

Installation Instructions for GC/GHC Molded Case Circuit Breakers



I.L. 15548
File 29-000

WARNING

DO NOT ATTEMPT TO INSTALL OR PERFORM MAINTENANCE ON EQUIPMENT WHILE IT IS ENERGIZED. SEVERE PERSONAL INJURY, DEATH, OR SUBSTANTIAL PROPERTY DAMAGE CAN RESULT FROM CONTACT WITH ENERGIZED EQUIPMENT. ALWAYS VERIFY THAT NO VOLTAGE IS PRESENT BEFORE PROCEEDING WITH THE TASK, AND ALWAYS FOLLOW GENERALLY ACCEPTED SAFETY PROCEDURES.

THE WESTINGHOUSE ELECTRIC CORPORATION IS NOT LIABLE FOR THE MISAPPLICATION OR MISINSTALLATION OF ITS PRODUCTS.

The user is cautioned to observe all recommendations, warnings, and cautions relating to the safety of personnel and equipment, as well as, all general and local health and safety laws, codes, and procedures.

The recommendations and information contained herein are based on Westinghouse experience and judgement, but should not be considered to be all-inclusive or covering every application or circumstance which may arise. If any questions arise, contact Westinghouse Electric Corporation for further information or instructions.

1. Introduction

GC/GHC circuit breakers (Fig. 1-1) (hereafter referred to as circuit breaker) are thermal-magnetic 1-, 2-, or 3-pole devices available in ratings from 15A to 100A continuous current. Three

methods of mounting circuit breakers are available: hardware for 2- and 3-pole, DIN rail or base mounting plate for 1-, 2-, and 3-pole. Circuit breakers are listed in accordance with Underwriters Laboratories, Inc. Standard UL489, and satisfy the (P1) requirements of the International Electrotechnical Commission Standard No. IEC 157-1.

The following accessories are available for use with GC/GHC circuit breakers:

- Auxiliary Switch
- Alarm (Signal)/Lockout Switch
- Shunt Trip
- Undervoltage Release Mechanism
- Lock Dog (S#1294C01H01)
- Padlockable Handle (S#1223C77G01)

2. Installation

The installation procedure consists of inspecting and mounting the circuit breaker, connecting and torquing the terminations. To install the circuit breaker, perform the following steps.

Note: GC/GHC circuit breakers are factory sealed. Underwriters Laboratories, Inc. Standard requires that internal accessories be installed at the factory. Where local codes and standards permit and UL listing is not required, internal accessories can be field installed. Accessory installation should be done before the circuit breaker is mounted and connected.

Mounting hardware (S#624B375G23 - where required) is supplied in separate packages.

