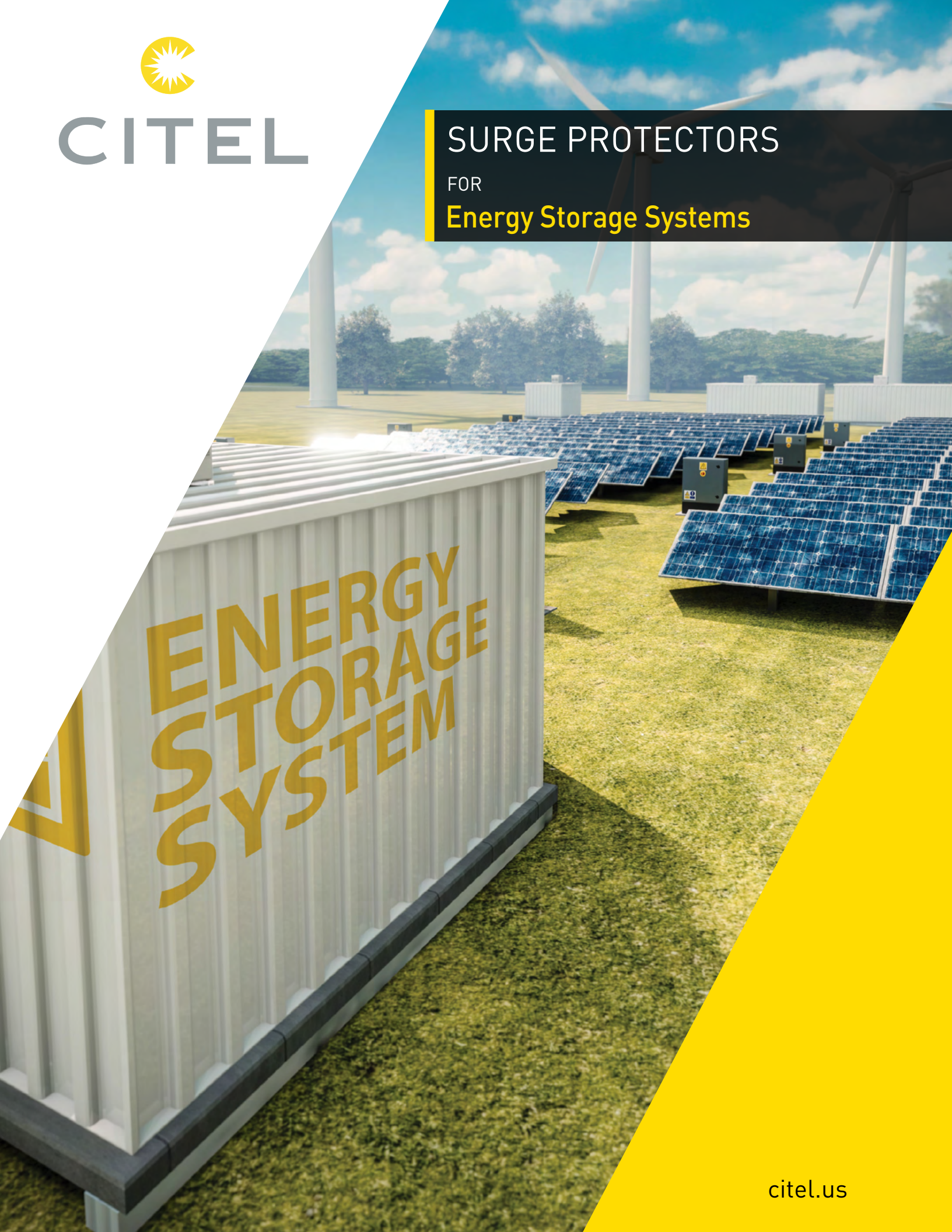
CITEL

SURGE PROTECTORS

FOR

Energy Storage Systems



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 (SPCs), Surge Protective Devices (SPDs), 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



