREE PHASE, LINE-TO-NEUTRAL, SENSING (BE3-32-3) INTERCONNECTION DIAGRAM

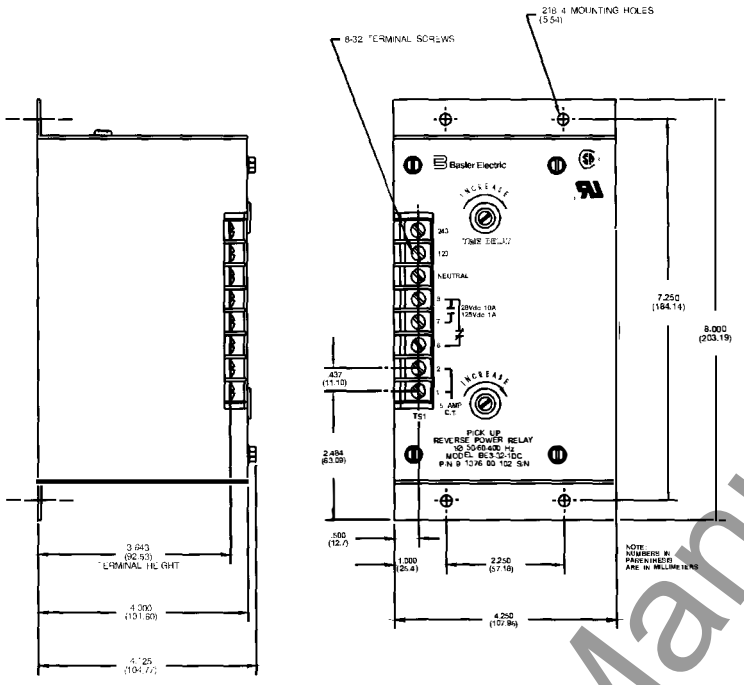

FIGURE 4. BE3-32-1 OUTLINE DRAWING

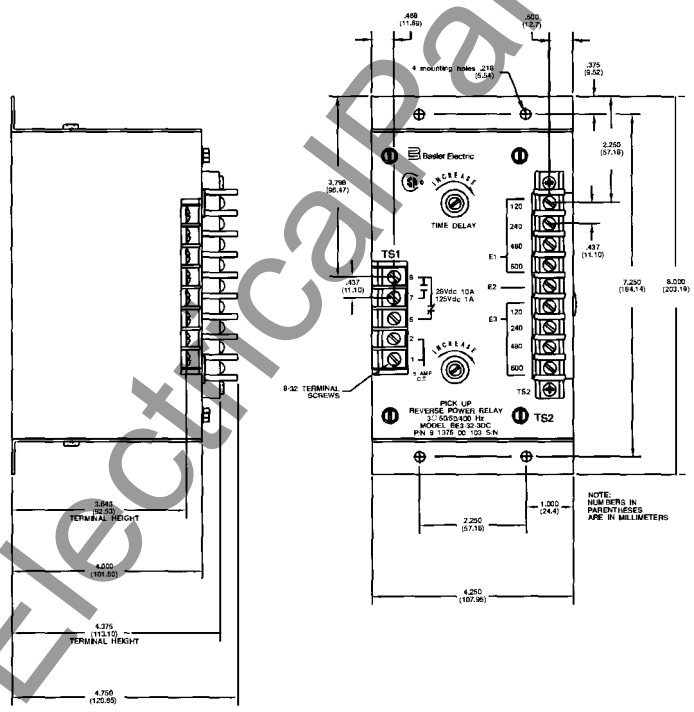

FIGURE 5. BE3-32-3 OUTLINE DRAWING

NOTES: 1. Dimensions in parentheses are in millimeters.
2. All drawings and data subject to change without notice.

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