



## Installation Instructions for Auxiliary Switch for Cutler-Hammer EHD, FDB, FD, HFD, FDC, FW, HFW, FWC Circuit Breakers, Molded Case Switches, and F-Frame Motor Circuit Protectors (MCP)

### ⚠ WARNING

**DO NOT ATTEMPT TO INSTALL OR PERFORM MAINTENANCE ON EQUIPMENT WHILE IT IS ENERGIZED. DEATH, SEVERE PERSONAL INJURY, 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.**

**CUTLER-HAMMER 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 Cutler-Hammer 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 Cutler-Hammer for further information or instructions.

### 1. INTRODUCTION

#### General Information

The auxiliary switch (Fig. 1-1) provides circuit breaker contact status and is used for remote identification and system interlock verification. The switch consists of one or two single-pole double-throw (SPDT) switches housed in a plug-in module.

Each SPDT switch has one "a" and one "b" contact. The plug-in module mounts in the accessory mounting cavity of the circuit breaker so that the operating arm rests against the accessory operating projection on the molded crossbar. When the molded crossbar is in the contacts-closed position, the "a" contact of each SPDT switch is closed and the "b" contact is open. When the molded crossbar is in the tripped or contacts-open position, the "a" contact is open and the "b" contact is closed.

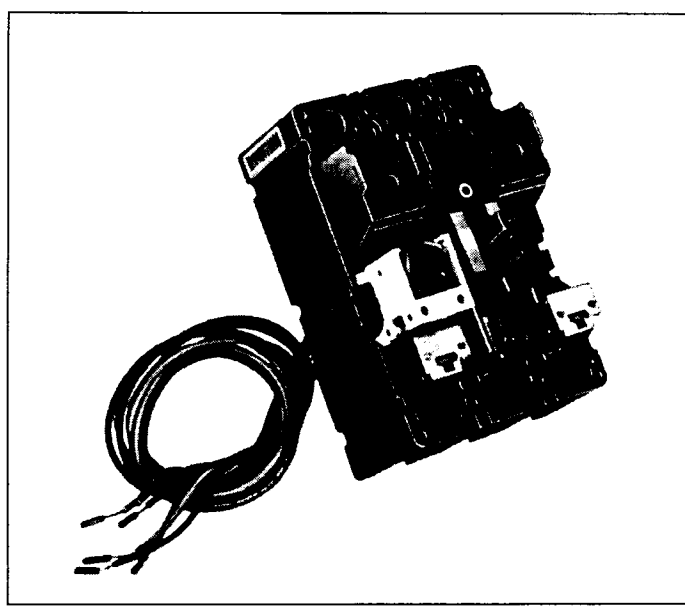


Fig. 1-1. Auxiliary Switch Installed in F-Frame Circuit Breaker

Table 1-1 lists electrical rating data for the auxiliary switch.

**Table 1-1. Auxiliary Switch Electrical Rating Data ①②③**

Maximum Voltage (V)	Freq.	Maximum Current (A)	Dielectric Withstand Voltage (V)
600	50/60 Hz	6	2500
125	DC	0.5 ④	2200
250	DC	0.25 ④	2200

- ① Endurance - 6000 electrical operations plus 4000 mechanical operations
- ② Pigtail wire size - No. 18 AWG (0.82 mm<sup>2</sup>)
- ③ Terminal block is approved for use with one or two No. 18 to No. 14 AWG solid or stranded copper wire. Torque is 7 lb-in (0.8 N.m).
- ④ Non-inductive load

Depending on the model ordered, connections for the auxiliary switch are in one of four forms. The standard wiring configuration is pigtail leads exiting the rear of the



base directly behind the auxiliary switch. Optional configurations include a terminal block mounted on the same side of the base as the accessory, leads exiting the side of the base where the accessory is mounted, and leads exiting the rear of the base on the side opposite the accessory. The 18-inch long pigtail leads are color coded for identification; identification labels are provided for pigtail leads and terminal block points. For allowable locations of all accessories, refer to Selection Data 29-120F.

