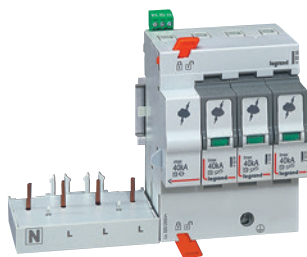
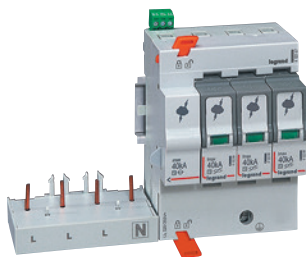


Class II (T2) low voltage SPDs



4 122 65



4 122 67



4 122 45



4 122 99

Technical characteristics p. 71-73

Protection against transient overvoltages for 230/400 V~ power networks (50/60 Hz). SPDs compliant with EN/IEC 61643-11 standards
Recommended for distribution boards

T2 add-on SPDs

SPDs with plug-in modules and status indicators:
- Green: SPD operational
- Orange: plug-in modules to be replaced
SPDs providing increased safety during their lifetime and maintenance cycles. Prewired MCB connexions for increased reliability and for quick and easy Installation.
To be equipped with DX³ MCBs (1 module/pole)
Earthing systems: TT, TNS

T2 - I_{max} 40 kA/pole

SPDs recommended for power installations
Up: 1.7 kV - In: 20 kA/pole - Uc: 320 V~
Recommended MCB: DX³ 25 A - C curve

Pack	Cat.Nos	Number of poles	Neutral position	Remote status monitoring (FS contact)	Number of modules
1	4 122 64 ¹	1P+N	Left	Yes	4
1	4 122 66 ¹	1P+N	Right	Yes	4
1	4 122 65 ¹	3P+N	Left	Yes	8
1	4 122 67 ¹	3P+N	Right	Yes	8

T2 - I_{max} 20 kA/pole

SPDs recommended for small installations
Up: 1.2 kV - In: 5 kA/pole - Uc: 320 V~
Recommended MCB: DX³ 20A - C curve

1	4 122 60 ¹	1P+N	Left	Yes	4
1	4 122 62 ¹	1P+N	Right	Yes	4
1	4 122 61 ¹	3P+N	Left	Yes	8
1	4 122 63 ¹	3P+N	Right	Yes	8

T2 SPDs

SPDs with plug-in modules and status indicators:
- Green: SPD operational
- Orange: plug-in modules to be replaced

T2 - I_{max} 40 kA/pole

SPDs recommended for power installations
Up: 1.7 kV - In: 20 kA/pole - Uc: 320 V~
Earthing systems : TT, TNC, TNS
Recommended MCB: DX³ 25 A - C curve

Pack	Cat.Nos	Number of poles	Neutral position	Remote status monitoring (FS contact)	Number of modules
1	4 122 40	1P	-	No	1
1	4 122 44 ¹	1P+N	Left	No	2
1	4 122 46 ¹	1P+N	Right	No	2
1	4 122 41	2P	-	No	2
1	4 122 42	3P	-	Yes	3
1	4 122 45 ¹	3P+N	Left	No	4
1	4 122 47 ¹	3P+N	Right	No	4
1	4 122 43	4P	-	No	4

T2 - I_{max} 40 kA/pole - 440V~ (IT)

SPDs recommended for big installations
Up: 2.1 kV - In: 20 kA/pole - Uc: 440 V~
Earthing systems : TT, TNC, TNS, IT
Recommended MCB: DX³ 25 A - C curve

1	4 122 30	1P	-	No	1
1	4 122 32	3P	-	Yes	3
1	4 122 33	4P	-	Yes	4

T2 - I_{max} 20 kA/pole

SPDs recommended for small installations
Up: 1.2 kV - In: 5 kA/pole - Uc: 320 V~
Earthing systems : TT, TNC, TNS
Recommended MCB: DX³ 20 A - C curve

1	4 122 20	1P	-	No	1
1	4 122 24 ¹	1P+N	Left	No	2
1	4 122 26 ¹	1P+N	Right	No	2
1	4 122 21	2P	-	No	2
1	4 122 25 ¹	3P+N	Left	No	4
1	4 122 27 ¹	3P+N	Right	No	4
1	4 122 23	4P	-	No	4

Replacement plug-in modules

1	4 122 99	For SPDs T2 - 40 kA Cat.Nos 4 122 40/41/42/43/44/45/ 46/47/64/65/66/67
1	4 123 00	N-PE module for SPDs T2 - 40 kA Cat.Nos 4 122 44/45/46/47
1	4 123 01	For SPDs T2 - 440 V Cat.Nos 4 122 30/32/33
1	4 122 97	For SPDs T2 - 20 kA Cat.Nos 4 122 20/21/23/24/25/26/27/60/61/62/63
1	4 122 98	N-PE module for SPDs T2 - 20 kA Cat.Nos 4 122 24/25/26/27

1: 1P+N and 3P+N: L-N and N-PE protection modes (common and differential modes), the N pole being protected by encapsulated spark gaps. Also called 1+1 and 3+1

See the video



Surge Protective Devices (SPDs)

technical characteristics

Modular SPDs

230/400 V~ power network (50/60 Hz) - Degree of protection IP 20
 Operating temperature: -10 to +40°C/Storage temperature: -20 to +70°C
 1P+N (3P+N) SPDs: L-N and N-PE protection, also called 1+1 (3+1 resp.) or CT2 type protection depending on installation standards.

