# VariSTAR Storm Trapper high energy MOV arrester installation instructions

Powering Business Worldwide

## 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**

Standards . . . . . **1**

**INSTALLATION PROCEDURE**

Application recommendations . . . . . **2**

## 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 VariSTAR® Storm Trapper high energy MOV arrester is designed to provide overvoltage protection at the low-voltage side of distribution transformers. The Storm Trapper high energy arrester is the industry's first low-voltage distribution class arrester. It has successfully passed all design tests for light duty distribution class arresters per IEEE Std C62.11™-1993 standard and is CSA® listed for safety.

**⚠ WARNING**

**As with any electrical device, precautions must be observed to prevent injury due to electrical shock. Be sure all electricity is shut off before installing an arrester. It is recommended that installation be made only by an authorized technician.**

## 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, contact your Eaton representative.

## Acceptance and Initial Inspection

Each Storm Trapper surge 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 Storm Trapper surge 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 Storm Trapper surge arrester is to be stored for an appreciable time before installation, provide a clean, dry storage area.

## Quality Standards

ISO 9001 Certified Quality Management System

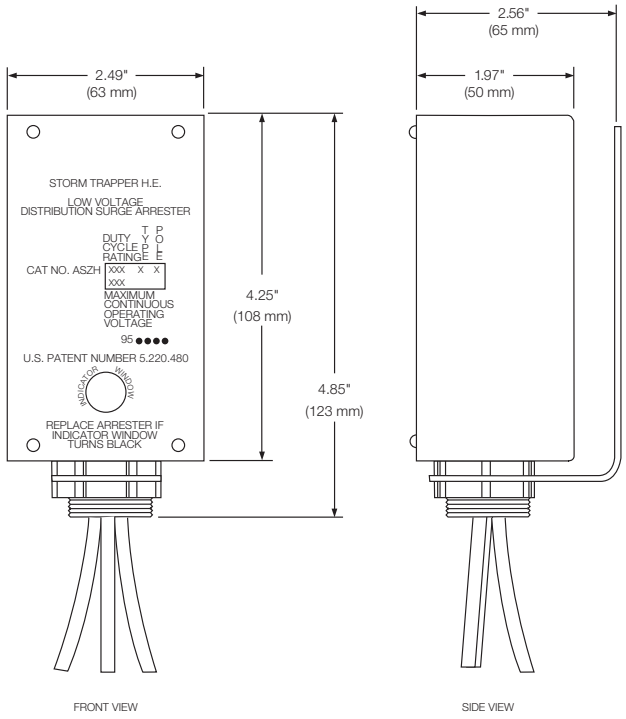



**Figure 1. Metal enclosed VariSTAR Storm Trapper high energy MOV arrester with optional mounting bracket.**

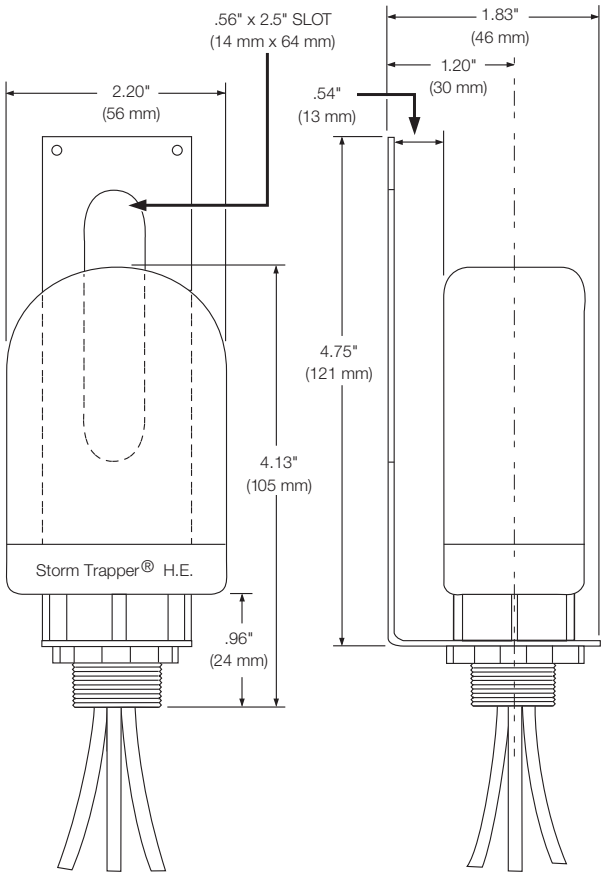



