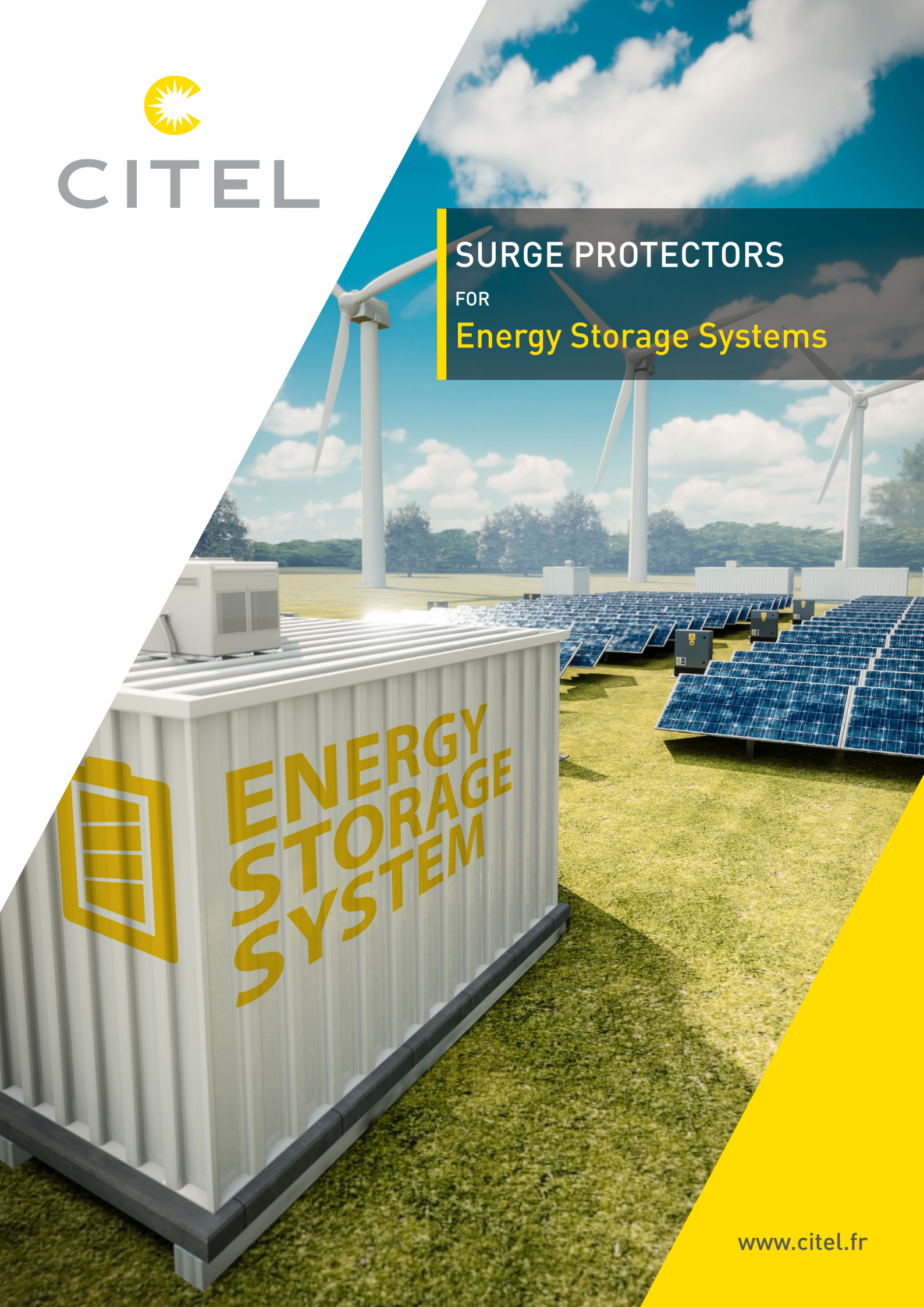
CITEL

SURGE PROTECTORS
FOR
Energy Storage Systems



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ESS : ENERGY STORAGE SYSTEM

ESS SURGE PROTECTORS AGAINST TRANSIENT OVERVOLTAGES

The Energy Storage System (ESS) respond, either, to a financial issue to improve energy management (peak management/frequency regulation) or to an ecological issue pushing for energetic transition phenomena.

