Catalog 35

Protecta*Lite®

Surge Protection for Superior Transmission and Distribution System Reliability

Put Protecta*Lite On. Or It's Lights Out.

OHIO BRASS®

HUBBELL

Warranty – Material

Hubbell Power Systems, Inc. (Company or HPS), warrants all its products sold to be merchantable (as such item is defined in the uniform Commercial Code) and to be free from defects in material and workmanship. Buyer must notify the Company promptly of any claim under this warranty. The Buyer's exclusive remedy for breach of this warranty shall be the repair or replacement, F.O.B. factory, at the Company's option, of any product defective under the warranty which is returned to the Company within one year from the date of shipment. NO OTHER WARRANTY, WHETHER EXPRESS OR ARISING BY OPERATION OF LAW, COURSE OF DEALING, USAGE OF TRADE OR OTHERWISE IMPLIED, SHALL EXIST IN CONNECTION WITH THE COMPANY'S PRODUCTS OR ANY SALE OR USE THEREOF. The Company shall in no event be liable for any loss of profits or any consequential or special damages incurred by Buyer. The Company's warranty shall run only to the first buyer of a product from the Company, from the Company's distributor, or from an original equipment manufacturer reselling the Company's 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. This warranty applies only to the use of the product as intended by Seller and does not cover any misapplication or misuse of said product.

Warranty – Application

Hubbell Power Systems, Inc. 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 change is made for the recommendation, or if it is provided free of charge.

Responsibility for selection of the proper product or application rests solely with the purchaser. In the event of errors or inaccuracies determined to be caused by Hubbell Power Systems, Inc., its liability will be limited to the re-performance of any such analysis or study.

PURCHASER INSPECTIONS

Tests, inspections and acceptance of all material must be made at the factory. Purchasers' 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 inspections should be given to HPS no later than two weeks prior to scheduled shipment date.

LIMITATION OF LIABILITY

IN NO EVENT, WHETHER AS A RESULT OF BREACH OF CONTRACT OR WARRANTY OR ALLEGED NEGLIGENCE, SHALL HPS BE LIABLE FOR SPECIAL OR CONSEQUENTIAL DAMAGES INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR REVENUE, LOSS OF USE OF THE EQUIPMENT OR ANY ASSOCIATED EQUIPMENT, LOSS OF CAPITAL, COST OF SUBSTITUTE EQUIPMENT, FACILITIES OR SERVICES, DOWNTIME COSTS, OR CLAIMS OF THIRD PARTIES OF THE BUYER FOR SUCH DAMAGES. Any claim by Buyer for breach of the foregoing warranty 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 breach. Any cause of action for breach of the foregoing warranty shall be brought within one year after the cause of action has accrued.

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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.

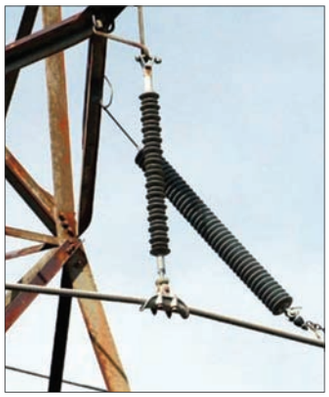
Protecta*Lite

INSIDE.....PAGE

reliability

Only Protecta*Lite® from Hubbell Power Systems (HPS) combines the reliability of the industry's leading arrester with the effectiveness of the leading insulator.

This proprietary pairing of a Hubbell arrester and Hubbell insulator represents the culmination of nearly a century of HPS high-voltage product experience and innovation. It also represents the HPS tradition of research, testing and development, which has created the industry's most recognized and reliable brands – such as Ohio Brass.