**Figure 2. External mount VariSTAR Storm Trapper high energy MOV arrester with optional mounting bracket.**

**Table 1. Application Recommendations**

| System Configuration | | Storm Trapper High Energy Arrester | | | | |
|---|---|---|---|---|---|---|
| **Phase/Wiring** | **Voltage (Volts rms)** | **Arrester Rating (Volts rms)** | **MCOV* (Volts rms)** | **Pole(s) (Phases)** | **See Wiring Diagram (Figure 3)** | **Catalog** Number** |
| Single-Phase/Two-Wire | 120 | 480 | 400 | 1 | 1 | ASZH480C100 |
| | 240 | 480 | 400 | 1 | 1 | ASZH480C100 |
| | 480 | 650 | 540 | 1 | 1 | ASZH650C100 |
| Single-Phase/Three-Wire | 240/120 | 480 | 400 | 2 | 2 | ASZH480C200 |
| | 480/240 | 480 | 400 | 2 | 2 | ASZH480C200 |
| Three-Phase (ungrounded)/ Three-Wire | 240 | 480 | 400 | 3 | 3 | ASZH480C300 |
| | 480 | 650 | 540 | 3 | 3 | ASZH650C300 |
| Three-Phase (one-phase grounded)/ Three-Wire | 240 | 480 | 400 | 2 | 4 | ASZH480C200 |
| | 480 | 650 | 540 | 2 | 4 | ASZH650C200 |
| Three-Phase (one-phase center-tap grounded)/ Four-Wire | 240/120 | 480 | 400 | 3 | 5 | ASZH480C300 |
| | 480/240 | 650 | 540 | 3 | 5 | ASZH650C300 |
| Three-Phase/ Four-Wire | 208Y/120 | 480 | 400 | 3 | 6 | ASZH480C300 |
| | 480Y/277 | 480 | 400 | 3 | 6 | ASZH480C300 |

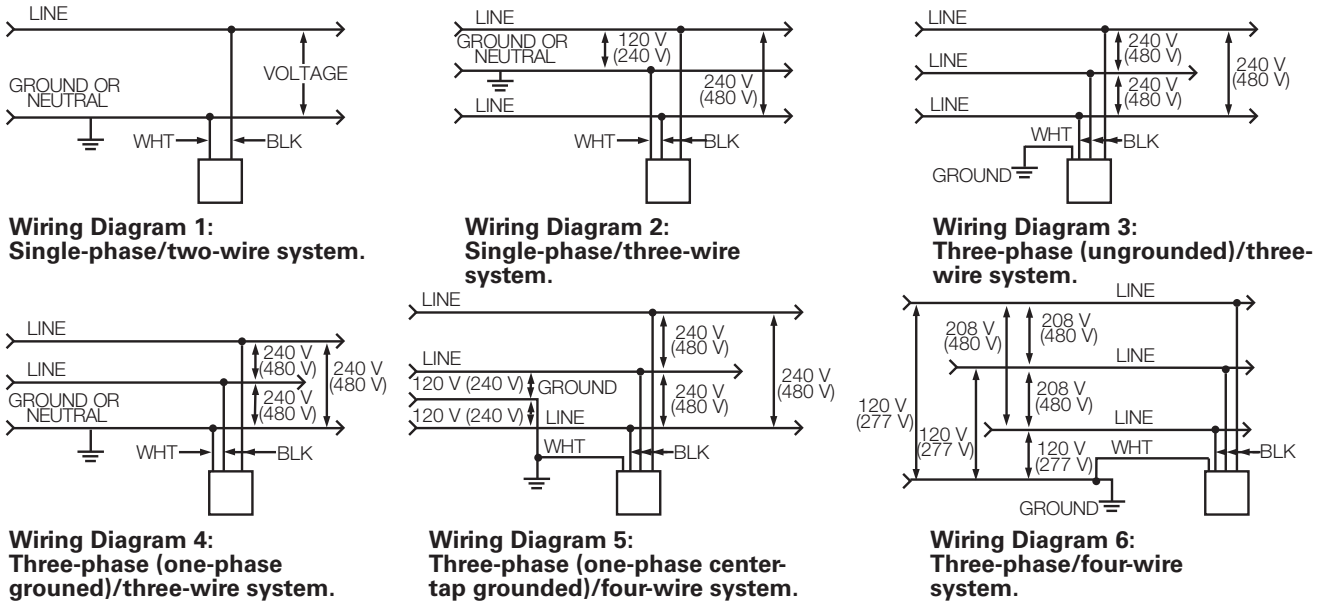
* Maximum continuous operating voltage (MCOV) is the maximum designated rms value of power frequency voltage that may be applied continuously between the terminals of the arrester. Temporary overvoltage capability should not be exceeded during transformer production electrical tests.