**Note: No more than three pigtail leads can be routed through the rear trough in the circuit breaker base. When the walking beam interlock is used with the circuit breaker, the rear trough cannot be used for accessory pigtail leads.**

This instruction leaflet (I.L.) gives detailed procedures to install the auxiliary switch.

## 2. INSTALLATION

**Note: For sealed circuit breakers, Underwriters Laboratories, Inc. UL489 requires that internal accessories be installed at the factory. The auxiliary switch is listed only for factory installation under UL File E7819.**

Where local codes and standards permit and UL listing is not required, internal accessories can be field-installed.

Before attempting to install the auxiliary switch, check that the catalog number is correct and the rating of the accessory satisfies job requirements.

The auxiliary switch as shown in kit form in Fig. 2-1, can be installed in the right accessory mounting cavity of a 2-pole circuit breaker, in the left or right cavity of a 3-pole circuit breaker, and in the left or neutral cavity of a 4-pole circuit breaker. An auxiliary switch must be installed in the circuit breaker before the circuit breaker is mounted in an electrical system. To install the auxiliary switch, perform the following procedures:

**Note: A circuit breaker that is mounted in an electrical system must be removed to install the accessory. To ensure correct accessory installation, the circuit breaker must be placed on a horizontal surface.**



## WARNING

**BEFORE REMOVING A CIRCUIT BREAKER INSTALLED IN AN ELECTRICAL SYSTEM, MAKE SURE THE CIRCUIT BREAKER IS SWITCHED TO THE OFF POSITION AND 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 DEATH OR SEVERE PERSONAL INJURY.**

- 2-1. Switch circuit breaker to the OFF position.
- 2-2. Disconnect and remove circuit breaker from mounting and terminal connections.
- 2-3. Remove the eight cover screws and cover. (The EHD and FDB may use only four cover screws.) Handle must be in the OFF position if the circuit breaker has a cover interlock.

