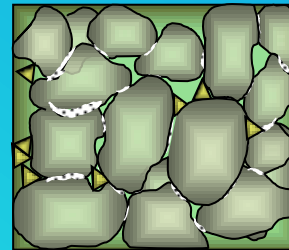
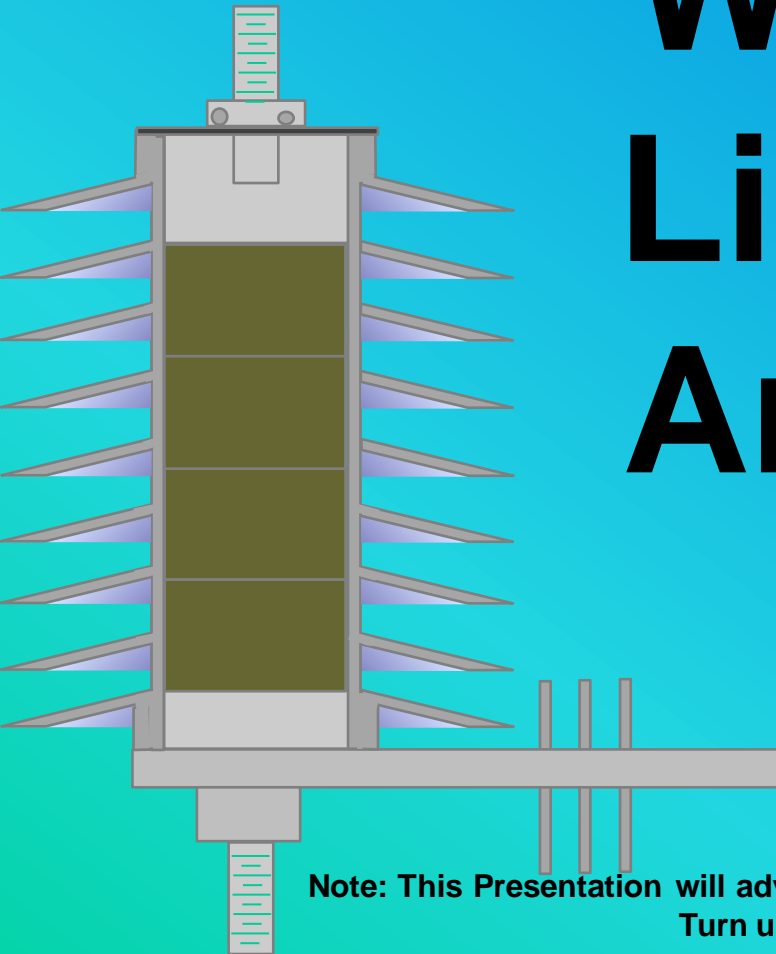
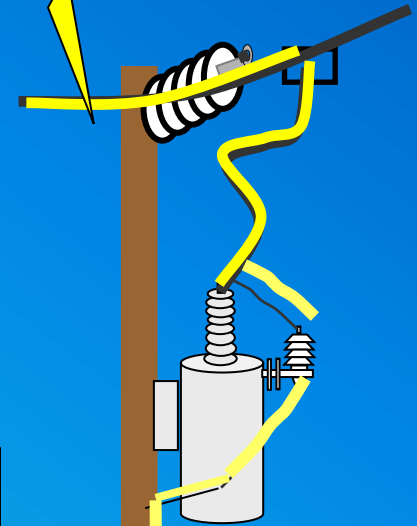


# What is a Lightning Arrester?



Note: This Presentation will advance automatically but it can be done manually if desired  
Turn up your volume for the best effects



**NO.....**  
**It's not a**  
**very fast**  
**Police**  
**Officer**

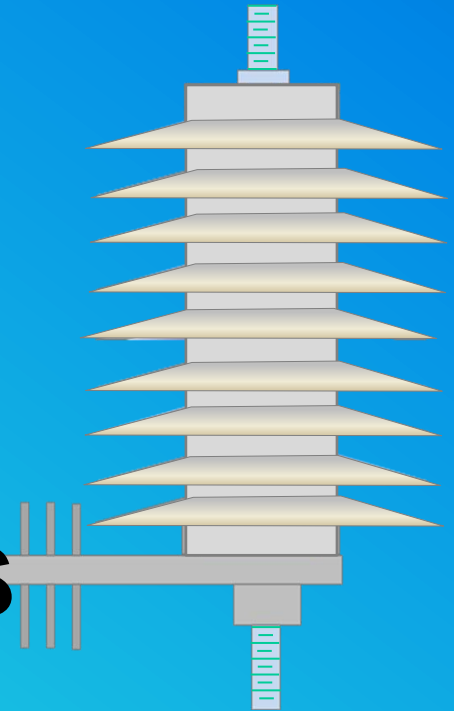
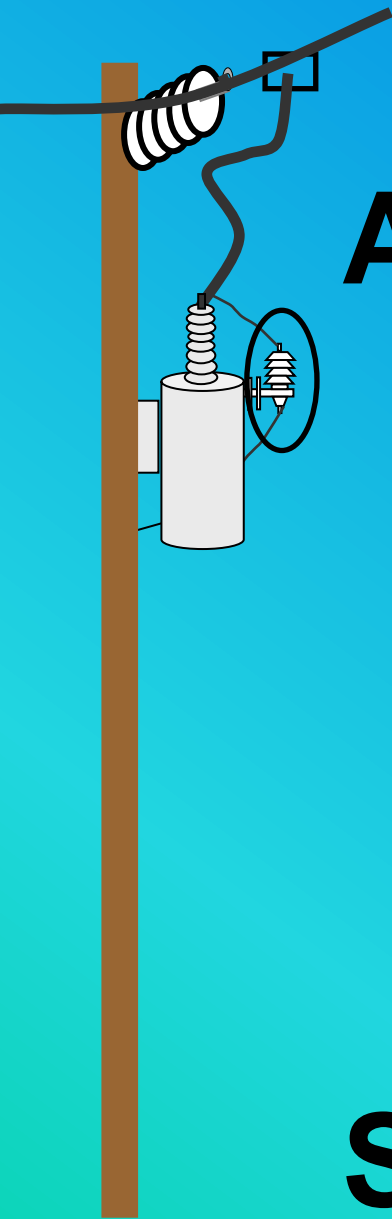




