Installation Instructions for Type SM Safety Handle Mechanism for L-Frame Series C Circuit Breakers and Molded Case Switches

**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.

**Introduction**

**General Information**

The SM safety handle mechanism (Fig. 1-1) provides a means of externally operating a circuit breaker mounted in an enclosure, and is designed to reduce the possibility of circuit breaker tampering. The handle mechanism is especially suited for use in automotive and machine tool industries through its conformance with NEMA 12 and J.I.C. requirements. A specially modified handle for NEMA 4 enclosure applications is also available. The handle mechanism accepts up to three padlock shackles, each with a maximum diameter of 3/8 inch (9.52 mm). A flange-mounted electrical interlock can also be installed. This handle mechanism is for use with L-frame Series C circuit breakers; the mounting instructions are for handle mechanism catalog numbers SM600R and SM600L. In this I.L., the term circuit breaker includes molded case switches.

**Associated Instruction Leaflets**

Flange Mounted Electrical Interlock.................. I.L. 13287

2. **INSTALLATION**

Installation consists of: modifying customer enclosure; mounting handle mechanism; installing circuit breaker mounting plate and circuit breaker; attaching cradle to mounting plate; attaching U-shaped operator to cradle and operating handle mechanism; and testing function of installed handle mechanism. To install the handle mechanism perform the following steps:

**WARNING**

**IF REPLACING AN EXISTING HANDLE MECHANISM, OR MOUNTING A NEW CIRCUIT BREAKER IN AN EXISTING ELECTRICAL SYSTEM, MAKE SURE 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. Inspect the handle mechanism for completeness. (See Fig. 2-1.)
Fig. 2-1 Handle Mechanism Components
Fig. 2-2 Drilling Plan and Dimensions

Notes:
① Clearance holes may be required in spacer for circuit breaker mounting hardware. See location of J holes.
② For reference only. Minimum 55-64 (21.83) dimension can be larger if cover latch supplied is spaced out to equal additional dimension.
③ Spacers supplied with door hardware kit.
④ Mounting plate extends one inch beyond each end of circuit breaker for bracing purposes.
⑤ Dimensions are given in Imperial and (Metric).

Dimensions for Mounting L-Frame Series C Circuit Breakers

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<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
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<tbody>
<tr>
<td>(Imperial)</td>
<td>(128.60)</td>
<td>(87.33)</td>
<td>(296.45)</td>
<td>(288.30)</td>
<td>(112.72)</td>
<td>(60.33)</td>
<td>(69.85)</td>
<td>(242.09)</td>
<td>(M6-1.0)</td>
<td>(193.82)</td>
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2-2. Using the drilling plans and dimensions provided in Fig. 2-2, drill and cutout enclosure flange for operating handle mechanism.

2-3. Drill clearance holes in back plate of enclosure for circuit breaker mounting plate hardware.

Note: If nameplate is assembled to operating handle module, unscrew retaining screws and remove nameplate before doing the next step.

When replacing existing LA, LAB, or HLA circuit breaker handle mechanisms, the original operating handle module can be retained if desired.

2-4. Check that gasket is in place on operating handle mechanism. Insert mechanism through cutout (from the inside) in enclosure flange. (See Fig 2-3.)

2-7. Mount the cradle over the circuit breaker handle and engage over special pin on mounting plate (see Fig 2-4).

2-5. Position nameplate over handle and secure to mechanism with two screws and washers supplied. (See Fig 2-3.)

2-6. Secure circuit breaker on mounting plate. (See Fig 2-4.)

2-8. Secure cradle to mounting plate with special bolt (see Fig. 2-4).

2-9. Position U-shaped operator over operating handle mechanism lever and cradle (see Fig 2-5). Slots in mechanism lever allow for some adjustment.

2-10. Secure U-shaped operator to operating handle mechanism lever with two bolts and lockwashers supplied (see Fig. 2-6).

2-11. Secure circuit breaker mounting plate to operating handle mechanism with two bolts, lock washers, and flat washers supplied (see Fig. 2-5).

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**CAUTION**

**DURING THE FOLLOWING STEP, DO NOT OVERTIGHTEN SPECIAL BOLT SECURING CRADLE TO MOUNTING PLATE. EXCESSIVE TIGHTENING MAY STRIP THREADS.**

2-12. Secure circuit breaker mounting plate to operating handle mechanism with two bolts, lock washers, and flat washers supplied (see Fig. 2-5).
Fig. 2-5  Securing Circuit Breaker and Mounting Plate to Operating Handle Mechanism and Enclosure Backplate

Note: If dimensions greater than K (Fig. 2-2) are found between backplate of enclosure and circuit breaker mounting bracket, spacers must be used. Clearance holes may be required in the spacers to accommodate protrusion of circuit breaker hardware.

2-12. Secure circuit breaker mounting plate to enclosure backplate using customer-supplied hardware (see Fig. 2-6).

2-13. Install cover interlock on enclosure cover. (See Fig 2-2.)

2-14. Test function of installed handle mechanism in the following manner.
   a. Close enclosure door. Switch handle mechanism to ON.
   b. Check that handle mechanism switches circuit breaker to ON position and that enclosure door cannot be opened.
   c. Switch handle mechanism to OFF position.
   d. Check that handle mechanism switches circuit breaker to OFF position and that enclosure door can be opened.
   e. Close enclosure door. Switch handle mechanism/circuit breaker to ON.
   f. Turn defeater mechanism button (Fig. 2-6) counterclockwise with a flat-blade screwdriver.
   g. Press Push-to-Trip button in the circuit breaker trip unit with a small flat-blade screwdriver to trip circuit breaker.
   h. Close enclosure door.
   i. Switch handle mechanism to extreme OFF (reset) position. Check that circuit breaker resets.
FOR TYPE SM SAFETY HANDLE MECHANISM STYLES LISTED BELOW, FLEXIBLE INSULATOR CAPS MUST BE INSTALLED OVER THE HEADS OF THE FASTENERS THAT SECURE THE HANDLE MECHANISM MOUNTING BRACKET TO THE ENCLOSURE.

FOR PREVIOUSLY INSTALLED SAFETY HANDLE MECHANISMS:

1. Install one flexible insulator cap over the fastener head for each of the four customer-supplied fasteners that secure the handle mechanism mounting bracket to the enclosure. Refer to Figure 1. Ensure that the entire fastener head is completely covered by the flexible insulator cap. Note: The flexible insulator cap will stretch and conform to the size and shape of the fastener head (i.e. pan-head, hex-head, etc.).

FOR NEW SAFETY HANDLE MECHANISM

INSTALLATIONS:

1. Install Safety Handle Mechanism in conjunction with I.L. 13282-M, Dated January, 1985, or later revision (for SM400L/SM400R); or, in conjunction with I.L. 29C284, Dated April, 1990, or later revision (for SM600L/SM600R).

2. Install one flexible insulator cap over the fastener head for each of the four customer-supplied fasteners that secure the handle mechanism mounting bracket to the enclosure. Refer to Figure 1. Ensure that the entire fastener head is completely covered by the flexible insulator cap. Note: The flexible insulator cap will stretch and conform to the size and shape of the fastener head (i.e. pan-head, hex-head, etc.).

Note:
This Notice applies to the following Type SM Safety Handle Mechanisms:

SM400L
SM400R
SM600L
SM600R

WARNING