Section 30

Arresters

IEEE Station Class and Intermediate

IEC Station Class

Protect Your Power.

Warranty

Warranty – Material

HPS warrants to Buyer that the products sold will be free of defects in workmanship or material for a period of one (1) year (or as otherwise specified) from the date of original shipment by HPS when stored, installed, operated or maintained in accordance with recommendations of HPS and standard industry practice and when used under proper and normal use. HPS shall in no event be responsible or liable for modifications, alterations, misapplication or repairs made to its products by Buyer or others, or for damage caused thereto by negligence, accident or improper use by Buyer or others. This warranty does not include reimbursement for the expenses of labor, transportation, removal or reinstallation of the products. This warranty shall run only to the first Buyer of a product from HPS, from HPS' Buyer, or from an original equipment manufacturer reselling HPS' product, and is non-assignable and non-transferable and shall be of no force and effect if asserted by any person other than such first Buyer. THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WHETHER WRITTEN, ORAL, EXPRESSED OR IMPLIED. THERE ARE NO WARRANTIES OF MERCHANTABILITY OR FITNESS OF ANY PRODUCT FOR A PARTICULAR PURPOSE.

Warranty – Application

HPS does not warrant the accuracy of and results from product or system performance recommendations resulting from any engineering analysis or study. This applies regardless of whether a charge is made for the recommendation, or if it is provided free of charge. Responsibility for selection of the proper product of application rests solely with the Buyer. In the event of errors or inaccuracies determined to be caused by HPS, its liability will be limited to the re- performance of any such analysis or study.

BUYER INSPECTIONS

Tests, inspections and acceptance of all material must be made at the factory. Buyer's inspectors are welcome at the factories and are provided with the necessary facilities for carrying out their work. Name and phone number of who should be contacted for inspection should be given to HPS no later than two weeks prior to scheduled shipment date.

LIMITATION OF LIABILITY

IN NO EVENT AND UNDER NO CIRCUMSTANCES SHALL HPS BE LIABILE TO BUYER OR TO ANY OTHER PERSON FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL OR INCIDENTAL LOSSES OR DAMAGES, INCLUDING, WITHOUT LIMITATION, DAMAGE TO OR LOSS OF USE OF ANY PRODUCT, LOST SALES, OR PROFITS, OR DELAY OR FAILURE TO PERFORM THIS WARRANTY OBLIGATION, OR CLAIMS OF THIRD PARTIES AGAINST PURCHASER, ARISING OUT OF OR IN CONNECTION WITH THE SALE, INSTALLATION, USE OF, INABILITY TO USE, OR THE REPAIR OR REPLACEMENT OF, HPS' PRODUCTS. As stated herein, the term "person" shall include without limitation, any individual proprietorship, partnership, corporation or entity.

EXCLUSIVE REMEDY

Any claim by Buyer that a product is defective or non-conforming shall be deemed waived by Buyer unless submitted to HPS in writing within thirty (30) days from the date Buyer discovered, or by reasonable inspection should have discovered the alleged defect or non-conformity. Any warranty claim must be brought within one year of discovery of the alleged defect or non-conformity. Upon prompt written notice by the Buyer that a product is defective or non-conforming, HPS' liability shall be limited to repairing or replacing the product, at HPS' option.

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NOTE: Because Hubbell Power Systems Inc., has a policy of continuous product improvement, we reserve the right to change design and specifications without notice.

IEEE and IEC Station Class Surge Arresters

INSIDE.....PAGE

precision

Hubbell Arresters

Over 70 years of Arrester Innovation

Ohio Brass introduced its first surge arresters more than a half-century ago. Since then, Hubbell Power Systems (HPS) and the Ohio Brass brand have led the industry in innovation, reliability and service.

During this time Hubbell, through the Ohio Brass brand name, introduced the world's first polymer-housed arresters, advanced MOV disc technology and refined manufacturing processes. The company has obtained many patents for products and design features that have helped keep Hubbell arresters at the forefront of technology.

Since your customers' power is only as reliable as your delivery system, trust your lines, substations and reputation to Hubbell Power System's Ohio Brass arresters.

engineering

Overview

Equipment Protection is Job One – Next to your people, your power grid infrastructure is your largest and most valuable investment. Protect it with Hubbell Power Systems (HPS) surge arresters. Every lightning strike, insulator flashover and switching surge adds wear and tear to your equipment, prematurely aging it, and requiring you to shoulder the costs of replacement. Even the smallest surge can shorten your equipment's life. Surge arresters, however, extend the life of your system by limiting the voltage across your equipment during a surge event.

How Arresters Work – Arresters, when placed in substations or on transmission or distribution lines, protect connected equipment against all types of voltage surges. Appearing as a very high impedance at normal operating voltages, the arrester rapidly transitions to a very low impedance on the arrival of a high voltage surge resulting from lightning or switching activity. The arrester, typically connected from line-to-ground across the equipment to be protected, then provides a by-pass route for surge current and, at the same time, clamps the line-to-ground voltage to a level well below the insulation withstand level (BIL or BSL) of the equipment. Once the surge has passed, the arrester returns to its original state, and the system survives the event without disruption.

Advancing Arrester Technology – The Ohio Brass Company, now fully integrated into Hubbell Power Systems, began the manufacture of surge arresters in 1950. The company had been, and continues to be, a major manufacturer of high voltage insulators, using the knowledge and experience gained in that long history to improve and innovate the arrester product lines, first with its own production of porcelain housings, later with the development of polymer materials for high voltage insulation that are now used for the latest technology polymer-housed arresters. Separately from the insulating materials development, the company was among the very early pioneers in metal oxide varistor (MOV) technology, which is at the heart of all modern surge arresters. It is the MOV that provides the non-linear resistance characteristic that gives the arrester the voltage limiting and current by-pass characteristics mentioned above. Over the years, HPS has made great strides in MOV technology, improving energy handling capability and providing better voltage clamping, allowing us to continue providing our customers with "best of class" surge protection, accompanied by "best in class" customer service.

Our High Quality MOV Discs and Polymer Housings – We opened our MOV disc plant in 1977 to control the most critical components of our surge arresters. This long history with MOV technology ensures that the MOV discs used in HPS arresters will always meet our exacting standards.

Our proprietary ESP™ weathershed material, made of a blend of silicone and EPDM, resists tracking and provides exceptional leakage distance. It has proven its mettle in some of the toughest weather conditions for the past decades.

We perform extensive testing on all of our products to ensure that all of our arresters meet or exceed industry standards.

These features protect your lines, your linemen and your bottom line.

Arrester Selection Guidelines

Hubbell manufactures a wide range of station class surge arresters to meet virtually all application requirements. All Hubbell surge arresters are qualified to the latest version of IEEE C62.11 or IEC 60099-4. Some Hubbell station class arresters are dually qualified to both IEEE and IEC standards. Both polymer and porcelain arrester options are available, which additionally offer varying levels of energy and mechanical capabilities to meet each client's specific needs. Hubbell surge arresters are installed in various environments across the world and continue to provide excellent equipment protection.

Selecting the Right Arrester for Your Needs – Selecting an appropriate arrester requires knowledge about your system and specific application. Factors that come into play are:

- Maximum system voltage
- System grounding practices (effectively grounded, impedance grounded, ungrounded)
- Insulation level of equipment to be protected
- Desired margins of protection to be provided
- Levels and durations of power frequency overvoltages
- Lengths of lines that will be switched
- Mechanical loads that arrester will be subjected to
- Available line-to-ground fault current
- Environmental conditions

Standard operating conditions for a.c. surge arresters are identified in IEC 60099-4 and IEEE C62.11, including:

- Nominal power system frequency of 48 to 62 Hz
- Altitude of 3281 ft (1000 m)
- Ambient air temperature in the general vicinity of the arrester between -40 °C and 40 °C
- Wind speeds ≤ 111 ft/s (34 m/s)
- Vertical installation

Exposure to conditions outside of these limits will require special consideration in the design and application of surge arresters. Surge arrester application and the associated service conditions are vast and wide ranging. Arresters can be exposed to sub-zero temperatures, hurricane force winds, contaminants and the impact of seismic conditions. Ensuring the arrester can successfully survive these conditions is key to ensuring longevity of the arrester and your equipment.

* For applications outside the usual service conditions, or any other application related question, please contact your Hubbell Power Systems Representative at 1.573.682.5521.

Arrester Selection Guidelines

The following IEEE and IEC summary tables provide key characteristics on Hubbell station arrester designs. Claimable values are made according to IEEE C62.11 and IEC 60099-4. These tables are provided for reference, although arresters with different characteristics such as voltage rating, energy handling capability, strength etc are available upon request. Please contact your Hubbell representative for additional information.

IEEE Arrester Designs

Product Line	IEEE Class	Duty Cycle Rating (kV rms)	MCOV (kV rms)	Housing Material	Switching Impulse Energy Rating, W_{th} (kJ/kV MCOV)	Single Impulse Charge Transfer Rating, Q_{rs} (C)	Rated Short Circuit Current (kA rms)	Maximum Design Cantilever load (MDCL) - in-lb (kNm)	Maximum Short-term Cantilever Load - in-lb (kNm)
PVI-LP	Intermediate	3 - 72	2.55 - 57	ESP™ Polymer	6 (C)	2.0	40	1,600 (0.18)	3,010 (0.36)
VL	Station	3 - 48	2.55 - 39	Porcelain	9 (E)	3.2	63	28,000 (3.16)	70,000 (7.91)
EVP	Station	3 - 228	2.55 - 180	ESP™ Polymer	9 (E)	3.2	63	10,000 (1.13)‡	20,000 (2.26) ‡
SVN	Station	12 - 564	10.2 - 448	Silicone Polymer	11 (F)	5.2	63	35,000 (4.0)	70,000 (7.91)
MVN	Station	12 - 444	10.2 - 353	Porcelain	11 (F)	5.2	63	60,000 (6.78)	150,000 (17)
SVNH	Station	144 - 444	115 - 353	Silicone Polymer	11 (F)	5.2	63	178,500 (20)	357,000 (40)
SVNR	Station	144 - 612	115 - 485	Silicone Polymer	15 (H)	8.8	63	178,500 (20)	357,000 (40)
SVNX	Station	258 - 588	209 - 470	Silicone Polymer	21 (K)	10.4	63	178,500 (20)	357,000 (40)

‡ For ratings above 115kV MCOV, the maximum working cantilever is 5,000 in-lb (565 Nm) & the maximum short-term cantilever is 10,000 in-lb (1130 Nm) Applies to arresters with a tripod mounting base.

IEC Arrester Designs

Product Line	IEC Class*	Ur (kV rms)	Uc (kV rms)	Housing Material	Thermal Energy Rating, W_{th} (kJ/kV Ur)	Repetitive Charge Transfer Rating, Q_{rs} (C)	Rated Short Circuit Current (kA rms)	Specified Long-term Load (SLL) - in-lb (kNm)	Specified Short-term Load (SSL) - in-lb (kNm)	Mean Breaking Load (MBL) - in-lb (kNm)
PVI-LP	SL	3 - 72	2.55 - 57	ESP™ Polymer	5	2.0	40	1,600 (0.18)	3,010 (0.34)	-
VL	SM	3 - 48	2.55 - 39	Porcelain	7	3.2	63	-	70,000 (7.9)	124,000 (14)
EVP	SM	3 - 228	2.55 - 180	ESP™ Polymer	8	3.2	63	8,000 (0.9)	16,000 (1.8)	-
PH3	SM	30 - 420	24 - 336	Silicone Polymer	7	3.2	63	35,400 (4)	70,800 (8)	-
MH3	SM	30 - 420	24 - 336	Porcelain	7	3.2	63	-	150,000 (17)	273,450 (30.9)
PH4	SH	30 - 444	24 - 355	Silicone Polymer	10	5.2	63	35,400 (4)	70,800 (8)	-
MH4	SH	30 - 444	24 - 355	Porcelain	10	5.2	63	-	150,000 (17)	273,450 (30.9)

* SL = Station Low, SM = Station Medium, SH = Station High

Arrester Selection Guidelines

Selecting the appropriate MCOV of a surge arrester is a critical step in the protection of vital utility equipment. The MCOV of an arrester should be selected to ensure it can withstand the maximum continuous line to ground voltage. The table below provides general guidelines for solidly grounded applications, as well as impedance or undergrounded circuits. A higher rated arrester may be required depending on the exact application. Please consult with Hubbell for additional support to select the appropriate MCOV for your specific application.

Normally Recommended Arrester MCOV for Various System Voltages

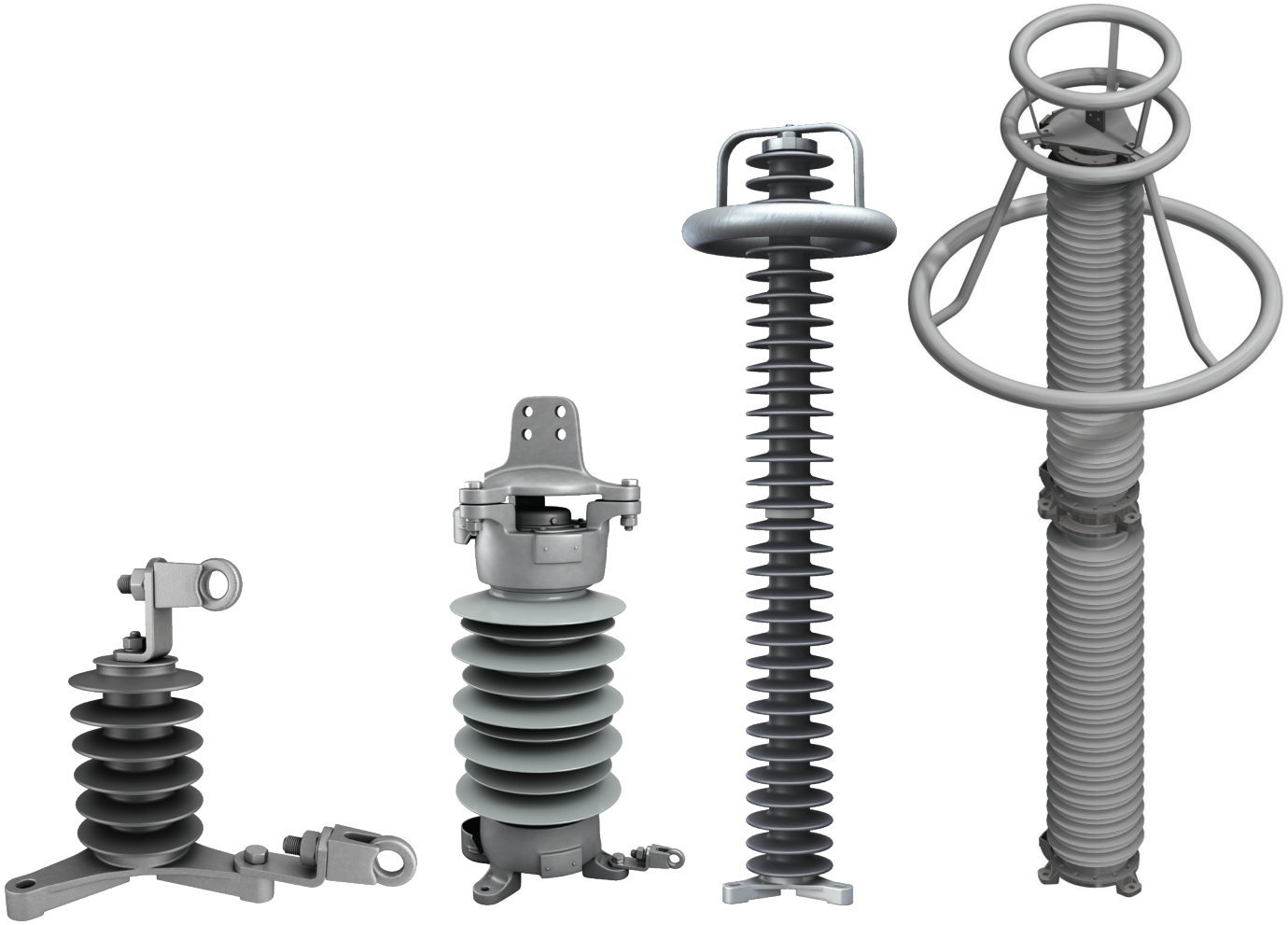
System L-L Voltage kV		Arrester MCOV (kV)		
		Grounded Neutral Circuits	Temporarily Ungrounded, Impedance Grounded or Ungrounded Circuits	
Nominal	Maximum		(1)	(2)
2.40	2.52	2.55	2.55	2.55
4.16	4.37	2.55	5.1	5.1
4.8	54	5.1	5.1	5.1
6.9	7.25	5.1	7.65	7.65
8.32	8.74	5.1	7.65	8.4
12	12.6	7.65	10.2	12.7
12.47	13.1	7.65	12.7	12.7
13.2	13.9	8.4	12.7	12.7
13.8	14.5	8.4	12.7	15.3
20.78	21.8	12.7	19.5	22
22.86	24	15.3	19.5	22
23	24.2	15.3	19.5	22
24.94	26.2	15.3	22	24
34.5	36.2	22	29	36
46	48.3	29	39	48
69	72.5	42	57	70
115	121	70	98	115
138	145	84	115	131
161	169	98	140	152
230	242	140	209	220
345	362	209	–	–
400	420	245	–	–
500	550	318	–	–
765	800	470	–	–

Notes: (1) For normal duty. Line-to-ground fault up to 30 minutes.

(2) For severe duty. Line-to-ground fault up to 2,000 hours.

trust

Polymer Housed Surge Arresters



PVI-LP, IEEE Intermediate Class, IEC Class SL

Overview – PVI-LP arresters are the most economical arrester to use on systems up to 69 kV (72.5 kV max). They are particularly suited for light-to-moderate duty applications where light weight and compact profile are of particular importance. Their narrow profile allows smaller phase-to-ground clearances and phase-to-phase spacings than other arresters, making them particularly well-suited for installations where space is at a premium, such as cabinets or other electrical enclosures and on mobile substations.

Construction:

- "Wrap" design, using fiberglass reinforced epoxy stranding to form a wrapped envelope directly over the MOV discs
- ESP™ rubber housing applied over wrapped MOV module
- Silicone compound interface between module and housing to render a void-free assembly
- Tripod base
  (Slotted 8.75 (222) - 10.0 (254) inches (mm) bolt circle)

At-a-Glance:

- Less than half the weight of a comparably rated porcelain-housed arrester
- Narrow profile for reduced clearance to ground and between phases
- Install straight from the package – no field assembly required

Products – Polymer Housed Surge Arresters – PVI-LP

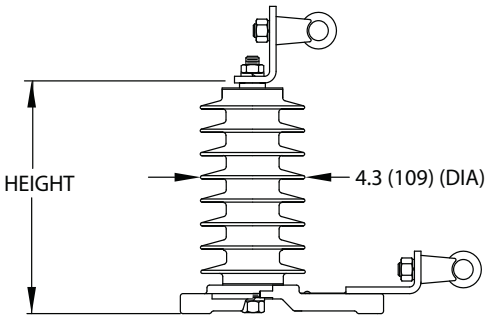
PVI-LP Electrical Characteristics

Base Arrester Catalog Number	Duty Cycle Rating (kV)	MCOV (kV)	Temporary Overvoltage Capability (kV)		Maximum Steep Current Impulse Residual Voltage (kV)	Maximum Switching Impulse Residual Voltage (kV)	Maximum Lightning Impulse Residual Voltage (kV)					
			1s	10s	10kA	0.5kA	1.5kA	3kA	5kA	10kA	20kA	40kA
300803	3	2.55	3.7	3.6	10.7	6.6	7.1	7.4	7.8	8.1	9.1	10.2
300805	6	5.1	7.5	7.1	19.6	13.1	14.1	14.8	15.5	16.2	18.2	20.4
300808	9	7.65	11.2	10.7	28.6	19.7	21.3	22.3	23.4	24.4	27.4	30.8
300809	10	8.4	12.3	11.7	31.4	21.8	23.4	24.6	25.8	26.9	30.2	33.9
300610	12	10.2	14.9	14.2	37.3	26.1	28.1	29.5	30.9	32.3	36.3	40.7
300813	15	12.7	18.6	17.7	47.8	32.8	35.4	37.1	38.9	40.6	45.6	51.2
300815	18	15.3	22.4	21.3	56.9	39.5	42.5	44.6	46.8	48.8	54.8	61.5
300817	21	17	24.9	23.7	62.4	43.5	46.9	49.2	51.5	53.8	60.4	67.8
300620	24	19.5	28.6	27.2	74.3	52.3	56.3	59	61.9	64.6	72.5	81.5
300822	27	22	32.2	30.7	85.1	59.2	63.8	66.9	70.1	73.2	82.2	92.3
300824	30	24.4	35.7	34	93.4	65.3	70.3	73.8	77.3	80.7	90.6	102
300629	36	29	42.5	40.5	111	78.4	84.4	88.6	92.8	96.9	109	122
300831	39	31.5	46.1	43.9	119	83.0	89.4	93.8	98.3	103	115	129
300636	45	36.5	53.5	50.9	136	95.8	103	108	113	118	133	149
300639	48	39	57.1	54.4	148	105	113	118	124	129	145	163
300642	54	42	61.5	58.6	161	113	122	128	134	140	157	176
300648	60	48	70.3	67	179	126	136	143	150	156	175	197
300657	72	57	83.5	79.5	216	152	164	172	181	188	212	238

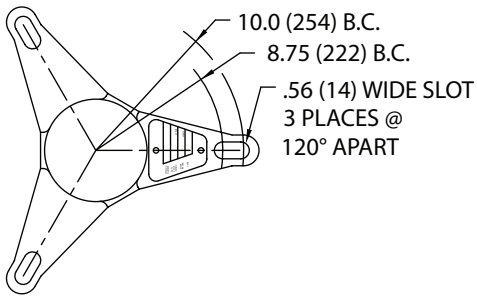
PVI-LP Physical Characteristics

Base Arrester Catalog Number	Duty Cycle Rating (kV)	MCOV (kV)	Creepage Distance - Inches (mm)	Arrester Height - Inches (mm)	Lightning Withstand Voltage (kV)	Power Frequency Withstand Voltage (kV)	Recommended Minimum Clearance - Inches (mm)		Net Weight - Pounds (kg)
							Phase to Ground	Phase to Phase	
300803	3	2.55	15.4 (391)	6.8 (173)	110	52	3.3 (84)	4.4 (112)	6 (2.7)
300805	6	5.1	15.4 (391)	6.8 (173)	110	52	3.3 (84)	4.6 (117)	6 (2.7)
300808	9	7.65	15.4 (391)	6.8 (173)	110	52	3.3 (84)	4.7 (119)	6 (2.7)
300809	10	8.4	15.4 (391)	6.8 (173)	110	52	3.5 (89)	4.9 (124)	6 (2.7)
300610	12	10.2	15.4 (391)	6.8 (173)	110	52	3.5 (89)	4.9 (124)	6 (2.7)
300813	15	12.7	30.8 (782)	12.2 (310)	175	105	4.8 (122)	6.2 (157)	10 (4.5)
300815	18	15.3	30.8 (782)	12.2 (310)	175	105	5.2 (132)	6.6 (168)	10 (4.5)
300817	21	17	30.8 (782)	12.2 (310)	175	105	6.2 (157)	7.6 (193)	10 (4.5)
300620	24	19.5	30.8 (782)	12.2 (310)	175	105	6.2 (157)	7.6 (193)	10 (4.5)
300822	27	22	46.2 (1173)	17.6 (447)	204	134	8.2 (208)	9.6 (244)	14 (6.4)
300824	30	24.4	46.2 (1173)	17.6 (447)	204	134	8.4 (213)	9.8 (249)	14 (6.4)
300629	36	29	46.2 (1173)	17.6 (447)	204	134	8.4 (213)	9.8 (249)	14 (6.4)
300831	39	31.5	61.6 (1565)	23.0 (584)	260	180	11.4 (290)	12.8 (325)	17 (7.7)
300636	45	36.5	61.6 (1565)	23.0 (584)	260	180	11.4 (290)	12.8 (325)	17 (7.7)
300639	48	39	61.6 (1565)	23.0 (584)	260	180	11.7 (297)	12.8 (325)	17 (7.7)
300642	54	42	77.0 (1956)	28.4 (721)	315	225	14.4 (366)	15.8 (401)	20 (9.1)
300648	60	48	77.0 (1956)	28.4 (721)	315	225	14.4 (366)	15.8 (401)	20 (9.1)
300657	72	57	92.4 (2347)	33.8 (859)	370	270	18.4 (467)	19.8 (503)	23 (10.5)

Figure 1



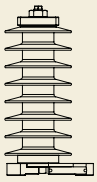
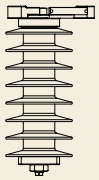
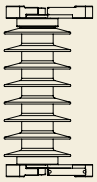
Base Mounting Information



PVI-LP Part Number Selection

30 X YYY - 3001

Step 1: Configuration

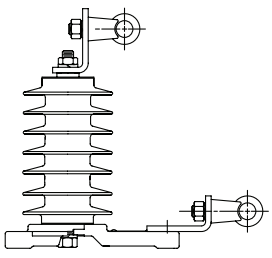
X ->	0 (standard)	1	2 (underhung)	3
Top	Cap	Cap	Tripod	Tripod
Bottom	Tripod	Cap	Cap	Tripod
				

Step 2: Catalog Key

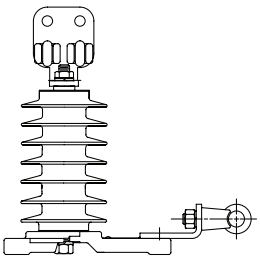
MCOV Rating (kV)	YYY	MCOV Rating (kV)	YYY
2.55	803	22	822
5.1	805	24.4	824
7.65	808	29	629
8.4	809	31.5	831
10.2	610	36.5	636
12.7	813	39	639
15.3	815	42	642
17	817	48	648
19.5	620	57	657

Step 3: Hardware

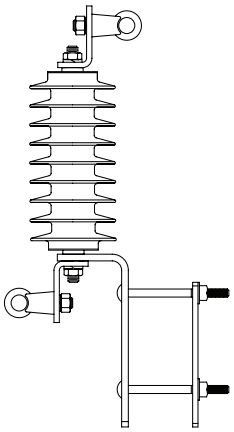
- **3001**:
  Top: Single Eye Bolt
  Bottom: Single Eye Bolt
- **3010**:
  Same as 3001 except arrester packaged in wooden crate



- **3002**:
  Top: 4-Hole NEMA pad with (2) Single Eye Bolts
  Bottom: Single Eye Bolt
- **3012**:
  Same as 3002 except arrester packaged in wooden crate



- **3011**:
  Crossarm Mount (for use with 301YYY) codes only



* For additional hardware options or non-standard configurations, please contact your Hubbell Power Systems Representative at 1.573.682.5521.