Cat.Nos	Type	Poles	Earthing system	Max. voltage (Uc)	Protection mode	Nominal current In/pole (8/20)	Max. discharge current			Protection level		Max. short-circuit current Isc (IscCR)	Protective device to be used ¹	FS auxiliary (remote status monitoring)
							I _{max} /pole (8/20)	I _{imp} /pole (10/350)	I _{total} (10/350)	Up (L-N/L-PE/N-PE)	Up at 5 kA			
4 122 80	T1+T2/35 kA	1P	TT, TNC, TNS, IT	440 V~	CT1	35 kA	50 kA	35 kA	35 kA	2.5 kV		50 kA	DPX ³ 160 80 A	yes
4 122 81	T1+T2/25 kA	1P+N	TT, TNS	350 V~	CT2	25/50 kA	50/100 kA	25/50 kA	50 kA	1.5/2.5/1.5 kV		50 kA	DPX ³ 160 80 A	yes
4 122 82	T1+T2/25 kA	3P	TNC	350 V~	CT1	25 kA	50 kA	25 kA	75 kA	1.5 kV		50 kA	DPX ³ 160 80 A	yes
4 122 83	T1+T2/25 kA	3P+N	TT, TNS	350 V~	CT2	25/100 kA	50/100 kA	25/100 kA	100 kA	1.5/2.5/1.5 kV		50 kA	DPX ³ 160 80 A	yes
4 122 70	T1+T2/12.5 kA	1P	TT, TNC, TNS	320 V~	CT1	25 kA	60 kA	12.5 kA	12.5 kA			50 kA	DX ³ 63 A C curve	no
4 122 71	T1+T2/12.5 kA	2P	TT, TNS	320 V~	CT1	25 kA	60 kA	12.5 kA	25 kA	1.5 kV at 12.5 kA 1.9 kV at 25 kA	1 kV	50 kA	DX ³ 63 A C curve	no
4 122 72	T1+T2/12.5 kA	3P	TNC	320 V~	CT1	25 kA	60 kA	12.5 kA	37.5 kA			50 kA	DX ³ 63 A C curve	yes
4 122 73	T1+T2/12.5 kA	4P	TT, TNS	320 V~	CT1	25 kA	60 kA	12.5 kA	50 kA			50 kA	DX ³ 63 A C curve	no
4 122 74/76	T1+T2/12.5 kA	1P+N	TT, TNS	320 V~	CT2	25/25 kA	60 kA	12.5/25 kA	25 kA	1.5/1.6/1.5 kV at 12.5 kA 1.9/2.1/1.5 kV at 25 kA	1 kV	50 kA	DX ³ 63 A C curve	yes
4 122 75/77	T1+T2/12.5 kA	3P+N	TT, TNS	320 V~	CT2	25/50 kA	60 kA	12.5/50 kA	50 kA			50 kA	DX ³ 63 A C curve	yes
4 122 50	T1+T2/8 kA	1P	TT, TNC, TNS	320 V~	CT1	20 kA	50 kA	8 kA	8 kA			50 kA	DX ³ 40 A C curve	no
4 122 51	T1+T2/8 kA	2P	TT, TNS	320 V~	CT1	20 kA	50 kA	8 kA	16 kA	1.2 kV at 8 kA 1.7 kV at 20 kA	1 kV	50 kA	DX ³ 40 A C curve	no
4 122 52	T1+T2/8 kA	3P	TNC	320 V~	CT1	20 kA	50 kA	8 kA	25 kA			50 kA	DX ³ 40 A C curve	no
4 122 53	T1+T2/8 kA	4P	TT, TNS	320 V~	CT1	20 kA	50 kA	8 kA	32 kA			50 kA	DX ³ 40 A C curve	no
4 122 54/56	T1+T2/8 kA	1P+N	TT, TNS	320 V~	CT2	20 kA	50 kA	8 kA	16 kA	1.2/1.5/1.5 kV at 8 kA 1.7/2/1.5 kV at 20 kA	1 kV	50 kA	DX ³ 40 A C curve	no
4 122 55/57	T1+T2/8 kA	3P+N	TT, TNS	320 V~	CT2	20 kA	50 kA	8 kA	25 kA			50 kA	DX ³ 40 A C curve	no
4 122 40	T2/40 kA	1P	TT, TNC, TNS	320 V~	CT1	20 kA	40 kA					50 kA	DX ³ 25 A C curve	no
4 122 41	T2/40 kA	2P	TT, TNS	320 V~	CT1	20 kA	40 kA			1.5 kV at 15 kA 1.7 kV at 20 kA	1 kV	50 kA	DX ³ 25 A C curve	no
4 122 42	T2/40 kA	3P	TNC	320 V~	CT1	20 kA	40 kA					50 kA	DX ³ 25 A C curve	yes
4 122 43	T2/40 kA	4P	TT, TNS	320 V~	CT1	20 kA	40 kA					50 kA	DX ³ 25 A C curve	no
4 122 44/46 4 122 64/66	T2/40 kA	1P+N	TT, TNS	320 V~	CT2	20 kA	40 kA			1.5/1.6/1.4 kV at 15 kA 1.7/2/1.4 kV at 20 kA	1 kV	50 kA	DX ³ 25 A C curve	no
4 122 45/47 4 122 65/67	T2/40 kA	3P+N	TT, TNS	320 V~	CT2	20 kA	40 kA					50 kA	DX ³ 25 A C curve	no
4 122 30	T2/40 kA	1P	TT, TNC, TNS, IT	440 V~	CT1	20 kA	40 kA			1.8 kV at 15 kA 2.1 kV at 20 kA	1.3 kV	50 kA	DX ³ 25 A C curve	yes
4 122 32	T2/40 kA	3P	TNC, IT	440 V~	CT1	20 kA	40 kA					50 kA	DX ³ 25 A C curve	yes
4 122 33	T2/40 kA	4P	TT, TNS, IT	440 V~	CT1	20 kA	40 kA					50 kA	DX ³ 25 A C curve	yes
4 122 20	T2/20 kA	1P	TT, TNS	320 V~	CT1	10 kA	20 kA			1.2 kV at 5 kA 1.4 kV at 10 kA	1.2 kV	25 kA	DX ³ 20 A C curve	no
4 122 21	T2/20 kA	2P	TT, TNS	320 V~	CT1	10 kA	20 kA					25 kA	DX ³ 20 A C curve	no
4 122 23	T2/20 kA	4P	TT, TNS	320 V~	CT1	10 kA	20 kA					25 kA	DX ³ 20 A C curve	no
4 122 24/26 4 122 60/62	T2/20 kA	1P+N	TT, TNS	320 V~	CT2	10/20 kA	20 kA			1.2/1.4/1.4 kV at 5 kA 1.4/1.4/1.4 kV at 10 kA	1.2 kV	25 kA	DX ³ 20 A C curve	no
4 122 25/27 4 122 61/63	T2/20 kA	3P+N	TT, TNS	320 V~	CT2	10/20 kA	20 kA					25 kA	DX ³ 20 A C curve	no
0 039 51 0 039 71	T2+T3/12 kA	1P+N	TT, TNS	275 V~	CT2	10/10 kA	12 kA			1.1/1.2/1.2 kV at 10 kA	1 kV	6 kA 10 kA	integrated protection	no
0 039 53 0 039 73	T2+T3/12 kA	3P+N	TT, TNS	275 V~	CT2	10/20 kA	20 kA					6 kA 10 kA	integrated protection	no

CT1: L(N)-PE protection modes.
 CT2: L-N and N-PE protection modes.
¹: DPX³ (only T1 + T2 SPDs Cat.Nos 4 122 80/81/82/83), DX³ or similar type circuit breakers (with T2 and other T1+T2 SPDs). For fuse protection or values other than those indicated in the table: please consult Legrand.

Characteristics of proximity SPDs

230 V~ protection: Type 3 (T3) SPDs

Cat.Nos	0 775 40 (p. 828)	6 946 64/66/70 (p. 608 and 614)	6 946 14/48/51/56/71 (p. 614)
Protection mode	LN/NPE	LN/LPE/NPE	LN
Up	1/1.2 kV	1 kV	1 kV
I _{max}	6 kA	-	-
I _n	1.5 kA	2 kA	2 kA
U _{oc}	3 kV	4 kV	4 kV

TT earthing system: Installation downstream of a residual current device (HPI type recommended).

RJ 45/RJ 11 protection

Cat. No.	6 946 64 (p. 614)	6 946 70 (p. 608)
U _c	200 V	200 V
U _p	600 V	600 V
I _{max}	1.5 kA	1.5 kA
I _n	1 kA	1 kA
U _{oc}	3 kV	3 kV

TV protection (9.5 mm coax.)

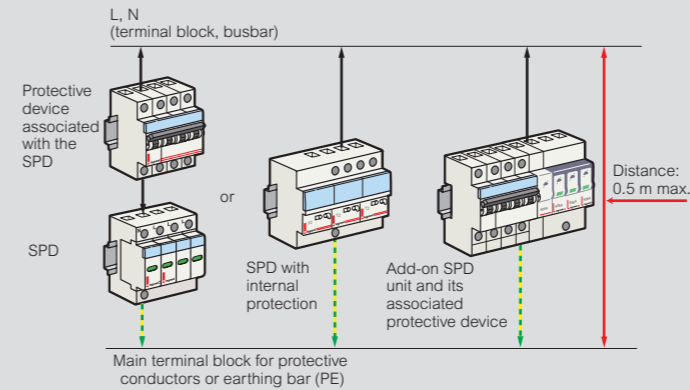
Cat. No.	6 946 66 (p. 614)
U _c	50 V
U _p	900 V
I _{max}	5 kA
I _n	1 kA
U _{oc}	3 kV

Installation

Associated overcurrent protection

SPDs must be protected by a circuit breaker (or fuses), to provide protection in the event of an overload, which may make the SPD reach its end of life (see selection table p. 10-11). This protective device will be defined to be coordinated or discriminating with regard to upstream protective devices.

Connection principles



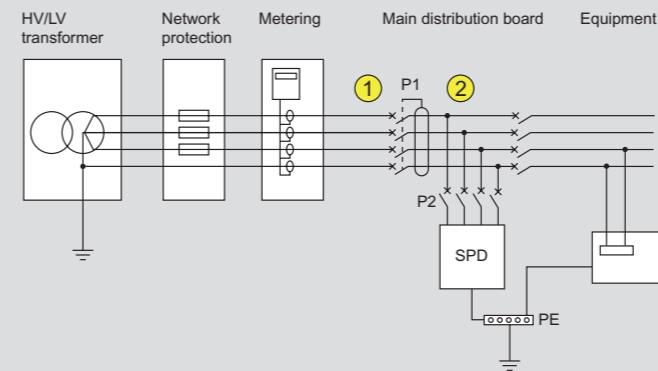
Connection lengths: as short as possible (< 50 cm if possible).

EMC (Electromagnetic Compatibility) rules: avoid loops, fix the cables firmly against the exposed metal conductive parts of the enclosure.

SPD types and earthing systems

When possible (according to local rules), the SPD and its associated overcurrent protection (P2) should be installed upstream of the main protection (P1) as shown below (according to standards HD/IEC 60364).

