

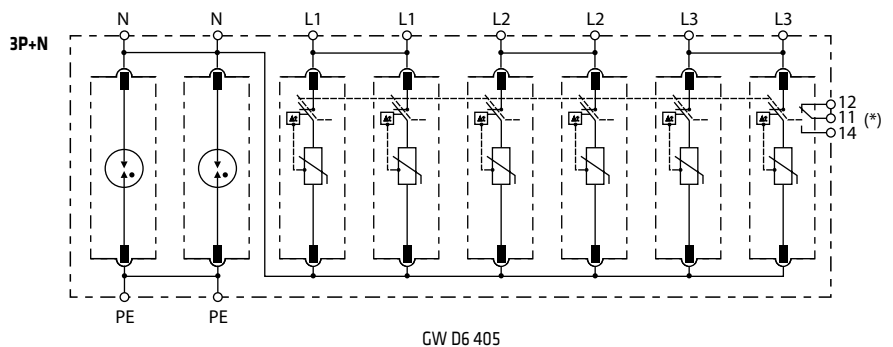
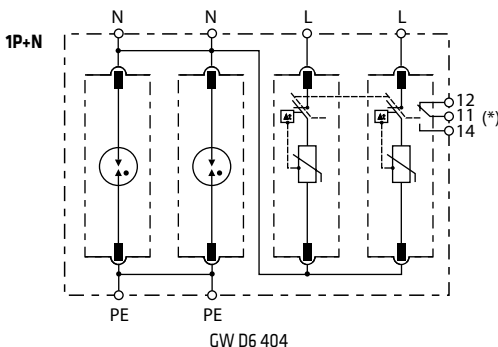
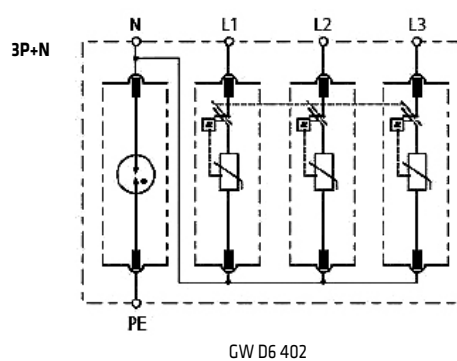
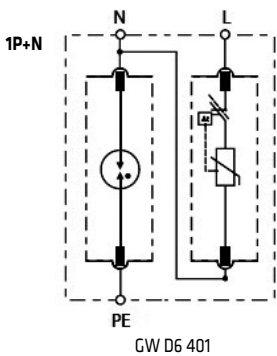
## MODULAR ACCESSORIES

### Surge protective devices LST type 1+2 and type 2

		TECHNICAL DATA				
Standard:		IEC 61643-1, EN 61643-11				
Type:		1+2 (10/350µs and 8/20µs)		2 (8/20µs)		
Maximum discharge current 8/20µs (Imax):	(kA)	65	100	20	40	
Impulse current 10/350µs (Iimp):	(kA)	12,5	25	-	-	
Rated discharge current 8/20µs (In):	(kA)	20	25	10	20	
Network:		TT - TNS	TT - TNS	TT - TNS	TT - TNS - TNC - IT	
Rated operational voltage (Un):	(V)	230 / 400	230 / 400	230 / 400	230 / 400	
Max continuous operating voltage (Uc):	(V)	275 (L - N) 255 (N - PE)	275 (L - N) 255 (N - PE)	320 (L - N) 255 (N - PE)	275 (L - N); 265 (N - PE) 440 (L - N) (GW D6 413)	
Voltage protection level at In (Up):	(kV)	< 1,3 (L - N) < 1,5 (N - PE)	< 1,5 (L - N) < 1,5 (N - PE)	< 1,4 (L - N) < 1,5 (N - PE)	< 1,3 (L - N) < 1,5 (N - PE) < 2 (L - N/PE) (GW D6 413)	
Residual voltage Ures per I<In	5 kA	-	-	-	< 0,9	
	10 kA	-	-	< 1,4 (L-N) - < 1,5 (N-PE)	< 1,1	
	12,5 kA	-	-	-	< 1,15	
	15 kA	-	-	-	< 1,2	
Rated frequency:	(Hz)	50/60	50/60	50/60	50/60	
Response time (ta):	(ns)	25 (L - N) 100 (N - PE)	25 (L - N) 100 (N - PE)	25 (L - N) 100 (N - PE)	25 (L - N) 100 (N - PE)	
Follow current interrupting rating (Ifi):	(A)	100	100	100	100	
Short circuit withstand (Icc):	(kA)	25	25	25	25	
State indicator:		yes	yes	yes	yes	
Auxiliary contact type:		no	Changeover	no	Changeover	
Maximum operating voltage for auxiliary contact:	(V)	-	250 ac - 125 dc	-	250 ac - 125 dc	
Maximum operating current for auxiliary contact:	(A)	-	1 ac - 0,2 dc	-	1 ac - 0,2 dc	
Rated tightening torque:	(Nm)	3	3	3	3	
Cable cross sections:	rigid	(mm <sup>2</sup> )	min 6 max 35	min 6 max 35	min 6 max 35	min 6 max 35
	flexible	(mm <sup>2</sup> )	min 6 max 25	min 6 max 25	min 6 max 25	min 6 max 25
Degree of protection:		IP20	IP20	IP20	IP20	
Operating temperature:	(°C)	-40...+80	-40...+80	-40...+80	-40...+80	

