

BE1-59NC CAPACITOR NEUTRAL OVERVOLTAGE RELAY

The BE1-59NC Capacitor Neutral Overvoltage Relay provides sensitive protection for capacitor banks.

ADVANTAGES

- Helps avoid cascading capacitor failures.
- Sensing circuit rejects harmonics and noise to achieve higher sensitivity to 50/60 Hz neutral voltage.
- Includes an early warning alarm output on minor unbalances such as a blown fuse.
- Can be set to trip when voltage across any capacitor exceeds 110% of nominal.

ADDITIONAL INFORMATION

INSTRUCTION MANUAL

Request publication 9-2794-00-990

BASLER RELAY STANDARDS, DIMENSIONS, ACCESSORIES

Request bulletin SDA

FEATURES
Page 2

APPLICATION
Page 2

**FUNCTIONAL
DESCRIPTION**
Pages 3-4

SPECIFICATIONS
Pages 4-5

ORDERING
Page 6

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FEATURES

- Response to harmonics is only one-hundredth of 50/60 Hz response.
- Pickups may be set down to 1% of full scale input voltage.
- Available with either inverse or definite timing characteristics.
- Low burden - 2VA at nominal input.
- Available for nominal inputs of 120 or 240 Vac.
- Alarm and trip outputs.
- Interference rejection to RFI, SWC and Fast Transient.

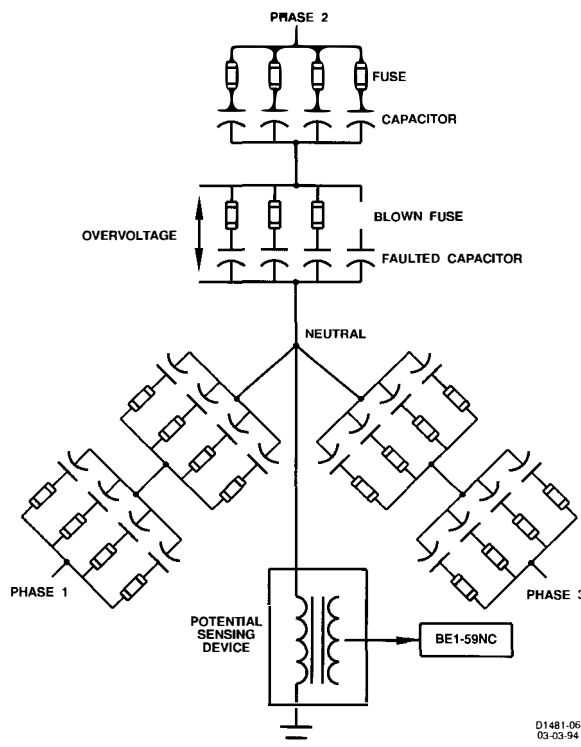
APPLICATION

The BE1-59NC relay is used for alarming or minor capacitor bank imbalances (such as those caused by a fuse blowing) and for tripping before the imbalance threatens cascading capacitor failures.

The relay is connected to sense the neutral voltage as shown in Figure 1.

The relay may be set to pickup within one percent of a nominal 120 or 240 Vac input. Such sensitive settings would be used for alarming. Higher pickup values are used for tripping, and should be made to trip before the voltage across a parallel section of the bank reaches 110% of nominal rating.

The settings for a single blown fuse as used for alarming and the number of uses that must be blown on a parallel section to reach 110% of nominal voltage for tripping must be calculated for each capacitor bank configuration. There are many configurations, of which Figure 1 is only one example.



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Figure 1 - Three Phase Bank

FUNCTIONAL DESCRIPTION

BE1-59NC relays are solid state relays requiring an external power supply source (AC or DC). The block diagram shown in Figure 2 illustrates the various functions in the relay.

