

Modular Surge Protective Devices (SPDs)

Cat.No(s): 4 103 01 to 08 - 4 103 10 to 17 - 4 103 20 to 25
4 103 40 to 45 - 4 103 56 to 59 - 4 103 70 to 75
4 103 80 to 85 - 4 103 90 to 99 - 4 143 04 to 09
4 143 14/15 - 4 143 24/25 - 4 143 44/45 - 4 143 50 to 53
4 143 60 to 63 - 4 143 74/75 - 4 143 84/85 - 4 143 94/95



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1. USE

■ 1.1 General use recommendations

To ensure correct protection, an surge protection device (SPD) is recommended:

- at the origin of each installation (mandatory depending on the type and location of the installation to be protected)
- in the secondary switchboard that powers sensitive equipment
- on all output lines of external electrical circuits (power supply for secondary buildings, external lighting or external distribution boards, etc.).

The installation of an SPD is mandatory when the safety of people may depend on the continuity of service of the equipment (even if this is not required by national standards). Although not mandatory according to installation standards, an SPD should always be installed for communication networks to protect communication equipment when there is an SPD in the low-voltage power network.

The range gathers several types of surge protection devices:

- SPDs T1+T2/12.5 kA (class I + II): recommended for general protection of distribution boards for the protection of low voltage electrical installations against surges from lightning strikes, load maneuvers and others.
- SPDs T2 (class II): recommended for the protection of secondary switchboards.
- LPS: lightning protection system according to EN/IEC 62305.

To define the type of SPD required according to the risk level of the installation, use the selection table (see catalogue) or our XLPro³ software and XLPro³ calculation software.

■ 1.2 Composition

Legrand surge protection devices (SPDs) for electrical installations are supplied with 230/400 V~ (50-60 Hz).

They are equipped with plug-in modules with status indicator:

- Green: operational SPD;
- Red: the plug-in module needs to be replaced.

And with an auxiliary unit for remote monitoring of the SPD status (depending on the version). It has an internal disconnecter that disconnects the SPD at the end of its useful life. (version end MOV - Varistor).

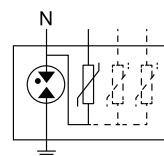
2. RANGE

Protection modes:

- SPDs 1P+N/3P+N

TN and TN-S Systems

Surge protection devices with LN and N-PE protection modes (common and differential protection modes), with neutral (N) being protected by encapsulated spark gaps with higher power capacities than phase protection. Also called «x+1» mode or «type 2 connection» (CT2) according to HD/IEC 60364 clause 534.



1P+N	3P+N
4 103 74	4 103 75
4 143 74	4 143 75
4 103 24	4 103 25
4 143 24	4 143 25
4 103 44	4 103 45
4 143 44	4 143 45
4 143 04	4 143 05
4 143 14	4 143 15
4 103 84	4 103 85
4 143 84	4 143 85
4 103 94	4 103 95
4 143 94	4 143 95

SPDs 1P/2P/3P/4P

IT, TN, TN-C, TN-S, TT and TNC-S systems

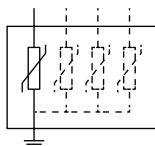
Surge protective devices with L-PE and N-PE protection modes (common modes). Also called mode «X+0» or «connection type 1» (CT1) according to standards HD/IEC 60364 clause 534.

2. RANGE (continued)

Protection modes (continued)

SPDs 1P/2P/3P/4P

IT, TN, TN-C, TN-S, TT and TNC-S systems



IT, TN, TN-C, TN-S and TT		TN-S and TNC-S
4 143 06	4 143 52	4 143 09
4 143 07	4 103 90	4 103 73
4 143 08	4 103 91	4 103 83
4 103 70	4 103 92	4 103 23
4 103 71	4 103 40	4 103 53
4 103 72	4 103 41	4 103 93
4 103 80	4 103 42	4 103 43
4 103 81	4 143 60	4 143 63
4 103 82	4 143 61	-
4 103 20	4 143 62	
4 103 21	4 103 56	
4 103 22	4 103 57	
4 143 50	4 103 58	
4 143 51	-	

Two-phase mains supplies

Use SPDs 1P or 2P.

Two-phase power supplies (L1-L2)	
Voltage ≤ 230 V~	Voltage > 230 V~
4 103 20	4 103 71
4 143 50	4 103 21
4 143 06	4 103 41
4 103 80	4 143 51
4 103 90	4 143 61
-	4 143 07
-	4 103 81
-	4 103 91

3. TECHNICAL CHARACTERISTICS

■ 3.1 Material characteristics

Base:

- Fiberglass reinforced polycarbonate (17%) (PC)
- Self-extinguishing: 850°/30 s
- Colour: RAL 7035 light grey

Plug-in module:

- Fiberglass reinforced polybutylene terephthalate (17%) (PBT)
- Self-extinguishing: 960°/30 s
- Colour: RAL 7035 light grey

Metal component materials : Brass alloy, Copper alloy, Phosphor Bronze alloy, Bichromated Carbon Steel.

■ 3.2 Maximum protection devices used with SPDs

	1					Ø : X,Y,Z (mm²)	Icc max. (Iscrr)
		TT		TN	IT		
		1P/2P 3P/4P	1P+N 3P+N		1P/2P 3P/4P		
T1+ T2/12.5 kA Uc ≤ 385V		C100 A				≥ 16	5 kA
		gL/gG 125 A					
T2/20 kA T2/45 kA Uc ≤ 460 V		gL/gG 80 A				≥ 10	10 kA

According to national regulations, the driver cannot be protected or cut. At a minimum, cutting the neutral conductor is recommended for ease of maintenance and controls of the insulation resistance of the installation. In this case, apply the normal rules of the neutral system to choose protections with protected or cut neutral.

1 DX³, TX³, DPX³, BPX³

Two-phase power supplies: 2P circuit breakers only (ratings: see above)

By default, the rating of the circuit breaker or fuse should be the maximum rating indicated. If selectivity is sought with upstream protection, it is possible to use a lower caliber but 3 levels maximum according to the Renard series.

Example:

The maximum protection is 125 A ---> minimum rating = 80 A

In this case, it is highly recommended to use the auxiliary to report the status of the circuit breaker and thus avoid unwanted operation of the circuit breaker during overvoltage treatment.