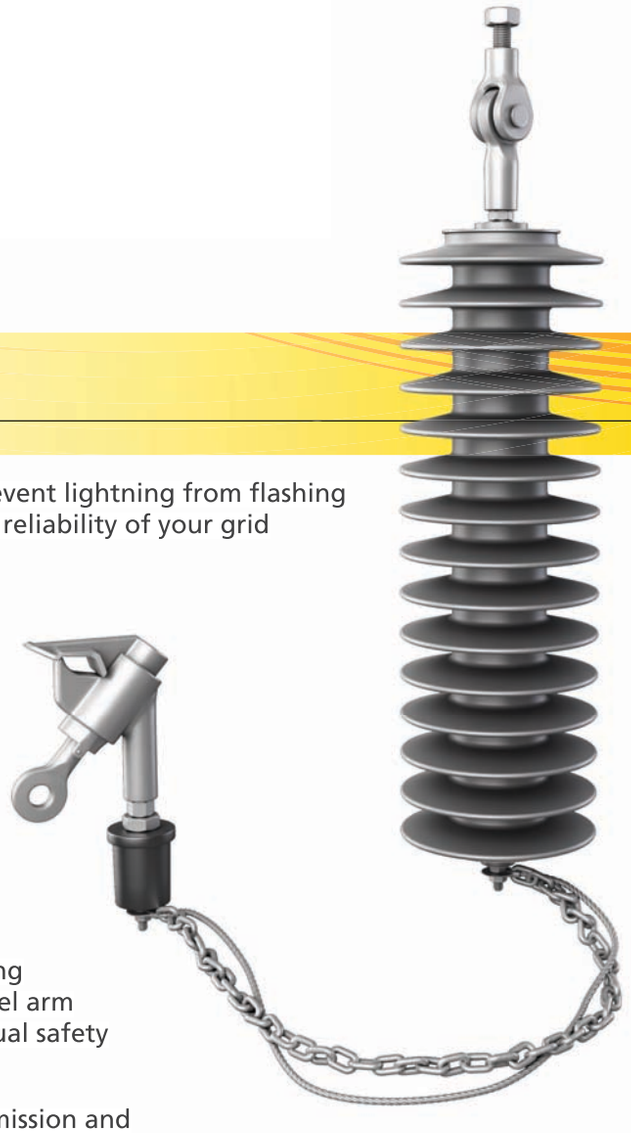


Over the past 25 years, Hubbell has put more than a half-million Protecta*Lite systems to work, protecting lines around the world from lightning flashover.

Keep the power on. With Protecta*Lite.

solutions

What is Protecta*Lite?



Protecta*Lite is a surge arrester specifically designed to prevent lightning from flashing over line insulation. There is no better way to enhance the reliability of your grid during electrical storms.

You can use Protecta*Lite to protect your existing insulators, or order it factory packaged with HPS Quadri*Sil insulators for new installations. Either way, Protecta*Lite will keep the power flowing during a lightning strike.

Effective Protection for Older Systems – Existing power systems can be a challenge to protect against flashovers. Questionable grounding, outdated construction standards and degrading materials can all present threats to system reliability during a surge.

Each Protecta*Lite system is custom made to fit your existing towers and systems. It can be suspended, mounted to a steel arm or configured however you need pertinent to your individual safety concerns and processes.

How Protecta*Lite Works – Protecta*Lite protects transmission and distribution lines by protecting the air around the insulator from lightning flashover. The lightning surge is safely diverted to ground in a controlled manner.

Available for applications ranging from 2.4kV to 500kV, Protecta*Lite protects your line performance, even when faced with adverse wind and ice conditions.

It can even protect unshielded lines.

Ease of Installation – Protect your power lines – and your bottom line – with quick and easy installation. The Protecta*Lite system is light weight, reducing line-loading and making installation easier, all while delivering top performance.

An Aesthetic Solution – Unsightly overhead shield wires are now unnecessary. Protecta*Lite eliminates the need for these shield wires in new systems and eliminates flashover in older systems that already have shield wires in place.

What is Protecta*Lite?

Cost Benefits – Protecta*Lite protects millions of dollars worth of system reliability when installed on lines. In the event of a strike, your largest infrastructure investments will remain safe and secure.

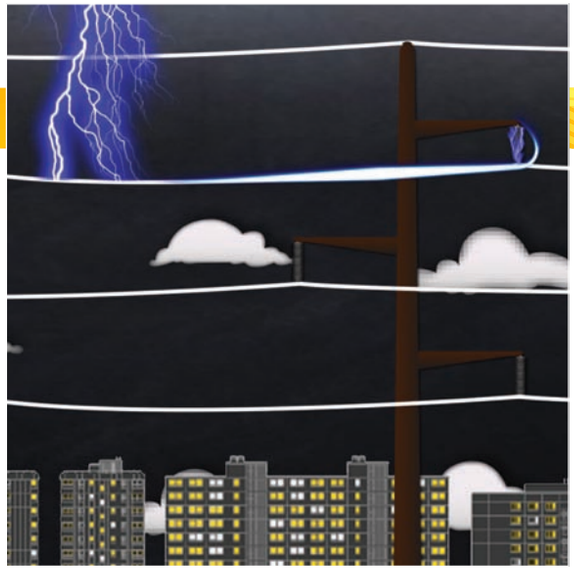
When using Protecta*Lite arresters, the system also is less expensive to protect compared to improving grounds, and Protecta*Lite arresters adds to the overall reliability of your power system. By installing Protecta*Lite to improve your system's performance, you can improve your reliability goals.