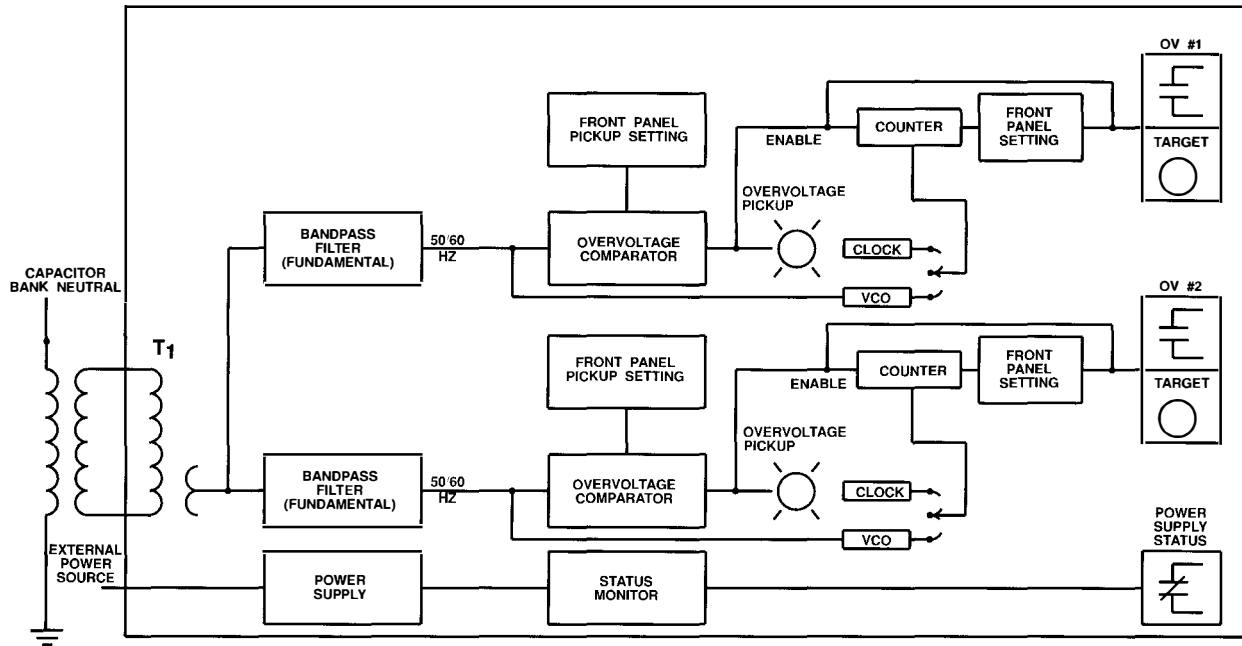


Figure 2 - Functional Block Diagram

Capacitor neutral voltage is dropped to a full scale level of 120 or 240 volts by using a transformer connected to the capacitor bank neutral. The full scale voltage corresponds to the phase-to-neutral voltage divided by the transformer ratio. The relay presents a negligible load on the transformer with only 2 VA burden.

The isolation transformer within the relay (T_1) drops the voltage level for electronic signal processing. Two signals are split off T_1 . One is for the alarm section, and one is for the trip section. They are identical except that different timing characteristics may be used in each section.

The overvoltage comparators are used to compare the input with front panel pickup settings. When the input is greater than the settings, the overvoltage pickup indicators illuminate and timing begins.

FUNCTIONAL DESCRIPTION

(continued)

Voltage controlled oscillators (VCO) are used in conjunction with clocks and counters to provide the timing characteristics (Inverse or Definite) desired for each section. The characteristics desired are specified by the relay style number as given on page 6.

Overvoltage outputs OV#1 and OV#2 may be either an overvoltage alarm or overvoltage trip. Both are equipped with targets which may be operated by trip current or internal circuitry. This is a style chart selection.

Auxiliary relays may also be selected when completing the style chart.

A rear view of the relay showing terminal blocks and internal circuits for a unit with two SPDT auxiliary output relays is shown in Figure 3.