3. TECHNICAL CHARACTERISTICS (continued)

■ 3.3 SPDs T1+T2 - 1P+N/3P+N

			Unit	4 103 74 4 143 74	4 143 04 4 143 14	4 103 75 4 143 75	4 143 05 4 143 15	
Number of poles			-	1P+N		3P+N		
Type of SPD (Protection Class)			kA	T1+T2/12.5 kA				
Maximum power fluctuation (Ue_L-PE/L-L)			V~	230/400	100/240	230/400	100/240	
Frequency			Hz	50/60 Hz				
Earthing system			-	TN and TN-S				
Protection modes			-	L-N and N-PE				
Maximum continuous operating voltage (Uc)			L-N	V~	385	175	385	175
			N-PE	V~	260	260	260	260
T1	Impulse discharge current (Iimp, 10/350)	L-N	kA	12.5		12.5		
		N-PE	kA	25		50		
	Total discharge current (L+N)/PE (Itotal, 10/350)		kA	12.5		37.5		
	Protection level (Up) at Iimp	L-N	kV	1.9	1.0	1.9	1.0	
N-PE		kV	1.5	1.4	1.5	1.4		
T2	Nominal current In (8/20)	L-N	kA	30		30		
		N-PE	kA	30		50		
	Imax (8/20)	L-N	kA	60		60		
		N-PE	kA	60		100		
	Total discharge current (L+N)/PE (Itotal, 8/20)	L-N	kA	60		100		
		N-PE	kA	60		100		
	Protection level (Up) at the input (8/20)	L-N	kV	2.1	1.4	2.1	1.4	
		N-PE	kV	1.5	1.5	1.5	1.5	
Resistance to short-circuit current (Iscrr , Iscmax)			kA	5				
Follow-up chain (Ifi)			A	100				
Residual current in Uc (IPE)			μA	< 750				
Response time			ns	≤ 25 (L-N); ≤ 100(L-PE and N-PE)				
Terminal capacity: solid or stranded wire Terminal capacity: flexible wire with ferrule			mm²	4 ~ 25 (11 ~ 4)				
Auxiliary contact for remote monitoring of SPD status		L-N	-	120 VCA @ 1 A / 24 VCC @ 1 A				
		N-PE	-	No				
Pollution level			-	2				
Location category			-	Indoor				
Number of ports			-	2		4		
Assembly method			-	Fixed				
Width (number of modules)			-	2		4		
Protection index			-	IP 20				
Operating temperature			°C	-40 ~ 70				
Storage temperature			°C	-25 ~ 70				
Humidity range			%	5 ~ 95				
Protection technology			-	Metal Oxide Varistor (MOV) L-N, Gas Discharge Tube (GDT) N-PE				
Disconnecter type			-	Thermal - Internal (L-N)				
Operation status signaling			-	Green - SERVICE, Red - END OF LIFE				
Failure mode			-	OCFM (open circuit fault mode)				
Maximum backup fuse (gL/gG)			A	80				
Maximum backup circuit breaker			A	125				

3. TECHNICAL CHARACTERISTICS (continued)

■ 3.4 SPDs T2 - 1P+N/3P+N

			Unit	4 103 84 4 143 84	4 103 94 4 143 94	4 103 24 4 143 24	4 103 44 4 143 44
Number of poles			-	1P+N			
Type of SPD (Protection Class)			kA	T2/20 kA	T2/45 kA	T2/20 kA	T2/45 kA
Maximum power fluctuation (Ue_L-PE/L-L)			V~	100/240		230/400	
Frequency			Hz	50/60 Hz			
Earthing system			-	TN and TN-S			
Protection modes			-	L-N and N-PE			
Maximum continuous operating voltage (Uc)		L-N	V~	175		320	
		N-PE	V~	175		320	
T2	Impulse discharge current (Iimp, 10/350)	L-N	kA	10	20	10	20
		N-PE	kA	20	45	20	45
	Total discharge current (L+N)/PE (Itotal, 10/350)		kA	20	45	20	45
	Protection level (Up) at Iimp	L-N	kV	0.8	1.2	1.5	1.8
		N-PE	kV	2			
Resistance to short-circuit current (Iscrr , Iscmax)			kA	10			
Follow-up chain (Ifi)			A	100			
Residual current in Uc (IPE)			µA	< 750			
Response time			ns	≤ 25 (L-N); ≤ 100(L-PE e N-PE)			
Terminal capacity: solid or stranded wire Terminal capacity: flexible wire with ferrule			mm²	4 ~ 25 (11 ~ 4)			
Auxiliary contact for remote monitoring of SPD status		L-N	-	120 VCA @ 1 A / 24 VCC @ 1 A			
		N-PE	-	No			
Pollution level			-	2			
Location category			-	Indoor			
Number of ports			-	2			
Assembly method			-	Fixed			
Width (number of modules)			-	2			
Protection index			-	IP 20			
Operating temperature			°C	-40 ~ 70			
Storage temperature			°C	-25 ~ 70			
Humidity range			%	5 ~ 95			
Protection technology			-	Metal Oxide Varistor (MOV) L-N, Gas Discharge Tube (GDT) N-PE			
Disconnecter type			-	Thermal - Internal (L-L, L-N and L-PE)			
Operation status signaling			-	Green - SERVICE, Red - END OF LIFE			
Failure mode			-	OCFM (open circuit fault mode)			
Maximum backup fuse (gL/gG)			A	80			

3. TECHNICAL CHARACTERISTICS (continued)

■ 3.4 SPDs T2 - 1P+N/3P+N (continued)

			Unit	4 103 85 4 143 85	4 103 95 4 143 95	4 103 25 4 143 25	4 103 45 4 143 45
Number of poles			-	3P+N			
Type of SPD (Protection Class)			kA	T2/20 kA	T2/45 kA	T2/20 kA	T2/45 kA
Maximum power fluctuation (Ue_L-PE/L-L)			V~	100/240		230/400	
Frequency			Hz	50/60 Hz			
Earthing system			-	TN and TN-S			
Protection modes			-	L-N and N-PE			
Maximum continuous operating voltage (Uc)		L-N	V~	175		320	
		N-PE	V~	175		320	
T2	Impulse discharge current (Iimp, 10/350)	L-N	kA	10	20	10	20
		N-PE	kA	20	45	20	45
	Total discharge current (L+N)/PE (Itotal, 10/350)		kA	20	45	20	45
	Protection level (Up) at Iimp	L-N	kV	0.8	1.2	1.5	1.8
N-PE		kV	2				
Resistance to short-circuit current (Iscrr , Iscmax)			kA	10			
Follow-up chain (Ifi)			A	100			
Residual current in Uc (IPE)			μA	< 750			
Response time			ns	≤ 25 (L-N); ≤ 100(L-PE and N-PE)			
Terminal capacity: solid or stranded wire			mm²	4 ~ 25 (11 ~ 4)			
Terminal capacity: flexible wire with ferrule							
Auxiliary contact for remote monitoring of SPD status		L-N	-	120 VCA @ 1 A / 24 VCC @ 1 A			
		N-PE	-	No			
Pollution level			-	2			
Location category			-	Indoor			
Number of ports			-	4			
Assembly method			-	Fixed			
Width (number of modules)			-	4			
Protection index			-	IP 20			
Operating temperature			°C	-40 ~ 70			
Storage temperature			°C	-25 ~ 70			
Humidity range			%	5 ~ 95			
Protection technology			-	Metal Oxide Varistor (MOV) L-N, Gas Discharge Tube (GDT) N-PE			
Disconnecter type			-	Thermal - Internal (L-L, L-N and L-PE)			
Operation status signaling			-	Green - SERVICE, Red - END OF LIFE			
Failure mode			-	OCFM (open circuit fault mode)			
Maximum backup fuse (gL/gG)			A	80			