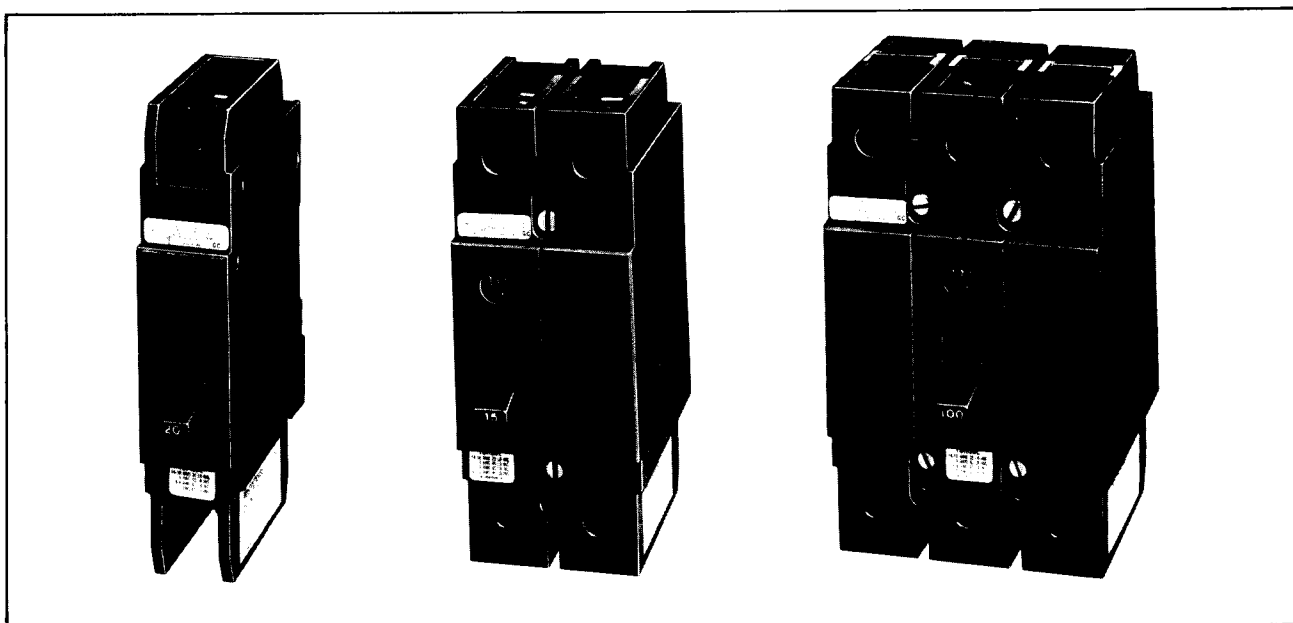


Fig. 1-1. GC/GHC 1-, 2-, and 3-Pole Circuit Breakers

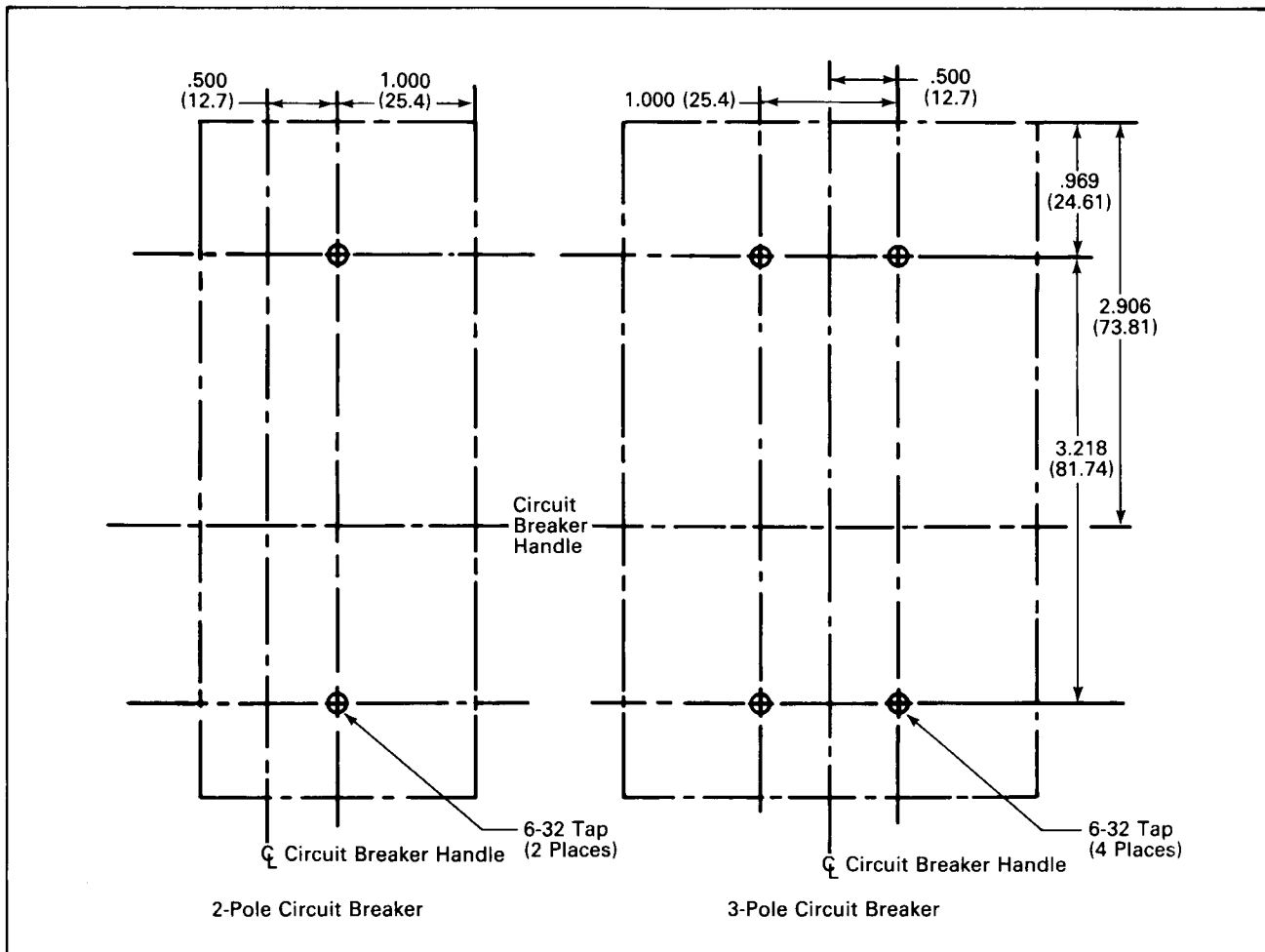


Fig. 2-1. Circuit Breaker Mounting Bolt Drilling Plans

2-1. Make sure that the circuit breaker is suitable for the intended installation by comparing nameplate data with system requirements. Inspect the circuit breaker for completeness, and check for damage before mounting.

WARNING

Before mounting the circuit breaker in an electrical system, make sure the circuit breaker is switched to the OFF position and that there is no voltage present where work is to be performed. Special attention should be paid to reverse feed applications to ensure no voltage is present. The voltages in energized equipment can cause severe personal injury or death.

2-2. To mount the circuit breaker, perform the following steps:

Note: If circuit breaker includes factory installed internal accessories, make sure accessory wiring can be reached when the circuit breaker is mounted.

a. Individual Mounting Panels

Predrill panel using bolt drilling plan (Fig. 2-1). Install circuit breaker using mounting screws and washers. Tighten screws firmly, but do not exceed 15 pound-inches (1.69 N.m.).