**According to  
most definitions,  
a Lightning  
Arrester is....**

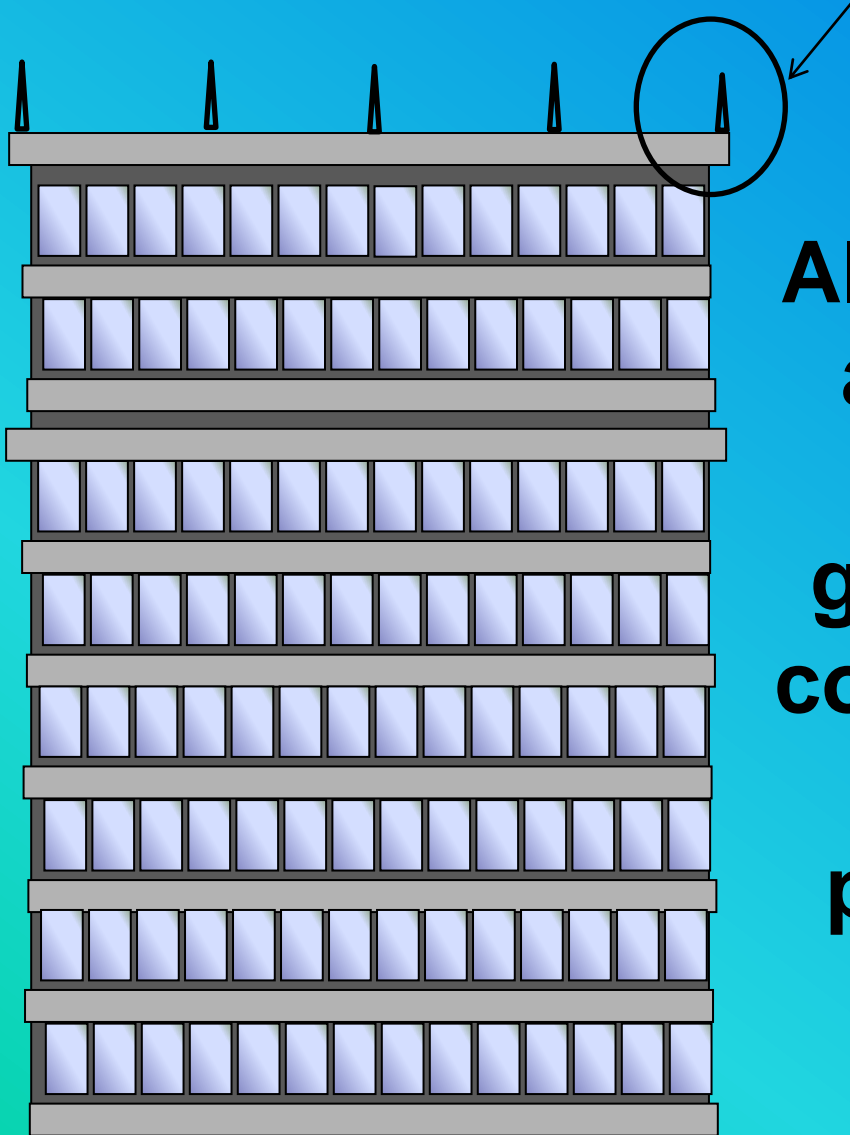


**A Device Used on  
Power Systems  
above 1000V to  
Protect other  
Equipment from  
Lightning and  
Switching Surges**





**It is not a Lightning Rod.**



**Although Lightning Rods are devices that divert lightning surges to ground, they are simple conductive terminals that are always at ground potential and are never energized.**



# Other Devices Similar to Lightning Arresters

**Surge Suppressor:** This is also a surge diverter, but generally for voltages well below 1000 volts.

**TVSS** (Transient Voltage Surge Suppressor) Again this is also a surge diverter, but generally for voltages well below 1000 volts.