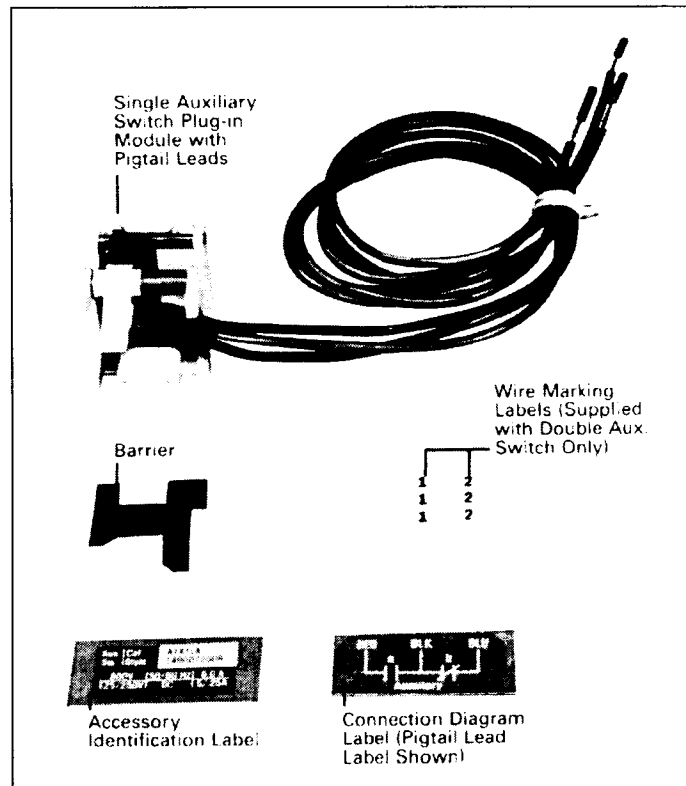


Fig. 2-1. Auxiliary Switch Kit

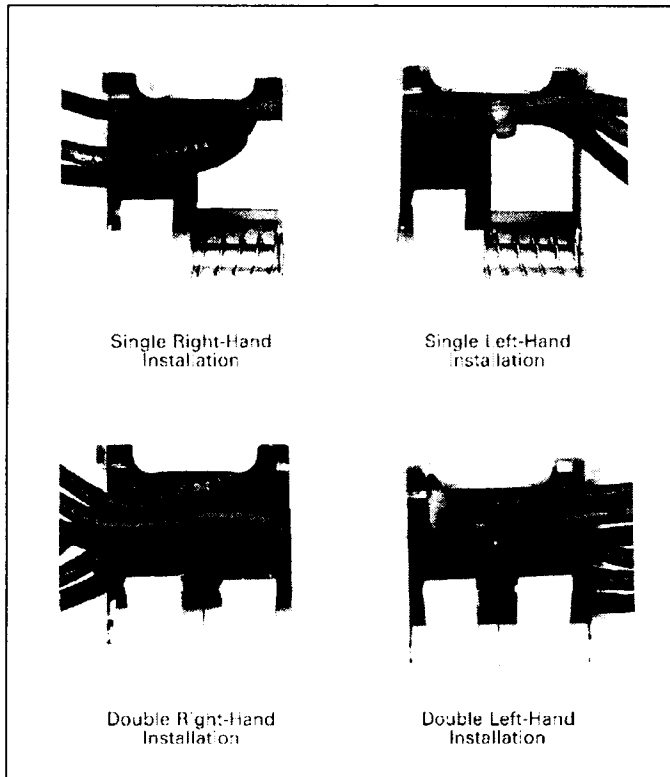


Fig. 2-2. Pigtail Lead Routing for Single and Double Auxiliary Switches

**CAUTION**

**DURING INSTALLATION OF THE AUXILIARY SWITCH, DO NOT TOUCH THE CIRCUIT BREAKER OR MCP CALIBRATED TRIP MECHANISM. CONTACT WITH THE CALIBRATED TRIP MECHANISM COULD CHANGE TRIP CHARACTERISTICS.**

**Note:** The SPDT switch in a single auxiliary switch is mounted on the right side of the plug-in module. If the plug-in module with pigtail leads is to be installed in the righthand accessory mounting cavity of the circuit breaker, the pigtail leads must be bent to exit the right side of the circuit breaker. (See Fig. 2-2.)

When a double auxiliary switch with pigtail leads is installed, the leads from the inner auxiliary switch must go into the wiring trough in the base nearest the line end of the circuit breaker. The leads from the outer auxiliary switch must go into the trough nearest the load end of the circuit breaker. Leads from the inner auxiliary switch must be clipped into the insulating barrier notches. (See Fig. 2-2.)

Wire marking labels are supplied in the double auxiliary switch kit to identify each separate bundle of leads.

**Note:** For an auxiliary switch having rear or opposite-side exiting pigtail leads, thread leads through trough in side of base before attempting to install the accessory. Pigtail leads exiting in this manner must be eased through the trough as the auxiliary switch is inserted into the mounting cavity.

