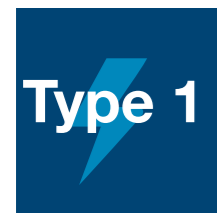


Surge Protection Devices

International standards classify SPDs as belonging to different 'Types', depending on characteristics and discharge capacity.

We offer Type 1, Spark Gap and Type 2 Surge Protection

Devices; these products are designed to be permanently installed by a licensed electrician. Type 3 devices are removable single socket or power board devices, available at retail outlets commonly used for limited protection of computer and audio-visual equipment.



Lightning protection

Diverts the energy content of the lightning and reduces the residual voltage to values < 6,000 - 1,300 V.

Type 1 SPD

Recommended installations at risk of lightning strike is characterized by a 10/350 μ s current wave.

Installation: Protection is provided when lightning currents couple into the equipotential bonding conductor of the low-voltage system, via the earth or parts of the external lightning protection system. Installed in buildings with overhead line feed and/or external lightning protection systems, in the main power supply as close as possible to the feeder before the meter, thus preventing lightning current spread.

Note, Type 1 SPDs need to be installed with Type 2 SPDs.



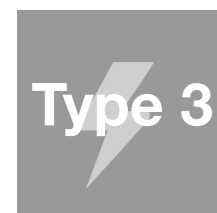
Surge protection

Reduces the remaining overvoltage to values < 2,000 - 600 V. The overvoltage must not exceed 4,000 V.

Type 2 SPD

Protection system for all low voltage electrical installations and characterized by an 8/20 μ s current wave.

Installation: Installed in electrical switchboards, these devices protect equipment by stopping the spread of overvoltages in systems and protecting loads. As second line of protection after lightning arresters, they limit surges from remote strikes or switching overvoltages. They must be installed upstream of sensitive, safety-relevant systems that can be damaged by switching overvoltages.



Socket surge protection for terminals

Reduces or secures the remaining overvoltage to values that are for end devices < 1,500 V.

Type 3 SPD

With low discharge capacity, Type 3 SPDs are recommended and installed as a supplement to Type 2 SPDs in the areas of sensitive loads, characterized by a combination of voltage waves (1.2/50 μ s) and current waves (8/20 μ s).

Installation: Installed near the protected device, typically at the socket.

Residential applications										
Commercial and institutional applications										
Type of installation	Very Coarse - Highly exposed to lightning - Point of supply entry for highly exposed, lightning prone sites including on hills and ridges, by tall trees or structures or connected by long overhead service power lines - Any installation with a Lightning Rod, LPS or Spark Gap Device - Proximity to very large motors or transformers; usually industrial sites, power plants or substations		Coarse - Proximity to industrial or large commercial sites that have or induce transients from large transformers or motors. - Or supplied by long service supply cables including private power poles - Large institutional - Power lines: metering box, point of connection, private power pole		Medium - Rarely exposed to lightning with underground service entrance, and short distance to neighbours - Suitable for most urban and suburban homes and domestic applications - Suitable for cascaded use, downstream of higher rated SPDs such as in: Major Submains, Distribution Boxes or Load Centres - Available with (R) or without (R) contact for condition monitoring		Fine - Supplementary protection for final circuits			
Type of Surge Protection	Type 1 + Type 2 Spark Gap Three phase Single phase		Type 2 65kA Three phase Single phase		Type 2 40kA Three phase Single phase		Type 2 20kA Three phase Single phase			
Spark Gap	SPL412A	SPL212A	-	-	-	-	-	-	-	-
TN-S / TT	-	-	SPL465(R)	SPL265(R)	SPL440	SPL440R	SPL240	SPL240R	SPL420(R)	SPL220(R)

Surge Protection Devices - Type 1 + Type 2

Our SPLxxx devices protect electrical and electronic equipment against transients originating from lightning and switching sources.

Note

When the surge protection device is used, backup protection must be used separately. For specific parameters, please refer to the technical data.

These transients can cause premature aging of equipment, logic failures and down time, to the complete destruction of electrical components.

Surge Protection Devices (SPD) - Type 1 + Type 2

Installation and connection:

- Spark Gap and MOV technology
- Single phase or Three phase
- TN-C or TN-S / TT
- Part numbers ending in 'R' have a contact to allow for wiring in alarm to indicate cartridge replacement



SPL212R



SPL412R

Designation	Iimp (10/350µs) (kA)	In (8/20µs) (kA)	Uc (V)	Width 18mm	Cat. Ref.
Single phase (1P+N)	12.5	12.5	350	2	SPL212R
Three phase (3P+N)	12.5	12.5	350	4	SPL412R

Surge Protection Devices - Type 2

Our SPLxxx devices protect electrical and electronic equipment against transients originating from lightning and switching sources.

