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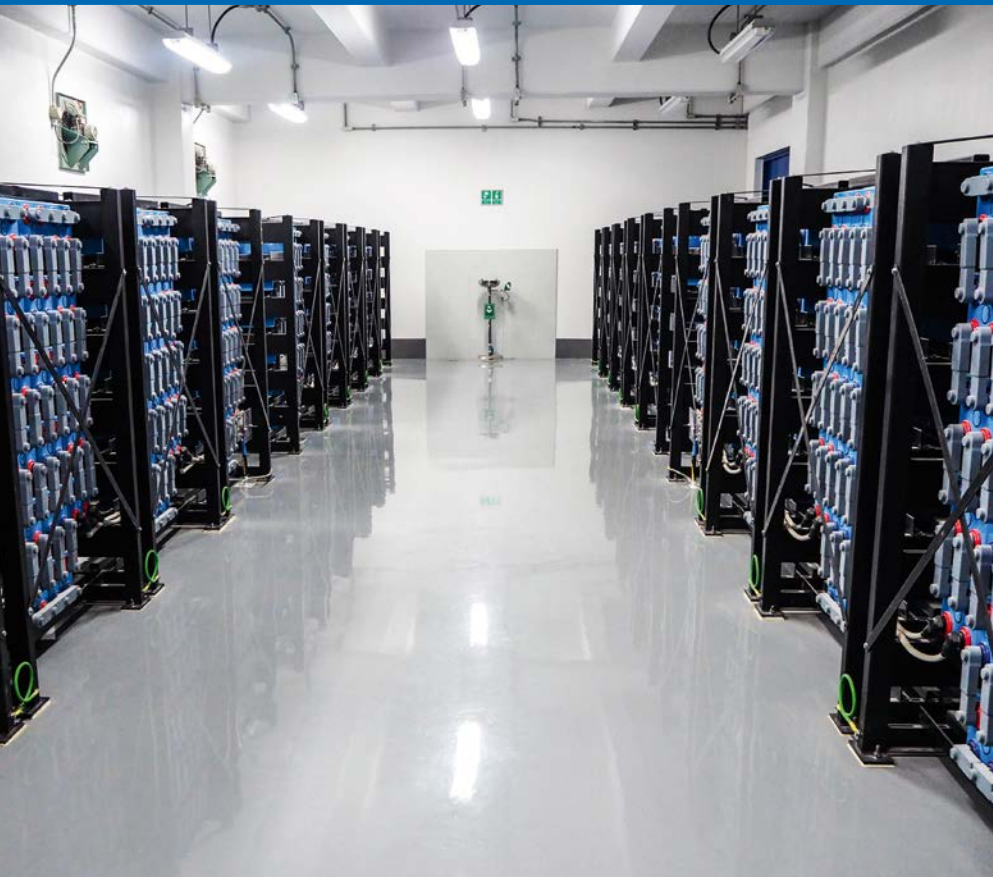


Overvoltage controlled. ANYWHERE.

# SOLUTION

Electrical energy storage

Surge protection



## Why to Protect?

The development of the energy industry has recently evolved into smart grids and renewable energy sources. The optimal use of produced energy, which belongs to features of smart grids, requires exploitation of electrical energy storage systems. These systems are powered by the surplus energy produced by photo-voltaic power plants or wind power plants, for example. If necessary, the stored energy is transferred back to the grid. That way, peaks of the load are balanced. The proper and reliable operation of electrical energy storage systems is conditioned by an adequate overvoltage protection.

Due to direct and indirect lightning strikes, lightning electromagnetic pulses (LEMPs) of up to several thousands of volts can be superposed in the grid of the charging station by the induction or the direct galvanic interconnection. Similar overvoltage phenomena of a lower energy can also occur in installations with large inductive loads in form of switching electromagnetic pulses (SEMPs).

These overvoltage pulses can damage important components of the electrical energy storage and can influence its function. For this reason, an appropriate overvoltage protection should be applied to reduce the risk of the damage of used technological equipment. The cost of the overvoltage protection is only a fraction of the purchase price of the protected equipment and potential operation losses.

