Surge Arresters
MN235005EN

Effective February 2016
Supersedes IS235-35-1 June 2014

COOPER POWER SERIES

UltraSIL polymer-housed VariSTAR surge arrester IEC 60099-4 for MV systems to 36 kV installation instructions

Powering Business Worldwide

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Contents

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

⚠ CAUTION

Always handle surge arrester—packed or unpacked—very carefully. Do not drop, jar, or handle an arrester roughly. Dropping, jarring, and/or rough handling may damage the arrester internally and/or externally, making it incapable of adequately protecting the apparatus or circuit on which it is to be installed or it may shorten the service life of the arrester significantly.

⚠ WARNING

Never install a damaged arrester. A damaged arrester may misoperate violently, causing severe personal injury and property damage.

⚠ CAUTION

Do not install an arrester if the voltage rating (Ur) and COV (Uc) data are not exactly the same on the arrester nameplate and the carton label. Do not install the arrester if the COV (Uc) is less than the maximum line to earth system voltage. Erroneous installation may cause a violent fault on the system with the potential for personal injury and property damage.

⚠ CAUTION

Make all electrical connections - ground and line - so that no mechanical stress is applied to the surge arrester. Mechanical stress may damage the arrester in such a manner that its service life is shortened significantly.

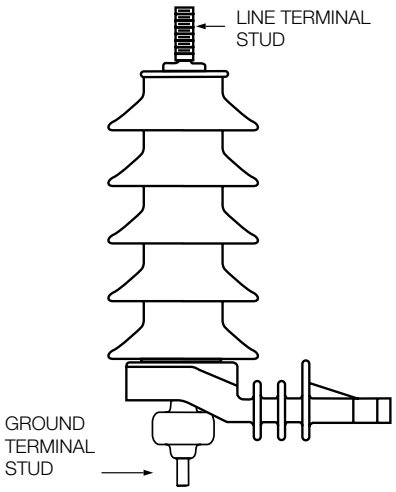


Figure 1. UltraSIL housed VariSTAR arrester.

IMPORTANT

This product as designed and packaged by Eaton has been classified by the US DOT as not regulated as an explosive.

Product information

Introduction

Eaton's Cooper Power™ series UltraSIL® polymer-housed VariSTAR® surge arrester Class 1 and Class 2 MOV surge arresters provide overvoltage protection to medium-voltage electrical distribution systems.

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 surge arrester is inspected, tested at the factory. It is in good condition when accepted by the carrier for shipment. Upon receipt of a surge arrester, inspect the surge arrester 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 surge arrester is to be stored for an appreciable time before installation, provide a clean, dry storage area. Locate the surge arrester so as to minimize the possibility of mechanical damage.

Standards

ISO 9001 Certified Quality Management System

Installation procedure

Note: In the event that safety and operating procedures do not exist for installing this arrester to, or removing it from a circuit, we suggest the following:

- Select a mounting location as close as possible to the apparatus that the arrester is to protect. Make the line lead and ground lead as short as possible.
- De-energize the electrical system.
- Connect the ground (earth) lead to the arrester ground terminal stud. Torque the hex nut to 27 Nm maximum.
- Install all mounting hardware on the arrester. Torque the hanger bracket hex nut to 27 Nm. See Figure 2 for NEMA® brackets.

Note: Make the arrester ground connection as short and direct as possible to a solid, effective, permanent, low-resistance ground. If the arrester has a ground lead disconnector, (isolator) the ground lead must be flexible enough to allow the disconnector to operate properly.

- Connect the line lead to the arrester line terminal stud. Torque the hex nut to 27 Nm maximum.

Note: The standard arrester terminals accommodate conductor diameters from 4 mm through 11 mm.

- Re-energize the electrical system.

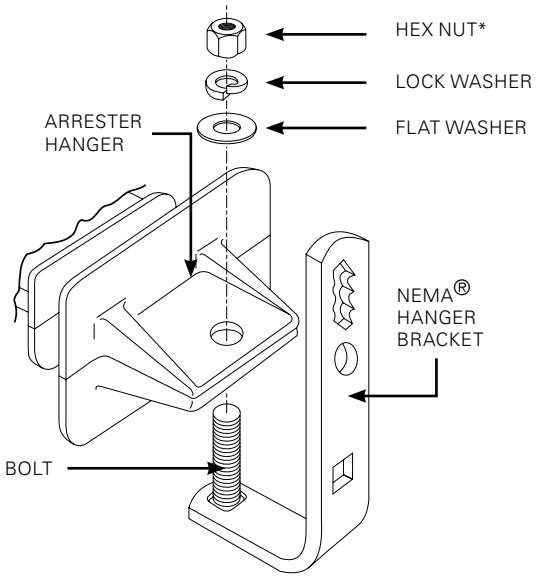
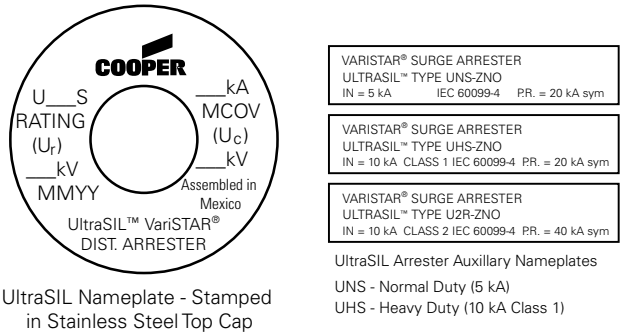


