



GEH-5193 Installation Instructions For NEMA Size 0 & 1

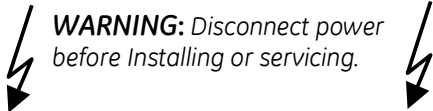
300/400-Line Combination Magnetic Starters

CR307-CR308, CR310-CR311, CR387, CR390, CR407-CR408

CR410-CR415, CR487, CR490, CR492, CR494 Series

Supersedes GEH-4793B & GEH4796B

CAUTION: Before installing in a nuclear application, determine that the product is intended for such use.



WARNING: Disconnect power before installing or servicing.

Description

ABB 300/400-Line full-voltage motor starters include a magnetic contactor and a three-leg block overload relay, providing motor protection against running and stalled motor overloads. The overload relay is provided with a yellow trip indicator located to the right of the reset arm, and is visible when the overload relay is tripped.

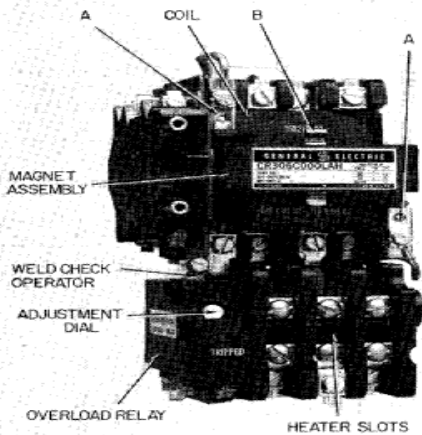


Figure 1. Typical 300/400-Line magnetic starter

Ratings—600 V Maximum

Starter Max Current Rating	Contactor Max. Current Rating	AC Volts	Max.Hp For AC Motors	
			Single-Phase	Poly-Phase
Size 0				
18 amp (open and enclosed)	20 amp (open) and 18amp (enclosed)	115	1	-
		200	-	3
		230	2	3
		460—575	-	5
Size 1				
27 amp (open and enclosed)	30 amp (open) and 27amp (enclosed)	115	2	-
		200	-	7½
		230	3	7½
		460—575	-	10

Motor branch circuit and control circuit over-current protection should be supplied in accordance with the National Electrical Code. CR305 contactors are suitable for use on a circuit capable of delivering not more than 5,000 RMS symmetrical amperes, 600 volts maximum when protected by H, J, K1, K5, RK1, RK5 class fuses, or a circuit breaker having an interrupting rating not less than 5,000 RMS symmetrical amperes.

Installation

Before connecting controller to power supply:

1. Remove all packing.
2. Clean magnet mating surfaces of any dirt or foreign matter.
3. Select and install heaters in accordance with heater table.
4. Operate movable magnet and operating arm by pressing on the nameplate to assure free movement.
5. Mount on a sturdy vertical support.
6. Make the electrical connections.
7. The starter overload relay may be reset manually by depressing and releasing the reset arm.

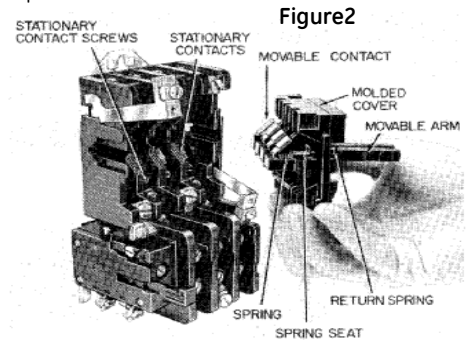
Coil Replacement

1. Remove power from device.
2. Press against coil while pulling up slightly on coil retainers (A—Figure 1) and move retainers away from coil.
3. Withdraw magnet assembly, coil, molded cover, and movable arm from device.
4. Withdraw spring clip (B—Figure 1) and remove armature from movable arm.
5. Remove coil from magnet.
6. Replace coil.
7. Reassemble device by reversing procedure.

Contact Replacement

1. Perform steps 1 through 5 under *Coil Replacement*.
2. Remove magnet from molded cover and movable arm.
3. Remove return spring from center of movable arm.
4. Remove molded cover from movable arm.
5. Depress and slide movable contact and spring from movable arm.

6. Remove screws holding stationary contacts in place and remove stationary contacts.
7. Reassemble device by reversing procedure.



Note: For starters with one or more normally closed contacts, perform steps 1 and 2 shown under Coil Replacement. Withdraw spring clip (B—Figure 1) and remove armature, coil, and magnet from device. Remove return spring from center of movable arm. Remove molded cover and stationary contacts before lifting movable arm from device.

Normally Closed Contacts

The contacts may be converted from normally open to normally closed with no additional parts. Perform steps 1 through 4 shown under *Coil Replacement*. Lift coil and magnet from movable arm. Remove return spring from center of movable arm. Depress movable contact spring and spring seat against movable contact and rotate these parts 1/2 turn without removing them from window. Remove the stationary contacts. Install the movable arm in the device. Install the stationary contacts so that their silver pads face the movable contact silver pads. Reassemble the device. To change contacts from normally closed to normally open position, reverse the above procedure.

Check For Welded Contacts In Overload Relay

With power disconnected, disconnect the control wiring from the relay terminals. Place a bell set or resistance measuring instrument across relay terminals. Depress and release reset arm to insure relay is reset.