Note

When the surge protection device is used, backup protection must be used separately. For specific parameters, please refer to the technical data.

These transients can cause premature aging of equipment, logic failures and down time, to the complete destruction of electrical components.

Surge Protection Devices (SPD) - Type 2

Installation and connection:

- Spark Gap and MOV technology
- Single phase or Three phase
- TN-S or TT
- Part numbers ending in 'R' have a contact to allow for wiring in alarm to indicate cartridge replacement
- Replacement NE & L-PE cartridges available

Designation	I _{max} (8/20µs) (kA)	In (8/20µs) (kA)	Up*(L-N) (V)	Width 18mm	Cat. Ref.
Single phase (1P+N)	20	10	1.3	2	SPL220
	40	20	1.5	2	SPL240
	65	35	1.9	2	SPL265
Three phase (3P+N)	20	5	1.3	4	SPL420
	40	20	1.5	4	SPL440
	65	35	1.9	4	SPL465
Single phase (1P+N)	20	10	1.3	2	SPL220R
	40	20	1.5	2	SPL240R
	65	35	1.9	2	SPL265R
Three phase (3P+N)	20	5	1.3	4	SPL420R
	40	20	1.5	4	SPL440R
	65	35	1.9	4	SPL465R



SPL240



SPL440



SPL220R



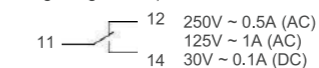
SPL465R

* Up value (N-PE) is 1.5 kV

Operational Status Indication (Fault indication)



"R" suffix - with remote terminal (Remote signaling contact)



Surge Protection Devices - Cartridge

Our SPLxxxx Surge Protection Device replacement cartridges and bases are IP2X This allows for simple 'hot swap' remove and replacement of expended cartridges.

Note

- Cartridges should be replaced when the visual indicator changes to 'Red'.
- Replacement cartridges are available for all different ratings and types
- A keying system exists to prevent a line (L-N) cartridge being interchanged by mistake with a neutral one (N-PE) and vice versa.
- Three phase SPD requires 3x L-N SPLxxxx cartridges are not compatible with legacy SPNxxxx products

Surge Protection Devices (SPD) - Cartridge

Designation	I _{max} (kA)	I _n (8/20μs) (kA)	U _p (kV)	Packing Qty.	Cat. Ref.
Phase cartridge	20	10	1.3	1	SPL020
	40	20	1.5	1	SPL040
	65	35	1.9	1	SPL065
Neutral cartridge	40	20	1.5	1	SPL040N
	65	20	1.5	1	SPL065N



SPL065



SPL065N

Guide of replacement cartridges for plug-in surge protection device

I _{max} (kA)	Phase cartridge	Neutral cartridge	Replaceable Cat. Ref.
65kA	SPL065	SPL065N	SPL265(R)
	SPL065	SPL065N	SPL465(R)
40kA	SPL040	SPL040N	SPL240(R)
	SPL040	SPL040N	SPL440(R)
20kA	SPL020	SPL040N	SPL220(R)
	SPL020	SPL040N	SPL420(R)



SPL465R

Surge Protection Devices for Photovoltaic (PV)

- For use in photovoltaic systems (IEC 60364-7-712)
- PV Type 2 / PV Class II (EN 50539-11)
- Without remote signaling

Technical Specifications

- U_e = 1000V U_p ≅ 3.7kV U_{cpv} ≅ 1170 V DC
- I_n = 15kA I_{scpv} = 2000A I_L = 80A
- I_{max} = 40kA (8/20μs)
- IP20
- Dimension (mm): L 98.7 x W 53.4 x H 65.7

Surge Protection Devices for Photovoltaic (PV)

Designation	Packing Qty	Cat. Ref.
SPD Type2 3P pluggable 40kA photovoltaic With lifetime indicator	1	SPV340
Cartridge Type2 1P photovoltaic +/- SPV340	1	SPV040