Additionally, Protecta*Lite enables you to creatively upgrade lines to higher system voltages without requiring more space and possible pole upgrades.

Raising the Bar for Reliability – Hubbell Power Systems direct-connected MOV surge arresters have been in service for more than 35 years and show no signs of aging. The same can be said for our polymer insulators.

Our arresters are highly resistant to moisture ingress, a leading cause of arrester failure. And in more than 25 years of field experience, our polymer insulators have proven themselves resistant to tracking and other environmental damage.

Simply put, we build these products to last. You can count on them to protect your system for years and provide maintenance-free service.



Without Protecta*Lite – Lightening can cause insulators on the line to flashover, causing momentary interruptions in service.

With Protecta*Lite – Lightening surges are diverted to ground, and service on the line is not interrupted.

Selecting Protecta*Lite

Protecting your power grid begins with selecting the proper Protecta*Lite system. Use this guide to determine what Protecta*Lite system you'll need. Each is custom built to fit your needs.

Step 1: Selecting the Correct MCOV

Determine Your Arrester Size Requirements – Use this selection guide featuring the appropriate arrester MCOV for some common system voltages, line to line. This chart suggests the appropriate MCOV rating based on grounding considerations. All voltages are expressed in RMS terms.

Note: These are recommended sizes only for typical line installations. If the connecting substation uses a different size arrester or still has SiC arresters in service, the recommended sizes for your Protecta*Lite application are likely to increase. Please call your Hubbell representative if you have needs not addressed in this chart.

Arrester Size

	System Voltage (kV)		Arrester MCOV (kV)*
	Nominal	Maximum	Effectively Grounded Neutral Circuit
Distribution	4.16	4.37	2.55
	12.47	13.1	7.65
	13.2	13.9	8.4
	13.8	14.5	8.4
	24.94	26.2	15.3
	34.5	36.2	22.0
Transmission	46	48.3	29
	69	72	42
	115	121	70
	138	145	84
	161	169	98
	230	242	140
	345	362	209
	500	550	318

Engineering Notes – For effectively grounded systems, the MCOV selected is usually the maximum line-to-ground voltage of the system.

For impedance grounded or ungrounded lines, select an arrester MCOV that is closer to 90% of the system voltage.

If your system voltage is not represented on this chart, please contact your Hubbell representative.

**Recommended sizes are the minimum suggested rating for the system voltage listed.*

*Select the right Protecta*Lite system for your needs using the **Web Application Tool** or **Interactive e-Catalog** at **HubbellPowerSystems.com**.*

Selecting Protecta*Lite

Step 2: Select Your Configuration

These examples represent some common Protecta*Lite configurations.

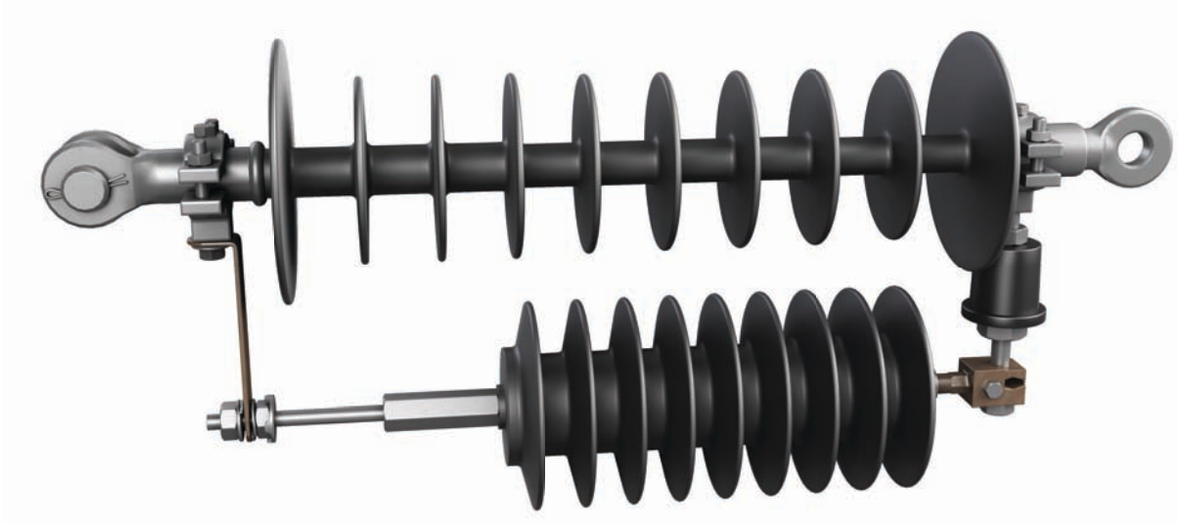
If your application requires an assembly not shown here, please contact your Hubbell representative to discuss additional custom design options.