# How do Lightning Arresters Protect Power Systems?

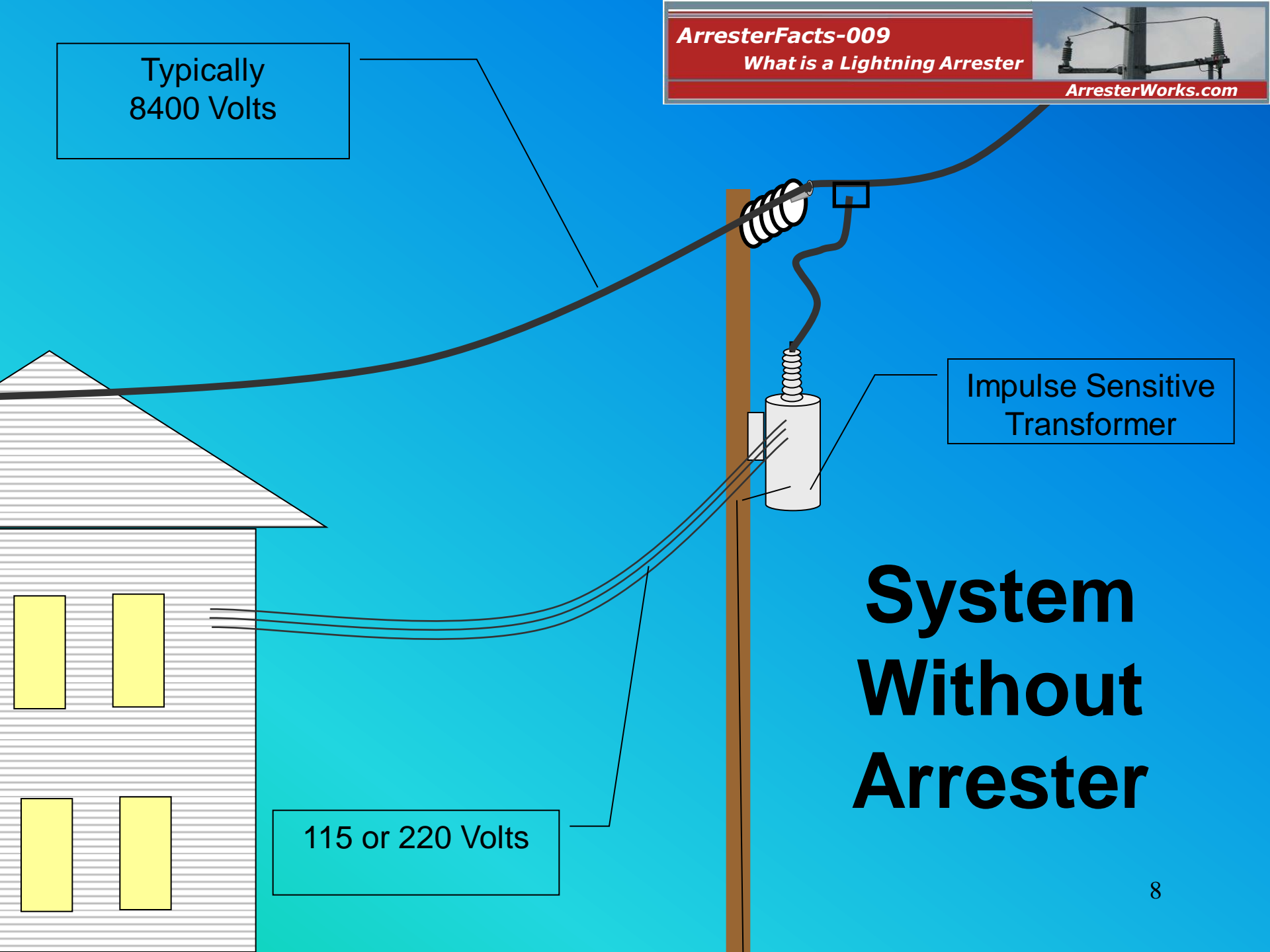


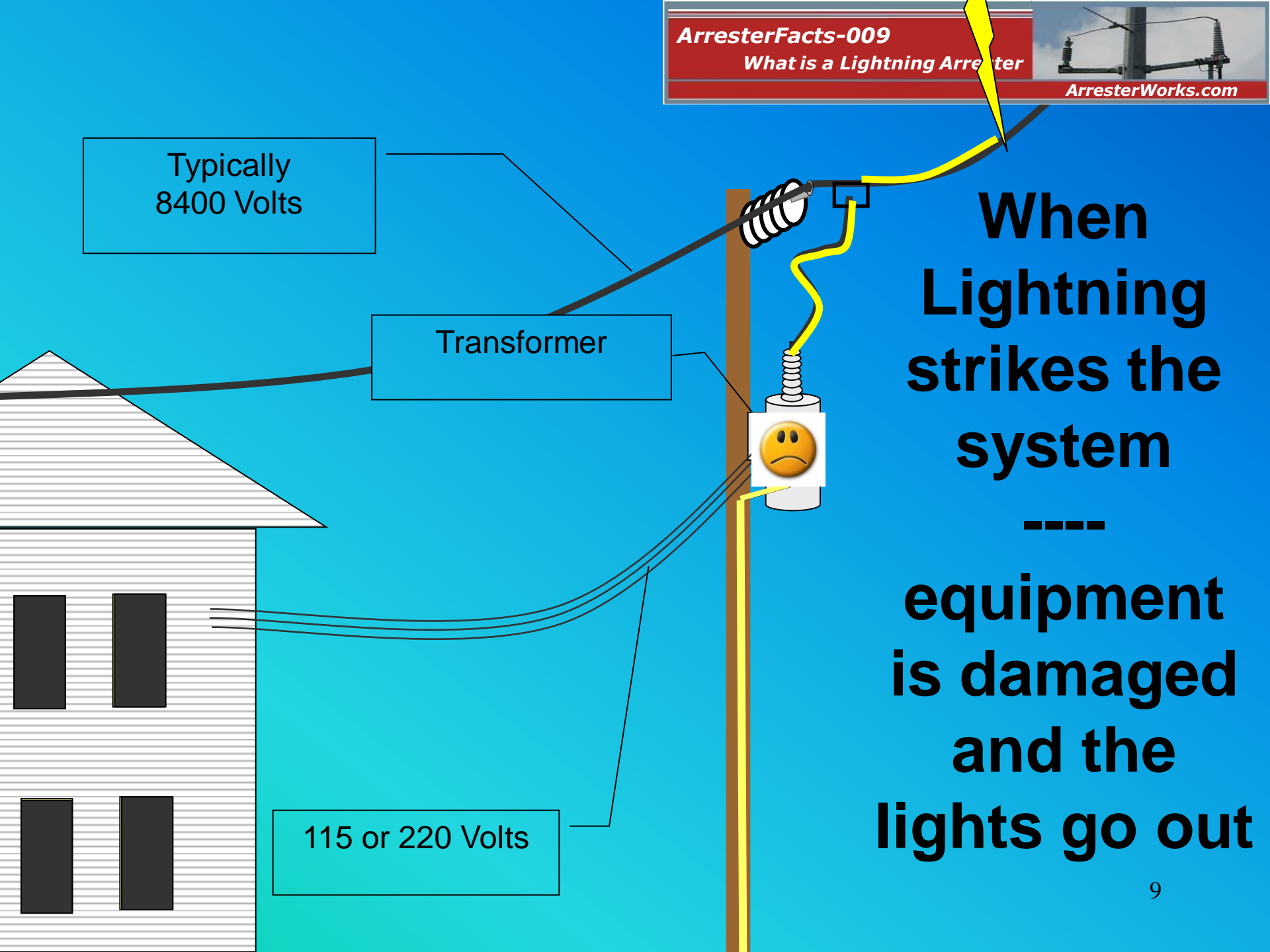
Typically  
8400 Volts

Impulse Sensitive  
Transformer

# System Without Arrester

115 or 220 Volts