3. TECHNICAL CHARACTERISTICS (continued)**■ 3.5 SPDs T1+T2 - NPE/1P**

			Unit	4 103 10	4 103 12	4 103 70	4 143 06	
Number of poles			-	NPE		1P		
Type of SPD (Protection Class)			kA	T1+T2/12.5 kA				
Maximum power fluctuation (Ue_L-PE/L-L)			V~	230/400			100/240	
Frequency			Hz	50/60 Hz				
Earthing system			-	IT, TN, TN-C, TN-S and TT		IT, TN, TN-C, TN-S and TT		
Protection modes			-	NPE		L-L, L-N and L-PE		
Maximum continuous operating voltage (Uc)			L-N	V~	-		385	175
			L-PE	V~	-		385	175
			N-PE	V~	260		-	
T1	Impulse discharge current (Iimp, 10/350)	L-N	kA	-		12.5		
		N-PE	kA	25	50	-		
	Protection level (Up) at Iimp	L-N	kV	-		1.9	1.0	
		N-PE	kV	1.5	1.4	-		
T2	Nominal current In (8/20)	L-N	kA	-		30		
		N-PE	kA	30	50	30		
	Imax (8/20)	L-N	kA	-		60		
		N-PE	kA	60	100	60		
	Protection level (Up) at the input (8/20)	L-N	kV	-		2.1	1.4	
		N-PE	kV	1.6	1.5	-		
Temporary overvoltages (LV supply failures)			V/s	1200 V / 200 ms		-		
Resistance to short-circuit current (Iscrr , Iscmax)			kA	-		5		
Follow-up chain (Ifi)			A	100		-		
Residual current in Uc (IPE)			µA	0		< 750		
Response time			ns	≤ 25 (L-N); ≤ 100(L-PE and N-PE)				
Terminal capacity: solid or stranded wire Terminal capacity: flexible wire with ferrule			mm²	4 ~ 25 (11 ~ 4)				
Auxiliary contact for remote monitoring of SPD status			L-N	-	120 VCA @ 1 A / 24 VCC @ 1 A			
			N-PE	-	No			
Pollution level			-	2				
Location category			-	Indoor				
Number of ports			-	1				
Assembly method			-	Fixed				
Width (number of modules)			-	1				
Protection index			-	IP 20				
Operating temperature			°C	-40 ~ 70				
Storage temperature			°C	-				
Humidity range			%	5 ~ 95				
Protection technology			-	Gas Discharge Tube (GDT)		Metal Oxide Varistor (MOV)		
Disconnecter type			-	-		Thermal - Internal (L-L, L-N and L-PE)		
Operation status signaling			-	-		Green - SERVICE, Red - END OF LIFE		
Failure mode			-	OCFM (open circuit fault mode)				
Maximum backup fuse (gL/gG)			A	-		125		
Maximum backup circuit breaker			A	-		100		

3. TECHNICAL CHARACTERISTICS (continued)**■ 3.6 SPDs T1+T2 - 2P/3P/4P**

			Unit	4 143 07	4 103 71	4 143 08	4 103 72	4 143 09	4 103 73	
Number of poles			-	2P		3P		4P		
Type of SPD (Protection Class)			kA	T1+T2/12.5 kA						
Maximum power fluctuation (Ue_L-PE/L-L)			V~	100/240	230/400	100/240	230/400	100/240	230/400	
Frequency			Hz	50/60 Hz						
Earthing system			-	IT, TN, TN-C, TN-S and TT				TN-S and TNC-S		
Protection modes			-	L-N and L-PE				L-N and L-PE		
Maximum continuous operating voltage (Uc)			L-N	V~	175	385	175	385	175	385
			L-PE	V~	175	385	175	385	175	385
			N-PE	V~	-				175	385
T1	Impulse discharge current (Iimp, 10/350)	L-N	kA	12.5						
	Protection level (Up) at Iimp	L-N	kV	1.0	1.9	1.0	1.9	1.0	1.9	
T2	Nominal current In (8/20)	L-N	kA	30						
	I _{max} (8/20)	L-N	kA	60						
	Total discharge current (L+N)/PE (I _{total} , 8/20)	L-N	kA	60						
		N-PE	kA	60						
	Protection level (Up) at the input (8/20)	L-N	kV	1.4	2.1	1.4	2.1	1.4	2.1	
Temporary overvoltages (LV supply failures)			V/s	-						
Resistance to short-circuit current (I _{sc} cr , I _{sc} max)			kA	5						
Follow-up chain (Ifi)			A	-						
Residual current in U _c (IPE)			μA	< 750						
Response time			ns	< 25						
Terminal capacity: solid or stranded wire Terminal capacity: flexible wire with ferrule			mm²	4 ~ 25 (11 ~ 4)						
Auxiliary contact for remote monitoring of SPD status		L-N	-	120 VCA @ 1 A / 24 VCC @ 1 A						
Pollution level			-	2						
Location category			-	Indoor						
Number of ports			-	2		3		4		
Assembly method			-	Fixed						
Width (number of modules)			-	2		3		4		
Protection index			-	IP 20						
Operating temperature			°C	-40 ~ 70						
Storage temperature			°C	-25 ~ 70						
Humidity range			%	5 ~ 95						
Protection technology			-	Metal Oxide Varistor (MOV)						
Disconnecter type			-	Thermal - Internal (L-L, L-N and L-PE)						
Operation status signaling			-	Green - SERVICE, Red - END OF LIFE						
Failure mode			-	OCFM (open circuit fault mode)						
Maximum backup fuse (gL/gG)			A	125						
Maximum backup circuit breaker			A	100						