Products – Polymer Housed Surge Arresters – EVP

EVP, IEEE Station Class, IEC Class SM

Overview – The EVP Polymer Housed Station Arrester by HPS and Ohio Brass represents the absolute latest in surge arrester technology. Based on proven PVN technology, our EVP line maintains our proprietary ESP™ weathershed material and protective levels. However, it has an even more robust sealing system to reduce moisture ingress to an unprecedented minimum. EVP arresters also feature a redesigned housing profile for maximum material utilization, and even make ordering easier by using an intelligent numbering system.

Construction:

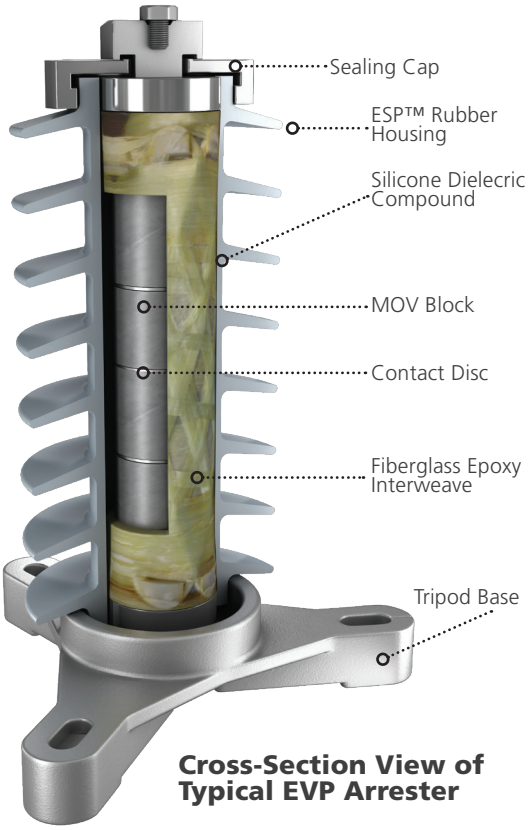
- Optimized wrap pattern and end hardware
- Even more effective sealing system
- Aluminum Top Cap
- Tri-pod base (standard 7.88 (200) to 10 (254) inches (mm) bolt circle slotted

At-a-Glance:

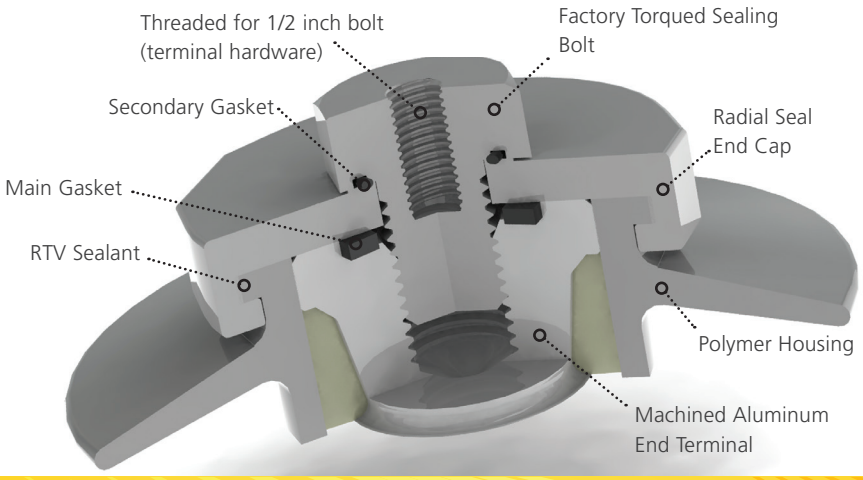
- The latest in surge arrester technology
- Utilizes proprietary ESP™ weathershed material
- More robust sealing system reduces moisture ingress

Our EVP Arresters Feature:

- 25% Recycled Packaging Material
- 15% Less Production Mass Compared to Previous Designs
- 50% Recyclable Packaging



Cross-Section View of Typical EVP Arrester



Detailed View of Sealing

Products – Polymer Housed Surge Arresters – EVP

EVP Electrical Characteristics

Base Arrester Catalog Number	Duty Cycle Rating (kV)	MCOV (kV)	Temporary Overvoltage Capability (kV)		Maximum Steep Current Impulse Residual Voltage (kV)	Maximum Switching Impulse Residual Voltage (kV)			Maximum Lightning Impulse Residual Voltage (kV)					
			1s	10s	10kA	0.5kA	1kA	2kA	1.5kA	3kA	5kA	10kA	20kA	40kA
EVP000300	3	2.55	3.62	3.47	10.6	6.09	6.32	6.6	6.53	6.89	7.23	7.74	8.47	9.46
EVP000500	6	5.1	7.25	6.94	18.6	12.2	12.7	13.2	13.1	13.8	14.5	15.5	16.9	18.9
EVP000800	9	7.65	10.9	10.4	27.2	18.3	18.9	19.8	19.6	20.7	21.7	23.2	25.4	28.4
EVP000900	10	8.4	11.9	11.4	29.5	20.1	20.8	21.8	21.5	22.7	23.8	25.5	27.9	31.2
EVP001000	12	10.2	14.5	13.9	35.2	24.4	25.3	26.5	26.2	27.6	28.9	30.9	33.9	37.8
EVP001300	15	12.7	18	17.3	43.6	30.4	31.5	32.9	32.6	34.3	36	38.5	42.2	47.1
EVP001500	18	15.3	21.7	20.8	51.8	36.6	37.9	39.7	39.2	41.4	43.4	46.4	50.8	56.8
EVP001700	21	17	24.2	23.1	58.1	40.6	42.2	44.1	43.6	46	48.2	51.6	56.5	63.1
EVP001900	24	19.5	27.7	26.5	66	46.6	48.4	50.6	50	52.7	55.3	59.2	64.8	72.4
EVP002100	25	21	29.8	28.6	70.8	50.2	52.1	54.5	53.8	56.8	59.5	63.7	69.8	77.9
EVP002200	27	22	31.3	29.9	74	52.6	54.6	57.1	56.4	59.5	62.3	66.7	73.1	81.6
EVP002400	30	24.4	34.7	33.2	81.6	58.3	60.6	63.3	62.6	66	69.1	74	81.1	90.5
EVP002700	33	27	38.4	36.7	90.7	64.6	67.1	70	69.2	73	76.5	81.9	89.7	100
EVP002900	36	29	41.4	39.6	97.5	69.6	72.3	75.6	74.7	78.7	82.5	88.4	96.8	108
EVP003100	39	31.5	44.8	42.9	105	75.4	78.3	81.9	80.9	85.3	89.4	95.7	105	117
EVP003600	45	36.5	51.9	49.6	122	87.3	90.6	94.7	93.6	98.7	103	111	121	135
EVP003900	48	39	55.4	53	130	93.2	96.8	101	100	105	111	118	130	145
EVP004200	54	42	62.5	59.8	145	105	109	114	113	119	125	133	146	163
EVP004800	60	48	69	66	161	116	120	126	124	131	138	147	161	180
EVP005300	66	53	75.9	72.6	176	128	133	139	137	144	151	162	177	198
EVP005700	72	57	82.8	79.3	193	139	145	151	149	158	165	177	194	216
EVP007000	90	70	104	99.3	243	175	181	189	187	197	207	221	243	271
EVP007400	90	74	105	101	246	177	184	192	190	200	210	225	246	275
EVP007600	96	76	111	106	259	186	194	202	200	211	221	237	259	289
EVP007800	96	78	111	106	259	186	194	202	200	211	221	237	259	289
EVP008400	108	84	125	120	290	210	218	228	226	238	249	267	292	327
EVP008800	108	88	125	120	290	210	218	228	226	238	249	267	292	327
EVP009800	120	98	139	133	324	234	243	254	251	265	278	297	326	364
EVP010600	132	106	152	145	352	255	265	277	274	289	303	324	355	396
EVP011500	144	115	166	159	384	279	289	302	299	315	330	354	387	433
EVP013100	168	131	194	185	449	326	338	353	349	368	386	413	452	505
EVP014000	172	140	199	191	465	335	348	363	359	379	397	425	465	520
EVP014400	180	144	207	198	482	348	361	378	373	394	413	442	484	540
EVP015200	192	152	221	211	513	372	386	403	398	420	440	471	516	577
EVP015400	192	154	221	211	513	372	386	403	398	420	440	471	516	577
EVP018000	228	180	262	251	608	441	458	479	473	499	523	560	613	685
EVP019000	240	190	276	264	639	465	482	504	498	526	551	590	646	721

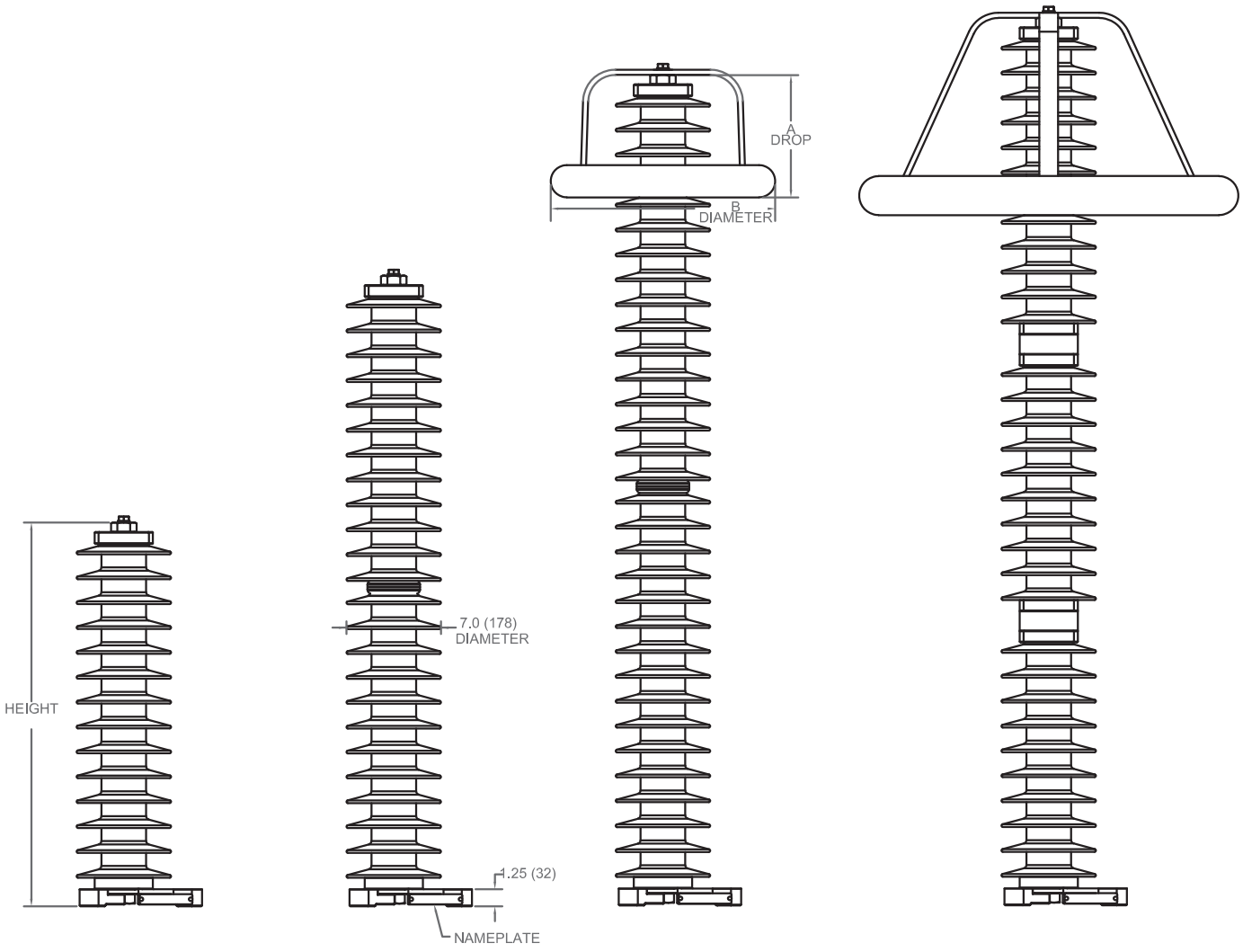
EVP Physical Characteristics

Base Arrester Catalog Number	Rated Voltage (kV)	MCOV (kV)	Creepage Distance - Inches (mm)	Arrester Height - Inches (mm)	Lightning Withstand Voltage (kV)	Switching Withstand Voltage (kV)	Power Frequency Withstand Voltage (kV)	Recommended Minimum Clearance - Inches (mm)		Arrester Net Weight - Pounds (kg)
								Phase to Ground	Phase to Phase	
EVP000300	3	2.55	19.6 (498)	9.9 (251)	101	84	50	4.5 (114)	9.0 (229)	12.6 (5.7)
EVP000500	6	5.1	19.6 (498)	9.9 (251)	101	84	50	4.5 (114)	9.0 (229)	12.6 (5.7)
EVP000800	9	7.65	24.8 (631)	11.7 (297)	127	106	63	4.5 (114)	9.0 (229)	15.0 (6.8)
EVP000900	10	8.4	24.8 (631)	11.7 (297)	127	106	63	4.5 (114)	9.0 (229)	15.0 (6.8)
EVP001000	12	10.2	24.8 (631)	11.7 (297)	127	106	63	4.5 (114)	9.0 (229)	15.0 (6.8)
EVP001300	15	12.7	30.0 (763)	13.5 (344)	153	128	75	5.1 (130)	9.3 (236)	17.3 (7.8)
EVP001500	18	15.3	30.0 (763)	13.5 (344)	153	128	75	5.7 (145)	10.0 (254)	17.3 (7.8)
EVP001700	21	17	40.5 (1029)	17.2 (437)	207	173	101	6.2 (157)	10.5 (267)	21.9 (9.9)
EVP001900	24	19.5	40.5 (1029)	17.2 (437)	207	173	101	6.8 (173)	11.2 (284)	21.9 (9.9)
EVP002100	25	21	40.5 (1029)	17.2 (437)	207	173	101	7.2 (183)	11.7 (297)	21.9 (9.9)
EVP002200	27	22	40.5 (1029)	17.2 (437)	207	173	101	7.4 (188)	11.9 (302)	21.9 (9.9)
EVP002400	30	24.4	40.5 (1029)	17.2 (437)	207	173	101	8.0 (203)	12.6 (320)	21.9 (9.9)
EVP002700	33	27	50.9 (1294)	20.9 (530)	261	219	125	8.7 (221)	13.4 (340)	26.6 (12.1)
EVP002900	36	29	50.9 (1294)	20.9 (530)	261	219	125	9.2 (234)	14.0 (356)	26.6 (12.1)
EVP003100	39	31.5	50.9 (1294)	20.9 (530)	261	219	125	9.8 (249)	14.7 (373)	26.6 (12.1)
EVP003600	45	36.5	61.5 (1562)	24.5 (623)	313	263	148	11.1 (282)	16.1 (409)	31.2 (14.2)
EVP003900	48	39	61.5 (1562)	24.5 (623)	313	263	148	11.7 (297)	16.8 (427)	31.2 (14.2)
EVP004200	54	42	61.5 (1562)	24.5 (623)	313	263	148	13.0 (330)	18.2 (462)	31.2 (14.2)
EVP004800	60	48	71.9 (1827)	28.2 (716)	367	308	172	14.1 (358)	19.5 (495)	35.9 (16.3)
EVP005300	66	53	71.9 (1827)	28.2 (716)	367	308	172	15.3 (389)	20.9 (531)	35.9 (16.3)
EVP005700	72	57	82.4 (2093)	31.9 (810)	421	353	194	16.5 (419)	22.3 (566)	41.1 (18.6)
EVP007000	90	70	123 (3124)	46.3 (1177)	631	529	275	20.2 (513)	26.4 (671)	58.9 (26.7)
EVP007400	90	74	123 (3124)	46.3 (1177)	631	529	275	20.5 (521)	26.7 (678)	58.9 (26.7)
EVP007600	96	76	123 (3124)	46.3 (1177)	631	529	275	21.5 (546)	27.9 (709)	58.9 (26.7)
EVP007800	96	78	123 (3124)	46.3 (1177)	631	529	275	21.5 (546)	27.9 (709)	58.9 (26.7)
EVP008400	108	84	123 (3124)	46.3 (1177)	631	529	275	24.0 (610)	30.7 (780)	58.9 (26.7)
EVP008800	108	88	123 (3124)	46.3 (1177)	631	529	275	24.0 (610)	30.7 (780)	58.9 (26.7)
EVP009800	120	98	144 (3654)	53.7 (1364)	652	546	283	31.3 (795)	43.1 (1095)	73.1 (33.2)
EVP010600	132	106	144 (3654)	53.7 (1364)	652	546	283	33.5 (851)	45.6 (1158)	73.1 (33.2)
EVP011500	144	115	165 (4185)	61.0 (1550)	758	635	320	36.0 (914)	48.4 (1229)	82.1 (37.2)
EVP013100	168	131	185 (4686)	72.5 (1841)	926	776	372	40.9 (1039)	54.0 (1372)	97.0 (44.1)
EVP014000	172	140	216 (5482)	83.5 (2121)	1006	843	395	47.6 (1209)	66.4 (1687)	120 (54.6)
EVP014400	180	144	216 (5482)	83.5 (2121)	1006	843	395	49.0 (1245)	68.0 (1727)	120 (54.6)
EVP015200	192	152	216 (5482)	83.5 (2121)	1006	843	395	51.4 (1306)	70.8 (1798)	120 (54.6)
EVP015400	192	154	216 (5482)	83.5 (2121)	1006	843	395	51.4 (1306)	70.8 (1798)	120 (54.6)
EVP018000	228	180	247 (6278)	94.5 (2400)	1166	977	436	58.7 (1491)	79.1 (2009)	133 (60.1)
EVP019000	240	190	247 (6278)	94.5 (2400)	1166	977	436	61.2 (1554)	81.9 (2080)	133 (60.1)

Products – Polymer Housed Surge Arresters – EVP

Grading Ring Diameters

Arrester MCOV	Drop A - Inches (mm)	Diameter B - Inches (mm)
98-131	9 (229)	16.5 (419)
140-190	14.5 (368)	27.9 (708)

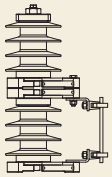


EVP Part Number Selection

EVP X YYY 0 0 - 3001

Hardware options are on the following page

Step 1: Configuration

X ->	0 (standard)	1	2 (under-hung)	3	9 (Multi Rated)
Top	Cap	Cap	Tripod	Tripod	Cap
Bottom	Tripod	Cap	Cap	Tripod	Tripod
					

For Hubbell internal use only (0-Standard)

Step 2: EVP Part Number Table

MCOV	YYY	MCOV	YYY
2.55	003	48	048
5.1	005	57	057
7.65	008	70	070
8.4	009	74	074
10.2	010	76	076
12.7	013	84	084
15.3	015	88	088
17	017	98	098
19.5	019	106	106
22	022	115	115
24.4	024	131	131
29	029	140	140
31.5	031	144	144
36.5	036	152	152
39	039	180	180
42	042	190	190

Step 3: Housing Leakage Distance

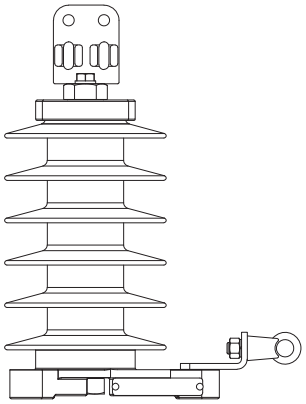
0 – Standard Leakage Distance
1 – High Leakage Distance
2 – Extra High Leakage Distance

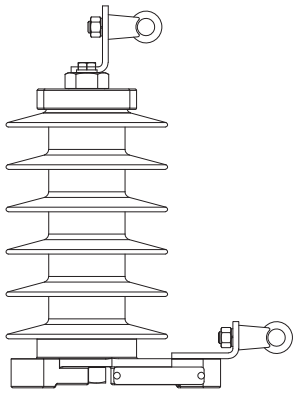
MCOV														Height (in)	Creep (in)
003 - 005	008 - 010	013 - 015	017 - 024	029 - 031	036 - 042	048	057	070 - 088	098 - 106	115	131	140 - 152	180 - 190		
0	-	-	-	-	-	-	-	-	-	-	-	-	-	9.9	19.6
1	0	-	-	-	-	-	-	-	-	-	-	-	-	11.7	24.8
2	1	0	-	-	-	-	-	-	-	-	-	-	-	13.5	30
-	2	1	0	-	-	-	-	-	-	-	-	-	-	17.2	40.5
-	-	2	1	0	-	-	-	-	-	-	-	-	-	20.9	50.9
-	-	-	2	1	0	-	-	-	-	-	-	-	-	24.5	61.5
-	-	-	-	2	1	0	-	-	-	-	-	-	-	28.2	71.9
-	-	-	-	-	2	1	0	-	-	-	-	-	-	31.9	82.4
-	-	-	-	-	-	2	1	0	-	-	-	-	-	46.3	123
-	-	-	-	-	-	-	2	1	0	-	-	-	-	53.7	144
-	-	-	-	-	-	-	-	2	1	0	-	-	-	61	165
-	-	-	-	-	-	-	-	-	2	1	0	-	-	72.5	184
-	-	-	-	-	-	-	-	-	-	2	1	0	-	83.5	216
-	-	-	-	-	-	-	-	-	-	-	2	1	0	94.5	247
-	-	-	-	-	-	-	-	-	-	-	-	2	1	111.1	288
-	-	-	-	-	-	-	-	-	-	-	-	-	2	127.7	330

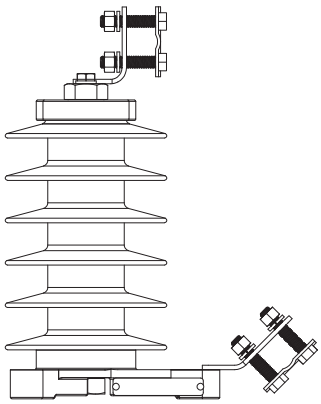
* For applications that require leakage distance, height or terminal size requirements not listed, please contact your Hubbell Power Systems Representative at 1.573.682.5521.

