

15, 25, and 35 kV class standard M.O.V.E. and POSI-BREAK™
M.O.V.E. elbow arrester installation instructions



DISCLAIMER OF WARRANTIES AND LIMITATION OF LIABILITY

The information, recommendations, descriptions and safety notations in this document are based on Eaton Corporation's ("Eaton") experience and judgment and may not cover all contingencies. If further information is required, an Eaton sales office should be consulted. Sale of the product shown in this literature is subject to the terms and conditions outlined in appropriate Eaton selling policies or other contractual agreement between Eaton and the purchaser.

THERE ARE NO UNDERSTANDINGS, AGREEMENTS, WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, OTHER THAN THOSE SPECIFICALLY SET OUT IN ANY EXISTING CONTRACT BETWEEN THE PARTIES. ANY SUCH CONTRACT STATES THE ENTIRE OBLIGATION OF EATON. THE CONTENTS OF THIS DOCUMENT SHALL NOT BECOME PART OF OR MODIFY ANY CONTRACT BETWEEN THE PARTIES.

In no event will Eaton be responsible to the purchaser or user in contract, in tort (including negligence), strict liability or otherwise for any special, indirect, incidental or consequential damage or loss whatsoever, including but not limited to damage or loss of use of equipment, plant or power system, cost of capital, loss of power, additional expenses in the use of existing power facilities, or claims against the purchaser or user by its customers resulting from the use of the information, recommendations and descriptions contained herein. The information contained in this manual is subject to change without notice.

Contents

SAFETY INFORMATION

Safety Information	iv
--------------------------	----

PRODUCT INFORMATION

Introduction	1
Acceptance and Initial Inspection	1
Handling and Storage	1
Quality Standards	1

INSTALLATION PROCEDURE

Application	2
Installation on an Energized or De-energized System	2



Safety for life



Eaton's Cooper Power Systems products meet or exceed all applicable industry standards relating to product safety. 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's Cooper Power Systems 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 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 a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

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

CAUTION

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

CAUTION: Indicates a hazardous situation which, if not avoided, could 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

CAUTION

High Voltage. Eaton's Cooper Power Systems M.O.V.E. Arrester 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. The M.O.V.E. Arrester should be installed and serviced only by personnel familiar with good safety practices and the handling of high voltage electrical equipment. It may be installed or removed from an energized system according to approved utility practices for removal of loadbreak terminators.

CAUTION

High Voltage. The full capability of reducing partial vacuum flashovers will not be realized unless the POSI-BREAK housing is used in conjunction with the POSI-BREAK probe. Failure to comply may result in minor or moderate injury.

Product information

Introduction

Eaton's Cooper Power Systems Standard M.O.V.E. and POSI-BREAK™ M.O.V.E. Elbow Arresters provide overvoltage protection to underground systems. They protect both the equipment and the cable from surge damage.

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. When additional information is desired to satisfy a problem not covered sufficiently for the user's purpose, please contact your Cooper Power Systems sales representative.

Acceptance and initial inspection

Each M.O.V.E. Elbow Arrester is completely assembled, inspected, and tested at the factory. It is in good condition when accepted by the carrier for shipment. Upon receipt of a M.O.V.E. Elbow Arrester inspect it thoroughly for damage and loss of parts incurred during shipment. If damage or loss is discovered, file a claim with the carrier immediately.

Handling and storage

If the M.O.V.E. Elbow Arrester is to be stored for an appreciable time before installation, provide a clean, dry storage area.

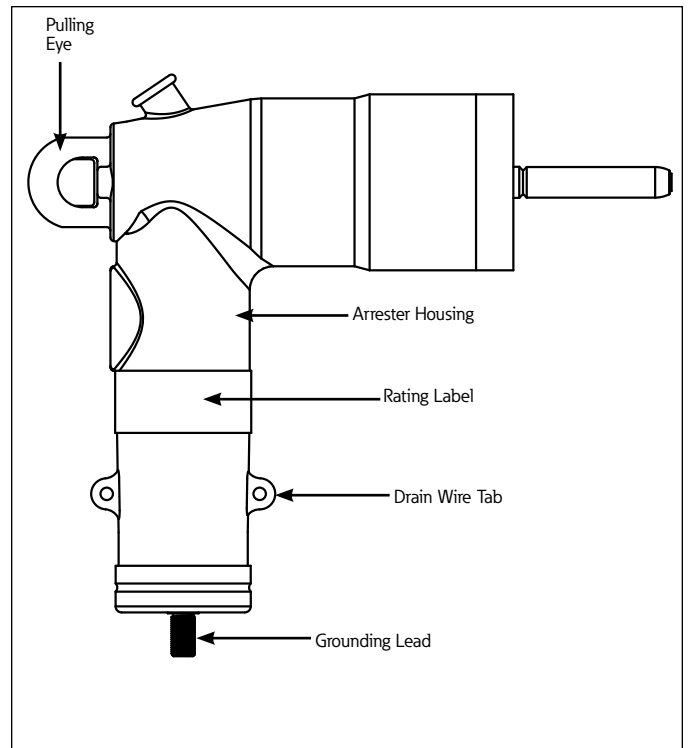


Figure 1. Line illustration of 200 A 25 kV POSI-BREAK Elbow Arresters.

Quality standards

ISO 9001 Certified Quality Management System

Installation procedure

Application

The M.O.V.E. Elbow Arrester should be installed only on systems where the power frequency voltage at the arrester does not exceed the maximum continuous operating voltage. (MCOV) values published. See Table 2.

All Eaton's Cooper Power Systems M.O.V.E. Elbow Arresters must be installed or removed from an energized bushing with a clampstick.

CAUTION

High Voltage. Do not install an arrester if the voltage or MCOV data listed on the arrester label are not exactly the same as that listed on the carton label. Do not install the arrester if the system line-to-ground voltage exceeds the MCOV rating on the arrester. Failure to comply may result in minor or moderate injury.

Table 1. Electrical Apparatus Specifiers Catalog Section Number Reference

M.O.V.E. Arrester Design	Catalog Section
Standard M.O.V.E.	235-65
POSI-BREAK M.O.V.E.	235-97

Note: Because the M.O.V.E. Elbow Arrester has a completely grounded case, it may be installed anywhere within the apparatus primary compartment. Determine the space requirements of the M.O.V.E. Elbow Arrester and ground lead before installation so that they do not restrict the installation, operation or removal of other devices.

Table 2. Recommended M.O.V.E. Arrester Applications

Nominal Circuit Voltage (kV)	Maximum Voltage (kV)	Duty Cycle (MCOV Ratings) (kV)		
		4-Wire Wye; Multi-grounded Neutral	3-Wire Wye; Solidly Grounded Neutral 30 minute ¹	Delta and Ungrounded Wye ²
2.4	2.54	—	—	3 (2.55)
4.15 Y/2.4	4.4 Y/2.54	3 (2.55)	6 (5.1)	—
4.16	4.4	—	—	6 (5.1)
4.8	5.08	—	—	6 (5.1)
6.9	7.26	—	—	9 (7.65)
8.32 Y/4.8	8.8 Y/5.08	6 (5.1)	9 (7.65)	—
12.0 Y/6.93	12.7 Y/7.33	9 (7.65)	12 (10.2)	—
12.47 Y/7.2	13.2 Y/7.62	9 (7.65)	15 (12.7)	—
13.2 Y/7.62	13.97 Y/8.07	10 (8.4)	15 (12.7)	—
13.8 Y/7.97	14.52 Y/8.38	10 (8.4)	15 (12.7)	—
13.8	14.52	—	—	18 (15.2)
20.78 Y/12.0	22.0 Y/12.7	15 (12.7)	21 (17.0)	—

1. Line-to-ground fault duration not to exceed 30 minutes. For longer durations, contact the factory for proper rating.

2. Use for high impedance grounded systems also.

Installation on an energized or de-energized system

WARNING

High Voltage. All associated apparatus must be de-energized during hands-on installation or maintenance. Failure to comply may result in death or serious personal injury.

Note: Verify the M.O.V.E. Elbow Arrester has the proper interface and voltage rating for the application.

Note: When the M.O.V.E. Elbow Arrester is installed on an energized system, it must be positioned so that its grounded end points downward or at the adjacent ground plane. A clampstick should be utilized when installing a M.O.V.E. Elbow Arrester on an energized system.

Note: Excessive force on the ground lead may cause the metal cap to separate from the arrester housing. Never handle the arrester by the attached ground lead.

Note: The nut attaching the ground lead to the threaded stud on the metal cap is factory installed to the proper torque value. Do not remove or retighten. Over torquing of the ground lead nut may cause the metal cap to separate from the arrester housing.

 **WARNING**

The operator should always use personal protective equipment (insulated gloves, clampstick, and eye protection) whenever operating the elbow. The operator should always be in the best possible operating position, providing firm footing and enabling a secure grasp of the clampstick, while maintaining positive control of the elbow before, during, and immediately after operation. If there is any question regarding the operator's operating position, de-energize the elbow before operation. The operator should not be looking directly at the connector during the moment of circuit interruption or connection. Failure to comply could result in death or serious injury.

- Attach ground lead of the arrester (connected to the base of the arrester) to the system ground with 4 to 8 ft-lbs torque.
- Attach a grounded drain wire to the elbow arrester drain wire tab. This ensures that the arrester is grounded if the end cap is separated during a pressure relief event.
- Lubricate the arrester interface with the lubricant supplied.
- Use a clampstick to remove the mating connector from the apparatus bushing. Install mating connector on a parking stand bushing.
- Verify ground lead attachment.
- Grasp pulling the eye of the arrester firmly using a clampstick. Position the tip of the arrester probe just into the nose of the loadbreak bushing. Position the arrester so that its grounded end points downward or at an adjacent ground plane.
- Thrust the arrester firmly onto the bushing.



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

**Eaton's Cooper Power Systems
Business**
2300 Badger Drive
Waukesha, WI 53188
United States
Cooperpower.com

© 2013 Eaton
All Rights Reserved
Printed in USA
Publication No. S235551 Rev 3
(Supersedes S235551 Rev 2)

EATON
Powering Business Worldwide

Eaton, Cooper Power Systems, and POSI-BREAK are valuable trademarks of Eaton, in the U.S. and other countries. You are not permitted to use these trademarks without the prior written consent of Eaton.