

# THE NEW STANDARD IN LIGHTNING PREVENTION



## CMCE<sup>®</sup>120 Lightning Suppressor

Effective against lightning and other forms of electromagnetic pulses, the CMCE 120 is the most advanced lightning protection device on the market. With over 8000 installations worldwide utilizing this technology – and no reported strikes in over 15 years – the CMCE 120 is positioned to be the new standard in global lightning prevention.

The CMCE 120 continuously balances the protected areas electromagnetic field – downstreaming excess energy harmlessly into the ground – eliminating the development of upward streamers.

### SPECIFICATIONS

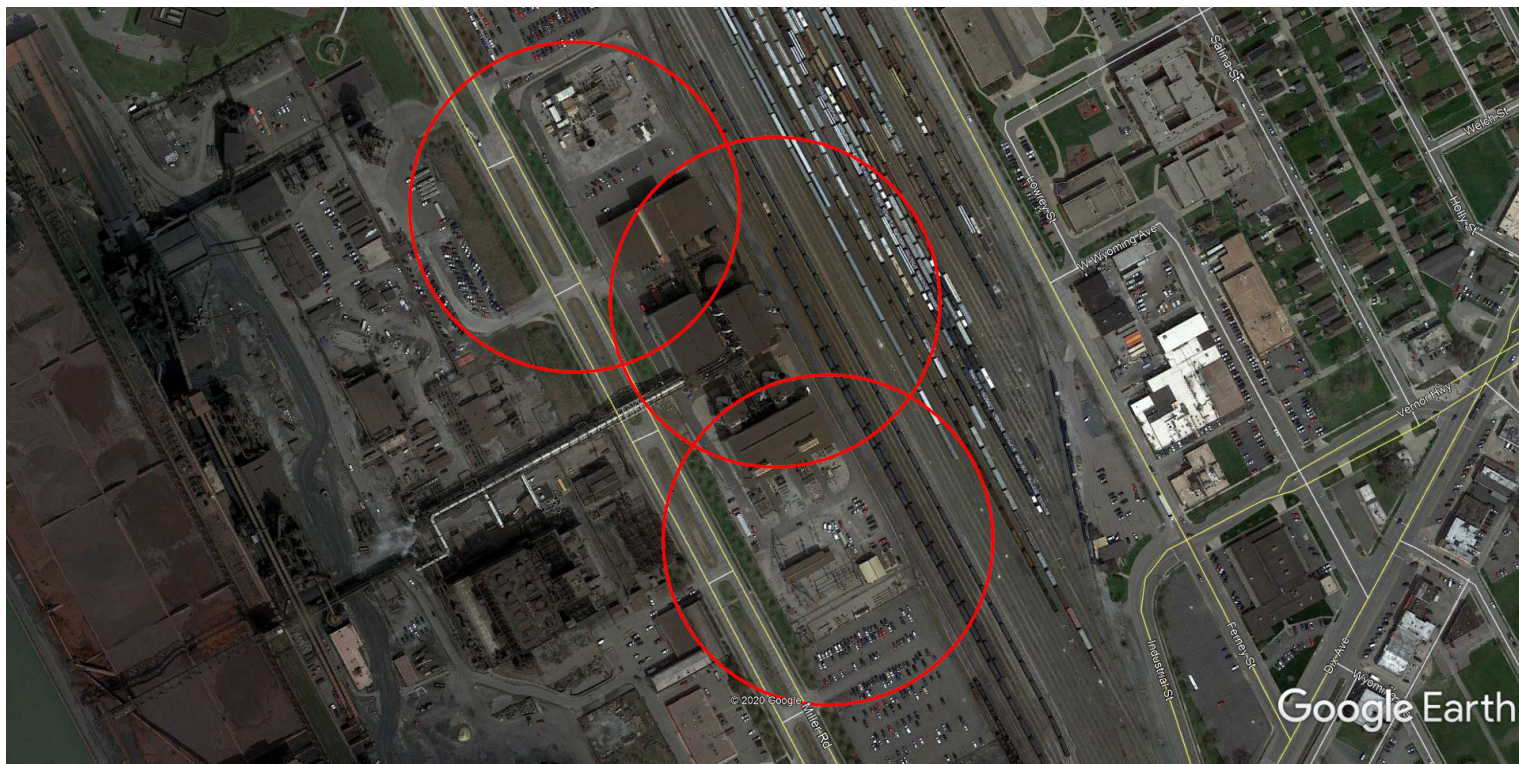
<b>DEVICE</b>	6-Modified Capacitors
<b>COVERAGE</b>	393 ft (120 m) Radius
<b>DISSIPATION</b>	640,000v/Microsecond
<b>DIMENSIONS</b>	14.5h x 9.5w inches
<b>WEIGHT</b>	17.9 lbs. (7.983 kg)
<b>POWER</b>	No power required

