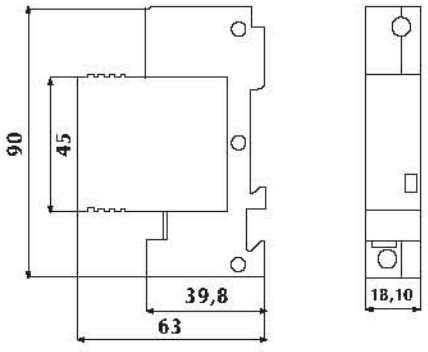
SBN25P



Basic circuit diagram of SBN25P

It is used for the protection of L.V. power supply systems against surges caused by lightning stroke. There fore, it creates an integral part of building protection and its installations against surge effects. SBN25P contains a high power gas discharge tube rated for max. lightning impulse current I_{imp} = 25kA (10/350). It is mainly used if there is an overhead line as a low voltage supply to a building or if there are residual current circuit breakers in protected facility. The recommended use is in the Lightning Protection Zones Concept at the boundaries
of LPZ 0_B – 1 and more according to IEC 1312-1 in low voltage power supply systems TNS, TT and IT. SBN-25P is in these applications mainly used for equipotential bonding between N and PE (equipotential busbar).

Type		SBN25P
Test class according to IEC 61643-1 and EN 61643-11		I+II / T1 + T2
Mode of protection		N/PE
Maximum continuous operating voltage	U_C	255 V/50 (60) Hz
Insulation resistance	R_i	>1000 MΩ
Max. lightning impulse current (10/350) * Charge * Spesific energy	I_{imp} Q W/R	25 kA 12,5 As 150 kJ/Ω
Max. discharge current (10/350)	I_{max}	60 kA
Nominal discharge current (8/20)	I_n	30 kA
Voltage protection level at I_{imp}	U_p	<1 kV
Lightning impulse sparkover voltage 1,2/50 µs		<1,5 kV
Follow current interrupting rating at U_C	I_f	100 A_{rms}
Response time	t_A	<100 ns
Operating temperature range	ϑ	-40°to + 80°C
Cross-section of the connected conductors (at tightening moment of clamps 3 Nm.)		10 mm^2
Protection type		IP 20
Mounting on		DIN rail 35 mm
Housing material		Silamid EFX
Lifetime		100.000 hrs
Weight	m	90 g

SB120PS

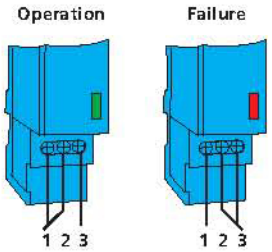
SB120PS

It is lightning arrester class I + II according to IEC 61643-1 and EN 61443-11. To be placed into the main or secondary switchboards at the beginning of electrical supply into a building. Complete device consists of a base and pluggable module.
These pluggable modules can be exchanged without disconnection of power supply. The recommended use is in the Lightning Protection Zones Concept at the boundaries of LPZ $0_{A(B)}$ -1 according to IEC 1312-1 in low voltage power supply systems TNC and TNS, but it can be used also in TT and IT systems. SB*P is used for protection of power supply system either by cable lines or by L.V. overhead line.

Type		SB120PS
Test class according to IEC 61643-1 and EN 61643-11		I+II / T1 + T2
Nominal voltage	U_N	120 V/50(60) Hz
Max. continuous operating voltage	U_c	144 V/50 (60) Hz
Max. lightning impulse current (10/350)	I_{imp}	8 kA
Max discharge current (8/20)	I_{max}	50kA
Nominal discharge current (8/20)	I_n	30kA
Voltage protection level at I_{imp}	U_p	<650 V
Response time	t_A	<25 ns
Recommended back up fuse		160 AgI/gG
Short-circuit withstand capability at max. back-up fuse	I_p	60 kA_{rms}
Operating temperature range	ϑ	-40°to + 80°C
Cross-section of the connected conductors (at tightening moment of clamps 3 Nm)		6 ÷ 25 mm^2 (solid) 6 ÷ 16 mm^2 (flexible)
Protection type		IP 20
Mounting on		DIN rail 35mm
Housing material		Silamid EFX
Potential free signal contact (S)		el.strength against surround. circuits 3750 V_{rms} el.strength against network circuits 3750 V_{rms} insulation resistance $2x10^7\Omega$ max.switching current ~0,5 A max.switching voltage ~250 V
Lifetime		100.000 hrs
Weight	m	130 g