Step 4: Hardware

End codes displayed apply to EVP0 and EVP2 standard configurations. Please contact your Hubbell representative for additional hardware code options.

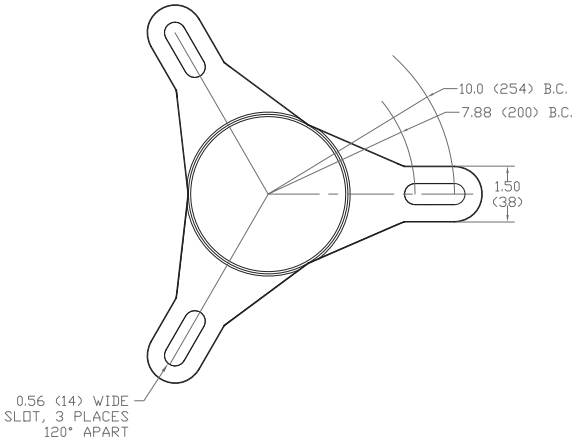






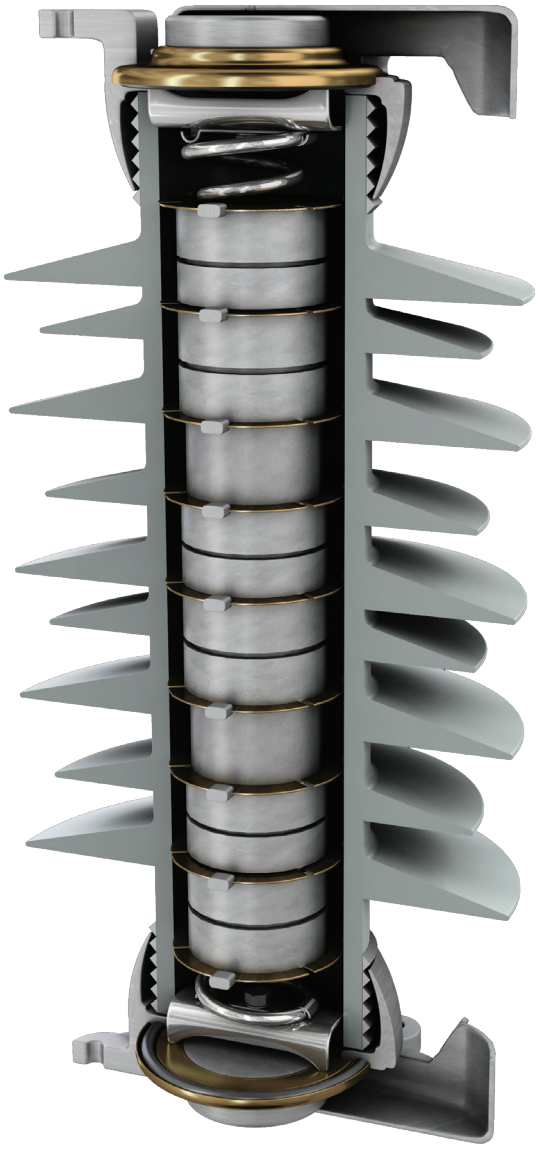
- **3001**:
  Line: 4-Hole NEMA pad with (2) single eye bolts
  Ground: Single eye bolt
- **3002**:
  Line: Single eye bolt
  Ground: Single eye bolt
- **3036**:
  Line: 4-Hole NEMA pad with clamp type terminal
  Ground: 4-Hole NEMA pad with clamp type terminal
- **3010**:
  Same as 3001 except arrester packaged in a wooden crate
- **3024**:
  Same as 3002 except arrester packaged in a wooden crate
- **3037**:
  Same as 3036 except arrester packaged in a wooden crate

Base Mounting View:



Products – Polymer Housed Surge Arresters – SVN, PH3 and PH4

SVN, IEEE Station Class
PH3, IEC Class SM
PH4, IEC Class SH



Overview – Standard SVN, PH3 and PH4 station class arresters are available for use on system voltages from 22.86 kV to 500 kV (24 kV max to 550 kV max). They offer an attractive alternative to porcelain housed arresters (MVN family), without sacrificing any reduction in protective capability or energy handling capability, for cases where the high mechanical strength of porcelain is not required and lower weight would be an advantage.

Construction:

- "Tube" design, using fiberglass reinforced epoxy tube overmolded with silicone rubber weathershed housing
- Single column of MOV discs and aluminum spacers (as required) centrally located within housing
- Disc column held under high spring compression between ductile iron end fittings affixed to housing
- Directional pressure relief system built integrated into end fittings

At-a-Glance:

- High leakage distance designs (standard designs at least 28% more leakage distance than IEEE C62.11 minimum); higher leakage distance designs available for high pollution areas
- Up to 47% lighter than comparable porcelain arresters
- Resilient polymer housing resistant to mechanical damage
- Tested to 63kA rated short circuit current; can handle reclosures with no concern for housing fragmentation

Products – Polymer Housed Surge Arresters – SVN

SVN Electrical Characteristics

Standard Arrester Catalog Number	Duty Cycle Rating (kV)	MCOV (kV)	Maximum Steep Current Impulse Residual Voltage (kV)	Maximum Switching Impulse Residual Voltage (kV)	Temporary Overvoltage Capability (kV)		Maximum Lightning Impulse Residual Voltage (kV)					
			10kA		1 s	10 s	1.5kA	3kA	5kA	10kA	20kA	40kA
SVN012GA010AA	12	10.2	32.1	24.4	14.9	14.3	26.2	27.3	28.2	29.6	31.6	34.8
SVN015GA013AA	15	12.7	39.9	30.3	18.5	17.8	32.6	33.9	35.1	36.8	39.3	43.3
SVN018GA015AA	18	15.3	48.2	36.5	22.3	21.4	39.3	40.9	42.3	44.4	47.4	52.5
SVN021GA017AA	21	17	53.5	40.6	24.8	23.8	43.7	45.4	47	49.3	53	58
SVN024GA019AA	24	19.5	62	46.9	28.4	27.3	50.5	52.5	54.5	57	61	67
SVN027GA022AA	27	22	69.5	53	32.1	30.8	57	59	61	64	68.5	75.5
SVN030GA024AA	30	24.4	79	60	35.6	34.1	64.5	67	69.5	72.5	77.5	85.5
SVN036GA029AA	36	29	92	69.5	42.3	40.5	75	78	80.5	84.5	90.5	99.5
SVN039GA031AA	39	31.5	101	76.5	45.9	44	82.5	86	89	93	99.5	110
SVN045GA036AA	45	36.5	115	87.5	53	51	94	98	101	106	114	125
SVN048GA039AA	48	39	124	94	57	54.5	101	105	109	114	122	134
SVN054GA042AA	54	42	133	101	61	58.5	108	113	117	122	131	144
SVN060GA048AA	60	48	152	116	70	67	124	129	134	140	150	165
SVN072GA057AA	72	57	180	137	83	79.5	147	153	159	166	178	195
SVN090GA070AA	90	70	221	167	102	98	180	187	194	203	217	239
SVN090GA074AA	90	74	234	177	108	103	191	198	205	215	230	253
SVN096GA076AA	96	76	240	182	111	106	196	204	211	221	236	260
SVN108GA084AA	108	84	265	201	122	117	216	225	233	244	261	287
SVN108GA088AA	108	88	277	210	128	123	226	235	243	255	273	300
SVN120GA098AA	120	98	308	241	143	137	252	262	271	284	304	334
SVN132GA106AA	132	106	334	261	155	148	273	284	294	308	329	362
SVN144GA115AA	144	115	363	283	168	161	296	308	318	334	357	393
SVN168GA131AA	168	131	412	322	191	183	337	350	362	380	406	447
SVN172GA140AA	172	140	441	344	204	196	360	374	387	406	434	477
SVN180GA144AA	180	144	454	355	210	201	370	385	398	418	447	491
SVN192GA152AA	192	152	479	374	222	212	391	406	420	441	471	518
SVN198GA158AA	198	158	497	388	230	221	406	422	437	458	489	538
SVN202GA161AA	202	161	507	396	235	225	414	430	445	467	499	549
SVN218GA175AA	218	175	551	431	255	245	450	468	484	508	543	597
SVN228GA180AA	228	180	566	443	262	252	462	481	497	522	557	613
SVN240GA190AA	240	190	598	467	277	266	488	507	525	551	588	647
SVN258GA209AA	258	209	657	532	305	292	537	558	577	606	647	712
SVN264GA212AA	264	212	667	540	309	296	545	566	586	615	657	723
SVN276GA220AA	276	220	692	560	321	308	565	587	608	638	681	750
SVN288GA230AA	288	230	724	585	335	322	591	614	635	667	712	784
SVN312GA245AA	312	245	770	623	357	343	629	654	676	710	758	834
SVN396GA318AA	396	318	1000	809	464	445	816	849	878	922	984	1083
SVN420GA335AA	420	335	1053	852	488	468	860	894	925	971	1037	1140
SVN444GA353AA	444	353	1109	898	515	493	906	942	974	1023	1092	1202

* Discharge voltages are based on a 500A surge of 45 µs time to crest through 88 kV MCOV and 1,000A surge of 45 µs time through 190 kV MCOV and 2,000A through 448 kV MCOV.

SVN Physical Characteristics

Standard Arrester Catalog Number	Duty Cycle Rating (kV)	MCOV (kV)	Creepage Distance - Inches (mm)	Total Height - Inches (mm)	Recommended Minimum Clearance - Inches (mm)		Net Weight - Pounds (kg)	Drawing Figure
					Phase to Ground	Phase to Phase		
SVN012GA010AA	12	10.2	83.9 (2131)	38.1 (968)	0.8 (20)	1.4 (36)	104 (47.3)	1
SVN015GA013AA	15	12.7	83.9 (2131)	38.1 (968)	1.4 (36)	2.1 (53)	106 (48.2)	1
SVN018GA015AA	18	15.3	83.9 (2131)	38.1 (968)	2.0 (51)	2.8 (71)	107 (48.6)	1
SVN021GA017AA	21	17	83.9 (2131)	38.1 (968)	2.4 (61)	3.3 (84)	107 (48.6)	1
SVN024GA019AA	24	19.5	83.9 (2131)	38.1 (968)	3.0 (76)	4.0 (102)	109 (49.5)	1
SVN027GA022AA	27	22	83.9 (2131)	38.1 (968)	3.6 (91)	4.6 (117)	111 (50.5)	1
SVN030GA024AA	30	24.4	83.9 (2131)	38.1 (968)	4.3 (109)	5.4 (137)	112 (50.9)	1
SVN036GA029AA	36	29	83.9 (2131)	38.1 (968)	5.3 (135)	6.5 (165)	115 (52.3)	1
SVN039GA031AA	39	31.5	83.9 (2131)	38.1 (968)	5.9 (150)	7.3 (185)	116 (52.7)	1
SVN045GA036AA	45	36.5	83.9 (2131)	38.1 (968)	7.0 (178)	8.5 (216)	119 (54.1)	1
SVN048GA039AA	48	39	83.9 (2131)	38.1 (968)	7.6 (193)	9.2 (234)	120 (54.5)	1
SVN054GA042AA	54	42	83.9 (2131)	38.1 (968)	8.3 (211)	9.9 (251)	122 (55.5)	1
SVN060GA048AA	60	48	83.9 (2131)	38.1 (968)	9.8 (249)	11.6 (295)	125 (56.8)	1
SVN072GA057AA	72	57	83.9 (2131)	38.1 (968)	11.9 (302)	14.0 (356)	130 (59.1)	1
SVN090GA070AA	90	70	113 (2870)	44.4 (1128)	14.8 (376)	17.3 (439)	144 (65.5)	1
SVN090GA074AA	90	74	113 (2870)	44.4 (1128)	15.8 (401)	18.4 (467)	145 (65.9)	1
SVN096GA076AA	96	76	113 (2870)	44.4 (1128)	16.3 (414)	18.9 (480)	146 (66.4)	1
SVN108GA084AA	108	84	143 (3632)	52.1 (1323)	18.1 (460)	21.1 (536)	160 (72.7)	1
SVN108GA088AA	108	88	143 (3632)	52.1 (1323)	19.1 (485)	22.1 (561)	161 (73.2)	1
SVN120GA098AA	120	98	143 (3632)	52.1 (1323)	21.4 (544)	24.7 (627)	168 (76.4)	1
SVN132GA106AA	132	106	172 (4369)	58.8 (1494)	23.3 (592)	26.9 (683)	181 (82.3)	1
SVN144GA115AA	144	115	172 (4369)	58.8 (1494)	25.4 (645)	29.3 (744)	186 (84.5)	1
SVN168GA131AA	168	131	197 (5004)	76.8 (1951)	29.1 (739)	33.5 (851)	264 (120)	2
SVN172GA140AA	172	140	197 (5004)	76.8 (1951)	31.2 (792)	35.8 (909)	286 (130)	3
SVN180GA144AA	180	144	197 (5004)	76.8 (1951)	32.2 (818)	37.0 (940)	288 (131)	3
SVN192GA152AA	192	152	227 (5766)	83.1 (2111)	34.0 (864)	39.0 (991)	298 (135)	3
SVN198GA158AA	198	158	227 (5766)	83.1 (2111)	35.4 (899)	40.5 (1029)	302 (137)	3
SVN202GA161AA	202	161	227 (5766)	83.1 (2111)	36.1 (917)	41.4 (1052)	304 (138)	3
SVN218GA175AA	218	175	256 (6502)	90.8 (2306)	39.5 (1003)	45.2 (1148)	320 (145)	3
SVN228GA180AA	228	180	256 (6502)	90.8 (2306)	40.5 (1029)	46.4 (1179)	324 (147)	3
SVN240GA190AA	240	190	285 (7239)	98.5 (2502)	42.9 (1090)	49.0 (1245)	338 (154)	3
SVN258GA209AA	258	209	314 (7976)	105 (2667)	47.3 (1201)	54.1 (1374)	365 (166)	3
SVN264GA212AA	264	212	314 (7976)	105 (2667)	48.1 (1222)	54.9 (1394)	367 (167)	3
SVN276GA220AA	276	220	314 (7976)	105 (2667)	49.9 (1267)	57.0 (1448)	371 (169)	3
SVN288GA230AA	288	230	344 (8738)	112 (2845)	52.3 (1328)	59.6 (1514)	387 (176)	3
SVN312GA245AA	312	245	369 (9373)	130 (3302)	55.7 (1415)	63.5 (1613)	459 (209)	4
SVN396GA318AA	396	318	457 (11608)	152 (3861)	72.8 (1849)	82.9 (2106)	559 (254)	4
SVN420GA335AA	420	335	489 (12421)	158 (4013)	76.8 (1951)	87.4 (2220)	578 (263)	4
SVN444GA353AA	444	353	516 (13106)	165 (4191)	81.0 (2057)	92.1 (2339)	597 (271)	4

Grading Ring Diameters

Arrester MCOV	Drop A - Inches (mm)	Diameter B - Inches (mm)
140–190	15 (381)	25 (635)
209–245	18 (457)	39 (991)
318 - 448	35.8 (909)	60 (1524)

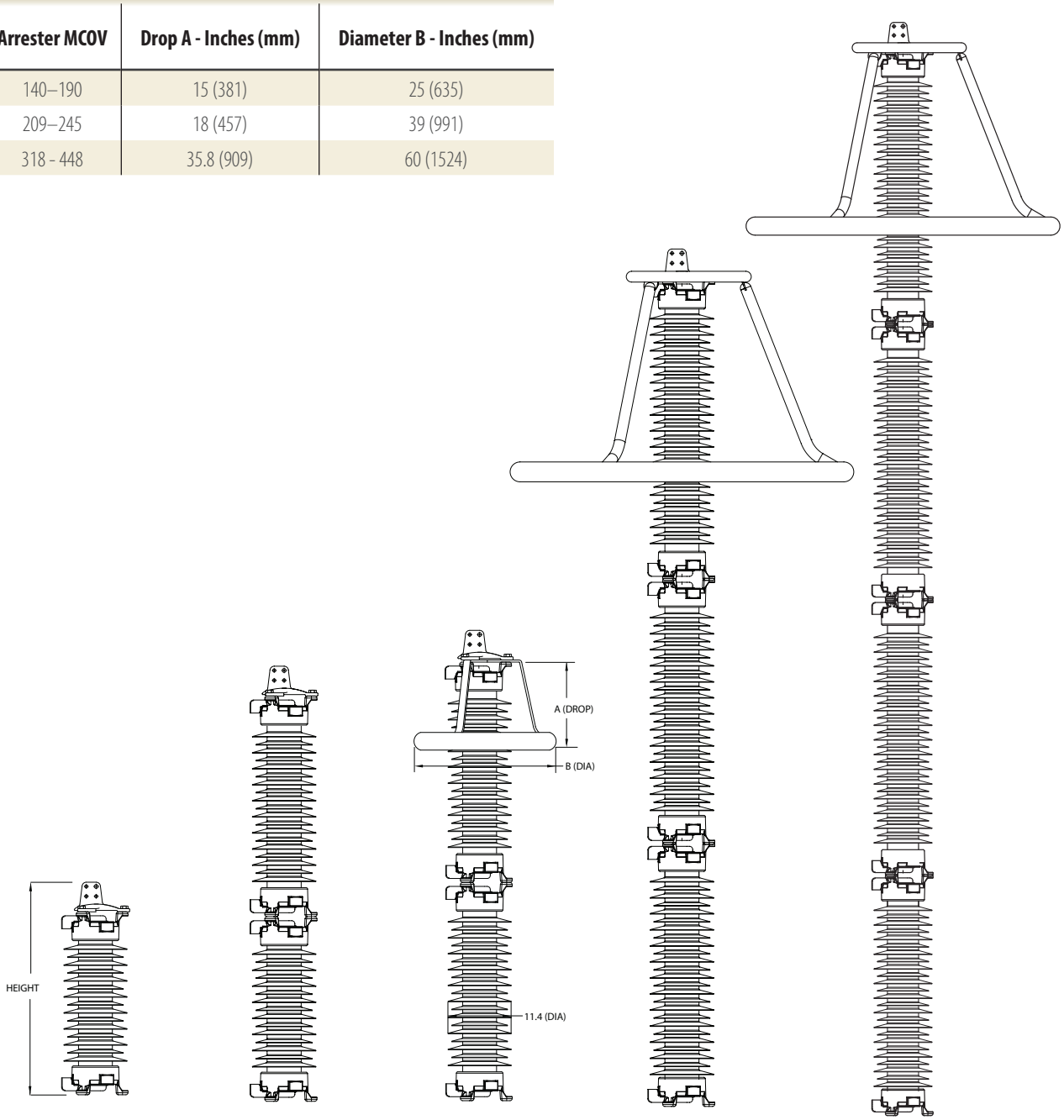


Figure 1 | Figure 2 | Figure 3 | Figure 4 | Figure 5

SVN Part Numbers

S V N 0 5 4 G A 0 4 2 A A

Step 1: Select Standard Part Number

Use Column 1 of Page 21 to select a standard part number, including Duty Cycle and MCOV ratings.

Duty Cycle Rating

Step 2: Configurations

G – Standard
U – Underhung
F – Fault Indicator

Step 3: Leakage Distance Requirement

A – Standard Leakage Distance
B – High Leakage Distance
C – Extra High Leakage Distance
D – Mega High Leakage Distance

MCOV Rating

Step 4: Line Terminals

A – Standard

Line Size - in (mm)	Code
0.25 (7) - 0.81 (21)	A
0.38 (10) - 1.12 (29)	B
0.16 (4) - 1.25 (31)	H

Step 5: Ground Terminals

A – Standard

Ground Size - in (mm)	Code
0.25 (7) - 0.81 (21)	A
0.38 (10) - 1.12 (29)	B
0.16 (4) - 1.25 (31)	H

Letter Code

MCOV														Height (in)	Leakage Distance (in)
010 057	070 076	084 098	106 115	131 144	152 161	175 180	190	209 220	230	245	318	335	353		
A														38.1	83.9
B	A													44.4	113
C	B	A												52.1	143
D	C	B	A											58.8	172
	D	C	B	A										76.8	197
		D	C	B	A									83.1	227
			D	C	B	A								90.8	256
				D	C	B	A							98.5	285
					D	C	B	A						105	315
						D	C	B	A					112	344
							D	C	B	A				130	369
								D	C	B				137	398
										C				145	248
											A			152	457
											B	A		162	487
											C	B	A	169	516
												C	B	184	541
													C	195	570

* For applications that require leakage distance, height or terminal size requirements not listed, please contact your Hubbell PowerSystems Representative at 1.573.682.5521.

Products – Polymer Housed Surge Arresters – PH3

PH3 Electrical Characteristics

Base Arrester Catalog Number	Um (kV)	Ur (kV)	Uc (kV)	Temporary Overvoltage Capability (kVrms)		Maximum Steep Current Impulse Residual Voltage (kV)	Maximum Switching Impulse Residual Voltage (kV)			Maximum Lightning Impulse Residual Voltage (kV)			
				1s	10s	10kA	0.5kA	1kA	2kA	5kA	10kA	20kA	40kA
PH3036wx030yz	36	30	24	32.6	30.5	79.0	58.0	60.5	63.0	69.0	73.5	80.5	90.0
PH3036wx033yz	36	33	26.4	35.9	33.6	87.0	64.0	66.5	69.5	76.0	81.0	89.0	99.5
PH3036wx036yz	36	36	28.8	39.2	36.6	94.5	69.5	72.0	75.5	82.5	88.0	96.5	108
PH3036wx039yz	36	39	31.2	42.4	39.7	103	75.5	78.5	82.0	89.5	95.5	105	117
PH3052wx042yz	52	42	33.6	45.7	42.8	111	81.5	84.5	88.5	96.5	103	113	126
PH3052wx048yz	52	48	38.4	52.2	48.9	127	93	97.0	101	111	118	130	145
PH3052wx051yz	52	51	40.8	55.5	51.9	135	99.0	103	107	117	125	137	153
PH3052wx054yz	52	54	43.2	58.8	55.0	142	105	108	113	124	132	145	162
PH3052wx060yz	52	60	48	65.3	61.1	158	116	121	126	138	147	161	180
PH3072wx054yz	72	54	43.2	58.8	55.0	142	105	108	113	124	132	145	162
PH3072wx060yz	72	60	48	65.3	61.1	158	116	121	126	138	147	161	180
PH3072wx066yz	72	66	52.8	71.8	67.2	174	128	133	139	152	162	178	199
PH3072wx072yz	72	72	57.6	78.3	73.3	189	139	144	151	165	176	193	216
PH3072wx075yz	72	75	60	81.6	76.4	197	145	150	157	171	183	201	224
PH3072wx084yz	72	84	67.2	91.4	85.5	220	162	168	176	192	205	225	251
PH3100wx078yz	100	78	62.4	84.9	79.4	205	151	157	164	179	191	210	234
PH3100wx084yz	100	84	67.2	91.4	85.5	220	162	168	176	192	205	225	251
PH3100wx090yz	100	90	72	97.9	91.6	237	174	180	189	206	220	241	270
PH3100wx096yz	100	96	76.8	104	97.7	253	186	193	201	220	235	258	288
PH3123wx090yz	123	90	72	97.9	91.6	237	174	180	189	206	220	241	270
PH3123wx096yz	123	96	76.8	104	97.7	253	186	193	201	220	235	258	288
PH3123wx102yz	123	102	81.6	111	104	268	197	204	213	233	249	273	305
PH3123wx108yz	123	108	86.4	118	110	284	209	216	226	247	264	290	323
PH3123wx120yz	123	120	96	131	122	315	231	240	251	274	293	321	359
PH3123wx132yz	123	132	105.6	144	134	347	255	265	277	302	323	354	396
PH3123wx138yz	123	138	110.4	150	140	362	266	276	289	315	337	370	413
PH3145wx108yz	145	108	86.4	118	110	284	209	216	226	247	264	290	323
PH3145wx120yz	145	120	96	131	122	315	231	240	251	274	293	321	359
PH3145wx132yz	145	132	105.6	144	134	347	255	265	277	302	323	354	396
PH3145wx138yz	145	138	110.4	150	140	362	266	276	289	315	337	370	413
PH3145wx144yz	145	144	115.2	157	147	378	278	288	301	329	352	386	431
PH3145wx168yz	145	168	134.4	183	171	440	324	336	351	383	410	449	502