## What to Protect?

- Frequency inverter
- Charger
- Communication lines (e.g. Ethernet)

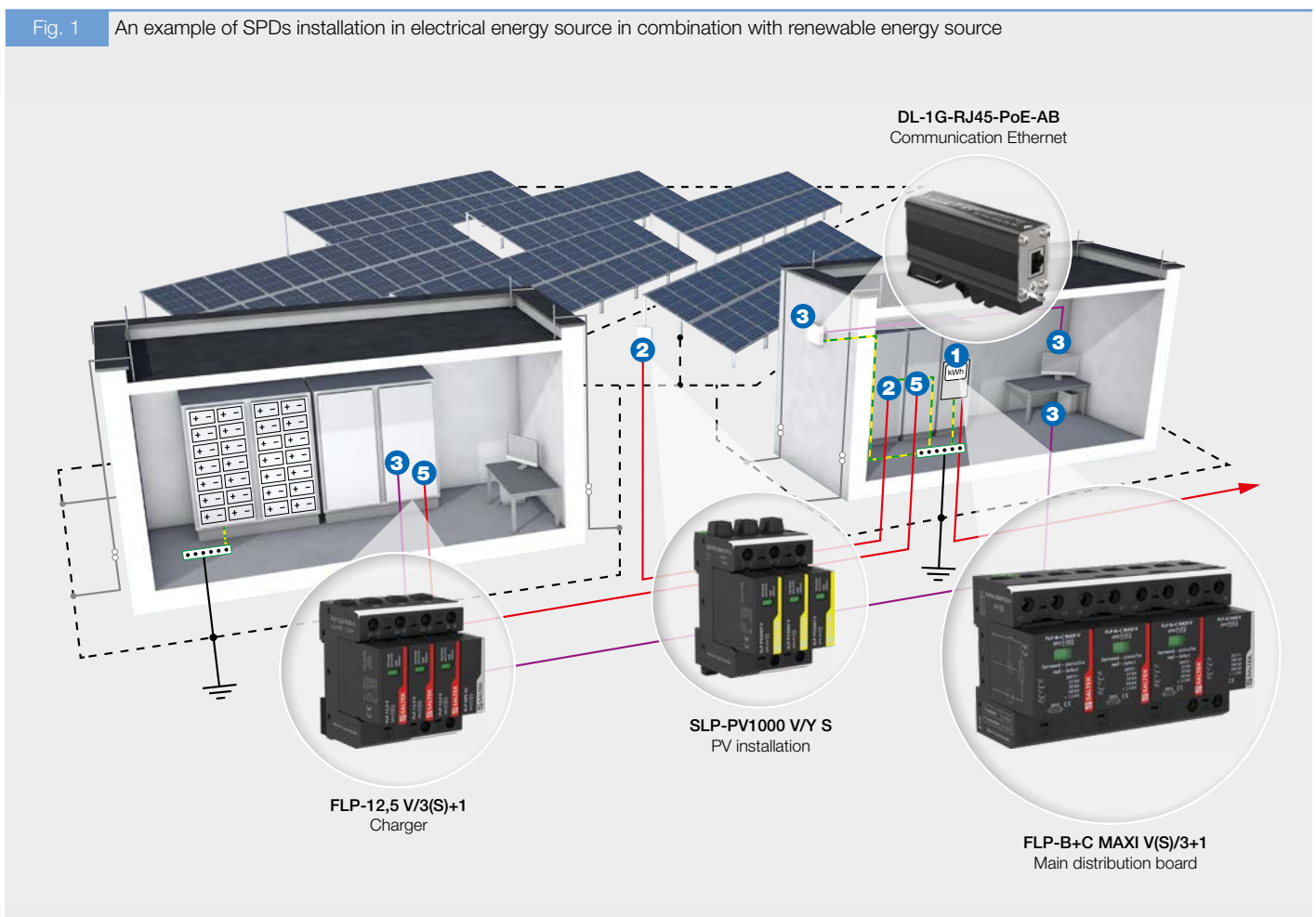


Fig. 2 Block diagram of storage in combination with renewable energy source

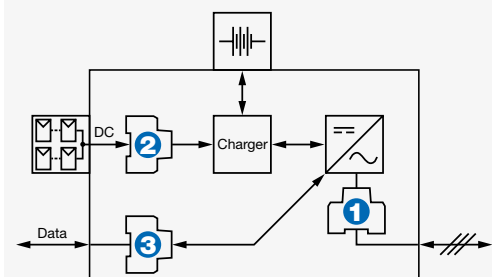


Fig. 3 Storage within an object

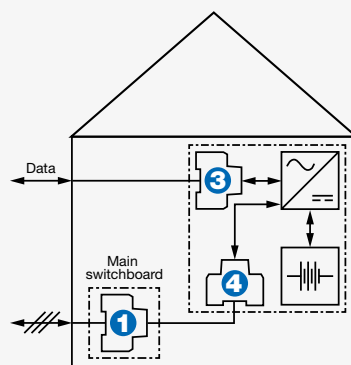
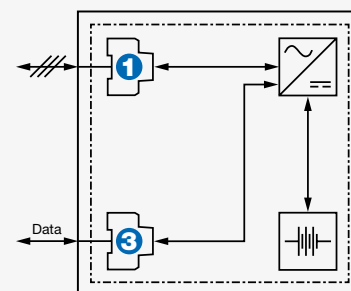


Fig. 4 Stand-alone storage



## Recommended SPDs for storage

### 1 FLP-B+C MAXI V(S)/3+1

Three-pole powerful combined lightning arrester.

Connection	Suitable networks	$U_c$	$I_{imp}$ (10/350 $\mu$ s)	$I_n$ (8/20 $\mu$ s)	$I_{max}$ (8/20 $\mu$ s)	Remote signalling	Ordering number
3+1	TN-S	260 V	25 kA	30 kA	60 kA	Yes	A05096

### 2 SLP-PV1000 V/Y S

Varistor surge arrester in Y-connection to protect photo-voltaic installations.

Connection	Suitable networks	$U_c$	$I_n$ (8/20 $\mu$ s)	$I_{max}$ (8/20 $\mu$ s)	Remote signalling	Ordering number
3+0	PV	1020 V DC	15 kA	40 kA	Yes	A03671

### 3 DL-1G-RJ45-PoE-AB

Two-stage Ethernet overvoltage protection combined with supply protection over this line.

Location	Network type	$U_c$ (line/supply)	$I_L$ (line/supply)	$I_n$ (C2) (8/20 $\mu$ s)	$U_p$ (C3) core-core	$U_p$ (C3) core-PE	Ordering number