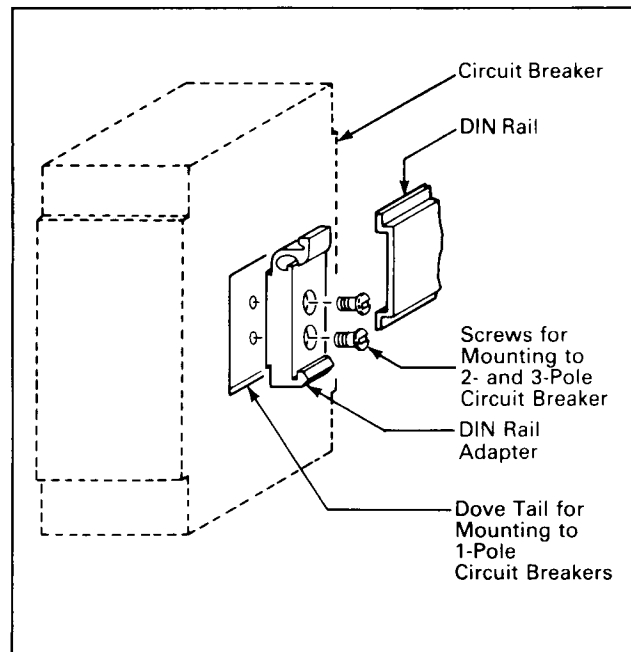


Fig. 2-2. Circuit Breaker DIN Rail Adapter

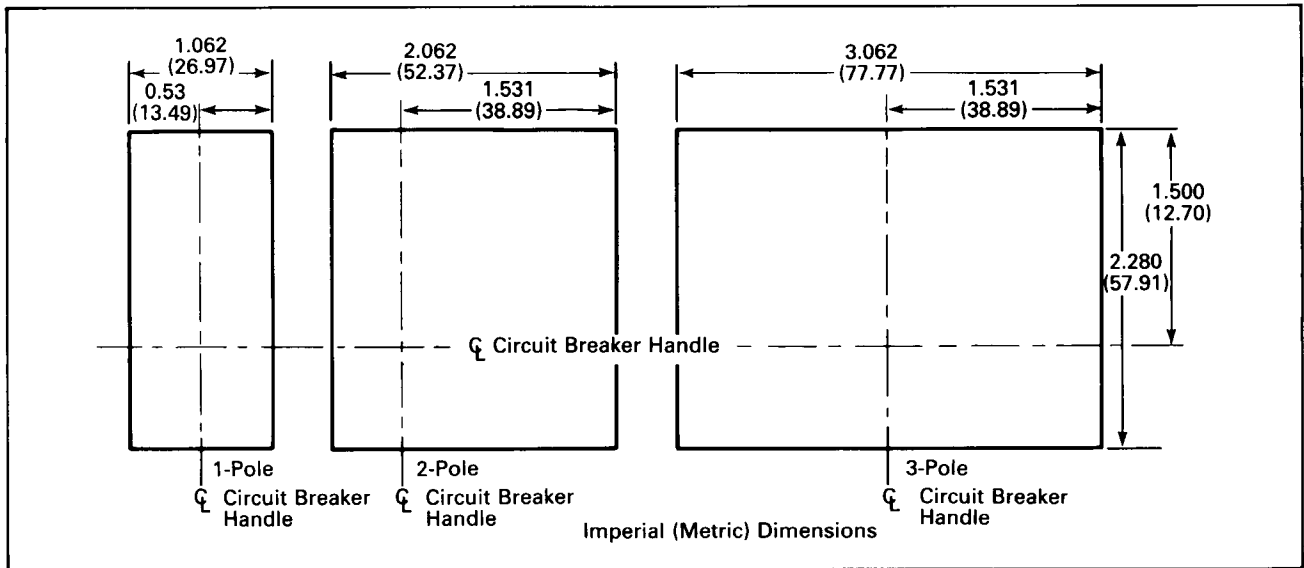


Fig. 2-3. Circuit Breaker Escutcheon Dimensions

b. Pre-assembled Panelboard Chassis

A recess is provided in the load-end of the circuit breaker for mounting to chassis rail.

c. DIN Rail Mounting

An adapter kit (S#1225C79G01) suitable for use with standard 35 millimeter DIN rail (such as 35 mm x 7.5 or 35 mm x 15 per DIN EN50022), should be preassembled to the rear of the circuit breaker (Fig. 2-2). Position circuit breaker as required by sliding adapter onto DIN rail.

Note: Adapter mounting screws are for use with 2- and 3-pole circuit breakers. Adapters for 1-pole circuit breakers clip into the base molding.

d. Base Mounting Plate

Install base mounting plate (S#207B513G01 – suitable for mounting six single pole circuit breakers) with hardware provided. Clip circuit breaker into retaining clips load-end first.

e. Deadfront Cover

Cut out mounting panel cover to correct escutcheon dimensions (Fig. 2-3).

CAUTION

When aluminum conductors are used, the application of a suitable joint compound is recommended to reduce the possibility of terminal overheating. Terminal overheating can cause nuisance tripping and damage to the circuit breaker.

Table 2-1. Terminal Types

For line and load-side. Terminals are UL listed as suitable for wire type and size given below.

Circuit Breaker Amps.	Terminal Type Material	Screw Head Type	Wire Type	AWG Wire Range	Metric Wire ^① Range (mm ²)	Torque Value lb-in (N.m)
15-20	Clamp (Plated Steel)	Slotted	Cu/Al	#14-10	1.5-4	See Table 2-2
25-100	Pressure (Aluminum Body)	Slotted	Cu/Al	#10-1/0	4-50	See Table 2-2

① Not UL Listed sizes

Table 2-2. Terminal Torque Values

AWG Wire Range	Torque Value lb-in	Torque Value N.m
#14-#10	20	2.26
#8	40	4.52
#6-#4	45	5.09
#3-1/0	45	5.09

2-3. After mounting the circuit breaker, line and load terminals and accessory leads should be connected. (See accessory lead identification on side of circuit breaker.)

