

BE1-50/51B Self-Powered Time Overcurrent Relay



Overview

A single-phase, self-powered, microprocessor-based time/instantaneous overcurrent relay that provides cost-saving overload and fault protection for generators, transformers, feeders, and motors. Available in multiple-rack, panel, and retrofit mounting options.

Features

- Self powered from 50/60 Hz systems, available for 5-ampere or 1-ampere CT secondaries.
- Patented integrating reset characteristic, even when current goes to zero. Replicates electromechanical reset for all applications.
- Fifteen field-selectable, inverse, fixed time and British Standard (BS142) time overcurrent curves on 200 series relays (10 on 100 series).
- Wide setting ranges:
 - Time Overcurrent: 0.5 to 15.9 (5-ampere Unit)
0.1 to 3.18 (1-ampere Unit)
 - Inst. Overcurrent: 1 to 99 (5-ampere Unit)
0.2 to 19.8 (1-ampere Unit)
- Current pickup accuracy $\pm 2\%$.
- Timing accuracy $\pm 2\%$.
- Less than 10% transient overreach.
- 5 VA burden (at nominal) self powered from 50/60 Hz systems, utilizes standard 5-ampere or 1-ampere CT secondaries.

Benefits

- Accurate, repeatable, and reliable operation.
- No additional power source required because relays are self-powered from 50/60 Hz systems. Available in 5-ampere or 1-ampere CT secondary models.
- Timings can be tailored to the application with multiple field-selectable curves.
- Flexible pickup is continuously adjustable over a wide range.
- Instantaneous protection can be set lower to provide more complete protection with a design that minimizes transient overreach.
- Models available to replicate decaying reset of electromechanical relay disks when current drops to zero.
- Reduce CT costs with low sensing and supply burdens.
- Reduce maintenance labor by eliminating the need for recalibration.
- Testing is easy with drawout construction and in-case testability.

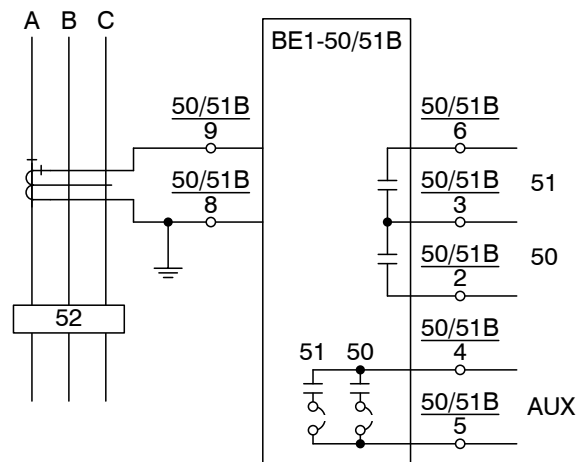


Figure 1 - BE1-50/51B Connection Diagram for a Typical Application

Specifications

Current Sensing

5 A Unit: 14 A continuous, 400 A 1-second
 1 A Unit: 2.8 A continuous, 80 A 1-second

Time Overcurrent (51) Element

Pickup:
 5 A Unit: 0.5 to 15.9 A in 0.1 A steps
 1 A Unit: 0.1 to 3.18 A in 0.02 A steps
 Accuracy: ±2%
 Dropout: 95% of pickup value
 Timing:
 Range: 0.0 to 9.9 s in 0.1 s steps
 Accuracy: Sum of ±1 cycle, ±2%

Curve Characteristics:

15 field selectable, inverse, fixed time and British Standard (BS142) time overcurrent curves on 200 series relays (10 on 100 series) can be selected by the front panel Curve switch.

Integrating Reset:

An instantaneous or integrating reset characteristic can be selected by the front panel SW3-4 switch.

Instantaneous Overcurrent (50) Element

Pickup:
 5 A Unit: 1 to 99 A in 1 A steps
 1 A Unit: 0.2 to 19.8 A in 0.2 A steps
 Accuracy: ±2%
 Dropout: 95% of pickup value

Curve Characteristics:

To avoid nuisance trips, the time to trip for ground applications is slightly longer. Otherwise, instantaneous characteristic curves are similar to electromechanical instantaneous units.