SPDs and TT earthing system

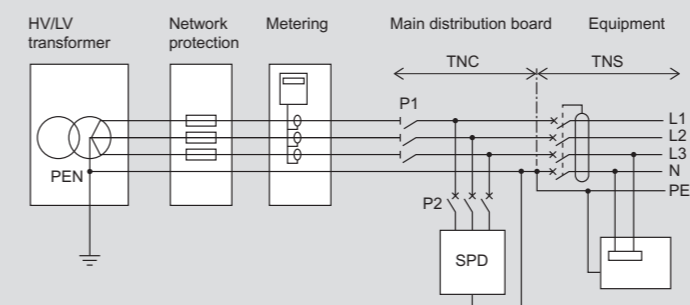


P1: main protection of the installation
 SPD: surge protective device with U_c 275 or 320 V recommended

① (upstream of P1): 1P+N/3P+N SPDs only (except for Cat.Nos 0 039 51/53/71/73).
 1P/2P/3P/4P SPDs and Cat.Nos 0 039 51/53/71/73 must always be installed downstream of a residual current device (discriminating or delayed, at the supply end of the installation).

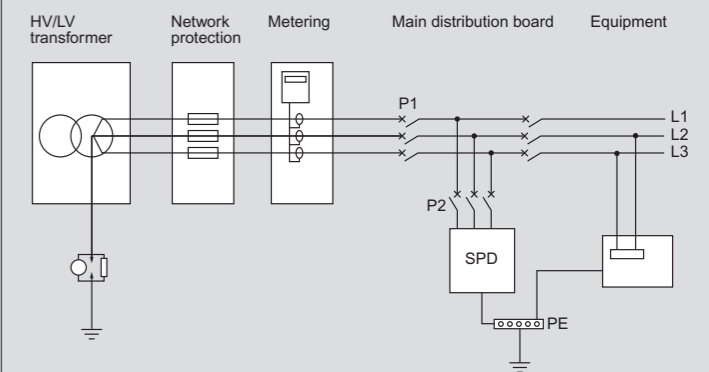
② (downstream of P1): any SPD.

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



P1: main protection of the installation
 SPD: surge protective device with U_c 275 or 320 V recommended

SPDs and IT earthing system



P1: main protection of the installation
 SPD: surge protective device with U_c 440 V (U_c < 440 V prohibited)

Coordinating upstream/downstream SPDs

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

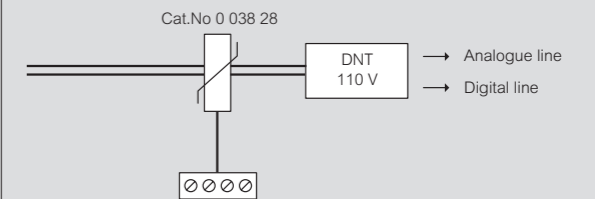
Minimum distances between SPDs

Upstream SPD	Downstream SPD	Minimum distance between SPDs (m)	
		With LPS	Without LPS
T1+T2/35 and T1+T2/25	T2/40 (U _c 440V) T2/40 (U _c 320V)	0 1	0 0
T1+T2/12.5 and T1+T2/8	T2/40 T2/20 or T2/12	5 8	0 0
T2/40	T2/20 or T2/12	-	1
T2/20	T2/12	-	0.5
T2/20 and T2/12	Proximity SPDs	-	2

Installation for telephone lines

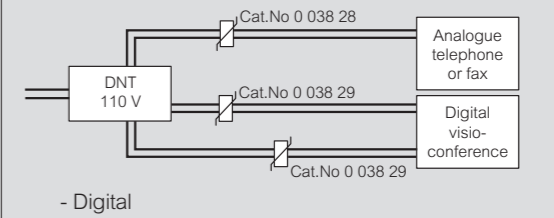
Protection of a telephone line

- Upstream the communication distribution box



- Downstream the communication distribution box

- Analogue or digital



- Digital



Surge Protective Devices (SPDs)

protection against transient overvoltages

Protection against lightning and overvoltages

Protection against the effects of lightning is essentially based on:

- Protecting buildings using a lightning protection system (LPS or lightning conductors) to catch lightning strikes and to drive the lightning current to earth.
- The use of surge protective devices (SPDs) to protect equipment.
- The design of the earthing system (passive protection of the installation).

Throughout the world, there are millions of lightning strikes each day in the summer (up to 1000 lightning strikes/second). Lightning is responsible for 25% to 40% of all damage to equipment. When added to industrial overvoltages (switching overvoltages due to the operation of internal equipment), they account for more than 60% of all electrical damages, which can be prevented by installing SPDs (according to the country and type of installation - source: insurance companies).

In some countries, and depending on the end use of the building, national regulations may always stipulate the installation of SPDs (for example, Germany, Austria, Norway, etc.). If there are no specific national regulations, SPDs are usually specified by national installation standards (based on HD/IEC 60364 international installation standards) and EN/IEC 62305 standards.

External lightning protection system (LPS) or lightning conductors: protection of buildings (EN/IEC 62305)

An external lightning protection system (LPS) protects buildings against direct lightning strikes. It is generally based on the use of lightning conductors (single rod, with sparkover device, meshed cage, etc.) and/or the metallic structure of the building.

If there is an LPS or if a lightning risk assessment has been carried out in accordance with EN/IEC 62305 standards, SPDs are generally required in the main distribution board (T1 or T1+T2 SPDs) and distribution boards (T2 SPDs).

Determination of the SPDs in the main distribution board in accordance with EN/IEC 62305 and TS/IEC 61643-12 (if there is insufficient information available):

LPL ¹ : Lightning protection level	Total lightning current of the LPS	Min. value of Imp current of the SPD (T1 or T1+T2)	Usage practices
I	200 kA	25 kA/pole (IT: 35kA min.)	Power installations
II	150 kA	18.5 kA/pole	Rarely used
III/IV	100 kA	12.5 kA/pole	Small installations

1: LPL (Lightning Protection Level)

Surge protective device (SPD) (internal protection)

The SPD

- Protects sensitive devices against overvoltages caused by lightning and industrial overvoltages, by limiting the overvoltages to values that are tolerated by the equipment
- Limits the possible harmful consequences in terms of the safety of people (medical equipment installed in the home, security systems, environmental systems, etc.)
- Maximises the continuity of operation of equipment and limits production losses

SPDs and standards

Standards EN/IEC 61643-11

Type of SPD		Test waves
EN 61643-11	IEC 61643-11	
Type 1 (T1)	Class I (T1)	limp: 10/350 µs (discharge current) In: 8/20 µs (nominal current, 15 shocks)
Type 2 (T2)	Class II (T2)	Imax: 8/20 µs (discharge current) In: 8/20 µs (nominal current, 15 shocks)

T1+T2 SPDs: tested in accordance with both methods.

T1 or T1+T2 SPDs are increasingly used at the supply origin of installations, even when there is no lightning conductor, as they enable higher energies to be discharged and increase the service life of the SPD.

HD/IEC 60364 electrical installation standards

According to articles 443 and 534 of HD/IEC 60364 standards from year 2015 and the TS/IEC 61643-12 guides, the use of SPDs in new or renovated buildings is compulsory for buildings with:

- Risks for human life, e.g. safety services, medical care facilities, hospitals...
- Public services and cultural heritage, e.g. loss of public services, data centres, museums, religious buildings, ...
- Commercial or industrial activities, e.g. hotels, banks, industries, commercial markets, farms, ...
- With direct lightning protection and/or designed according to EN/IEC 62305-2 (with LPS: T1 or T1+T2 SPDs, limp ≥ 12.5 kA)

- Receiving large number of persons, e.g. large residential, offices, schools, ... (Europe)

In the case of small buildings, e.g. small commercial buildings, houses, small multi-family buildings, ..., a risk analysis shall be realized (article 443.5). If this is not done, SPDs are made mandatory by HD/IEC 60364 installation standards.