PH3 Electrical Characteristics

Base Arrester Catalog Number	Um (kV)	Ur (kV)	Uc (kV)	Temporary Overvoltage Capability (kVrms)		Maximum Steep Current Impulse Residual Voltage (kV)	Maximum Switching Impulse Residual Voltage (kV)			Maximum Lightning Impulse Residual Voltage (kV)			
				1s	10s	10kA	0.5kA	1kA	2kA	5kA	10kA	20kA	40kA
PH3170wx132yz	170	132	105.6	144	134	347	255	265	277	302	323	354	396
PH3170wx138yz	170	138	110.4	150	140	362	266	276	289	315	337	370	413
PH3170wx144yz	170	144	115.2	157	147	378	278	288	301	329	352	386	431
PH3170wx162yz	170	162	129.6	176	165	425	313	324	339	370	396	434	485
PH3170wx168yz	170	168	134.4	183	171	440	324	336	351	383	410	449	502
PH3245wx180yz	245	180	144	196	183	473	347	360	377	411	440	482	539
PH3245wx192yz	245	192	153.6	209	195	504	370	384	401	439	469	514	574
PH3245wx198yz	245	198	158.4	215	202	520	382	396	414	453	484	530	592
PH3245wx216yz	245	216	172.8	235	220	567	417	432	452	494	528	579	646
PH3245wx228yz	245	228	182.4	248	232	598	439	456	477	521	557	610	682
PH3300wx216yz	300	216	172.8	235	220	567	417	432	452	494	528	579	646
PH3300wx228yz	300	228	182.4	248	232	598	439	456	477	521	557	610	682
PH3300wx240yz	300	240	192	261	244	629	462	480	502	548	586	642	717
PH3300wx258yz	300	258	206.4	281	263	676	497	516	539	589	630	690	771
PH3300wx264yz	300	264	211.2	287	269	693	509	528	552	603	645	707	789
PH3362wx258yz	362	258	206.4	281	263	676	497	516	539	589	630	690	771
PH3362wx264yz	362	264	211.2	287	269	693	509	528	552	603	645	707	789
PH3362wx276yz	362	276	220.8	300	281	724	532	552	577	630	674	739	825
PH3362wx288yz	362	288	230.4	313	293	755	554	576	602	657	703	770	860
PH3420wx330yz	420	330	264	359	336	865	636	660	690	753	806	883	986
PH3420wx336yz	420	336	268.8	366	342	880	647	671	702	766	820	898	1003
PH3420wx360yz	420	360	288	392	366	944	693	720	752	821	879	963	1076
PH3420wx372yz	420	372	297.6	405	379	975	716	743	777	849	908	995	1111
PH3420wx378yz	420	378	302.4	411	385	991	728	756	790	863	923	1011	1129
PH3420wx390yz	420	390	312	424	397	1022	751	779	814	890	952	1043	1165
PH3420wx396yz	420	396	316.8	431	403	1038	762	792	827	904	967	1059	1183
PH3420wx420yz	420	420	336	457	428	1100	808	839	877	958	1025	1123	1254

PH4 Electrical Characteristics

Base Arrester Catalog Number	Um (kV)	Ur (kV)	Uc (kV)	Temporary Overvoltage Capability (kVrms)		Maximum Steep Current Impulse Residual Voltage (kV)	Maximum Switching Impulse Residual Voltage (kV)			Maximum Lightning Impulse Residual Voltage (kV)			
				1s	10s	10kA	0.5kA	1kA	2kA	5kA	10kA	20kA	40kA
PH4036wx027yz	36	27	21.6	29.7	27.8	76.5	53	54.5	56	60.5	63.5	68	75
PH4036wx030yz	36	30	24	33	30.9	85	59	60.5	62.5	67.5	70.5	75.5	83.5
PH4036wx033yz	36	33	26.4	36.3	34	93.5	64.5	66.5	68.5	74	77.5	83	91.5
PH4036wx036yz	36	36	28.8	39.6	37.1	102	70.5	72.5	74.5	80.5	84.5	90.5	100
PH4036wx039yz	36	39	31.2	42.9	40.2	110	76	78.5	81	87.5	91.5	98	108
PH4052wx042yz	52	42	33.6	46.2	43.3	119	82.5	85	87.5	94.5	99	106	117
PH4052wx048yz	52	48	38.4	52.8	49.4	136	94	97	100	108	113	121	134
PH4052wx051yz	52	51	40.8	56.1	52.5	145	100	103	106	115	120	129	142
PH4052wx054yz	52	54	43.2	59.4	55.6	153	106	109	112	121	127	136	150
PH4052wx060yz	52	60	48	66	61.8	170	118	121	125	135	141	151	167
PH4072wx054yz	72	54	43.2	59.4	55.6	153	106	109	112	121	127	136	150
PH4072wx060yz	72	60	48	66	61.8	170	118	121	125	135	141	151	167
PH4072wx066yz	72	66	52.8	72.6	68	187	129	133	137	148	155	166	183
PH4072wx072yz	72	72	57.6	79.2	74.2	203	141	145	149	161	169	181	200
PH4072wx075yz	72	75	60	82.5	77.3	212	147	151	156	168	176	189	208
PH4072wx078yz	72	78	62.4	85.8	80.3	220	152	157	162	175	183	196	216
PH4072wx081yz	72	81	64.8	89.1	83.4	230	159	164	169	182	191	205	225
PH4072wx084yz	72	84	67.2	92.4	86.5	238	165	170	175	189	198	212	234
PH4100wx084yz	100	84	67.2	92.4	86.5	238	165	170	175	189	198	212	234
PH4100wx090yz	100	90	72	99	92.7	255	176	182	187	202	212	227	250
PH4100wx096yz	100	96	76.8	106	98.9	272	188	194	200	216	226	242	267
PH4123wx090yz	123	90	72	99	92.7	255	176	182	187	202	212	227	250
PH4123wx096yz	123	96	76.8	106	99	272	188	194	200	216	226	242	267
PH4123wx108yz	123	108	86.4	119	111	306	211	217	224	242	254	272	300
PH4123wx120yz	123	120	96	132	124	339	235	241	249	269	282	302	333
PH4123wx132yz	123	132	105.6	145	136	373	258	265	274	296	310	332	366
PH4123wx138yz	123	138	110.4	152	142	390	269	277	286	309	324	347	382
PH4145wx108yz	145	108	86.4	119	111	306	211	217	224	242	254	272	300
PH4145wx120yz	145	120	96	132	124	339	235	241	249	269	282	302	333
PH4145wx132yz	145	132	105.6	145	136	373	258	265	274	296	310	332	366
PH4145wx138yz	145	138	110.4	152	142	390	269	277	286	309	324	347	382
PH4145wx144yz	145	144	115.2	158	148	406	281	289	298	322	338	362	399

PH4 Electrical Characteristics

Base Arrester Catalog Number	Um (kV)	Ur (kV)	Uc (kV)	Temporary Overvoltage Capability (kVrms)		Maximum Steep Current Impulse Residual Voltage (kV)	Maximum Switching Impulse Residual Voltage (kV)			Maximum Lightning Impulse Residual Voltage (kV)			
				1s	10s	10kA	0.5kA	1kA	2kA	5kA	10kA	20kA	40kA
PH4170wx132yz	170	132	105.6	145	136	373	258	265	274	296	310	332	366
PH4170wx144yz	170	144	115.2	158	148	406	281	289	298	322	338	362	399
PH4170wx162yz	170	162	129.6	178	167	458	317	326	336	363	381	408	449
PH4170wx168yz	170	168	134.4	185	173	475	328	338	348	377	395	423	466
PH4245wx180yz	245	180	144	198	185	509	352	362	373	403	423	453	499
PH4245wx192yz	245	192	153.6	211	198	542	375	386	398	430	451	483	532
PH4245wx198yz	245	198	158.4	218	204	559	386	398	410	443	465	498	548
PH4245wx216yz	245	216	172.8	238	222	609	421	433	447	483	507	543	598
PH4245wx228yz	245	228	182.4	251	235	643	445	457	472	510	535	573	631
PH4300wx216yz	300	216	172.8	238	222	609	421	433	447	483	507	543	598
PH4300wx228yz	300	228	182.4	251	235	643	445	457	472	510	535	573	631
PH4300wx240yz	300	240	192	264	247	678	469	482	497	537	564	604	665
PH4300wx258yz	300	258	206.4	284	266	728	503	518	534	577	606	649	714
PH4300wx264yz	300	264	211.2	290	272	745	515	530	547	591	620	664	731
PH4362wx258yz	362	258	206.4	284	266	728	503	518	534	577	606	649	714
PH4362wx264yz	362	264	211.2	290	272	745	515	530	547	591	620	664	731
PH4362wx276yz	362	276	220.8	304	284	779	538	554	571	617	648	694	764
PH4362wx288yz	362	288	230.4	317	297	812	562	578	596	644	676	724	797
PH4420wx330yz	420	330	264	363	340	931	644	662	683	738	775	830	913
PH4420wx336yz	420	336	268.8	370	346	948	655	674	696	752	789	845	930
PH4420wx360yz	420	360	288	396	371	1015	702	722	745	805	845	905	996
PH4420wx372yz	420	372	297.6	409	383	1049	725	746	770	832	873	935	1029
PH4420wx378yz	420	378	302.4	416	389	1066	737	758	782	845	887	950	1045
PH4420wx390yz	420	390	312	429	402	1099	760	782	807	872	915	980	1078
PH4420wx396yz	420	396	316.8	436	408	1117	772	795	820	886	930	996	1096
PH4420wx420yz	420	420	336	462	433	1185	819	843	869	939	986	1056	1162

PH3 & PH4 Housing Data

Um (kV)	Ur (kV)	Pollution Level*	Creepage Distance - Inches (mm)	Total Height - Inches (mm)	Lightning Withstand Voltage (kV)	Switching Withstand Voltage (kV)	Power Frequency Withstand Voltage (kV)	Drawing Figure	Grading Ring Height A - Inches (mm)	Grading Ring Diameter B - Inches (mm)
36	30-39	M/H/V	83.9 (2130)	38.1 (967)	367	266	189	1		
52	42-60	M/H/V	83.9 (2130)	38.1 (967)	367	266	189	1		
72	54-75	M/H	83.9 (2130)	38.1 (967)	367	266	189	1		
72	84	M/H	113 (2880)	44.4 (1127)	480	348	247	1		
72	54-84	V	113 (2880)	44.4 (1127)	480	348	247	1		
100	78	M	84 (2130)	38.1 (967)	367	266	189	1		
100	84-96	M	113 (2880)	44.4 (1127)	480	348	247	1		
100	78-96	H	113 (2880)	44.4 (1127)	480	348	247	1		
100	78-96	V	143 (3620)	52.1 (1323)	585	424	301	1		
123	90-96	M	113 (2880)	44.4 (1127)	480	348	247	1		
123	108-120	M	143 (3620)	52.1 (1323)	585	424	301	1		
123	132-138	M/H	172 (4370)	58.8 (1493)	690	500	355	1		
123	90-120	H	143 (3620)	52.1 (1323)	585	424	301	1		
123	90-138	V	172 (4370)	58.8 (1493)	690	500	355	1		
145	108-120	M	143 (3620)	52.1 (1323)	585	424	301	1		
145	132-144	M	172 (4370)	58.8 (1493)	690	500	355	1		
145	168	M/H	197 (5010)	76.8 (1951)	847	614	436	2		
145	108-144	H	172 (4370)	58.8 (1493)	690	500	355	1		
145	108-168	V	197 (5010)	76.8 (1951)	847	614	436	2		
170	132-144	M/H	172 (4370)	58.8 (1493)	690	500	355	1		
170	162-168	M/H	197 (5010)	76.8 (1951)	847	614	436	2		
170	132-168	V	227 (5760)	83.1 (2111)	960	696	494	2		
245	180	M	197 (5010)	76.8 (1951)	847	614	436	3	15.0 (381)	25.2 (640)
245	192-198	M	227 (5760)	83.1 (2111)	960	696	494	3	15.0 (381)	25.2 (640)
245	216-228	M	256 (6500)	90.8 (2307)	1065	772	548	3	15.0 (381)	25.2 (640)
245	180-228	H	256 (6500)	90.8 (2307)	1065	772	548	3	15.0 (381)	25.2 (640)
245	180-228	V	315 (7990)	105 (2673)	1275	924	656	3	15.0 (381)	25.2 (640)

* M = Medium, H = Heavy, V = Very Heavy

PH3 & PH4 Housing Data

Um (kV)	Ur (kV)	Pollution Level*	Creepage Distance - Inches (mm)	Total Height - Inches (mm)	Lightning Withstand Voltage (kV)	Switching Withstand Voltage (kV)	Power Frequency Withstand Voltage (kV)	Drawing Figure	Grading Ring Height A - Inches (mm)	Grading Ring Diameter B - Inches (mm)
300	216-228	M	256 (6500)	90.8 (2307)	1065	772	548	3	15.0 (381)	25.2 (640)
300	240	M	285 (7240)	98.5 (2503)	1170	848	602	3	15.0 (381)	25.2 (640)
300	258-264	M	315 (7990)	105 (2673)	1275	924	656	3	15.0 (381)	25.2 (640)
300	216	H	315 (7990)	105 (2673)	1275	924	656	3	18.0 (457)	39.0 (990)
300	228-264	H	315 (7990)	105 (2673)	1275	924	656	3	15.0 (381)	25.2 (640)
300	216	V	369 (9380)	130 (3291)	1545	1120	795	4	18.0 (457)	39.0 (990)
300	228-264	V	369 (9380)	130 (3291)	1545	1120	795	4	15.0 (381)	25.2 (640)
362	258-276	M	315 (7990)	105 (2673)	1275	924	656	3	18.0 (457)	39.0 (990)
362	288	M	344 (8740)	112 (2843)	1380	1000	710	3	18.0 (457)	39.0 (990)
362	258-288	H	369 (9380)	130 (3291)	1545	1120	795	4	18.0 (457)	39.0 (990)
362	258-288	V	457 (11610)	152 (3853)	1860	1348	957	4	18.0 (457)	39.0 (990)
420	330	M	369 (9380)	130 (3291)	1545	1120	795	4	35.7 (908)	60.2 (1530)
420	336	M	398 (10120)	137 (3487)	1650	1196	849	4	35.7 (908)	60.2 (1530)
420	360-378	M	428 (10860)	145 (3683)	1755	1272	903	4	18.0 (457)	39.0 (990)
420	390-396	M	457 (11610)	152 (3853)	1860	1348	957	4	18.0 (457)	39.0 (990)
420	420	M	487 (12360)	162 (4123)	1965	1424	1011	4	18.0 (457)	39.0 (990)
420	330-336	H	428 (10860)	145 (3683)	1755	1272	903	4	35.7 (908)	60.2 (1530)
420	360-378	H	428 (10860)	145 (3683)	1755	1272	903	4	18.0 (457)	39.0 (990)
420	390-396	H	457 (11610)	152 (3853)	1860	1348	957	4	18.0 (457)	39.0 (990)
420	420	H	487 (12360)	162 (4123)	1965	1424	1011	4	18.0 (457)	39.0 (990)
420	330-420	V	516 (13110)	169 (4293)	2070	1500	1065	4	18.0 (457)	39.0 (990)

* M = Medium, H = Heavy, V = Very Heavy

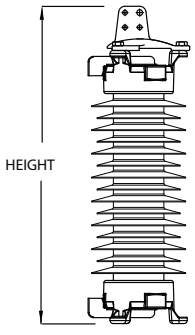


Figure 1

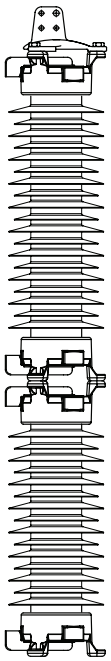


Figure 2

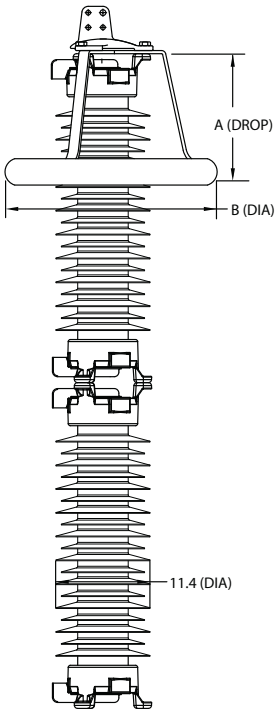


Figure 3

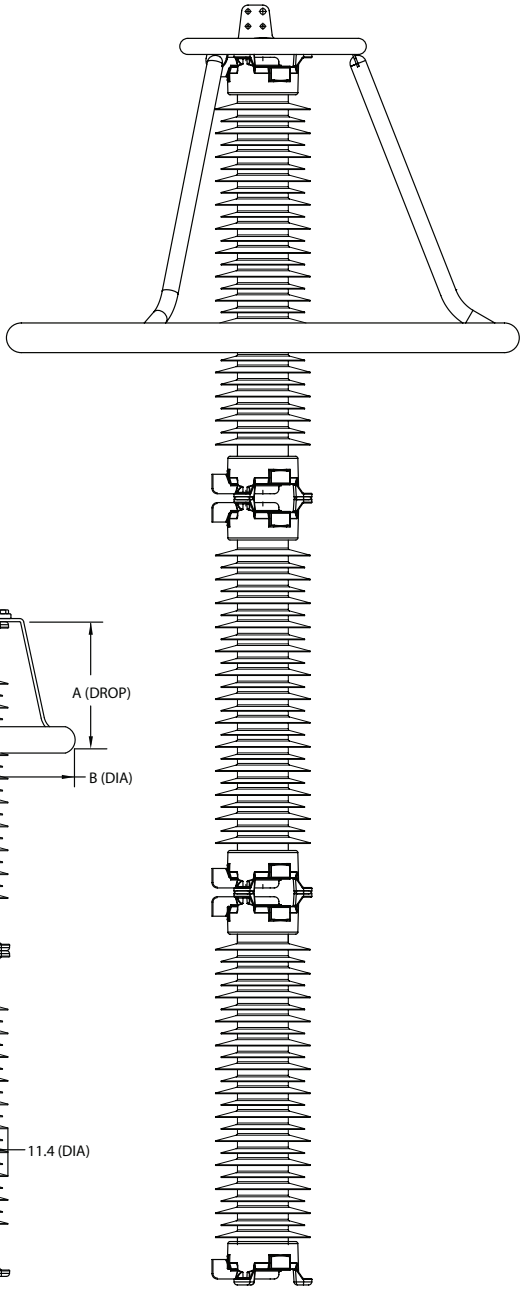


Figure 4

PH3/PH4 Part Numbers

P H 3 1 4 5 G V 1 2 0 A A

Step 1: Select the IEC classification

3 = Class Station Medium
4 = Class Station High

Step 2: Select the max system voltage (Um)

Step 3: Configurations

G – Standard
U – Underhung
F – Fault Indicator

Step 4: Select the appropriate site pollution level from the table below

Site Pollution	Code
Medium (≥ 20 mm creep per kV Um)	M
Heavy (≥ 25 mm creep per kV Um)	H
Very Heavy (≥ 31 mm creep per kV Um)	V

Step 5: Select Ur

Step 6: Line Terminals

A – Standard

Line Size - in (mm)	Code
0.25 (7) - 0.81 (21)	A
0.38 (10) - 1.12 (29)	B
0.16 (4) - 1.25 (31)	H

Step 7: Ground Terminals

A – Standard

Ground Size - in (mm)	Code
0.25 (7) - 0.81 (21)	A
0.38 (10) - 1.12 (29)	B
0.16 (4) - 1.25 (31)	H

Products – High Strength Polymer Housed Surge Arresters – SVNH & SVNX

SVNH arresters are available for use on system voltages from 161 to 500 kV. These arresters offer a high strength alternative to the SVN arresters, without sacrificing protective capability or energy handling capability.

SVNH Electrical Characteristics

Standard Arrester Catalog Number	Duty Cycle Rating (kV)	MCOV (kV)	Maximum Steep Current Impulse Residual Voltage (kV)	Maximum Switching Impulse Residual Voltage (kV)	Temporary Overvoltage Capability (kV)		Maximum Lightning Impulse Residual Voltage (kV)					
			10kA		1s	10s	1.5kA	3kA	5kA	10kA	20kA	40kA
SVNH144GA115	144	115	386	274	170	163	296	307	318	334	356	392
SVNH168GA131	168	131	440	312	194	186	338	350	362	380	406	446
SVNH172GA140	172	140	470	334	207	199	361	374	387	406	433	477
SVNH180GA144	180	144	484	343	213	204	371	384	398	418	446	490
SVNH192GA152	192	152	511	362	225	216	392	406	420	441	471	518
SVNH240GA190	240	190	638	453	281	269	490	507	525	551	588	647
SVNH258GA209	258	209	702	498	309	296	539	558	577	606	647	712
SVNH264GA212	264	212	712	506	313	301	546	566	586	615	656	722
SVNH276GA220	276	220	739	525	325	312	567	587	608	638	681	749
SVNH288GA230	288	230	772	548	340	326	593	614	635	667	712	783
SVNH294GA235	294	235	789	560	347	333	606	627	649	682	727	800
SVNH312GA245	312	245	823	584	362	347	632	654	677	711	758	834
SVNH396GA318	396	318	1068	758	470	451	820	849	878	923	984	1083
SVNH420GA335	420	335	1125	799	495	475	864	894	925	972	1037	1141
SVNH444GA353	444	353	1185	842	522	501	910	942	975	1024	1093	1202

The SVNX arresters are lightweight and are more resistant to fragmenting than traditional porcelain arresters. SVNX arresters are typically applied to system voltages higher than 500 kV where the energy requirements are higher than required for lower voltage systems.

SVNX Electrical Characteristics

Standard Arrester Catalog Number	Duty Cycle Rating (kV)	MCOV (kV)	Maximum Steep Current Impulse Residual Voltage (kV)	Maximum Switching Impulse Residual Voltage (kV)	Temporary Overvoltage Capability (kV)		Maximum Lightning Impulse Residual Voltage (kV)					
			20kA	2kA	1s	10s	1.5kA	3kA	5kA	10kA	20kA	40kA
SVNX396GA318AA	396	318	970	774	462	442	768	795	820	859	911	975
SVNX420GA335AA	420	335	1022	815	487	466	809	837	863	905	959	1027
SVNX444GA353AA	444	353	1077	859	513	491	853	882	910	954	1011	1082
SVNX588GA470AA	588	470	1434	1144	683	654	1135	1175	1211	1270	1346	1441

SVNH Physical Characteristics

Standard Arrester Catalog Number	Duty Cycle Rating (kV)	MCOV (kV)	Creepage Distance - Inches (mm)	Total Height - Inches (mm)	Recommended Minimum Clearance - Inches (mm)		Net Weight - Pounds (kg)	Drawing Figure
					Phase to Ground	Phase to Phase		
SVNH144GA115AA	144	115	184 (4676)	68.9 (1750)	25.1 (638)	28.9 (734)	346 (157)	1
SVNH168GA131AA	168	131	184 (4676)	68.9 (1750)	28.8 (732)	33.1 (841)	350 (159)	1
SVNH172GA140AA	172	140	184 (4676)	68.9 (1750)	30.9 (785)	35.4 (899)	353 (160)	1
SVNH180GA144AA	180	144	225 (5704)	78.8 (2001)	31.8 (808)	36.5 (927)	401 (182)	2
SVNH192GA152AA	192	152	225 (5704)	78.8 (2001)	33.6 (853)	38.6 (980)	404 (184)	2
SVNH240GA190AA	240	190	285 (7230)	112 (2856)	42.5 (1080)	48.5 (1232)	607 (276)	3
SVNH258GA209AA	258	209	285 (7230)	112 (2856)	46.9 (1191)	53.5 (1359)	614 (279)	3
SVNH264GA212AA	264	212	285 (7230)	112 (2856)	47.6 (1209)	54.3 (1379)	615 (280)	3
SVNH276GA220AA	276	220	285 (7230)	112 (2856)	49.4 (1255)	56.4 (1433)	617 (280)	3
SVNH288GA230AA	288	230	326 (8291)	122 (3108)	51.7 (1313)	59.0 (1499)	651 (296)	3
SVNH294GA235AA	294	235	326 (8291)	122 (3108)	52.9 (1344)	60.3 (1532)	652 (296)	3
SVNH312GA245AA	312	245	326 (8291)	122 (3108)	55.2 (1402)	62.9 (1598)	656 (298)	3
SVNH396GA318AA	396	318	449 (11408)	152 (3862)	72.1 (1831)	82.1 (2085)	828 (376)	3
SVNH420GA335AA	420	335	469 (11913)	176 (4470)	76.1 (1933)	86.5 (2197)	993 (451)	4
SVNH444GA353AA	444	353	469 (11913)	176 (4470)	80.2 (2037)	91.2 (2316)	998 (454)	4

These arresters are typically applied to system voltages higher than 500 kV where the energy requirements are higher than required for lower voltage systems. If a high energy rated arrester is required for a lower system voltage, Hubbell Power Systems can provide these. Please contact your Hubbell Power Systems Representative at 1.573.682.5521 for more information.