### Type 1+2 LST circuit diagrams

SPDs 1+2 type protect electrical equipment from overvoltages due to the direct and indirect effects of lightning strikes or due to manoeuvres on electrical network supply. They provide protection for installations in areas with a high frequency of lightning strikes and are typically installed in primary distribution panels.

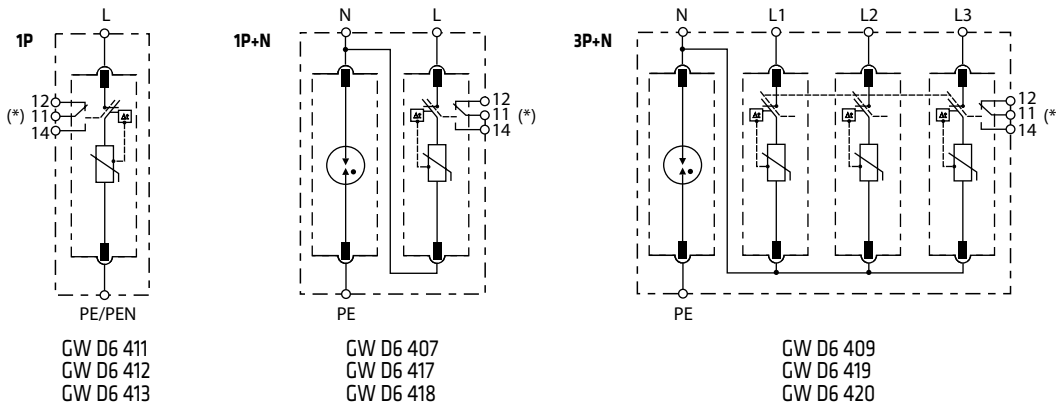


(\*) Only for version with auxiliary contact

## MODULAR ACCESSORIES

### Type 2 LST circuit diagrams

SPDs 2 type protect electrical equipment from overvoltages due to the indirect effects of lightning strikes or due to manoeuvres on electrical network supply. They are suitable for installation at the beginning of electrical system, in the middle boards and next to electrical loads.

