

50 A 2:1 series multiple (dual voltage) switch cap/wrench, lever or hotstick operable handles installation instructions



Powering Business Worldwide

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Safety for life



Eaton meets or exceeds all applicable industry standards relating to product safety in its Cooper Power™ series products. We actively promote safe practices in the use and maintenance of our products through our service literature, instructional training programs, and the continuous efforts of all Eaton employees involved in product design, manufacture, marketing, and service.

We strongly urge that you always follow all locally approved safety procedures and safety instructions when working around high voltage lines and equipment, and support our “Safety For Life” mission.

Safety information

The instructions in this manual are not intended as a substitute for proper training or adequate experience in the safe operation of the equipment described. Only competent technicians who are familiar with this equipment should install, operate, and service it.

A competent technician has these qualifications:

- Is thoroughly familiar with these instructions.
- Is trained in industry-accepted high and low-voltage safe operating practices and procedures.
- Is trained and authorized to energize, de-energize, clear, and ground power distribution equipment.
- Is trained in the care and use of protective equipment such as arc flash clothing, safety glasses, face shield, hard hat, rubber gloves, clampstick, hotstick, etc.

Following is important safety information. For safe installation and operation of this equipment, be sure to read and understand all cautions and warnings.

Hazard Statement Definitions

This manual may contain four types of hazard statements:

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in equipment damage only.

Safety instructions

Following are general caution and warning statements that apply to this equipment. Additional statements, related to specific tasks and procedures, are located throughout the manual.

DANGER

Hazardous voltage. Contact with hazardous voltage will cause death or severe personal injury. Follow all locally approved safety procedures when working around high- and low-voltage lines and equipment.

G103.3

WARNING

Before installing, operating, maintaining, or testing this equipment, carefully read and understand the contents of this manual. Improper operation, handling or maintenance can result in death, severe personal injury, and equipment damage.

G101.0

WARNING

This equipment is not intended to protect human life. Follow all locally approved procedures and safety practices when installing or operating this equipment. Failure to comply can result in death, severe personal injury and equipment damage.

G102.1

WARNING

Power distribution and transmission equipment must be properly selected for the intended application. It must be installed and serviced by competent personnel who have been trained and understand proper safety procedures. These instructions are written for such personnel and are not a substitute for adequate training and experience in safety procedures. Failure to properly select, install or maintain power distribution and transmission equipment can result in death, severe personal injury, and equipment damage.

G122.3

Product information

Introduction

Eaton's Cooper Power™ series 50 A externally operated single-phase dual voltage switches are designed for use in distribution transformers filled with transformer oil, Envirotemp™ FR3™ fluid, or an approved equivalent. They are designed for use in pole- or pad-mounted transformers. The switches are used to connect primary windings in series for a higher winding ratio or parallel for a lower voltage winding ratio.

Read this manual first

Read and understand the contents of this manual and follow all locally approved procedures and safety practices before installing or operating this equipment.

Additional information

These instructions cannot cover all details or variations in the equipment, procedures, or process described nor provide directions for meeting every possible contingency during installation, operation, or maintenance. For additional information, contact your Eaton representative.

Acceptance and initial inspection

Each tap changer switch is in good condition when accepted by the carrier for shipment. Upon receipt, inspect the shipping container for signs of damage. Unpack the tap changer switch and inspect it thoroughly for damage incurred during shipment. If damage is discovered, file a claim with the carrier immediately.

Handling and storage

Be careful during handling and storage of the tap changer switch to minimize the possibility of damage. If the switch is to be stored for any length of time prior to installation, provide a clean, dry storage area.

Standards

ISO 9001 Certified Quality Management System

General mounting description

Torque requirements

To Seal - 80-120 inch pounds.

Clearance

Table 1. Dielectric Clearance Dimensions

kV BIL	Minimum mounting clearance under-oil to Gnd/ between phases/and depth below top level
95	1.1"
125	1.5"

Mechanical - External handle clear of obstructions. When the lever handle with index plate is used, flattening for the gasket sealing surface must not exceed a depth of .25"

Mechanical strength

Designed to support leads sized per rating of switch. Standard dielectric dimensions for lead separation should be followed. Connection of leads can be made either to bolt tabs or crimped into connectors (if supplied). Special stationary contact with crimp barrels are available for #16-14, #12-10, and #8 copper wires. Bolt tab designed to accept 1/4"-20 bolt and ring tongue terminals through #4. A larger terminal may be used if the terminal amperage rating corresponds with the switch rating.