Mechanical Failure Indication

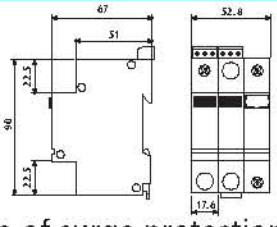
Is optically indicated by a red or green changeover field on front side of the device. The green field signals that the device is fully functional. The red field signals a damage of the protecting unit.

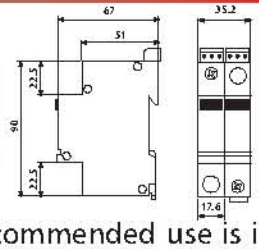


Connection of Remote Monitoring

As long as the unit SB*PS is functional, the contacts 1-2 are connected. This applies if the unit is alive or also if there is absence of voltage. If there is a damaged varistor in the unit because of heat effect due to overload, the contacts 2-3 are connected.

S1PC* and S1PC*S



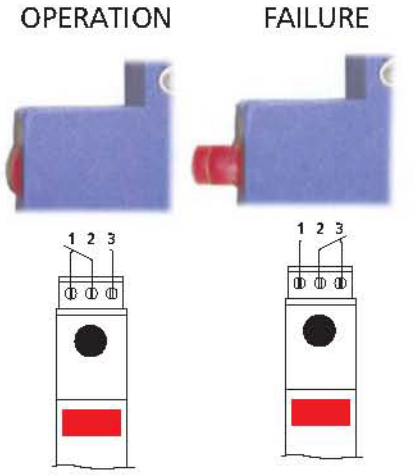
A compact range of surge protection devices of 1st and 2nd stage. The recommended use is in the Lightning Protection Zones Concept at the boundaries of LPZ $0_{A(B)}$-1 according to IEC 1312-1, IEC 62305 and EN 61643-11 in low voltage power supply systems TNS, TNC, TT. S1PC* (Surge Protection Compact) is suitable for protection of electrical installation which are connected to supply system by cable lines or overhead line as a low voltage supply to a building. They are produced in a compact range for max. discharge currents I_{max} (8/20) = 60, 90, 120, 150kA (L/N). The withstand capability against discharge current between the terminals N/PE are either I_{imp}(10/350)=20kA (for models S1PC) or I_{imp}(10/350)=80kA (for models S1PC*.0).

Type			S1PC 60(S) S1PC.0 60	S1PC 90(S) S1PC.0 90	S1PC 120(S) S1PC.0 120	S1PC 150(S) S1PC.0 150
Test class according to IEC 61643-1and EN 61643-11			I+II / T1 + T2			
Nominal voltage	U_N		230 V/50 (60) Hz			
Max.continuous operating voltage	U_C		275 V/50 (60) Hz			
Max.lightning impulse current (10/350) * charge * specific energy	I_{imp} Q W/R	L/N	8 kA 4 As 16 kJ/Ω	12 kA 6 As 36 kJ/Ω	16 kA 8 As 64 kJ/Ω	20 kA 10 As 100 kJ/Ω
Max.lightning current I_{imp} (10/350) * charge * specific energy	I_{imp} Q W/R	N/PE	20 kA (S1PC),80 kA (S1PC.0) 10 As (S1PC),40 As (S1PC.0) 100 kJ/Ω (S1PC),40As (S1PC.0)			
Maximum discharge current (8/20)	I_{max}	L/N	60 kA	90 kA	120 kA	150 kA
Nom. discharge current (8/20)	I_n	L/N	30 kA	50 kA	65 kA	80 kA
Voltage protection level at I_{imp}	U_p	L/N	< 1,3 kV			
Response time	t_A	L/N N/PE	< 25ns < 100 ns			
Recommended back-up fuse			315 AgL/gG			
Recommended back-up fuse ("V" connection)			63 AgL/gG			
Short-circuit withstand capability at max. back-up fuse	I_p		80 kA_{rms}			
Operating temperature range	ϑ		-40° to + 80°C			
Cross-section of the connected conductors (at tightening moment of clamps 4Nm)			50 mm^2 (solid) 35 mm^2 (flexible)			
Protection type			IP 20			
Mounting on			DIN rail 35mm			
Housing material			SLOVAMID 6FRC2			
Lifetime			min 100.000 hrs			
Weight	m		347 g			
Potential free signal contact (S)			el.strength against surround. circuits el.strength against network circuits insulation resistance max.switching current max.switching voltage			3750 V_{rms} 3750 V_{rms} $2x10^7\Omega$ ~0,5 A ~250 V

Type			S1PC.1 60 S1PC.1 60(S)	S1PC.1 90 S1PC.1 90(S)	S1PC.1 120 S1PC.1 120(S)	S1PC1 150 S1PC.1 150(S)
Test class according to IEC 61643-1and EN 61643-11			I+II / T1 +T2			
Nominal voltage	U_N		230 V/50 (60) Hz			
Max.continuous operating voltage	U_C		275 V/50 (60) Hz			
Max.lightning impulse current (10/350) * charge * specific energy	I_{imp} Q W/R	L/PEN	8kA 4 As 16 kJ/Ω	12 kA 6 As 36 kJ/Ω	16 kA 8 As 64 kJ/Ω	20 kA 10 As 100 kJ/Ω
Max.lightning impulse current (10/350) * charge * specific energy	I_{imp} Q W/R					
Maximum discharge current (8/20)	I_{max}	L/PEN	60 kA	90 kA	120 kA	150 kA
Nom. discharge current (8/20)	I_n		30 kA	50 kA	65 kA	80 kA
Voltage protection level at I_{imp}	U_p	L/PEN	<1,3 kV			
Response time	t_A	L/PEN	<25ns			
Recommended back-up fuse			315 AgL/gG			
Recommended back-up fuse ("V" connection)			63 AgL/gG			
Short-circuit withstand capability at max. back-up fuse	I_p		80 kA_{rms}			
Operating temperature range	ϑ		-40° to +80°C			
Cross-section of the connected conductors (at tightening moment of clamps 4Nm)			50 mm^2 (solid) 35 mm^2 (flexible)			
Protection type			IP 20			
Mounting on			DIN rail 35mm			
Housing material			SLOVAMID 6FRC2			
Potential free signal contact (S)			el.strength against surround. circuits el.strength against network circuits insulation resistance max.switching current max.switching voltage			3750 V_{rms} 3750 V_{rms} $2x10^7\Omega$ ~0,5 A ~250 V
Lifetime			min 100.000 hrs			
Weight	m		270 g			

S1PC* consists of lightning arrester 1st stage and surge arrester 2nd stage according to IEC 61643-1 and EN 61643-11. By a special distribution of varistors we have been successful in decreasing the size, especially by saving space by leaving out the decoupling elements, which are usually placed between the 1st and 2nd stage cascade of surge protection. The S1PC * compact protection products provide particularly effective power supply system protection against transverse and lengthwise surges in cooperation with recommended application of arresters of 3rd stage protection. Particular varistor sections connected between terminals L/N comply to IEC 61643-1 and EN 61643-11. They are provided with internal disconnecters which are activated when a failure of the varistors occurs. Indication of failure of these disconnecters is partly mechanical (by a red signalling target) and partly remote monitoring (by potential free signal contact).

Connection of remote monitoring for S1PC*



S3PC*

A compact range of surge protection devices of 1st and 2nd stage. The recommended use is in the Lightning Protection Zones Concept at the boundaries of LPZ $0_{A(B)}$ -1 according to IEC 1312-1, IEC 62305 and EN 61643-11 in low voltage power supply systems TNS, TNC and TT.
S3PC* (Surge Protection Compact) is suitable for protection of electrical installation which is connected to supply system by cable lines or overhead line. They are produced in a compact range for max. discharge currents $I_{max}(8/20)$ = 60, 90, 120, 150kA (L/N). The withstand capability against discharge current between the terminals N/PE are either $I_{imp}(10/350)=20kA$ (for models S3PC) or $I_{imp}(10/350)=80kA$ (for models S3PC.0).

Type			S3PC 60 S3PC.0 60(S)	S3PC 90 S3PC.0 90(S)	S3PC 120 S3PC.0 120(S)	S3PC 150 S3PC.0 150(S)
Test class according to IEC 61643-1and EN 61643-11			I+II / T1 + T2			
Nominal voltage	U_N		3x400/230V/50(60) Hz			
Max.continuous operating voltage	U_C		3x480/275V/50(60) Hz			
Max.lightning impulse current (10/350) * charge * specific energy	I_{imp} Q W/R	L/N	8kA 4 As 16 kJ/Ω	12 kA 6 As 36 kJ/Ω	16 kA 8 As 64 kJ/Ω	20 kA 10 As 100 kJ/Ω
Max.lightning impulse current (10/350) * charge * specific energy	I_{imp} Q W/R	N/PE	20 kA (S3PC),80 kA (S3PC.0) 10 As (S3PC),40 As (S3PC.0) 100 kJ/Ω (S3PC), 1600 kJ/Ω (S3PC.0)			
Maximum discharge current (8/20)	I_{max}	L/N	60 kA	90 kA	120 kA	150 kA
Nom. discharge current (8/20)	I_n	L/N	30 kA	50 kA	65 kA	80 kA
Voltage protection level at I_{imp}	U_p	L/N	< 1,3 kV			
Response time	t_A	L/N N/PE	< 25ns < 100ns			
Recommended back-up fuse			315 AgL/gG			
Recommended back-up fuse ("V" connection)			63 AgL/gG			
Short-circuit withstand capability at max. back-up fuse	I_p		80 kA_{rms}			
Operating temperature range	ϑ		-40° to + 80°C			
Cross-section of the connected conductors (at tightening moment of clamps 4Nm)			50 mm^2 (solid) 35 mm^2 (flexible)			
Protection type			IP 20			
Mounting on			DIN rail 35mm			
Housing material			SLOVAMID 6FRC2			
Potential free signal contact (S)			el.strength against surround. circuits 3750 V_{rms} el.strength against network circuits 3750 V_{rms} insulation resistance $2x10^7\Omega$ max.switching current ~0,5 A max.switching voltage ~250 V			
Lifetime			min 100.000 hrs			
Weight	m		872 g			

Type			S3PC.1 60 S3PC.1 60(S)	S3PC.1 90 S3PC.1 90(S)	S3PC.1 120 S3PC.1 120(S)	S3PC.1 150 S3PC.1 150(S)
Test class according to IEC 61643-1and EN 61643-11			I+II / T1 + T2			
Nominal voltage	U_N		3x400/230V/50(60) Hz			
Max.continuous operating voltage	U_C		3x480/275V/50(60) Hz			
Max.lightning impulse current (10/350) * charge * specific energy	I_{imp} Q W/R	L/PEN	8kA 4 As 16 kJ/Ω	12 kA 6 As 36 kJ/Ω	16 kA 8 As 64 kJ/Ω	20 kA 10 As 100 kJ/Ω
Max.lightning impulse current (10/350) * charge * specific energy	I_{imp} Q W/R					
Maximum discharge current (8/20)	I_{max}	L/PEN	60 kA	90 kA	120 kA	150 kA
Nom. discharge current (8/20)	I_n		30 kA	50 kA	65 kA	80 kA
Voltage protection level at I_{imp}	U_p	L/PEN	< 1,3 kV			
Response time	t_A	L/PEN	< 25ns			
Recommended back-up fuse			315 AgL/gG			
Recommended back-up fuse ("V" connection)			63 AgL/gG			
Short-circuit withstand capability at max. back-up fuse	I_p		80 kA_{rms}			
Operating temperature range	ϑ		-40° to + 80°C			
Cross-section of the connected conductors (at tightening moment of clamps 4Nm)			50 mm^2 (solid) 35 mm^2 (flexible)			
Protection type			IP 20			
Mounting on			DIN rail 35mm			
Housing material			SLOVAMID 6FRC2			
Potential free signal contact (S)			el.strength against surround. circuits el.strength against network circuits insulation resistance max.switching current max.switching voltage			3750 V_{rms} 3750 V_{rms} $2x10^7\Omega$ ~0,5 A ~250 V
Lifetime			min 100.000 hrs			
Weight	m		788 g			

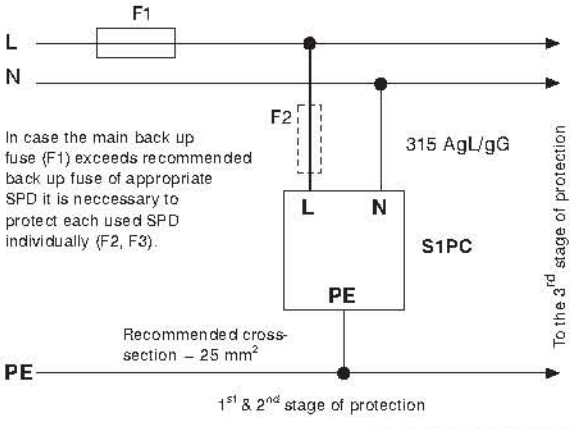
S3PC* consists of lightning arrester 1st stage and surge arrester 2nd stage according to IEC 61643-1 and EN 61643-11 standard. By a special distribution of varistors we have been successful in decreasing the size, especially by saving space by leaving out the decoupling elements, which are usually placed between the 1st and 2nd stage cascade of surge protection. The S3PC compact protection products provide particularly effective power supply system protection against transverse and lengthwise surges in cooperation with recommended application of arresters of 3rd stage (class III). Particular varistor sections connected between terminals L/N comply to IEC 61643-1 and EN 61643-11. They are provided with internal disconnecters which are activated when a failure of the varistors occurs.

Indication of failure of these disconnecters is partly mechanical (by a red signalling target) and partly remote monitoring (by potential free signal contact).
Note: It is possible to require S3PC.0 designed for IT-systems at U_N=3x400 V by the special demand entirely.

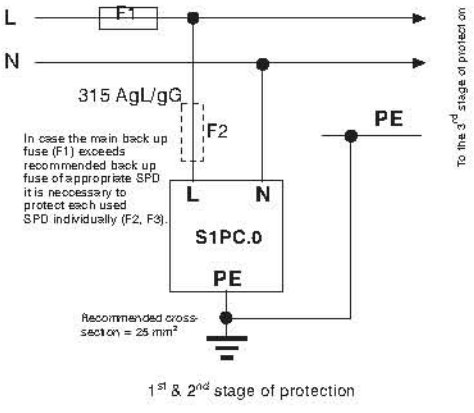
Connection of remote monitoring for S1PC* type.

Recommended wiring of lightning arresters S1PC*.type.

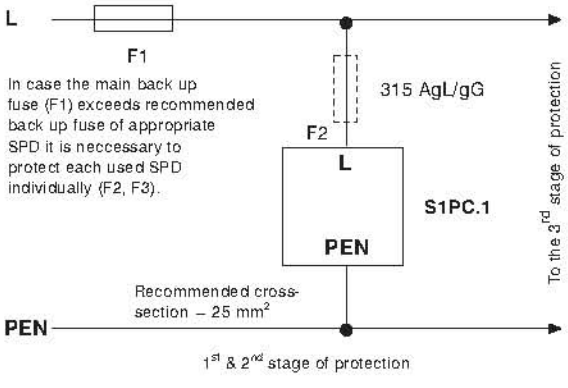
Recommended wiring for System TN-S



Recommended wiring for System TT

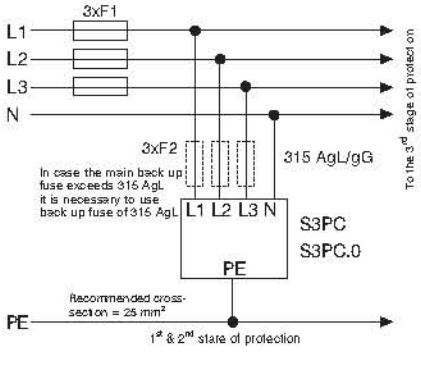


Recommended wiring for TN-C system

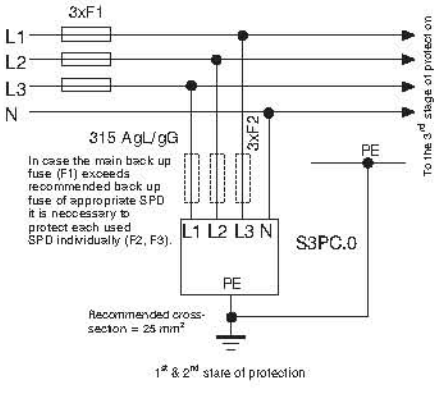


Recommended wiring of lightning arresters S3PC* type (S)

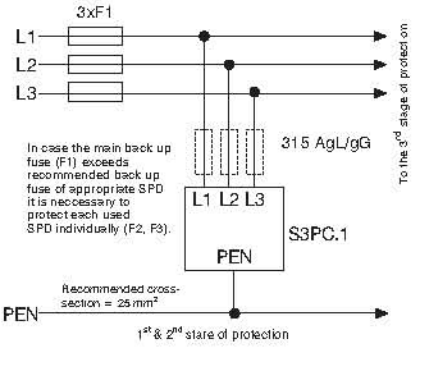
Recommended wiring for System TN-S



Recommended wiring for System TT



Recommended wiring for System TN-C



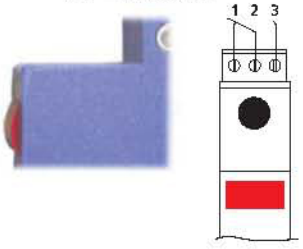
PROTECTION OF PHOTOVOLTAIC SYSTEMS CLASS I + II

SBC PV*

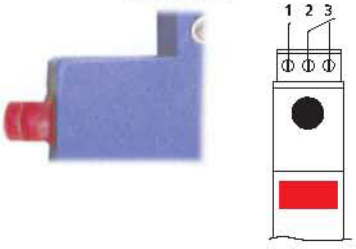
A compact range of surge protection devices (class I + II) is designed for protection of positive and negative busbars of photovoltaic systems against the surge effects according to EN 61643-11 and IEC 61643-1. The recommended use is in the Lightning Protection Zones Concept at the boundaries of LPZ $0_{A(B)}$ - 1 and higher according to IEC 1312-1 and IEC 62305. Particular varistor sectors connected between terminals L+, L- and PE are equipped with fitted internal disconnectors, which are activated when varistors fail (overheat). Failure indication of these disconnectors is partly mechanical (by red signalling target) and partly remote monitoring by potential free switching contacts (only SBC PV* S type).

Connection of Remote Monitoring For SBC*PV

OPERATION



FAILURE



Type			SBC PV 200 SBC PV(S)200	SBC PV 400 SBC PV(S)400	SBC PV 600 SBC PV(S)600	SBC PV 800 SBC PV(S)800	SBC PV 1000 SBC PV(S)1000
Test class according to IEC 61643-1and EN 61643-11			I+II / T1 + T2				
Nominal AC voltage of several MOV sections	U_c		60 V	120 V	240 V	280 V	400 V
Max.continuous operating voltage DC(L+→L-)	U_N		200 V	400 V	600 V	800 V	1000 V
Max. Lightning impulse current (10/350)	I_{imp}	L+/L-	12 kA				
- charge	Q	L+/L-	6 As				
- specific energy	W/R	L+/L-	36 kj/Ω				
Max. discharge current (8/20)	I_{max}	L+/PE	120 kA				
Nominal dicsharge current (8/20)	I_n	L-/PE	65 kA				
Voltage protection level at I_{imp}	U_p		< 350 V	< 1100 V	< 2000 V	< 2400 V	< 3400 V
Response time	t_A		< 25ns < 100ns				
Recommended back-up fuse			63 AgL/gG				
Operating temperature range	ϑ		-40° to +80°C				
Cross-section of the connected conductors (at tightening moment of clamps 4Nm			6 ÷ 35 mm² (solid) 6 ÷ 25 mm² (flexible)				
Protection type			IP 20				
Mounting on			DIN rail 35mm				
Housing material			SLOVAMID 6FRC2				
Potential free signal contact (S)			el.strength against surround. circuits el.strength against network circuits insulation resistance max.switching current max.switching voltage				3750 V_{rms} 3750 V_{rms} $2x10^7\Omega$ ~0,5 A ~250 V
Lifetime			100.000 hrs				
Weight	m		780 g				