**Mounting bracket option available. Change last digit in catalog number to 1 (Example: ASZH480C101).

## Installation procedure

The Storm Trapper high energy arrester is moisture proof for indoor and outdoor use. Prior to installing a Storm Trapper high energy arrester:

1. Consult Table 1 to make certain the arrester is correct for the applied system configuration.
2. Refer to the appropriate wiring diagram in Figure 3 for the proper connections.




**Wiring Diagram 1: Single-phase/two-wire system.**

**Wiring Diagram 2: Single-phase/three-wire system.**

**Wiring Diagram 3: Three-phase (ungrounded)/three-wire system.**

**Wiring Diagram 4: Three-phase (one-phase grouned)/three-wire system.**

**Wiring Diagram 5: Three-phase (one-phase center-tap grounded)/four-wire system.**

**Wiring Diagram 6: Three-phase/four-wire system.**

**Figure 3. Wiring diagrams.**

**Note:** Black leads to line: white leads to ground.
Voltage between a white lead and any black lead should not exceed arrester MCOV rating.
Eaton recommends that the arrester leads be trimmed to the minimum required length.




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

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




© 2016 Eaton
All Rights Reserved
Printed in USA
Publication No. MN235017EN
October 2016

Eaton is a registered trademark.

All trademarks are property
of their respective owners.

For Eaton's Cooper Power series product information call 1-877-277-4636 or visit: www.eaton.com/cooperpowerseries.

# VariSTAR Storm Trapper high energy MOV arrester installation instructions

Powering Business Worldwide

## 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**

Standards . . . . . **1**

**INSTALLATION PROCEDURE**

Application recommendations . . . . . **2**

## 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 VariSTAR® Storm Trapper high energy MOV arrester is designed to provide overvoltage protection at the low-voltage side of distribution transformers. The Storm Trapper high energy arrester is the industry's first low-voltage distribution class arrester. It has successfully passed all design tests for light duty distribution class arresters per IEEE Std C62.11™-1993 standard and is CSA® listed for safety.

**⚠ WARNING**

**As with any electrical device, precautions must be observed to prevent injury due to electrical shock. Be sure all electricity is shut off before installing an arrester. It is recommended that installation be made only by an authorized technician.**

## 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, contact your Eaton representative.

## Acceptance and Initial Inspection

Each Storm Trapper surge 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 Storm Trapper surge 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 Storm Trapper surge arrester is to be stored for an appreciable time before installation, provide a clean, dry storage area.

## Quality Standards

ISO 9001 Certified Quality Management System

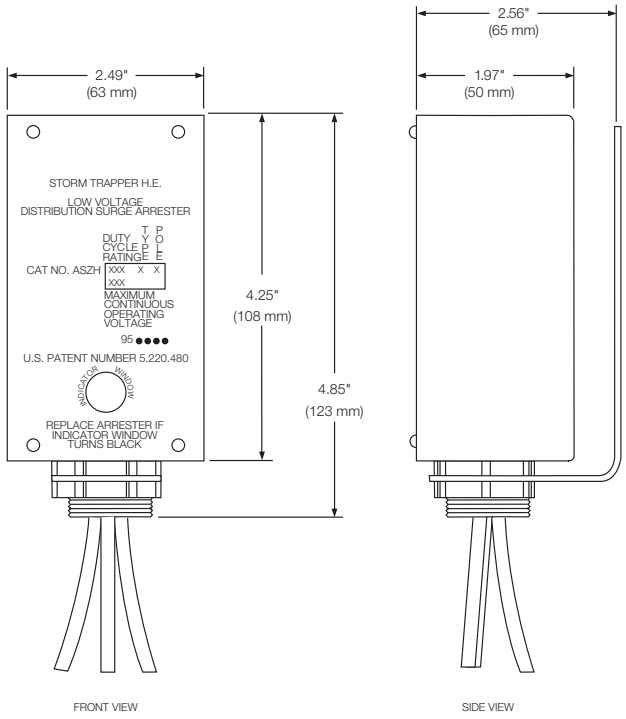



**Figure 1. Metal enclosed VariSTAR Storm Trapper high energy MOV arrester with optional mounting bracket.**

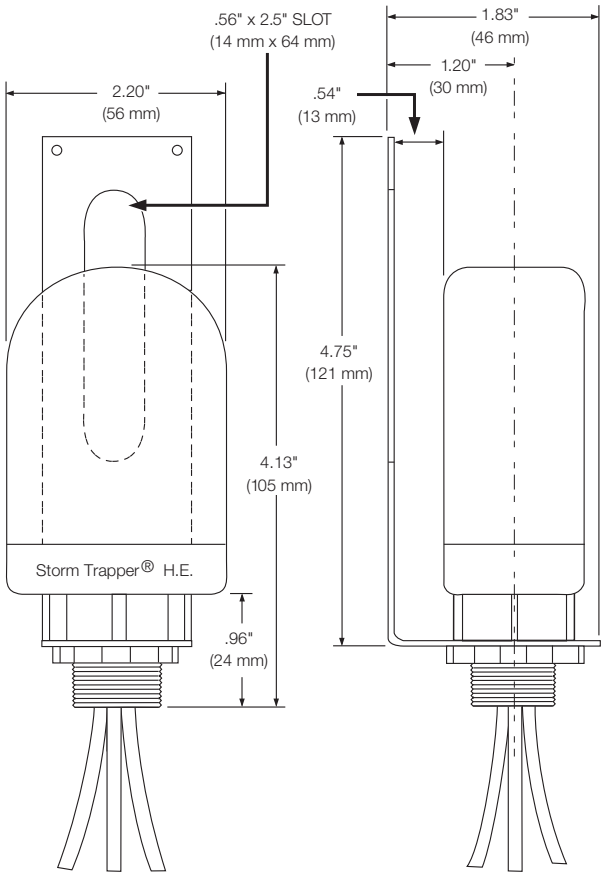



**Figure 2. External mount VariSTAR Storm Trapper high energy MOV arrester with optional mounting bracket.**

**Table 1. Application Recommendations**

| System Configuration | | Storm Trapper High Energy Arrester | | | | |
|---|---|---|---|---|---|---|
| **Phase/Wiring** | **Voltage (Volts rms)** | **Arrester Rating (Volts rms)** | **MCOV* (Volts rms)** | **Pole(s) (Phases)** | **See Wiring Diagram (Figure 3)** | **Catalog** Number** |
| Single-Phase/Two-Wire | 120 | 480 | 400 | 1 | 1 | ASZH480C100 |
| | 240 | 480 | 400 | 1 | 1 | ASZH480C100 |
| | 480 | 650 | 540 | 1 | 1 | ASZH650C100 |
| Single-Phase/Three-Wire | 240/120 | 480 | 400 | 2 | 2 | ASZH480C200 |
| | 480/240 | 480 | 400 | 2 | 2 | ASZH480C200 |
| Three-Phase (ungrounded)/ Three-Wire | 240 | 480 | 400 | 3 | 3 | ASZH480C300 |
| | 480 | 650 | 540 | 3 | 3 | ASZH650C300 |
| Three-Phase (one-phase grounded)/ Three-Wire | 240 | 480 | 400 | 2 | 4 | ASZH480C200 |
| | 480 | 650 | 540 | 2 | 4 | ASZH650C200 |
| Three-Phase (one-phase center-tap grounded)/ Four-Wire | 240/120 | 480 | 400 | 3 | 5 | ASZH480C300 |
| | 480/240 | 650 | 540 | 3 | 5 | ASZH650C300 |
| Three-Phase/ Four-Wire | 208Y/120 | 480 | 400 | 3 | 6 | ASZH480C300 |
| | 480Y/277 | 480 | 400 | 3 | 6 | ASZH480C300 |

