



PRODUCT OVERVIEW

SURGE PROTECTION

Lightning and surge protection

1. Introduction – Legislative

The use of modern sophisticated apparatus, equipment, consumer electronics and control systems places high demands on their electromagnetic compatibility. Modern electronic control systems provided with circuits with a very high integration level are becoming more and more sensitive to electromagnetic disturbances and overvoltage. The installation of surge protections according to effective legal regulations will reduce the danger of damaged to a minimum. Technical designs are according to EU standards:

a) Protective bonding to the same potential including the conductor cross section for the main and additional bonding is defined by standards **EN 50 310**.

b) Lightning protection is specified in the **EN 62 305**.

c) Classification of protections is set forth in standard **EN 61 643-11**.

Protections are classified into three basic categories:

SPD type 1 – lightning current arresters

SPD type 2 – surge protections

SPD type 3 – surge protections

d) Classification of low-voltage distributions into impulse resistance categories, including specification of the maximum allowed overvoltage is determined in standard **EN 60 664-1**

Lightning protection zones

The standard EN 62305-4 defines lightning protection zones LPZ in view of the direct and indirect (electromagnetic pulse – LEMP) lightning effect:

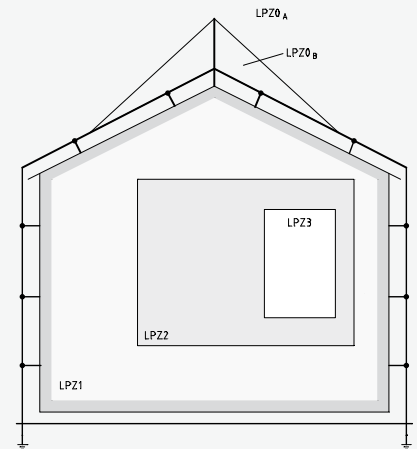
LPZ 0_A – free area (possibility of a direct lightning strike, non-attenuated LEMP)

LPZ 0_B – lightning conductor receiver protection area (direct lightning strike protection, non-attenuated LEMP)

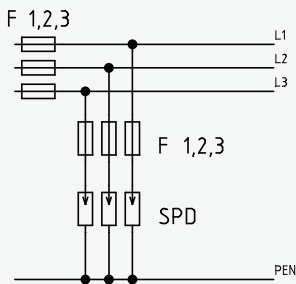
LPZ 1 – inside a building (direct lightning strike is eliminated, attenuated LEMP – depending upon shielding)

LPZ 2 – inside a room – e.g. a server room with a conductive floor, FeAl floors and wall lining (further attenuation of LEMP in connection with a higher shielding level)

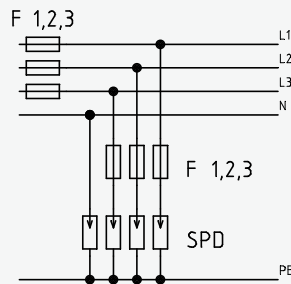
LPZ 3 – inside a metal box (e.g. 19" RACK)



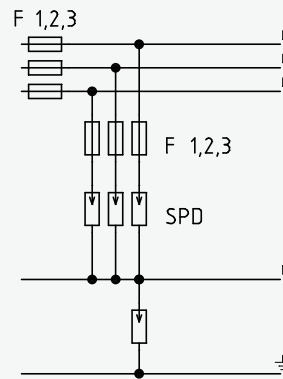
2. Connection of protections in TN, TT and IT systems