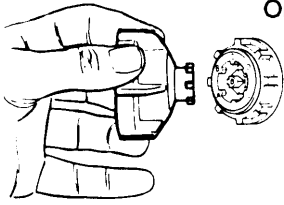
CAUTION

Equipment Damage. Caution should be used in lead training [dressing] to avoid lead forces of over 60 pounds on the switch in any direction. Anticipate thermal expansion and contraction as well as mechanical stresses from transportation, which will vary by application. Misuse of lead training could result in equipment damage.

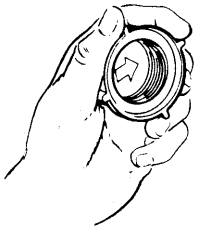
Electrical ratings

Impulse Withstand	125 kV BIL
60 Hz 1 Minute Withstand	40 kV
Continuous Current	50 A rms Series Position 100 A rms Parallel Position

Operation instructions

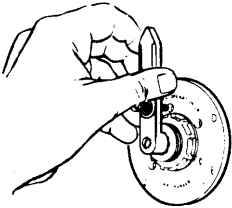


On Cap/wrench
It is keyed for one way in/one way out when fully switching to ensure positive switch contact.



The molded arrow on the switch shaft must line up with the molded arrow inside the wrench.

The white molded arrow on the interior of the cap points to the switched position.



Lever or hotstick handles

Lever or point of rigid Hotstick Handle points to the switched position. To switch, back out lock screw, rotate to desired position, turn in lock screw to ensure positive switch contact.

WARNING

Enclosed "Warning" decals (Cooper P/N 1139089A01 and P/N 1139090A01) must be displayed at or near operating handle of switch as a warning to service personnel. Failure to do so will constitute a waiver of all warranty and indemnity obligations which may be attributable to Eaton.

WARNING

The misapplication of the switch constitutes a potential hazard to life and property. Accordingly, the user must exercise due care in utilizing these instructions to assure that the switch is properly applied.

The decals included with the handle kit are to be located on the tank wall near the switch operating handle as a warning to service personnel (see Figure 1).

Failure to do so will constitute a waiver of all warranty and indemnity obligations attributable to Eaton.

Cap/Wrench Switches

WARNING

DE-ENERGIZE TRANSFORMER BEFORE CHANGING VOLTAGE. REMOVE PROTECTIVE CAP AND USE KEY ON END TO OPERATE SWITCH, REPLACE CAP BEFORE ENERGIZING.

 Power Systems

1139089A01

Lever or Hotstick Handle Switches

WARNING

DE-ENERGIZE TRANSFORMER BEFORE CHANGING VOLTAGE. BEFORE OPERATING HANDLE, BACK OUT LOCKSCREW TO CLEAR INDEX PLATE. AFTER CHANGING SWITCH POSITION, TURN IN LOCKSCREW SECURELY BEFORE ENERGIZING AGAIN.

 Power Systems

1139090A01

Figure 1. Warning decals.

Mounting sequence and dimensions

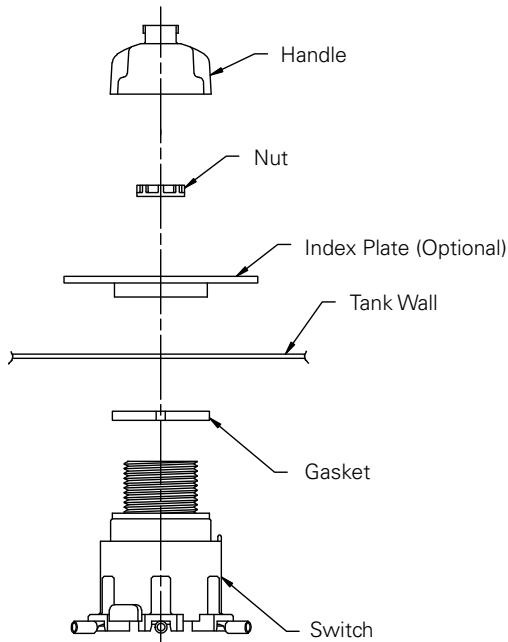


Figure 2. Cap/wrench assembly.