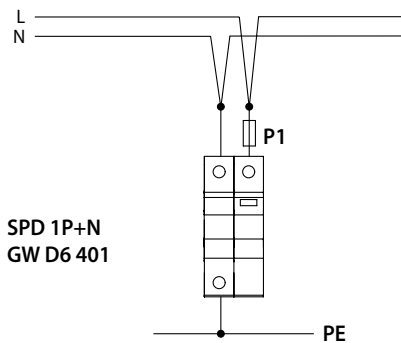


(\*) Only for version with auxiliary contact

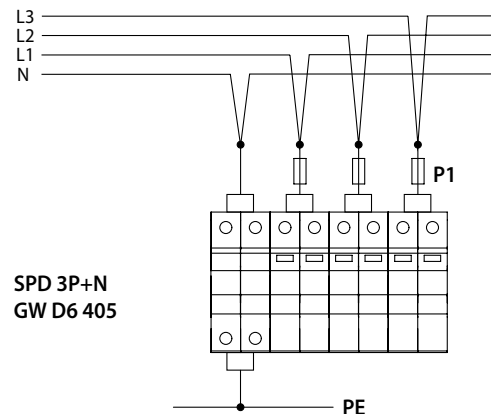
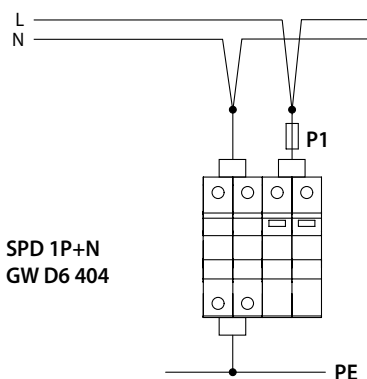
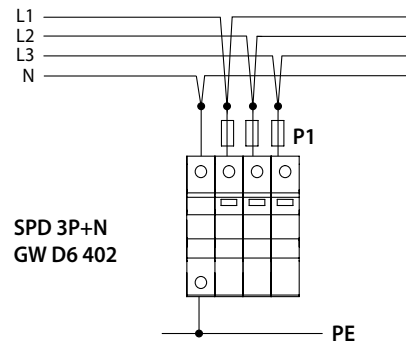
### Type 1+2 LST connection

