



# INSTALLATION INSTRUCTIONS

INSTRUCTION SHEET NO. 17-5155 (8/16)

## POLYMER-HOUSED ARRESTERS

### SVN/SVNH/SVNX/PH3/PH4

#### ⚠ 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 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 SVN, SVNH, SVNX, PH3 and PH4 arrester contains a number of vertically stacked zinc oxide valve elements permanently sealed in housing(s) consisting of fiberglass filament wound tubes covered by silicone rubber weathersheds. Each housing is provided with a means of pressure relief in the remote event of an arrester failure. Metal end fittings, attached 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, high rated 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.

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

### ALTITUDE AND TEMPERATURE

Standard SVN, SVNX, PH3 and PH4 series arresters 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. In case of doubt concerning application, consult your HPS sales representative.

### PACKAGING FOR SHIPMENT

SVN, PH3, and PH4 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.

SVNH and SVNX arresters: Arrester units are shipped vertically, with multiple units bolted to a pallet and crated. Terminal hardware items 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

Rough handling can result in damage to the surge arrester. Units should be carefully removed from the crate for inspection. Careful inspection of individual polymer housings prior to installation is required to assure that no damage has occurred during shipment. *If any 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.

### **LIFTING**

All Hubbell polymer 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.

### **ASSEMBLY**

#### **Single unit arresters**

Each arrester is shipped completely assembled. 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 Hubbell 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.**

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. 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). 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 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. The energy available in the form of retained charge on the arrester 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 precaution, install a temporary ground on the line end of the arrester after it is disconnected from the line, to 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 Ohio Brass. There is no single field test that will indicate the complete operating characteristics of the arrester.

## **STORAGE**

As all Hubbell arresters are designed for outdoor use, they 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.

## **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 and associated installation instructions..

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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.*