Countries still following earlier versions of HD/IEC installation standards:

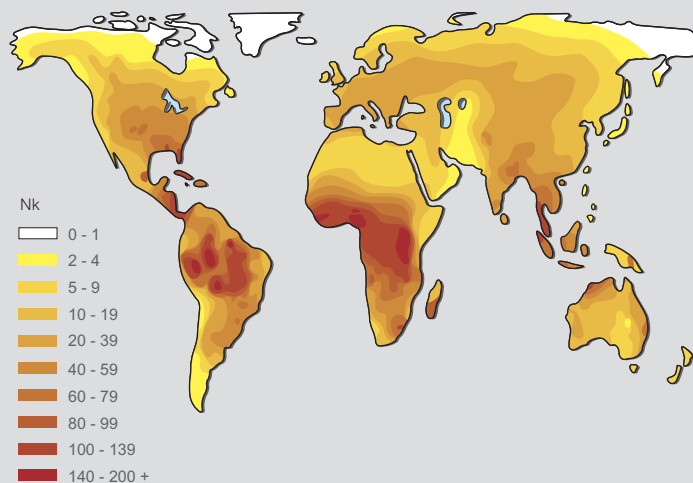
According to articles 443 and 534 of HD/IEC 60364 standards and the TS/IEC 61643-12 guides, the use of SPDs in new or renovated buildings is compulsory at the supply origin of the installation in the following cases:

- Buildings with lightning conductors or LPS (T1 or T1+T2 SPDs, limp ≥ 12.5 kA)
- Buildings with totally or partially overhead power supplies in AQ2 geographical areas (article 443.3.2.1 - AQ2: Nk > 25, see map below) and based on a risk assessment taking into account the type of power supply to the building (article 443.3.2.2)

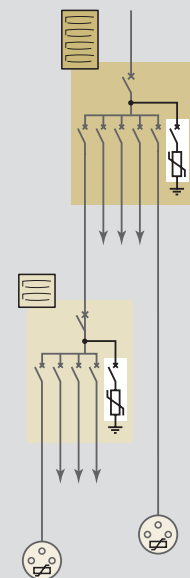
According to article 443.3.2.2, SPDs (Type 2) are also required in the following cases:

- Commercial/industrial buildings, public buildings and services, religious buildings, schools and large residential complexes, etc.
- Hospitals and buildings containing medical equipment and/or safety services for people and property (fire alarm, technical alarms, etc.)

Important: it is advisable to install an SPD when the safety of people may depend on the continuity of service of equipment (even if this is not required by national standards). Although not compulsory according to national installation standards, an SPD should always be installed to protect the communication equipment when there is an SPD on the low voltage power network.



Protection of distribution boards and sensitive equipment (cascaded protection)



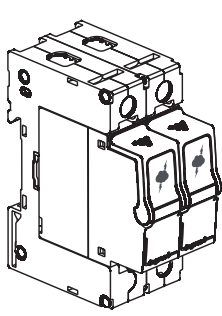
Effective protection against overvoltages cannot generally be assured with a single SPD if its protection level (U_p) is greater than 1.2 kV (EN/IEC 62305 and TS/IEC 61643-12).

When there are overvoltages, an SPD protects equipment by limiting these overvoltages to values that can be tolerated by the equipment. Thus, depending on its discharge capacity (discharge current I_{max} , etc.) and its protection level (U_p), an SPD will limit these overvoltages to varying values depending on the energy levels involved. The overvoltage values that may be transmitted downstream of the SPD may double over distances of more than 10 m due to resonances associated with the type of electrical installation and the type of equipment. Overvoltages greater than 2.5 kV may then occur and damage equipment if the residual energy is high enough (2.5 kV being the insulation level of most electrical and electronic equipment, or typically 1.5 kV for electrical domestic appliances).

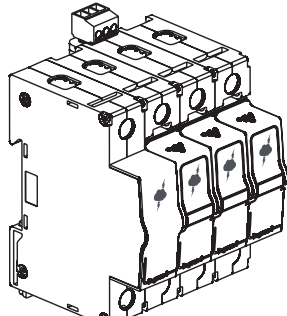
SPDs should be installed in the distribution boards supplying equipment that is sensitive or critical for the activity being carried out (and/or near to equipment with proximity SPDs).

Modular surge protective devices (SPDs)

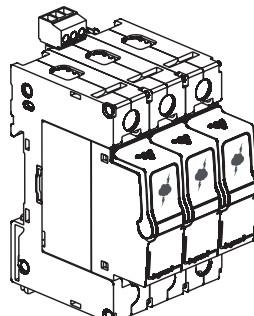
Cat. Nos: 4 122 20/21/23/24/25/26/27/30/32/33/
 40/41/42/43/44/45/46/47/50/51/52/53/54/55/56/57
 70/71/72/73/74/75/76/77



4 122 41



4 122 75



4 122 32

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1. GENERAL CHARACTERISTICS

1.1 Brief description

Surge protective devices for installations supplied with 230/400 V~ (50-60 Hz).

Equipped with plug-in modules with status indicator:

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

Equipped with an auxiliary unit for the remote monitoring of the SPD status (depending on the version).

SPDs T1+T2/8 kA and 12,5 kA (class I + II): recommended for general protection of main distribution boards.

SPDs T1+T2/12.5 kA (class I + II): recommended for small installations with lightning conductor/LPS protection (level III/IV LPS) and power installations without lightning conductor/LPS.

SPDs T1+T2/25 and 35 kA (class I + II): recommended for power installations with lightning conductors or LPS.

SPDs T2 (class II): recommended for the protection of secondary distribution boards.

LPS: lightning protection system according to standards EN/IEC 62305

1.2 Protection modes

SPDs 1P+N/3P+N

TT, TNS systems

4 122 24	4 122 26
4 122 25	4 122 27
4 122 44	4 122 46
4 122 45	4 122 47
4 122 54	4 122 56
4 122 55	4 122 57
4 122 74	4 122 76
4 122 75	4 122 77

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

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

TT, TN (TNC, TNS), IT systems

TT, TN (TNC, TNS)		IT 230/440V~
4 122 20	4 122 51	4 122 30
4 122 21	4 122 52	4 122 32
4 122 23	4 122 53	4 122 33
4 122 40	4 122 70	
4 122 41	4 122 71	
4 122 42	4 122 72	
4 122 43	4 122 73	
4 122 50		



IT 230/400 V~ → U_c 440 V~

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.

Two-phase mains supplies

Use SPDs 1P or 2P.

Two-phase mains supplies (L1-L2)	
Voltage ≤ 230 V~	Voltage > 230 V~
4 122 20/21	4 122 30
4 122 40/41	
4 122 50/51	
4 122 70/71	

1.3 Applications

1.3.1 Installation standards

1.3.1.1 NFC 15-100

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

- equipped with an LPS (lightning protection system) or lightning conductor (also see section 1.3.3)
- supplied with overhead power lines when located in a geographical area classified AQ2 (Nk > 25)

In the latter case, a lack of SPDs can however be justified by a risk analysis according to the UTE C 15-443 guide, standard IEC 60364-4-443 or any other recognised equivalent method.

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

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

Note:

SPDs are usually 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 a lightning conductor.

Nk = keraunic level (number of days a year when lightning strikes occur in a given area)

Ng = Nk/10 where Ng: number of strikes a year per km².

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

- Type 1 or Type 1 + Type 2 SPD (I_{imp} ≥ 12.5 kA) compulsory at the installation source (main distribution board in secondary buildings)
- Installations more than 10 m high (apartment buildings, office buildings, hotels, etc): Type 2 SPD recommended for protecting private areas and floor distributors (communal areas) in addition to a Type 1 or Type 1 + Type 2 SPD
- Installations with numerous private areas (apartment buildings, office buildings, etc): Type 2 SPD where I_n ≥ 5 kA compulsory at the source of each private area if the Type 1 or Type 1 + Type 2 SPD cannot be installed at the installation source.

1.3.1.2 HD 60364, IEC 60364

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

- Buildings with lightning conductors or a LPS (T1 or T1+T2 SPD, I_{imp} ≥ 12.5 kA)
- Buildings with totally or partially overhead power supplies in AQ2 geographical areas (article 443.3.2.1 - AQ2: Nk > 25) and based on a risk assessment taking into account the type of power supply to 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, public services, 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)

1.3.2 Legrand recommendations

To ensure correct protection, an SPD is recommended:
 - at the origin of each installation (compulsory depending on the type and location of the installation to be protected)
 - at secondary distribution board feeding sensitive equipment
 - on all outdoor electrical circuit outgoing lines (power supply for secondary buildings, outdoor lighting or outdoor distribution boards, etc).

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

To define the type of SPD needed according to the installation level of risk, use the selection chart (see catalogue) or our XLPRO³ and XLPRO³ Calcul software.

1.3.3 EN 62305 (IEC 62305)

An external lightning protection system (LPS) protects buildings against direct lightning strikes. It is generally based on the use of lightning conductors (single rods, with ESE, meshed cage, etc.) and/or the metal structure of the building.
 If there is an LPS or a lightning risk assessment has been carried out in accordance with standards EN/IEC 62305, SPDs are generally required in the main distribution board (T1 or T1+T2 SPDs) and distribution boards (T2 SPDs).

