

# 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 <sup>1</sup>	FS auxiliary (remote status monitoring)
							I <sub>max</sub> /pole (8/20)	I <sub>imp</sub> /pole (10/350)	I <sub>total</sub> (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 <sup>3</sup> 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 <sup>3</sup> 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 <sup>3</sup> 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 <sup>3</sup> 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	1.5 kV at 12.5 kA 1.9 kV at 25 kA	1 kV	50 kA	DX <sup>3</sup> 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 <sup>3</sup> 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	1.5 kV at 12.5 kA 1.9 kV at 25 kA	1 kV	50 kA	DX <sup>3</sup> 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	1.5 kV at 12.5 kA 1.9 kV at 25 kA	1 kV	50 kA	DX <sup>3</sup> 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 <sup>3</sup> 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	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 <sup>3</sup> 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	1.2 kV at 8 kA 1.7 kV at 20 kA	1 kV	50 kA	DX <sup>3</sup> 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 <sup>3</sup> 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	1.2 kV at 8 kA 1.7 kV at 20 kA	1 kV	50 kA	DX <sup>3</sup> 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	1.2 kV at 8 kA 1.7 kV at 20 kA	1 kV	50 kA	DX <sup>3</sup> 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 <sup>3</sup> 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	1.2/1.5/1.5 kV at 8 kA 1.7/2/1.5 kV at 20 kA	1 kV	50 kA	DX <sup>3</sup> 40 A C curve	no
4 122 40	T2/40 kA	1P	TT, TNC, 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 <sup>3</sup> 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 <sup>3</sup> 25 A C curve	no
4 122 42	T2/40 kA	3P	TNC	320 V~	CT1	20 kA	40 kA			1.5 kV at 15 kA 1.7 kV at 20 kA	1 kV	50 kA	DX <sup>3</sup> 25 A C curve	yes
4 122 43	T2/40 kA	4P	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 <sup>3</sup> 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 <sup>3</sup> 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			1.5/1.6/1.4 kV at 15 kA 1.7/2/1.4 kV at 20 kA	1 kV	50 kA	DX <sup>3</sup> 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 <sup>3</sup> 25 A C curve	no
4 122 32	T2/40 kA	3P	TNC, 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 <sup>3</sup> 25 A C curve	yes
4 122 33	T2/40 kA	4P	TT, 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 <sup>3</sup> 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 <sup>3</sup> 20 A C curve	no
4 122 21	T2/20 kA	2P	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 <sup>3</sup> 20 A C curve	no
4 122 22	T2/20 kA	4P	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 <sup>3</sup> 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 <sup>3</sup> 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			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 <sup>3</sup> 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			1.1/1.2/1.2 kV at 10 kA	1 kV	6 kA 10 kA	integrated protection	no

CT1: L(N)-PE protection modes.  
 CT2: L-N and N-PE protection modes.  
<sup>1</sup>: DPX<sup>3</sup> (only T1 + T2 SPDs Cat.Nos 4 122 80/81/82/83), DX<sup>3</sup> 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 <sub>max</sub>	6 kA	-	-
I <sub>n</sub>	1.5 kA	2 kA	2 kA
U <sub>oc</sub>	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 <sub>c</sub>	200 V	
U <sub>p</sub>	600 V	
I <sub>max</sub>	1.5 kA	
I <sub>n</sub>	1 kA	
U <sub>oc</sub>	3 kV	

### TV protection (9.5 mm coax.)

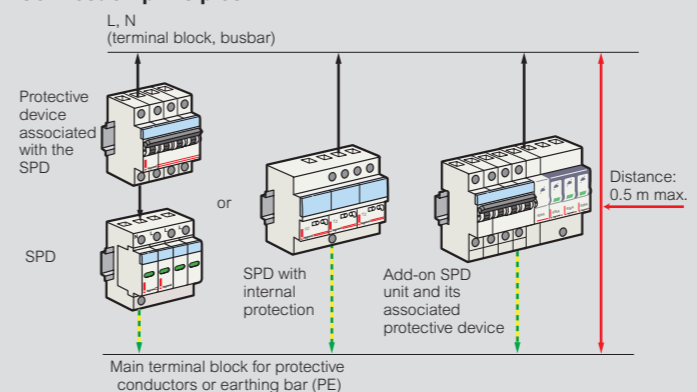
Cat. No.	6 946 66 (p. 614)
U <sub>c</sub>	50 V
U <sub>p</sub>	900 V
I <sub>max</sub>	5 kA
I <sub>n</sub>	1 kA
U <sub>oc</sub>	3 kV