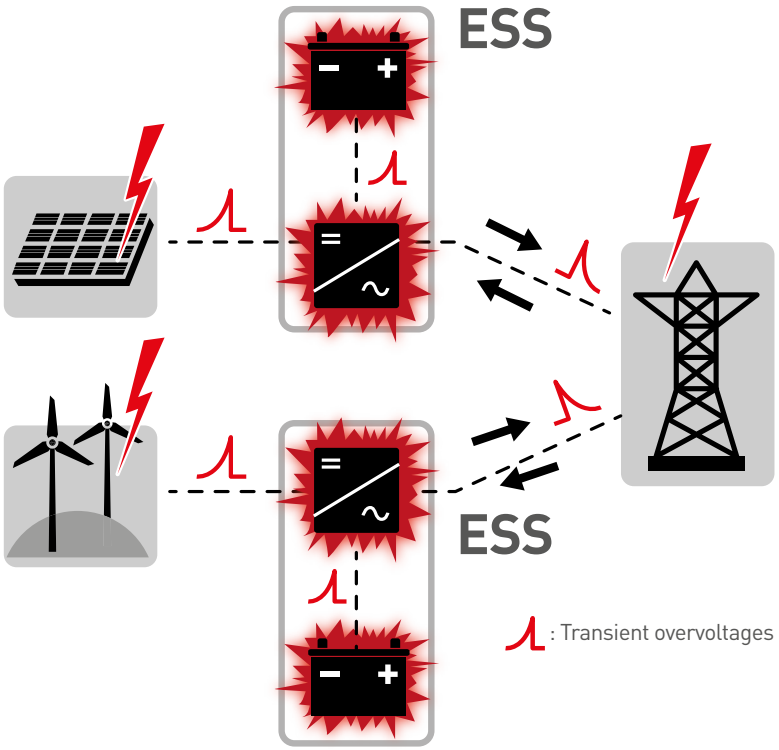
Through the energy storage system, green energy production becomes more efficient. The cost of facilities and the importance of the operation and efficiency of such equipment makes their loss of service unacceptable. Some measures must be taken to limit damages, due to external influences. One of the risks to be taken into account is the possible default due to transient overvoltages generated by the lightning or by the switching operations.

THE RISK OF "SURGE VOLTAGES"

The risk of surge voltage can impact all the components of the installation, as well the solar panels as the batteries or the network, which means protecting the installations from this phenomenon.

Moreover, specialists in ESS equipment have noted a reduced robustness in impulse over-voltage (Uw) of these materials, in particular battery systems, and due to the imperative continuity of service, they recommend the use of surge protectors at their terminals.

Surge protectors on the AC part are also recommended, as well as air conditioning to cool the batteries.



SURGE PROTECTION OF ESS EQUIPEMENT

The critical point is the protection of the battery storage system, for this reason and with the following consequences:
- Maximum DC operating voltage very high (1000 Vdc until 1500 V)
- A specific Surge Protection Device is necessary, it must be compatible with his voltages and in conformity with the forth coming IEC61643-41 (Test methods for surge protector for DC low voltage powerline)

CITEL's R&D teams have developed specific products to protect your ESS equipment against overvoltages. As for our standardization experts, they have ensured that CITEL products comply with the future test standard for DC surge protectors.

- DC power Type 2 SPD
- Pluggable modules
- Internal disconnectors, signaling and remote disconnection
- Max operating voltages: 500, 800, 1200, 1500 Vdc
- Discharge current : In 20 kA /Imax 50 kA
- Isccr : 100 kA with associated fuses 50 A rating
- prIEC 61643-41 compliance

SELECT YOUR ESS SPD

The key criteria of selection for DC SPD :

- Type 2 Surge Protector (no proven risk of direct lightning discharge)
- Uc (max. operating voltage) > Umax of the DC network + 10%
- In (Nominal discharge current) > 5 kA
- Isccr (admissible short-circuit current) with associated fuse > Ip at the installation point

DC BATTERY PROTECTION

SFD50-1500DC

DDC50-21Y-1500

CITEL model		SFD50-1500DC	DDC50-21Y-800	DDC50-21Y-1200	DDC50-21Y-1500
Part number		**39601**	**828511353**	**828511553**	**828511653**
Max. DC operating voltage	Uc	1500 Vdc	800 Vdc	1200 Vdc	1500 Vdc
Nominal discharge current (8/20µs)	In	50 kA	20 kA		
Max. discharge current (8/20µs)	Imax	100 kA	50 kA		
Protection level +/PE (-/PE)	Up	< 0.4 kV	2.5 kV	3.6 kV	5 kV
Admissible short-circuit current	Isccr	100 000 A			
Standards		prIEC 61443-41 - IEC 61643-11			
Remote signaling		Option RSFD50	Option DDC50**S**-21Y-800	Option DDC50**S**-21Y-1200	Option DDC50**S**-21Y-1500

PROTECT THE WHOLE EQUIPMENT OF THE INSTALLATION

To ensure a full efficiency against surge voltages, SPDs must used also on the various networks of the ESS installation