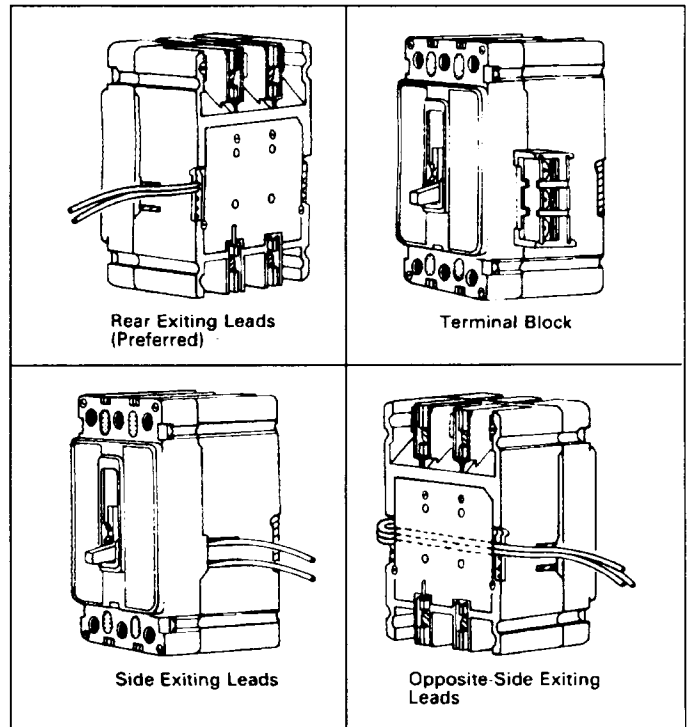


Fig. 2-3. Accessory Wiring Options

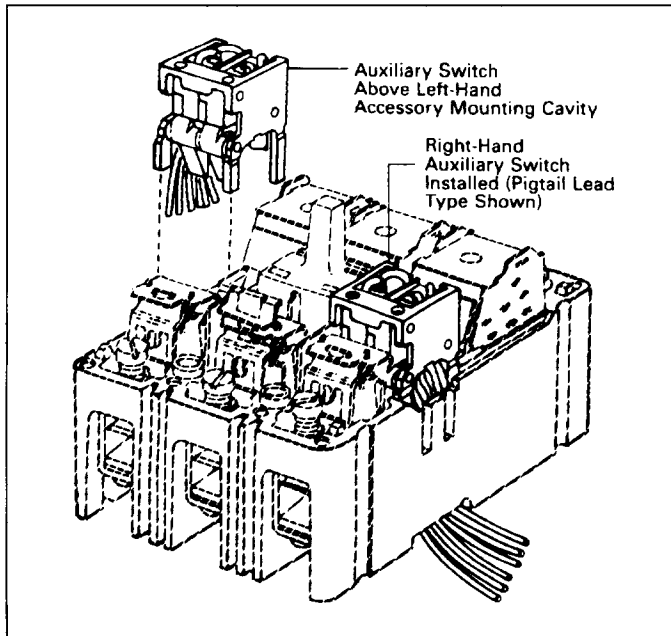


Fig. 2-4. Auxiliary Switch Installation Positions

- 2-4. Route wiring to meet installation requirements (see Fig. 2-3).
- 2-5. Insert the auxiliary switch as described in the following steps (see Fig. 2-4):
- Slide barrier into position between molded crossbar and trip bar. Long leg of barrier must go into slot in base (see Fig. 2-5).
  - Slide auxiliary switch plug-in module into mounting slots in base so that auxiliary switch operating arm(s) is between accessory operating projection on the molded crossbar and the arc extinguisher (see Fig. 2-6). For terminal block assemblies, slide terminal block into mounting trough in side of base as plug-in module is being positioned.
  - If required, complete routing of opposite-side exiting leads.
  - For double auxiliary switch with pigtail leads, attach wire marking labels to the bundle of three leads for each switch.



## CAUTION

**WHEN INSTALLING THE CIRCUIT BREAKER COVER, MAKE SURE THAT ALL INTERNAL PARTS ARE IN PLACE:**

- **ARC EXTINGUISHERS ARE IN EACH ARC EXTINGUISHER CAVITY.**
- **INTERPHASE BARRIER IS FULLY INSERTED IN BASE.**
- **SLIDING HANDLE BARRIER IS CORRECTLY INSTALLED WITH O ON BARRIER OVER ARC EXTINGUISHER.**
- **PUSH-TO-TRIP BUTTON SHOULD BE GUIDED THROUGH HOLE IN COVER USING A SMALL SCREWDRIVER.**
- **PIGTAIL LEADS ARE CLEAR OF THE COVER.**

- 2-6. With circuit breaker handle in the OFF position and pigtail leads routed (or terminal block mounted) as required, install circuit breaker cover and eight cover screws. (The EHD and FDB may use only four cover screws.)
- 2-7. When auxiliary switch is installed at a non-UL approved location, remove and discard UL listing label.