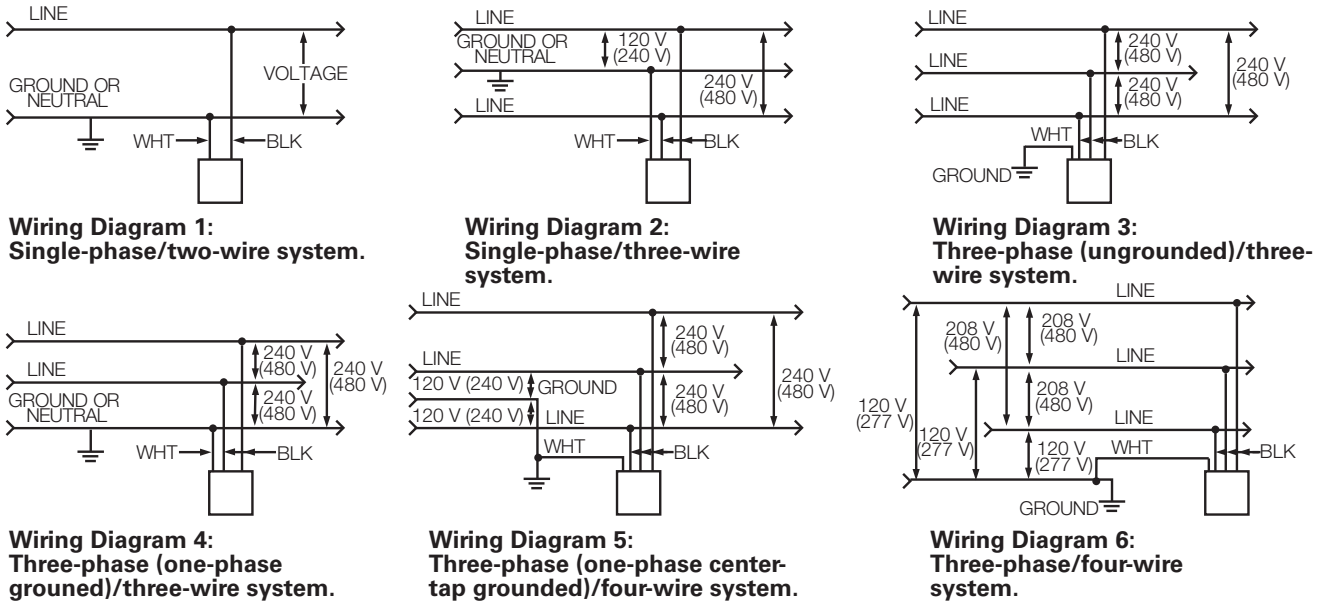
* Maximum continuous operating voltage (MCOV) is the maximum designated rms value of power frequency voltage that may be applied continuously between the terminals of the arrester. Temporary overvoltage capability should not be exceeded during transformer production electrical tests.

**Mounting bracket option available. Change last digit in catalog number to 1 (Example: ASZH480C101).

## Installation procedure

The Storm Trapper high energy arrester is moisture proof for indoor and outdoor use. Prior to installing a Storm Trapper high energy arrester:

1. Consult Table 1 to make certain the arrester is correct for the applied system configuration.
2. Refer to the appropriate wiring diagram in Figure 3 for the proper connections.




**Wiring Diagram 1: Single-phase/two-wire system.**

**Wiring Diagram 2: Single-phase/three-wire system.**

**Wiring Diagram 3: Three-phase (ungrounded)/three-wire system.**

**Wiring Diagram 4: Three-phase (one-phase grouned)/three-wire system.**

**Wiring Diagram 5: Three-phase (one-phase center-tap grounded)/four-wire system.**

**Wiring Diagram 6: Three-phase/four-wire system.**

**Figure 3. Wiring diagrams.**

**Note:** Black leads to line: white leads to ground.
Voltage between a white lead and any black lead should not exceed arrester MCOV rating.
Eaton recommends that the arrester leads be trimmed to the minimum required length.




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

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




© 2016 Eaton
All Rights Reserved
Printed in USA
Publication No. MN235017EN
October 2016

Eaton is a registered trademark.

All trademarks are property
of their respective owners.

For Eaton's Cooper Power series product information call 1-877-277-4636 or visit: www.eaton.com/cooperpowerseries.