Typically  
8400 Volts

Transformer

115 or 220 Volts

**When  
Lightning  
strikes the  
system**

**----  
equipment  
is damaged  
and the  
lights go out**

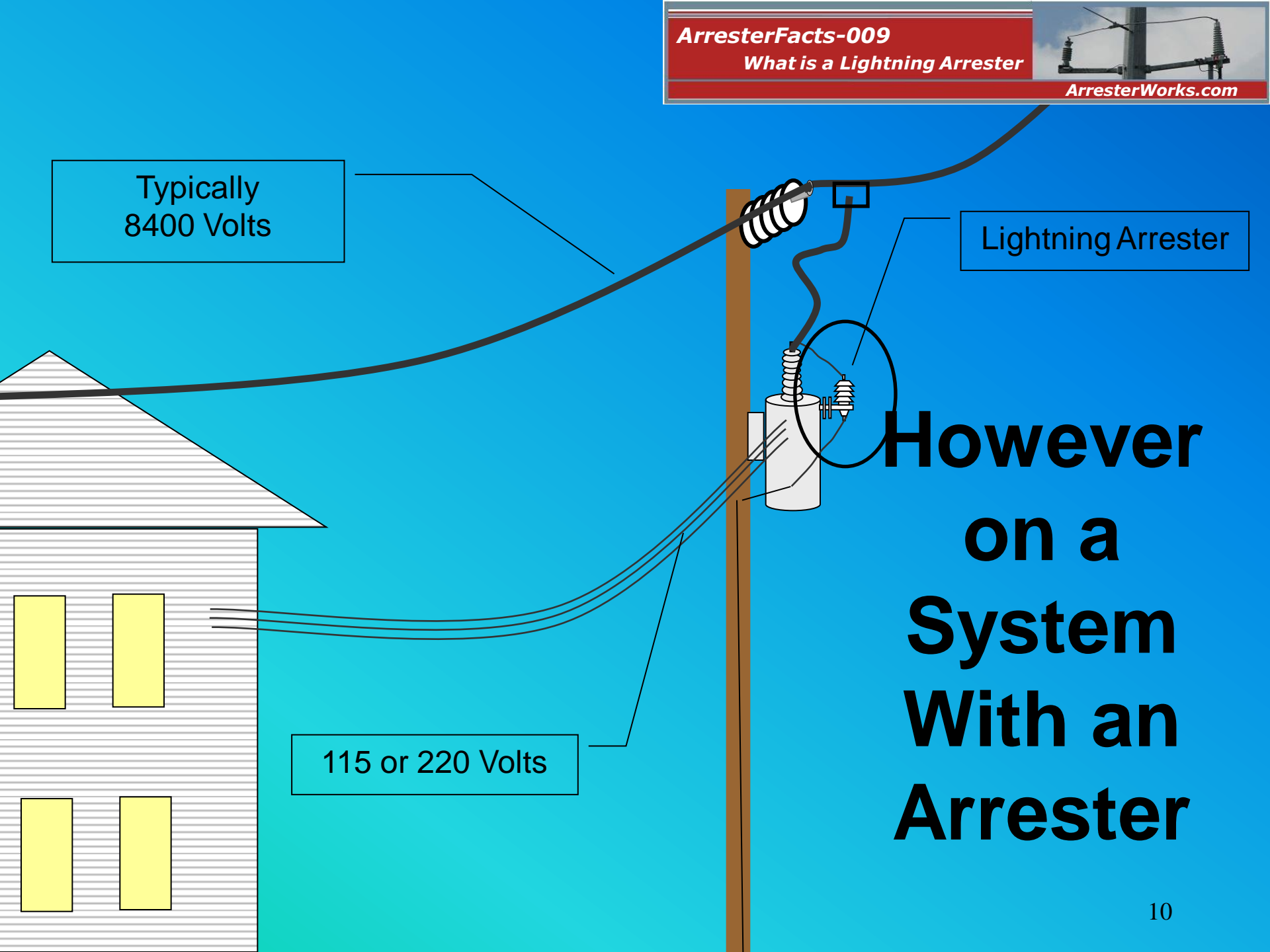
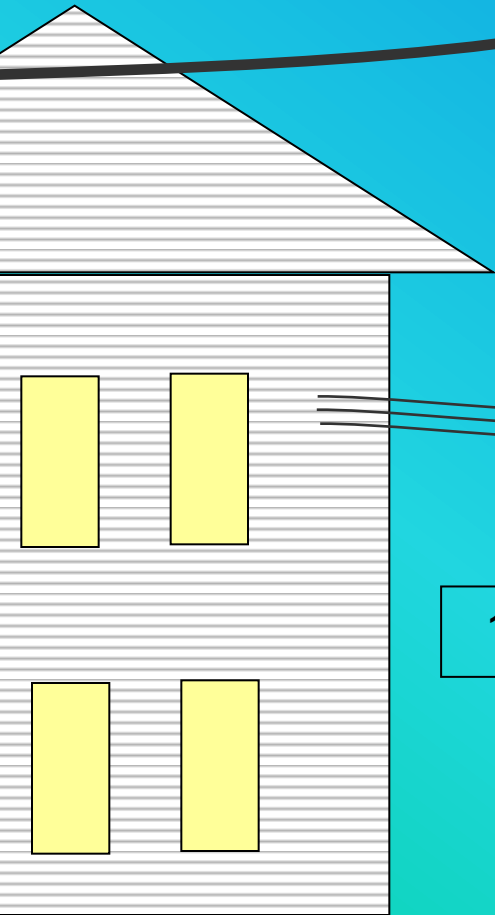