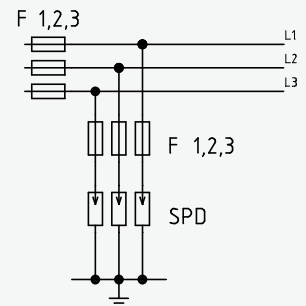
SPD connection in TN-C system



SPD connection in TN-S system

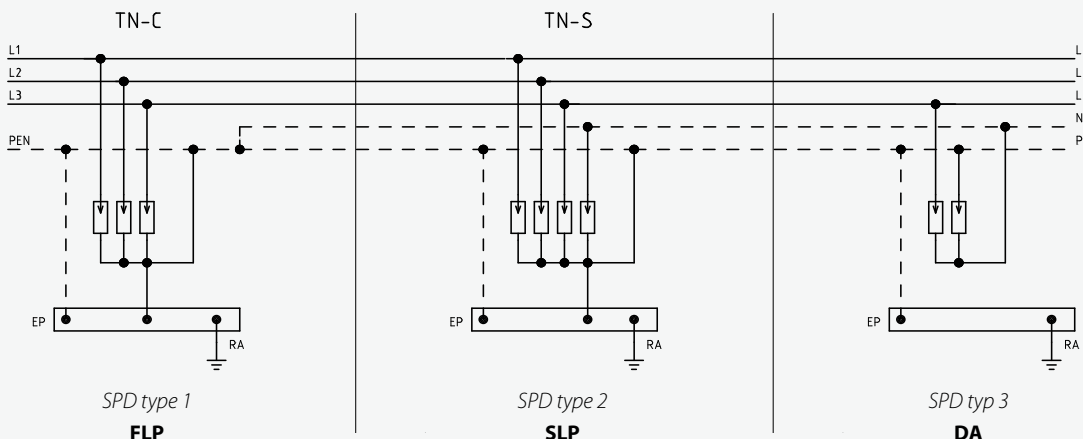


SPD connection in TT system



SPD connection in IT system

3. Principle of connection of surge protections in TN systems



Choose from our wide range of surge arresters:

SPD type 1 – lightning current arresters

FLP-A50-1,5	50 kA (10/350 μ s), encapsulated high-performance spark gap, voltage protection level 1,5 kV
FLP-A35	35 kA (10/350 μ s), encapsulated high-performance spark gap
FLP-A35-0.9	35 kA (10/350 μ s), encapsulated high-performance spark gap, voltage protection level 900 V
FLP-A100 N	100 kA (10/350 μ s), spark gap for N-PE
FLP-NPE	80 kA (10/350 μ s), N-PE module
FLP-275 V (S)	60 kA (8/20 μ s), replaceable varistor module, visual fault signalling, (optional remote status signalling)
FLP-275 V/3 (S)	180 kA (8/20 μ s)/3 pole, replaceable varistor module, visual fault signalling, (optional remote status signalling)
FLP-275 V/4 (S)	240 kA (8/20 μ s)/4 pole, replaceable varistor module, visual fault signalling, (optional remote status signalling)



SPD type 1 and 2 – combined B+C

FLP-B+C GE (S)	20 kA (10/350 μ s), combined arrester type 1 and 2, visual fault signalling, (optional remote status signalling)
FLP-B+C GE/3 (S)	60 kA (10/350 μ s)/3 pole, combined arrester type 1 and 2, visual fault signalling, (optional remote status signalling)
FLP-B+C GE/3(S)+1	60 kA (10/350 μ s)/3 pole + 80 kA (10/350 μ s), combined arrester type 1 and 2, visual fault sig., (opt. remote status signalling)