#### TT NETWORK - TNS NETWORK

##### Single-phase system



##### Three-phase system

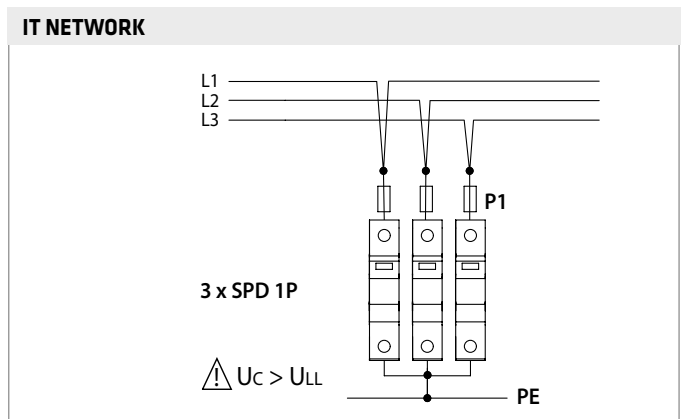
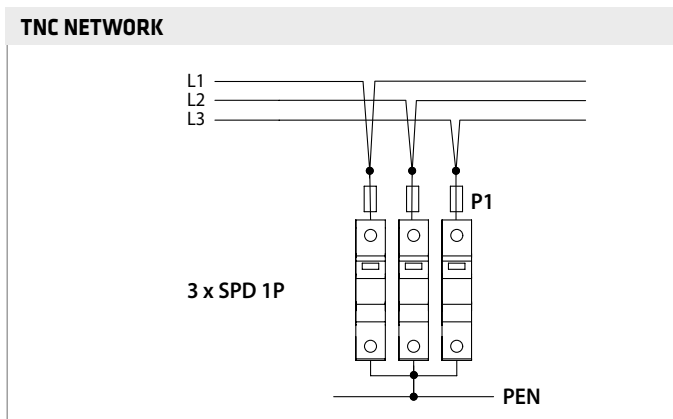
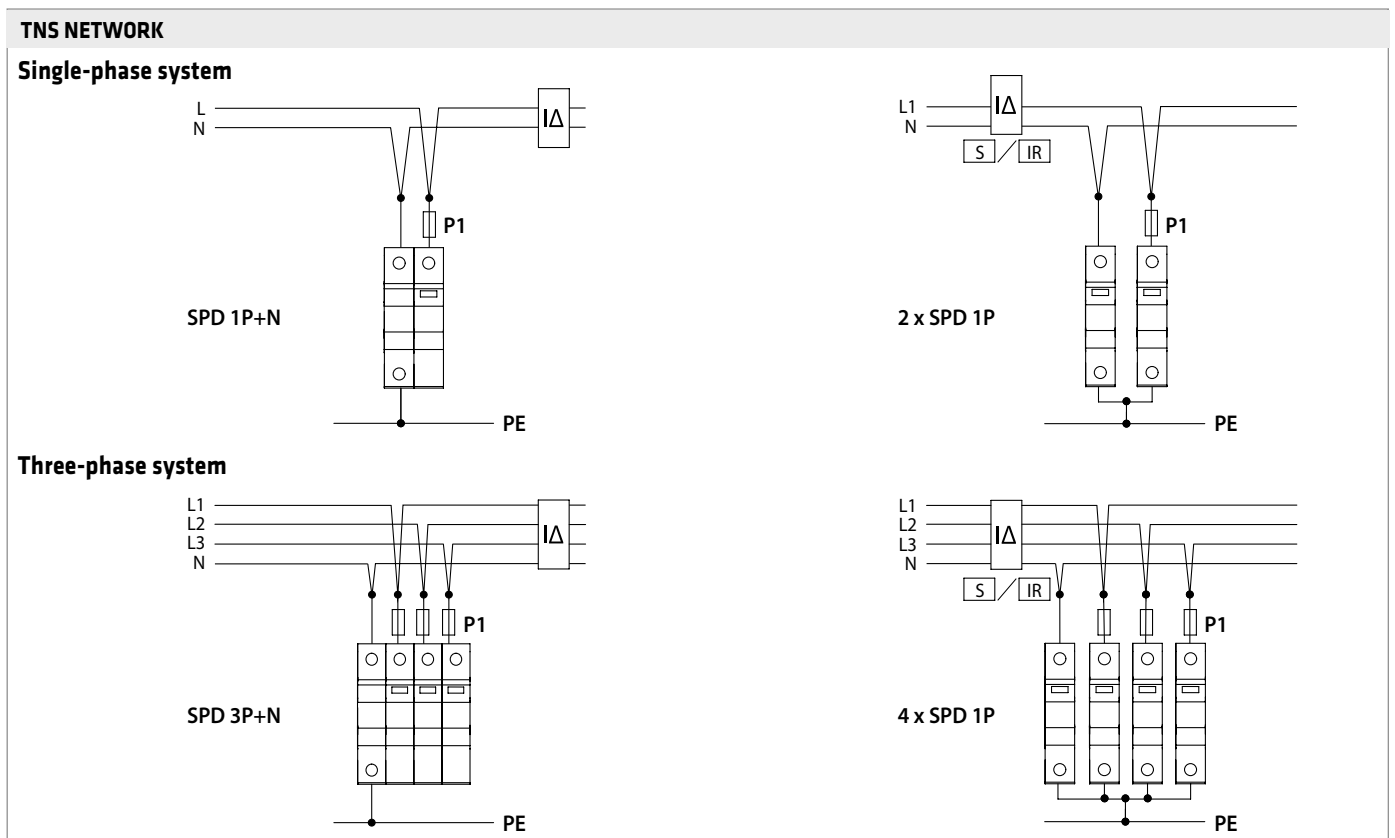
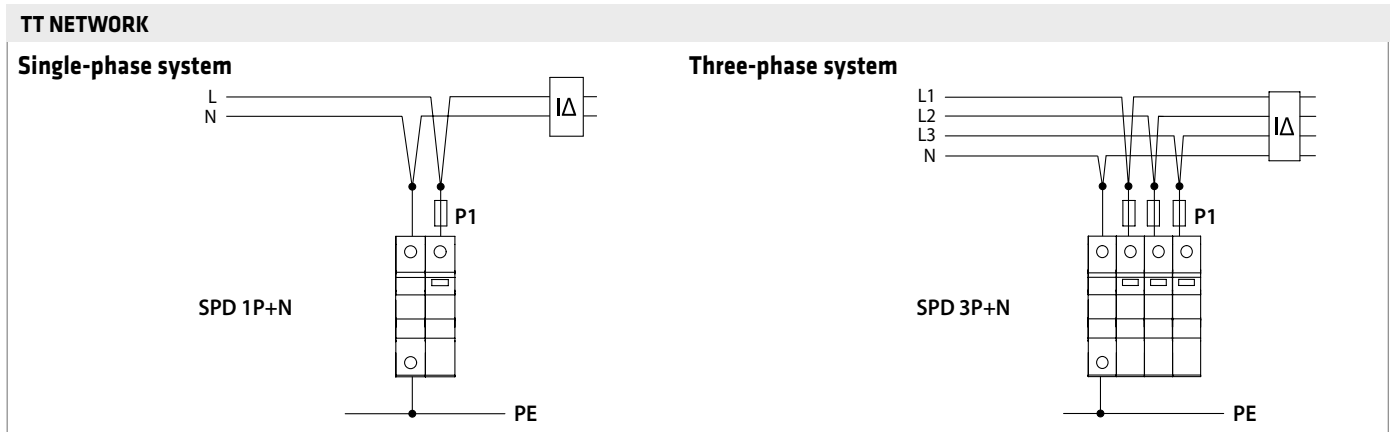