If your configuration requires mounting of the arrester across an insulator, please provide your Hubbell Representative with the insulator part number.

*Remember to specify an Ohio Brass insulator for your Protecta*Lite System.*

Distribution Configurations – We offer a wide array of distribution configurations to fit the engineering design of your power system. Both suspension and dead-end configurations are available with a variety of mounting hardware to meet your particular requirements and simplify installation.

*Select the right Protecta*Lite system for your needs using the **Web Application Tool** or **Interactive e-Catalog** at **HubbellPowerSystems.com**.*



Flash Fact:

95% of lightning strikes are larger than 10,000 amps.

Distribution Configurations

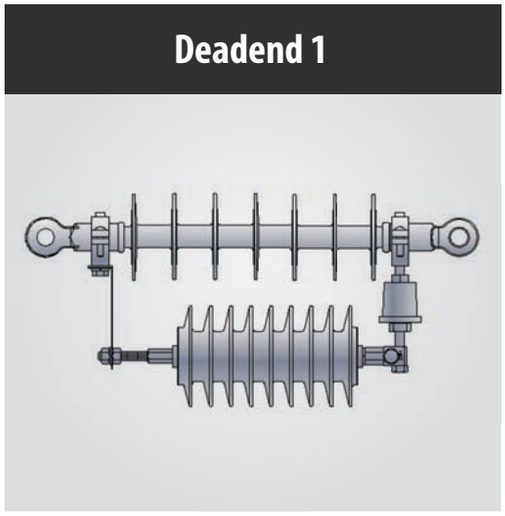
Suspension 1

Suspension 2

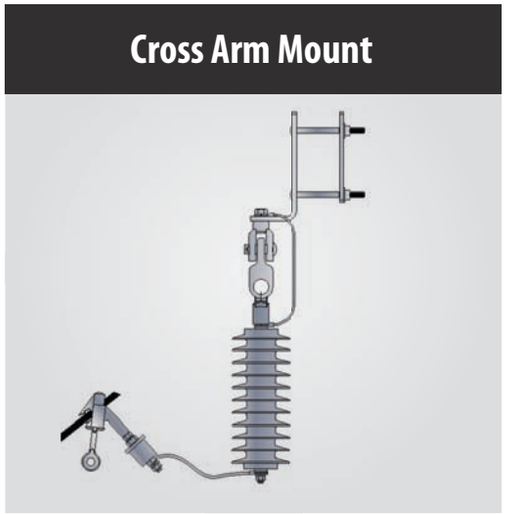
Suspension 3

Suspension 4

Deadend 1



Cross Arm Mount



Selecting Protecta*Lite

Transmission Configurations – We offer a wide array of transmission configurations to fit the engineering design of your power system. Each is available with a variety of mounting hardware to meet your particular requirements and simplify installation.

If your application requires an assembly not shown here, please contact your Hubbell representative to discuss additional custom design options.

If your configuration requires mounting of the arrester across an insulator, please provide your Hubbell Representative with the insulator part number.

*Select the right Protecta*Lite system for your needs using the **Web Application Tool** or **Interactive e-Catalog** at **HubbellPowerSystems.com**.*

Flash Fact:

All line arresters disconnect themselves from the line if they fail.