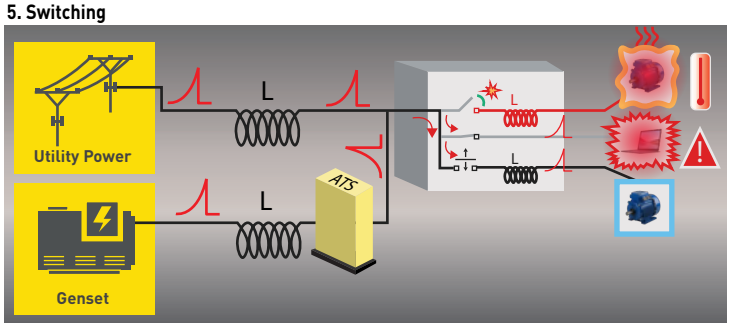
3. Strike on Overhead Lines



4. Coupling



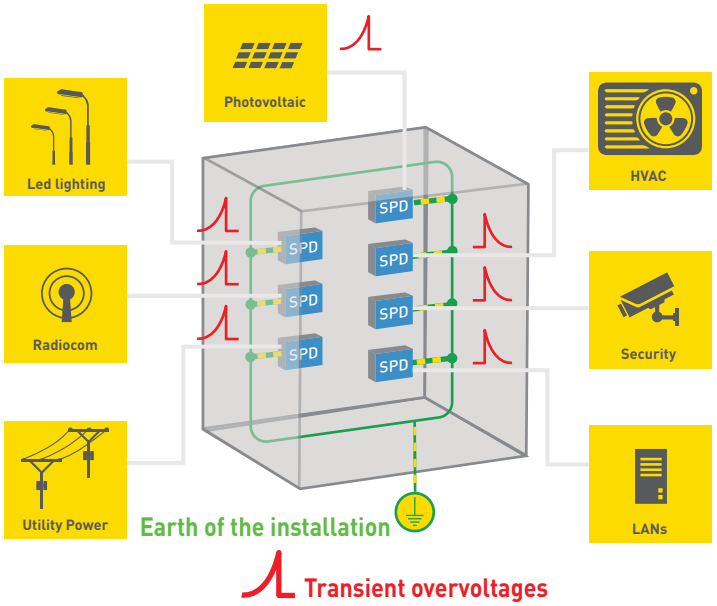
5. Switching



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.**

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COMMON ENERGY STORAGE SYSTEM APPLICATIONS

As the technology for Energy Storage and Management Systems becomes more sophisticated, the risk of damage caused by lightning strikes and power grid disturbances becomes more prominent. Mission-critical Energy Storage Systems must deploy a coordinated web of Surge Protective Devices (SPDs) to ensure continuous operation.

Power Conversion Systems



Conversion Cabinet



- Grid-Tied Inverters (DC & AC)
- Rectifiers
- AC-DC Converters

DC Energy Storage



High-Capacity Batteries



- Battery Management Electronics
- Communication Modules
- Local Cooling Fans

Battery Management Systems



Input/Output Controller



- Thermocouples
- Voltage/Current Monitoring Systems
- RS485/Modbus
- CanBus

Thermal & Safety Systems



HVAC Chiller



- HVAC Pumps/Motors-VFD
- Air Handlers
- Roof Top Chillers
- Fire Detection & Suppression

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COORDINATED PROTECTION STRATEGY



Description/Location/Model

Main Electrical Panel 1 MDS750E

AC Battery Output 2 DAC80US Series

DC Battery Input 3 DS220S

Data Connections 4 DLA Series

Inverters & Combiners 5 DPVN40CUS

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RECOMMENDED PRODUCTS (TECHNICAL CHARACTERISTICS)

AC Power







Product	MDS750E	DAC100US	DAC80US
Application	Main Electrical AC Power Grid		Battery AC Output
Voltage(s)	240, 277, 480		
Phase	3D, 3Y		
In (8/20µs)-kA	20		
Imax (8/20µs)-kA	440	100	80
UL Standard	Listed Type 1		

DC Power









Product	DS50PVS-1500/51/DC	DS50VGPVS	DPVN40CUS	DS220S
Application	Energy Storage Systems	Photovoltaic	Inverters & Combiners	Power Supplies
Voltage(s)-(DC)	1500	500, 600, 1000, 1500	600, 1200, 1500	12, 24, 48
In (8/20µs)-kA	10	20		10
Imax (8/20µs)-kA	40			20
UL Standard	Listed Type 4CA	Listed Type 1CA		Recognized Type 4CA

Ethernet & Data







Product	MJ8-C6A	DLA	P8AX
Application	Indoor Gigabit Ethernet & PoE	Internal Data Connections	Coaxial/RF
Connection	RJ45	Screw Terminal	N, F, BNC, SMA, TNC
Voltage(s)-(DC)	60	12, 24	up to 400
Imax (8/20µs)-kA	16	20	
UL Standard	UL 497B		

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