SVNX Physical Characteristics

Standard Arrester Catalog Number	Duty Cycle Rating (kV)	MCOV (kV)	Creepage Distance - Inches (mm)	Total Height - Inches (mm)	Recommended Minimum Clearance - Inches (mm)		Net Weight - Pounds (kg)	Drawing Figure
					Phase to Ground	Phase to Phase		
SVNX396GA318AA	396	318	449 (11408)	152 (3862)	67.0 (1702)	77.0 (1956)	1080 (491)	3
SVNX420GA335AA	420	335	469 (11913)	176 (4470)	71.0 (1803)	81.0 (2057)	1285 (584)	4
SVNX444GA353AA	444	353	469 (11913)	176 (4470)	75.0 (1905)	85.0 (2159)	1294 (588)	4
SVNX588GA470AA	588	470	736 (18694)	259 (6579)	100 (2540)	114 (2896)	1847 (840)	5

Grading Ring Diameters

Arrester MCOV	Drop A - Inches (mm)	Diameter B - Inches (mm)
140–190	15 (381)	25 (635)
209–245	18 (457)	39 (991)
318 - 448	35.8 (909)	60 (1524)

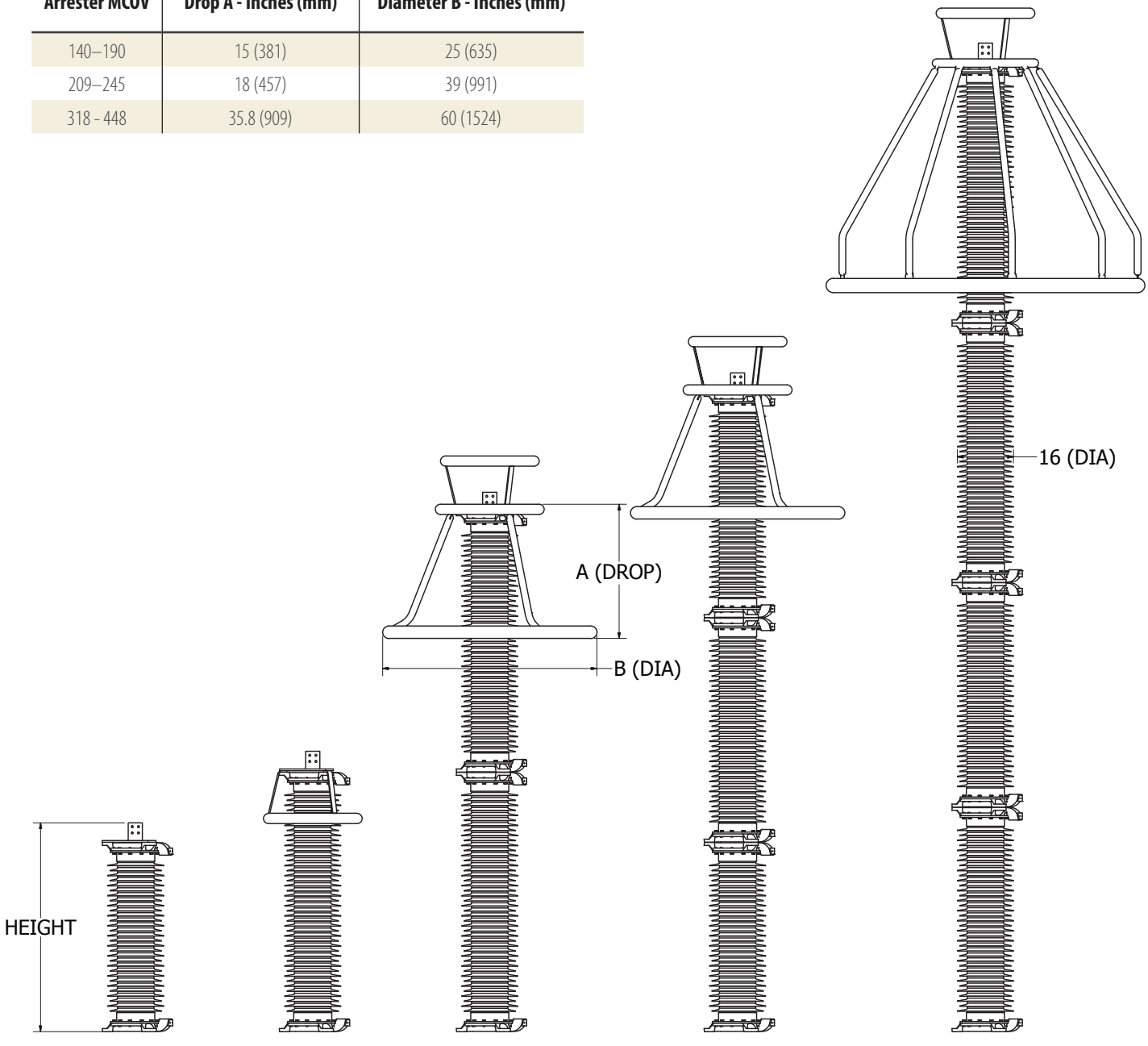


Figure 1 Figure 2 Figure 3 Figure 4 Figure 5

SVNH & SVNX Part Numbers

S V N H 3 9 6 G A 3 1 8 A A

Step 1: Select Standard Part Number

Use Column 1 of Page 33 to select a standard part number and arrester type, including Duty Cycle and MCOV ratings.

Duty Cycle Rating

Step 2: Configurations

G – Standard
U – Underhung

Step 3: Leakage Distance Requirement

A – Standard Leakage Distance
B – High Leakage Distance
C – Extra High Leakage Distance

MCOV Rating

Step 4: Line Terminals

A – Standard

Line Size - in (mm)	Code
0.25 (7) - 0.81 (21)	A
0.38 (10) - 1.12 (29)	B

Step 5: Ground Terminals

A – Standard

Ground Size - in (mm)	Code
0.25 (7) - 0.81 (21)	A
0.38 (10) - 1.12 (29)	B

Letter Code	MCOV 115 131	MCOV 144 152	MCOV 190 220	MCOV 230 245	MCOV 318	MCOV 335 353	MCOV 470	Height (in)	Leakage Distance (in)
	A							68.9	184
	B	A						78.8	225
	C	B	A					112	285
		C	B	A				122	326
			C	B				132	368
				C				142	408
					A			152	449
					B	A		176	469
					C	B		186	511
						C		196	552
							A	259	736
							B	269	777
							C	279	817

* For applications that require leakage, height or terminal size requirements not listed, please contact your Hubbell Power Systems Representative at 1.573.682.5521.

SVNR Electrical Characteristics

Standard Arrester Catalog Number	Duty Cycle Rating (kV)	MCOV (kV)	Maximum Steep Current Impulse Residual Voltage (kV)	Maximum Switching Impulse Residual Voltage (kV)	Temporary Overvoltage Capability (kV)		Maximum Lightning Impulse Residual Voltage (kV)					
			10kA	2kA	1s	10s	1.5kA	3kA	5kA	10kA	20kA	40kA
SVNR144GA115	144	115	353	297	164	155	250	261	269	284	356	384
SVNR168GA131	168	131	401	338	187	177	293	307	316	333	405	437
SVNR172GA140	172	140	429	361	210	201	357	373	384	405	433	467
SVNR180GA144	180	144	441	371	216	207	367	384	395	417	445	480
SVNR192GA152	192	152	466	392	228	218	388	405	417	440	470	507
SVNR228GA180	228	180	552	464	270	258	459	480	494	521	557	600
SVNR240GA190	240	190	582	490	285	273	484	506	521	550	588	633
SVNR258GA209	258	209	641	539	314	300	533	557	574	605	647	698
SVNR264GA212	264	212	650	547	318	304	541	566	582	614	657	708
SVNR276GA220	276	220	674	567	330	316	561	586	603	637	681	734
SVNR288GA230	288	230	705	593	345	330	586	613	631	665	711	767
SVNR294GA235	294	235	721	606	353	337	600	627	645	681	728	785
SVNR312GA245	312	245	751	632	368	352	625	653	672	709	758	818
SVNR396GA318	396	318	975	820	477	456	811	848	872	920	984	1061
SVNR420GA335	420	335	1026	863	503	481	853	892	918	969	1036	1117
SVNR444GA353	444	353	1082	910	530	507	900	941	968	1022	1092	1178
SVNR468GA372	468	372	1140	959	558	534	948	992	1020	1077	1151	1241
SVNR588GA476	588	476	1459	1227	714	683	1213	1269	1305	1378	1473	1588
SVNR612GA485	612	485	1486	1250	728	696	1236	1293	1330	1404	1500	1618

SVNR Physical Characteristics

Standard Arrester Catalog Number	Duty Cycle Rating (kV)	MCOV (kV)	Creepage Distance - Inches (mm)	Height - Inches (mm)	Recommended Minimum Clearance - Inches (mm)		Net Weight - Pounds (kg)	Drawing Figure
					Phase to Ground	Phase to Phase		
SVNR144GA115AA	144	115	184 (4676)	68.9 (1750)	25.3 (644)	29.2 (741)	420 (191)	1
SVNR168GA131AA	168	131	184 (4676)	68.9 (1750)	29.0 (738)	33.4 (848)	415 (189)	1
SVNR172GA140AA	172	140	184 (4676)	68.9 (1750)	31.1 (791)	35.7 (908)	412 (187)	1
SVNR180GA144AA	180	144	225 (5704)	78.8 (2001)	32.0 (814)	36.8 (934)	485 (220)	2
SVNR192GA152AA	192	152	225 (5704)	78.8 (2001)	33.9 (862)	38.9 (989)	482 (219)	2
SVNR228GA180AA	228	180	285 (7230)	112 (2856)	40.5 (1029)	46.3 (1177)	732 (333)	3
SVNR240GA190AA	240	190	285 (7230)	112 (2856)	42.9 (1089)	49.0 (1245)	739 (336)	3
SVNR258GA209AA	258	209	285 (7230)	112 (2856)	47.3 (1202)	54.1 (1373)	724 (329)	3
SVNR264GA212AA	264	212	285 (7230)	112 (2856)	48.1 (1222)	54.9 (1395)	723 (329)	3
SVNR276GA220AA	276	220	285 (7230)	112 (2856)	49.9 (1268)	57.0 (1447)	720 (327)	3
SVNR288GA230AA	288	230	326 (8291)	122 (3108)	52.2 (1325)	59.5 (1512)	775 (352)	3
SVNR294GA235AA	294	235	326 (8291)	122 (3108)	53.5 (1358)	61.0 (1549)	773 (351)	3
SVNR312GA245AA	312	245	326 (8291)	122 (3108)	55.7 (1416)	63.5 (1614)	769 (350)	3
SVNR396GA318AA	396	318	449 (11408)	152 (3862)	72.8 (1850)	82.9 (2105)	975 (443)	3
SVNR420GA335AA	420	335	511 (12967)	186 (4718)	76.8 (1950)	87.3 (2217)	1228 (558)	4
SVNR444GA353AA	444	353	552 (14028)	196 (4970)	81.0 (2057)	92.1 (2339)	1278 (581)	4
SVNR468GA372AA	468	372	633 (16084)	215 (5472)	85.4 (2170)	97.1 (2467)	1392 (633)	4
SVNR588GA476AA	588	476	898 (22816)	299 (7584)	110 (2789)	125 (3166)	1958 (890)	5
SVNR612GA485AA	612	485	898 (22816)	299 (7584)	112 (2841)	127 (3225)	1954 (888)	5

Grading Ring Diameters

Arrester MCOV	Drop A - Inches (mm)	Diameter B - Inches (mm)
144 - 190	15 (381)	27.9 (709)
209 - 245	23.6 (599)	38 (965)
318 - 372	35.8 (909)	60.5 (1537)
476 - 485	66 (1676)	90 (2286)

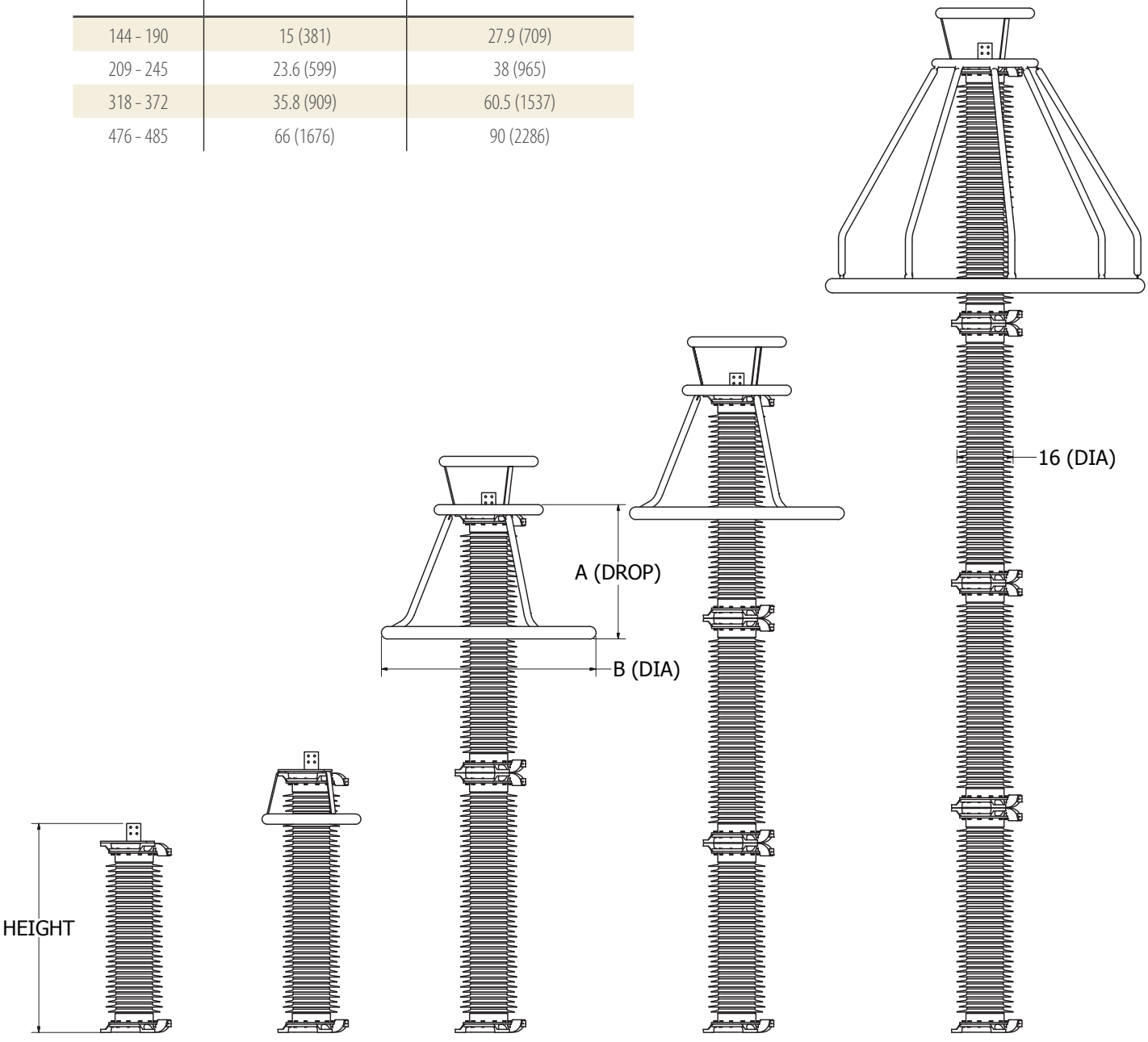


Figure 1 Figure 2 Figure 3 Figure 4 Figure 5

SVNH & SVNX Part Numbers

S V N R 3 9 6 G A 3 1 8 A A

Step 1: Select Standard Part Number

Use Column 1 of Page 37 to select a standard part number and arrester type, including Duty Cycle and MCOV ratings.

Duty Cycle Rating

Step 2: Configurations

G – Standard
U – Underhung

Step 3: Leakage Distance Requirement

A – Standard Leakage Distance
B - High Leakage Distance
C - Extra High Leakage Distance

MCOV Rating

Step 4: Line Terminals

A – Standard

Line Size - in (mm)	Code
0.25 (7) - 0.81 (21)	A
0.38 (10) - 1.12 (29)	B

Step 5: Ground Terminals

A – Standard

Ground Size - in (mm)	Code
0.25 (7) - 0.81 (21)	A
0.38 (10) - 1.12 (29)	B

Letter Code	MCOV									Height (in)	Leakage Distance (in)
	115 - 140	144 - 152	180 - 220	230 - 245	318	335	353	372	476 - 485		
	A									68.9	184
	B	A								78.8	225
	C	B	A							112	285
		C	B	A						122	326
			C	B	A					152	449
				C	B	A				186	511
					C	B	A			196	552
						C	B	A		215	633
							C	B	A	299	898

* For applications that require leakage, height or terminal size requirements not listed, please contact your Hubbell Power Systems Representative at 1.573.682.5521.

Porcelain Housed Surge Arresters

capacity

VL, IEEE Station Class, IEC Class SM

Overview – VL arresters are the most economical porcelain housed surge arrester to use on systems up to 69 kV (72.5 kV max). They are particularly attractive for medium duty applications, where their compact profile and strength are of importance. This feature can be well suited for cabinets, electrical enclosures or on mobile substations.

Construction:

- Porcelain housing for maximized mechanical strength
- Single column of MOV discs and aluminum spacers (as required) centrally located within housing
- Disc column held under high spring compression between ductile iron end fittings affixed to housing
- Directional pressure relief system built integrated into end fittings
- Various hardware and end fittings to meet application requirements

At-a-Glance:

- Operate at altitudes up to 12,000 feet (3,600 meters)
- Designed to withstand wind speeds in excess of 120 mph
- Install straight from the package – no field assembly required
- Dual qualified to IEEE and IEC standards

Products – Porcelain Housed Surge Arresters – VL

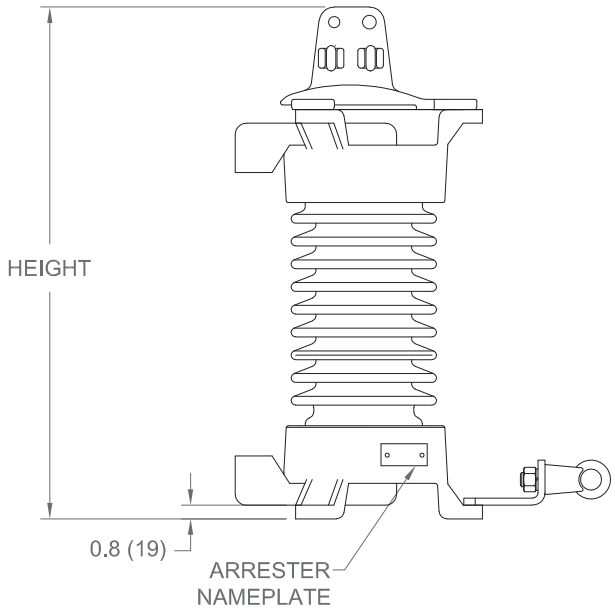
VL Electrical Characteristics

Standard Arrester Catalog Number	Duty Cycle Rating Ur (kV)	MCOV (kV)	Temporary Overvoltage Capability (kVrms)		Maximum Steep Current Impulse Residual Voltage (kV)	Maximum Switching Impulse Residual Voltage (kV)		Maximum Lightning Impulse Residual Voltage (kV)					
			1s	10s	10kA	0.5kA	1kA	1.5kA	3kA	5kA	10kA	20kA	40kA
VLN003GA003AA	3	2.55	3.8	3.6	9.0	7.0	7.0	6.8	7.1	7.5	8.0	8.8	9.8
VLN006GA005AA	6	5.1	7.5	7.2	18.0	13.0	14.0	13.5	14.3	14.9	16.0	17.5	19.6
VLN009GA008AA	9	7.65	11.3	10.8	26.0	19.0	20.0	20.3	21.4	22.4	24.0	26.3	29.4
VLN010GA009AA	10	8.4	12.4	11.9	28.0	21.0	22.0	22.0	23.2	24.3	26.0	28.5	31.8
VLN012GA010AA	12	10.2	15	14.4	34.0	25.0	26.0	26.2	27.6	29.0	31.0	33.9	37.9
VLN015GA013AA	15	12.7	18.7	18.0	42.0	31.0	32.0	33.0	34.7	36.4	39.0	42.7	47.7
VLN018GA015AA	18	15.3	22.5	21.6	50.5	38.0	39.0	39.7	41.9	43.9	47.0	51.5	57.5
VLN021GA017AA	21	17	25.0	24.1	55.5	41.0	43.0	43.5	45.9	48.1	51.5	56.4	63.0
VLN024GA019AA	24	19.5	28.7	27.6	63.5	47.0	49.0	49.9	52.6	55.1	59.0	64.6	72.2
VLN027GA022AA	27	22	32.4	31.1	71.5	52.5	54.5	56.2	59.3	62.1	66.5	72.8	81.3
VLN030GA024AA	30	24.4	35.9	34.5	79.5	58.5	61.0	62.5	65.9	69.1	74.0	81.0	90.5
VLN036GA029AA	36	29	42.7	41.0	94.5	69.5	72.0	74.4	78.4	82.2	88.0	96.4	107.6
VLN039GA031AA	39	31.5	46.3	44.6	103	75.5	78.5	80.7	85.1	89.2	95.5	104.6	116.8
VLN045GA036AA	45	36.5	53.7	51.6	120	87.5	91.0	93.8	98.9	103.7	111.0	121.5	135.8
VLN048GA039AA	48	39	57.4	55.2	127	93.0	97.0	99.7	105.1	110.2	118.0	129.2	144.3

VL Physical Characteristics

Standard Arrester Catalog Number	Duty Cycle Rating, Ur (kV)	MCOV (kV)	Creepage Distance - Inches (mm)	Total Height - Inches (mm)	Lightning With-stand Voltage	Switching Withstand Voltage	Power Frequency Withstand Voltage	Net Weight - Pounds (kg)
					kV	kV	kVrms	
VLN003GA003AA	3	2.55	6.2 (157)	19.1 (486)	95	76	30	75.6 (34.3)
VLN006GA005AA	6	5.1	6.2 (157)	19.1 (486)	95	76	30	76.9 (34.9)
VLN009GA008AA	9	7.65	6.2 (157)	19.1 (486)	95	76	30	77.3 (35.1)
VLN010GA009AA	10	8.4	6.2 (157)	19.1 (486)	95	76	30	77.6 (35.2)
VLN012GA010AA	12	10.2	11.1 (282)	21.1 (537)	110	88	45	83.7 (38.0)
VLN015GA013AA	15	12.7	11.1 (282)	21.1 (537)	110	88	45	84.2 (38.2)
VLN018GA015AA	18	15.3	20.0 (508)	24.1 (613)	150	120	60	91.1 (41.3)
VLN021GA017AA	21	17	20.0 (508)	24.1 (613)	150	120	60	91.5 (41.5)
VLN024GA019AA	24	19.5	20.0 (508)	24.1 (613)	150	120	60	92.4 (41.9)
VLN027GA022AA	27	22	31.7 (805)	28.1 (715)	200	160	80	102 (46.3)
VLN030GA024AA	30	24.4	31.7 (805)	28.1 (715)	200	160	80	102 (46.6)
VLN036GA029AA	36	29	31.7 (805)	28.1 (715)	200	160	80	104 (47.2)
VLN039GA031AA	39	31.5	41.0 (1041)	31.9 (810)	250	200	100	114 (51.8)
VLN045GA036AA	45	36.5	41.0 (1041)	31.9 (810)	250	200	100	116 (52.7)
VLN048GA039AA	48	39	41.0 (1041)	31.9 (810)	250	200	100	116 (52.9)

End codes displayed apply to VL standard configurations. VL arresters come standard with an AA hardware code. VL arresters are packaged in a carton. A wooden crate can be provided by replacing the GA code from the standard arrester catalog number with an EA code. Additional hardware code options are available.