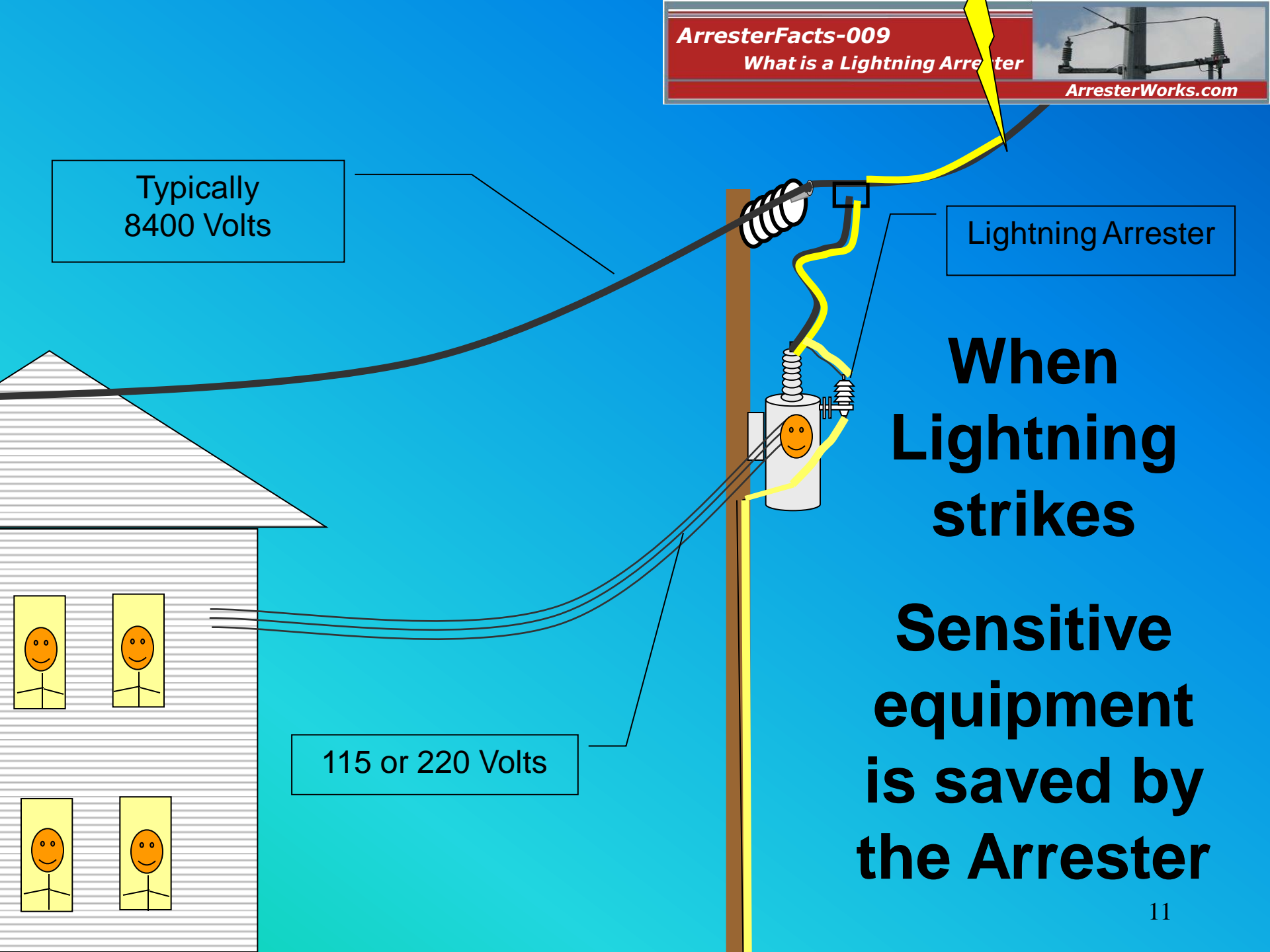
Typically  
8400 Volts

Lightning Arrester

**However  
on a  
System  
With an  
Arrester**

115 or 220 Volts





Typically  
8400 Volts

Lightning Arrester

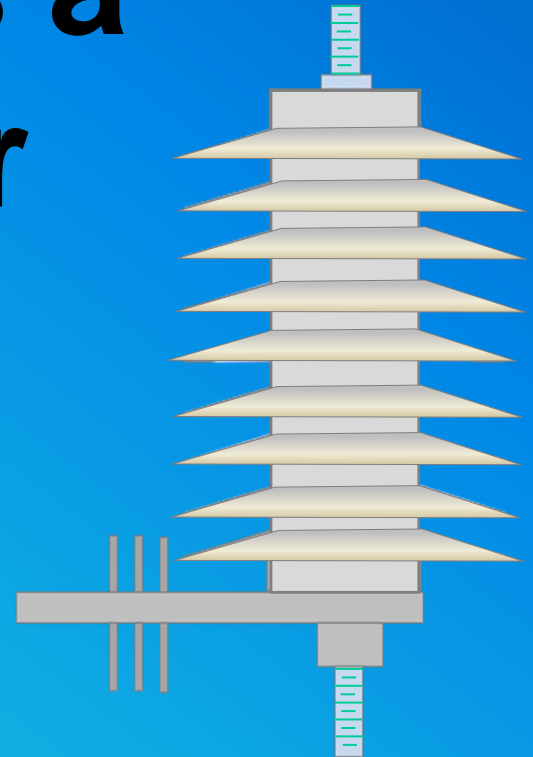
**When  
Lightning  
strikes  
Sensitive  
equipment  
is saved by  
the Arrester**

115 or 220 Volts



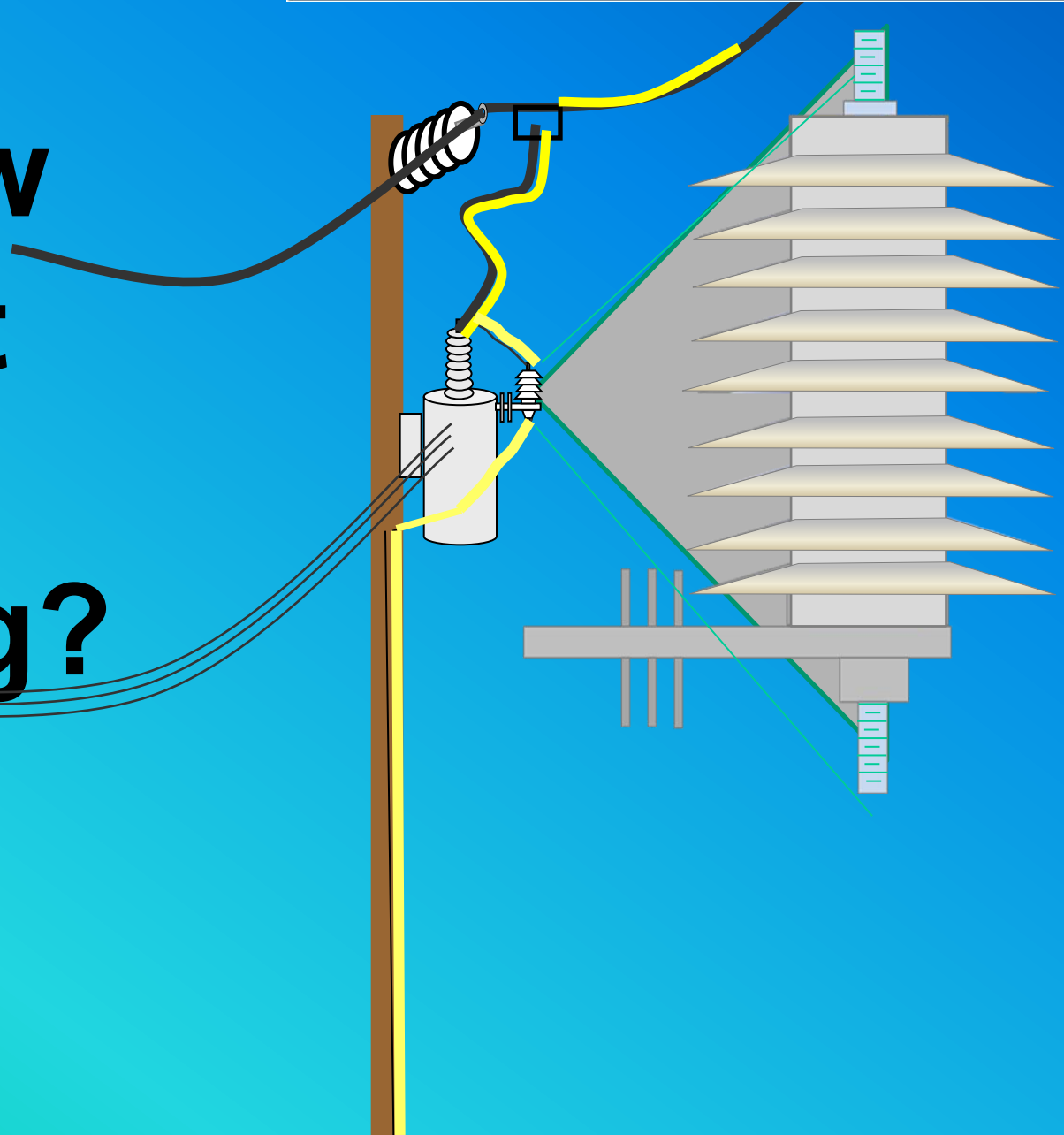
# What exactly does a lightning arrester do?

- It Does not Absorb the Lightning
- It Does not Stop the Lightning
- It Does **Divert** the Lightning to Ground
- It Does Clamp (limit) the Voltage produced by the Lightning
- It Only protects equipment electrically in parallel with it.





Ok, how  
does it  
divert  
lightning?

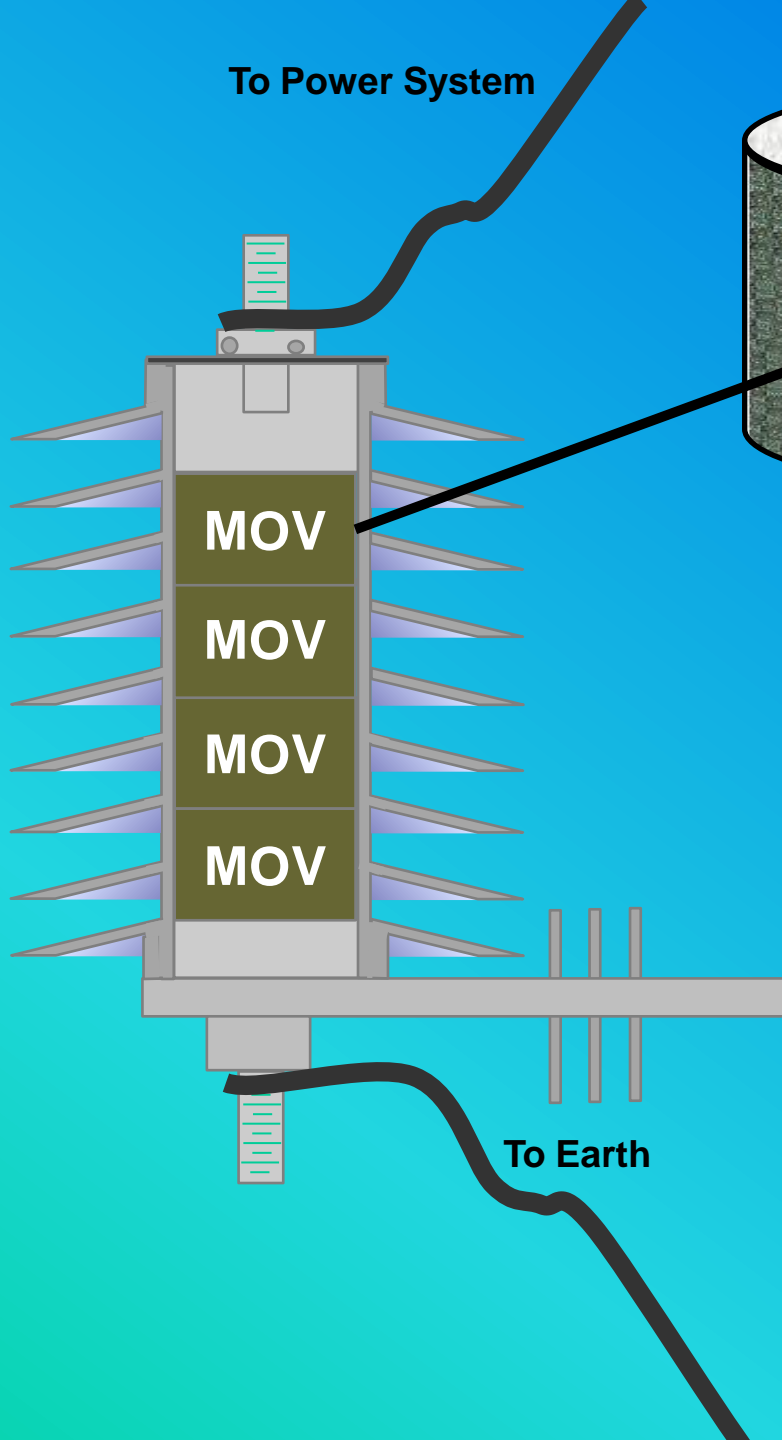


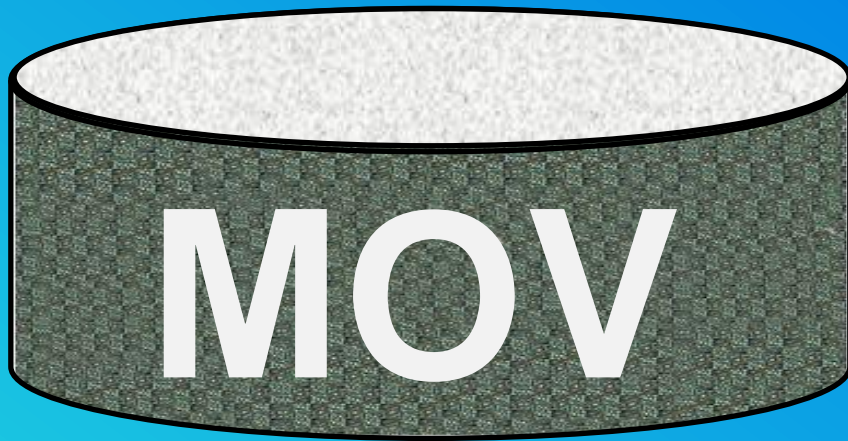


At the Heart of All Arresters is the Metal Oxide Varistor (MOV)

The MOV Disk is a Semiconductor that is sensitive to Voltage.

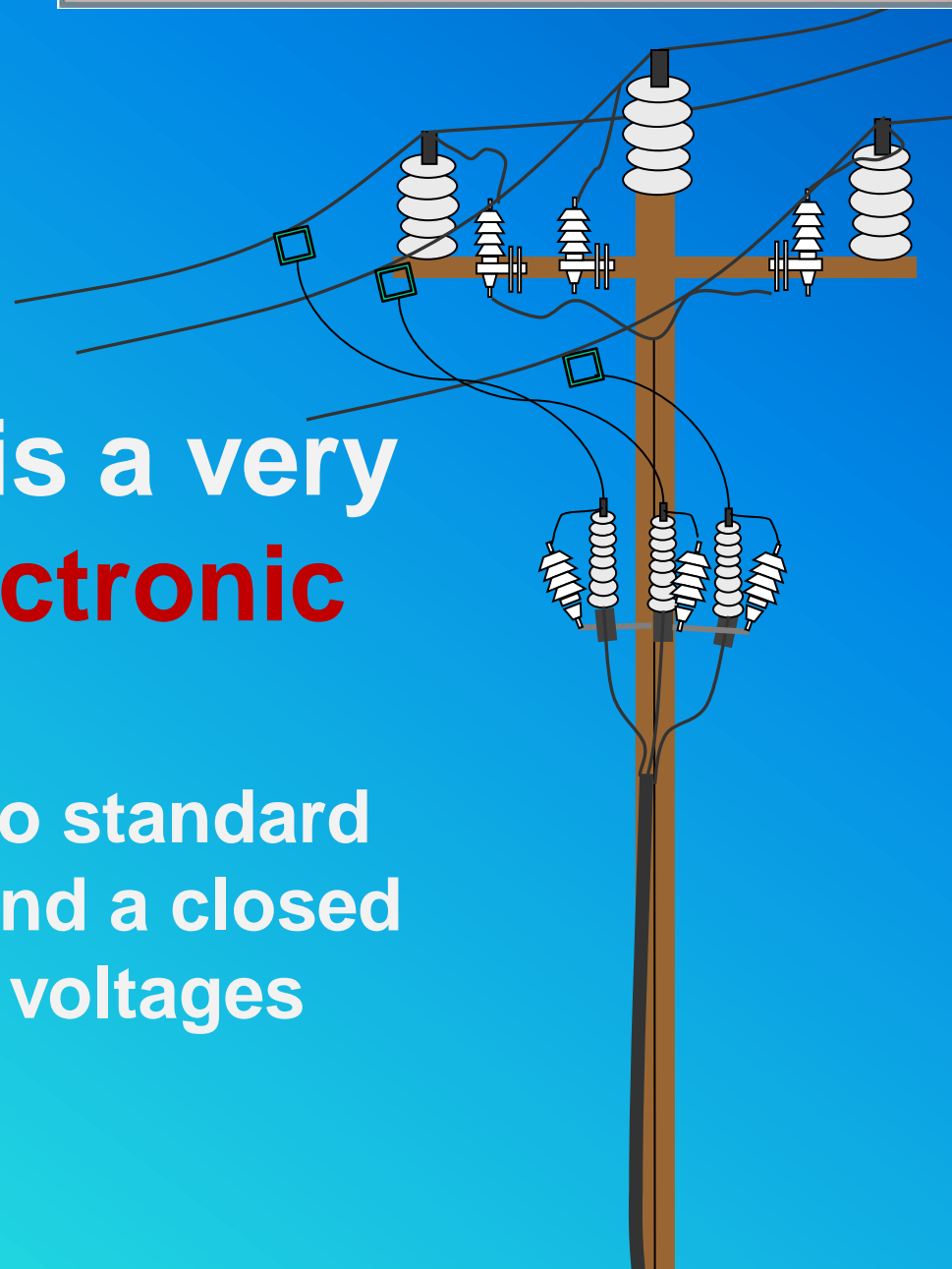
At normal Voltages the MOV disk is an insulator and will not conduct current. But at higher voltages caused by lightning it becomes a conductor