Transmission Configurations

Suspension 1

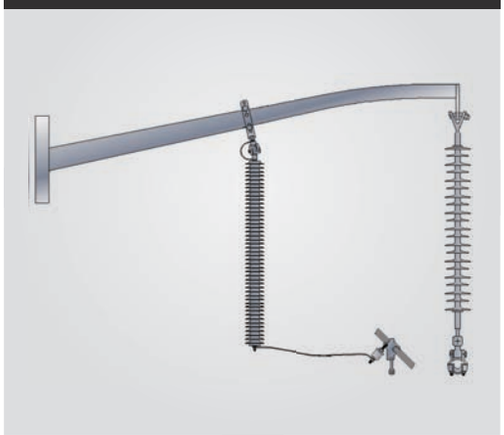
Suspension 2

Suspension 3

Suspension 4

Cross Arm Mount

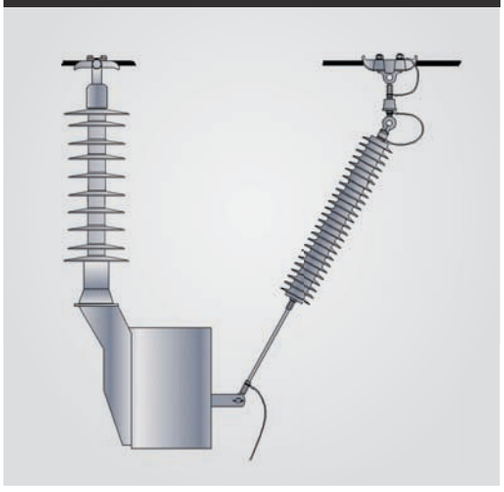
Davit Arm



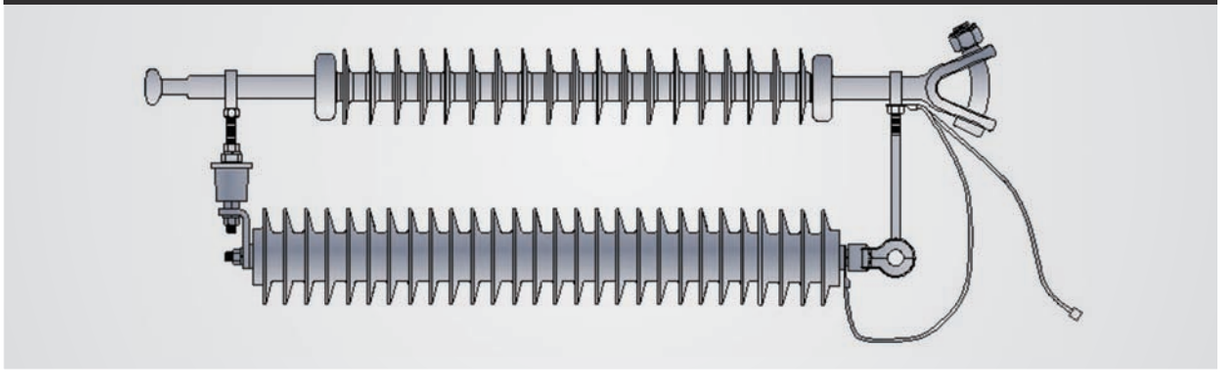
Transmission Configurations

Vertical Tangent 1

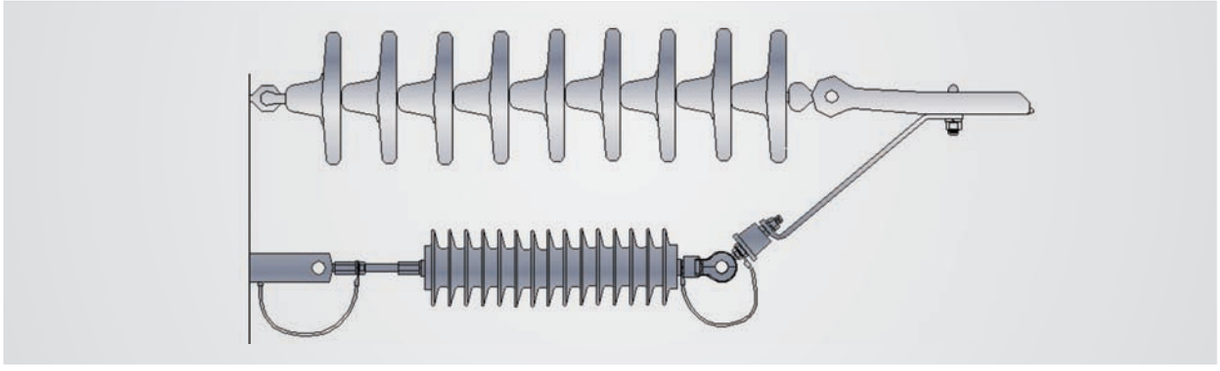
Vertical Tangent 2



Deadend 1

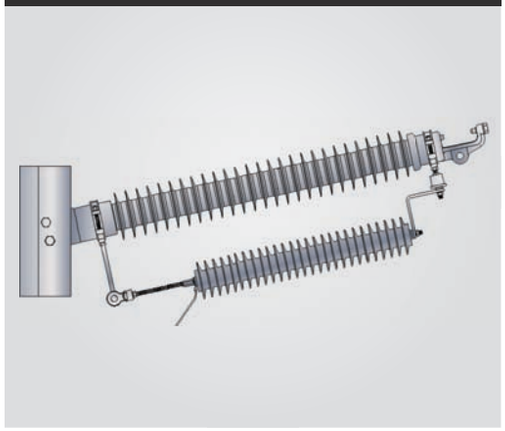


Deadend 2

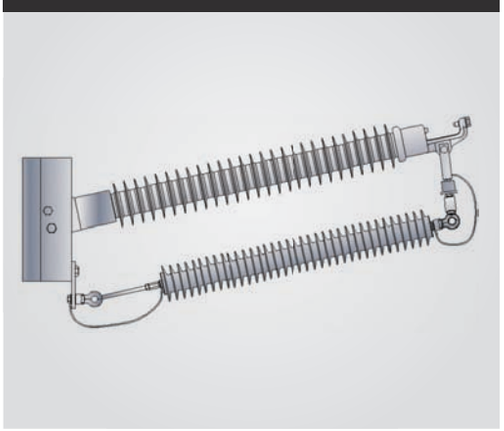


Transmission Configurations

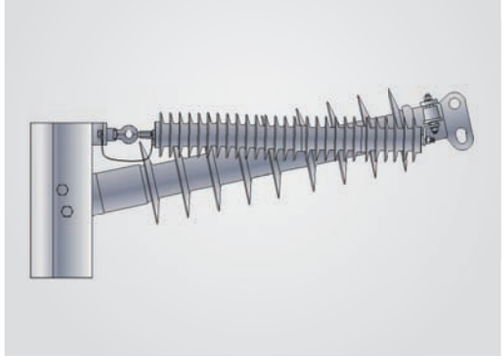
Horizontal Assembly Post 1



Horizontal Assembly Post 2



Horizontal Assembly Post 3



Flash Fact:

Insulators are not damaged by lightning flashovers.

Selecting Protecta*Lite

Step 3: Additional Considerations

We're willing and able to accommodate a variety of customization needs within our Protecta*Lite system. If you have any unique or specific requirements, such as:

- Accommodating a unique conductor size
- Requiring a specific length of ground lead

Please let your Hubbell Representative know so we can provide you with the Protecta*Lite system that will best protect your power grid.

Flash Fact:

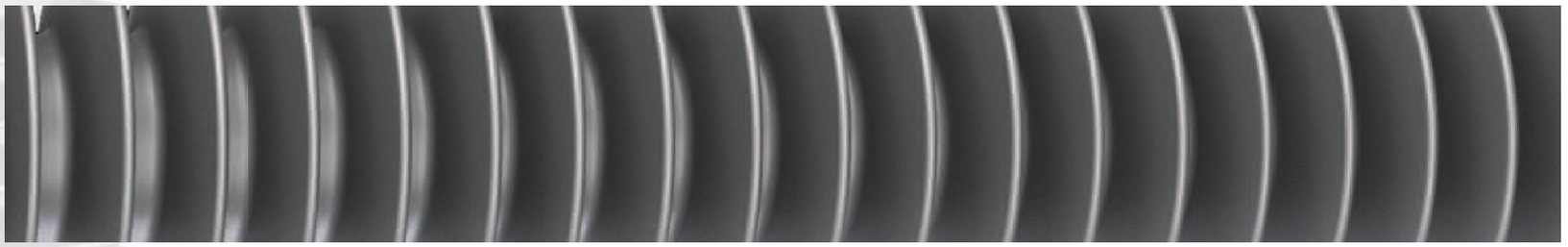
Arresters are the only way to offer 100% lightning protection to an insulator.