Figure 2. Installation of arrester to NEMA® hanger bracket.
**Torque requirement of hex nut is 27 Nm max.*



UltraSIL Nameplate - Stamped in Stainless Steel Top Cap

UltraSIL Arrester Auxillary Nameplates
UNS - Normal Duty (5 kA)
UHS - Heavy Duty (10 kA Class 1)

Figure 3. Typical nameplate data.

⚠ WARNING

Before performing any test on an arrester, contact your Eaton representative. Some test procedures may damage the arrester externally and/or internally, making it incapable of protecting the apparatus or the circuit on which it is installed or shortening its service life significantly.

Field testing

All UltraSIL polymer-housed VariSTAR surge arresters have passed a complete series of production tests prior to shipment; therefore, no field testing prior to initial energization is necessary. Never, even briefly, apply any power frequency voltage in excess of COV (U_C) as stamped on the arrester top cap. There are currently no industry accepted methods for field testing of arresters.

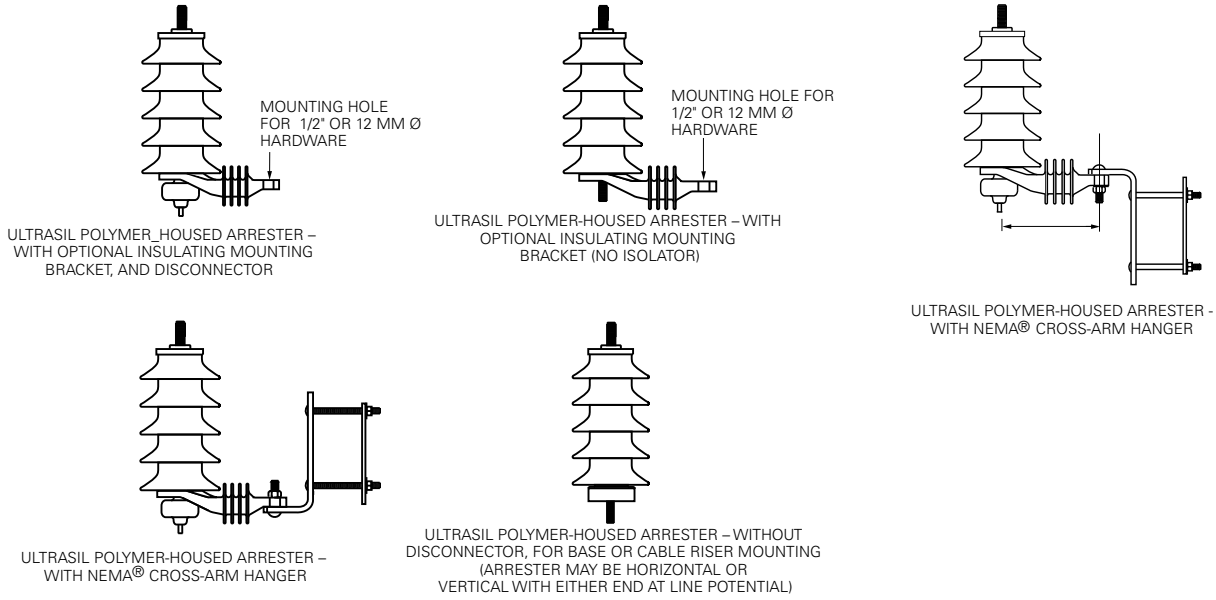


Figure 4. UltraSIL polymer-housed VariSTAR surge arrester mounting options.

Removing an arrester from a circuit

- De-energize the electrical system.
- Disconnect the arrester line lead(s) from the circuit.

Note: A small amount of static charge may be retained in an arrester when it is removed from an energized circuit.

- Discharge the arrester by attaching the line terminal to a temporary ground.
- Mark the temporary ground to make sure it is removed before the arrester is reinstalled.
- Disconnect the arrester ground lead(s) from the circuit.
- Re-energize the electrical system.
- For transportation, the restraining device must be attached to any arrester that has an intact ground lead disconnector and terminal stud.

⚠ WARNING

Always consider an arrester to be energized until both the line and the ground leads have been disconnected from the circuit to avoid potential for personal injury.