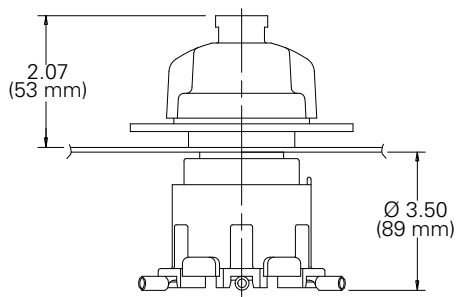


Figure 3. One-phase cap wrench switch.

* Dimension will decrease as tank wall thickness increases. Maximum dimension given with 14 gauge tank wall.

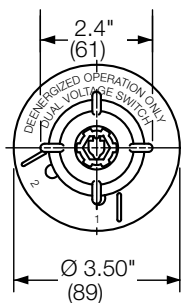


Figure 4. Cap wrench-front view.

Note: Switch can be used on 14 gauge to .25 inch thick frontplate. Bolt tabs are bent up 90° and have a hole to accept .25 inch (6 mm) hardware.

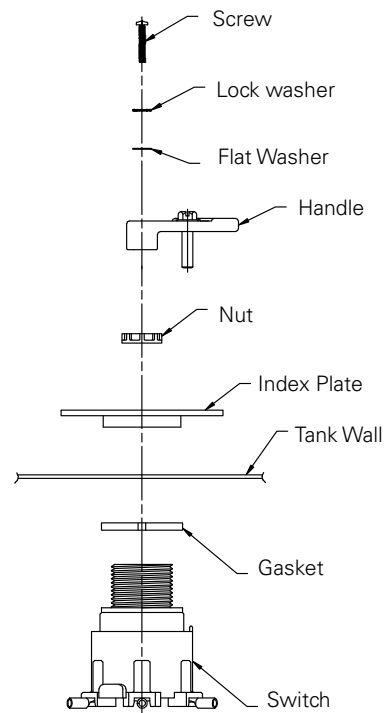


Figure 5. Lever handle assembly.

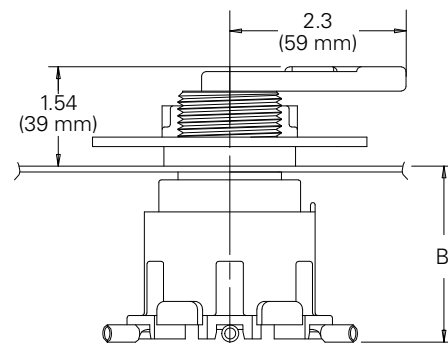


Figure 6. Lever handle switch.

* Dimension will decrease as tank wall thickness increases. Maximum dimension given with 14 gauge tank wall. ("B" Dimension - See Table 2)

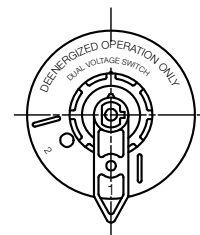


Figure 7. Lever handle-front view.

* Dimension will decrease as tank wall thickness increases. Maximum dimension given with 14 gauge tank wall.

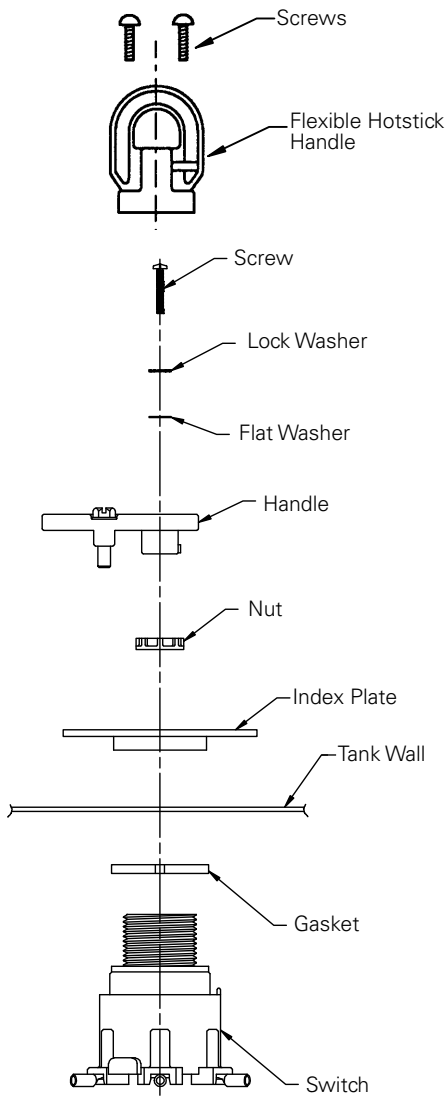


Figure 8. Flexible hotstick handle assembly.

