

Installation Instructions for Alarm (Signal)/Lockout Switch and Alarm (Signal)/Lockout Switch and Auxiliary Switch Combination for NDB, ND, HND, NDC, NW, HNW, NWC Circuit Breakers, Series C Molded Case Switches, and Motor Circuit Protectors (HMCP)



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Powering Business Worldwide



WARNING

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

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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 Eaton 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 Eaton for further information or instructions.

1. INTRODUCTION

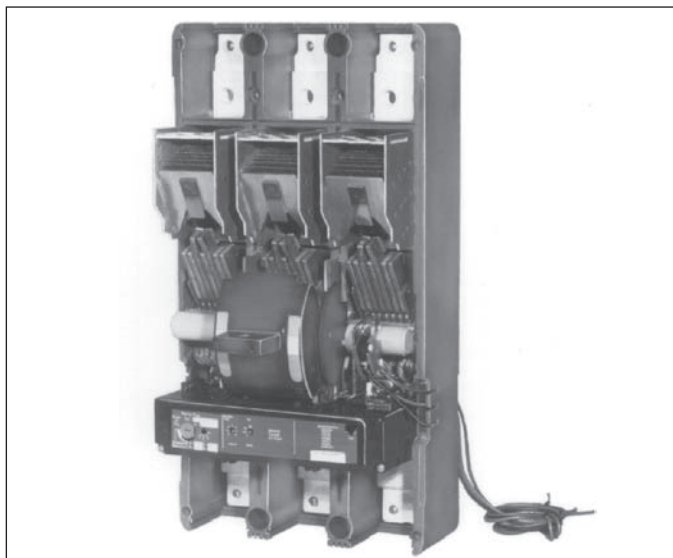


Fig. 1-1. Alarm (Signal)/Lockout Switch Installed in N-Frame Circuit Breaker.

General Information

The alarm (signal)/lockout switch (ASL switch) (Fig. 1-1) is attached to a plug-in module available in the following combinations:

- One or two ASL switches
- One auxiliary switch and one ASL switch
- Two auxiliary switches and one ASL switch

The plug-in module is mounted in slots in the top of the trip unit and occupies the accessory mounting cavity in the circuit breaker frame. The ASL switch provides remote signaling and interlocking when the circuit breaker trips; it consists of one or two single-pole, double-throw (SPDT) switches. Each SPDT switch has a make (alarm) and a break (lockout) contact; it is mounted so that the switch actuator arm is controlled by the position of the circuit breaker crossbar.

When the circuit breaker is in the ON or OFF position, the crossbar allows the make contact to open and the break contact to close. When the circuit breaker is in the tripped position, the make contact is closed and the break contact is open. Any type of trip operation (for example, automatic trip, shunt trip, or undervoltage release) actuates the ASL switch.

The auxiliary switch(es) in the combination accessory indicates circuit breaker contacts status, and is used for remote signaling and system interlocking purposes. Each SPDT switch has one "a" and one "b" contact. The plug-in module is mounted in slots in the top of the trip unit; it occupies the accessory cavity in the circuit breaker frame, and is positioned so that the switch actuator is operated by the crossbar. When the crossbar is in the contacts-closed position, the "a" contact of each SPDT switch is closed and the "b" contact is open. When the crossbar is in the tripped or contacts-open position, the "a" contact is open and the "b" contact is closed.

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

For this publication, the term circuit breaker shall also include molded case switch and motor circuit protector.

Depending on the model ordered, connections for the ASL switch and auxiliary switch contacts are in one of four forms. The standard wiring configuration is pigtail leads exiting the rear of the base directly behind the accessory. 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 (457.2 mm) 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 Frame Book 29-105.

NOTICE

No more than three pigtail leads can be routed through the rear trough in the circuit breaker base.

This instruction leaflet (IL) gives detailed procedures for installing the ASL switch and ASL switch/auxiliary switch combination (accessory combination).

Table 1-1. Alarm (Signal)/Lockout and 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	0.5④	
250	DC	0.25④	

- ① Endurance- 400 electrical operations plus 5600 mechanical operations.
- ② Pigtail wire size - No. 18 AWG (0.82 mm).
- ③ Terminal block is listed for use with one or two No. 18 to No. 14 AWG solid or stranded copper wires. Torque is 7 lb-in (0.8 N.m).
- ④ Non-inductive load.

