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Application Note

Electromechanical Overcurrent Motor Protection Relay Replacement Type IAC66K

In continuing to provide the protective relay market with the newest innovations for replacement units, Basler Electric is offering a microprocessor-based BE1-50/51B-230 as the exact replacement for the obsolete IAC66K relay. SThis series of Basler Electric overcurrent relays is designed to retrofit into the same case as the original relay. No changes in relay case wiring are necessary. If a new case is needed with the IAC66K replacement relay, the case can be installed into the same panel cutout as the original type S1 case.

A companion document, Application Note PC-5051B, details a project utilizing BE1-50/51B plug-and-play relays to replace aging electromechanical IAC- and CO-type relays. Download it from www.basler.com.

Description

The BE1-50/51B-230 relay is a single phase self powered (CT) digital overcurrent relay designed to replace the IAC66K relay. This relay is primarily used in motor protection. In addition to the standard long time curve possessed by the IAC66K relay for motor protection, the BE1-50/51B-230 has a total of 10 available time curves for customer selection. Refer to Figure 1 for a listing of all of the available time curves.

Each BE1-50/51B-230 relay consists of a time overcurrent unit (TOC), and two instantaneous units (IOC) connected internally to replicate the IAC66K relay functionality.

Application

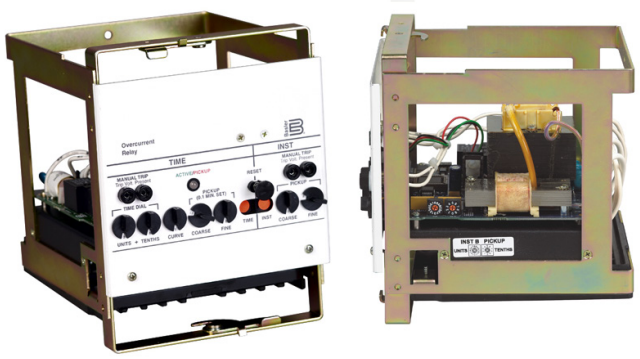
References to "high dropout" (50B) and "normal dropout" (50A) are terms used to describe the electromechanical inst elements. In reality, microprocessor-based inst units do not have the same limitations as their electromechanical counterparts and provide a pickup/dropout ratio of 95% or greater as compared to a high of 80% in the electromechanical version.

As previously stated, the BE1-50/51B-230, relay is a motor protection relay.

Curve Type

BE1	*Similar To*
S	GE IAC 55
L	GE IAC 66
D	ABB CO-6
M	ABB CO-7
I	GE IAC 51
V	GE IAC 53
E	GE IAC 77
B	BS142-B*
C	BS142-C*
F	None†

Figure 1 - Available Time Curves



BE1-50/51B-230 Overcurrent Protection Relay

The relay includes an instantaneous overcurrrent unit designated 50B, which is referenced as the high drop out IOC unit. This unit is used to distinguish between motor running overload and locked rotor current. This is accomplished by determining the setting of the 50B IOC unit so that the pickup is between motor full load current and locked rotor current.

The 50A unit (normal dropout unit) is set above the current level of locked rotor current. The time overcurrent unit, namely the 51 unit, must coordinate with the motor thermal limits. Determination of this setting must consider the service factor of the motor as given by the manufacturer or the nameplate data.

The user of this relay must determine the required settings for the three units of the BE1-50/51B-230 relay so that the motor is adequately protected. Refer to Figure 2 illustrating the motor protection curve and control circuitry. Also, consideration must be given to the NEC codes, as well as any local code requirements that may be in effect.

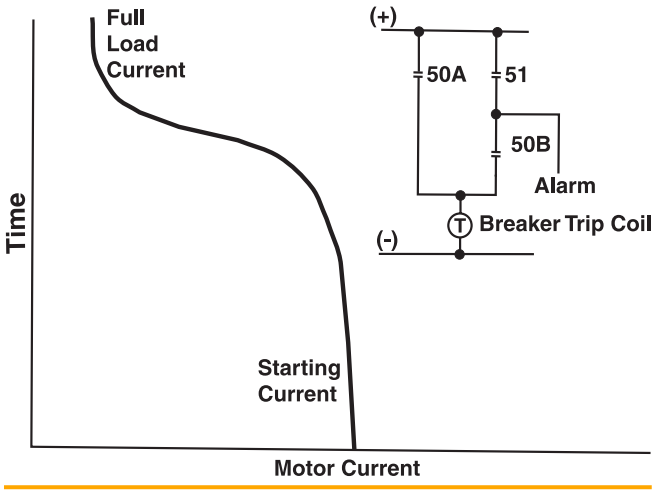


Figure 2 - Motor Protection Curve and Control Circuitry

Operation

The operation of the BE1-50/51B-230 relay is as follows:

For a motor overload condition, the time overcurrent unit 51 will pick up after timing out and give an alarm signal.

If a locked rotor condition prevails, the high drop unit 50B will pick up instantaneously and the 51 TOC unit will pick up after timing out (set to within the thermal limits of the motor). With both units operated and picked up in a series connection, the circuit breaker will be tripped.

For a faulted condition, the normal dropout instantaneous unit 50A IOC will pick up instantaneously and trip the breaker.

Other retrofit options

Basler Electric also offers, in addition to the motor protection relay, a wide range of overcurrent relays designed to be retrofitted into the older GE or W-ABB cases. Also offered are reclosing relays, namely the BE1-79A. The BE1-79A is available in models that replace ACR, NLR and RC reclosing relays. Most retrofit units are available with cases for new installation.

For more upgrade solutions, see the Upgrade Experts chart.

You also may download a copy of the Time Current Characteristics spreadsheet in the Technical Resources tab of the BE1-50/51 product page on our web site.

For ordering assistance, contact your local Basler sales representative or visit our web site at www.basler.com.

Basler Electric®
Highland, Illinois USA
Tel +1 618.654.2341
Fax +1 618.654.2351
email: info@basler.com

Suzhou, P.R. China
Tel +86 512.8227.2888
Fax +86 512.8227.2887
email: chinainfo@basler.com

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Basler
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