3. TECHNICAL CHARACTERISTICS (continued)**■ 3.7 SPDs T2 - NPE/1P - 20 kA**

				Unit	4 103 14/15	4 103 80	4 103 20	4 143 50
Number of poles				-	NPE	1P		
Type of SPD (Protection Class)				kA	T2/20 kA			
Maximum power fluctuation (Ue_L-PE/L-L)				V~	230/400	100/240	230/400	415
Frequency				Hz	50/60 Hz			
Earthing system				-	IT, TN, TN-C, TN-S and TT			
Protection modes				-	NPE	L-L, L-N e L-PE		
Maximum continuous operating voltage (Uc)			L-N	V~	260	175	320	460
			L-PE	V~				
			N-PE	V~				
T2	Nominal current In (8/20)	L-N	kA	-	10			
		N-PE	kA	10	10			
	Imax (8/20)	L-N	kA	-	20			
		N-PE	kA	20	20			
	Protection level (Up) at the input (8/20)	L-N	kV	-	0.8	1.5	2.0	
		N-PE	kV	2	-			
Temporary overvoltages (LV supply failures)				V/s	1200 V / 200 ms	-		
Resistance to short-circuit current (Iscrr , Iscmax)				kA	-	10		
Follow-up chain (Ifi)				A	100	100		
Residual current in Uc (IPE)				µA	0 - LCF	< 750		
Response time				ns	< 100	≤ 25 (L-N); ≤ 100(L-PE e N-PE)		
Terminal capacity: solid or stranded wire Terminal capacity: flexible wire with ferrule				mm²	4 ~ 25 (11 ~ 4)			
Auxiliary contact for remote monitoring of SPD status			L-N	-	-	120 VCA @ 1 A / 24 VCC @ 1 A		
			N-PE	-	No			
Pollution level				-	2			
Location category				-	Indoor			
Number of ports				-	1			
Assembly method				-	Fixed			
Width (number of modules)				-	1			
Protection index				-	IP 20			
Operating temperature				°C	-40 ~ 70			
Storage temperature				°C	-25 ~ 70			
Humidity range				%	5 ~ 95			
Protection technology				-	Gas Discharge Tube (GDT)	Metal Oxide Varistor (MOV)		
Disconnecter type				-	-			Thermal - Internal (L-L, L-N and L-PE)
Operation status signaling				-	-			Green - SERVICE, Red - END OF LIFE
Failure mode				-	OCFM (open circuit fault mode)			
Maximum backup fuse (gL/gG)				A	-			80

3. TECHNICAL CHARACTERISTICS (continued)

■ 3.8 SPDs T2 - 2P/3P/4P - 20 kA

				Unit	4 103 81	4 103 21	4 143 51	4 103 82	4 103 22	4 143 52
Number of poles				-	2P			3P		
Type of SPD (Protection Class)				kA	T2/20 kA					
Maximum power fluctuation (Ue_L-PE/L-L)				V~	100/240	230/400	415	100/240	230/400	415
Frequency				Hz	50/60 Hz					
Earthing system				-	IT, TN, TN-C, TN-S and TT					
Protection modes				-	L-L, L-N and L-PE					
Maximum continuous operating voltage (Uc)			L-N	V~	175	320	460	175	320	460
			L-PE	V~						
T2	Nominal current In (8/20)			L-N	kA	10				
	Imax (8/20)			L-N	kA	20				
	Protection level (Up) at the input (8/20)			L-N	kV	0.8	1.5	2.0	0.8	1.2
Resistance to short-circuit current (Isc cr , Isc max)				kA	10					
Follow-up chain (Ifi)				A	100					
Residual current in Uc (IPE)				µA	< 750					
Response time				ns	≤ 25					
Terminal capacity: solid or stranded wire Terminal capacity: flexible wire with ferrule				mm²	4 ~ 25 (11 ~ 4)					
Auxiliary contact for remote monitoring of SPD status			L-N	-	120 VCA @ 1 A / 24 VCC @ 1 A					
			N-PE	-	No					
Pollution level				-	2					
Location category				-	Indoor					
Number of ports				-	2			3		
Assembly method				-	Fixed					
Width (number of modules)				-	2			3		
Protection index				-	IP 20					
Operating temperature				°C	-40 ~ 70					
Storage temperature				°C	-25 ~ 70					
Humidity range				%	5 ~ 95					
Protection technology				-	Metal Oxide Varistor (MOV)					
Disconnecter type				-	Thermal - Internal (L-N)					
Operation status signaling				-	Green - SERVICE, Red - END OF LIFE					
Failure mode				-	OCFM (open circuit fault mode)					
Maximum backup fuse (gL/gG)				A	80					

3. TECHNICAL CHARACTERISTICS (continued)**■ 3.8 SPDs T2 - 2P/3P/4P - 20 kA (continued)**

			Unit	4 103 83	4 103 23	4 143 53
Number of poles			-	4P		
Type of SPD (Protection Class)			kA	T2/20 kA		
Maximum power fluctuation (Ue_L-PE/L-L)			V~	100/240	230/400	415
Frequency			Hz	50/60 Hz		
Earthing system			-	TN-S AND TNC-S		
Protection modes			-	L-L, L-N and L-PE		
Maximum continuous operating voltage (Uc)		L-N	V~	175	320	460
		L-PE	V~			
T2	Nominal current In (8/20)	L-N	kA	10		
	I _{max} (8/20)	L-N	kA	20		
	Protection level (Up) at the input (8/20)	L-N	kV	0.8	1.2	2.0
Resistance to short-circuit current (I _{sc} cr , I _{sc} max)			kA	10		
Follow-up chain (Ifi)			A	100		
Residual current in Uc (IPE)			μA	< 750		
Response time			ns	≤ 25		
Terminal capacity: solid or stranded wire Terminal capacity: flexible wire with ferrule			mm²	4 ~ 25 (11 ~ 4)		
Auxiliary contact for remote monitoring of SPD status		L-N	-	120 VCA @ 1 A / 24 VCC @ 1 A		
		N-PE	-	No		
Pollution level			-	2		
Location category			-	Indoor		
Number of ports			-	4		
Assembly method			-	Fixed		
Width (number of modules)			-	4		
Protection index			-	IP 20		
Operating temperature			°C	-40 ~ 70		
Storage temperature			°C	-25 ~ 70		
Humidity range			%	5 ~ 95		
Protection technology			-	Metal Oxide Varistor (MOV)		
Disconnecter type			-	Thermal - Internal (L-N)		
Operation status signaling			-	Green - SERVICE, Red - END OF LIFE		
Failure mode			-	OCFM (open circuit fault mode)		
Maximum backup fuse (gL/gG)			A	80		