2. INSTALLATION

NOTICE

The ASL switch(es) and accessory combination can be field-installed in ND, HND, and NDC circuit breakers under UL File E64983.

The ASL switch(es) and accessory combination can be field-installed in NW, HNW, and NWC circuit breakers. The ASL switch(es) and accessory combination are listed for factory installation under UL File E7819.

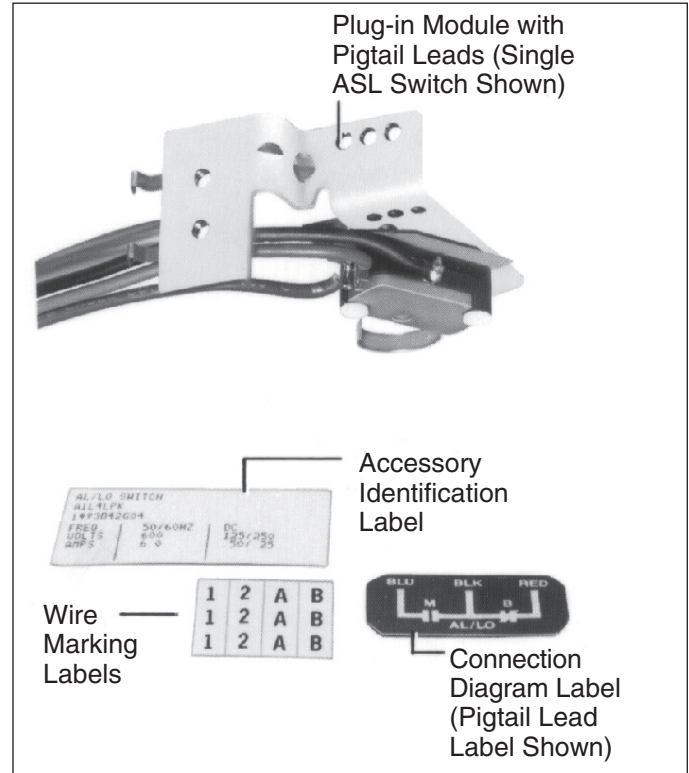


Fig. 2-1. Alarm (Signal) Lockout Switch Kit.

For sealed circuit breakers (NDB), Underwriters Lab oratories Inc. UL 489 requires that internal accessories be installed at the factory. The ASL switch and auxiliary switch are listed 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 in sealed circuit breakers. In this case, UL listing becomes invalid and the label should be removed.

Before attempting to install the ASL switch or accessory combination, check that the catalog number is correct as ordered and that the rating of the accessory(s) satisfies the job requirements.

The ASL switch (shown in kit form in Fig. 2-1) and accessory combination, is installed in the right or left accessory mounting cavity of a 2-, 3-, or 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:

NOTICE

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.

General Installation

**WARNING**

THE VOLTAGES IN ENERGIZED EQUIPMENT CAN CAUSE DEATH OR SEVERE PERSONAL INJURY. 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.

NOTICE

Steps 2-1 through 2-8 and 2-11 through 2-17 are for general installation and apply to the ASL switch and the accessory combination. Step 2-9 covers installation of the ASL switch. Step 2-10 covers installation of the accessory combination.

For new circuit breaker installation, the trip unit must be installed in circuit breaker before attempting to install an ASL switch or accessory combination.

2-1. Switch circuit breaker to OFF position.

NOTICE

Molded case switch trip units are not equipped with a PUSH-TO-TRIP button. For molded case switches, omit Step 2-3.

2-2. Disconnect and remove circuit breaker from installation and terminal connections.

2-3. Press PUSH-TO-TRIP button to trip operating mechanism and check handle moves to trip position with white colored indicator visible in escutcheon window.

2-4. Remove circuit breaker cover screws and covers.

NOTICE

To install accessory, circuit breaker must be in tripped position.

2-5. For high instantaneous trip-type (catalog suffix K designation) molded case switches, find recessed hole in left pole of the trip unit normally intended for intermediate plunger, remove dust cover (Fig. 2-4) and push a fine point implement in hole to trip the molded case switch.

NOTICE

For all combinations of accessories, leads from the inner accessory switch must go to the wiring trough nearest the line end of the circuit breaker. For a double or triple combination, leads from the outer accessory switch must go to the center trough. Pigtail leads exiting in this manner should be eased through trough as mounting bracket is inserted into trip unit retaining slots. Use center trough also for leads exiting the side of the circuit breaker.

2-6. Route wiring to meet installation requirements (see Fig. 2-2).

