

Single-phase MagneX™ interrupter installation instructions



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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

 **WARNING**

Eaton's MagneX interrupter is designed to be operated in accordance with normal safe operating procedures. These instructions are not intended to supersede or replace existing safety and operating procedures.

Read all instructions before installing the MagneX interrupter.

The interrupter should be installed and serviced only by personnel familiar with good safety practice and the handling of high-voltage electrical equipment. Failure to comply can result in death, severe personal injury and equipment damage.

Product information

Introduction

Eaton designs its Cooper Power™ series MagneX™ interrupter to be an over-current protective device that protects distribution transformers from damaging overloads and secondary faults, and is also used for switching the transformer “on” or “off”.

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 representative.

Acceptance and initial inspection

Each MagneX interrupter is in good condition when accepted by the carrier for shipment. Upon receipt, inspect the shipping container for signs of damage. Unpack the MagneX interrupter 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 MagneX interrupter to minimize the possibility of damage. If the MagneX interrupter 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

Electrical ratings

Table 1. Voltage Ratings and Characteristics

| Description | Rating |
|------------------------------------|-----------|
| Impulse 1.2 x 50 Microsecond Wave | 150 kV |
| 60 Hz-1 Minute Voltage Withstand | 50 kV |
| Continuous Current Rating | 42 A |
| Switching Load Currents, 200 Times | 42 A |
| Magnetizing Current Switching | 200 Times |

Continuous current ratings and dielectric testing are in accordance with ANSI/IEEE Std C57.12.00™-1987 standard.

Switching and Fault Close IEEE Std C37.41™-1988 standard.

Overload Protection ANSI/IEEE Std C57.91™-1981 standard.

Table 2. Interrupting Rating

| Voltage kV-LG (A) | RMS Symmetric (A) | RMS Asymmetric (A) |
|-------------------|-------------------|--------------------|
| 8.3 | 2800 | 4200 |
| 15.5 | 1500 | 2250 |
| 23.0 | 500 | 750 |

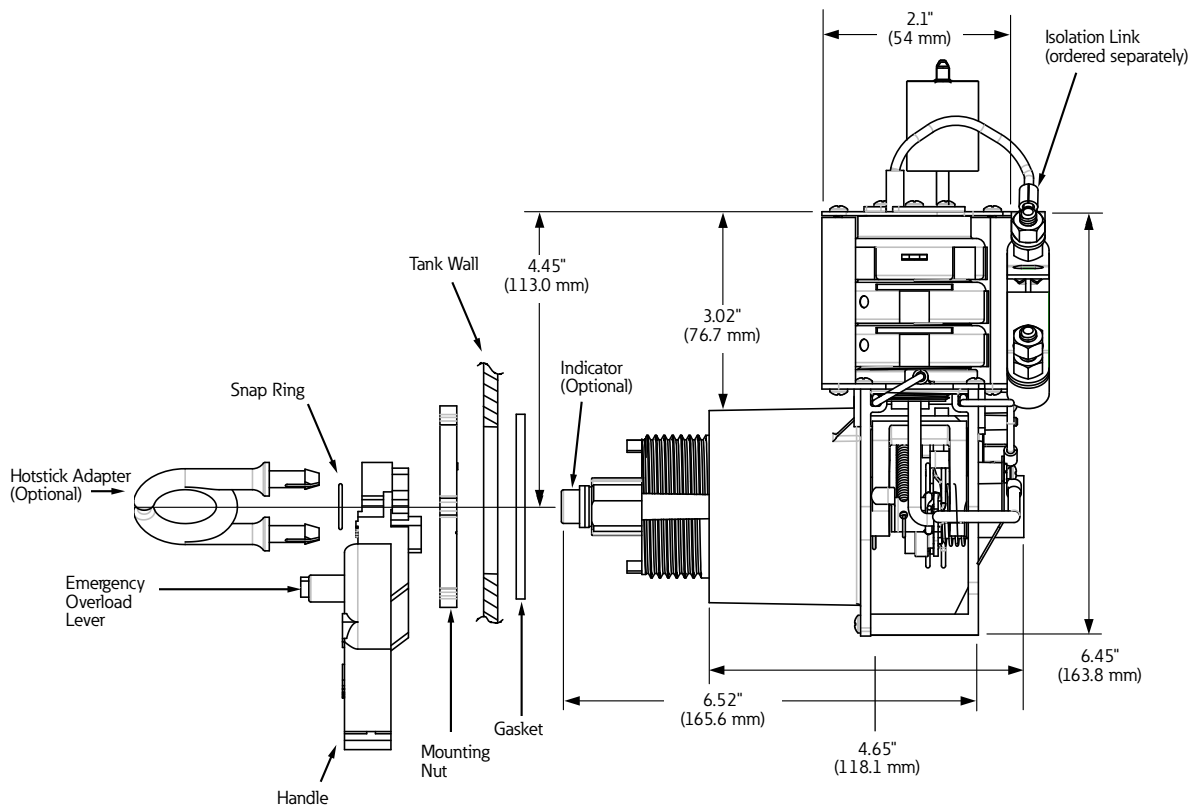


Figure 1. Side View with optional hotstick adaptor and handle.

Note: Dimensions given are for reference only, inches (mm).

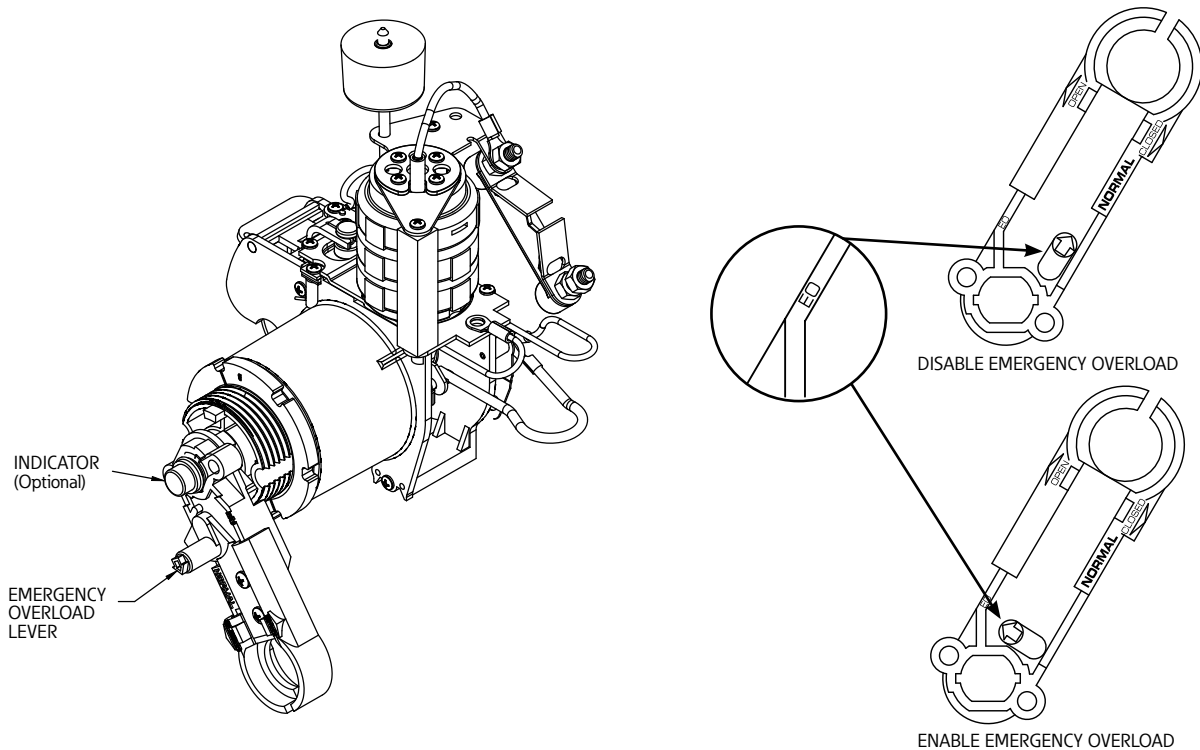


Figure 2. Enable/Disable Emergency Overload (EO) feature on standard handle.

Application/operation

The MagneX interrupter is a primary loadbreak interrupting device, which is handle operated only. Handle operation must be performed with an operating tool, such as a hotstick, hookstick or disconnect stick. When the handle is down against its physical stop, the contacts are “closed” (standard position). Rotating the handle upward (counter clockwise) causes the spring loaded contacts to “open.” Moving the handle downward against its physical stop returns the device to the “closed” position. (Refer to Figure 2).