3. TECHNICAL CHARACTERISTICS (continued)**■ 3.9 SPDs T2 - NPE/1P - 45 kA**

			Unit	4 103 16	4 103 90	4 103 40	4 143 60	
Number of poles			-	NPE	1P			
Type of SPD (Protection Class)			kA	T2/45 kA				
Maximum power fluctuation (Ue_L-PE/L-L)			V~	230/400	100/240	230/400	415	
Frequency			Hz	50/60 Hz				
Earthing system			-	IT, TN, TN-C, TN-S and TT				
Protection modes			-	NPE	L-L, L-N and L-PE			
Maximum continuous operating voltage (Uc)			L-N	V~	-	175	320	460
			L-PE	V~	-	175	320	460
			N-PE	V~	260	-	-	-
T2	Nominal current In (8/20)	L-N	kA	-	20			
		N-PE	kA	20	-			
	Imax (8/20)	L-N	kA	-	45			
		N-PE	kA	45	-			
	Total discharge current (L+N)/PE (Itotal, 8/20)	L-N	kA	-				
		N-PE	kA	45				
	Protection level (Up) at the input (8/20)	L-N	kV	-	1.2	1.8	2.5	
		N-PE	kV	2	-			
Temporary overvoltages (LV supply failures)			V/s	1200 V / 200 ms	-			
Resistance to short-circuit current (Iscrr , Iscmax)			kA	-	10			
Follow-up chain (Ifi)			A	100	100			
Residual current in Uc (IPE)			µA	0 - LCF	< 750			
Response time			ns	< 100	≤ 25 (L-N); ≤ 100(L-PE and N-PE)			
Terminal capacity: solid or stranded wire Terminal capacity: flexible wire with ferrule			mm²	4 ~ 25 (11 ~ 4)				
Auxiliary contact for remote monitoring of SPD status			L-N	-	-	120 VCA @ 1 A / 24 VCC @ 1 A		
			N-PE	-	No			
Pollution level			-	2				
Location category			-	Indoor				
Number of ports			-	1				
Assembly method			-	Fixed				
Width (number of modules)			-	1				
Protection index			-	IP 20				
Operating temperature			°C	-40 ~ 70				
Storage temperature			°C	-25 ~ 70				
Humidity range			%	5 ~ 95				
Protection technology			-	Gas Discharge Tube (GDT)	Metal Oxide Varistor (MOV)			
Disconnecter type			-	Thermal - Internal (L-L, L-N and L-PE)				
Operation status signaling			-	-		Green - SERVICE, Red - END OF LIFE		
Failure mode			-	OCFM (open circuit fault mode)				
Maximum backup fuse (gL/gG)			A	-		80		

3. TECHNICAL CHARACTERISTICS (continued)**■ 3.10 SPDs T2 - 2P/3P/4P - 45 kA**

			Unit	4 103 91	4 103 41	4 143 61	4 103 92	4 103 42	4 143 62
Number of poles			-	2P			3P		
Type of SPD (Protection Class)			kA	T2/45 kA					
Maximum power fluctuation (Ue_L-PE/L-L)			V~	100/240	230/400	415	100/240	230/400	415
Frequency			Hz	50/60 Hz					
Earthing system			-	L-N and L-PE					
Protection modes			-	L-L, L-N and L-PE					
Maximum continuous operating voltage (Uc)		L-N	V~	175	320	460	175	320	460
		L-PE	V~						
T2	Nominal current In (8/20)		L-N	kA	20				
	Imax (8/20)		L-N	kA	45				
	Total discharge current (L+N)/PE (Itotal, 8/20)		L-N	kA	45				
	Protection level (Up) at the input (8/20)		L-N	kV	1.2	1.8	2.5	1.2	1.8
Resistance to short-circuit current (Iscrr , Iscmax)			kA	10					
Follow-up chain (Ifi)			A	100					
Residual current in Uc (IPE)			μA	< 750					
Response time			ns	≤ 25					
Terminal capacity: solid or stranded wire Terminal capacity: flexible wire with ferrule			mm²	4 ~ 25 (11 ~ 4)					
Auxiliary contact for remote monitoring of SPD status		L-N	-	120 VCA @ 1 A / 24 VCC @ 1 A					
		N-PE	-	No					
Pollution level			-	2					
Location category			-	Indoor					
Number of ports			-	2			3		
Assembly method			-	Fixed					
Width (number of modules)			-	2			3		
Protection index			-	IP 20					
Operating temperature			°C	-40 ~ 70					
Storage temperature			°C	-25 ~ 70					
Humidity range			%	5 ~ 95					
Protection technology			-	Metal Oxide Varistor (MOV)					
Disconnecter type			-	Thermal - Internal (L-N)					
Operation status signaling			-	Green - SERVICE, Red - END OF LIFE					
Failure mode			-	OCFM (open circuit fault mode)					
Maximum backup fuse (gL/gG)			A	80					

3. TECHNICAL CHARACTERISTICS (continued)

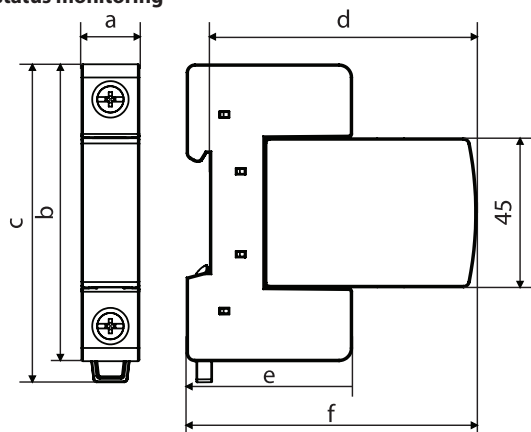
■ 3.10 SPDs T2 - 2P/3P/4P - 45 kA (continued)

			Unit	4 103 93	4 103 43	4 143 63
Number of poles			-	4P		
Type of SPD (Protection Class)			kA	T2/45 kA		
Maximum power fluctuation (Ue_L-PE/L-L)			V~	100/240	230/400	415
Frequency			Hz	50/60 Hz		
Earthing system			-	L-PE and N-PE		
Protection modes			-	L-L, L-N and L-PE		
Maximum continuous operating voltage (Uc)		L-N	V~	175	320	460
		L-PE	V~			
T2	Nominal current In (8/20)		L-N	kA	20	
	Imax (8/20)		L-N	kA	45	
	Total discharge current (L+N)/PE (Itotal, 8/20)		L-N	kA	45	
	Protection level (Up) at the input (8/20)		L-N	kV	1.2	1.8
Resistance to short-circuit current (Isc cr , Iscmax)			kA	10		
Follow-up chain (Ifi)			A	100		
Residual current in Uc (IPE)			µA	< 750		
Response time			ns	≤ 25		
Terminal capacity: solid or stranded wire Terminal capacity: flexible wire with ferrule			mm²	4 ~ 25 (11 ~ 4)		
Auxiliary contact for remote monitoring of SPD status		L-N	-	120 VCA @ 1 A / 24 VCC @ 1 A		
		N-PE	-	No		
Pollution level			-	2		
Location category			-	Indoor		
Number of ports			-	4		
Assembly method			-	Fixed		
Width (number of modules)			-	4		
Protection index			-	IP 20		
Operating temperature			°C	-40 ~ 70		
Storage temperature			°C	-25 ~ 70		
Humidity range			%	5 ~ 95		
Protection technology			-	Metal Oxide Varistor (MOV)		
Disconnecter type			-	Thermal - Internal (L-N)		
Operation status signaling			-	Green - SERVICE, Red - END OF LIFE		
Failure mode			-	OCFM (open circuit fault mode)		
Maximum backup fuse (gL/gG)			A	80		