**CAUTION**

LEADS SHOULD BE FORMED AND ROUTED TO CLEAR ALL MOVING PARTS WHEN ACCESSORY IS PROPERLY INSTALLED. LEADS COULD BE DAMAGED IF IN CONTACT WITH MOVING PARTS.

NOTICE

For all combinations of accessories, leads from inner accessory switch must go to the wiring trough nearest line end of circuit breaker. For a double or triple combination, leads from the outer accessory switch must go to center trough.

Alarm (Signal)/Lockout Switch Installation

2-7. Insert the ASL switch as described in the following steps (see Fig. 2-3):

a. Turn ASL switch mounting bracket to line up with slots in trip unit.

- b. Slide ASL switch mounting bracket into slots until retaining clip snaps into trip unit. For terminal block assemblies, slide terminal block into mounting slot on side of base as plug-in module is being positioned.
- c. If required, complete routing of leads to opposite side through rear wiring trough.
- d. For double ASL switch with pigtail leads, attach wire marking labels to bundle of three leads for each switch. (Markers designated 1 and 2 are provided.)
- e. For ASL/auxiliary switch accessory combinations with pigtail leads, attach wire marking labels to bundle of three leads for each switch. (Markers designated A and B are provided if required.)

Accessory Combination Installation

2-8. Install accessory combination switch as described in the following steps (see Fig. 2-4):

- a. Turn accessory combination mounting bracket to line up with slots in trip unit.
- b. Slide accessory combination mounting bracket into slots until retaining clip snaps into trip unit. For terminal block assemblies, slide terminal block into mounting slot on side of base as accessory combination is being positioned.
- c. If required, complete routing of leads to opposite side through rear wiring trough.
- d. For double auxiliary switch pigtail leads, attach wire marking labels to bundle of three leads for each switch. (Markers designated 1 and 2 are provided if required.)



CAUTION

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

- **ALL LEADS ARE CLEAR OF THE COVER.**

2-9. With circuit breaker handle in TRIPPED position and accessory pigtail leads (if used) routed as required, install circuit breaker covers. Secure with pan-head cover screws. Torque to 22-24 lb-in (2.49-2.72 N.m.).

2-10. Place accessory labels (supplied with kit) on circuit breaker (see Fig. 2-5).

NOTICE

Accessory labels show connection diagram for ASL switch and/or auxiliary switch contacts. Pigtail leads are color coded red, black, and blue. Be sure that accessory terminal marking label is attached correctly to leads and agrees with related leads at accessory.

2-11. Test ASL switch(es) by connecting continuity tester or ohmmeter across pigtail leads or terminal block connections. Check continuity as follows:

- a. Circuit breaker handle OFF
Check that make contact(s) are open and break contact(s) are closed.
- b. Circuit breaker handle ON
Check that make contact(s) are open and breaker contact(s) are closed.

NOTICE

For molded case switches, omit Step c.

- c. Press PUSH-TO-TRIP button
Check that make contact(s) are closed and break contact(s) are open.
- d. If ASL switch(es) fails test, make sure that module is properly seated in trip unit slots. If problem persists. contact Cutler-Hammer.

2-12. Test auxiliary switch(es) (when supplied). Connect continuity tester or ohmmeter across pigtail leads or terminal block connections. Check continuity as follows:

- a. Circuit breaker handle OFF
"a" contacts(s)- open
"b" contact(s)- closed.
- b. Circuit breaker handle ON
"a" contact(s) - closed
"b" contact(s) - open

NOTICE

For molded case switches, omit step c.

- c. Press PUSH-TO-TRIP button
"a" contact(s)- open
"b" contact(s) - closed no continuity.

d. If auxiliary switch(es) fails test, make sure that auxiliary switch(es) module is properly seated in trip unit slots. If auxiliary switch(es) appears to be correctly installed and the problem persists, contact Eaton.

2-13. Install circuit breaker.

2-14. Connect accessory leads as required (see Fig. 2-6). Eaton assumes no responsibility for malfunctioning accessories installed improperly by the customer.

