

# PORCELAIN-HOUSED ARRESTERS VL/VLA/MVN/VNX & MH3/MH4/H5 - SERIES



## Installation Instructions: 17-5092

### CAUTION

The equipment covered by these instructions should be installed and serviced only by competent personnel familiar with good safety practices. This instruction is written for such personnel and is not intended as a substitute for adequate training and experience in safe procedures.

### WARNING

Prior to installing this product, check the nameplate information to verify that it is the correct product for the application. Verify that the nameplate information corresponds to the information provided on the outline drawing.

### Introduction

Hubbell Power Systems surge arresters are designed to limit surge voltage by conducting the surge current to ground, and thus avoiding equipment damage. The arresters are of single pole design, suitable for outdoor use, and designed in accordance with the latest revision of industry standard IEEE C62.11 and/or IEC 60099-4.

Each VL, VLA, MVN, MH3, MH4, VNX and H5 arrester contains a number of vertically stacked zinc oxide valve elements permanently sealed in porcelain housing(s). Each housing is provided with a means of pressure relief in the remote event of an arrester failure. Metal end fittings, cemented to the housing, provide a means for bolting the arrester units together and to a foundation.

An outline drawing is included with every arrester and should be reviewed for details. Three arresters are required for three-phase installations. Smaller, lower rated arresters are shipped as a single assembled unit, while larger, high rated arrester models consist of two to four individually assembled units that must be stacked and bolted together in the field.

### Application

#### WARNING

Hubbell Arresters must be applied where the continuous phase-to-ground voltage at the arrester location does not exceed the arrester continuous voltage capability as indicated on the nameplate. Arrester physical size may not determine the voltage rating. Do not install arrester if type, rated voltage ( $U_r$  for IEC arresters) and maximum continuous operating voltage ( $U_c$  for IEC arresters) are not exactly the same on the nameplate and packaging labels.

### Packaging

**VL and VLA arresters:** Arresters are packaged in either sturdy cardboard boxes or in wooden crates, depending on arrester size. VL arresters are shipped with the 4-hole pad suspension cap assembled to the arrester. Terminal hardware is shipped unattached to the arrester and will be contained in a mesh bag inside the box or crate. Units are shipped horizontally.

**MVN, MH3, and MH4 arresters:** Arrester units are shipped horizontally in wooden crates. Arresters are packaged in individual crates up to three units. If an arrester consists of more than three units, it will ship in multiple crates. The suspension cap, terminal hardware and unit mounting hardware are shipped unattached to the arrester and will be contained in the arrester crate.

**VNX and H5 arresters:** Arrester units are shipped vertically, with multiple units bolted to a pallet and crated. Arresters are packaged in individual crates up to four units. If an arrester consists of more than four units, it will ship in multiple crates. Terminal hardware items are shipped unattached to the arrester and will be contained within the arrester crate.

**Grading and corona rings:** Grading rings and corona rings (where applicable) are shipped separately, strapped to a wooden pallet or packed in a fully enclosed wooden crate.

### Initial Inspection

Rough handling can result in damage to the surge arrester. Arresters should be carefully removed from the carton or crate for inspection. If damage is apparent, do not install the arrester. Claims for shipping damage should be registered immediately with the common carrier.

The arrester model number, rated voltage ( $U_r$  for IEC arresters), and MCOV ( $U_c$  for IEC arresters) are identified on the arrester nameplate. Multi-unit arresters included individual unit nameplates to identify each unit rated voltage. The arrester nameplate will additionally include the appropriate stacking order for multi-unit arresters.

The nameplate information should be checked against the shipping memorandum.

Styrofoam plugs are installed in VL, VLA, MVN, MH3 and MH4 series arrester pressure relief vents. These plugs are included to discourage nesting by small birds and animals. The plugs should be left in place.

### Installation Location

Install the arrester electrically as close as practicable to the equipment to be protected. Keep the arrester connections short and direct. The footings of all outdoor piers or supports should extend below the frost line and be elevated above the ground line sufficiently to meet personnel safety requirements.

## Altitude and Temperature

All Hubbell porcelain housed arresters covered by these instructions can be used from 0 to 12,000 feet (3600m) altitude. These arresters can be used in locations where the maximum temperature does not exceed 60° C and where the weighted average temperature does not exceed 45° C. The minimum operating temperature is -40° C.