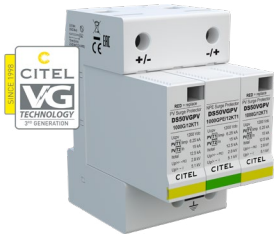
MAIN ELECTRICAL PANEL

SFD1-13S-31

DAC1-13VGS-31-275

CITEL model		DAC1-13VGS-31-275	SFD1-13S-31
Part number		**821730244**	**64048**
Network		3-phase+N	3-phase+N
Type of SPD		Type 1+2+3 - DIN Rail	DIN Rail
Max. AC operating voltage	Uc	275 Vac	500 Vac
Nominal discharge current (8/20µs)	In	20 kA	50 kA
Impulse current by pole (10/350µs)	Iimp	12.5 kA	12.5 kA
Protection level	Up	⩽ 1.5 kV	⩽ 0.4 kV
Admissible short-circuit current	Isccr	50 000 A	100 000 A
Standards		IEC 61643-11 / NF EN 61643-11 / UL1449 ed.5	

SURGE PROTECTOR FOR CONNECTED PV SITES



DS50VGPV-1000G/12KT1

CITEL model		DS50PV-1000G/12KT1	DS50VGPV-1000G/12KT1
Part number		**482383**	**482303**
Type of SPD		Type 1	Type 1
Maximum DC operating voltage	Ucpv	1200 Vdc	1200 Vdc
Nom. discharger current (8/20µs)	In	15 kA	15 kA
Lightning current (10/350µs)	Iimp	6.25 kA	6.25 kA
Total lightning current (10/350µs)	Itotal	12.5 kA	12.5 kA
Protection level	Up	2.6/4.6 kV*	2.8/5.1 kV*
Standards		EN 50539-11 / IEC 61643-31	
Remote signalling		Option DS50PV**S**-1000G/12KT1	Option DS50VGPV**S**-1000G/12KT1

- *) Common mode (+/PE or -/PE)/Differential mode (+/-)

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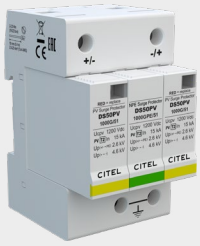
SURGE PROTECTOR FOR CONNECTED PV SITES



DS50PV-100G/51

CITEL model		DS50PV-600/51	DS50PV-1000G/51
Part number		**480421**	**480381**
Type of SPD		Type 2	Type 2
Maximum DC operating voltage	Ucpv	720 Vdc	1200 Vdc
Nom. discharge current (8/20µs)	In	15 kA	15 kA
Protection level	Up	2.8 kV*	2.6/4.6 kV*
Standards		EN 50539-11/IEC 61643-11	
Remote signalling		Option DS50PV**S**-600/51	Option DS50PV**S**-1000G/51

- *) Common mode (+/PE or -/PE)/Differential mode (+/-)
- Specific version DS50VGPV available : total suppression of operating and leakage currents.

SURGE PROTECTOR FOR WIND TURBINE

DACN1-25VGS-10-440

CITEL model		DACN1-25VGS-10-440
Part number		29221022
Network		1-phase
Type of SPD		Type 1 - DIN Rail
Max. DC operating voltage	Uc	440 Vac
Nominal discharge current (8/20µs)	In	25 kA
Max. discharge current (max. withstand (8/20µs)	Imax	70 kA
Protection level +/PE (-/PE)	Up	⩽ 1.5 kV
Admissible short-circuit current	Isccr	50 000 A
Remote signaling		output on changeover contact
Standards		IEC 61643-11 / EN 61643-11 / UL1449 ed.5

SURGE PROTECTORS FOR CONTROL SYSTEMS (DATALINE)

DLA-24D3

MJ8-POE-C6A

CITEL model		DLA range	MJ8 range
Typical application		RS485, 4-20mA	Ethernet (PoE)
Configuration		1pair+shield	RJ45
Nominal line voltage	Un	12 V, 24 V	48 Vdc
Max. load current	IL	300 mA	2000 mA
Nominal discharge current *8/20µs Test x 10 - C2 Category*	In	5 kA	2 kA
Maximum discharge current *max. withstand @ 8/20 µs by pole*	Imax	20 kA	-
Impulse current *2 x 10/350µs Test - D1 Category*	Iimp	5 kA	0.5 kA
Standards		IEC 61643-21 / NF EN 61643-21 / UL497A	
Mounting		DIN rail	

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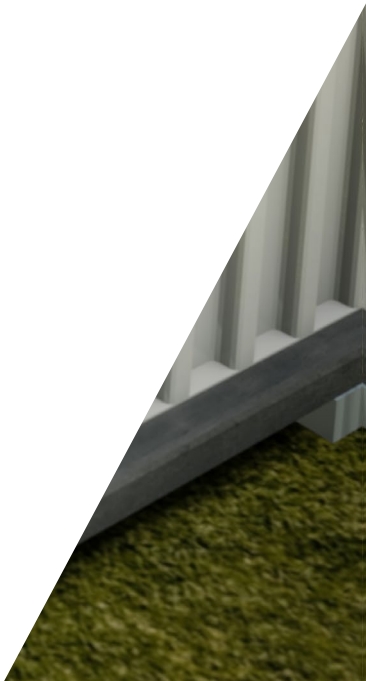

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