4. DIMENSIONS AND WEIGHT

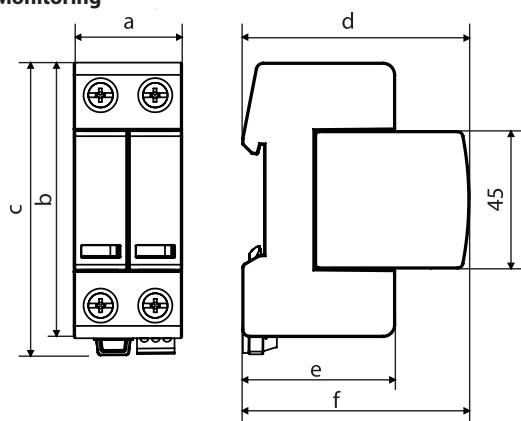
■ 4.1 Dimensions

1P+N/3P+N/1P/2P/3P/4P catalog numbers without aid for SPD status monitoring



	Type of SPD	Dimensions (mm)					
		a	b	c	d	e	f
T1+T2	1P	17.5	89.6	98.0	81.0	50.3	87.8
	1P+N/2P	35.3		95.2			
	3P	53.0		100			
	3P+N/4P	70.8		95.2			
T2	1P	17.5	89.6	98.0	67.5	50.3	74.4
	1P+N/2P	35.3		95.2			
	3P	53.0		100			
	3P+N/4P	70.8		95.2			

Catalog Numbers 1P+N/3P+N/3P/4P with Auxiliary for SPD Status Monitoring

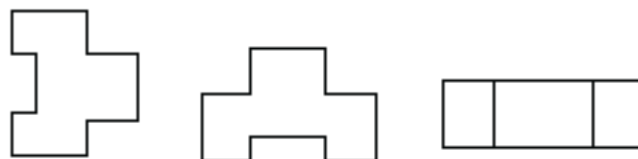


	Type of SPD	Dimensions (mm)					
		a	b	c	d	e	f
T1+T2	1P+N	35.3	89.6		81.0	50.3	87.8
	3P	53.0					
	3P+N/4P	70.8					
T2	1P+N	35.3	89.6		67.5	50.3	74.4
	3P	53.0					
	3P+N/4P	70.8					

5. INSTALLATION RULES

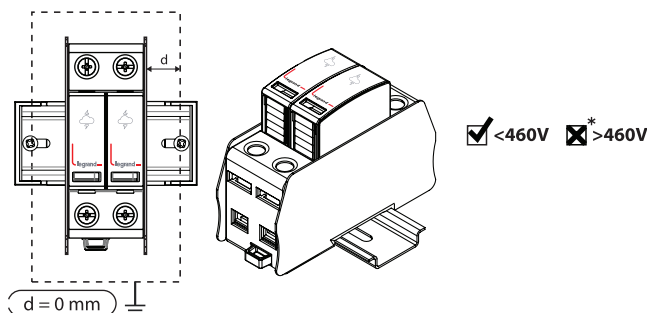
■ 5.1 Operating positions

Vertical, horizontal or sideways



Fixed on EN 60715 or DIN 35 rail.

■ 5.2 Minimum distance from any grounded conductive surface



* For 460V ≥ , d > 5,0mm or side barrier

■ 5.3 Installation standards

NF C 15-100

According to this standard, SPDs are mandatory at the origin of any new installation (or refurbishment) that is:

- equipped with an LPS (lightning protection system) or lightning arrester (see also section 1.3.3);
- supplied with overhead power lines when located in a geographical area classified as AQ2 (Nk > 25) In the latter case, the lack of SPDs may, however, be justified by a risk analysis in accordance with UTE C 15-443 guide, IEC 60364-4-443 or any other recognised equivalent method.

An SPD may also be required in geographical areas classified as AQ2 for certain installations:

- with home medical services
- equipped with security systems for people and goods (fire alarm , technical or social alarms, etc.).

Note:

SPDs are generally recommended anywhere where the safety of people may depend directly or indirectly on the continuity of service of this equipment.

The use of SPDs is also strongly recommended in mountainous areas, near large bodies of water or dominant structures (tall buildings, trees, etc.), for installations at the end of a line or located less than 50 m from buildings equipped with lightning rods.

Nk = keraunic level (number of days per year when lightning strikes occur in a given area) Ng = Nk/10 where Ng: number of strikes per year per km².

Installations with lightning rods or LPS (or equipped with something that can act as a lightning rod, such as a metal structure higher than the surrounding buildings, antennas, etc.):

- Type 1 or Type 1+ Type 2 SPD (Iimp ≥ 12.5 kA) mandatory at the installation source (main switchboard in secondary buildings)
- Installations over 10 m in height (apartment buildings, office buildings, hotels, etc.): SPD Type 2 recommended for protection of private areas and floor distributors (common areas), in addition to an SPD Type 1 or Type 1 + Type 2

5. INSTALLATION RULES (continued)

■ 5.3 Installation standards (continued)

NF C 15-100 (continued)

- Installations with numerous private areas (apartment buildings, office buildings, etc): SPD Type 2 where ≥ 5 kA mandatory at the source of each private area if SPD Type 1 or Type 1+Type 2 can not be installed in the installation source.

HD 60364, IEC 60364

According to articles 443 and 534 of the HD/IEC 60364 standards and TS/IEC 61643-12 guides, the use of SPDs in new or renovated buildings is mandatory at the end of the supply of the installation in the following cases:

- Buildings with lightning rods or LPS (T1 or T1+T2 SPD, $I_{imp} \geq 12.5$ kA)
- Buildings with fully or partially airborne power supplies in AQ2 geographical areas (Article 443.3.2.1 - AQ2: $N_k > 25$) and on the basis of a risk assessment taking into account the type of electrical power supply in the building (Article 443.3.2.2)

According to Article 443.3.2.2, SPDs (Type 2) are also required in the following cases:

- Commercial/industrial buildings, utilities, religious buildings, schools, large residential complexes, etc.
- Hospitals and buildings containing medical equipment and/or security systems for people and property (fire alarms, technical alarms, etc.)