Determination of SPDs in the main distribution board according to EN/IEC 62305 and TS/IEC 61643-12 (if there is insufficient information available):

Buildings with an external LPS

LPL⁽¹⁾: Lightning protection level	LPS total lightning current	Min. value of the SPD limp 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/IV	100 kA	12.5 kA/pole	Small installations

(1): LPL (Lightning Protection Level)

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

Risk assessment according to EN/IEC 62305

The risk assessment aims to evaluate if protective measures are needed. It defines their type and the level of needs to protect a building against lightning impacts (lightning protection of the building with an external LPS) and to protect equipment against impacts on the power or data lines, and against transient overvoltages due to lightning impacts on the LPS or close to the building.

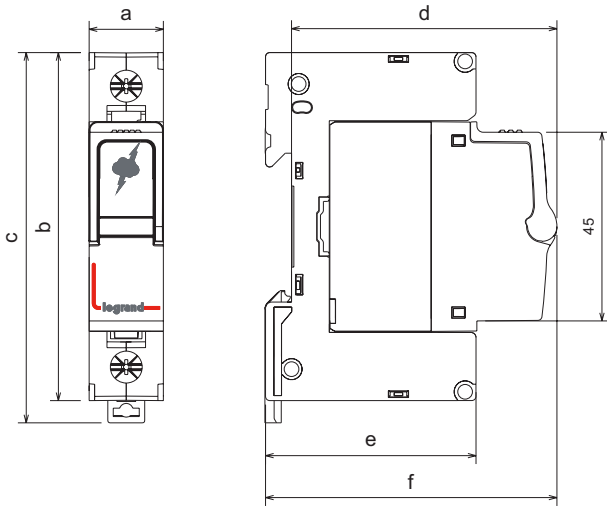
To evaluate if protective measures are needed, it takes into account the following criteria :

- 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 lightning density, number of persons usually present, etc...
- possible origins of the threats (S1: impacts on the building, S2: impacts close to the building, S3: impacts on the lines, S4: impacts close to the lines)
- possible losses or damages (L1: human safety, L2: public services, L3: cultural heritage and L4: economic value)
- and the level of acceptable risks depending on the type of building and its final use.

When the calculated risk is too high (higher than the acceptable level), protective measures must be implemented (LPS, SPDs, earthings, ...) 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, a LPL of I being the highest level of needs corresponding to a lightning current discharge of 200kA on the SPF and to T1 or T1+T2 SPDs of 100kA (25kA/pole for 4P SPDs) to be installed at the main board. LPL : see table above.

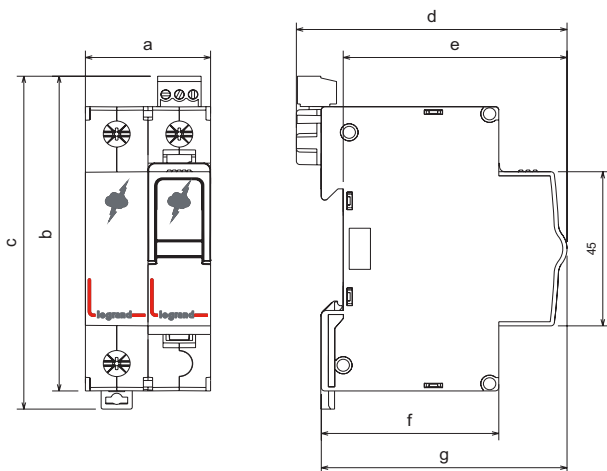
2. DIMENSIONS

2.1 1P+N/3P+N/1P/2P/3P/4P catalogue numbers without auxiliary for SPD status monitoring



Type of SPD	Dimensions (mm)					
	a	b	c	d	e	f
1P	17,7	83	88,3	63,3	50,2	69,5
1P+N / 2P	35,4	83	88,3	63,3	50,2	69,5
3P	53,1	83	88,3	63,3	50,2	69,5
3P+N / 4P	70,8	83	88,3	63,3	50,2	69,5

2.2 1P+N/3P+N/3P/4P catalogue numbers with auxiliary for SPD status monitoring

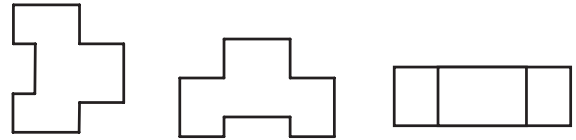


Type of SPD	Dimensions (mm)						
	a	b	c	d	e	f	g
1P+N	35,4	91,9	97,2	76,5	63,3	50,2	69,5
3P	53,1	91,9	97,2	76,5	63,3	50,2	69,5
1P+N / 4P	70,8	91,9	97,2	76,5	63,3	50,2	69,5

3. TECHNICAL CHARACTERISTICS

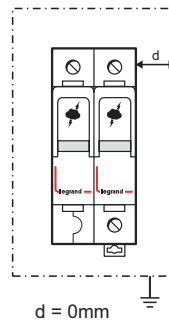
3.1 Operating positions

Vertical, horizontal or on its side



Fixed on EN 60715 or DIN 35 rail

3.2 Minimum distance from any earthed conductive surface



3.3 Enclosure materials

Base:

- Fibreglass reinforced (10%) polycarbonate (PC)
- Self-extinguishing: 850°/30 s
- Colour: RAL 7035 light grey

Plug-in module:

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

3.4 Metal component materials

- Cage terminals: zinc-plated steel
- Terminal screws: zinc-plated steel
- Base contacts: tinned copper, nickel-plated copper
- Springs: stainless steel
- Plug-in module contacts: tinned bronze, nickel-plated bronze, brass
- Rivet: aluminium

3.5 Resistance to shock and vibrations

Sinusoidal vibrations

- In accordance with IEC 60721-3-3
- Frequency range: 1 to 150 Hz
- Duration: 10 cycles
- Displacement : 3.5 mm
- Acceleration: 1 g where $g = 9.81 \text{ m/s}^2$

Shock

- In accordance with IEC 60721-3-3
- Acceleration: 15 g where $g = 9.81 \text{ m/s}^2$

■ 3.6 Operating characteristics

3.6.1 General characteristics

SPDs T1+T2 - 1P+N/3P+N

Cat. Nos.		4 122 54/56	4 122 55/57	4 122 74/76	4 122 75/77	
Number of poles		1P+N	3P+N	1P+N	3P+N	
Type of SPD		T1+T2/8 kA	T1+T2/8 kA	T1+T2/12.5 kA	T1+T2/12.5 kA	
Mains supply		230 V~ 240 V~	230/400 V~ 240/415 V~	230 V~ 240 V~	230/400 V~ 240/415 V~	
Maximum supply fluctuation		(230 V~ ; 230/400 V~) +10% (240 V~ ; 240/415 V~) +6%				
Frequency		50/60 Hz				
Earthing system		TT, TNS				
Protection modes		L-N/N-PE/L-PE				
Max. continuous operating voltage (Uc)		L-N	320 V~			
		N-PE	255 V~			
		L-PE	320 V~			
T1	Impulse discharge current (Iimp, 10/350)	L-N	8 kA	8 kA	12.5 kA	12.5 kA
		N-PE	16 kA	25 kA	25 kA	50 kA
		L-PE	8 kA	8 kA	12.5 kA	12.5 kA
	Total discharge current (L+N)/PE (Itotal, 10/350)		16 kA	25 kA	25 kA	50 kA
	Protection level at Iimp	L-N	1.2 kV	1.2 kV	1.5 kV	1.5 kV
		N-PE	1.5 kV	1.5 kV	1.5 kV	1.5 kV
L-PE		1.5 kV	1.5 kV	1.6 kV	1.6 kV	
T2	Nominal current In (8/20)	L-N	20 kA	20 kA	25 kA	25 kA
		N-PE	20 kA	20 kA	25 kA	50 kA
		L-PE	20 kA	20 kA	25 kA	25 kA
	I _{max} (8/20)	L-N/N-PE/L-PE	50 kA	50 kA	60 kA	60 kA
	Total discharge current (L+N)/PE (Itotal, 8/20)		60 kA	60 kA	60 kA	125 kA
	Protection level (Up) at In	L-N	1.7 kV	1.7 kV	1.9 kV	1.9 kV
N-PE		1.5 kV	1.5 kV	1.5 kV	1.5 kV	
L-PE		2 kV	2 kV	2.1 kV	2.1 kV	
Protection level (Up) at 5 kA		L-N	1 kV	1 kV	1 kV	1 kV
		N-PE	1.5 kV	1.5 kV	1.5 kV	1.5 kV
		L-PE	1.1 kV	1.1 kV	1.1 kV	1.2 kV
Temporary overvoltages (LV supply faults)		L-N: 336 V/5 s (withstand mode) L-PE: 440 V/5 s (withstand mode) L-N: 440 V/2 hrs (failure mode)				
Temporary overvoltages (HV supply faults)		1200 V (withstand mode)				
Protective device to be used : circuit breakers, fuses		See 3.6.2				
Short-circuit current withstand (I _{sccr} , I _{scc} max)		50 kA				
Follow current (I _{fi})		N-PE = 100 A				
Residual current at Uc (I _{pe})		0 A				
Response time		L/N: 25 ns; N/PE: 100 ns				
Terminal capacity: solid or flexible wire		6/35 mm ²				
Terminal capacity: flexible wire with ferrule		6/25 mm ²				
Auxiliary contact for remote monitoring of SPD status		No	No	Yes	Yes	
		250 V~ - 1A - 1.5 mm ² max				
Pollution level		2				
Location category		Indoor				
Number of ports		1				
Method of mounting		Fixed				
Width (number of modules)		2	4	2	4	
Protection index		IP 20/IK 04				
Operating temperature		-25°C to +70°C				
Storage temperature		-40°C to +70°C				
Humidity range		HR : 5 - 95 %				