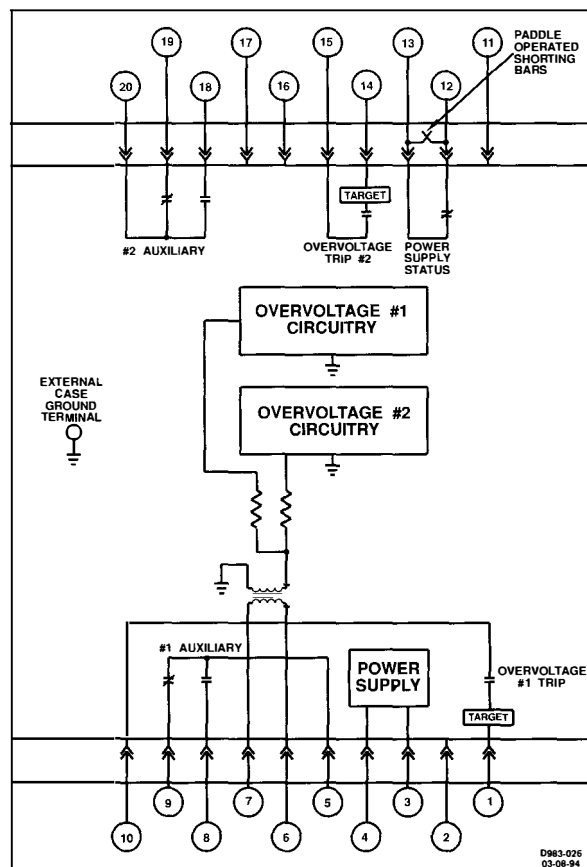


Figure 3 - BE1-59NC With 2 AUX Relays

SPECIFICATIONS

INPUT RANGES AND PICKUP LEVELS

Input Range	Pickup
120 Vac, 60 Hz	1-20 V
120 Vac, 60 Hz	10-50 V
240 Vac, 60 Hz	2-40 V
240 Vac, 60 Hz	20-100 V

Input ranges for 50 Hz models are 100 V and 200 V.

HARMONIC REJECTION

Response is down 40db or more.

BURDEN

2 VA maximum at nominal input.

TIMING CHARACTERISTICS

Inverse: See Instruction Manual for curve. Two thumbwheels provide time dial settings of 00 to 99 in 01 increments. Setting 00 provides instantaneous operation.

Definite: This is a flat fixed time independent of input current. Three thumbwheels provide time dial settings of 0.00 to 9.99 in 0.01 increments. Setting 0.00 provides instantaneous operation. Time dial settings correspond to actual time in seconds to 2 decimal places.

Timing Accuracy: $\pm 5\%$ or 25ms, whichever is greater.

SPECIFICATIONS

(continued)

POWER SUPPLY

Type per Style Chart	Nominal Input Voltage	Input Voltage Range	Burden at Nominal
J	125 Vdc	62 to 150 Vdc	7.5 W
	120 Vac	90 to 132 Vac	15.0 W
K	48 Vdc	24 to 60 Vdc	7.0 W
L	24 Vdc	14 to 32 Vdc	7.5 W
Y	48 Vdc/	24 to 60 Vdc	7.0 W
	125 Vdc Selectable	62 to 150 Vdc	7.5 W
Z	250 Vdc	140 to 280 Vdc	12.0 W
	230 Vac	190 to 270 Vac	33.5 VA

OUTPUT CONTACTS

Resistive: Make and carry 30 A for 0.2 seconds, carry 3 A continuously and break 0.3 A at 125/250 Vdc.

Inductive: Same as resistive, with L/R up to 0.04.

TARGETS

Magnetically latched, manually reset on overvoltage outputs #1 and #2. Target coils are in series with the output contacts and require a minimum of 0.2 amperes to operate. Target coil resistance is 0.1 ohms.

ISOLATION

1500 Vac at 60 Hertz for one minute in accordance with IEC 255-5 and ANSI/IEEE C37.90-1989 (Dielectric Test).

RADIO FREQUENCY INTERFERENCE (RFI)

Field tested using a five watt, hand-held transmitter operating at random frequencies centered around 144 MHz and 440 MHz, with the antenna located six inches from the relay in both horizontal and vertical planes.