2-4. After the circuit breaker is installed, check all mounting hardware and terminal connecting hardware for correct torque loading. Torque values for line/load terminals are given in Tables 2-1 and 2-2 and on the circuit breaker nameplate.

3. Manual Operation

Manual operation of the circuit breaker is controlled by the circuit breaker handle. There are two positions shown on the handle to indicate when the circuit breaker is ON or OFF, also, the tripped position is shown by a white strip. (See Fig. 3-1.)

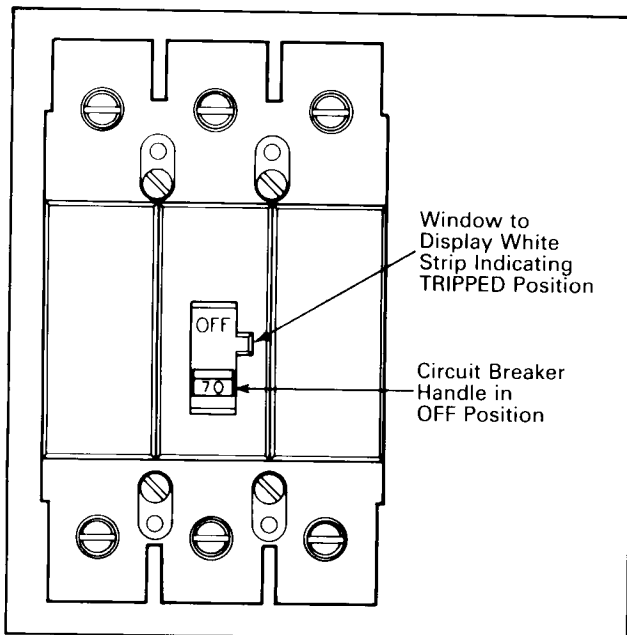


Fig. 3-1. Circuit Breaker Manual Controls

Circuit Breaker Reset

After an automatic trip operation, the circuit breaker is reset by moving the circuit breaker handle to the extreme OFF position.

Note: In the event of a thermal trip, the circuit breaker cannot be reset until the thermal element cools.

4. Inspection and Field Testing

Molded case circuit breakers are designed to provide years of almost maintenance-free operation. The following procedure describes how to inspect and test a circuit breaker in service.

Inspection

Circuit breakers in service should be inspected periodically. The inspection should include the following checks.

WARNING

Before inspecting the circuit breaker in an electrical system, make sure the circuit breaker is switched to the OFF position and that there is no voltage present where work is to be performed. Special attention should be paid to reverse feed applications to ensure no voltage is present. The voltages in energized equipment can cause severe personal injury or death.

CAUTION

Make sure that cleaning agents or solvents used to clean the circuit breaker are suitable for the job. Some commercial cleaning agents will damage the nameplates or molded parts.

4-1. Remove dust, dirt, soot, grease, or moisture from the surface of the circuit breaker using a lint-free dry cloth, brush, or vacuum cleaner. Do not blow debris into circuit breaker. If contamination is found, look for the source and eliminate the problem.

4-2. Switch circuit breaker to ON and OFF several times to be sure that the mechanical linkages are free and do not bind. If mechanical linkages are not free, replace circuit breaker.

4-3. Check base, cover, and operating handle for cracks, chipping, and discoloration. Circuit breakers should be replaced if cracks or severe discoloration is found.

4-4. Check terminals and connectors for looseness or signs of overheating. Overheating will show as discoloration, melting, or blistering of conductor insulation, or as pitting or melting of conductor surfaces due to arcing. If there is no evidence of overheating or looseness, do not disturb or tighten the connections. If there is evidence of overheating, terminations should be cleaned or replaced. Before re-energizing the circuit breaker, all terminations and cable should be refurbished to the condition when originally installed.

4-5. Check circuit breaker mounting hardware, tighten if necessary.

4-6. Check area where circuit breaker is installed for any safety hazards, including personal safety and fire hazards. Exposure to certain types of chemicals can cause deterioration of electrical connections.

Field Testing

Any field testing should be done in accordance with NEMA Standards Publication AB2-1984.