Industrial Solutions

GEH-6432 User's Guide

Solid State Overload Relay

NEMA Sizes 5 & 6

WARNING: Disconnect all power from the starter and overload relay before installing, modifying, or servicing.

AVERTISSEMENT: Couper l'alimentation avant installation, modification, ou entretien.

CAUTION: Before installing this product in a nuclear application, determine if it is intended for such use.

ATTENTION: Avant d'installer le produit dans une application nucléaire, verifier si cela est permis.

Introduction

The **ABB** Solid State Overload Relay is shown in Figure 1. The catalog numbers and electrical specifications are listed in Table 1.

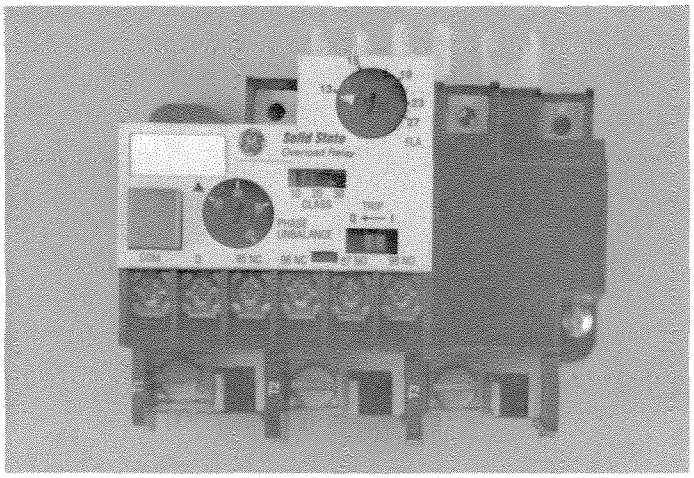

Figure 1. Solid State Overload Relay (external current transformers not shown).

Replacement Installation

The following instructions describe the installation of a Solid State Overload Relay as a replacement for an existing overload relay on a 300-Line starter.

1. Disconnect all sources of power to the starter.
2. Disconnect all control and power wiring from the load side of the existing overload relay.
3. Remove and save the overload relay mounting screw, located at the bottom right and upper left corners of the overload relay housing.
4. Remove the overload relay from the starter baseplate.
5. Reassemble the Solid State Overload Relay from this kit in the reverse order.
6. Check to see that the two wires from each current transformer have been reconnected to the top and bottom terminals on the same pole of the Solid State Overload Relay as on the overload relay that was replaced.
7. Torque the bottom terminal screws to 20 lb–in and the top terminal screws to 12 lb–in.
8. Connect the control and power wiring to the terminals on the load side of the Solid State Overload Relay, shown in Figure 2.
9. Reconnect power sources to the starter.
10. Fully depress the blue reset button on the Solid State Overload Relay to insure that it is in the reset position. The yellow trip flag will be at its right position, as illustrated in Figure 2.

Catalog Number: Replacement Starter Mount	NEMA Size	Current Range, amps	Max Fuse Size, amps (Class T,H,J,L,R,K)	Max Breaker Rating, amps	Use with ABB Contactor
CR324GXNS	5	32–68	250	250	CR306G
CR324GXPS	5	65–135	500	400	CR306G
CR324GX●S	5	130–270	800	800	CR306G
CR324HXSS	6	130–270	800	800	CR306HH
CR324HXTS	6	260–540	1600	1600	CR306HH

NOTE: Maximum fuse and breaker sizes are intended as guidelines. Refer to NEC and local codes for proper fuse and breaker selection.

Table 1. Solid State Overload Relay, NEMA Sizes 5 & 6, catalog numbers and electrical specifications.