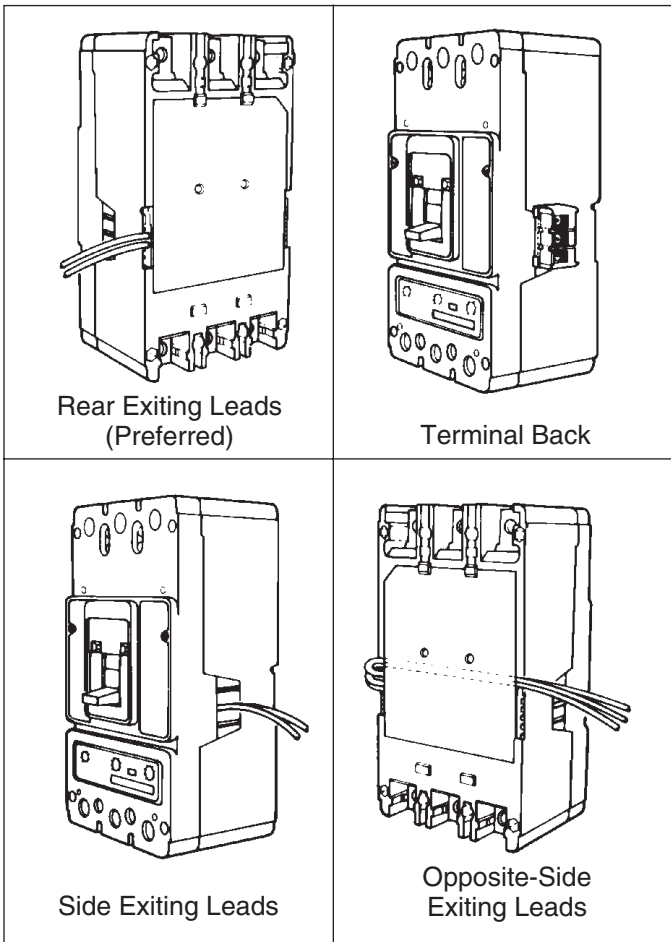


Figure 2-2 Accessory Wiring Options.

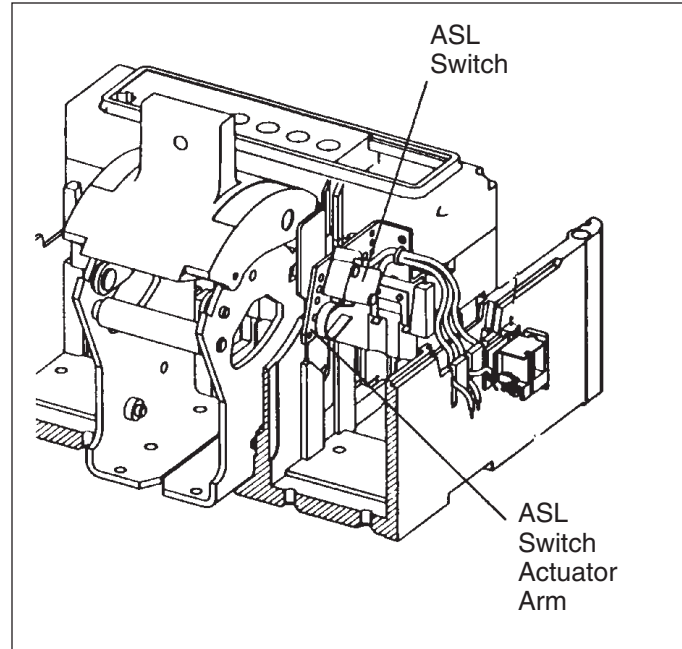


Figure 2-3 Alarm (Signal) Lockout Switch Installation.

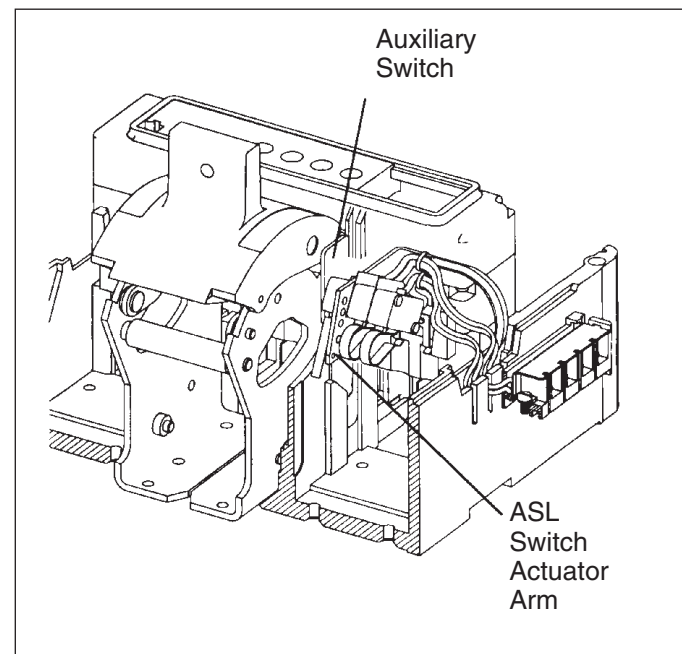


Figure 2-4 Accessory Combination Installation.