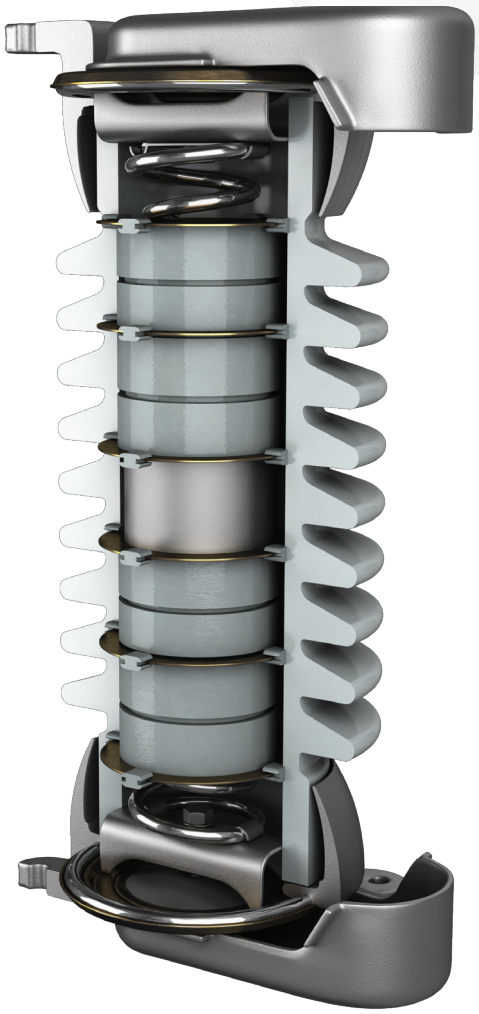
- **AA**

  Line: 4-Hole NEMA pad with (2) single eye bolts

  Ground: Single eye bolt

For applications that require higher creepage distance, different terminal requirements or any other non-standard requests, please contact your Hubbell Power Systems representative for additional assistance.

Products – Porcelain Housed Surge Arresters



MVN, IEEE Station Class
MH3, IEC Class SM
MH4, IEC Class SH

Overview – Porcelain housed surge arresters have been the standard in the industry for the last 70 years. The MVN, MH3 and MH4family of surge arresters continue in this proud tradition and they are available for use on system voltages from 2.4 kV to 500 kV (2.52 kV max to 550 kV max). They offer high mechanical strength compared to polymer housed station class surge arresters. Additionally, the MVN, MH3 and MH4 families (up to 353 kV MCOV) meet the requirements for High Seismic Performance per IEEE Standard 693-2005.

Construction:

- Porcelain housing for maximized mechanical performance
- Single column of MOV discs and aluminum spacers (as required) centrally located within housing
- Disc column held under high spring compression between ductile iron end fittings affixed to housing
- Directional pressure relief system built integrated into end fittings

At-a-Glance:

- Operate at altitudes up to 12,000 feet/3,600 meters
- Designed to withstand winds up to 120 mph
- High cantilever strength for windstorms or earthquakes

Products – Porcelain Housed Surge Arresters – MVN

MVN Electrical Characteristics

Standard Arrester Catalog Number	Duty Cycle Rating (kV)	MCOV (kV)	Maximum Steep Current Impuse Residual Voltage (kV)	Maximum Switching Impulse Residual Voltage (kV)	Temporary Overvoltage Capability (kV)		Maximum Lightning Impulse Residual Voltage (kV)					
			10kA		1s	10s	1.5kA	3kA	5kA	10kA	20kA	40kA
MVN012GA010AA	12	10.2	32.1	24.4	15.2	14.5	26.2	27.3	28.2	29.6	31.6	34.8
MVN015GA013AA	15	12.7	39.9	30.3	18.9	18.1	32.6	33.9	35.1	36.8	39.3	43.3
MVN018GA015AA	18	15.3	48.2	36.5	22.8	21.8	39.3	40.9	42.3	44.4	47.4	52.5
MVN021GA017AA	21	17	53.5	40.6	25.3	24.2	43.7	45.4	47	49.3	53	58
MVN024GA019AA	24	19.5	62	46.9	29.1	27.7	50.5	52.5	54.5	57	61	67
MVN027GA022AA	27	22	69.5	53	32.8	31.3	57	59	61	64	68.5	75.5
MVN030GA024AA	30	24.4	77	58.5	36.4	34.7	63	65.5	68	71	76	83.5
MVN036GA029AA	36	29	92	69.5	43.2	41.3	75	78	80.5	84.5	90.5	99.5
MVN039GA031AA	39	31.5	99.5	75.5	46.9	44.8	81	84.5	87.5	91.5	98	108
MVN045GA036AA	45	36.5	115	87.5	54.5	52	94	98	101	106	114	125
MVN048GA039AA	48	39	124	94	58	55.5	101	105	109	114	122	134
MVN054GA042AA	54	42	133	101	62.5	60	108	113	117	122	131	144
MVN060GA048AA	60	48	152	116	71.5	68.5	124	129	134	140	150	165
MVN066GA053AA	66	53	167	127	79	75.5	137	142	147	154	165	181
MVN072GA057AA	72	57	180	137	85	81	147	153	159	166	178	195
MVN090GA070AA	90	70	221	167	104	99.5	180	187	194	203	217	239
MVN090GA074AA	90	74	234	177	110	105	191	198	205	215	230	253
MVN096GA076AA	96	76	240	182	113	108	196	204	211	221	236	260
MVN108GA084AA	108	84	265	201	125	120	216	225	233	244	261	287
MVN108GA088AA	108	88	277	210	131	125	226	235	243	255	273	300
MVN120GA098AA	120	98	308	241	146	139	252	262	271	284	304	334
MVN126GA102AA	126	102	321	251	152	145	262	273	282	296	316	348
MVN132GA106AA	132	106	334	261	158	151	273	284	294	308	329	362
MVN144GA115AA	144	115	363	283	171	164	296	308	318	334	357	393
MVN168GA131AA	168	131	412	322	195	186	337	350	362	380	406	447
MVN172GA140AA	172	140	441	344	209	199	360	374	387	406	434	477
MVN180GA144AA	180	144	454	355	215	205	370	385	398	418	447	491
MVN192GA152AA	192	152	479	374	226	216	391	406	420	441	471	518
MVN202GA161AA	202	161	507	396	240	229	414	430	445	467	499	549
MVN216GA168AA	216	168	528	413	250	239	431	449	464	487	520	572
MVN228GA180AA	228	180	566	443	268	256	462	481	497	522	557	613
MVN240GA190AA	240	190	598	467	283	270	488	507	525	551	588	647
MVN258GA209AA	258	209	657	532	311	297	537	558	577	606	647	712
MVN264GA212AA	264	212	667	540	316	302	545	566	586	615	657	723
MVN276GA220AA	276	220	692	560	328	313	565	587	608	638	681	750
MVN288GA230AA	288	230	724	585	343	327	591	614	635	667	712	784
MVN294GA235AA	294	235	739	598	350	334	603	627	649	681	727	800
MVN300GA243AA	300	243	765	619	362	346	624	649	672	705	753	828
MVN312GA245AA	312	245	770	623	365	349	629	654	676	710	758	834
MVN336GA274AA	336	274	861	697	408	390	703	731	756	794	848	933
MVN360GA288AA	360	288	906	733	429	410	739	769	795	835	891	981
MVN396GA318AA	396	318	1000	809	474	453	816	849	878	922	984	1083
MVN420GA335AA	420	335	1053	852	499	477	860	894	925	971	1037	1140
MVN444GA353AA	444	353	1109	898	526	502	906	942	974	1023	1092	1202

* Discharge voltages are based on a 500A surge of 45 µs time to crest through 88 kV MCOV and 1,000A surge of 45 µs time through 190 kV MCOV and 2,000A through 353 kV MCOV.

MVN Physical Characteristics

Standard Arrester Catalog Number	Duty Cycle Rating (kV)	MCOV (kV)	Creepage Distance - Inches (mm)	Total Height - Inches (mm)	Recommended Minimum Clearance - Inches (mm)		Net Weight - Pounds (kg)	Drawing Figure
					Phase to Ground	Phase to Phase		
MVN012GA010AA	12	10.2	43.9 (1115)	31.7 (805)	0.8 (20)	1.4 (36)	129 (58.6)	1
MVN015GA013AA	15	12.7	43.9 (1115)	31.7 (805)	1.4 (36)	2.1 (53)	131 (59.5)	1
MVN018GA015AA	18	15.3	43.9 (1115)	31.7 (805)	2 (51)	2.8 (71)	132 (60.0)	1
MVN021GA017AA	21	17	43.9 (1115)	31.7 (805)	2.4 (61)	3.3 (84)	133 (60.5)	1
MVN024GA019AA	24	19.5	43.9 (1115)	31.7 (805)	3.0 (76)	4 (102)	134 (60.9)	1
MVN027GA022AA	27	22	43.9 (1115)	31.7 (805)	3.6 (91)	4.6 (117)	136 (61.8)	1
MVN030GA024AA	30	24.4	43.9 (1115)	31.7 (805)	4.3 (109)	5.4 (137)	137 (62.3)	1
MVN036GA029AA	36	29	43.9 (1115)	31.7 (805)	5.3 (135)	6.5 (165)	140 (63.6)	1
MVN039GA031AA	39	31.5	43.9 (1115)	31.7 (805)	5.8 (147)	7.1 (180)	141 (64.1)	1
MVN045GA036AA	45	36.5	75.0 (1905)	38.1 (968)	7.0 (178)	8.5 (216)	172 (78.2)	1
MVN048GA039AA	48	39	75.0 (1905)	38.1 (968)	7.6 (193)	9.2 (234)	174 (79.1)	1
MVN054GA042AA	54	42	75.0 (1905)	38.1 (968)	8.3 (211)	9.9 (251)	176 (80.0)	1
MVN060GA048AA	60	48	75.0 (1905)	38.1 (968)	9.8 (249)	11.6 (295)	179 (81.4)	1
MVN066GA053AA	66	53	75.0 (1905)	38.1 (968)	10.9 (277)	12.9 (328)	181 (82.3)	1
MVN072GA057AA	72	57	75.0 (1905)	38.1 (968)	11.9 (302)	14.0 (356)	184 (83.6)	1
MVN090GA070AA	90	70	100 (2540)	44.1 (1120)	14.8 (376)	17.3 (439)	218 (99.1)	1
MVN090GA074AA	90	74	100 (2540)	44.1 (1120)	15.8 (401)	18.4 (467)	220 (100)	1
MVN096GA076AA	96	76	100 (2540)	44.1 (1120)	16.3 (414)	18.9 (480)	221 (100)	1
MVN108GA084AA	108	84	126 (3200)	50.6 (1285)	18.1 (460)	21.1 (536)	257 (117)	1
MVN108GA088AA	108	88	126 (3200)	50.6 (1285)	19.1 (485)	22.1 (561)	258 (117)	1
MVN120GA098AA	120	98	126 (3200)	50.6 (1285)	21.4 (544)	24.7 (627)	264 (120)	1
MVN126GA102AA	126	102	153 (3886)	57.1 (1450)	22.3 (566)	25.8 (655)	294 (134)	1
MVN132GA106AA	132	106	153 (3886)	57.1 (1450)	23.3 (592)	26.9 (683)	295 (134)	1
MVN144GA115AA	144	115	153 (3886)	57.1 (1450)	25.4 (645)	29.3 (744)	300 (136)	1
MVN168GA131AA	168	131	175 (4445)	76.6 (1946)	29.1 (739)	33.5 (851)	392 (178)	2
MVN172GA140AA	172	140	175 (4445)	76.6 (1946)	31.2 (792)	35.8 (909)	415 (189)	2
MVN180GA144AA	180	144	200 (5080)	82.6 (2098)	32.2 (818)	37.0 (940)	443 (201)	3
MVN192GA152AA	192	152	200 (5080)	82.6 (2098)	34.0 (864)	39.0 (991)	448 (204)	3
MVN202GA161AA	202	161	226 (5740)	89.1 (2263)	36.1 (917)	41.4 (1052)	485 (220)	3
MVN216GA168AA	216	168	226 (5740)	89.1 (2263)	37.7 (958)	43.2 (1097)	488 (222)	3
MVN228GA180AA	228	180	253 (6426)	95.6 (2428)	40.5 (1029)	46.4 (1179)	525 (239)	3
MVN240GA190AA	240	190	253 (6426)	95.6 (2428)	42.9 (1090)	49.0 (1245)	531 (241)	3
MVN258GA209AA	258	209	279 (7087)	102 (2591)	47.3 (1201)	54.1 (1374)	575 (261)	3
MVN264GA212AA	264	212	279 (7087)	102 (2591)	48.1 (1222)	54.9 (1394)	577 (262)	3
MVN276GA220AA	276	220	305 (7747)	109 (2769)	49.9 (1267)	57.0 (1448)	608 (276)	3
MVN288GA230AA	288	230	305 (7747)	109 (2769)	52.3 (1328)	59.6 (1514)	613 (279)	3
MVN294GA235AA	294	235	326 (8280)	128 (3251)	53.4 (1356)	60.9 (1547)	700 (318)	4
MVN300GA243AA	300	243	326 (8280)	128 (3251)	55.4 (1407)	63.1 (1603)	704 (320)	4
MVN312GA245AA	312	245	326 (8280)	128 (3251)	55.7 (1415)	63.5 (1613)	705 (320)	4
MVN336GA274AA	336	274	353 (8966)	134 (3404)	62.5 (1588)	71.2 (1808)	751 (341)	4
MVN360GA288AA	360	288	379 (9627)	141 (3581)	65.8 (1671)	74.9 (1902)	790 (359)	4
MVN396GA318AA	396	318	431 (10947)	154 (3912)	72.8 (1849)	82.9 (2106)	892 (405)	4
MVN420GA335AA	420	335	459 (11659)	160 (4064)	76.8 (1951)	87.4 (2220)	928 (422)	4
MVN444GA353AA	444	353	479 (12167)	179 (4547)	81 (2057)	92.1 (2339)	1026 (466)	5

MVN Detail

Grading Ring Diameters

Arrester MCOV	Drop A - Inches (mm)	Diameter B - Inches (mm)
140–190	15 (381)	25 (635)
209–245	18 (457)	39 (991)
318–353	35.8 (909)	60 (1524)

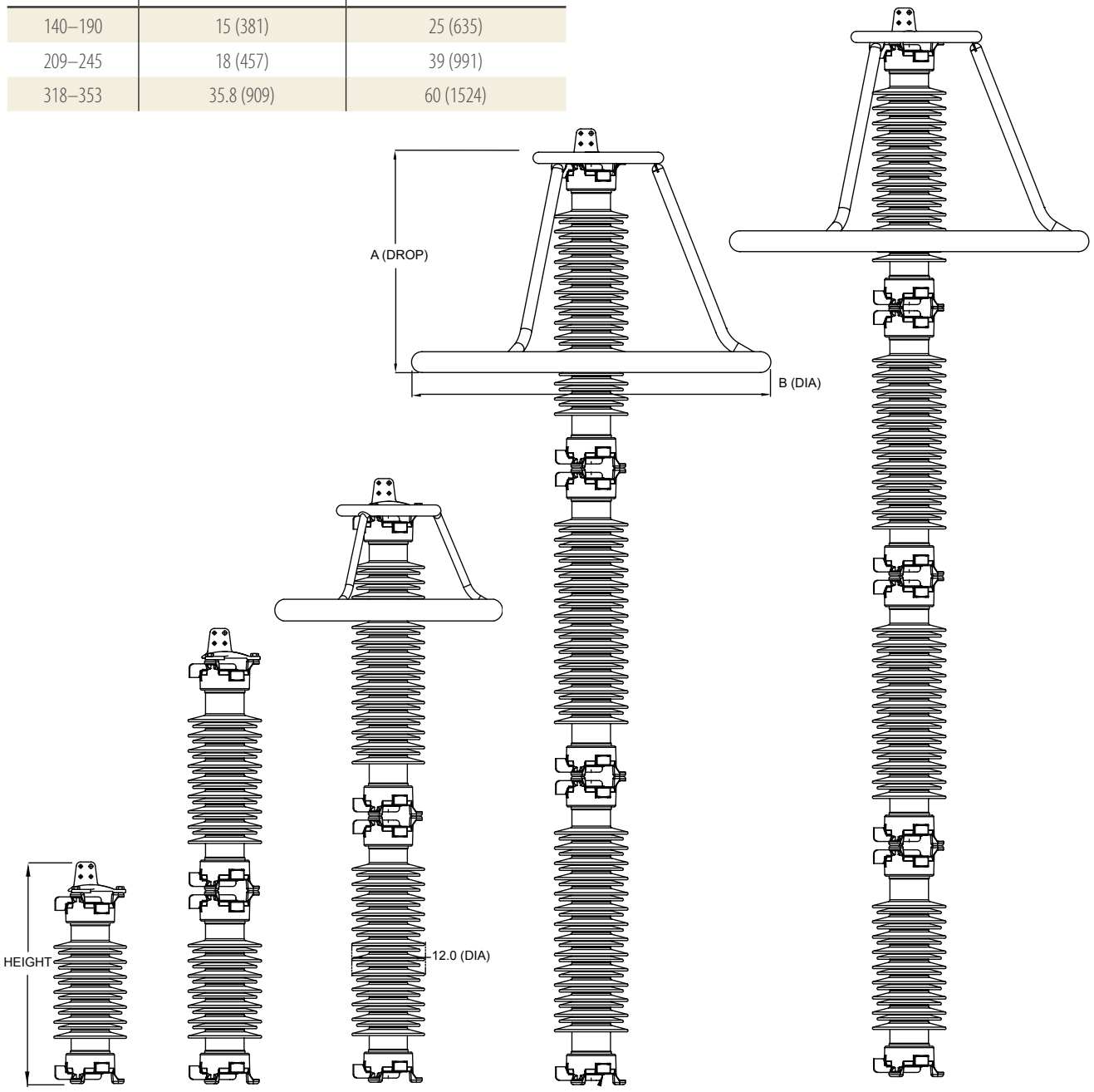


Figure 1 Figure 2 Figure 3 Figure 4 Figure 5

MVN Part Number Selection

M V N 0 5 4 G A 0 4 2 A A

Step 1: Select Standard Part Number

Use Column 1 of Page 46 to select a standard part number, including Duty Cycle and MCOV ratings.

Duty Cycle Rating

MCOV Rating

Step 2: Housing/Color Configuration

G – Gray Housing (standard)
B – Brown Housing
U – Underhung (with gray housing color)
F – Fault Indicator

Step 3: Leakage Distance Requirement

A – Standard Leakage Distance
B – High Leakage Distance
C – Extra High Leakage Distance
D – Mega High Leakage Distance

Step 4: Line Terminals

A – Standard

Line Size - in (mm)	Code
0.25 (7) - 0.81 (21)	A
0.38 (10) - 1.12 (29)	B
0.16 (4) - 1.25 (31)	H

Step 5: Ground Terminals

A – Standard

Ground Size - in (mm)	Code
0.25 (7) - 0.81 (21)	A
0.38 (10) - 1.12 (29)	B
0.16 (4) - 1.25 (31)	H

Letter Code	MCOV														Height (in)	Leakage Distance (in)
	10.2 31.5	042 057	070 076	084 098	106 115	131 140	144 152	180 190	209 212	220 230	245	318	335	353		
	A														31.7	43.9
	B	A													38.1	75
	C	B	A												44.1	100
	D	C	B	A											50.6	126
		D	C	B	A										57.1	153
			D	C	B	A									76.6	175
				D	C	B	A								82.6	200
					D	C	B								89.1	226
						D	C	A							95.6	253
							D	B	A						102	279
								C	B	A					109	305
								D	C	B	A				128	326
									D	C	B				134	353
										D	C				141	379
												A			154	431
												B	A		160	458
													B	A	179	479
														B	186	505

* For applications that require leakage, height or terminal size requirements not listed, please contact your Hubbell Power Systems Representative at 1.573.682.5521.

Products – Porcelain Housed Surge Arresters – MH3

MH3 Electrical Characteristics

Base Arrester Catalog Number	Um (kV)	Ur (kV)	Uc (kV)	Temporary Overvoltage Capability (kVrms)		Maximum Steep Current Impulse Residual Voltage (kV)	Maximum Switching Impulse Residual Voltage (kV)			Maximum Lightning Impulse Residual Voltage (kV)			
				1s	10s	10kA	0.5kA	1kA	2kA	5kA	10kA	20kA	40kA
MH3036wx030yz	36	30	24	32.6	30.5	79.0	58.0	60.0	63.0	68.2	73.0	79.9	89.3
MH3036wx033yz	36	33	26.4	35.9	33.6	88.0	65.0	67.0	70.0	75.7	81.0	88.7	99.1
MH3036wx036yz	36	36	28.8	39.2	36.6	95.0	70.0	73.0	76.0	82.2	88.0	96.4	108
MH3036wx039yz	36	39	31.2	42.4	39.7	104	76.0	79.0	83.0	89.7	96.0	105	117
MH3052wx042yz	52	42	33.6	45.7	42.8	111	82.0	85.0	89.0	96.2	103	113	126
MH3052wx048yz	52	48	38.4	52.2	48.9	127	94.0	97.0	101	110	118	129	144
MH3052wx051yz	52	51	40.8	55.5	51.9	135	99.0	103	107	117	125	137	153
MH3052wx054yz	52	54	43.2	58.8	55.0	142	105	108	113	123	132	145	161
MH3052wx060yz	52	60	48	65.3	61.1	158	116	121	126	137	147	161	180
MH3072wx054yz	72	54	43.2	58.8	55.0	142	105	108	113	123	132	145	161
MH3072wx060yz	72	60	48	65.3	61.1	158	116	121	126	137	147	161	180
MH3072wx066yz	72	66	52.8	71.8	67.2	174	128	133	139	151	162	177	198
MH3072wx072yz	72	72	57.6	78.3	73.3	189	139	144	151	164	176	193	215
MH3072wx075yz	72	75	60	81.6	76.4	197	145	150	157	171	183	200	224
MH3072wx084yz	72	84	67.2	91.4	85.5	220	162	168	176	191	205	225	251
MH3100wx078yz	100	78	62.4	84.9	79.4	205	151	157	164	178	191	209	234
MH3100wx084yz	100	84	67.2	91.4	85.5	220	162	168	176	191	205	225	251
MH3100wx090yz	100	90	72	97.9	91.6	237	174	180	189	205	220	241	269
MH3100wx096yz	100	96	76.8	104	97.7	253	186	193	201	219	235	257	287
MH3123wx090yz	123	90	72	97.9	91.6	237	174	180	189	205	220	241	269
MH3123wx096yz	123	96	76.8	104	97.7	253	186	193	201	219	235	257	287
MH3123wx102yz	123	102	81.6	111	104	268	197	204	213	233	249	273	305
MH3123wx108yz	123	108	86.4	118	110	284	209	216	226	247	264	289	323
MH3123wx120yz	123	120	96	131	122	315	231	240	251	274	293	321	358
MH3123wx132yz	123	132	105.6	144	134	347	255	265	277	302	323	354	395
MH3123wx138yz	123	138	110.4	150	140	362	266	276	289	315	337	369	412
MH3145wx108yz	145	108	86.4	118	110	284	209	216	226	247	264	289	323
MH3145wx120yz	145	120	96	131	122	315	231	240	251	274	293	321	358
MH3145wx132yz	145	132	105.6	144	134	347	255	265	277	302	323	354	395
MH3145wx138yz	145	138	110.4	150	140	362	266	276	289	315	337	369	412
MH3145wx144yz	145	144	115.2	157	147	378	278	288	301	329	352	385	430
MH3145wx168yz	145	168	134.4	183	171	440	324	336	351	383	410	449	501