In the “closed” position, this device will operate automatically due to an overcurrent condition or rise in oil temperature. In this case, the circuit will be “open,” with the handle pointed downward in the “closed” (standard position). To reset, the handle must be rotated upward (counter clockwise) to the “open” position and then back down (clockwise) against its physical stop to the “closed” position. (Refer to Figure 2).

With handle reversed 180° (optional orientation), when the handle is up against its physical stop, the contacts are “closed.” Rotating the handle downward (counter clockwise) causes the spring loaded contacts to “open.” Moving the handle upward (clockwise) against its physical stop returns the device to the “closed” position.

Optional indicator

In normal conditions, the optional indicator lens is clear showing the un-tripped position. When an overload or a fault occurs, the orange fluorescent flag will stick out in the clear lens to indicate the tripped position.

 **WARNING**

If indicator is in the “tripped” position, move handle to “open” position before working on the unit.

Emergency overload operation

Some MagneX interrupters are equipped with an optional emergency overload setting. The emergency overload will allow approximately 30% overload before tripping. (Refer to Figure 2).

Enable emergency overload

1. Insert hotstick into hotstick loop.
2. Move handle to "open" position
3. Turn emergency overload lever counterclockwise to "EO" position.
4. Move handle against its physical stop to "closed" position.

Disable emergency overload

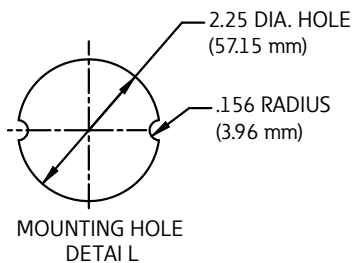
1. Insert hotstick into hotstick loop.
2. Move handle to "open" position.
3. Turn emergency overload lever clockwise to "normal" position.
4. Move handle against its physical stop to "closed" position.

Operation requirements

CAUTION

The MagneX interrupter must be used with an isolation link or current-limiting fuse.

This prevents the primary circuit from being energized in event of a faulted transformer.



Installation

The single-phase MagneX interrupter is mounted through the transformer tank wall for side wall mount. Use 2.25" diameter hole size with anti-rotation nibs (.156" radius), refer to Figure 3. Nibs (either one or two) must be on the horizontal centerline of the tank hole ± 5 degrees. Refer to Figures 3, 4, and 5 to see how the unit should be installed and connected. The oil level should be 2" (minimum) above top of interrupting chamber, under any potential transformer installation conditions and oil temperatures. Sealing is accomplished with gasket on inside of tank and sealing nut on protruding threads through tank wall.

The MagneX interrupter should be kept perpendicular with the tank wall during installation (through the tank wall mounting hole from the inside of the tank). This may require some type of support (inside tank) until the sealing nut is snug up against the tank wall. The sealing nut shall be tightened to snug plus 1/2 turn, (90-120 in-lbs, 10-14 Nm). (Note: Snug is defined as the point at which the sealing nut no longer turns freely as the MagneX interrupter is supported).

CAUTION

Do not lift the MagneX interrupter by the float or apply any vertical force to the float. Failure to comply may result in equipment damage, minor or moderate injury.

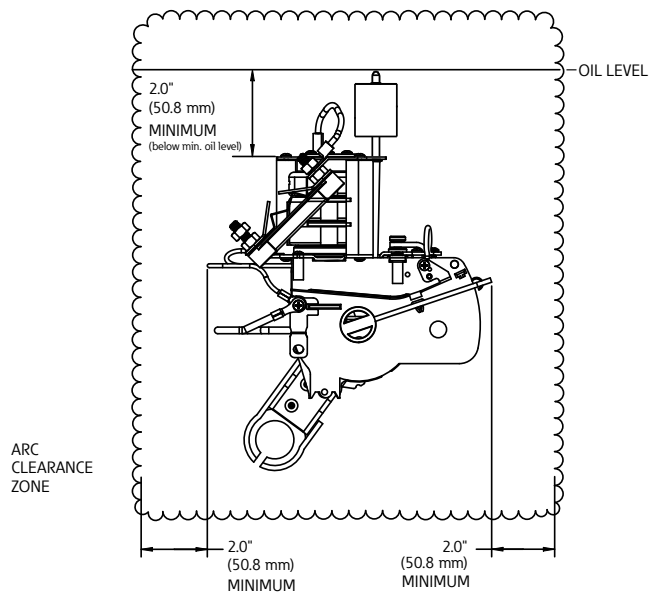


Figure 3. MagneX interrupter typical installation indicating minimum oil level and arc clearance zone.