### DEVICE DISTINCTIONS

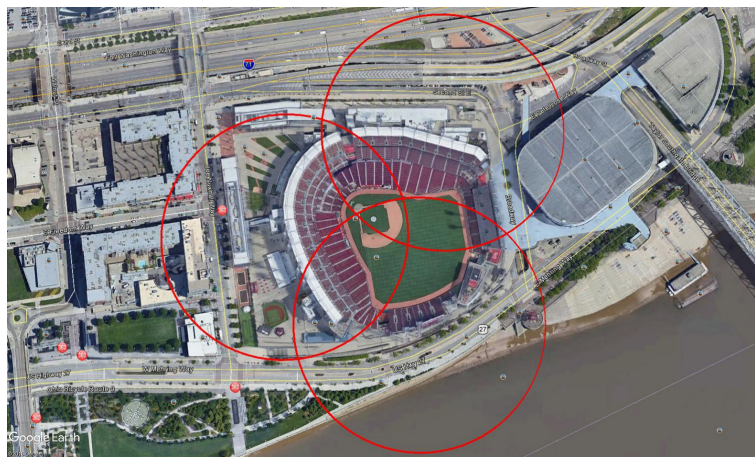
- 8000+ Worldwide installations utilizing this technology
- Lab and field tested 100% effective
- No reported strikes in over 15 years!
- < 5Ω Ground resistance critical infrastructure install target range
- 10 Year Manufacturer Warranty



## COVERAGE EXAMPLES



CMS Energy - Dearborn Industrial Generation  
Each circle represents one device with a coverage radius of 120 m each.



Great American Ball Park-Cincinnati, OH



Chemical Plant - Example Only



# INSTALLATIONS



# OPERATING PRINCIPLES

During a thunderstorm, winds within the storm cloud cause precipitation particles to collide. These collisions cause very small ice crystals to lose electrons while larger particles of soft hail gain electrons.

Upward winds within the cloud redistribute these particles and the charges they carry. The soft hail causes a negative charge build up near the middle and lower part of the storm cloud which, in turn, causes a positive charge to build up on the ground beneath the storm cloud.

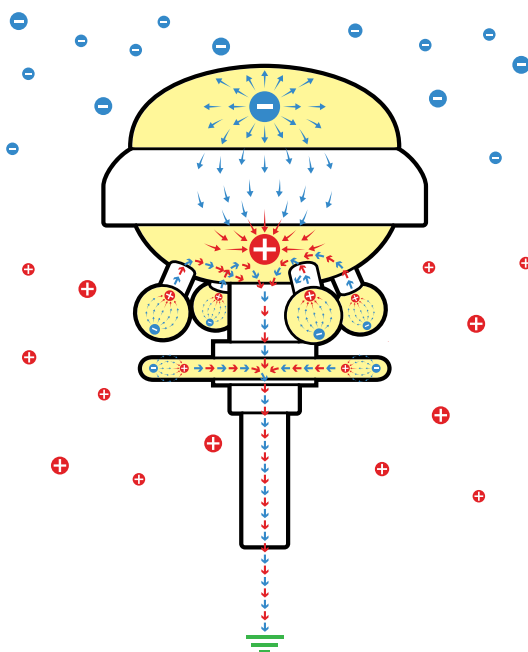
Eventually, when the charge difference between the negative charge in the cloud and the positive charge on the ground become large, the negative charge starts moving toward the ground. As it moves, it creates a conductive path toward the ground.

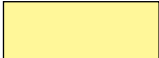
This path follows a zigzag shape as the negative charge jumps through segments in the air. When the negative charge from the cloud makes a connection with the positive charge on the ground, current surges through the jagged path, creating a visible flash of lightning.

## LIGHTNING CANNOT BE STOPPED. ENERGY BUILDING UP IN STORM CLOUDS NEEDS TO BE RELEASED. WHAT CAN BE CONTROLLED IS WHERE THAT LIGHTNING DOESN'T STRIKE!

The CMCE 120 acts as a modified capacitor collecting positive and negative charges from the atmosphere, structures beneath the device and the ground, reducing the difference of potential and eliminating the development of upward streamers.

By eliminating the development of upward streamers lightning is prevented from developing. Stepped leaders will continue to seek out a pathway to release its energy, but for areas protected by the CMCE 120 Lightning Suppressor those pathways are eliminated



 = Capacitor

Each capacitor has one of its electrodes referenced to earth.

The free electrode induces atmospheric charges contrary to that of the earth, balancing the charge of the electrodes which generates a potential difference.

This generates a flow of charges to earth in harmless milliamps.

# TECHNOLOGY COMPARISON

CMCE 120	CONVENTIONAL LIGHTNING RODS/EARLY STREAMER EMISSION RODS
Does not stimulate or capture lightning.	Stimulates and captures lightning.
During storm activity, maximum transfer values (leak currents) of 30 $\mu$ A may be registered through the grounding wire with leaks of 300 $\mu$ A with lightning activity within 300 m of device.	During storm activity, maximum transfer values (leak currents) may be registered. In the event of a direct strike 120 A to 350,000 A, medium values of 30,000 A to 70,000 A.
The electrostatic charge within the protected coverage area is progressively compensated to earth as the difference of potential between cloud and ground increases.	The probability of lightning striking a rod increases 70-80% during storm activity. The intensity of a lightning strike is impossible to predict exposing assets to potentially severe levels of damage.
Especially effective for protecting high-risk special hazard environments prone to fire or explosion.	Not recommended for environments with special hazards since it stimulates and attracts lightning.
Does not generate electromagnetic pulses, over-tensions, over-intensity or electric risks in within the protected area.	The largest contributor of electromagnetic pulses.
Does not generate electromagnetic compatibility effects.	Generates electromagnetic pulses, over-tension, over-intensity and electric risks.
Connection to earth is compatible with low tension ground connection. Providing the ground resistance is < 10 $\Omega$ , the device can be coupled to an existing ground connection.	Connection to earth is not compatible with low tension ground connections and should be independent from existing high-tension connections.
Does not contain electronic elements.	Early streamer emission rods contain electronic elements.
99% effective in minimizing facility technical interruptions.	Increases the percentage of facility technical interruptions related to direct strike.

# COST OF A STRIKE

Realistic numbers show that damage in the U.S. exceeds \$7 billion per year. Fatalities and injuries range widely, however, 2015 has already been called the most deadly year in recent history. It is estimated that lightning accounts for 61% of all accidents in storage and processing activities, where natural events are identified as the root cause of the incidents. In North America, 16 out of 20 accidents involving petroleum products storage tanks were as a result of lightning strikes.

## PETROCHEMICAL DOWNSTREAM COSTS

**\$420,000,000** — Plant loss in Texas

**\$52,000,000** — Plant loss in Oklahoma

**\$52,000,000** — Plant loss in Virginia

Source: Willis Energy Market Review, 12/13

## STORAGE & PROCESSING ACTIVITIES

**61%** — Incidents caused by lightning.

**80%** — Incidents involving petroleum products storage tanks attributed to lightning strikes.

Source: Journal of Hazardous Materials

**30%** — U.S. businesses damaged by lightning.

Source: Carnegie Mellon Report

## ELECTRICAL INFRASTRUCTURE

**35%** — Annual lightning related power outages exceeding \$1 Billion in losses.

Source: Ralph Bernstein, EPRI

**19%** — Nuclear power plant safety activations initiated by lightning.

Source: U.S. Nuclear Regulatory Commission.

## MARINE

**#3** — On the list of highest average dollar amount of insurance claims.

## FIRES

**12,000** — Number of lightning initiated wild fires - per year - over a 7 year study.

Source: National Inter-agency Fire Center 2007

**18%** of all lumber yard fires and **30%** of all church fires are caused by lightning.

Source: Ohio Insurance Institute.

**31,000+** — U.S. Fire Departments' annual response rate to fires caused by lightning resulting in \$214M in property damage.

Source: NFPA 2008

## INSURANCE LOSSES

**\$1.065B+** — Cost of homeowner claims in 2008 attributed to light strikes.

Source: Insurance Information Institute.

**\$5 Billion+** — Total insurance losses due to lightning strikes reported in 2006.

Source: TMCNet Newsletter, 2006

## MINING

**7 Weeks** — Production shutdown to a Tennessee mining operation when a smelter pot line is 'frozen' by a lightning induced electrical outage. Production is shut down for 7 weeks. (2007)

**12** — Miners killed, 2005 West Virginia, when lightning strike results in a methane gas explosion.

# CERTIFICATIONS AND WARRANTY

EMP Defense, Inc., along with its global manufacturing partner SERTEC S.R.L., works with the Quality Management System according to the international standards ISO 9001 and ISO 14001, as well as OHSAS 18001 Occupational Health and Safety applied to: design, marketing, management, assembly and assembly of the CMCE SERTEC electroatmospheric protector.

Studies of technical needs in accordance with the regulation of prevention of occupational hazards, complies with its technical specifications according to the manuals and procedures.

## REGULATIONS IN WHICH CERTIFICATE IS FOUND

- **INTN Product Certificate** (National Institute of Technology, Standardization and Metrology).
- **UNE-EN (IEC 62305: 2012)**, lightning protection: parts 1 (General principles), 2 (Risk assessment) and 3 (physical damage to structures and human risk).
- **UNE-EN 62305-1: 2011 - UNE-EN 62305-3: 2011; NFPA 780: 2011 - IRAM 2184: 2011 - CTE (Technical Building Code CODE) Su8**, security against the risk caused by the action of lightning.
- Electromagnetic compatibility according to standard **EN61000-6 (1,2,3,4): 2002** and from **EN61000-4-2** to **EN61000-4-9**.
- **Directive 2002/98/EC** on restrictions on the use of certain dangerous substances in electrical and electronic equipment, also known as the **RoHS Directive**, is designed to facilitate the dismantling and recovery of electrical and electronic equipment at the end of its life cycle.
- High Voltage Comparative Tests in the INTI according to **NFC-17100**, where the comparative difference is that there are no lightning discharges.

## 10 YEAR MANUFACTURERS WARRANTY

### ANNUAL MAINTENANCE

Mandatory annual inspections, testing and maintenance, performed by a certified technician, is required to satisfy manufacturers warranty.