MH3 Electrical Characteristics

Base Arrester Catalog Number	Um (kV)	Ur (kV)	Uc (kV)	Temporary Overvoltage Capability (kVrms)		Maximum Steep Current Impulse Residual Voltage (kV)	Maximum Switching Impulse Residual Voltage (kV)			Maximum Lightning Impulse Residual Voltage (kV)			
				1s	10s	10kA	0.5kA	1kA	2kA	5kA	10kA	20kA	40kA
MH3170wx132yz	170	132	105.6	144	134	347	255	265	277	302	323	354	395
MH3170wx138yz	170	138	110.4	150	140	362	266	276	289	315	337	369	412
MH3170wx144yz	170	144	115.2	157	147	378	278	288	301	329	352	385	430
MH3170wx162yz	170	162	129.6	176	165	425	313	324	339	370	396	434	484
MH3170wx168yz	170	168	134.4	183	171	440	324	336	351	383	410	449	501
MH3245wx180yz	245	180	144	196	183	473	347	360	377	411	440	482	538
MH3245wx192yz	245	192	153.6	209	195	504	370	384	401	438	469	514	574
MH3245wx198yz	245	198	158.4	215	202	520	382	396	414	452	484	530	592
MH3245wx216yz	245	216	172.8	235	220	567	417	432	452	493	528	578	646
MH3245wx228yz	245	228	182.4	248	232	598	439	456	477	520	557	610	681
MH3300wx216yz	300	216	172.8	235	220	567	417	432	452	493	528	578	646
MH3300wx228yz	300	228	182.4	248	232	598	439	456	477	520	557	610	681
MH3300wx240yz	300	240	192	261	244	629	462	480	502	547	586	642	717
MH3300wx258yz	300	258	206.4	281	263	676	497	516	539	588	630	690	770
MH3300wx264yz	300	264	211.2	287	269	693	509	528	552	602	645	706	789
MH3362wx258yz	362	258	206.4	281	263	676	497	516	539	588	630	690	770
MH3362wx264yz	362	264	211.2	287	269	693	509	528	552	602	645	706	789
MH3362wx276yz	362	276	220.8	300	281	724	532	552	577	630	674	738	824
MH3362wx288yz	362	288	230.4	313	293	755	554	576	602	657	703	770	860
MH3420wx330yz	420	330	264	359	336	865	636	660	690	753	806	883	986
MH3420wx336yz	420	336	268.8	366	342	880	647	671	702	766	820	898	1003
MH3420wx360yz	420	360	288	392	366	944	693	720	752	821	879	963	1075
MH3420wx372yz	420	372	297.6	405	379	975	716	743	777	848	908	994	1110
MH3420wx378yz	420	378	302.4	411	385	991	728	756	790	862	923	1011	1129
MH3420wx390yz	420	390	312	424	397	1022	751	779	814	889	952	1042	1164
MH3420wx396yz	420	396	316.8	431	403	1038	762	792	827	903	967	1059	1183
MH3420wx420yz	420	420	336	457	428	1100	808	839	877	957	1025	1122	1254

MH4 Electrical Characteristics

Base Arrester Catalog Number	Um (kV)	Ur (kV)	Uc (kV)	Temporary Overvoltage Capability (kVrms)		Maximum Steep Current Impulse Residual Voltage (kV)	Maximum Switching Impulse Residual Voltage (kV)			Maximum Lightning Impulse Residual Voltage (kV)			
				1s	10s	20kA	0.5kA	1kA	2kA	5kA	10kA	20kA	40kA
MH4036wx030yz	36	30	24	33.2	31.1	85	59	60.5	62.5	67.5	70.5	75.5	83.5
MH4036wx033yz	36	33	26.4	36.5	34.2	93.5	64.5	66.5	68.5	74	77.5	83	91.5
MH4036wx036yz	36	36	28.8	39.8	37.3	102	70.5	72.5	74.5	80.5	84.5	90.5	100
MH4036wx039yz	36	39	31.2	43.1	40.4	110	76	78.5	81	87.5	91.5	98	108
MH4052wx042yz	52	42	33.6	46.4	43.5	119	82.5	85	87.5	94.5	99	106	117
MH4052wx048yz	52	48	38.4	53	49.7	136	94	97	100	108	113	121	134
MH4052wx051yz	52	51	40.8	56.4	52.8	145	100	103	106	115	120	129	142
MH4052wx054yz	52	54	43.2	59.7	55.9	153	106	109	112	121	127	136	150
MH4052wx060yz	52	60	48	66.3	62.1	170	118	121	125	135	141	151	167
MH4072wx054yz	72	54	43.2	59.7	55.9	153	106	109	112	121	127	136	150
MH4072wx060yz	72	60	48	66.3	62.1	170	118	121	125	135	141	151	167
MH4072wx066yz	72	66	52.8	72.9	68.3	187	129	133	137	148	155	166	183
MH4072wx072yz	72	72	57.6	79.6	74.5	203	141	145	149	161	169	181	200
MH4072wx075yz	72	75	60	82.9	77.6	212	147	151	156	168	176	189	208
MH4072wx078yz	72	78	62.4	86.2	80.7	220	152	157	162	175	183	196	216
MH4072wx081yz	72	81	64.8	89.5	83.8	230	159	164	169	182	191	205	225
MH4072wx084yz	72	84	67.2	92.8	86.9	238	165	170	175	189	198	212	234
MH4100wx084yz	100	84	67.2	92.8	86.9	238	165	170	175	189	198	212	234
MH4100wx090yz	100	90	72	99.5	93.2	255	176	182	187	202	212	227	250
MH4100wx096yz	100	96	76.8	106	99.4	272	188	194	200	216	226	242	267
MH4123wx090yz	123	90	72	99.5	93.2	255	176	182	187	202	212	227	250
MH4123wx096yz	123	96	76.8	106	99.4	272	188	194	200	216	226	242	267
MH4123wx108yz	123	108	86.4	119	112	306	211	217	224	242	254	272	300
MH4123wx120yz	123	120	96	133	124	339	235	241	249	269	282	302	333
MH4123wx132yz	123	132	105.6	146	137	373	258	265	274	296	310	332	366
MH4123wx138yz	123	138	110.4	152	143	390	269	277	286	309	324	347	382
MH4145wx108yz	145	108	86.4	119	112	306	211	217	224	242	254	272	300
MH4145wx120yz	145	120	96	133	124	339	235	241	249	269	282	302	333
MH4145wx132yz	145	132	105.6	146	137	373	258	265	274	296	310	332	366
MH4145wx138yz	145	138	110.4	152	143	390	269	277	286	309	324	347	382
MH4145wx144yz	145	144	115.2	159	149	403	279	287	296	319	335	359	395

Products – Porcelain Housed Surge Arresters – MH4

MH4 Electrical Characteristics

Base Arrester Catalog Number	Um (kV)	Ur (kV)	Uc (kV)	Temporary Overvoltage Capability (kVrms)		Maximum Steep Current Impulse Residual Voltage (kV)	Maximum Switching Impulse Residual Voltage (kV)			Maximum Lightning Impulse Residual Voltage (kV)			
				1s	10s	20kA	0.5kA	1kA	2kA	5kA	10kA	20kA	40kA
MH4170wx132yz	170	132	105.6	146	137	373	258	265	274	296	310	332	366
MH4170wx144yz	170	144	115.2	159	149	403	279	287	296	319	335	359	395
MH4170wx162yz	170	162	129.6	179	168	458	317	326	336	363	381	408	449
MH4170wx168yz	170	168	134.4	186	174	475	328	338	348	377	395	423	466
MH4245wx180yz	245	180	144	199	186	509	352	362	373	403	423	453	499
MH4245wx192yz	245	192	153.6	212	199	542	375	386	398	430	451	483	532
MH4245wx198yz	245	198	158.4	219	205	559	386	398	410	443	465	498	548
MH4245wx216yz	245	216	172.8	239	224	609	421	433	447	483	507	543	598
MH4245wx228yz	245	228	182.4	252	236	643	445	457	472	510	535	573	631
MH4300wx216yz	300	216	172.8	239	224	609	421	433	447	483	507	543	598
MH4300wx228yz	300	228	182.4	252	236	643	445	457	472	510	535	573	631
MH4300wx240yz	300	240	192	265	248	678	469	482	497	537	564	604	665
MH4300wx258yz	300	258	206.4	285	267	724	500	515	531	574	602	645	710
MH4300wx264yz	300	264	211.2	292	273	740	512	527	543	587	616	660	726
MH4362wx258yz	362	258	206.4	285	267	724	500	515	531	574	602	645	710
MH4362wx264yz	362	264	211.2	292	273	740	512	527	543	587	616	660	726
MH4362wx276yz	362	276	220.8	305	286	774	535	550	568	614	644	690	759
MH4362wx288yz	362	288	230.4	318	298	804	556	572	590	637	669	716	789
MH4420wx330yz	420	330	264	365	342	931	644	662	683	738	775	830	913
MH4420wx336yz	420	336	268.8	371	348	948	655	674	696	752	789	845	930
MH4420wx360yz	420	360	288	398	373	1015	702	722	745	805	845	905	996
MH4420wx372yz	420	372	297.6	411	385	1044	722	743	766	828	869	930	1024
MH4420wx378yz	420	378	302.4	418	391	1062	734	755	779	842	884	946	1042
MH4420wx390yz	420	390	312	431	404	1091	754	776	800	865	908	972	1070
MH4420wx396yz	420	396	316.8	438	410	1108	766	788	813	878	922	987	1087
MH4420wx420yz	420	420	336	464	435	1175	812	836	862	932	978	1047	1153
MH4550wx420yz	550	420	336	464	435	1185	819	843	869	939	986	1056	1162
MH4550wx444yz	550	444	355.2	491	460	1252	865	890	919	992	1042	1115	1228

MH3 & MH4 Physical Characteristics

Um (kV)	Ur (kV)	Pollution Level*	Creepage Distance - Inches (mm)	Total Height - Inches (mm)	Lightning Withstand Voltage (kV)	Switching Withstand Voltage (kV)	Power Frequency Withstand Voltage (kV)	Drawing Figure	Grading Ring Height A - Inches (mm)	Grading Ring Diameter B - Inches (mm)
36	30-39	M/H/V	43.9 (1116)	31.7 (806)	276	220	108	1		
52	42-60	M	43.9 (1116)	31.7 (806)	276	220	108	1		
52	48	H/V	75.0 (1905)	38.1 (969)	360	300	159	1		
72	54-84	M/H	75.0 (1905)	38.1 (969)	360	300	159	1		
72	60	V	100 (2540)	44.1 (1121)	441	402	212	1		
100	78-96	M/H	100 (2540)	44.1 (1121)	441	402	212	1		
100	84	V	126 (3207)	50.6 (1286)	509	468	294	1		
123	90-96	M	100 (2540)	44.1 (1121)	441	402	212	1		
123	102-120	M	126 (3207)	50.6 (1286)	509	468	294	1		
123	132-138	M	153 (3874)	57.1 (1451)	603	532	345	1		
123	90-120	H	126 (3207)	50.6 (1286)	509	468	294	1		
123	132-138	H	153 (3874)	57.1 (1451)	603	532	345	1		
123	90-138	V	153 (3874)	57.1 (1451)	603	532	345	1		
145	108-120	M	126 (3207)	50.6 (1286)	509	468	294	1		
145	132-144	M	153 (3874)	57.1 (1451)	603	532	345	1		
145	108-144	H	153 (3874)	57.1 (1451)	603	532	345	1		
145	108-144	V	200 (5080)	82.6 (2099)	882	804	424	2		
170	132-144	M	153 (3874)	57.1 (1451)	603	532	345	1		
170	162-168	M	175 (4445)	76.6 (1946)	801	702	371	2		
170	132-168	H	175 (4445)	76.6 (1946)	801	702	371	2		
170	132-168	V	226 (5747)	89.1 (2264)	950	870	506	2		
245	180-198	M	200 (5080)	82.6 (2099)	882	804	424	2		
245	216	M	226 (5747)	89.1 (2264)	950	870	506	2		
245	228	M	253 (6414)	95.6 (2429)	1018	936	588	3	15.0 (381)	25.2 (640)
245	180-228	H	253 (6414)	95.6 (2429)	1018	936	588	3	15.0 (381)	25.2 (640)
245	180-228	V	305 (7748)	109 (2759)	1206	1064	690	3	15.0 (381)	25.2 (640)

* M = Medium, H = Heavy, V = Very Heavy

MH3 & MH4 Physical Characteristics

Um (kV)	Ur (kV)	Pollution Level*	Creepage Distance - Inches (mm)	Total Height - Inches (mm)	Lightning Withstand Voltage (kV)	Switching Withstand Voltage (kV)	Power Frequency Withstand Voltage (kV)	Drawing Figure	Grading Ring Height A - Inches (mm)	Grading Ring Diameter B - Inches (mm)
300	216	M	253 (6414)	95.6 (2429)	1018	936	588	3	18.0 (457)	40.0 (990)
300	228-240	M	253 (6414)	95.6 (2429)	1018	936	588	3	15.0 (381)	25.2 (640)
300	258-264	M	279 (7081)	102 (2594)	1112	1000	639	3	15.0 (381)	25.2 (640)
300	216	H	305 (7748)	109 (2759)	1206	1064	690	3	18.0 (457)	40.0 (990)
300	228-264	H	305 (7748)	109 (2759)	1206	1064	690	3	15.0 (381)	25.2 (640)
300	216	V	379 (9621)	141 (3572)	1527	1404	882	4	18.0 (457)	40.0 (990)
300	228-264	V	379 (9621)	141 (3572)	1527	1404	882	4	15.0 (381)	25.2 (640)
362	258-288	M	305 (7748)	109 (2759)	1206	1064	690	3	18.0 (457)	40.0 (990)
362	258-288	H	379 (9621)	141 (3572)	1527	1404	882	4	18.0 (457)	40.0 (990)
362	258-288	V	458 (11622)	160 (4067)	1809	1596	1035	4	18.0 (457)	40.0 (990)
420	330-336	M	353 (8954)	134 (3407)	1459	1338	800	4	35.7 (908)	60.2 (1530)
420	360	M	379 (9621)	141 (3572)	1527	1404	882	4	18.0 (457)	40.0 (990)
420	372-378	M	405 (10288)	147 (3737)	1621	1468	933	4	18.0 (457)	40.0 (990)
420	390-396	M	431 (10955)	154 (3902)	1715	1532	984	4	18.0 (457)	40.0 (990)
420	420	M	458 (11622)	160 (4067)	1809	1596	1035	4	18.0 (457)	40.0 (990)
420	330-336	H	431 (10955)	154 (3902)	1715	1532	984	4	35.7 (908)	60.2 (1530)
420	360-396	H	431 (10955)	154 (3902)	1715	1532	984	4	18.0 (457)	40.0 (990)
420	420	H	458 (11622)	160 (4067)	1809	1596	1035	4	18.0 (457)	40.0 (990)
420	330-336	V	531 (13495)	192 (4880)	2130	1936	1227	5	35.7 (908)	60.2 (1530)
420	360-420	V	531 (13495)	192 (4880)	2130	1936	1227	5	18.0 (457)	40.0 (990)
420	420	H	487 (12360)	162 (4123)	1965	1424	1011	4	18.0 (457)	39.0 (990)
420	330-420	V	516 (13110)	169 (4293)	2070	1500	1065	4	18.0 (457)	39.0 (990)

* M = Medium, H = Heavy, V = Very Heavy

Products – Porcelain Housed Surge Arresters – MH3/MH4

MH3/MH4 Detail

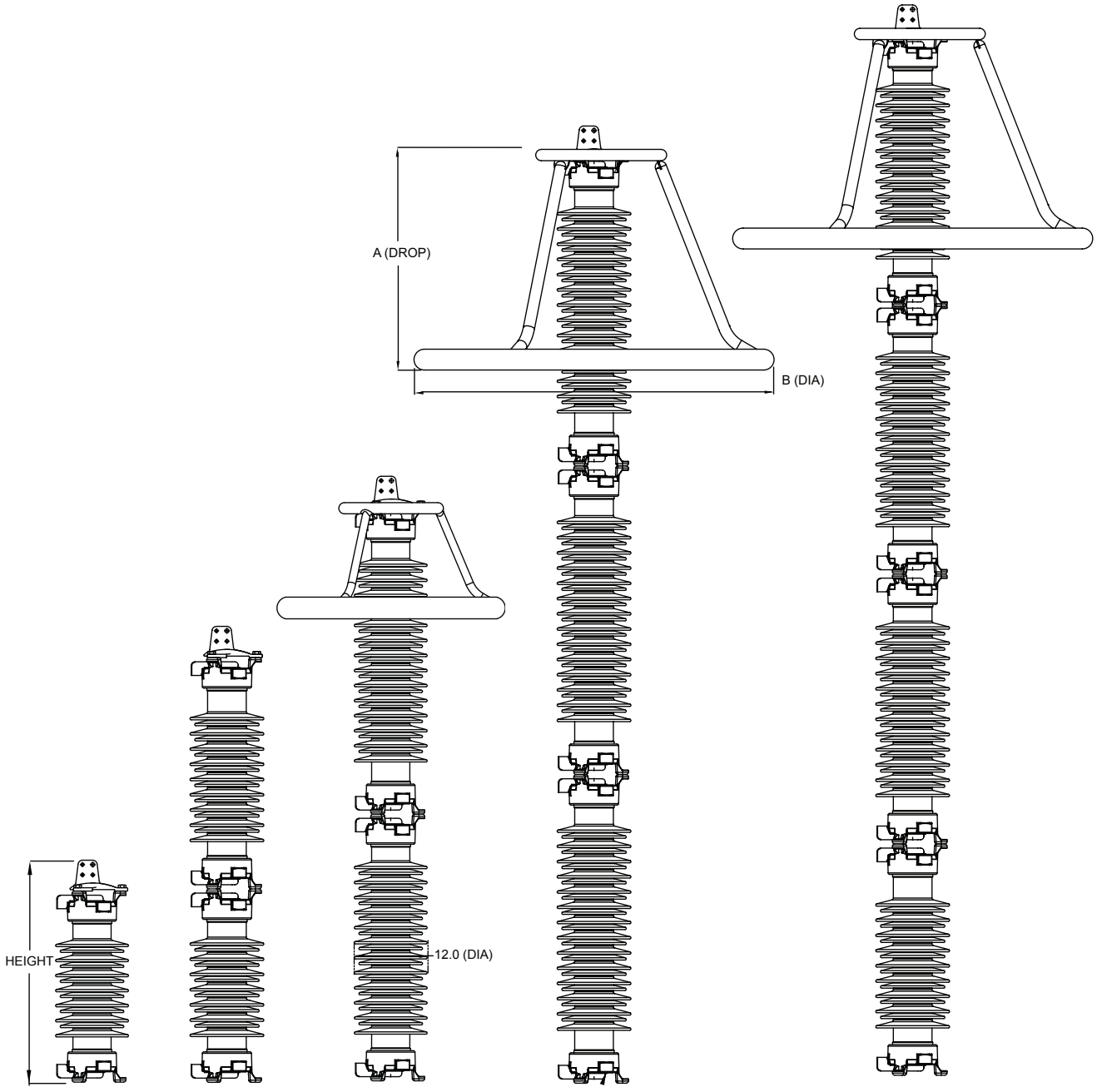


Figure 1 Figure 2 Figure 3 Figure 4 Figure 5

MH3/MH4 Part Numbers

M H 4 3 6 2 G M 2 7 6 A A

Step 1: Select the IEC classification

3 = Class Station Medium (SM)
4 = Class Station High (SH)

Step 2: Select the max system voltage (Um)

Step 3: Configurations

G – Gray Housing (standard)
B – Brown Housing
U – Underhung
F – Fault Indicator

Step 4: Select the appropriate site pollution level from the table below

Site Pollution	Code
Medium (≥ 20 mm creep per kV Um)	M
Heavy (≥ 25 mm creep per kV Um)	H
Very Heavy (≥ 31 mm creep per kV Um)	V

Step 5: Select Ur

Step 6: Line Terminals

A – Standard

Line Size - in (mm)	Code
0.25 (7) - 0.81 (21)	A
0.38 (10) - 1.12 (29)	B
0.16 (4) - 1.25 (31)	H

Step 7: Ground Terminals

A – Standard

Ground Size - in (mm)	Code
0.25 (7) - 0.81 (21)	A
0.38 (10) - 1.12 (29)	B
0.16 (4) - 1.25 (31)	H

Packaging and Mounting Information

Packaging – All SVN, PH3, PH4, MVN, MH3 and MH4 arresters are packed in a wooden crate compatible for forklift use. SVNH, SVNR and SVNX arrester units are shipped vertically, with multiple units bolted to a pallet and crated. Most VL and VLA arresters are packed with each porcelain unit in a separate cardboard carton. EVP arresters above 98kV MCOV will be packaged in a wooden crate compatible for forklift use. All other EVP and PVI-LP arresters will be packaged in a cardboard carton.

All packaging includes proper labeling for correct assembly upon construction. Stacking bolts, when required, are included. If needed, grading rings are packed, shipped separately, and tagged for easy identification.

Base Mounting Summary Table

Product Line	Bolt Circle - Inches (mm)	Bolt Size - Inches (mm)	Attachment Lug	
			Thickness - Inches (mm)	Hole Size - Inches (mm)
PVI-LP	8.75 (222) - 10.0 (254)	0.5 (12.7)	1.25 (32)	0.56 (14) slotted
EVP	7.88 (200) - 10.0 (254)	0.5 (12.7)	1.25 (32)	0.56 (14) slotted
VL, SVN, PH3, PH4, MVN, MH3, MH4	10.0 (254)	0.5 (12.7)	0.63 (16)	0.56 (14)
SVNH, SVNR, SVNX	16.5 (419)	0.75 (19)	0.88 (22)	0.81 (21) x 1.11 (28) slotted

Mounting holes will accommodate ½ or ¾ inch bolts. Rated cantilever strength is achieved with the use of ½ or ¾ inch bolts. Mounting bolts, nuts, and washers are not furnished with arresters.

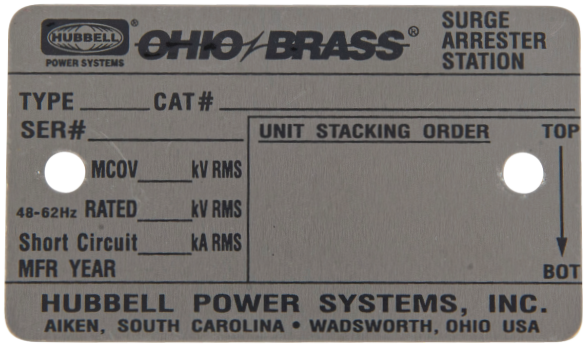
Horizontal Mounting of Arresters – Many Hubbell Power Systems substation arresters can be mounted horizontally. The first consideration is the cantilever force at the mounting point not exceed the cataloged rated working cantilever load of the arrester under consideration. This force is a calculation of the total weight of the arrester multiplied by 50% of the total height of the arrester.

Other considerations such as how much residual strength is available for large conductor loading, ice loading and wind loading require a more detailed analysis. In these cases please contact your Hubbell Power Systems Representative at 1.573.682.5521 for technical assistance.

Nameplates

- Each arrester is identified with an arrester nameplate attached to its bottom casting.
- Arrester nameplates display the MCOV (Uc), duty cycle rating (Ur) pressure relief current, serial and catalog numbers as required by IEEE or IEC standards.
- On multiple-unit stacks, the plate is attached to the bottom unit. It features all of the same information as well as the stacking sequence.
- Multiple-unit arresters must be stacked in the order listed on the base nameplate. The stacking sequence is also listed on the arrester crates for easy reference.
- Additionally, multiple-unit stacks feature a unit nameplate on the upper casting of each unit. This identifies the serial number of the specific unit.

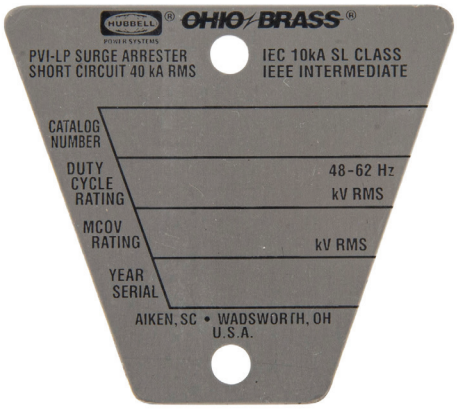
Hollow Core



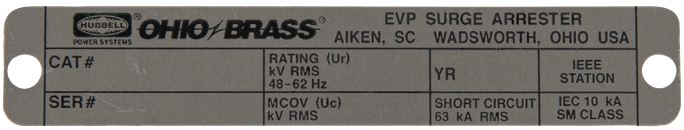
Station Arrester Nameplate

Arrester Unit Nameplate

Solid Core



PVI-LP Nameplate



EVP Nameplate

Accessories: Surge Counters

Counters:

- Arrester surge counters, also known as discharge counters can be provided with or without a built-in milliamp meter to provide a continuous grading current reading.
- Operation of an arrester surge counter and the optional grading current instrument requires that the arrester base be insulated from the ground. Insulating bases are required to mount the surge counter.