Note: Switch can be used on 14 gauge to .25 inch thick frontplate. Bolt tabs are bent up 90° and have a hole to accept .25 inch (6 mm) hardware.

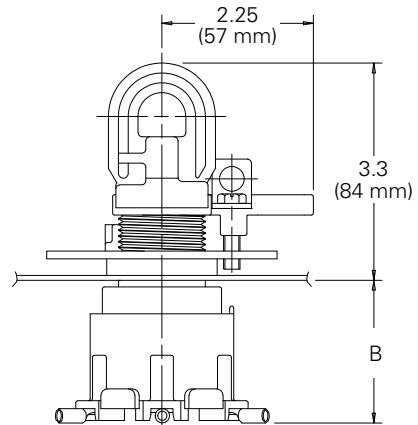


Figure 9. One-phase flexible hotstick switch.

* Dimension will decrease as tank thickness increases. Maximum dimension given with 14 gauge tank wall. ("B" Dimension - See Table 2)

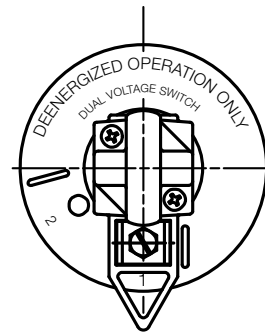


Figure 10. Flexible hotstick handle-front view.

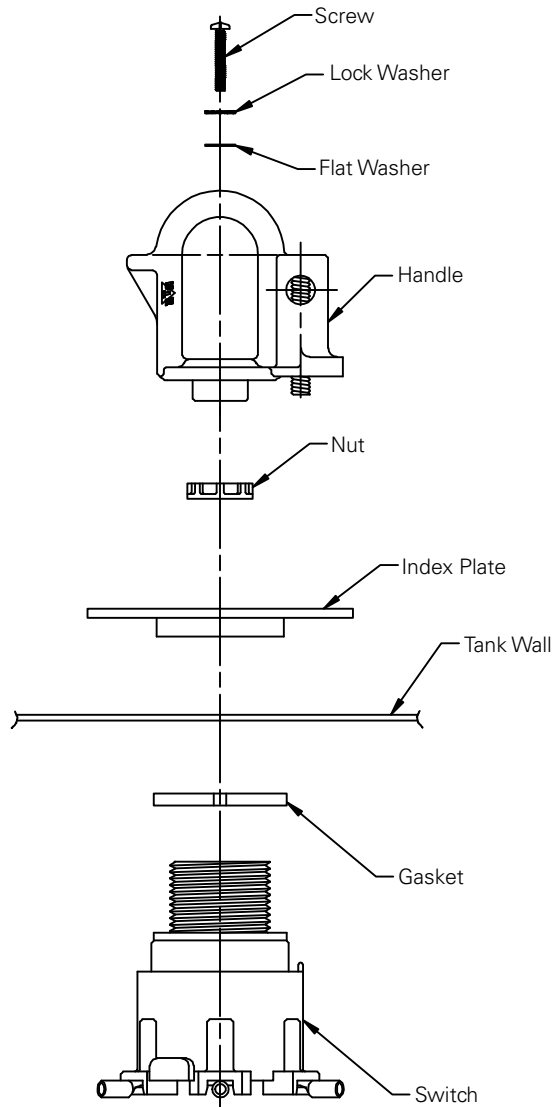


Figure 11. 100 A tap-changer mounting with rigid one-piece hotstick handle. (One-phase switch view shown.)

* Dimension will decrease as tank wall thickness increases. Maximum dimension given with 14 gauge tank wall.