## Line and Ground Connections

Install supplied line and ground terminals to the arrester as indicated on the outline drawing. Connect the arrester ground to the apparatus ground and the main station ground, utilizing a reliable common ground network of low resistance. Line connections should not place excessive mechanical stress on the arrester. During assembly please refer to the maximum recommended tightening torque values listed below:

## Lifting

Stud Size	Maximum Recommended Tightening Torque
1/2"	40 ft-lb (54 Nm)
3/4"	125 ft-lb (170 Nm)

All Hubbell porcelain housed arresters covered by these instructions may be lifted by the provided top terminal cap or by a sling through eyebolts attached to the mounting lugs of the top end fitting.

Suspension caps have 11/16 in (17.5 mm) diameter lifting holes. Use appropriate clevis fitting for connection to hook. Arrester units should be upright before units are bolted together.

## Single-Unit Arresters

Each arrester is shipped completely assembled. Install the arrester vertically on the foundation using care to ensure it is perpendicular, shimming under all but one foot if necessary. It is important that all feet rest solidly on the foundation before foundation bolts are drawn down to avoid unnecessary stresses in the end fittings. Tighten the bolts according to the recommended torque table. The pressure relief vents should be oriented away from adjacent equipment to minimize potential damage to nearby equipment in the remote event of arrester failure.

## Multi-Unit Arresters

**⚠ CAUTION**

**Multi-unit arresters must be erected in the exact order identified on the outline drawing and on the nameplate attached to the lower end fitting of the bottom unit.**

Field assembly is required for multi-unit arresters. Each unit is fully assembled and should be bolted together according to the outline drawing. First, install the base unit vertically on the foundation using care to ensure it is perpendicular, shimming under all but one foot if necessary. It is important that all feet rest solidly on the foundation before foundation bolts are drawn

down to avoid unnecessary stresses in the end fittings. Tighten the bolts according to the recommended torque table. The pressure relief vents should be oriented away from adjacent equipment to minimize potential damage to nearby equipment in the remote event of arrester failure.

Select the next unit by referencing the stacking order shown on the arrester nameplate and outline drawing. Then mount the next unit on top of the base unit and secure it with the bolts provided. Repeat prior steps to ensure the unit is vertical and pressure relief vents are aligned to the bottom unit. Repeat this procedure for additional units

## Grading Rings

Depending on voltage rating, the arrester may have a grading ring. The outline drawing identifies the proper location of the grading ring. Install the ring as indicated with the bolts provided.

## Discharge Counters

An insulating base is required when installing a discharge counter with arresters. Both of these are accessories and are available through your HPS sales person. Install the discharge counter and insulating bases as shown on outline drawings

**⚠ WARNING**

**Always be certain that the ground connection is firmly made before connecting the arrester to an energized line. If an insulating unit is used at the ground end to permit use of a discharge counter, the discharge counter must be connected (or the insulating unit shorted out) before connecting the arrester to an energized line.**

## Periodic Inspection, Maintenance And Removal

Before inspecting or handling, disconnect the arrester from the line. When a metal-oxide arrester is disconnected from an energized line, it is possible for a small amount of static charge to be retained by the arrester. As a precautionary measure, install a temporary ground on the line end of the arrester after it is disconnected from the line. This will ensure that any retained charge is discharged to ground. **Remove the temporary ground before the arrester is re-installed.**

These arresters do not require testing, and no test that applies power voltage in excess of maximum arrester voltage rating should be made without consulting Hubbell. There is no single field test that will indicate the complete operating characteristics of the arrester.

## Storage

All Hubbell porcelain housed arresters covered by these instructions may be stored outdoors if suitable precautions are taken to prevent deterioration of the packing material. The arresters should be covered with a waterproof covering to keep them dry, clean, and free from litter until used. In climates where outdoor temperature and humidity extremes rapidly deteriorate the packing material, it is recommended that arresters to be stored outdoors be removed from their packing and be bolted (vertically) to a skid.

*These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to Hubbell Power Systems, Inc.*

**Hubbell Power Systems, Inc.  
1850 Richland Avenue, East  
Aiken, SC 2980**