SPD type 2 – surge arresters

SLP-xxx	40 kA (8/20 μ s), visual fault signalling
SLP-xxx S	40 kA (8/20 μ s), visual fault signalling, remote status signalling
SLP-xxx V	40 kA (8/20 μ s), replaceable varistor module, visual fault signalling
SLP-xxx VS	40 kA (8/20 μ s), replaceable varistor module, visual fault signalling, remote status signalling
xxx - for voltage U_c [V AC] 75, 130, 275, 385, 440, 550	
SLP-275 V/1(S)+1	40 kA (8/20 μ s)/1 pole + 40 kA(8/20 μ s), replaceable varistor module, visual fault signalling
SLP-275 V/3(S)+1	120 kA (8/20 μ s)/3 pole + 40 kA(8/20 μ s), replaceable varistor module, visual fault signalling
SLP-075 VB (S)	25 kA (8/20 μ s), with suppressed leakage current, replaceable varistor module, visual fault signalling
SLP-130 VB (S)	25 kA (8/20 μ s), with suppressed leakage current, replaceable varistor module, visual fault signalling
SLP-275 VB (S)	25 kA (8/20 μ s), with suppressed leakage current, replaceable varistor module, visual fault signalling
SLP-330 GE V (S)	40 kA (8/20 μ s), with suppressed leakage current, replaceable varistor module, visual fault signalling
SLP-330 GE V/1(S)+1	40 kA (8/20 μ s) + 40 kA (8/20 μ s), with suppressed leakage current, replaceable varistor module, visual fault signalling
SLP-330 GE V/3(S)+1	120 kA (8/20 μ s)/3 pole + 40 kA (8/20 μ s), with suppressed leakage current, replaceable varistor module, visual fault signalling
SLP-100 PH V/2	40 kA (8/20 μ s), for photovoltaic systems, replaceable varistor module, visual fault signalling
SLP-500 PH V/2	40 kA (8/20 μ s), for photovoltaic systems, replaceable varistor module, visual fault signalling
SLP-550 PH V/2	40 kA (8/20 μ s), for photovoltaic systems, replaceable varistor module, visual fault signalling
SLP-700 PH V/3	40 kA (8/20 μ s), for photovoltaic systems, replaceable varistor module, visual fault signalling
SLP-800 PH V/3	40 kA (8/20 μ s), for photovoltaic systems, replaceable varistor module, visual fault signalling
SLP-1000 PH V/3	40 kA (8/20 μ s), for photovoltaic systems, replaceable varistor module, visual fault signalling

S = optional remote status signalling



Surge separating inductors

RTO-16	500 V AC, max. 16 A, coupling impedance to coordination of activities of SPD
RTO-35	500 V AC, max. 35 A, coupling impedance to coordination of activities of SPD
RTO-63	500 V AC, max. 63 A, coupling impedance to coordination of activities of SPD



SPD type 3 – surge arresters

DA-275 DJ	6 kV (1,2/50 μ s, 8/20 μ s), visual fault signalling
DA-275 V/1(S)+1	6 kV (1,2/50 μ s, 8/20 μ s), replaceable varistor module, visual fault signalling, (optional remote status signalling)
DA-275 V/3(S)+1	6 kV (1,2/50 μ s, 8/20 μ s), replaceable varistor module, visual fault signalling, (optional remote status signalling)
CZ-275 A	3 kV (1,2/50 μ s, 8/20 μ s), for additional installation in devices with acoustic fault signalling
CZ-275 S	3 kV (1,2/50 μ s, 8/20 μ s), for additional installation in devices with remote fault signalling
DA-275 PP1 MOSAIC	3 kV (1,2/50 μ s, 8/20 μ s), socket with surge protection



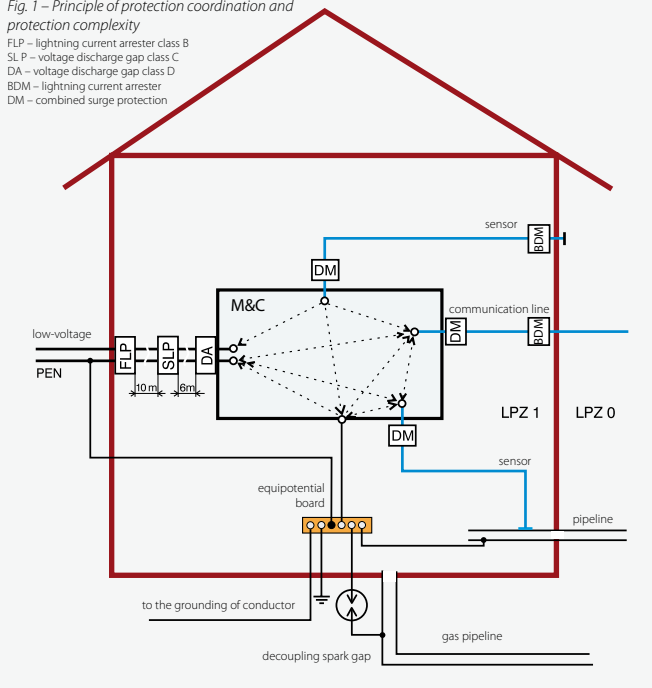
SPD type 3 – surge arresters with RFI filter