EN 62305 (IEC 62305)

An external lightning protection system (LPS) protects buildings from direct lightning strikes. It is generally based on the use of lightning rods (simple rods, with ionization device, mesh cage, etc.) and/or on the metal structure of the building.

If there is an LPS or a risk assessment has been carried out in accordance with EN/IEC 62305 standards, SPDs are usually required in the main switchboard (T1 or T1+T2 SPDs) and switchboards (T2 SPDs). Determination of SPDs in the main distribution board according to EN/IEC 62305 and TS/IEC 61643-12 (if insufficient information is available):

Buildings with an external LPS

LPL : Lightning protection level	LPS* total lightning current	Min. value of the SPD Iimp current (T1 or T1+T2)	Usage practices
I	200 kA	25 kA/pole (IT: 35 kA min.)	Power installations
II	150 kA	18,5 kA/pole	Rarely used
III	100 kA	12,5 kA/pole	Small installations

* LPS : Lightning Protection System

Note:

According to EN/IEC 62305 standards, T1 and T1+T2 SPDs may also be required if there is a risk of direct impact to power lines (EN/IEC 62305-1 table E.2). However, according to the EN 62305-4 standard (appendix C.2.2), this only happens if there is really a risk of direct impact in the last 50 m of the line and if there is this risk it must really be taken into account.

Risk assessment according to EN/IEC 62305

The risk assessment aims to assess whether protective measures are necessary. It defines the type and level of needs to protect a building from lightning strikes (building lightning protection with an LPS external) and to protect equipment from impacts to power or data lines, and from transient overvoltages due to lightning strikes on or near the LPS.

To assess whether protective measures are necessary, the following criteria are taken into account:

- dimensions and type of construction of the building, type and level of use, type and number of lines entering the building, surrounding environment and local density of lightning, number of people usually present, etc.

- possible sources of threats (S1: impacts on the building, S2: impacts on the building, S3: impacts on the lines, S4: impacts close to the lines)
- possible loss or damage (L1: human security, L2: public services, L3: cultural heritage and L4: economic value)
- and the level of acceptable risks depending on the type of building and its end use.

When the calculated risk is very high (higher than the acceptable level), protective measures should be implemented (LPS, SPDs, earthing, etc.) and adapted to the level of needs. This level of needs is expressed in terms of LPL (Lightning Protection Level) with values ranging from I to IV, with an LPL of I being the highest level of needs corresponding to a lightning current discharge of 200kA in the SPF and to SPDs T1 or T1+T2 of 100kA (25kA/pole for SPDs 4P) to be installed on the main board. LPL: see table above.

6. MOUNTING

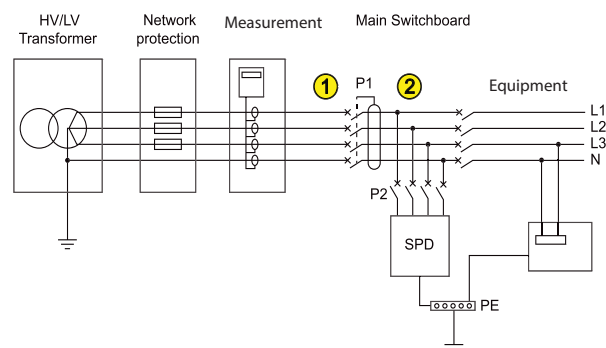
Surge protective devices must not be installed in places where there is a risk of fire or explosion without special provisions. They must be disconnected before checking the insulation resistance of the installation.

■ 6.1 Types of SPD and Grounding Systems

Residual Differential Devices and Service Continuity: If the protection device of the main switchboard is located upstream of the SPD includes a residual current device, which must be type S or retarded at the installation source (residual current device immunized against overvoltages up to 5 kA according to NF C 15-100 and 3 kA according to HD/IEC 60364). Also recommended for secondary switchboards.

When possible (in accordance with local rules), the SPD and its associated protective device should be installed upstream of the main protective device, as shown below (in accordance with HD/IEC 60364 standards).

SPDs and TT grounding system

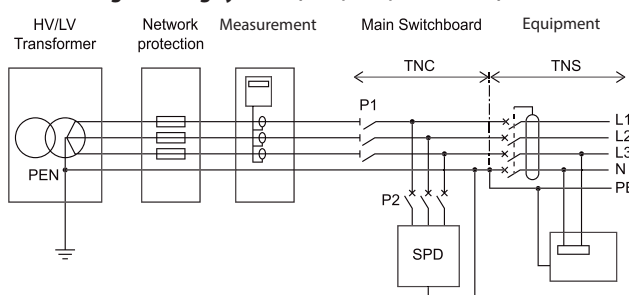


P1: Main protective device of the installation

P2: Protective device used with the SPD

- ① (upstream from P1): SPDs 1P+N/3P+N only
SPDs 1P/2P/3P/4P must always be installed downstream of a residual current device (discriminant or delayed, at the origin of the installation).
- ② (downstream from P1): any SPD

SPDs and TN grounding systems (TNC, TNS, and TNC-S)



6. MOUNTING (continued)

■ 6.1 Types of SPD and Grounding Systems (continued) SPDs and TN grounding systems (TNC, TNS, and TNC-S) (continued)

P1: Main protection device of the installation

P2: Protection device used with the SPD (see page 2)

Two-phase power supplies

Use 1P or 2P SPDs.

For more details on associated protective device: see page 2.

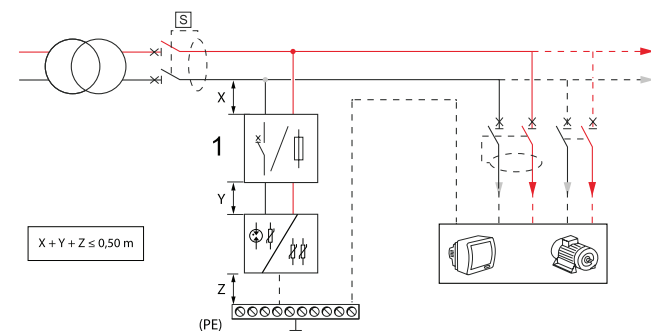
■ 6.2 Connections

Verify that the grounding connection to which the exposed conductive parts of the installation are connected complies with NF C 15-100 (HD/IEC 60364).

