



INSTALLATION INSTRUCTIONS
INSTRUCTION SHEET NO. 17-5092 (8/16)
PORCELAIN-HOUSED ARRESTERS
VLA / VL / MVN / VNX / MH3 / MH4 / H5

⚠ 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

Hubbell surge 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 and maximum continuous operating voltage/ U_c data are not exactly the same on the nameplate, bracket and carton labels.

INTRODUCTION

Hubbell surge arresters are designed to limit surge voltage by conducting the surge current to ground, and thus avoiding equipment damage. The arresters covered by these installation instructions 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 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 installation. Smaller, lower rated arresters are shipped as a single assembled unit, while larger, higher rated models consist of two to five individually assembled units that must be stacked and bolted together in the field.

APPLICATION

⚠ WARNING

Hubbell surge 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.

In case of doubt concerning application, contact your Hubbell Power Systems representative.

ALTITUDE AND TEMPERATURE

Standard VLA, VL, MVN, VNX, MH3, MH4 and H5 series arresters can be used up to 12,000 feet (3600m) altitude unless otherwise indicated on the outline drawing. 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. In case of doubt concerning application, consult your HPS sales representative.

PACKAGING FOR SHIPMENT

VLA and VL arresters: Arresters are packaged in either sturdy cardboard boxes or in wooden crates, depending on size (except for special cases where a wooden crate has been specified by the customer). VL and VLA arresters are shipped with 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. The suspension cap and terminal 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. Suspension cap and terminal hardware are shipped unattached to the arrester and will be contained within the arrester crate.

Grading rings: Grading rings (where applicable) are shipped separately, strapped to a wooden pallet.

INITIAL INSPECTION

Although it is very unlikely, extraordinary rough handling can result in damage to the arrester. Units should be carefully removed from the carton or crate for inspection. Careful inspection of individual porcelain housings prior to installation is required to assure that no damage has occurred during shipment. *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 nameplate attached to the lower end fitting. In multiple-unit arresters, this nameplate also contains information on the stacking order of the units; additional information pertaining to each unit (unit part number, unit MCOV or U_c , and unit serial number) is contained on a nameplate attached to the upper end fitting of each unit.

The nameplate information should be checked against the shipping memorandum. If at any time it is necessary to

correspond with HPS, complete nameplate data should be furnished in order to expedite replies.

Styrofoam plugs have been placed in pressure relief vents to discourage nesting by small birds and animals. The plugs in no way interfere with venting operation, and they 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.

It is permissible to mount some lower voltage arresters horizontally. However, please consult your HPS sales representative to be sure that horizontal mounting is permissible for a particular arrester. When mounted horizontally, the pressure relief vents must be pointed downward.

LIFTING

All Hubbell porcelain housed arresters may be lifted by the suspension cap or by a sling around the porcelain just below the top casting. Arresters should be upright before units are bolted together. Suspension caps have 11/16 in (17.5 mm) diameter lifting holes. Use appropriate clevis fitting for connection to hook.

MOUNTING

Single unit arresters

Install the arrester vertically on the foundation using care to see that 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 firmly. The pressure relief vents should be oriented to minimize damage to adjacent equipment by incandescent gases in the remote event of arrester failure.

Multi-unit arresters

⚠ CAUTION

Units of 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.

⚠ CAUTION

Special arresters consisting of two or more *parallel* units have identical numeric serial numbers with different alpha suffixes, and *are not* interchangeable with units having different numerical serial numbers.

Install the base unit vertically on the foundation using care to see that 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 firmly. The pressure relief vents should be oriented to minimize damage to adjacent equipment by incandescent gases in the remote event of arrester failure.

Select the next unit carefully by reference to the unit model number and the stacking order shown on the arrester nameplate and outline drawing; then mount it on top of the base unit and secure it loosely with bolts provided. Use stiffening washers if and where indicated on the outline drawing. Carefully check that the unit is vertical, shimming under all but one foot if necessary. Repeat this procedure for additional units. Recommended maximum tightening torque values are provided under the line and ground connections section.

Special **multi-rated** arresters have two or more units, of which one or more of the units can be shorted by a supplied shorting bar to obtain an arrester voltage rating that is lower than the voltage rating of the arrester with the shorting bar removed. The shorting bar is connected to the arrester using terminals provided. The outline drawing supplied with the arrester indicates the locations for installation of the terminals.

GRADING RINGS

Depending on voltage rating, arresters may have one or more grading rings. The outline drawing identifies the proper location(s) of the grading ring(s). Note that, in some cases, a grading ring is required between units. Install the rings as indicated with the bolts provided.

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. Connection to the line should be made through a suitable line connector. Line connections should be made in such a manner that no excessive mechanical stress is placed on the arrester. During assembly please refer to the maximum recommended fastener tightening torque values listed below:

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

⚠ WARNING

Always be certain that the ground connection is firmly made before connecting the arrester to an energized line. If an insulating base is used at the ground end to permit use of a discharge counter, the discharge counter must be connected (or the insulating base 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. The energy available in the form of retained charge on the arresters is imperceptibly small.

After disconnecting the arrester from the line, a slight "pin-prick" type spark may be felt by anyone touching the line end. 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.*

Hubbell surge arresters require no special care. They may be hot-washed, subject to the usual care and techniques used in hot-washing insulation to avoid external flashover.

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 Ohio Brass. There is no single field test that will indicate the complete operating characteristics of the arrester.

STORAGE

All Hubbell surge arresters are designed for outdoor use, and may be stored outdoors if suitable precautions are taken to prevent deterioration of the packing material. The arresters may be covered with a polyethylene or other 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.

PORCELAIN TOP UNITS

Porcelain top arresters (VLA) with center line terminals are particularly suited for use in metal cubicles. These arresters can be mounted in any position when installed in a reasonably clean and dry indoor environment.

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.

HUBBELL Power Systems • The Ohio Brass Company
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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.