

Application Note

How to Select the Appropriate BE1-50/51B Model for IAC or CO Replacement

Basler Electric produces a number of “equivalent” time overcurrent relays designed to replace existing GE-type IAC and Westinghouse-type CO time overcurrent relays. The selection of the appropriate BE1-50/51B model is often confusing because of the combination of connections, time overcurrent ranges, time characteristic and instantaneous overcurrent ranges to be replaced. Often, this information hides in plain sight on the nameplate of the relay to be replaced, or it may be necessary to consult the setting sheet for the relay.

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Time Delay Characteristics

IAC and CO relays each contain a single characteristic. The Basler Electric BE1-50/51B contains 14 standard curves for IAC and CO relays, as well as two (2) British Standard Curves and a definite time choice. The operating characteristic curve for the BE1-50/51B is switch-selectable by the user. The table below lists the most popular IAC and CO characteristics and their equivalent BE1-50/51B characteristic switch selection position.

Characteristic	GE Model	Switch Position	Westinghouse Model	Switch Position
Inverse Time	IAC51	I2	CO-8	I1
Very Inverse Time	IAC53	V2	CO-9	V1
Extremely Inverse Time	IAC77	E2	CO-11	E1
Inverse - Short Time	IAC55	S2	CO-2	S1
Inverse - Long Time	IAC66	L2	CO-4	L1
Inverse - Long Time			CO-5	L1
Inverse - Moderate			CO-7	M1/M2
Inverse - Definite			CO-6	D1/D2

IAC and CO relays are designed to operate at either 60Hz or 50Hz. Basler BE1-50/51B relays may be used on either 50Hz or 60Hz systems. A circuit board selector is used to set the relay for 60Hz or 50Hz systems.

Time Overcurrent Setting Range

Older IAC relays were built with setting ranges with a 4:1 tap range; later designs expanded this to 8:1. For a majority of the models, the total tap adjustment span of ranges covers 0.5 to 16 Amps. A number of sensitive models have ranges of 0.1 to 0.4 or 0.15 to 0.6 Amps. IAC relays fit a standard S1 size case.

Typical older CO relays have setting ranges of 0.5 to 2.5 Amps, 2 to 6 Amps, and 4 to 12 Amps. Recent designs have ranges of 0.5 to 2.5 Amps and 1 to 12 Amps. Typical CO relays fit a standard FT11 case; a few styles require the standard FT21 case.

The 5 Amp BE1-50/51B units have a setting range of 0.5 to 15.9 Amps. This range is adjustable in increments of 0.1 Amp. The 1 Amp units cover the range of 0.1 to 3.18 Amps and are adjustable in increments of 0.02 Amp. Specific BE1-50/51B plug-and-play relays are designed to fit the S1, FT11 and FT21 cases with a terminal-for-terminal match.

Reset Characteristics

In the past, users were concerned about the reset characteristic of an electronic overcurrent relay when changing from electromechanical relays. Reset occurs when the current level is less than pickup. The BE1-50/51B has an internal switch that provides selection of either an instantaneous or a decaying reset characteristic.

The instantaneous reset characteristic forces the timer to zero when the input current falls below 95% of setting. This fast reset characteristic prevents the ratcheting effect on electromechanical relay disks that occurs for repeated faults.

The decaying reset characteristic replicates the decaying reset of electromechanical relay disks. When enabled, the relay will continue the decaying process even when the input current goes to zero.

Instantaneous Overcurrent Setting Range

IAC models may be provided with an instantaneous overcurrent element within the total setting range of 0.5 to 160 Amps. The elements included in an IAC relay will not have this total range and may have setting adjustment ranges of 3:1, 4:1 and 8:1 (0.5 to 1.5, 4 to 12, 1 to 4, 10 to 40, 0.5 to 4 and 10 to 80).

CO styles may be provided with an instantaneous overcurrent element within the total setting range of 0.25 to 144 Amps. The elements included in a CO relay will not have this total range and may have setting adjustment ranges from 2:1 through 24:1 (0.25 to 0.5, 1 to 2, 2 to 48, and 6 to 144).