ST 1+2+3	1G	8.5 / 58 V DC	0.5 / 1.5 A	0.15 kA	60 / 90 V	500 V	A06148

### DM-006/1-RB

Two-stage overvoltage protection of signal lines. Use in case of RS-485 communication.

Location	Number of lines	$U_c$	$I_L$	$I_n$ (C2)	$U_p$ (C3) core-core	Floating	Ordering number
ST 2+3	1	8.5 V DC	0.5 A	5 kA	12 V	No	A06061

### 4 SLP-275 V/3+1

Assembly of three-pole varistor surge arrester and closed spark gap.

Connection	Suitable networks	$U_c$	$I_n$ (8/20 $\mu$ s)	$I_{max}$ (8/20 $\mu$ s)	Remote signalling	Ordering number
3+1	TN-S	275 V AC	20 kA	40 kA	No	A01946

### 5 FLP-12,5 V/3(S)+1

Combination of varistor lightning current arrester and encapsulated efficiency spark gap.

Connection	Suitable networks	$U_c$	$I_n$ (8/20 $\mu$ s)	$I_{max}$ (8/20 $\mu$ s)	Remote signalling	Ordering number
3+1	TN-S	275 V AC	30 kA	60 kA	Yes	A03428

**SALTEK s.r.o.**

Drážďanská 85  
400 07 Ústí nad Labem  
Czech Republic  
Phone: +420 272 942 470  
Fax: +420 475 622 213  
E-mail: [trade@saltek.cz](mailto:trade@saltek.cz)  
[www.saltek.eu/en](http://www.saltek.eu/en)

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