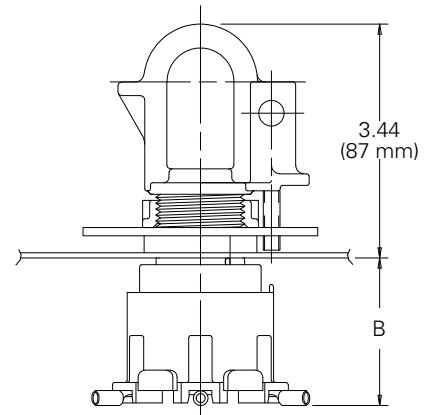


Figure 12. One-phase rigid one-piece hotstick.

* Dimension will decrease as tank wall thickness increases. Maximum dimension given with 14 gauge tank wall. ("B" Dimension - See Table 2)

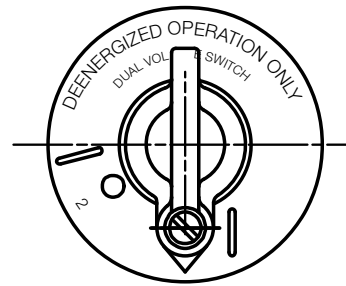


Figure 13. Rigid one-piece hotstick-front view.

* Dimension will decrease as tank wall thickness increases. Maximum dimension given with 14 gauge tank wall.

Table 2. Dual Voltage Switch Mounting Sequence (All configurations).

Contact Type	"A" Dia.	"B" Dim.
Bolt Tabs 90° Bend	2.91 (74.0 mm)	2.81 (71.4 mm)
14-16 AWG Long Shank	4.20 (106.70 mm)	2.18 (55.4 mm)
10-12 AWG Long Shank		
8 AWG Long Shank		
Three 14-16 AWG Long Shank and Two 90° Bolt Tab	2.91 (73.9 mm)	2.81 (71.4 mm)
Three 10-12 AWG Long Shank and Two 90° Bolt Tab		
Three 18 AWG Long Shank and Two 90° Bolt Tab		
Three 14-16 AWG Long Shank and Two Straight Bolt Tab	4.47 (113.5 mm)	2.18 (55.4 mm)
Three 10-12 AWG Long Shank and Two Straight Bolt Tab		
Three 8 AWG Long Shank and Two Straight Bolt Tab		
.25-20 Stud 90°	4.07 (103.3 mm)	2.81 (71.4 mm)
.25-20 Stud 45°	4.52 (114.8 mm)	2.18 (55.4 mm)

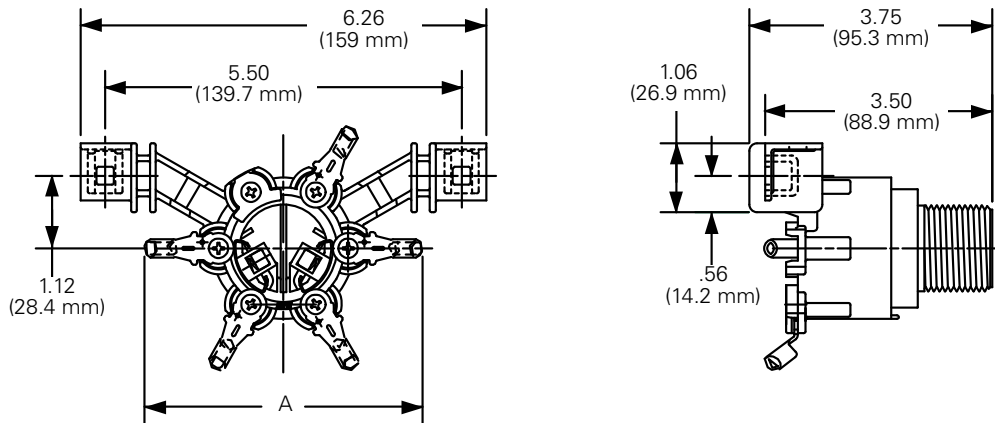


Figure 14. Switch with terminal posts.

*When required, accepts .25 inch rounded short square neck bolt, carriage bolt. Hardware not included.

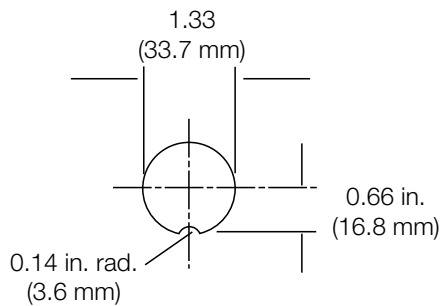


Figure 15. Switch mounting hole.



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