One or two instantaneous overcurrent elements are available in the BEI-50/51B relays. The instantaneous elements within the BEI-50/51B are adjustable over the range of:

- 5 Amp units: 2 to 99 Amps
- 1 Amp units: 0.2 to 19.8 Amps

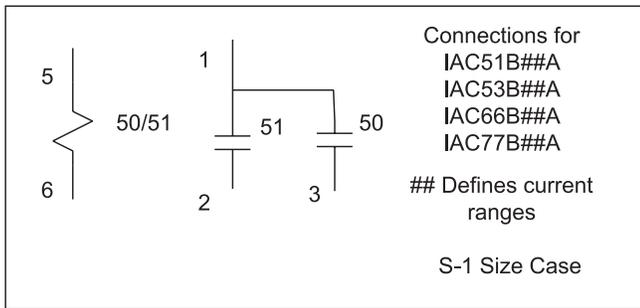


Figure 1 - BEI-50/51B-214 (5A), BEI-50/51B-225 (1A)

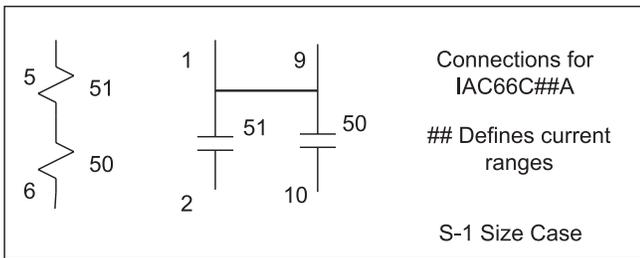


Figure 2 - BEI-50/51B-215 (5A)

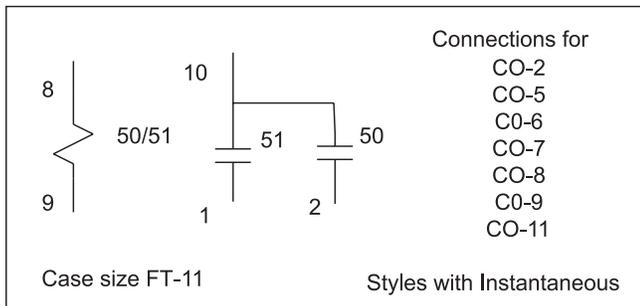


Figure 3 - BEI-50/51B-219 (5A), BEI-50/51B-226 (1A)

Some BEI-50/51B units can be equipped with a second instantaneous element. The pickup adjustment ranges for this element are:

- 5 Amp units: 1 to 15.9 Amps
- 1 Amp units: 0.2 to 3.18 Amps

Connections

Specific BEI-50/51B plug-and-play relays (dash numbers) are designed to fit in the installed S1, FT11 and FT21 cases with a terminal-for-terminal match. These connections and dash numbers are shown below. These units are supplied with a new cover or cover glass to permit the reset of targets.

For More Information

For more information on retrofit solutions, visit our web site at www.basler.com and download Bulletin UHK about the BEI-50/51B family.

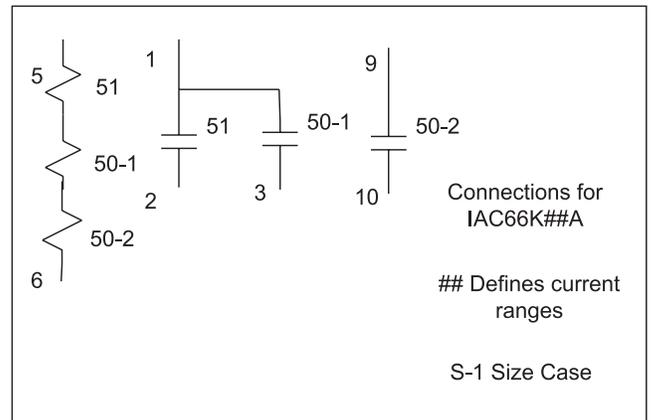


Figure 4 - BEI-50/51B-239 (5A)

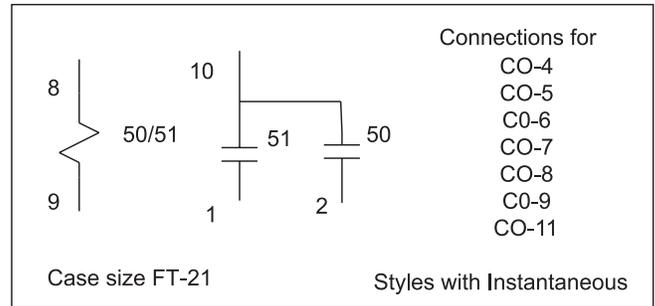


Figure 5 - BEI-50/51B-240 (5A)