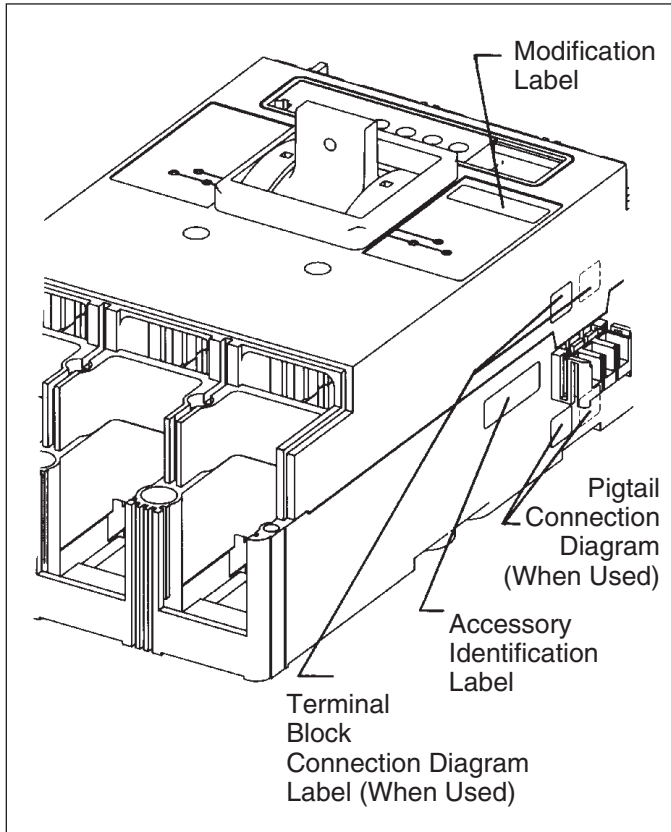


Figure 2-5 Preferred Mounting Locations for Accessory Nameplate Labels.

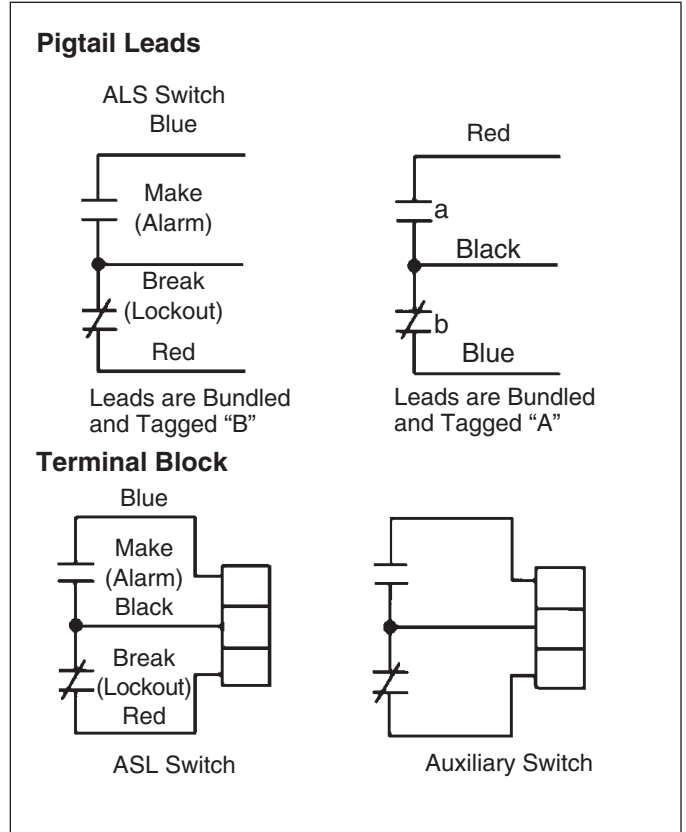


Figure 2-6 Alarm (Signal)/Lockout Switch - Auxiliary Switch Connection Diagram.

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