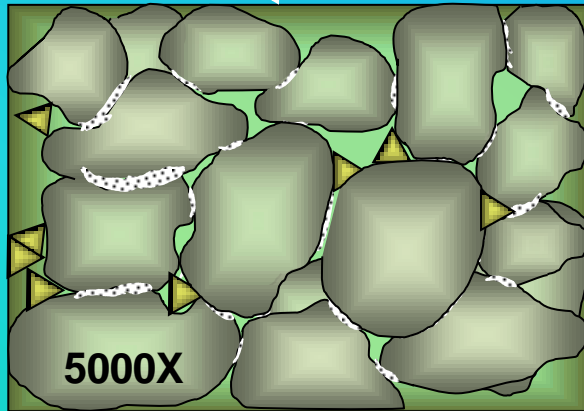
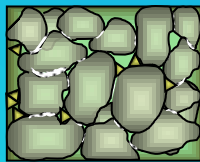
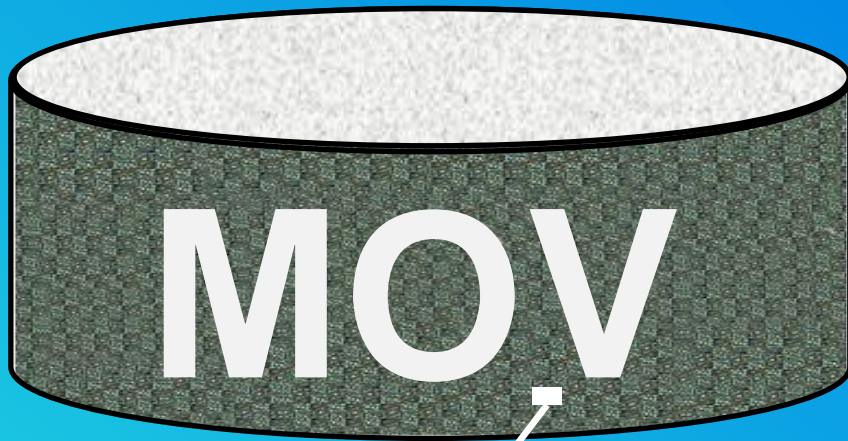




The MOV Disk is a very  
**fast acting electronic**  
**switch**

It is an open switch to standard  
system AC voltages and a closed  
switch to lightning voltages





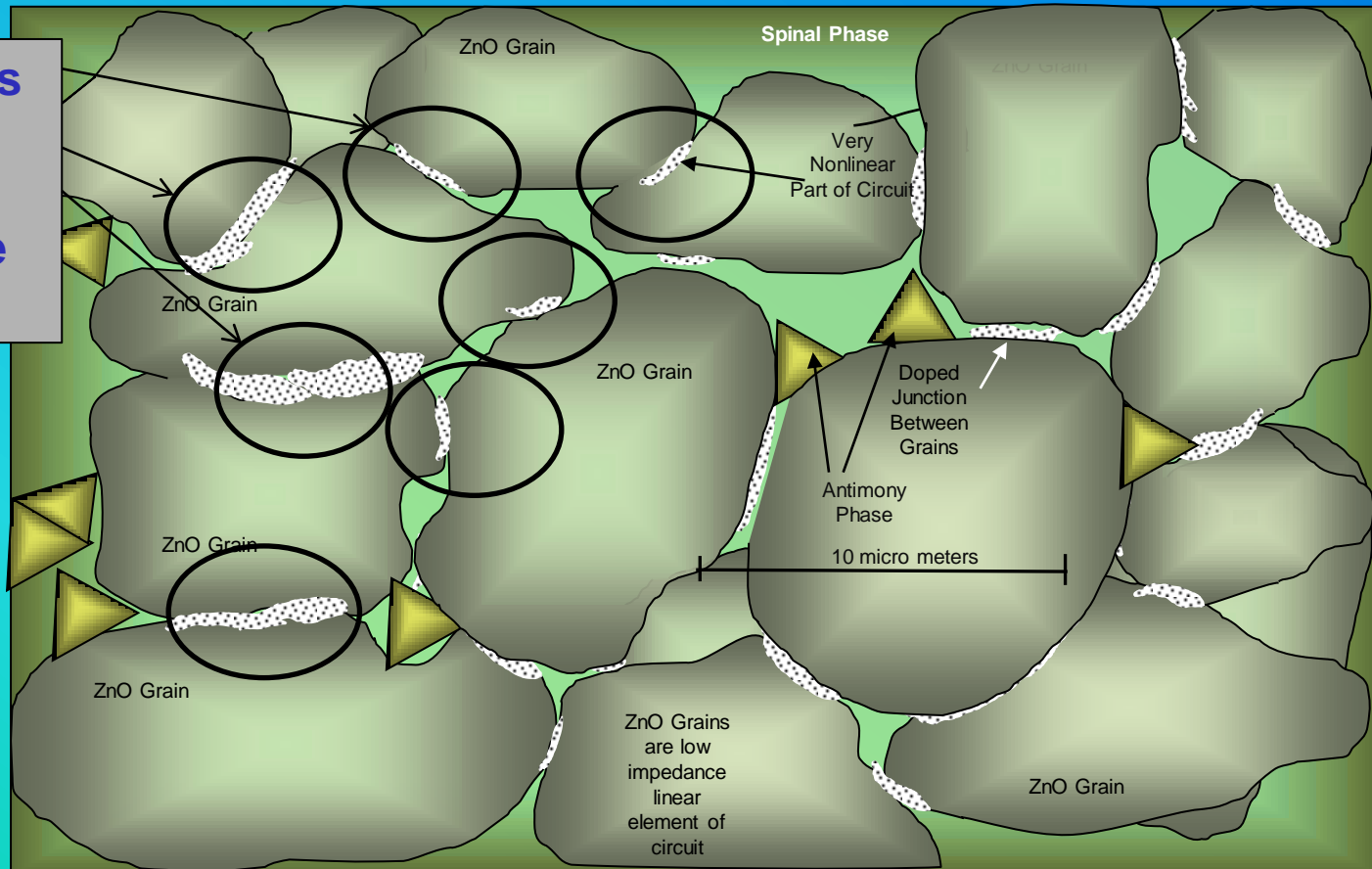
By magnifying the MOV material 5000 times, Metal Oxide Grains and Dopants in the material can be discerned