P1 = fuse or miniature circuit breaker

For technical information contact the Technical Assistance Service or visit [gewiss.com](http://gewiss.com)

## MODULAR ACCESSORIES

### Type 2 LST connection



P1 = fuse or miniature circuit breaker

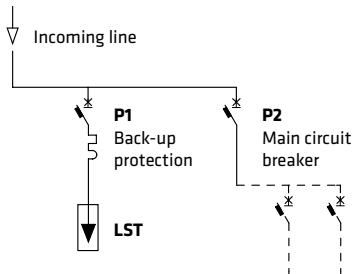
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## MODULAR ACCESSORIES

### Back-up protection

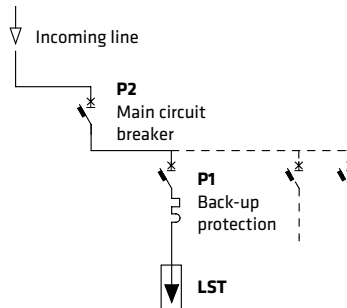
#### LST type 1+2

##### Service continuity priority



	$P1 \leq 125A \text{ gG}$
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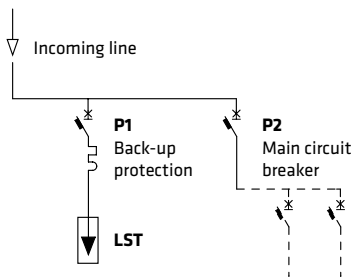
##### Protection priority



	$\text{if } P2 > 125A \Rightarrow P1 \leq 125A \text{ gG}$ $\text{if } P2 \leq 125A \Rightarrow \text{NO protection P1}$
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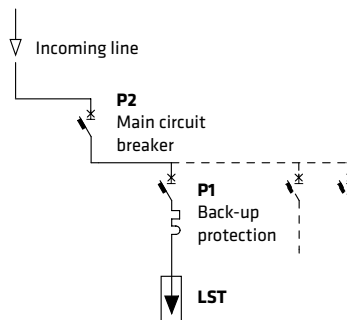
#### LST type 2

##### Service continuity priority



	<b>LST</b> $I_{max}=20kA$	<b>LST</b> $I_{max}=40kA$
	$P1 \leq 63A \text{ gG}$	$P1 \leq 80A \text{ gG}$
	$P1 \leq 40A \text{ curve C}$	$P1 \leq 50A \text{ curve C}$