Catalog Information

Part Number	Description
245170	Surge Counter only
245171	Surge Counter with Total Leakage Current Measurement (30 mA)
245176	Surge Counter with Total Leakage Current Measurement w/ Auxiliary Connection
245177	Surge Counter with Total Leakage Current Measurement (50mA)

Surge Counter

Product Details

Surge Counter	Minimum Count Current	200 Amp (8/20 µs)
	Maximum High Current Withstand	100 kA (4/10 µs)
	Nominal Residual Voltage at 100 kA	5 kV peak
	Count Rate	up to 10 per second
Electro-Mechanical Cyclometer	Vibration stability	30 m/s^2 (10-500 Hz) per IEC 60068-2-6
	Shock stability	800 m/s^2 (6ms) per IEC 60068-2-27
	Maintenance-free operation	10 million pulses
	General Design	According to EN 61010-1, EN 50178

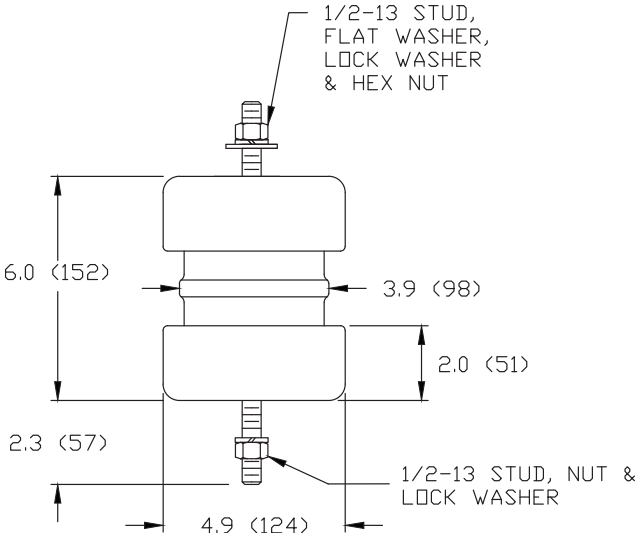
Accessories: Insulating Bases

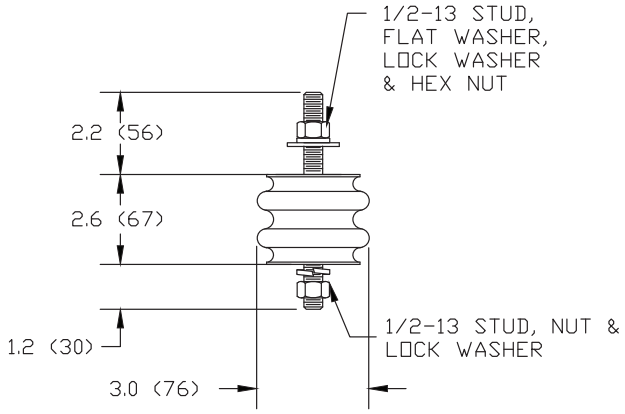
Insulating Bases – Arresters installed with surge counters require that the arrester is insulated from the ground with insulating bases. Each leg of the tripod base will need an insulating base as shown below.

Part No. 2721453076
Heavy Duty 3 Piece Insulating Base Assembly Kit - For use with type MH3, MH4, MVN, PH3, PH4 and SVN arresters.

Part No. 2730973001
Normal Duty 3 Piece Insulating Base Assembly Kit - For use with Type PVI-LP, EVP and VL arresters.

Note: A quantity of one insulating base assembly kit should be ordered per arrester.





Hardware

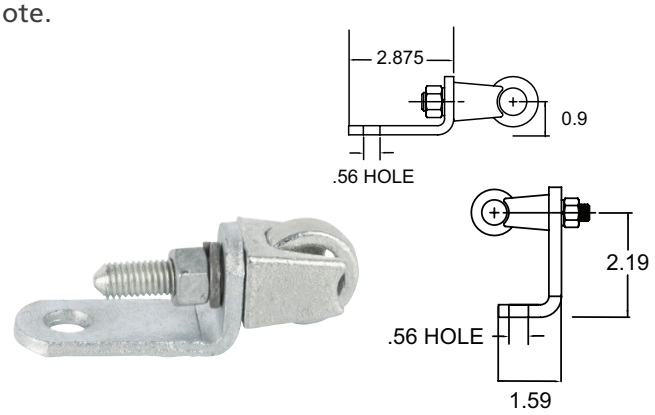
Line and Ground Terminals – All Hubbell arresters include as standard line and ground terminals for conductors from 0.25 (7) to 0.81 (21) inch (mm) diameters. These are made from hot-dipped galvanized (HDG)malleable iron, compatible with either aluminum or copper.

To obtain a full replacement hardware kit for an EVP arrester with standard hardware, specify part number PSCPTERMKIT01.

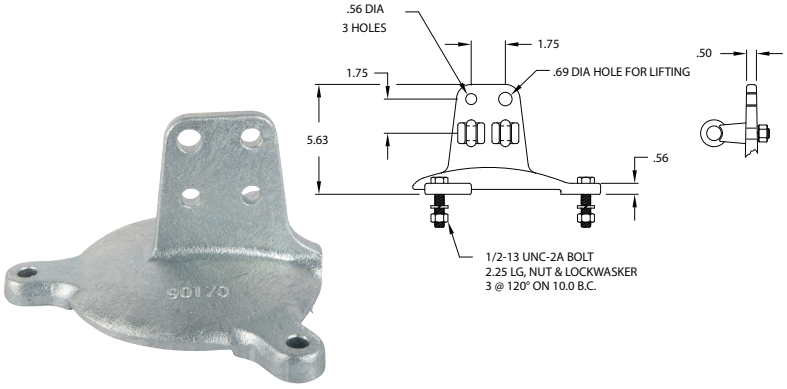
The arrangement of mounting terminals on arresters makes it possible to align them in any direction to accommodate the angle of the incoming lead wire.

If your conductor size exceeds standard terminal capacity, contact your Hubbell Power Systems Representative at 1.573.682.5521 for an appropriate quote.

HDG Terminal Assy, Part No. M271414-3001
Suitable for Cu or Al conductor size 0.25 (7) to 0.81 (21) inch (mm) diameter.
(AWG#4 – 500 MCM)

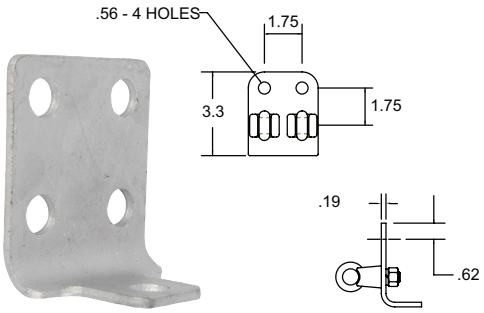


HDG Terminal Bracket Assy, Part No. M71874-3001
Suitable for Cu or Al c onductor Size 0.25 (7) to 0.81 (21) inch (mm) diameter.
(AWG#4 – 500 MCM)



Suspension Cap, Part No. 90170-4001
This cap is the standard suspension cap furnished with VL, SVN, PH3, PH4, MVN, MH3 and MH4 arresters.

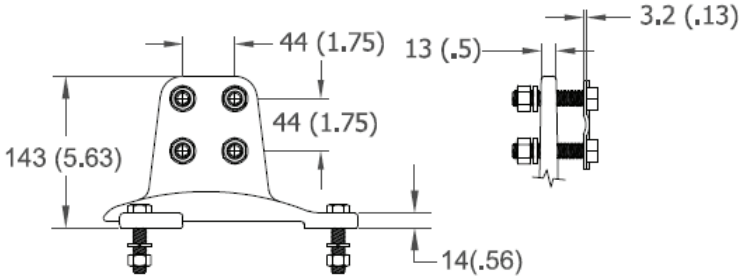
Part No. 272087-3001K includes the suspension cap, terminal assembly and mounting bolts



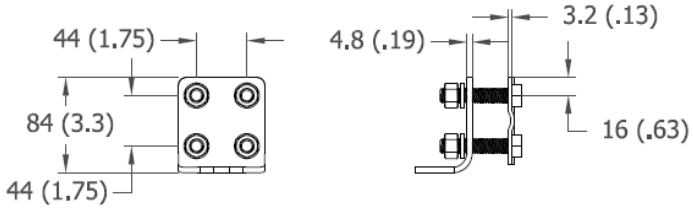
4-Hole NEMA Pad, Part No. 274914-4002
Line-end terminals are available with a 4-hole NEMA pad with a single eye-bolt. Single eye-bolt ground-end terminals are automatically included. The 4-hole NEMA pad is typically furnished with standard EVP & PVI-LP end codes.

Engineering Note: Maximum recommended tightening torque to be applied to the end stud when installing terminals and leads is 40 ft-lbs (54 Nm).

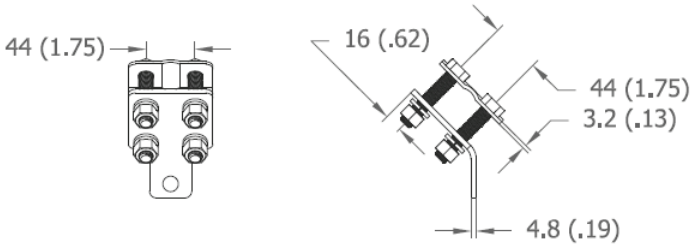
Suspension cap with clamp type terminal



4-Hole NEMA pad with clamp type terminal



4-Hole 45° NEMA ground pad with clamp type terminal



4-Hole NEMA Clamp, Part No. PSPP00NMCLMP01

Line and ground terminals are available with a 4-hole NEMA pad with clamp type connector. The clamp is suitable for Cu or AL conductor size 0.16 (4.1) – 1.25 (31) inch (mm). The clamp type terminal can be provided with hollow-core or solid-core arresters for both the line and ground connection.

Arrester Routine Factory Testing

Hubbell performs routine acceptance testing on 100% of arresters manufactured. Testing is done in accordance with IEEE C62.11 and IEC 60099-4. Additional testing is performed in accordance with internal Hubbell design specifications. If required, please contact your local representative for a copy of the routine arrester test certification.

Arrester Routine Factory Testing: After assembly, the arresters are 100% tested as follows:

Discharge Voltage: Determined by the sum of the resistor elements, each arrester is tested to be within a manufacturer specified range that aligns with the arrester's published ratings.

Reference Voltage: The voltage at which the arrester conducts the reference current per the table below. This test verifies the proper MOV discs were used in the assembly.

PVI-LP	7 mA
EVP, MH3, PH3, VL	9.5 mA
MVN, MH4, SVN, PH4, SVNH	17 mA
SVNR	28.5 mA
SVNX	34 mA

Partial Discharge (PD): Power-frequency voltage is raised to the duty cycle voltage rating of the arrester or unit, held for not less than 2s, and then lowered to 15 times the MCOV of the arrester or unit. The measured PD shall not exceed 10 pC.

Seal Test: The helium-mass spectrometer test is performed on arresters with >10% internal gas volume to verify the environmental seal of the arrester or unit.

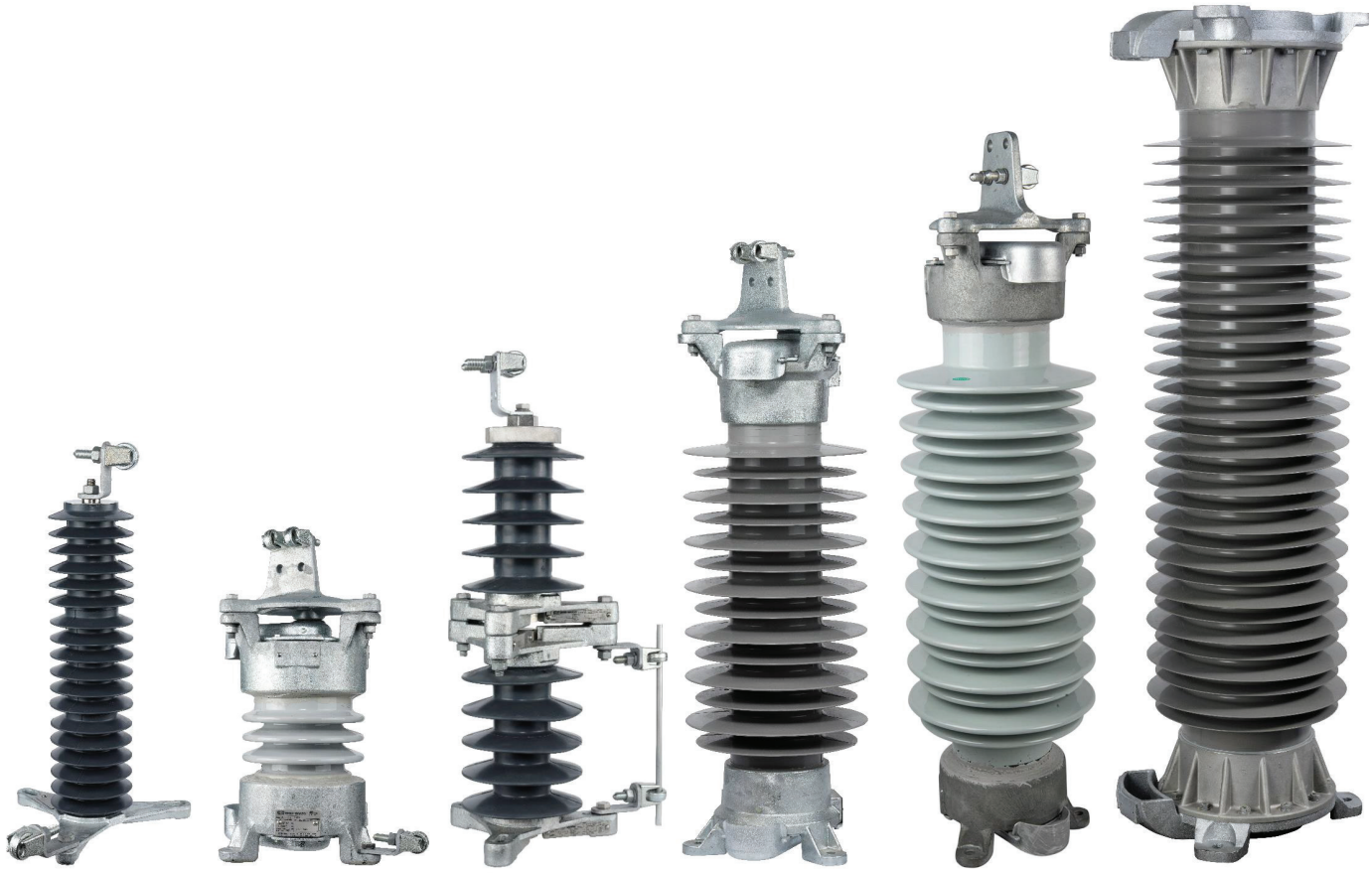
Power Frequency (PF): A minimum voltage of 1.20 times the MCOV of the arrester or unit is applied to verify that the measured values of watts loss does not exceed the arrester or unit's specified limits.

Seismic Testing

IEEE 693 is the governing standard for seismic testing of substation equipment for IEEE C62.11 and IEC 60099-4 surge arresters. The IEEE 693 standard details test procedures for seismically validating a wide range of products including arresters, switches, bushings, and a multitude of other equipment. Hubbell Power Systems qualifies the seismic capability of its surge arresters to Annex K of IEEE 693.

All VL and PVI-LP arresters under 35 kV rated voltage are seismically qualified by inherently acceptable criteria. All other Hubbell Power Systems arresters are qualified by shake table testing. To be qualified, a surge arrester must survive the shake table test with no structural damage and remain functional, as demonstrated by successfully passing routine production tests after shake table testing.

IEEE 693 allows seismic qualification based on the concept of "qualifying equipment by group". This concept permits products of different voltage ratings, but similar physical structure, to be combined into groups for qualification purposes, with the most seismically vulnerable piece of equipment of each group being analyzed or tested. All arresters which do not exceed the listed height, mass and center of gravity for these arresters is also qualified to IEEE 693.



Arrester FAQs

1. What is the difference between a grading ring and a corona ring?

A grading ring is used to ensure a uniform voltage distribution along the length of an electrical device. This is important for surge arresters so each MOV disc in the arrester is energized at the appropriate voltage.

A corona ring is traditionally used to electrically shield external hardware to prevent corona from developing. This corona could lead to degradation of insulating materials or create interference to electronic communication.

Surge arresters below 500 kV system voltage do not typically need corona rings.

2. Why are the catalog phase to phase and phase to ground clearances less than spacing in other industry codes such as the National Electric Code?

The clearances in this catalog are the minimum distances for which the uniform internal voltage distribution of the arrester will not be compromised. It is not the intention of Hubbell Power Systems to overrule a specific customer requirement. If a specific end user application dictates a larger clearance the standard Hubbell Power Systems will function properly.

3 Why are the heights of the arrester less than the spacing mandated in other industry codes such as the National Electric Code?

The arresters in this catalog are designed and tested in accordance with IEEE C62.11 which defines minimum insulation withstand of station class arrester. It is not the intention of Hubbell Power Systems to overrule a specific customer requirement. If a specific end user application dictates a larger spacing Hubbell Power Systems can supply a special arrester with the required spacing.

4. Where can I find the Design Test Report for my arrester?

Design Test Reports can be found on the Hubbell Power Systems website under the resources tab.

5. How do I know if I need a grading ring or corona ring for my arrester?

The Hubbell/Ohio Brass Engineers have performed all necessary electric field calculations to make this decision. Therefore, all of our surge arrester part numbers already include rings if required, and you need not specify rings. They will automatically ship with your arrester, stacked on a separate pallet.

6. Can Hubbell Power Systems arresters be mounted in a non-vertical configuration?

Many Hubbell Power Systems substation arresters can be mounted horizontally. The first consideration is the cantilever force at the mounting point not exceed the cataloged rated working cantilever load of the arrester under consideration. This force is a calculation of the total weight of the arrester multiplied by 50% of the total height of the arrester.

7. Where is the terminal hardware that comes with the arresters located?

Suspension cap and terminal hardware items are shipped unattached to the arrester and will be contained in a separate bag or box within the arrester crate. In the case of a multi-unit arrester the hardware will be in the crate of the bottom unit.

Other considerations such as how much residual strength is available for large conductor loading, grading ring loading, ice loading and wind loading require a more detailed analysis. In these cases please contact your Hubbell Power Systems representative at 1.573.682.5521 for technical assistance.

When mounting the arrester in a non vertical or under-hung position, the orientation of the sheds must be considered. If the sheds are inverted this can allow water to pool around the center of the arrester and decrease the creepage distance. This can result in increased chance of flashover.

Arrester FAQs

8. What does MCOV rating of a surge arrester mean?

MCOV stands for the Maximum Continuous Operating Voltage. It represents the power frequency voltage that may be continuously applied to a surge arrester.

The MCOV selected for a given system voltage is a function of the maximum line-to-line voltage as well as the system grounding parameters. Hubbell Power Systems application engineers can assist with the proper MCOV selection for your specific requirement.

9. What if I need a different arrester configuration than what is offered in the catalog.

Hubbell Power Systems can offer many customization options for arresters. Options include increased creepage distances, increased height, different arrester MCOV's, various terminal sizes, higher energy rating, and mounting hardware. Contact your Hubbell Representative at 1.573.682.5521 for more information on arrester customization options.

10. How does MCOV rating differ from Duty Cycle rating?

The Duty Cycle rating of a surge arrester is the power frequency voltage at which the arrester can successfully withstand the duty cycle test per IEEE Standard C62.11. The Duty Cycle rating is a short-term TOV (Temporary Over Voltage) rating.

11. What is the difference between a station class and an intermediate arrester?

Generally, station class arresters have the lowest protective characteristics and most durability, while intermediate arresters perform at levels slightly less robust than station class arresters.

Both of these arresters have traditionally been used in sub-station applications. The arrester IEEE Standard C62.11 defines the performance levels of each of these designs.

12. Why is the system grounding type important to consider when selecting the MCOV rating?

The type of grounding determines the amount of neutral shift during a fault on the power system. The resulting TOV on the arrester could cause damage unless the arrester is sized properly.

Your Hubbell Power Systems Representative can help with the selection of the proper size arrester for your application.

13. How do I use the pressure relief rating value in making my arrester selection?

When a surge arrester fails, it will become shorted. It then will conduct the available short circuit current in the substation.

To minimize the possibility of a catastrophic failure, you should select an arrester with a pressure relief rating that is greater than the available short-circuit current in your substation.

14. What routine maintenance and testing does Hubbell Power Systems recommend for station class surge arresters?

Hubbell Power Systems arresters are designed to provide years of successful service without any recommended maintenance. Arresters do not require field testing; however, if testing must be performed we recommend that Hubbell Power Systems be contacted prior to beginning a testing.

15. I have a question that is not covered in this section.

We'll be happy to answer any of your arrester questions. Just contact your local Hubbell Power Systems Representative or call our main customer service line at 1.573-682-5521.

Engineering Terminology

A Glossary of Terms Used in This Catalog

BIL (Basic Insulation Level): The electrical strength of insulation in terms of the crest value of a standard lightning impulse under standard atmospheric conditions.

Corona Ring: A metal ring used to electrically shield external hardware by preventing corona discharge effects from developing. This will come with the arrester is required by design.

Crest Value: The maximum value that a wave, surge or impulse attains.

Design Tests: Tests made on each design to establish performance characteristics and to demonstrate compliance with the appropriate standards of the industry. Once made, they need not be repeated unless the design is changed so as to modify performance.

Discharge Counter: A device for recording the number of arrester discharge operations.

Discharge Voltage: The voltage that appears across the terminals of an arrester during passage of discharge current. Sometimes referred to as IR.

Discharge Withstand Current: The specified magnitude and wave shape of a discharge current that can be applied to an arrester a specified number of times without causing damage to it.

Duty Cycle Voltage: The designated maximum permissible voltage between its terminals at which an arrester is designed to perform its duty cycle.

ESP Polymer: Proprietary ESP™ weathershed material, made of a blend of silicone and EPDM. ESP's properties have been confirmed in a series of performance tests that include tracking resistance, contamination, aging, and seal design.

Fault Current: The current from the connected power system that flows in a short circuit.

Front-of-wave (FOW) Impulse Voltage: The resulting voltage from a current impulse with a wave front that rises with a virtual front time of 1 µs. The current magnitude is equal to the lightning impulse classifying current.

Grading Ring: A metal ring mounted to electrostatically modify the voltage gradient or distribution. This will come with the arrester if required by the design.

Ground Terminal: The conducting part provided for connecting the arrester to ground.

Impulse Protective Level: The discharge-voltage value for a defined wave shape.

Impulse Withstand Voltage: The crest value of an impulse that, under specified conditions, can be applied without causing a disruptive discharge.

Line Terminal: The conducting part of an arrester provided for connecting the arrester to the circuit conductor.

Engineering Terminology

Maximum Design Cantilever Load-Static (MDCL-Static): The maximum cantilever load the surge arrester is designed to continuously carry.

MOV (Metal Oxide Varistor): The power semi-conductor that limits the surge voltage allowing the arrester to perform its protection function. This is the electrically active component of the surge arrester.

MCOV (Maximum Continuous Operating Voltage): The maximum designated root-mean-square (rms) value of power-frequency voltage that may be applied continuously between the terminals of the arrester.

Partial Discharge (PD): A localized electric discharge resulting from ionization in an insulation system when the voltage stress exceeds critical value. The discharge partially bridges the insulation between electrodes.

Q_{rs}: Repetitive charge transfer rating given in Coulombs. Test performed on individual MOV blocks without thermal recovery.

Q_{th}: Thermal charge transfer rating given in Coulombs. Applicable for distribution arresters only.

Reference Current (Iref): The peak value of the resistive component of a power frequency current high enough to make the effects of stray capacitance of the arrester negligible.

Reference Voltage (Vref): The lowest peak value independent of polarity of power frequency voltage, divided by the square root of 2, required to produce a resistive component of current equal to the reference current of the arrester.

Routine Tests: Tests made by the manufacturer on every device to verify that the product meets the design specifications.

Surge Arrester: A protective device for limiting surge voltages on equipment by diverting surge current and returning the device to its original status. It is capable of repeating these functions multiple times.

TOV (Temporary Over Voltage): A power frequency voltage in excess of normal line-to-ground voltage. A TOV is typically system generated. The magnitude and duration are a function of the power system parameters.

- **Prior Duty TOV**: The TOV of the arrester if it has been energized before an over voltage event.
- **No Prior Duty TOV**: The TOV of the arrester if it has not been energized prior to an over voltage event.

W_{th}: Thermal energy rating of a station or intermediate arrester given in kJ/kV of Ur (IEC) or kJ/kV of MCOV (IEEE)

Notes

Notes

NOTE: Because Hubbell has a policy of continuous product improvement, we reserve the right to change design and specifications without notice.

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