**Note: When installing auxiliary switch in 2-pole circuit breakers or circuit breakers with cover mounted accessories, alternate label mounting positions on side of circuit breaker should be selected.**

- 2-8. Place labels supplied with kit on circuit breaker. (See Fig. 2-7.)

**Note: Labels on circuit breaker show connection diagram for auxiliary switch contacts. Pigtail leads are color coded red, black, and blue.**

- 2-9. Test auxiliary switch(es). Connect continuity tester or ohmmeter across pigtail leads or terminal block connections. Check continuity as follows:
- Circuit breaker handle OFF -  
 "a" contact(s) - open  
 "b" contact(s) - closed.

- b. Circuit breaker handle ON -  
 "a" contact(s) - closed  
 "b" contact(s) - open.
- c. Press PUSH-TO-TRIP button -  
 "a" contact(s) - open  
 "b" contact(s) - closed.

2-10. Install circuit breaker.

2-11. Connect auxiliary switch as required (see Fig. 2-8).

**NOTE: Switch positions are shown as they exist when the circuit breaker is in the OFF or TRIPPED position.**

Cutler-Hammer assumes no responsibility for malfunctioning accessories installed improperly by the customer.

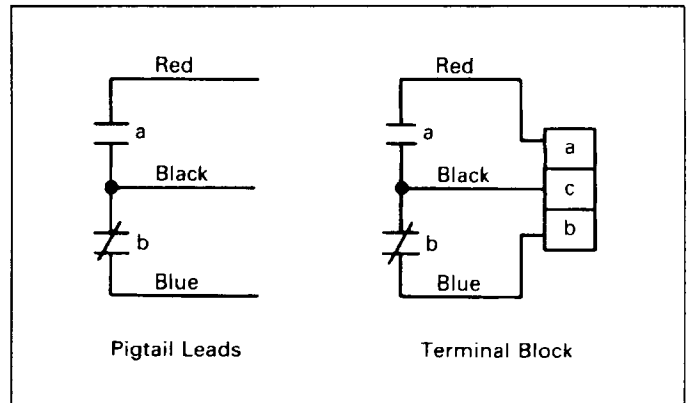


Fig. 2-8. Auxiliary Switch Connection Diagram

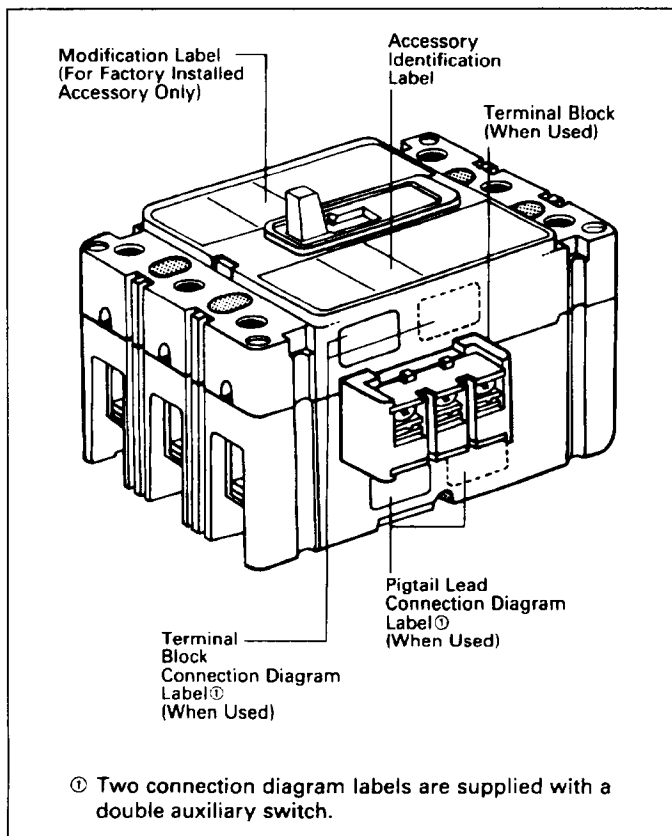


Fig. 2-7. Preferred Mounting Locations for Accessory Nameplate Labels





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