SPD connected to the mains and the protective conductor (PE) using a connection as short as possible, $X+Y+Z \leq 50$ cm. Mandatory connection of the earthing terminal of the surge protective device to the protective conductor (PE) in the switchboard.

Equipotentiality rules: interconnection of the exposed conductive parts of the equipment and the protective conductor (PE) in the switchboard, which in turn is connected to the grounding terminal of the surge protective device.

Electromagnetic compatibility rules: avoid loops, fix the cables firmly against the exposed metal conductive parts.



1: Protective device used with SPD (see page 2 for more details)

Recommended cross-sections and connection lengths to be removed:

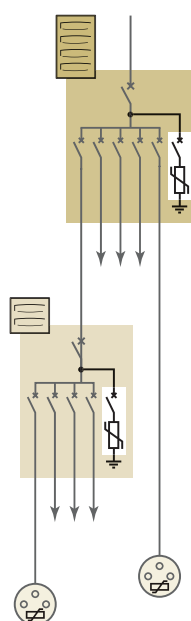
	6 - 35 mm ²
	6 - 3 mm 2 6 - 25 mm (with ferrule)

Tools required and tightening torque

- Flat-head screwdriver Ø 4 to 6.5 mm
- Screwdriver Ø 4 to 6.5 mm, recessed Pozidriv PZ2
- Maximum torque: 3 Nm

■ 6.3 Cascading SPDs

Effective surge protection generally cannot be guaranteed with a single SPD if its protection level (U_p) is greater than 1.2 kV (EN/IEC 62305 and TS/IEC 61643-12).



When there are overvoltages, an SPD protects the equipment by limiting these overvoltages to values that can be tolerated by the equipment. Thus, depending on its discharge capacity (discharge current I_n , I_{max} , etc.) and its protection level (U_p), an SPD will limit these overvoltages to varying values depending on the power levels involved.

The overvoltage values that can be transmitted downstream of the SPD can double at distances greater than 10 m due to resonances associated with the type of electrical installation and the type of equipment. Overvoltages greater than 2.5 kV can occur and damage the equipment if the waste energy is high enough (2.5 kV is the insulation level of most electrical and electronic equipment, or even 1.5 kV for household appliances).

SPDs should be installed in switchboards that provide sensitive or critical equipment for the activity being performed (and/or near equipment with proximity SPDs).

■ 6.4 Coordinating upstream/downstream SPDs

It consists of ensuring that any downstream SPD (in distribution enclosures or proximity SPDs) is properly coordinated in terms of energy with any SPD located upstream (TS 61643-12).

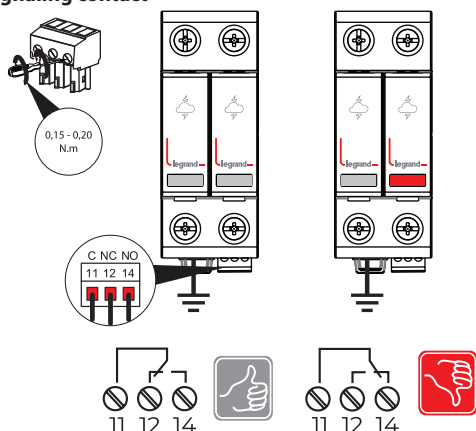
Minimum distances between SPDs (m)

Upstream SPD	Downstream SPD	Minimum distance (m)	
		With LPS*	Without LPS*
T1+T2/35 and T1+T2/25	T2/40 (Uc 440V)	0	0
	T2/40 (Uc 320V)	1	0
T1+T2/12,5 and T1+T2/8	T2/40	5	0
	T2/20 ou T2/12	8	0
T2/40	T2/20 ou T2/12	-	1
T2/20	T2/12	-	0.5
T2/20 and T2/12	SPDs of closeness	-	2

* LPS : Lightning Protection System

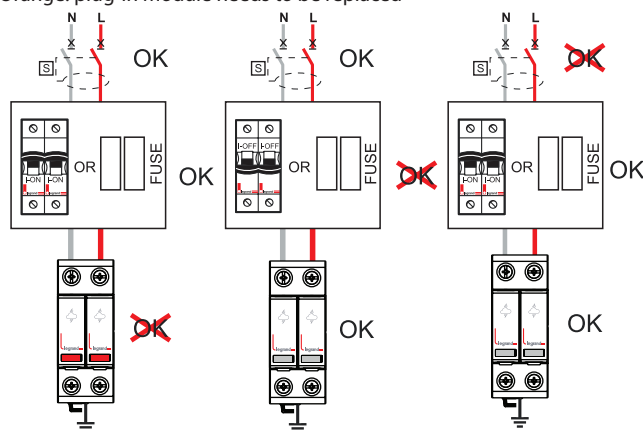
7. ACCESSORIES

7.1 Signaling contact



7.2 Replacement plug-in modules with status indicator

- Green: SPD operational
- Orange: plug-in module needs to be replaced



Plug-in replacement	1P/2P/3P/4P	1P+N/3P+N
T1+T2/12,5 kA	4 103 01/06	4 103 11*
T2/20 kA	4 103 02/03/07	4 103 15
T2/45 kA	4 103 04/05/08	4 103 17

* Products with PLUG FOR SPD T1+T2/50kA NPE cannot be removed from the base

8. STANDARDS AND REGULATIONS

Conforming to standards EN 61643-11:2012 and IEC 61643-11 edition 1: 2011.

These SPDs ensure compliance with the installation obligations and recommendations of standards NF C 15-100 (HD/IEC 60364) part 534, standards IEC/EN 62305 and guide UTE C 15-443 (TS/IEC 61643-12).

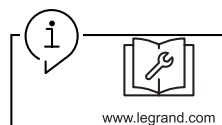
Conforming to directives 2014/35/UE.

9. OTHER INFORMATION

XLPro Calcul: Calculation notes creation software, addressed to installers, design office and maintenance operators. Definition of the electrical characteristics of a low voltage installation in compliance with the applicable standards

XLPro³ Tool Selectivity and backup / Legrand Selectivity and backup: Software dedicated to installers, panelbuilders and design offices. Definition of the selectivity and backup values of an association of electrical devices and obtention of the tripping curves of the selected products.

XLPro Panels: Distribution panel design software, addressed to panelbuilders and electrical panel designers. Design of the electrical distribution of the panel, production of electrical diagrams, establishment of products and overall costing of the project.



Instruction sheet: all mounting information, available on e-catalog.

PEP: available on e-catalog.

For further technical information, please contact Legrand technical support.

Unless otherwise indicated, data reported in this document refers exclusively to test conditions according to product standards.

For different conditions of use of the product, inside electrical equipment or in any different installation context, refer to the regulatory requirements of the equipment, local regulations and design specifications of the system.