Selecting Protecta*Lite

Step 4: Place Your Order

Contact Your Hubbell Representative – Because each Protecta*Lite system is custom built to suit your individual needs and specifications, we no longer use a universal part-numbering order system.

Once you've identified your arrester size, configuration and additional requirements, all you have to do is contact your Hubbell representative.



You also can reach us at:

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protection

Technical Terms Reference Guide

Back Flashover: A flashover of insulation resulting from a lightning strike to part of a network or electric installation that is normally at ground potential.

Discharge Voltage: The voltage level that the arrester clamps to during a surge in kV. Sometimes referred to as IR.

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

Flashover: An electrical disruptive discharge around or over the surface of an insulator. This typically results in the operation of an over-current device.

Ground Flash Density: The average number of lightning strikes per unit area per unit time at a particular location.

Keraunic Level: The number of active thunderstorm days annually.

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.

Metal-Oxide Surge Arrester (MOSA): A surge arrester utilizing valve elements fabricated from nonlinear resistance metal-oxide materials.

MOV (Metal Oxide Varistor): The power semiconductor that limits the surge voltage, allowing the arrester to perform its protection function.

OHSW (Overhead Shield Wire): Grounded wire or wires placed above phase conductors for the purpose of intercepting direct strikes in order to protect the phase conductors from such strikes. They may be grounded directly or indirectly through short gaps. Sometimes referred to as Overhead Ground Wire.

Technical Terms Reference Guide

Shield Angle: The angle between the vertical line through the Over Head Ground Wire and a line connecting the Over Head Ground Wire with ground.

Structure Footing Resistance: The resistance between the tower grounding system and true ground.

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.

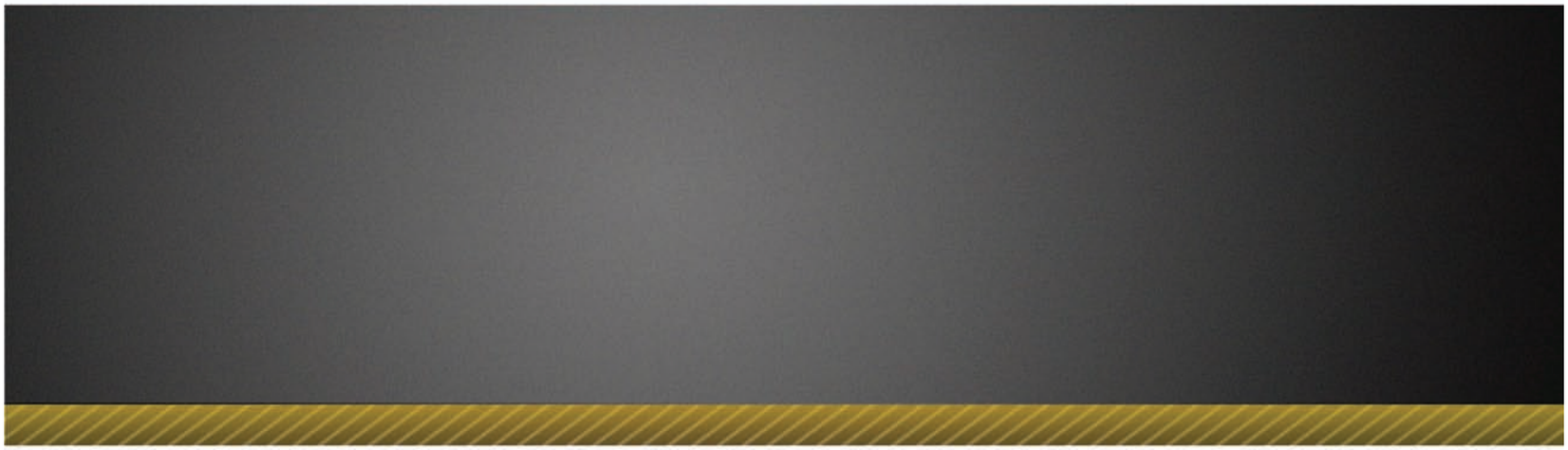
TLA: Transmission Line Arrester

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.

Flash Fact:

More than half of all lightning flashes consist of more than one strike.

safety



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Never Compromise™
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