SALTEK®

Overvoltage controlled. ANYWHERE.

SOLUTION

Electromobility

Surge protection of charging stations

Nowadays, environmental awareness and cleanliness of the environment are emphasized. The field fitting well with this trend – Electromobility – is therefore developing very quickly. In order to lower emissions into the atmosphere, the number of vehicles with combustion engines is reduced by replacing them by electric vehicles. These trends involve the necessary development of a sufficiently large network of charging stations with safe and reliable operation. The safe and reliable operation can be ensured by proper overvoltage protections. Charging station can be stand-alone or located within a building (garage). This material is primary concerned with stand-alone stations. Stations located in buildings will be protected according to standard rules. You can find these rules in our guide – Surge protection of LV systems.

Why to Protect?

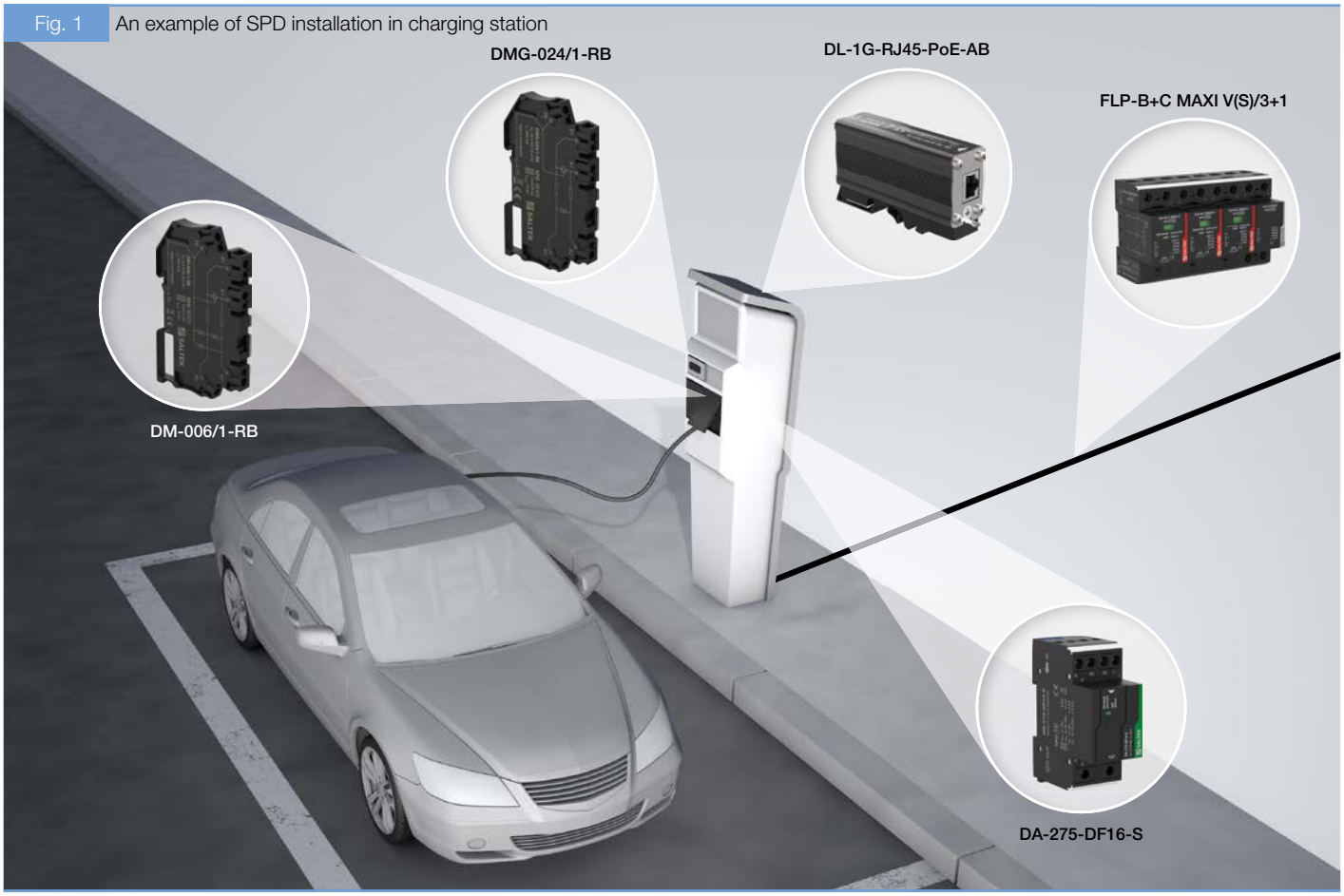
Due to direct and indirect lightning strikes, lightning electromagnetic pulses (LEMPs) of up to several thousands of volts can be superposed in the grid of the charging station by the induction or the direct galvanic interconnection. Similar overvoltage phenomena of a lower energy can also occur in installations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

These overvoltage pulses can damage the charging station, or even the connected, just charging vehicle. For this reason, charging stations should be equipped with an appropriate overvoltage protection to reduce the risk of damage of various devices included in the charging station. The cost of the overvoltage protection is only a fraction of the purchase price of the protected equipment.