SPDs T2 - 1P+N/3P+N

Cat. Nos.		4 122 24/26	4 122 25/27	4 122 44/46	4 122 45/47
Number of poles		1P+N	3P+N	1P+N	3P+N
Type of SPD		T2/20 kA	T2/20 kA	T2/40 kA	T2/40 kA
Mains supply		230 V~ 240 V~	230/400 V~ 240/415 V~	230 V~ 240 V~	230/400 V~ 240/415 V~
Maximum supply fluctuation		(230 V~ ; 230/400 V~) +10% (240 V~ ; 240/415 V~) +6%			
Frequency		50/60 Hz			
Earthing system		TT, TNS			
Protection modes		L-N/N-PE/L-PE			
Max. continuous operating voltage (Uc)	L-N	320 V~			
	N-PE	255 V~			
	L-PE	320 V~			
Nominal current In (8/20)	L-N	5 kA	5 kA	20 kA	20 kA
	N-PE	20 kA	20 kA	20 kA	20 kA
	L-PE	5 kA	5 kA	20 kA	20 kA
I _{max} (8/20)	L-N/N-PE/L-PE	20 kA	20 kA	40 kA	40 kA
Total discharge current (L+N)/PE (I _{total} , 8/20)		40 kA	60 kA	60 kA	60 kA
Protection level (Up) at I _n	L-N	1.2 kV	1.2 kV	1.7 kV	1.7 kV
	N-PE	1.4 kV	1.4 kV	1.4 kV	1.4 kV
	L-PE	1.4 kV	1.4 kV	2 kV	2 kV
Protection level (Up) at 5 kA	L-N	1.2 kV	1.2 kV	1 kV	1 kV
	N-PE	1.4 kV	1.4 kV	1.4 kV	1.4 kV
	L-PE	1.4 kV	1.4 kV	1.1 kV	1.1 kV
Residual voltage at 10 kA	L-N	1.4 kV	1.4 kV	1.2 kV	1.2 kV
	N-PE	1.4 kV	1.4 kV	1.4 kV	1.4 kV
	L-PE	1.4 kV	1.4 kV	1.4 kV	1.4 kV
Residual voltage at 15 kA	L-N			1.5 kV	1.5 kV
	N-PE			1.4 kV	1.4 kV
	L-PE			1.6 kV	1.6 kV
Temporary overvoltages (LV supply faults)		L-N: 336 V/5 s (withstand mode) L-PE: 440 V/5 s (withstand mode) L-N: 440 V/2 hrs (failure mode)			
Temporary overvoltages (HV supply faults)		1200 V (withstand mode)			
Protective device to be used : circuit breakers, fuses		See 3.6.2			
Short-circuit current withstand (I _{sc} , I _{sc} max)		25 kA		50 kA	
Follow current (I _{fi})		N-PE = 100 A			
Residual current at U _c (I _{pe})		0 A			
Response time		L/N: 25 ns; N/PE: 100 ns			
Terminal capacity: solid or flexible wire		6/35 mm ²			
Terminal capacity: flexible wire with ferrule		6/25 mm ²			
Auxiliary contact for remote monitoring of SPD status		No			
Pollution level		2			
Location category		Indoor			
Number of ports		1			
Method of mounting		Fixed			
Width (number of modules)		2	4	2	4
Protection index		IP 20/IK 04			
Operating temperature		-25°C to +70°C			
Storage temperature		-40°C to +70°C			
Humidity range		HR : 5 - 95 %			

SPDs T1+T2 - 1P/2P/3P/4P

Cat. Nos.		4 122 50/51	4 122 52	4 122 53	4 122 70/71	4 122 72	4 122 73
Number of poles		1P/2P	3P	4P	1P/2P	3P	4P
Type of SPD		T1+T2/8 kA	T1+T2/8 kA	T1+T2/8 kA	T1+T2/12.5 kA	T1+T2/12.5 kA	T1+T2/12.5 kA
Mains supply		230 V~ 240 V~	400 V~ 415 V~	230/400 V~ 240/415 V~	230 V~ 240 V~	400 V~ 415 V~	230/400 V~ 240/415 V~
Maximum supply fluctuation		(230 V~ ; 230/400 V~ ; 400 V~) +10% (240 V~ ; 240/415 V~ ; 415 V~) +6%					
Frequency		50/60 Hz					
Earthing system		TT, TNS	TNC	TT, TNS	TT, TNS	TNC	TT, TNS
Protection modes		L(N)-PE					
Max. continuous operating voltage (Uc)		L(N)-PE	320 V~				
T1	Impulse discharge current (Iimp, 10/350)	L(N)-PE 8 kA			12.5 kA		
	Total discharge current (L+N)/PE (Itotal, 10/350)	2P: 16 kA	25 kA	32 kA	2P: 25 kA	37.5 kA	50 kA
	Protection level at Iimp	L(N)-PE 1.2 kV	1.2 kV	1.2 kV	1.5 kV	1.5 kV	1.5 kV
T2	Nominal current In (8/20)	L(N)-PE 20 kA			25 kA		
	I _{max} (8/20)	L(N)-PE 50 kA			60 kA		
	Total discharge current (L+N)/PE (Itotal, 8/20)	2P: 100 kA	125 kA		2P: 120 kA	125 kA	
	Protection level (Up) at In	L(N)-PE 1.7 kV	1.7 kV	1.7 kV	1.9 kV	1.9 kV	1.9 kV
Protection level (Up) at 5 kA		L(N)-PE 1 kV	1 kV	1 kV	1 kV	1 kV	1 kV
Temporary overvoltages (LV supply faults)		L-PE: 440 V/5 s (withstand mode) L-N(L-PEN): 440 V/2 hrs (failure mode)					
Temporary overvoltages (HV supply faults)		1200 V + 255 V (failure mode)					
Protective device to be used : circuit breakers, fuses (TN system only)		See 3.6.2					
Short-circuit current withstand (I _{sc} , I _{sc} max)		50 kA					
Residual current at U _c (I _{pe})		I _{pe} < 0.5 mA					
Response time		25 ns					
Terminal capacity: solid or flexible wire		6/35 mm ²					
Terminal capacity: flexible wire with ferrule		6/25 mm ²					
Auxiliary contact for remote monitoring of SPD status		No	No	No	No	Yes	No
		250 V~ - 1A - 1.5 mm ² max					
Pollution level		2					
Location category		Indoor					
Number of ports		1					
Method of mounting		Fixed					
Width (number of modules)		1 (4 122 50) 2 (4 122 51)	3	4	1 (4 122 70) 2 (4 122 71)	3	4
Protection index		IP 20/IK 04					
Operating temperature		-25°C to +70°C					
Storage temperature		-40°C to +70°C					
Humidity range		HR : 5 - 95 %					