Each MOV Disk with a 35mm diameter and a 35mm height contains about **28 Billion** MOV Grains



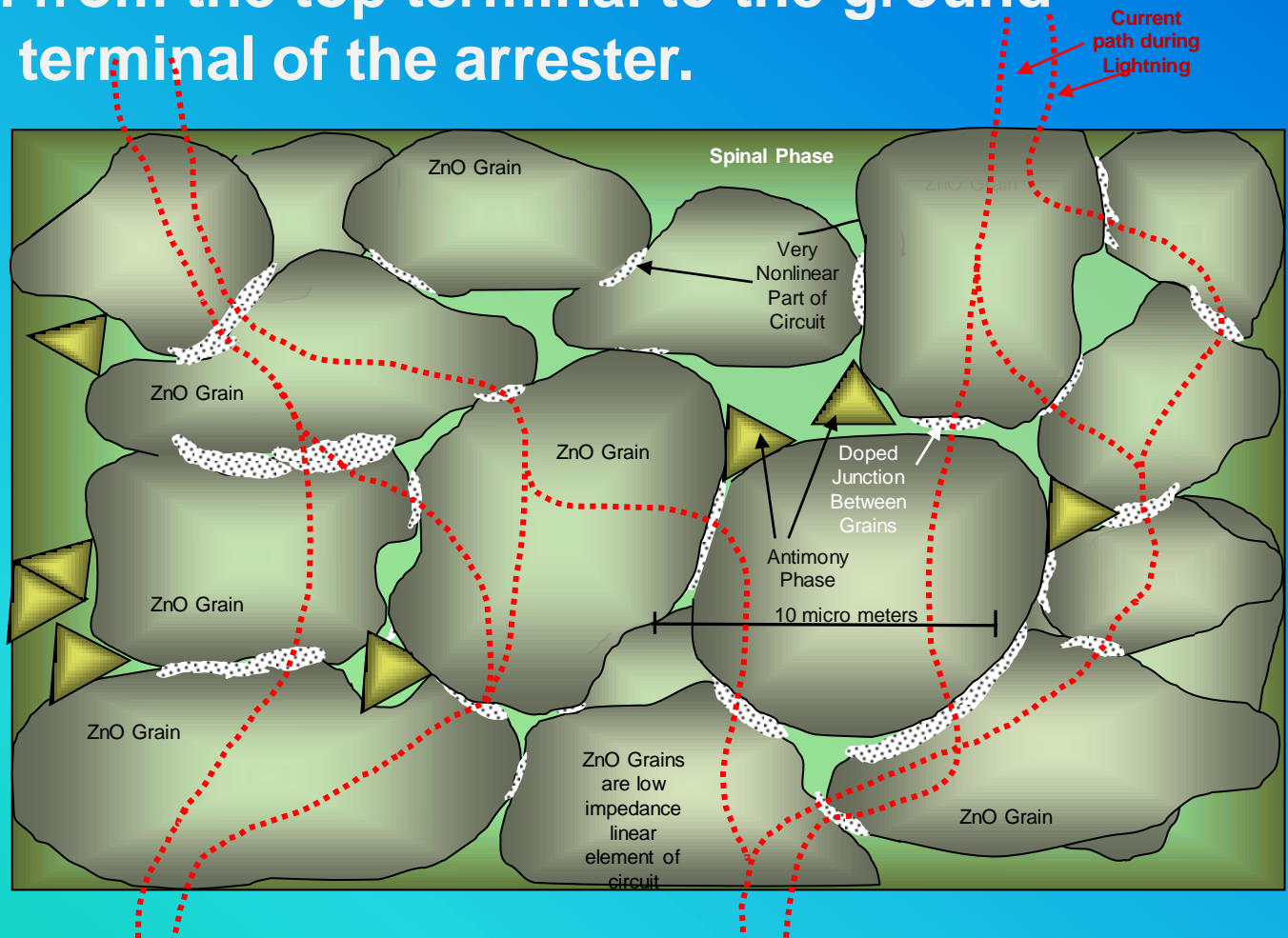
The MOV Grains and their Junctions are the Electronic Switches that turn on and off in unison to divert the lightning around the equipment.

The Switches are at the junctions between the grains



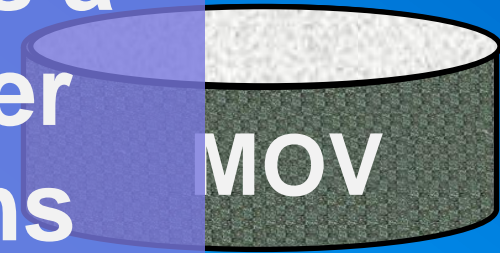


A lightning arrester is essentially a collection of billions of microscopic junctions of Metal Oxide Grains that turn on and off in microseconds to form a current path from the top terminal of the arrester to the ground terminal of the arrester.

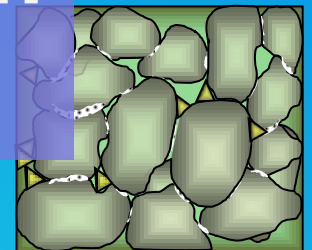




So there you have it. A Lightning Arrester is a device, used on power systems, that contains billions of electronic switches that divert lightning around sensitive equipment and saves them from damage.



MOV  
MOV  
MOV  
MOV



# ***ArresterFacts-009***

## ***What is a Lightning Arrester***



***ArresterWorks.com***

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**Rev 11-11**