What to Protect?

- Rectifier for the DC charging output
- Rectifier for powering the control unit
- Baterry – in case of charging station with energy acumulation
- Communication between the control unit and the charging connector (e.g. RS-485)
- Signal from the charging connector (e.g. temperature measurement)
- Communication between antenna and control unit (e.g. Ethernet) for data cable longer than 1 m

Fig. 1 An example of SPD installation in charging station



Some of the charging stations have the possibility of accumulating energy. For these types of stations surge protection system does not change.

Fig. 2 Block diagram of the charging station

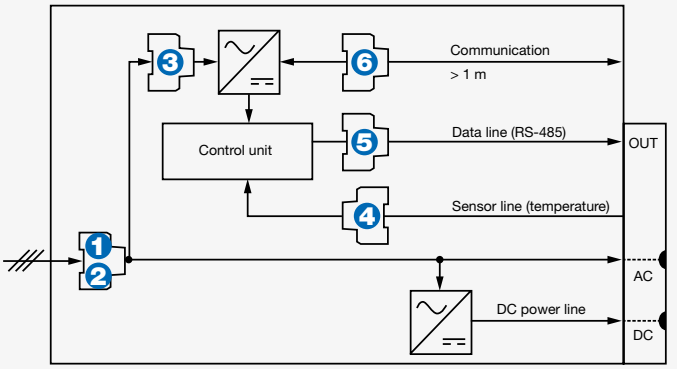
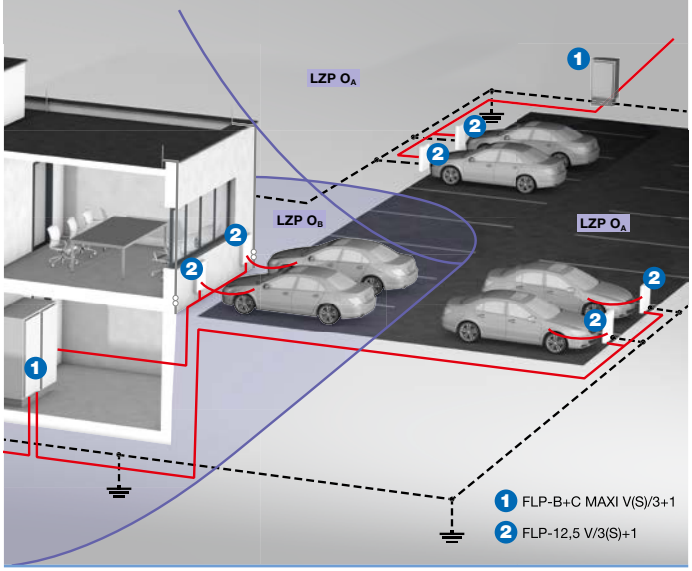


Fig. 3 SPD selection by lightning protection zones



Recommended SPDs for charging stations

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

Three-pole combined high performance lightning current arrester. The use for external wiring at the beginning of installation.

Connection	Suitable networks	U_c	I_{imp} (10/350 µs)	I_n (8/20 µs)	I_{max} (8/20 µs)	Remote signalling	Ordering number
3+1	TN-S, TT	260 V	25 kA	30 kA	60 kA	Yes	A03572

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

Three-pole combined high performance lightning current arrester. The use for the cable inlet in the ground.

Connection	Suitable networks	U_c	I_{imp} (10/350 µs)	I_n (8/20 µs)	I_{max} (8/20 µs)	Remote signalling	Ordering number
3+1	TN-S, TT	275 V	12.5 kA	30 kA	60 kA	Yes	A03428

3 DA-275-DF16-S

Overvoltage protection of the type 3 with an integrated noise-suppressing RF filter.

Connection	Suitable networks	U_C	I_L	I_n (L+N-PE) (8/20 µs)	U_{OC} (8/20 µs) (L+N-PE)	Remote signalling	Ordering number
Symmetric	TN, TT	275 V	16 A	5 kA	25 V	Yes	A05722

4 DMG-024/1-RB

Two-stage overvoltage protection of signal lines (e.g. temperature).

Location	Number of lines	U_C	I_L	I_n (C2)	U_p (C3) core-core	Floating	Ordering number
ST 2+3	1	25 V	0.5 A	5 kA	25 V	Yes	A06062

5 DM-006/1-RB

Two-stage overvoltage protection of signal lines (e.g. RS-485).

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	A06057

6 DL-1G-RJ45-PoE-AB

Two-stage Ethernet overvoltage protection combined with supply protection over this line. For cable longer than 1 m.

Location	Network type	U_C (line/supply)	I_L (line/supply)	I_n (C2) (8/20 µs)	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

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