SPDs T2 - 1P/2P/3P/4P

Cat. Nos.		4 122 20/21	4 122 23	4 122 40/41	4 122 42	4 122 43
Number of poles		1P/2P	4P	1P/2P	3P	4P
Type of SPD		T2/20 kA	T2/20 kA	T2/40 kA	T2/40 kA	T2/40 kA
Mains supply		230 V~ 240 V~	230/400 V~ 240/415 V~	230 V~ 240 V~	400 V~ 415 V~	230/400 V~ 240/415 V~
Maximum supply fluctuation		(230 V~ ; 230/400 V~ ; 400 V~) +10% (240 V~ ; 240/415 V~ ; 415 V~) +6%				
Frequency		50/60 Hz				
Earthing system		TT, TNS		TT, TNS	TNC	TT, TNS
Protection modes		L(N)/PE				
Max. continuous operating voltage (Uc)		320 V~				
Nominal current In (8/20)		5 kA	5 kA	20 kA	20 kA	20 kA
Imax (8/20)		20 kA	20 kA	40 kA	40 kA	40 kA
Total discharge current (L+N)/PE (Itotal, 8/20)		2P: 40 kA	80 kA	2P: 80 kA	120 kA	125 kA
Protection level (Up) at In		L(N)-PE 1.2 kV	1.2 kV	1.7 kV	1.7 kV	1.7 kV
Protection level (Up) at 5 kA		L(N)-PE 1.2 kV	1.2 kV	1 kV	1 kV	1 kV
Residual voltage at 10 kA		L(N)-PE 1.4 kV	1.4 kV	1.2 kV	1.2 kV	1.2 kV
Residual voltage at 15 kA		L(N)-PE		1.5 kV	1.5 kV	1.5 kV
Temporary overvoltages (LV supply faults)		L-PE: 440 V/5 s (withstand mode) L-N(L-PEN): 440 V/2 hrs (failure mode)				
Temporary overvoltages (HV supply faults)		1200 V + 255 V (failure mode)				
Protective device to be used : circuit breakers, fuses (TN system only)		See 3.6.2				
Short-circuit current withstand (Iscrr, Isc max)		25 kA		50 kA		
Residual current at Uc (I _{pe})		I _{pe} < 0.5 mA				
Response time		25 ns				
Terminal capacity: solid or flexible wire Terminal capacity: flexible wire with ferrule		6/35 mm ² 6/25 mm ²				
Auxiliary contact for remote monitoring of SPD status		No	No	No	Yes	No
		250 V~ - 1A - 1.5 mm ² max				
Pollution level		2				
Location category		indoor				
Number of ports		1				
Method of mounting		Fixed				
Width (number of modules)		1 (4 122 20) 2 (4 122 21)	4	1 (4 122 40) 2 (4 122 41)	3	4
Protection index		IP 20/IK 04				
Operating temperature		-25°C to +70°C				
Storage temperature		-40°C to +70°C				
Humidity range		HR : 5 - 95 %				

SPDs T2 - 1P/2P/3P/4P (400 V~)

Cat. Nos.		4 122 30	4 122 32	4 122 33
Number of poles		1P	3P	4P
Type of SPD		T2/40 kA	T2/40 kA	T2/40 kA
Mains supply		400 V~ 415 V~	400 V~ 415 V~	230/400 V~ 240/415 V~
Maximum supply fluctuation		(230/400 V~ ; 400 V~) +10% (240/415 V~ ; 415 V~) +6%		
Frequency		50/60 Hz		
Earthing system		TT, TNC, TNS, IT	TNC, IT	TT, TNS, IT
Protection modes		L(N)/PE		
Max. continuous operating voltage (Uc)		440 V~		
Nominal current In (8/20)		20 kA		
Imax (8/20)		40 kA		
Total discharge current (L+N)/PE (Itotal, 8/20)		120 kA / 125 kA		
Protection level (Up) at In		L(N)-PE	2.1 kV	
Protection level (Up) at 5 kA		L(N)-PE	1.3 kV	
Residual voltage at 15 kA		L(N)-PE	1.8 kV	
Temporary overvoltages (LV supply faults)		L-PE: 440 V/5 s (withstand mode) L-N(L-PEN): 440 V/2 hrs (failure mode)		
Temporary overvoltages (HV supply faults)		1200 V + 440 V (failure mode)		
Protective device to be used : circuit breakers, fuses (TN system only)		See 3.6.2		
Short-circuit current withstand (Iscrr, Isc max)		50 kA		
Residual current at Uc (Ipe)		Ipe < 0.5 mA		
Response time		25 ns		
Terminal capacity: solid or flexible wire		6/35 mm ²		
Terminal capacity: flexible wire with ferrule		6/25 mm ²		
Auxiliary contact for remote monitoring of SPD status		No	Yes	Yes
		250 V~ - 1A - 1.5 mm ² max		
Pollution level		2		
Location category		Indoor		
Number of ports		1		
Method of mounting		Fixed		
Width (number of modules)		1	3	4
Protection index		IP 20/IK 04		
Operating temperature		-25°C to +70°C		
Storage temperature		-40°C to +70°C		
Humidity range		HR : 5 - 95 %		

3.6.2 Overcurrent Protective devices used with SPDs

	Uc	①	230/400 V~ ; 240/415 V~ ; 50/60 Hz				Ø : (X, Y, Z)
			TT 1P/2P/4P	1P+N / 3P+N	TN	IT	
T1+T2/12,5 kA	320 V		C63 (C 32 --- C 125 A)				≥ 16 mm ²
			gG ≤ 63 A	Icc ≤ 6 kA : gG ≤ 63 A Icc > 6 kA : gG ≤ 125 A			
T1+T2/8 kA	320 V		C40 (C 20 --- C 80 A)				≥ 10 mm ²
			gG ≤ 40 A	Icc ≤ 6 kA : gG ≤ 40 A Icc > 6 kA : gG ≤ 80 A			
T2/40 kA	440 V		C25 (C 10 --- C 63 A)		C25 (C 10 --- C 40 A)	≥ 10 mm ²	
			gG ≤ 25 A	Icc ≤ 6 kA : gG ≤ 25 A Icc > 6 kA : gG ≤ 63 A			
T2/40 kA	320 V		C25 (C 10 --- C 63 A)				≥ 10 mm ²
			gG ≤ 25 A	Icc ≤ 6 kA : gG ≤ 25 A Icc > 6 kA : gG ≤ 63 A			
T2/20 kA	320 V		C20 (C 10 --- C 40 A)				≥ 6 mm ²
			gG ≤ 20 A	Icc ≤ 6 kA : gG ≤ 20 A Icc > 6 kA : gG ≤ 40 A			

①	Type of SPD				
	1P+N	2P (2x 1P)	3P	3P+N	4P (4x 1P)
TT or TNS		2P or 1P+N	3P (TNC)	4P or 3P+N	
IT(+N)		-	2P	3P (IT)	4P

N conductor may not be cut or protected if allowed by local national rules. At minima, cut of neutral conductor recommended for purposes of easy maintenance and easy controls of the insulation resistance of the installation.

① DX³, TX³, ~~DPX~~, ~~DPX~~

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

4. CONFORMITY

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 73/23/EC + 93/68/EC.

5. INSTALLATION

5.1 General principle

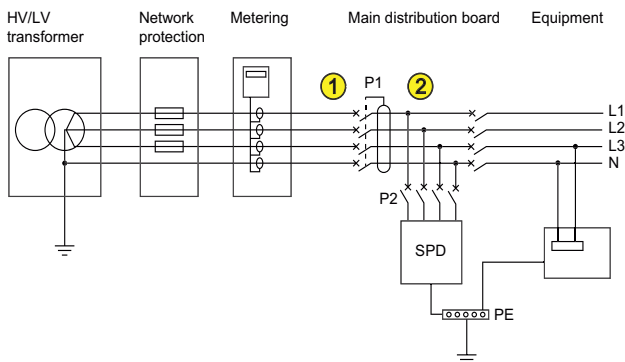
Surge protective devices must not be installed in locations where there is a risk of fire or explosion without special provisions. They must be disconnected before checking the insulation resistance of the installation.

5.2 Types of SPD and earthing systems

Residual current devices and continuity of service: if the main distribution board protective device located upstream of the SPD includes a residual current device, this must be type S or delayed at the installation source (residual current device immunised against overvoltages up to 5 kA in accordance with standard NF C 15-100 and 3 kA in accordance with standard HD/IEC 60364). Also recommended for secondary distribution boards.

