

Surge Arresters

**15, 25 and 35 kV Class Standard M.O.V.E.,
VariGAP M.O.V.E. and POSI-BREAK M.O.V.E.
Elbow Arrester Installation Instructions**

Service Information

S235-55-1

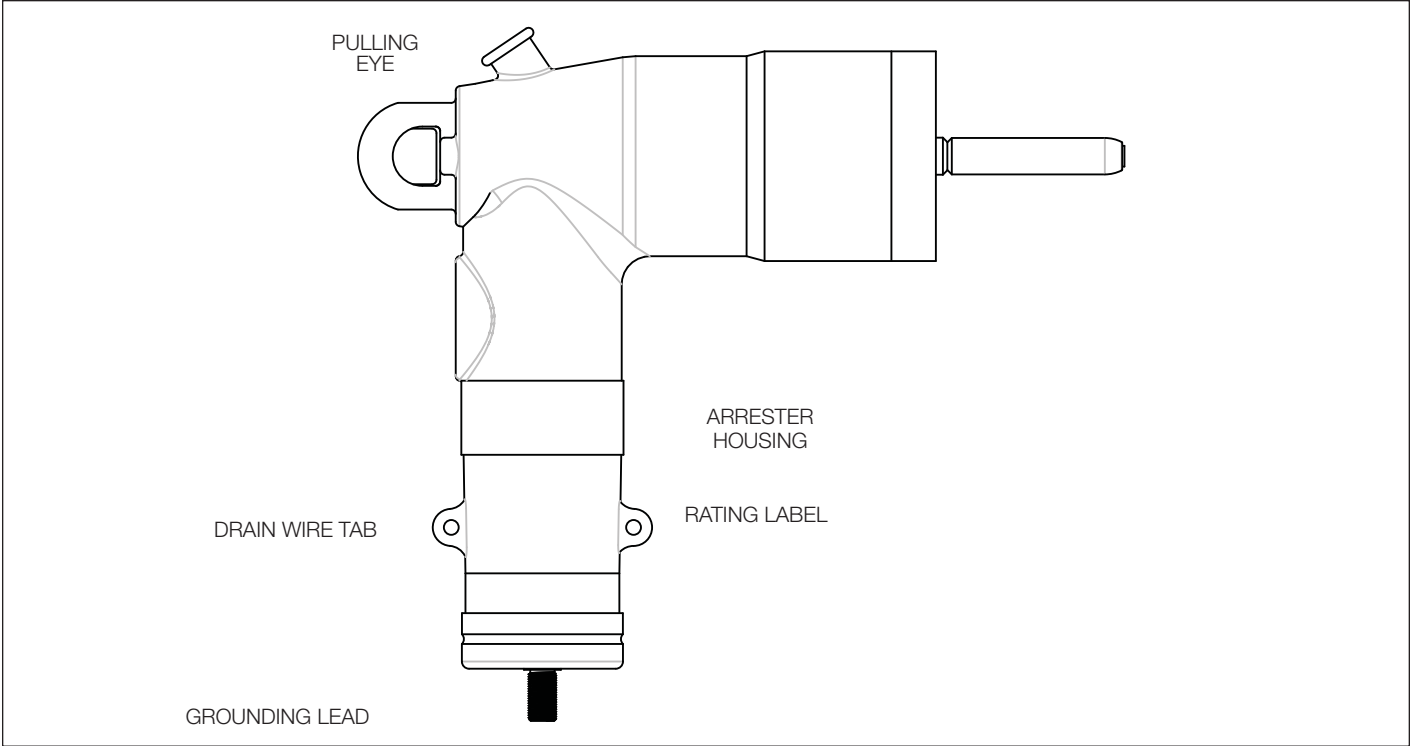


Figure 1.
Line illustration of 200 A 25 kV POSI-BREAK Elbow.

Contents

General	1
Safety Information	2
Product Information	3
Installation Procedure	4

CAUTION: 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.

CAUTION: The 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.



SAFETY FOR LIFE



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 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, 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.

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



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.



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 may result in death, severe personal injury and equipment damage.



WARNING: Power distribution equipment must be 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 this equipment can result in death, severe personal injury, and equipment damage.

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.

PRODUCT INFORMATION

Introduction

The Cooper Power Systems Standard M.O.V.E., POSI-BREAK M.O.V.E. and VariGAP M.O.V.E. 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. 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. 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. arrester is to be stored for an appreciable time before installation, provide a clean, dry storage area.

Quality Standards


ISO 9001:2000-Certified Quality Management System

INSTALLATION PROCEDURE

APPLICATION

The M.O.V.E. 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 on page 4, Table 2.

All Cooper Power Systems M.O.V.E. Arresters must be installed or removed from an energized bushing with a hotstick.



CAUTION: 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.

TABLE 1
Electrical Apparatus Specifiers Catalog Section Number Reference

M.O.V.E. Arrester Design	Catalog Section
VariGAP MOV (Gapped)	235-55
Standard MOV	235-65
POSI-BREAK MOV	235-97
POSI-BREAK VariGAP MOV (Gapped)	235-98

NOTE: Because the M.O.V.E. 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. Arrester and ground lead before installation so that they do not restrict the installation, operation or removal of other devices.

INSTALLATION ON AN ENERGIZED OR DE-ENERGIZED SYSTEM

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

NOTE: When the M.O.V.E. 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 hotstick should be utilized when installing a M.O.V.E. 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 torqueing of the ground lead nut may cause the metal cap to separate from the arrester housing.

- 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 hotstick to remove the insulated protective cap or loadbreak elbow from the apparatus bushing. The loadbreak elbow should be placed on a parking stand bushing.
- Verify ground lead attachment.
- Grasp pulling the eye of the arrester firmly using a hotstick. 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.

⚠ WARNING: The operator should not be looking directly at the arrester during the moment of circuit interruption or arrester. Positive control of the connector and cable should be maintained at all times. The operator should have a means of isolating an energized conductor readily available and convenient. Companies that operate separable connectors may have other requirements.

⚠ WARNING: M.O.V.E. Arresters should not be repaired in the field. All M.O.V.E. Arresters should be returned to Cooper Power Systems for repairs and/or maintenance.

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 ²	Delta and Ungrounded Wye ¹
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)/18 (15.3) ³	21 (17.0)	—
22.86 Y/13.2	24.2 Y/13.97	18 (15.3)/21 (17.0) ³	24 (19.5)	—
24.94 Y/14.4	26.4 Y/15.24	18 (15.3)/21 (17.0) ³	27 (22.0)	—
27.6 Y/15.93	29.255 Y/16.89	21 (17.0)/24 (19.5) ³	—	—
34.5 Y/19.92	36.51 Y/21.1	27 (22.0) ⁴	—	—

1. Use for high impedance grounded systems also.
 2. Line-to-ground fault duration not to exceed 30 minutes. For longer durations, contact the factory for proper rating.
 3. Selection of Cooper M.O.V.E. Arrester with a higher rated MCOV rating may improve the probability of surge sharing on systems not protected with MOV arresters at the riser poles.
 4. The 22.0 kV MCOV rating is available only in the 35 kV Class Large Interface (Interface No. 1).