by ABB

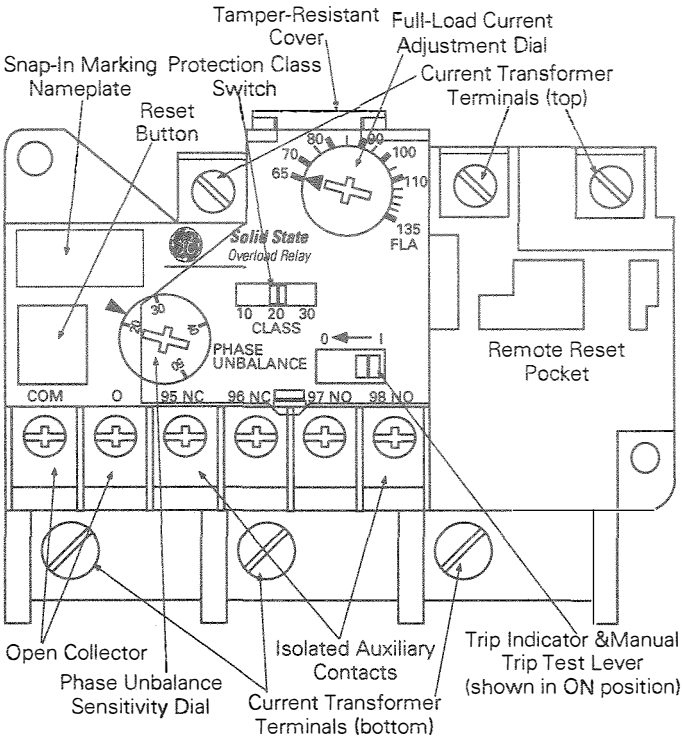

Figure 2. Top face of Solid State Overload Relay, with controls and features indicated.

Adjusting the Solid State Overload Relay

The following adjustments to the Solid State Overload Relay are illustrated in Figure 2. The adjustments should be performed in the following order.

The settings as the unit is received from the factory are as follows:

- Full-load current at minimum.
- Phase current unbalance sensitivity at 20%.
- Protection class at 20.

Full-Load Current Adjustment

This setting is the current beyond which the Solid State Overload Relay will trip. Use the following guidelines to determine the appropriate setting:

- For motors with a service factor of 1.0, set the full-load current on the Solid State Overload Relay to 0.9 times the full-load amps (FLA) rating on the motor's nameplate.
- For motors with a service factor of 1.15–1.25, set the full-load current on the Solid State Overload Relay to the FLA rating on the motor's nameplate.

Press on the tamper-resistant cover above the FLA dial, then lift up near the tab on the other side to remove the cover. Rotate the FLA dial so that the arrow on the dial points to the desired current, as indicated by the ampere markings around the dial. Do not rotate past the marked area. The knob moves in small steps to allow precise adjustment of the full-load current. Replace the tamper-resistant cover to provide additional dust protection. To protect against unauthorized persons' tampering with the settings, insert a wire lock through the locking tabs.

Phase Current Unbalance Sensitivity Adjustment

The Solid State Overload Relay contains a trip function activated by an unbalance among the phase currents. The percent difference between the highest and lowest phase current may be set between 20% and 50%. This means that the lowest phase current can be 20–50% lower than the highest phase current without producing a trip. A phase-unbalance trip occurs within 3–5 seconds after the lowest phase current falls below the set percentage of the highest phase current.

Protection Class Setting

CAUTION: The slide switch must be in one of the three detent positions. If the slide is between one of the detents, the default is protection class 30.

ATTENTION: Le bouton de selection de la classe de protection doit être dans une des trois positions stables. Si le bouton se trouve entre deux positions, la classe de protection est fixée à 30 par défault.

Set the desired protection class to 10, 20, or 30 by sliding the switch to the appropriate detent position. The time–current curves for the protection classes are shown in Figure 3. Select the class appropriate to the particular application.

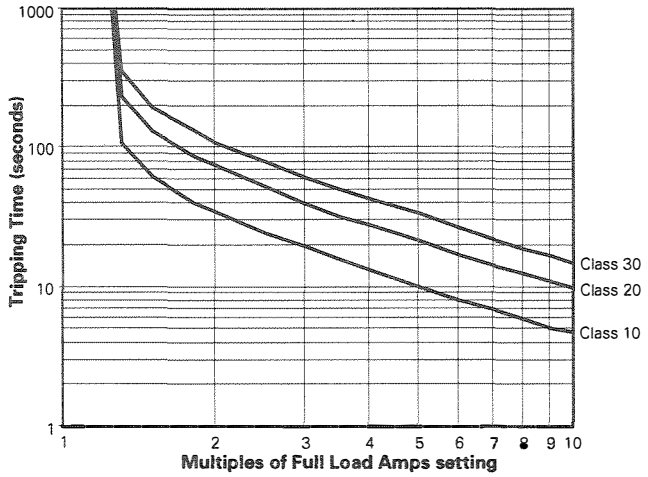

Figure 3. Time–current curves (cold state) for the protection classes.

Test for Welded Contacts

The following procedure can be performed periodically to insure that the Solid State Overload Relay contacts have not welded because of a short circuit in the control circuit.

1. Disconnect all power and control wiring from the Solid State Overload Relay.
2. Place a bell set or resistance-measuring instrument across the NC relay terminals (95 and 96).