SURGE WITHSTAND CAPABILITY

Qualified to ANSI/IEEE C37.90.1-1989 *Standard Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems*.

OPERATING TEMPERATURE

-40°C (-40°F) to +70°C (+158°F).

STORAGE TEMPERATURE

-65°C (-85°F) to +100°C (+212°F).

SHOCK

In standard tests, the relay has withstood 15 g in each of three mutually perpendicular planes without structural damage or degradation of performance.

VIBRATION

In standard tests, the relay has withstood 2 g in each of three mutually perpendicular planes, swept over the range of 10 to 500 Hz for a total of six sweeps, 15 minutes each sweep, without structural damage or degradation of performance.

WEIGHT

13.6 pounds maximum.

CASE SIZE

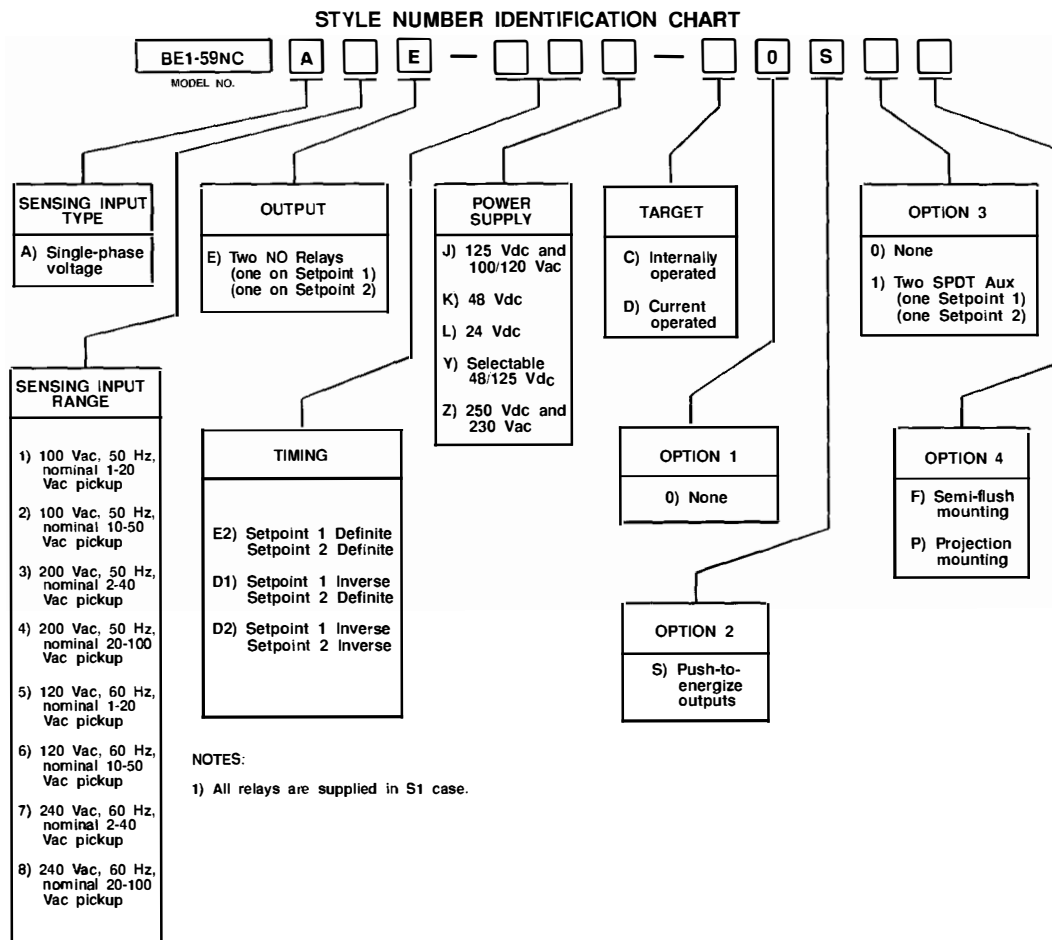
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TABLE 1. *Continued*

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NOTES

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