### 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

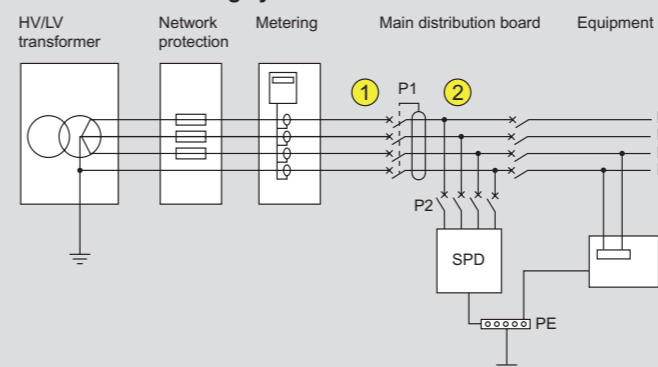


Connection lengths: as short as possible (< 50 cm if possible).  
 EMC (Electromagnetic Compatibility) rules: avoid loops, fix the cables firmly against the exposed metal conductive parts of the enclosure.

### SPD types and earthing systems

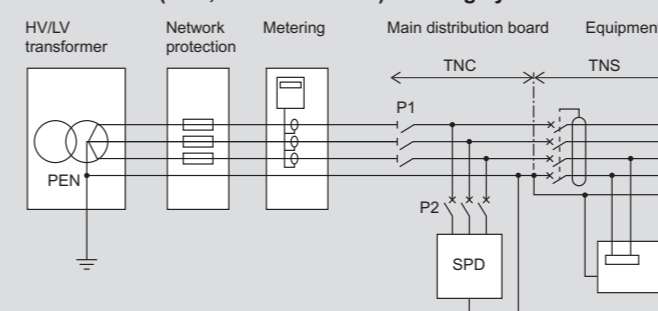
When possible (according to local rules), the SPD and its associated overcurrent protection (P2) should be installed upstream of the main protection (P1) as shown below (according to standards HD/IEC 60364).

#### SPDs and TT earthing system



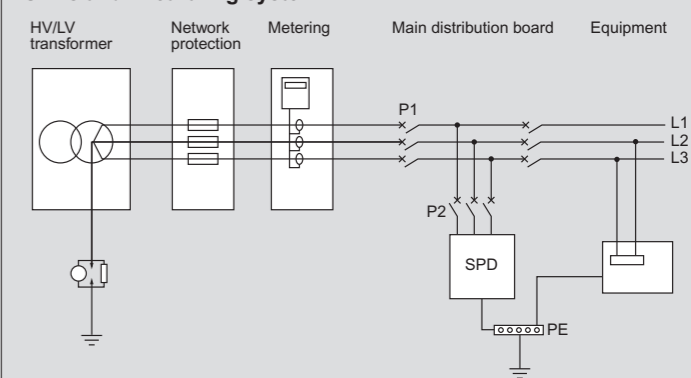
P1: main protection of the installation  
 SPD: surge protective device with Uc 275 or 320 V recommended  
 ① (upstream of P1): 1P+N/3P+N SPDs only (except for Cat.Nos 0 039 51/53/71/73). 1P/2P/3P/4P SPDs and Cat.Nos 0 039 51/53/71/73 must always be installed downstream of a residual current device (discriminating 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 Uc 275 or 320 V recommended

### SPDs and IT earthing system



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

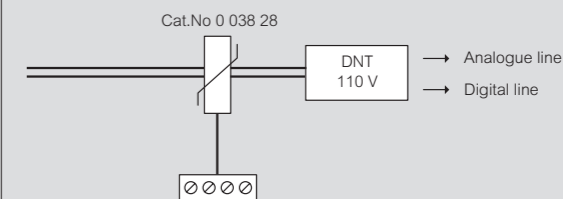
#### Minimum distances between SPDs

Upstream SPD	Downstream SPD	Minimum distance between SPDs (m)	
		With LPS	Without LPS
T1+T2/35 and T1+T2/25	T2/40 (Uc 440V) T2/40 (Uc 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

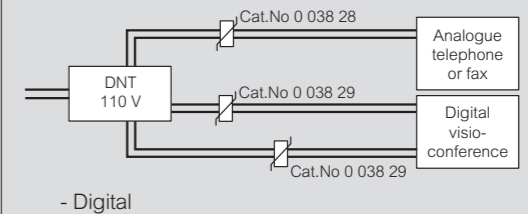
#### Protection of a telephone line

- Upstream the communication distribution box



- Downstream the communication distribution box

- Analogue or digital



- Digital