In this condition there should be continuity between the terminals. Depress white manual check operator to trip the relay. In the tripped condition the circuit between the terminals should be open indicating the contacts are operating normally. Rewire the terminals and reset the relay for normal operation

Maintenance

1. Always remove power from device before performing any maintenance.
2. Keep magnet mating surface free of accumulated dirt or dust.
3. *Do Not Oil Or Grease* the magnet mating surfaces.
4. Contacts are carefully designed for maximum life. They need only be replaced when nearly all the silver tip is gone and the contact tip support is exposed. *Do Not File* the contacts. Filing or dressing the contacts only results in lost tip material and reduces life.
5. The ultimate tripping current of the installed relay heater can be adjusted $\pm 10\%$ by using the adjustment dial, shown in Figure 1.

6. On reversing and two-speed starters, the mechanical interlock has been factory adjusted and normally should never have to be readjusted. If readjustment is ever needed, these steps should be followed:

- A. Close one contactor by hand by pushing down on armature.
- B. Using the other hand, loosen the nut on opposite contactor interlock arm and slide it towards the top of the elongated slot until all gap is taken up between the two arms. Follow the same procedure with the opposite contactor and interlock arm.
- C. Best adjustment is usually obtained when both mechanical interlock arm assemblies are as far up in the elongated slot as possible.
- D. With both arms adjusted, there should be a very slight gap (approximately 1/16- inch) between the arms with both contactors open. Neither arm should overlap the other with both contactors open.

Caution: Before adjusting or operating reverser, make sure the mechanical interlock arm is engaged with movable contact arm.

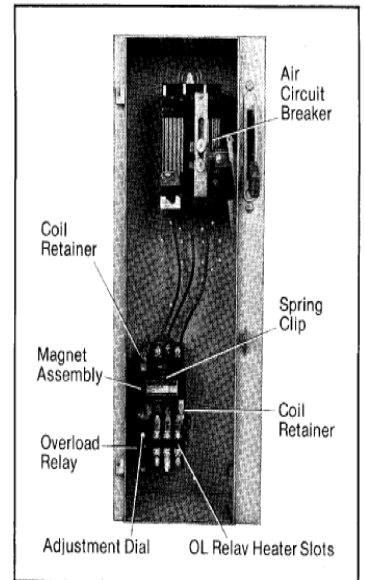


Figure 3. Typical CR307 combination starter.

*****Coil Suffix Table**

(Order 15D21G plus coil suffix number below)

60 Hertz	115-120V	200-208V	230-240V	----	460-480V	575-600V
50 Hertz	110	-----	220V	380V	440V	550V
Coil Suffix	002	023	003	064	004	005

When reassembling, note that the magnet and movable arm assembly (Items 5 through 10) will fit *only one way*. The magnet, Item 8, and movable arm, Item 7, will fit either way but will be quieter if reassembled the same way they were taken apart.

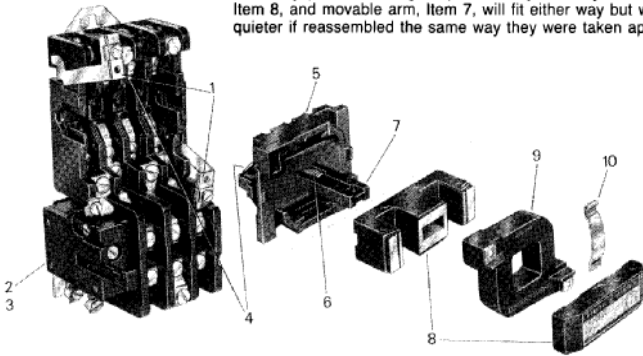


Figure 4.

Principal Renewal Parts

Accessory Kits

- First NO aux. cont for CR305, CR306.....CR305X100A
- First NC aux. cont. for CR305, CR306.....CR305X100B
- First NO-NC aux. cont. for CR305, CR306..CR305X100C
- Additional NO aux. cont. for all forms. CR305X100D
- Additional NC aux. cont. for all forms. ... CR305X100E
- Pushbutton..... CR305X120N
- Selector switch, H—O—A. CR305X130N
- Selector switch, OFF—ON. CR305X130P
- Indicating light. CR305X150N
- Fifth pole. CR305X111B
- Control circuit fuse..... CR305X141A, B, C, D

Ref.No Figure.4	Description	Catalog Number	Quantity Required		
			CR307/CR308/ CR387	CR301/CR311/CR390	
				Left Cont..	Right Cont.
1	Coil retainer assembly	546A301G050	2	2	2
2	Overload relay (3-heater, non-compensated form, 1 NC contact)	CR324C310F	1	1+	++
3	Overload relay (3-heater, non-compensated, 1 NO-1 NC contacts)	CR324C360F	1	1+	++
4	Set of stationary and movable contacts with springs and screws for four poles: NEMA Size 0 NEMA Size 1	----- 546A300G002 546A301G053	- 1 1	- 1 1	- 1 1
5	Molded cover for stationary and movable contacts	188D711P001	1	1	1
6	Return spring for movable contact support	541A278P001	1	1	1
7	Molded movable contact support for 2-, 3-, 4- pole	187D350P001	1	1	1
8	Armature and frame (magnet)	546A301G054	1	1	1
9	Operating coil	15D21G***	1	1	1
10	Spring retainer for armature	546A588P001	1	1	1
11	Overload relay for 2-speed single-winding controller (1 NC contact)	CR324C310G	-	1	-
12	Overload relay for 2-speed single-winding controller (1 NO-1 NC contact)	CR324C360G	-	1	-

*** Add coil suffix number from above table to complete the catalog number. Example: Cat. No. 15D21G002 has ratings of 115—120V, 60 Hz and 110V, 50 Hz.
+Omitted on 2-speed single-winding controller.
++ Quantity one for multi-speed controller.

These instructions do not purport to cover all details or variations in equipment not to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purpose, the matter should be referred to the ABB Company.