Accessories

Wildlife protection

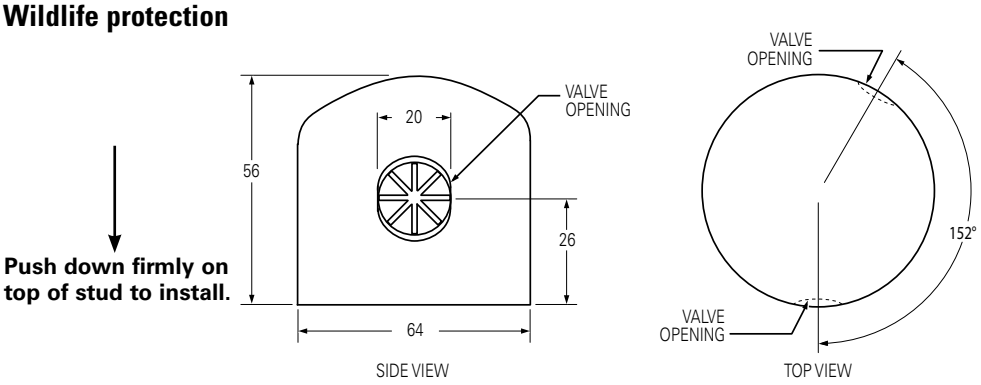


Figure 5. Universal wildlife protector (catalog number AV346X1C). (All dimensions in mm).

The universal wildlife protector has two self-adjusting "valve" style openings which vary from 0 to 19 mm in diameter, thus allowing for a large variety of conductor/insulation sizes while providing optimum wildlife protection.

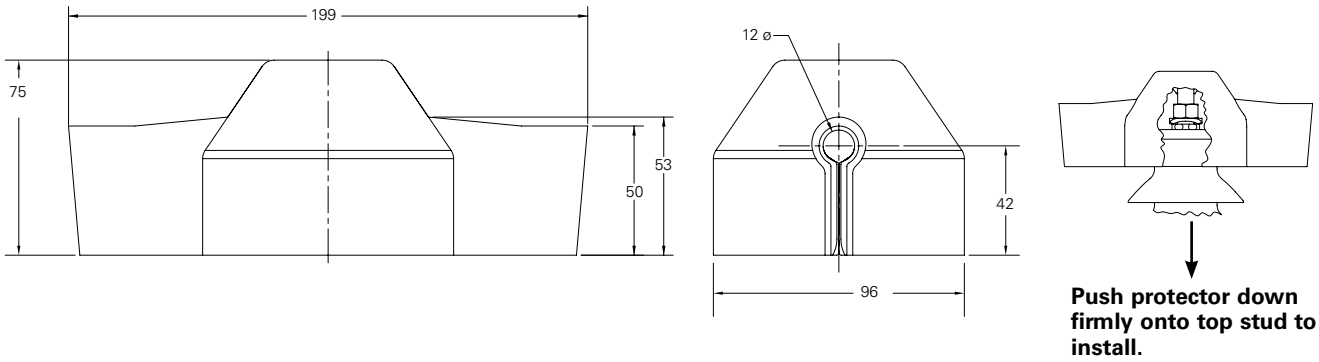


Figure 6. Line terminal wildlife guard (catalog number AV698X1C). (All dimensions in mm.)

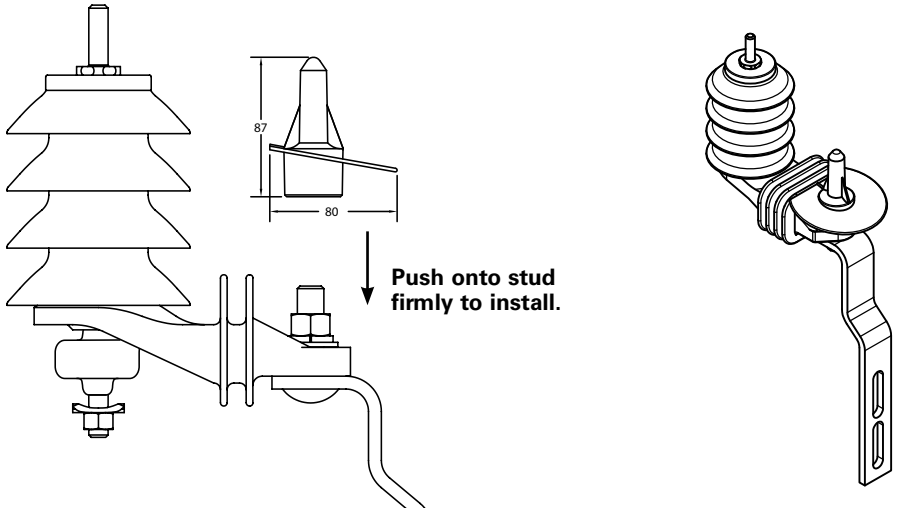


Figure 7. Ground terminal wildlife guard (catalog number AV731X1C). (All dimensions in mm.) Left shows attachment of ground terminal wildlife guard, right images shows ground terminal wildlife guard completely installed.

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Printed in USA
Publication No. MN235005EN
February 2016

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