3. Depress and release the reset button to insure that the Solid State Overload Relay is reset. In this condition, there should be continuity between the terminals.
4. Slide the mechanical trip test lever from right to left to trip the Solid State Overload Relay. There should be no continuity, indicating that the contacts are operating normally. *If continuity is indicated with the relay tripped, do not use the relay.*
5. If the contacts work properly, reconnect power and control wiring and reset the Solid State Overload Relay for normal operation.

Additional Features

Reset Button

Depress the reset button fully and release to reset the Solid State Overload Relay after a trip. For motor protection purposes, the reset occurs on the upstroke of the reset button. It is also designed so that even if the reset button is continually held down, the Solid State Overload Relay will still trip normally.

Remote Reset Pocket

The Remote Reset (catalog number CR324XRRM) is an optional, field-installable accessory. When the Solid State Overload Relay trips, it can be remotely reset by applying 120 Vac or 24 Vdc across the Remote Reset terminals.

To install the Remote Reset, remove and discard the cover plate over the Remote Reset pocket on the Solid State Overload Relay. The module snaps into place in the slots provided.

Trip Indicator and Manual Trip Test Lever

When the trip indicator is to the right, indicated by I, the Solid State Overload Relay contacts are in the normal position. When the relay is tripped, the indicator moves to the left, indicated by 0. To manually test the Relay, move the indicator manually to the left.

Isolated Auxiliary Contacts

The Solid State Overload Relay provides one pair of normally open (NO) and one pair of normally closed (NC) isolated contacts to allow for diagnostic use or for alarm signaling when the Relay trips. The terminals accept AWG #22–14, 60/75° C copper wire only. Tighten the terminal screws to 12 lb-in.

Open Collector

With this feature connected as illustrated in Figure 4, it is possible to differentiate between overload and phase-unbalance trips. The terminals are marked COM for common and O for output. After an overload trip, the output appears as during normal operation. There is no output following a phase-unbalance trip. Nominal rating is +24 Vdc at 25 mA NPN, suitable to drive a PLC input. The terminals accept AWG #22–14, 60/75° C copper wire only. Tighten the terminal screws to 12 lb-in.

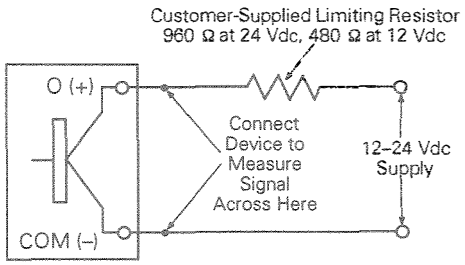

Figure 4. Open collector wired for trip-type differentiation.

Snap-In Marking Nameplate

Write on the nameplate with a permanent marker or pen to identify starters and overloads.

Wiring Diagram

Figure 5 is a typical three-phase wiring diagram.

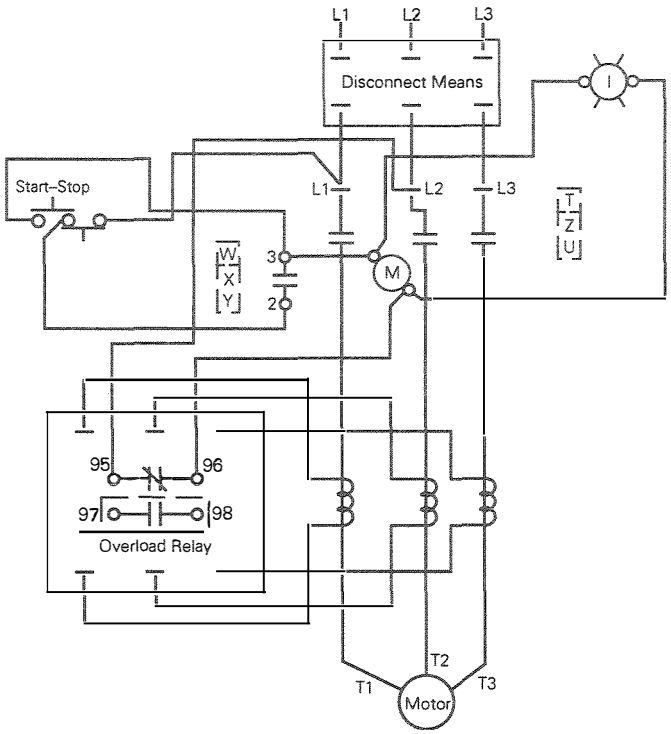

Figure 5. Typical three-phase wiring diagram.

These instructions do not cover all details or variations in equipment nor do they provide for every possible contingency that may be met in connection with installation, operation, or maintenance. Should further information be desired or should particular problems arise that are not covered sufficiently for the purchaser's purposes, the matter should be referred to your local ABB Sales Office.

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