DA-275 BFG	230 V AC, 16 A, visual fault signalling, earth terminal, class I.
DA-275 DF x (S)	230 V AC, x = 2 A, 6 A, 10 A, 16 A, visual fault signalling, (optional remote status signalling)
DA-275 DFI x	230 V AC, x = 1 A, 6 A, 10 A, 16 A, fault signalling due to supply interruption, visual fault signalling
DA-400 DF 16 (S)	400 V AC, 16 A, visual fault signalling, (optional remote status signalling)

Telecommunication, signal and data protections

Fig. 1 – Principle of protection coordination and protection complexity

FLP – lightning current arrester class B
SLP – voltage discharge gap class C
DA – voltage discharge gap class D
BDM – lightning current arrester
DM – combined surge protection



Lightning current arrester

BD lightning current arrester
BDM, BDG lightning current arrester combined with surge protection

Combination of coarse and fine surge protection

DM-xxx/J z DS to protect 1-wire lines
DM-xxx/n z, DM-xxx/1 z DJ to protect 2-wire lines
DM-xxx/1 3z DJ to protect 3-wire lines
DM-xxx/1 4z DJ to protect 4-wire lines
xxx = U_n [V DC]: 6, 12, 24, 48
z = coupling impedance (R – resistance, L – inductivity)

Special surge protection

DP for small voltage supply
DM-PROFIBUS for the PROFIBUS industrial bus
CLSA-TLF, CLSA-ISDN, DL for telecommunication
DL for computer equipment
DM-SECURE surge guard and overvoltage protection

Surge arrester for video circuits

VL arrester for video circuits
VL DJ arrester for video circuits on rail 35 mm

Surge arrester for coaxial line

FX, HX, ZX lightning current arrester
SX surge arresters



SURGE PROTECTORS FOR PHOTOVOLTAIC SYSTEMS

The new SALTEK type 2 surge protections are specially designed for installation in the direct current circuits of photovoltaic/solar systems at the boundary of the LPZ 0_B – 1 zones and higher. In conjunction with the FLP-B+C GE, they ensure complete overvoltage protection of these systems.

These high-performance surge protections are able to divert up to 40 kA/pole in a wave of 8/20 μ s.

Two versions of protections are available: Two-pole, which are usually installed in 2+0 mode connection and three-pole, designed for connection in 2+1 mode.

Overvoltage protectors comprise:

- highly efficient varistors with thermal disconnecter,
- visual failure status indication,
- optional remote status indication ("S" version) with potential-free contact.



SALTEK, Limited Liability Company, is a Czech company specialized in the development and the production of surge protective devices (SPD). We offer a wide assortment of lightning current arresters and surge protections protecting electric and electronic equipment in low voltage

supply mains, a wide range of surge protections for computers, measurement and control and telecommunication. All products conform to international standards.

Exceptional attention is paid to care for product quality. The Quality Control System according to

ISO 9000 standards was introduced and certified in 1998. In the following year, the company implemented the Safety Management System and the Environmental Management System.



www.saltek.cz

Manufacture
and headquarter

SALTEK s.r.o.
Drážďanská 85
400 07 Ústí nad Labem
Czech Republic

Tel.: +420 475 655 511
Fax: +420 475 622 213
GSM: +420 602 413 437
E-mail: info@saltek.cz

Sales office
and technical support

SALTEK TRADE, s.r.o.
Arkalycká 833/1
149 00 Praha 4
Czech Republic

Tel.: +420 272 942 470
Fax: +420 267 913 411
GSM: +420 724 082 375
E-mail: info@saltek.cz

DISTRIBUTOR: