POWER SUPPLY SYSTEMS LIGHTNING ARRESTER CLASS II

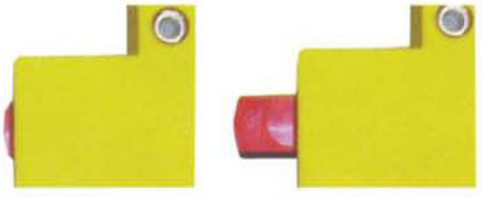
SCF*

Surge arrester class II according to IEC 61643-1 and EN 61643-11 (2nd stage protection). To be placed into the secondary switchboards . Models SCF* contains a special ZnO varistors with I_{max}(8/20)=40kA or I_{max} (8/20)=20kA.They are manufactured in a compact range for nominal voltages of 60V,120V,230V,280V,400V,500V and 720V.The recommended use is in the Ligtning Protection Zones Concept at the boundaries of LPZ O_B-1 and more according to IEC 1312-1and IEC 62305 in low voltage power supply systems TNC and TNS ,but it can also be used in TT and IT stystems. SCF S (SCT) can be used in applications, where the remote monitoring of failure is required.This type has some construction as SCF(SCT),but it also contains potential free contact for remote monitoring of failure.

Type		SCF 60 SCF 60(S)	SCF 120 SCF 120(S)	SCF 230 SCF 230(S)	SCF 280 SCF 280(S)
Test class according to IEC 61643-1and EN 61643-11		II / T2			
Nominal voltage /50 (60) Hz	U_N	60 V	120 V	230 V	280 V
Maximum continuous operating voltage/50 (60) Hz	U_C	75 V	144 V	275 V	320 V
Maximum discharge current (8/20)	I_{max}	40 kA			
Nom. discharge current (8/20)	I_n	15 kA	20 kA		
Voltage protection level at I_n	U_p	<350 V	<850 V	<1,3 kV	
Response time	t_A	<25 ns			
Recommended back-up fuse		160 AgL/gG			
Short-circuit withstand capability at max. back-up fuse	I_p	60 kA_{rms}			
Operating temperature range	ϑ	-40º to + 80ºC			
Cross-section of the connected conductors (at tightening moment of clamps 3Nm)		6÷25 mm^2 (solid) 6÷16 mm^2 (flexible)			
Protection type		IP 20			
Mounting on		DIN rail 35mm			
Housing material		SLOVAMID 6FRC2			
Lifetime		min 100.000 hrs			
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
Weight	m	98 g			

Type		SCF 400 SCF 400(S)	SCF 500 SCF 500(S)	SCT 230 SCT 230(S)	SCT 280 SCT 280(S)
Test class according to IEC 61643-1and EN 61643-11		II / T2			
Nominal voltage /50 (60) Hz	U_N	400 V	500 V	230 V	280 V
Max.continuous operating voltage/50 (60) Hz	U_C	480 V	600 V	275 V	320 V
Maximum discharge current (8/20)	I_{max}	40 kA		20 kA	
Nom. discharge current (8/20)	I_n	15 kA			
Voltage protection level at I_n	U_p	< 2 kV	< 2,5 kV	< 1,3 kV	
Response time	t_A	< 25 ns			
Recommended back-up fuse		160 AgL/gG		100 AgL/gG	
Short-circuit withstand capability at max. back-up fuse	I_p	60 kA_{rms}		30 kA_{rms}	
Operating temperature range	ϑ	-40° to + 80°C			
Cross-section of the connected conductors (at tightening moment of clamps 3Nm)		6 ÷ 25 mm^2 (solid) 6 ÷ 16 mm^2 (flexible)			
Protection type		IP 20			
Mounting on		DIN rail 35mm			
Housing material		SLOVAMID 6FRC2			
Lifetime		min 100.000 hrs			
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			
Weight	m	100g	110g	90 g	

OPERATION FAILURE



Mechanical Failure Indication

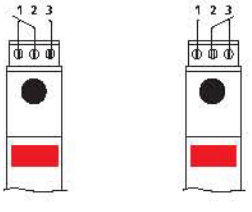
Is indicated by a red signalling target. If the red target is pushed in, the device is fully functional.
The red target pushed out signals a damage of the protecting unit.

* The devices are manufactured with nominal voltages of 60V,120V,230V,280V,400V,500V and 720 V.

Connection of Remote Monitoring

As long as the unit SCF-S (SCT* S) 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.

Operation Failure



SC*

Surge arrester class II according to IEC 61643-1 and EN 61643-11 (2nd stage protection). To be placed into the secondary switchboards. Complete device consists of a base and pluggable module. These pluggable modules can be exchanged without disconnection of power supply. Models SC* contains a special ZnO varistors with $I_{max}(8/20)=40$ kA or $I_{max}(8/20)=20$kA.

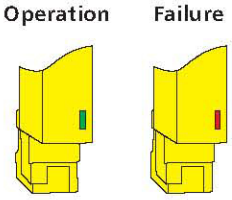
They are manufactured in a compact range for nominal voltages of 60 V, 120 V, 230 V, 280 V, 400 V, 500 V and 720 V. The recommended use is in the Lightning Protection Zones Concept at the boundaries of LPZ 0_B-1 and more according to IEC 1312-1 and IEC 62305 in low voltage power supply systems TNC and TNS, but it can also be used in TT and IT systems. SC*S can be used in applications, where the remote monitoring of failure is required. This type has the same construction as SC*,but it also contains potential free contact for remote monitoring of failure.

Type		SC 60 SC 60(S)	SC 120 SC 120(S)	SC 230 SC 230(S)	SC 280 SC 280(S)
Surge arrester class II according to IEC 61643-1 and EN 61643-11 (2nd stage protection)		II / T2			
Nominal voltage / 50 (60) Hz	U_N	60 V	120 V	230 V	280 V
Max.continuous operating voltage /50 (60) Hz	U_C	75 V	144 V	275 V	320 V
Maximum discharge current (8/20)	I_{max}	40 kA			
Nom. discharge current (8/20)	I_n	15 kA	20 kA		
Voltage protection level at I_n	U_p	<350 V	<850 V	<1,3 kV	
Response time	t_A	<25 ns			
Recommended back-up fuse		160 AgL/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 3Nm)		6 + 25 mm^2 (solid) 6 + 16 mm^2 (flexible)			
Protection type		IP 20			
Mounting on		DIN rail 35mm			
Housing material		SLOVAMID 6FRC2			
Lifetime		min 100.000 hrs			
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			
Weight	m	98 g			

Type		SC 400 SC 400(S)	SC 500 SC 500(S)	SCMT 230 SCMT 230(S)	SCMT 280 SCMT 280(S)
Test class according to IEC 61643-1and EN 61643-11		II / T2			
Nominal voltage /50 (60) Hz	U_N	400 V	500 V	230 V	280 V
Max.continuous operating voltage /50 (60) Hz	U_C	480 V	600 V	275 V	320 V
Maximum discharge current (8/20)	I_{max}	40 kA		20 kA	
Nom. discharge current (8/20)	I_n	15 kA			
Voltage protection level at I_n	U_p	< 2 kV	< 2,5 kV	< 1,3 kV	
Response time	t_A	< 25 ns			
Recommended back-up fuse		160 AgL/gG		100 AgL/gG	
Short-circuit withstand capability at max. back-up fuse	I_p	60 kA_{rms}		30 kA_{rms}	
Operating temperature range	ϑ	-40° to + 80°C			
Cross-section of the connected conductors (at tightening moment of clamps 3Nm)		6 ÷ 25 mm^2 (solid) 6 ÷ 16 mm^2 (flexible)			
Protection type		IP 20			
Mounting on		DIN rail 35mm			
Housing material		SLOVAMID 6FRC2			
Lifetime		min 100.000 hrs			
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			
Weight	m	100 g	110 g	90 g	90 g

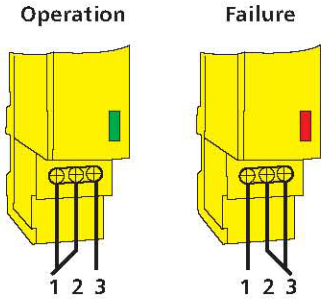
Mechanical Failure Indication

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.

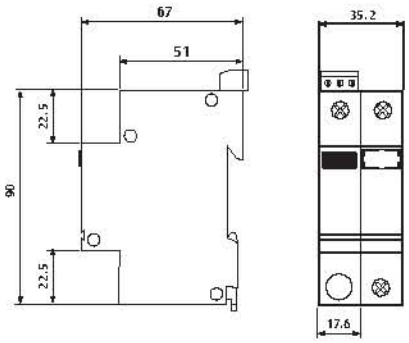


Connection of Remote Monitoring

As long as the unit SC* S 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.



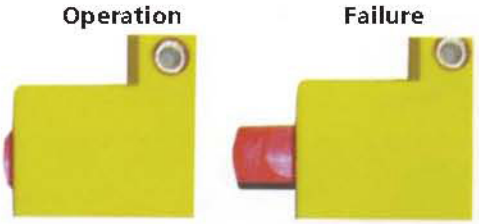
SSPU1* and SSPU3*



A compact range of surge protection devices (class II) is designed for protection of one-phase or there phases L.V. supply system against the surge effects. 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 and IEC 62305 in low voltage power supply systems.There is a varistor in SSPU* (Schirtec Surge Protection Unit) fitted for protection of phase conductors, there is also a high power gas discharge tube intended for protection of middle operating conductor in TN-S and TT systems .The whole SSPU* configuration are housed in a yellow plastic box ,adapted for mounting on DIN rail 35 mm. All varistor sectors are equipped with fitted internal disconnectors ,which are activated if the varistors fail (overheat).Failure indication of these disconnectors is partially mechanical (by red signalling target pushed out while occurence of failure),and partially remote monitoring (by potential free switching contacts).

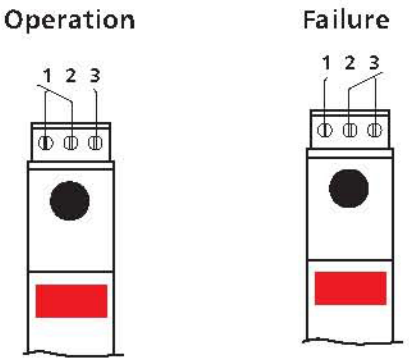
Mechanical Failure Indication

Is realized by a red signalling target. If the red target is pushed in, the function is right. The red target pushed out signals a damage of the protecting unit.



Connection of Remote Monitoring

As long as SSPU 1 unit is functional, the clamps 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 during its overload, the clamps 2-3 are connected.



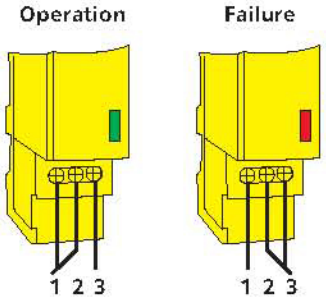
Type			SSPU1-120S	SSPU1-240S	SSPU3-120S	SSPU3-240S
Test class according to IEC 61643-1 and EN 61643-11			II / T2			
Nominal voltage AC	U_N		120 V	240 V	3X208/120 V	3X416/240 V
Max.continuous operating voltage / 50 (60) Hz	U_C	L/N	144 V	282 V	3X250/144 V	3X500/282 V
		N/PE	255V/50Hz			
Max. lightning impulse current (10/350)	I_{imp}	L/N	3 kA			
		N/PE	20 kA			
* Charge	Q	L/N	1,5 As			
		N/PE	10 As			
* Specific energy	WR	L/N	2,3 kJ/Ω			
		N/PE	100 kJ/Ω			
Max. discharge current (8/20)	I_{max}	L/N	40 kA			
Nominal discharge current (8/20)	I_n	L/N	20 kA			
Voltage protection level at I_n	U_P	L/N N/PE	<850V	<1,3 V	<850 V	<1,3 kV
Voltage protection level at I_{imp}	U_P	L/N N/PE	<1,3 kV			
DC sparkover voltage			500V ∓10%			
Follow current interrupting rating at U_c	I_{fi}	N/PE	$<100A_{rms}$			
Response time	t_A	L/N	<25ns			
		N/PE	<100ns			
Recommended back-up fuse			160 AgL/gG			
Short-circuit withstand capability	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)			$25mm^2$ (solid) $16mm^2$ (flexible)			
Protection type			IP 20			
Mounting on			DIN rail 35mm			
Housing Material			SLOVAMID 6FRC2			
Lifetime			min 100.000 hrs			
Potential free signal contact (S)			El.strength against surrond. circuits: $3750V_{rms}$ El.strength against network circuits: $3750V_{rms}$ Insulation resistance: $2x10^7\Omega$ Max. switching current: ~0,5A Max. switching voltage: ~250V			
Weight	m		172g		380 g	

SSPUM1* and SSPUM3*

A compact range of surge protection devices (class II) is designed for protection of one-phase or there phases L.V. supply system against the surge effects. 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 and IEC 62305 in low voltage power supply systems.
Complete device consists of a base and pluggable modules.These pluggable modules can be exchanged without disconnection of power supply.
There is a varistor in SSPUM 1 (Schirtec Surge Protection Unit) fitted for protection of phase conductors, there is also a high power gas discharge tube intended for protection of middle operating conductor in TN-S and TT systems.
All varistor sectors are equipped with fitted internal disconnectors which are activated if the varistors fail (overheat). Failure indication of these disconnectors is partially mechanical (by red signalling field on front side of device), and partially remote monitoring (by potential free switching contacts only SSPUM S).

Mechanical Failure Indication

Is optically indicated by a change of colour signalisation 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 indication

As long as SSPU3 unit is functional, the clamps 1-2 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 during its overload ,the clamps 2-3 connected.

Type			SSPUM1-240 S	SSPUM1-385 S	SSPUM3-240 S	SSPUM3-385 S
Test class according to IEC 61643-1 and EN 61643-11			II / T2			
Nominal voltage AC	U_N		240 V		3X416/240 V	
Max.continuous operating voltage / 50 (60) Hz	U_C	L/N	282 V	385 V	3X500/282 V	3X385/225 V
		N/PE	255V			
Max. lightning impulse current (10/350)	I_{imp}	L/N	3 kA			
		N/PE	15 kA			
* Charge	Q	L/N	1,5 As			
		N/PE	7,5 As			
* Specific energy	W/R	L/N	2,3 kJ/Ω			
		N/PE	50 kJ/Ω			
Max. discharge current (8/20)	I_{max}	L/N	40 kA			
Nominal discharge current (8/20)	I_n	L/N	20 kA			
Voltage protection level at I_n	U_P	L/N	<1,3 kV	<1,8 V	<1,3 kV	<1,8 kV
		N/PE				
Voltage protection level at I_{imp}	U_P	L/N	<1,3 kV			
		N/PE				
DC sparkover voltage		N/PE	500V ∓10%			
Follow current interrupting rating at U_c	I_{fi}	N/PE	$<100A_{rms}$			
Response time	t_A	L/N	<25ns			
		N/PE	<100ns			
Recommended back-up fuse			160 AgL/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 momment of clamps 3 Nm)			$25mm^2$ (solid) $16mm^2$ (flexible)			
Protection type			IP 20			
Mounting on			DIN rail 35mm			
Housing Material			SLOVAMID 6FRC2			
Lifetime			min 100.000 hrs			
Potential free signal contact (S)			El.strength against surrond. circuits: $3750V_{rms}$ El.strength against network circuits: $3750V_{rms}$ Insulation resistance: $2x10^7\Omega$ Max. switching current: ~0,5A Max. switching voltage: ~250V			
Weight	m		172g		380 g	

SCN20 and SCN20M

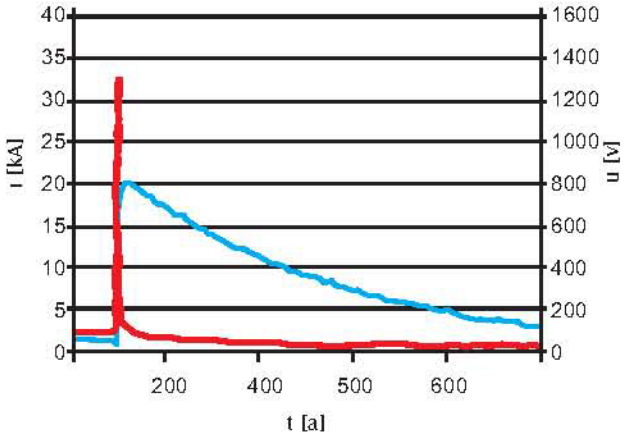
Module SCN20 is one part of modular units of surge protection intended for mouting on DIN rail 35 mm .It is used for the protection of L.V. power supply systems against surges caused by lightning stroke.Therefore,it creates an integral part of building protection and its installations against surge effects. SCN20 contains a high power gas discharge tube rated for max. lightning impulse current I_{imp}=20 kA(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. It fulfils construction demands posed on class II for lightning arresters. The recommended use is in the Lightning Protection Zones Concept at the boundaries of $LPZ0_B$-1 and more according to IEC 1312-1 and IEC 62305 in low voltage power supply systems TNS,TT and IT*.
SCN20 is in these applications mainly used equipotential bonding between N and PE (equipotential busbar).

*** For IT systems without outlet we use a special modification of gas discharge tube SCN20M.**

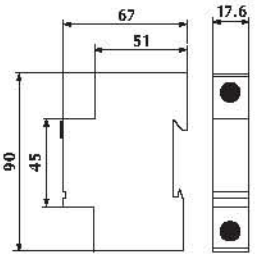
Type		SCN20	SCN20M
Test class according to IEC 61643-1 and EN 61643-11		II / T2	
Modes of protection		N/PE	
Max. continuous operating voltage	U_C	255V/50(60)Hz	
Insulation resistance	R_i	>1000MΩ	
Max. discharge current (8/20)	I_{max}	50kA	
Nominal discharge current (8/20)	I_n	20kA	
Max. lightning impulse current (10/350)	I_{imp}	20kA	15kA
Charge	Q	10As	7,5As
Spesific energy	W/R	100kJ/Ω	50kJ/Ω
Voltage protection level at I_{imp}	U_p	<1,3kV	
Follow current extinguishing capability at U_C	I_f	<100 A_{rms}	
Response time	t_A	<100ns	
Lightning impulse sparkover voltage 1,2/50 μs		<1,5kV	
Operating temperature range	ϑ	-40°to +80°C	
Cross-section of the connected conductors (at tightening moment of clamps 3Nm.)		10mm^2	
Protection type		IP 20	
Mounting on		DIN rail 35mm	
Housing material		SLOVAMID 6FRC2	
Weight	m	84g	

Basic circuit diagram of SCN-20

The typical SCN-20 response to a stroke of test impulse $I_{imp}(10/350)=20kA$



SPR 100



An auxiliary connection module which serves for easier installation of surge and lightning arresters on DIN rail 35mm.

Type		SPR100
Nominal voltage	U_N	500V (AC/DC)
Nominal current	I_N	100A
Max lightning impulse current $I_{max}(10/350)$	I_{imp}	100kA
Recommended back-up fuse		250AgL/gG
Short-circuit withstand capability	I_p	80kA$_{rms}$
Operating temperature range	ϑ	-40 to +80°C
Cross-section of connected conductors (at tightening of clamps 4Nm.)		6÷25mm^2 (solid) 6÷16mm^2 (flexible)
Mounting on		DIN rail 35mm
Housing material		SLOVAMID 6FRC2

SSPUM PV*

A compact range of surge protection devices (class 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_B-1 and higher according to IEC 1312-1 and IEC 62305. SSPUM PV* consists of a base and pluggable modules. These pluggable modules can be exchanged without disconnection of power supply. 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 visual (discoloration of the signal field) and partly remote monitoring by potential free switching contacts (only SSPUM PV(S)* type).

Type		SSPUM PV200 SSPUM PV(S)200	SSPUM PV400 SSPUM PV(S)400	SSPUM PV600 SSPUM PV(S)600	SSPUM PV800 SSPUM PV(S)800	SSPUM PV1000 SSPUM PV(S)1000
Test class according to IEC 61643-1and EN 61643-11		II / T2				
Nominal voltage AC of plugable modules SC*	U_N	60 V	120 V	240 V	280 V	400 V
Max.continuous operating voltage DC(L+/L-,L+/PE,L-/PE)	U_C	200 V	400 V	600 V	800 V	1000 V
Max. discharge current at wave shape(8/20)	I_{max}	40 kA				
Nom. discharge current at wave shape (8/20)	I_n	15 kA	20 kA			15 kA
Voltage protection level at I_n	U_p	<950 V	<1,7 kV	<2,5 kV	<2,8 kV	<3,5 kV
Response time	t_A	<25ns				
Recommended back-up fuse		125 AgL/gG				
Operating temperature range	ϑ	-40° to + 80°C				
Recommended cross-section of connected conductors at tightening moment 3Nm		6÷25 mm² (solid) 6÷16 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 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	300 g				

Visual failure indication

Overloading and disconnection of varistor is indicated by discoloration of the signal field from green to red colour.