Frequency Response

<0.5% change in required pickup current with a ±5 Hz change from nominal 50/60 Hz current.

Transient Response

<10% overreach with system time constants up to 40 ms.

Harmonic Response

A relay set for 1 A pickup picks up at 0.96 A with a current containing 40% seventh harmonic. This corresponds to a 10:1 rejection ratio. Other conditions may be evaluated in the same manner.

Outputs

Resistive:
 120/240 Vac: Make and carry 30 A for 0.2 s, carry 7 A for 120 s, 3 A continuous, 5 A break
 125/250 Vdc: Make and carry 30 A for 0.2 s, carry 7 A for 120 s, 3 A continuous, 0.3 A break
 Inductive:
 120/240 Vac, 125/250 Vdc: Make and carry 30 A for 0.2 s, carry 7 A for 120 s, 3 A continuous, 0.3 A break (L/R=0.04)

Environmental

Operating Temp: -40°C to 70°C (-40°F to 158°F)
 Storage Temp: -50°C to 70°C (-58°F to 158°F)
 Isolation: IEEE C37.90
 Transient Surge: IEEE C37.90.1
 RFI: IEEE C37.90.2
 ESD: IEEE C37.90.3
 Vibration: IEC 255-21-1
 Shock: IEC 255-21-2

Agency/Certifications

UL (cURus) recognized for the USA and Canada.

Physical

Weight: 3.9 kg (8.6 lb)
 Dimensions (WxHxD):
 A1 Case, Semi-Flush Mount:
 6.65 x 7.57 x 6.19 inches
 (168.9 x 192.3 x 157.2 mm)
 S1 Case, Semi-Flush Mount:
 6.65 x 9.32 x 6.19 inches
 (168.9 x 236.7 x 157.2 mm)
 S1 Case, Projection Mount:
 6.65 x 9.32 x 8.59 inches
 (168.9 x 236.7 x 218.2 mm)

For complete specifications, download the instruction manual at www.basler.com.

ORDERING

How to Order: Designate the Model Number from the table below to define the desired configuration.

	Model Number	Case Style	SW3-3 Selects	Sensing Input Range (Amps)	
				TIME	INST
5 A System CT Secondaries	BE1-50/51B-105	A1	0.2 second delay	0.5 to 15.9	1.0 to 99.0
	BE1-50/51B-205	A1	Curve set	0.5 to 15.9	1.0 to 99.0
	BE1-50/51B-106	S1 (projection mount)	0.2 second delay	0.5 to 15.9	1.0 to 99.0
	BE1-50/51B-206	S1 (projection mount)	Curve set	0.5 to 15.9	1.0 to 99.0
	BE1-50/51B-107	S1 (semi-flush mount)	0.2 second delay	0.5 to 15.9	1.0 to 99.0
	BE1-50/51B-207	S1 (semi-flush mount)	Curve set	0.5 to 15.9	1.0 to 99.0
1 A System CT Secondaries	BE1-50/51B-101	A1	0.2 second delay	0.1 to 3.18	0.2 to 19.8
	BE1-50/51B-201	A1	Curve set	0.1 to 3.18	0.2 to 19.8
	BE1-50/51B-102	S1 (projection mount)	0.2 second delay	0.1 to 3.18	0.2 to 19.8
	BE1-50/51B-202	S1 (projection mount)	Curve set	0.1 to 3.18	0.2 to 19.8
	BE1-50/51B-103	S1 (semi-flush mount)	0.2 second delay	0.1 to 3.18	0.2 to 19.8
	BE1-50/51B-203	S1 (semi-flush mount)	Curve set	0.1 to 3.18	0.2 to 19.8

Related Products

BE1-FLEX Protection, Automation and Control System

Designed to be configurable for nearly any Power System Application.

Accessories

Cases, Covers, Connectors, Mounting, Misc.

Designed for adaptive customization with your protective device.

Test Plug

To allow testing of the relay without removing system wiring. Basler ElectricP/N 10095.