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

SPDs and TT earthing system



P1: main protective device of the installation

P2: protective device used with the SPD (see 3.6.2)

SPD: surge protective device with U_c 275 or 320 V recommended

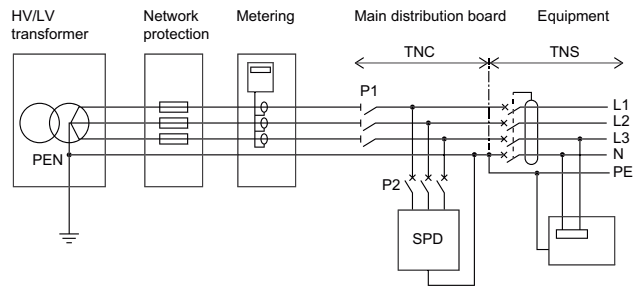
① (upstream of P1): SPDs 1P+N/3P+N only

(except for Cat. Nos. 0 039 51/53/71/73).

SPDs 1P/2P/3P/4P and Cat. Nos. 039 51/53/71/73 must always be installed downstream of a residual current device (discriminating or delayed, at the origin of the installation).

② (downstream of P1): any SPD

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



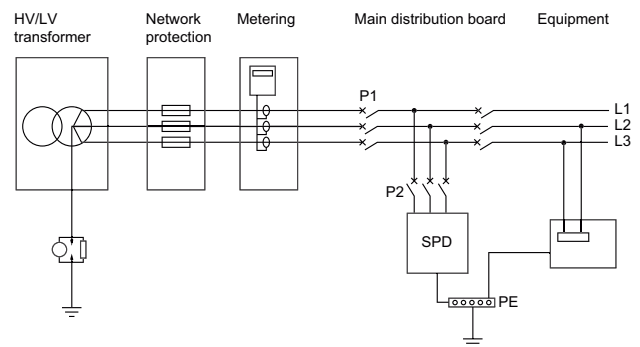
P1: main protective device of the installation

P2: protective device used with the SPD (see 3.6.2)

SPD: surge protective device with U_c 275 or 320 V recommended

SPDs and IT earthing system (230/400 V~)

Cat. Nos 4 122 30/32/33



P1: main protective device of the installation

P2: protective device used with the SPD (see 3.6.2)

SPD: surge protective device with U_c 440 V (**$U_c < 440$ V prohibited**)

Two-phase mains supplies

Use SPDs 1P or 2P.

Associated protective device: see section 3.6.2

5.3 Connections

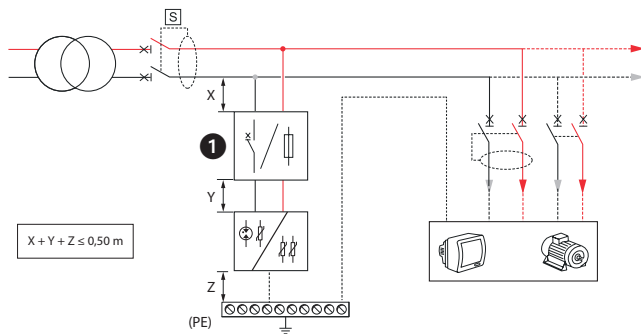
Check that the earth connection to which the exposed conductive parts of the installation are connected complies with standard NF C 15-100 (HD/IEC 60364).

SPD connected to the mains supply and to the protective conductor (PE) using as short a connection as possible, $X+Y+Z \leq 50$ cm.

Compulsory connection of the earth terminal on the surge protective device to the protective conductor (PE) on the distribution board.

Equipotentiality rules: interconnection of the exposed conductive parts of the equipment and the protective conductor (PE) on the distribution board, which is itself connected to the earth 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 the SPD (see 3.6.2)

Recommended connection cross-sections and lengths to be stripped:

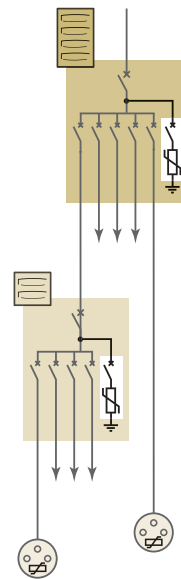
	6 - 35 mm ²
	6 - 35 mm ² 6 - 25 mm ² (with ferrule)

Tools required and tightening torque

- Flat blade screwdriver Ø 4 to 6.5 mm
- Crosshead screwdriver Ø 4 to 6.5 mm, Pozidriv PZ2 recess
- Min. torque: 2.5 Nm
- Max. torque: 3 Nm

5.4 Cascaded SPDs

Effective protection against overvoltages cannot generally be assured 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 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 energy levels involved. The overvoltage values likely to be transmitted downstream of the SPD can double over distances of more 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 then occur and damage equipment if the residual energy is high enough (2.5 kV being the insulation level of most electrical and electronic equipment, or even 1.5 kV for electrical domestic appliances). SPDs should be installed in the distribution boards supplying equipment that is sensitive or critical for the activity being carried out (and/or near to equipment with proximity SPDs).

5.5 Coordinating upstream/downstream SPDs

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

Minimum distances between SPDs (m)

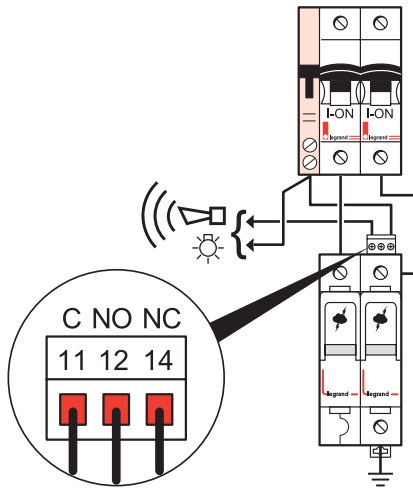
Upstream SPD	Downstream SPD	Minimum distance (m)	
		With LPS*	Without LPS*
T1+T2/35 and T1+T2/25	T2/40 (Uc 440V)	0	0
	T2/40 (Uc 320V)	1	0
T1+T2/12.5 and T1+T2/8	T2/40	5	0
	T2/20 or T2/12	8	0
T2/40	T2/20 or T2/12	-	1
T2/20	T2/12	-	0.5
T2/20 and T2/12	Proximity SPDs	-	2

* LPS : Lightning Protection System

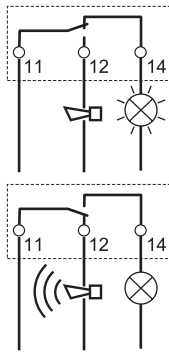
6. ACCESSORIES

6.1 Signalling auxiliary

Cat. Nos 4 122 32/33/42/72/74/75/76/77

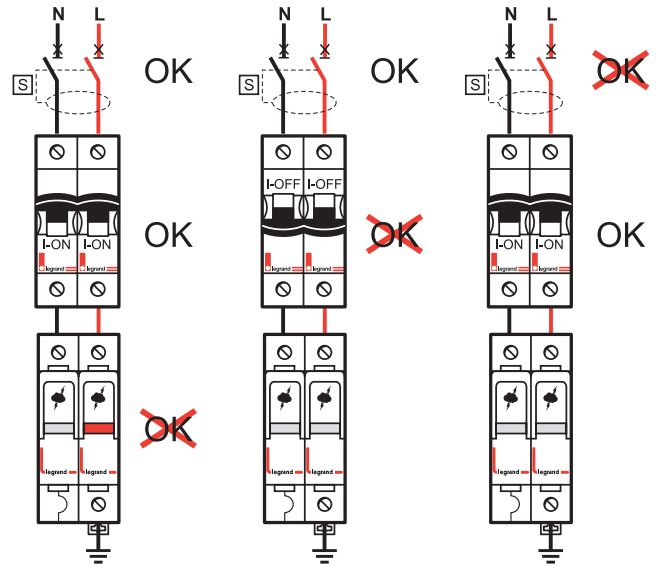


ON	OK
ON	OK
OFF	OK
OFF	OK



6.2 Replacement plug-in modules with status indicator

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



Module Cat. Nos.	Type	SPD Cat. Nos.
4 122 97	T2/20 kA	4 122 20/24/25
4 122 98	T2/20 kA (N-PE module)	4 122 24/25
4 122 99	T2/40 kA	4 122 40/42/44/45
4 123 00	T2/40 kA (N-PE module)	4 122 44/45
4 123 01	T2/40 kA (440 V)	4 122 30/32/33
4 123 02	T1+T2/8 kA	4 122 50/51/52/53/54/55/56/57
4 123 03	T1+T2/12.5 kA	4 122 70/71/72/73/74/75/76/77