

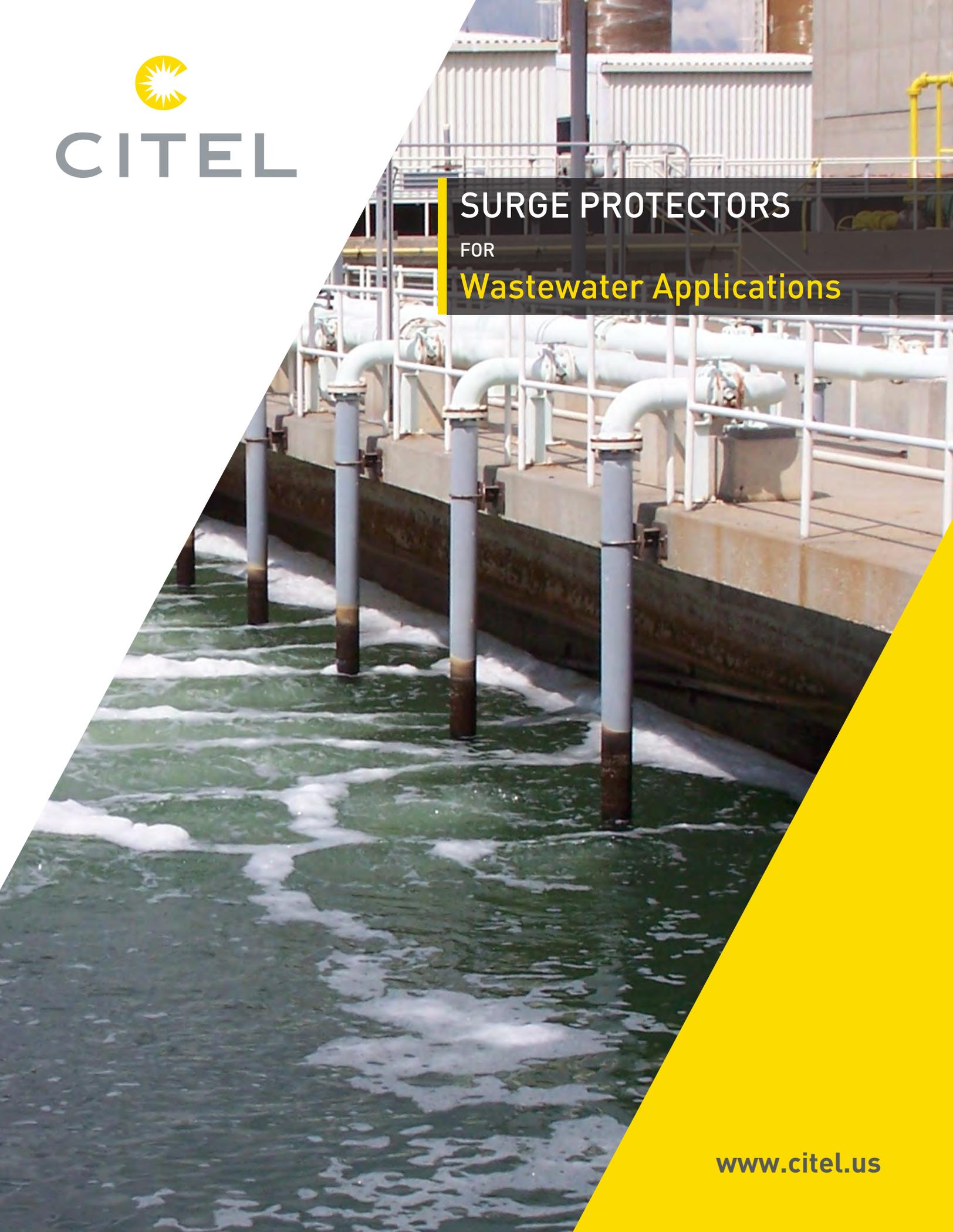


CITEL

SURGE PROTECTORS

FOR

Wastewater Applications



www.citel.us

CITEL, the global solutions provider



Since 1937, Citel has been an innovator in the field of Surge Protection. Today, Citel is a global leader in the development of reliable and adapted Surge Mitigation Solutions for critical applications.

Citel is unique as a manufacturer of Surge Protective Components (SPC's), Surge Protective Devices (SPD's) and coordinated protection systems.

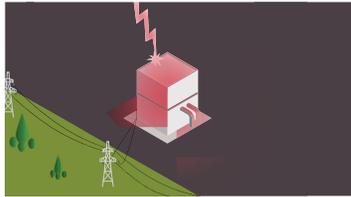
- Over 1 Billion Lines Protected
- Local support in over 200 countries
- High Current R&D Laboratories at your disposal

THREAT

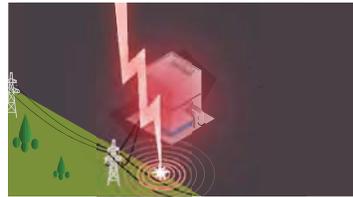
\$26B in losses due to Power Surges

Today's increased reliance on very sensitive electronics and processes make surge protection an important discussion topic in order to avoid catastrophic business losses. The Insurance Institute for Business & Home Safety study found that \$26 billion dollars was lost due to non-lightning power surges. In addition, there are about 25 million lightning strikes in the US each year that cause between \$650M to \$1B in losses according to the Insurance Information Institute, State Farm©.

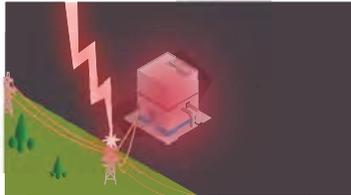
1. Direct Strike



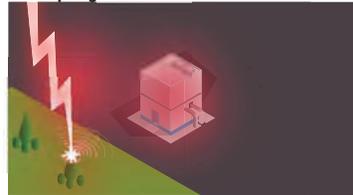
2. Earth Potential rise



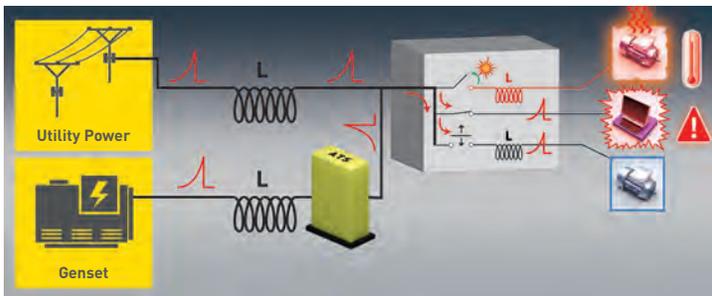
3. Strike on overhead lines



4. Coupling



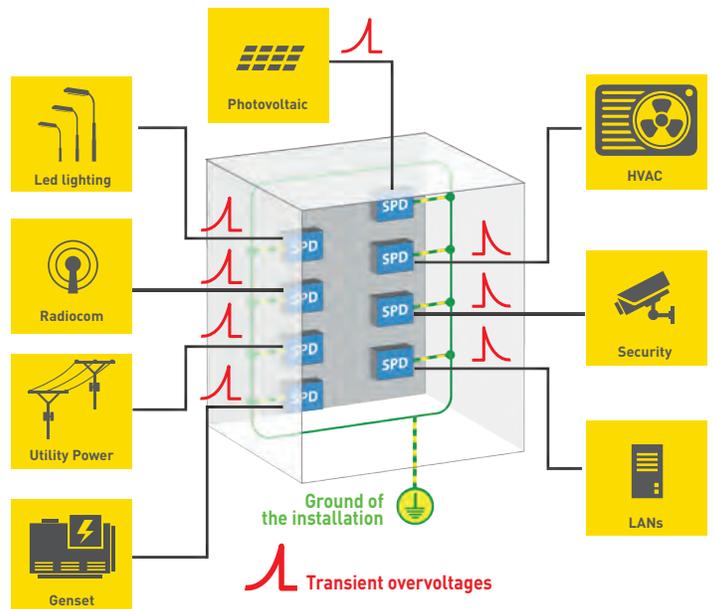
5. Switching



SOLUTION

Global Surge Mitigation Concept

Our philosophy is simple – determine your risk and evaluate every line (power or signal) for vulnerabilities. We call this the “box” concept. It works equally well for a single piece of equipment or an entire facility. Once you have determined your “boxes”, it is simple to develop a coordinated protection scheme to eliminate all threats from lightning and switching surges.

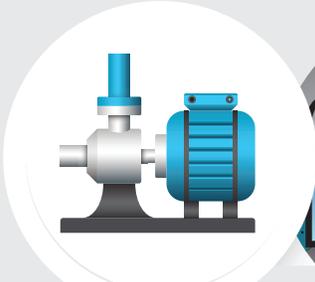


CITEL provides a wide range of surge protectors adapted to every network: **AC power, DC power, Telecom, Data and Coaxial**.

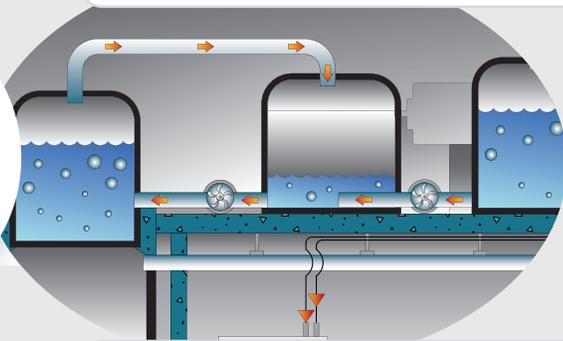
COMMON WATER & WASTEWATER APPLICATIONS

As the technology for Water & Wastewater treatment plants becomes more sophisticated, the risk of damage caused by lightning strikes and power line disturbances become more evident. Mission critical infrastructure must deploy a coordinated system of surge protection devices [SPD] to assure continuous operation.

Power Pumps and Drives



Pumps



Equipment: Pumps, Variable Frequency Drives (VFD)

Networks:

- AC Primary power supply line
- AC Pump feed lines
- DC for VFD
- Data Line : STN, 4-20mA, wireless, coaxial links

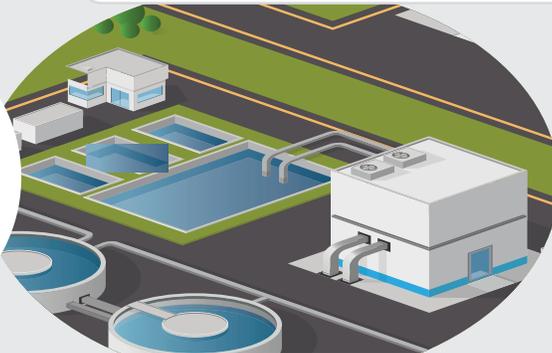
Main Threats

- Switching Transients
- Lightning Strike to nearby ground
- Lightning Strike to facility

Treatment Process Monitoring



Instrumentation



Equipment: Flow Meters, Chlorine Analyzers, Pressure Sensors, Temperature Sensors, Level Sensors

Networks:

- AC Power
- DC Power: Loop/POE
- Data Line: STN, 4-20mA, wireless, coaxial links

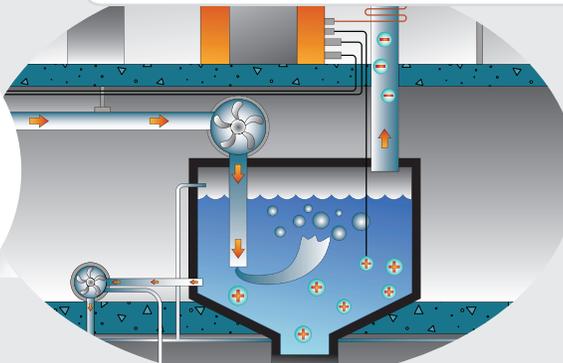
Main Threats

- Switching Transients
- Lightning Strike to nearby ground
- Lightning Strike to facility

Treatment Process Control



Level Sensors
Valves Actuators



Equipment: PLC, Process Control Values, Actuators, Agitators, Level Sensors, Temperature Sensors

Networks:

- AC Power
- DC Power: Loop/POE
- Data Line: STN, 4-20mA, wireless, coaxial links

Main Threats

- Switching Transients
- Lightning Strike to nearby ground
- Lightning Strike to facility

SCADA DCS and Communications



Distributed
Control Systems



Equipment: SCADA, DCS, & Communications

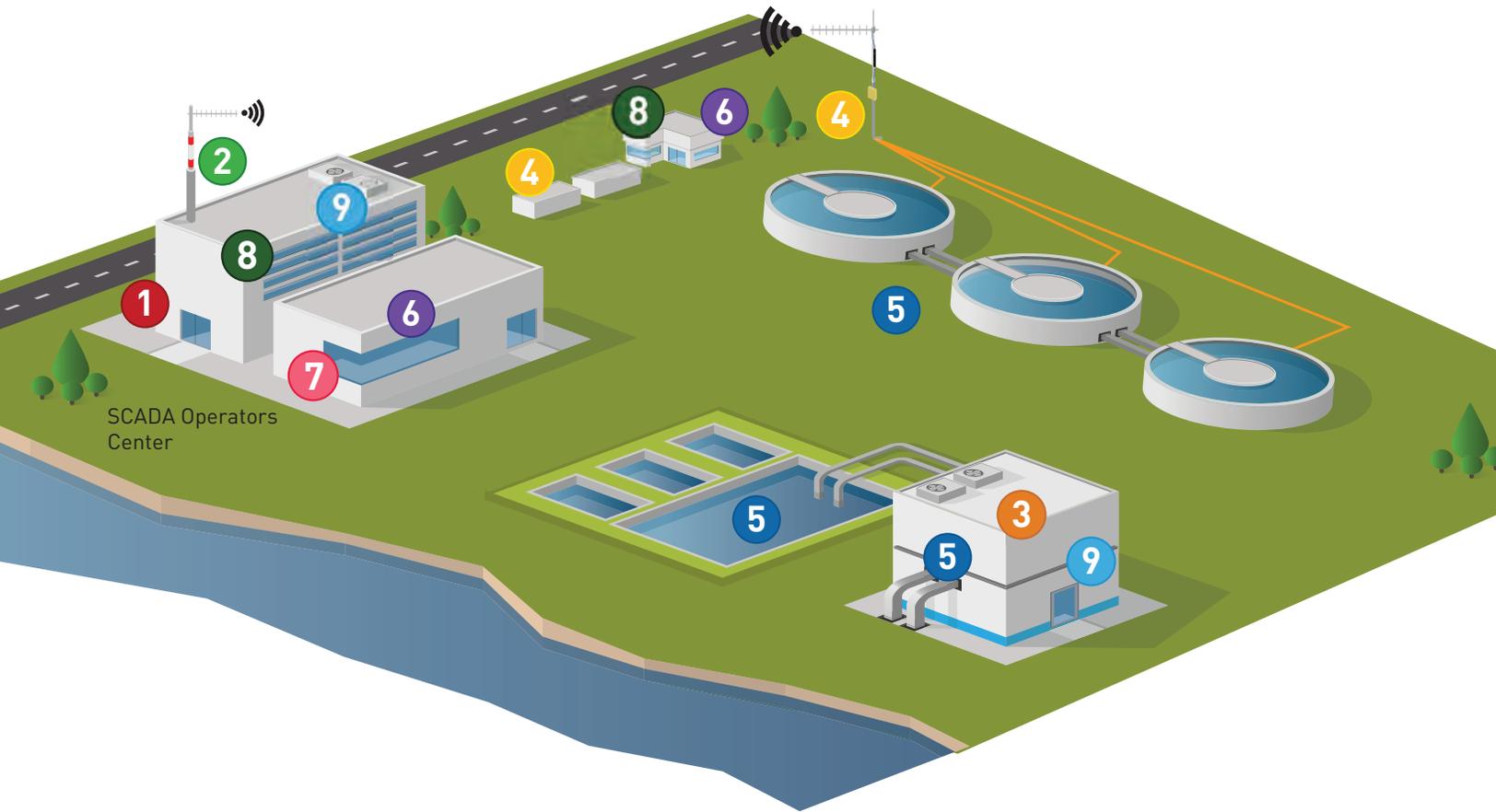
Networks:

- AC Power
- DC Power
- Data Line: STN, Ethernet, Wireless, Coaxial links

Main Threats

- Switching Transients
- Lightning Strike to nearby ground
- Lightning Strike to facility

COORDINATED PROTECTION STRATEGY



Location/Description/Model

- AC Power - Main Distribution Panel **1** MDS Series
- Coaxial - Antenna / Radio Wireless **2** P8AX Series, CWCMJ8 Series
- AC Power- Pumps & Drives **3** M series, DS70US Series
- AC Power - Distribution Panels **4** M series
- Field Instrumentation **5** CAD Series, DLA Series, TSP Series
- Data- Ethernet / POE **6** MJ8 Series, CWCMJ8 Series
- DCS & SCADA Cabinet **7** DS70US Series, MJ8 Series, DLA Series
- AC Power - Lighting Panel **8** DS70US Series
- AC Power - Lighting Fixtures **9** MLPXU Series

RECOMMENDED PRODUCTS (TECHNICAL CHARACTERISTICS)

AC Power SPDs



Product Family	MDS750E	M50	DS70US	MLPXU
Protection Type	AC Power	AC Power	AC Power	AC Power
Location	Incoming AC Panel	Distribution Panel	Lightning Control & VFD	Lightning Fixture
Maximum Surge Rating - I _{max}	I _{max} is 750kA	50kA (8/20μs) per phase	75kA (8/20μs) per mode	20kA (8/20μs) per phase
Nominal Surge Rating – In (UL 1449) (8/20μs)	20kA	20kA	20kA	10kA
Features	LED Indication, audible alarm, remote contacts, surge counter, stainless steel enclosure available, % of protection present indication available	LED Indication, audible alarm	Din Rail mount, Remote contacts, Replaceable modules	Compact, Series or Parallel install LED Indicators
Approvals	UL 1449 4th Ed. Type 1/2 Listed	UL 1449 4th Ed. Type 1/2 Listed	UL 1449 4th Ed. Type 1 Listed	UL 1449 4th Ed. Type 4CA

Ethernet & POE



Product Family	DLA	MJ8	CWCMJ8	TSP15M
Protection Type	Twisted Pair Wires	Indoor Ethernet	Indoor, Outdoor Ethernet	Field Instrument Protection
Max Surge rating(8/20μs)	20kA	16kA	16kA	15kA
Voltage	Up to 170Vdc	Up to 60Vdc	Up to 60Vdc	Up to 48Vdc
Main Features	Din Rail mounting, Shielded Protection RS485, RS232, 4-20mA, RS422, ADSL	Din Rail mounting, RJ45 Shielded Connectors, CAT6 Ethernet, POE++	RJ45 Shielded Connectors, POE++ Up to IP67 rating	Conduit Mount, Direct Transducer Mount, Parallel or Series Connection Options.
Approvals	UL497B Listed	UL497B Listed	UL497B Listed	

Coaxial SPD



Product Family	P8AX
Protection Type	Gas Discharge Tube - DC Pass
Max Surge rating(8/20μs)	20kA
Frequency Range	DC to 6GHz
RF Power	Up to 780W
Main features	Connectors: N, F, BNC, TNC, 7/16, SMA, etc, Bi-directional, Replaceable GDT
Approvals	UL497E Listed

Power + Dataline Signal SPD



Product Family	CAD2
Protection Type	DC or AC Power + Dataline or Ethernet
Max Surge rating - I _{max} (8/20μs)	AC 70kA to 280kA, DC20kA, Dataline 20kA
Voltage	Any configuration AC or DC up to 600 volts
Main Features:	Din Rail Mount Remote contacts, Replaceable Modules, Stainless Steel Available Individual fault indicator windows
Approvals	UL 1449 4th Ed. Type

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