Recommended clearances

Mechanical

Handle movement must be clear of obstruction. (Refer to Figure 4).

Dielectric (Under-oil)

Clouds of gas will rise during operation, so it is not recommended that other components be located above the MagneX interrupter, unless they are outside the arc clearance zone and have an insulated barrier between them that will deflect gas bubbles from MagneX interrupter operation away from the component above the interrupter.

Table 3. Dielectric Clearances

| kV BIL | Clearance to Ground (In Oil) |
|--------|------------------------------|
| 95 | 1.1" |
| 125 | 1.5" |
| 150 | 2.0" |

Oil level must be a minimum of 2 inches above the top of chamber.

The outline drawings shown in Figures 2 and 3 describe the MagneX interrupter and its application in oil-filled apparatus. This information should be used only by trained personnel familiar with the design requirements for oil-filled apparatus. This information is not intended as a substitute for adequate training and experience in such design. Should clarification or further information be required for the user's purposes, contact your Eaton representative.

All energized parts of the MagneX interrupter must be under oil and spaced away from other energized parts or ground with sufficient distance to withstand all operating and test voltages. In order for proper switch operation to occur, an arc clearance zone is required around the MagneX interrupter. This zone should be under oil and free of all foreign materials. The boundaries of this zone are defined in Figure 3.

WARNING

Recommended (minimum) under-oil clearances must be followed to avoid internal arcing which could result in component failure, property damage or possible severe personal injury.

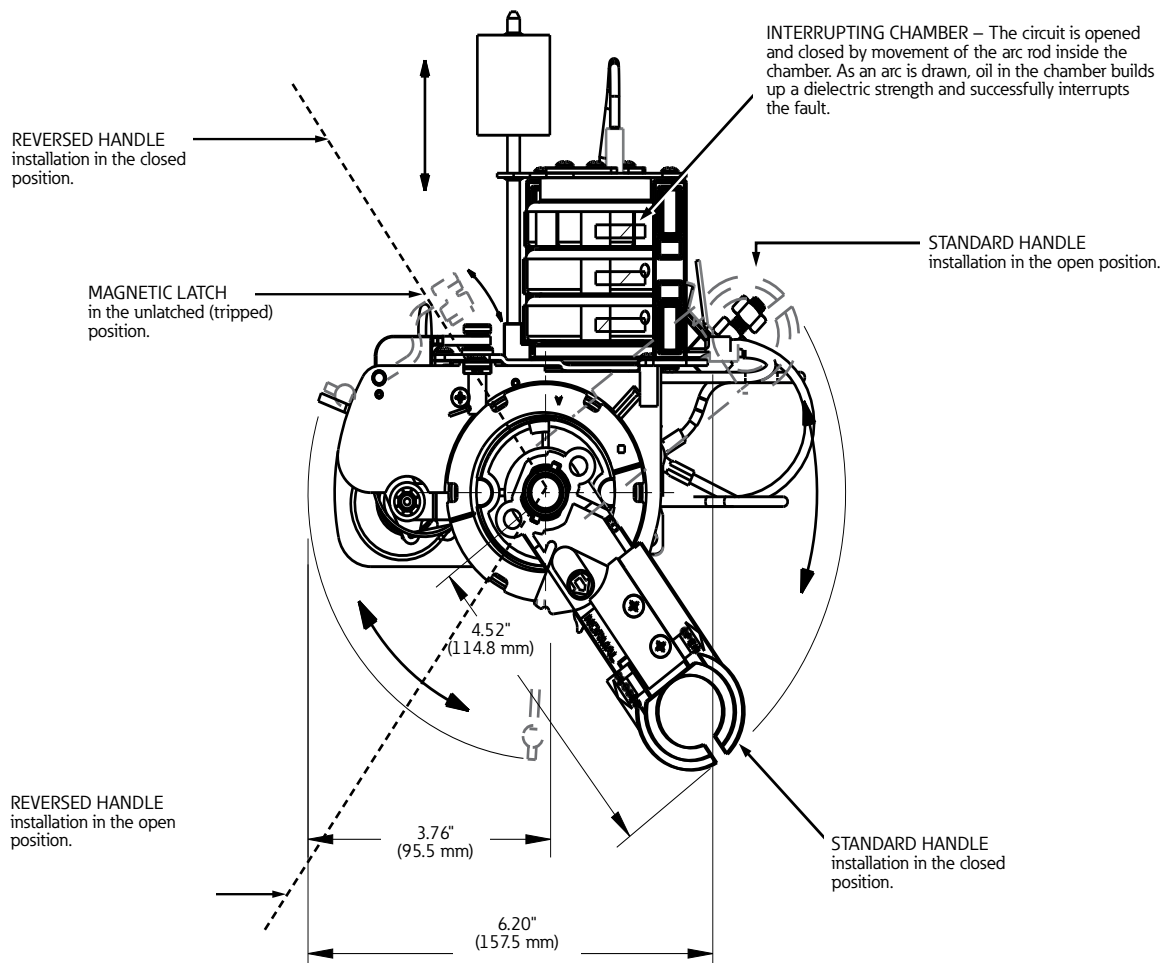


Figure 4. MagneX Interrupter showing handle swing – Front View with Standard Handle.

Note: Dimensions given are for reference only.

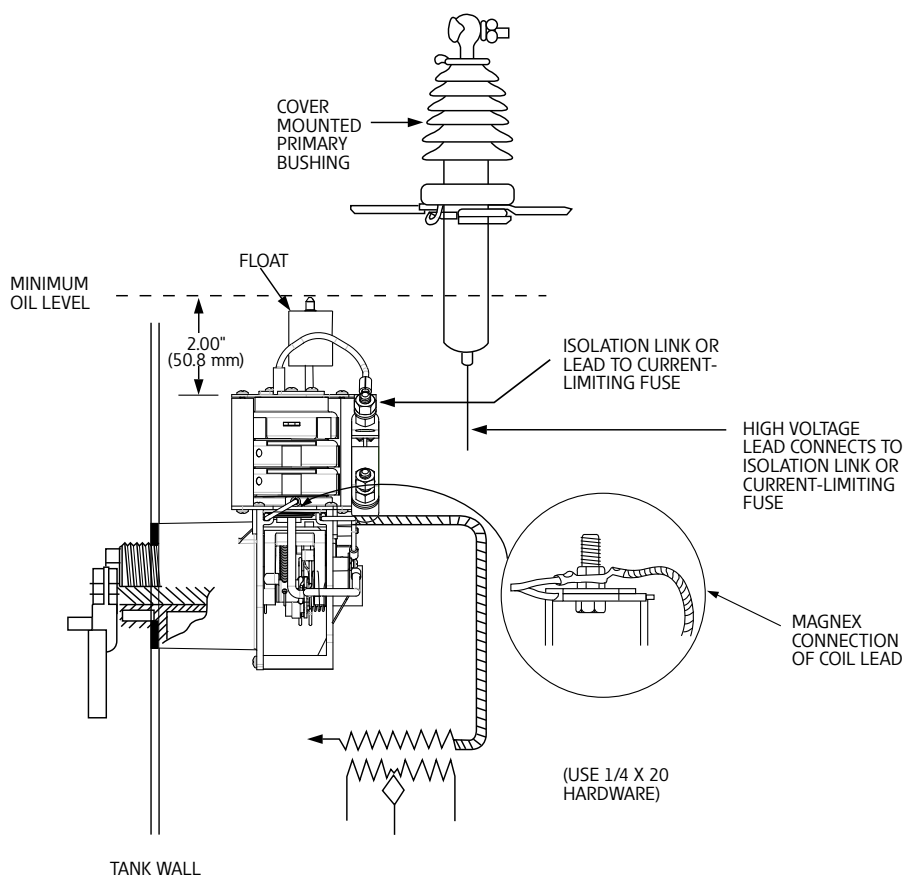


Figure 5. MagneX interrupter typical installation indicating minimum oil level.

Mechanical strength

Strip point of housing threads

The torque strength of the sealing nut and housing threads exceeds 400 in-lbs (45 Nm). This device requires no additional bracing or support, as it is fully self-supporting. The mechanical strength of the device exceeds the maximum stress from leads or interrupting functions.

Decal

A "Caution Decal" and "Warning Decal" are included and should be located on the tank wall near the MagneX interrupter handle. **(Failure to do so will constitute a waiver of all warranty and indemnity obligations attributed to Eaton).**

CAUTION

Do not operate this device if there is evidence of tank distress or leaking.

(Handle must be rotated fully against the stop in the closed position.)

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Eaton
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com

**Eaton's Cooper Power Systems
Division**
2300 Badger Drive
Waukesha, WI 53188
United States
Eaton.com/cooperpowerseries

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