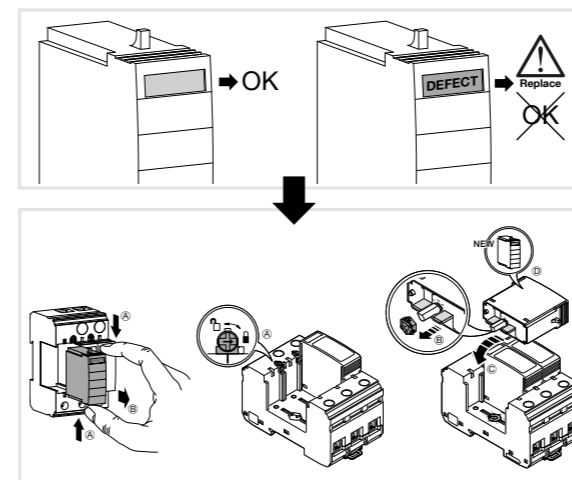


SPV340



SPV040

Fault indication and cartridge replacement



Cross-sectional area of connecting wire of terminal block (mm)

	min.	max.
16 mm	1,5 mm ²	25 mm ²
16 mm	1,5 mm ²	35 mm ²

Electrical characteristics - Type 1 + Type 2

Ref	Type 1 + Type 2	
Commerical number	SPL212R	SPL412R
System voltage	230V	230/400V
Replacement cartridge (L-N)	-	-
Replacement cartridge (N-PE)	-	-
Line system type	TN-S/TT	
Protection type	Common Mode/Differential Mode	
Max continuous operating AC voltage (Uc)	350Vac	
Voltage protection level (Up)	1.5kV	1.5kV
MAX backup overcurrent protection (fuse)	160A gL/gG	160A gL/gG
MAX backup overcurrent protection (MCB)	-	-
Short circuit withstand capability Isccr	12.5kA	12.5kA
Response time	L-N ≤ 25ns N-PE ≤ 100ns	
Normal discharge current (8/20u) L-N	12.5kA	3 x 12.5kA
Normal discharge current (8/20u) N-PE	50kA	50kA
Lighting impluse current (10/350us) limp L-N	12.5kA	12.5kA
Lighting impluse current (10/350us) limp N-PE	50kA	50kA
Max discharge current Imax	-	-
Operating temperature	-40°C - 85°C	
Operating state/Fault indication	Green (good) / Red (replace)	
Conductor connection capacity	Min 4mm ² Max 35 mm ²	
Number of modules	2	4
Single phase	Y	-
Three phase	-	Y
Mounting	35mm DIN rail according to IEC 60715	
Enclosure material (Flame Retardant)	UL94V-0	
L-N	1	3
N-PE	1	1
IP rating	IP20	
Humidity	5% - 95%	
Dimension (mm)	L90 x W36 x H67.6	L90 x W72 x H67.6

Electrical characteristics - Type 2

Ref	Type 2					
Commerical number	SPL220*	SPL240*	SPL265*	SPL420*	SPL440*	SPL465*
System voltage	230V	230V	230V	230/400V	230/400V	230/400V
Replacement cartridge (L-N)	SPL020	SPL040	SPL065	SPL020	SPL040	SPL065
Replacement cartridge (N-PE)	SPL040N	SPL040N	SPL065N	SPL040N	SPL040N	SPL065N
Line system type	TN-S/TT					
Protection type	Common Mode/Differential Mode					
Max continuous operating AC voltage (Uc)	350Vac					
Voltage protection level (Up)	1.3kV	1.5kV	1.9kV	1.3kV	1.5kV	1.9kV
MAX backup overcurrent protection (fuse)	40A gL/gG	80A gL/gG	125A gL/gG	40A gL/gG	80A gL/gG	125A gL/gG
MAX backup overcurrent protection (MCB)	32A Type C	32A Type C	63A Type C	32A Type C	32A Type C	63A Type C
Short circuit withstand capability Isccr	25kA	25kA	25kA	25kA	25kA	25kA
Response time	L-N ≤ 25ns N-PE ≤ 100ns					
Normal discharge current (8/20u) L-N	10kA	20kA	35kA	3 x 10kA	3 x 20kA	3 x 35kA
Normal discharge current (8/20u) N-PE	20kA	40kA	65kA	20kA	40kA	65kA
Lighting impluse current (10/350us) limp L-N	-	-	-	-	-	-
Lighting impluse current (10/350us) limp N-PE	-	-	-	-	-	-
Max discharge current Imax	20kA	40kA	65kA	20kA	40kA	65kA
Operating temperature	-40°C - 85°C					
Operating state/Fault indication	Green (good) / Red (replace)					
Conductor connection capacity	Min 4mm ² Max 35 mm ²					
Number of modules	2	2	2	4	4	4
Single phase	Y	Y	Y	-	-	-
Three phase	-	-	-	Y	Y	Y
Mounting	35mm DIN rail according to IEC 60715					
Enclosure material (Flame Retardant)	UL94V-0					
L-N	1	1	1	3	3	3
N-PE	1	1	1	1	1	1
IP rating	IP20					
Humidity	5% - 95%					
Dimension (mm)	L90 x W36 x H66.6 L99.5 x W36 x H66.6 (*R)			L90 x W72 x H66.6 L99.5 x W36 x H66.6 (*R)		