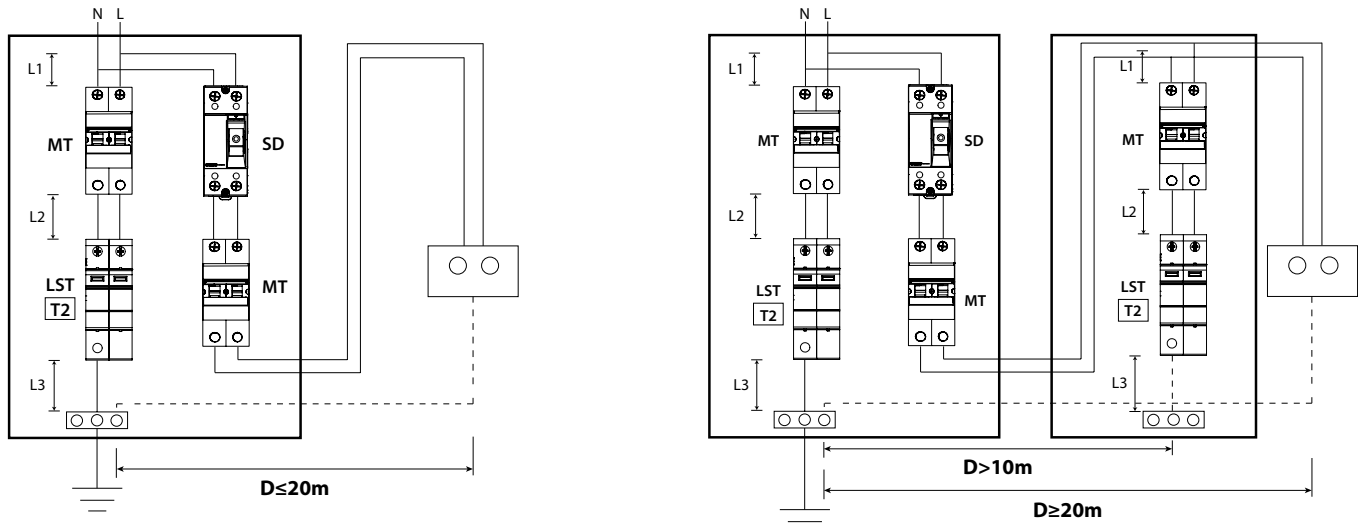
##### Protection priority



	<b>LST</b> $I_{max}=20kA$	<b>LST</b> $I_{max}=40kA$
	$\text{if } P2 > 63A \Rightarrow P1 \leq 63A \text{ gG}$ $\text{if } P2 \leq 63A \Rightarrow \text{NO protection P1}$	$\text{if } P2 > 80A \Rightarrow P1 \leq 80A \text{ gG}$ $\text{if } P2 \leq 80A \Rightarrow \text{NO protection P1}$
	$\text{if } P2 > 40A \Rightarrow P1 \leq 40A \text{ curve C}$ $\text{if } P2 \leq 40A \Rightarrow \text{NO protection P1}$	$\text{if } P2 > 50A \Rightarrow P1 \leq 50A \text{ curve C}$ $\text{if } P2 \leq 50A \Rightarrow \text{NO protection P1}$

### Installation rules

The length of the wiring of SPD ( $L1 + L2 + L3$ ) must be as short as possible ( $L1+L2+L3 \leq 0,5 \text{ m}$ ). The surge protective devices LST can protect an electrical load placed at a maximum distance of 20m, if the load is further away, it's necessary to install an additional SPD. The minimum installation distance between two LST must be 10m.

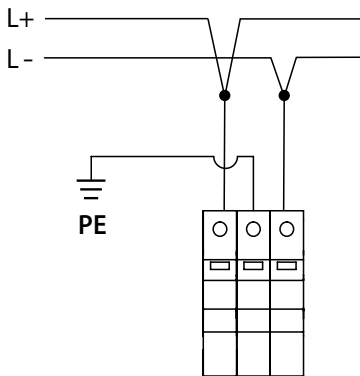


## MODULAR ACCESSORIES

### Surge protective devices LST for PV applications

TECHNICAL DATA			
Standard	EN 50539-11, EN 61643-11		
Type	2 (8/20µs) Photovoltaic		
Rated operating voltage (Un):	(V)	600 d.c.	1000 d.c.
Maximum discharge current 8/20µs (Imax):	(kA)	40	
Maximum continuous operating voltage (Ucpv)	(V)	660 d.c.	1060 d.c.
Voltage protection level at In (Up):	(kV)	< 2,6 (600V)	< 4 (1000V)
Short circuit DC current withstand (Iscpv):	(kA)	10	
State indicator:		yes	
Auxiliary contact type:		no	
Rated tightening torque:	(Nm)	3	
Cable cross sections:	rigid	(mm <sup>2</sup> )	min 6 max 35
	flexible	(mm <sup>2</sup> )	min 6 max 25
Degree of protection:		IP20	
Operating temperature:	(°C)	-40...+85	

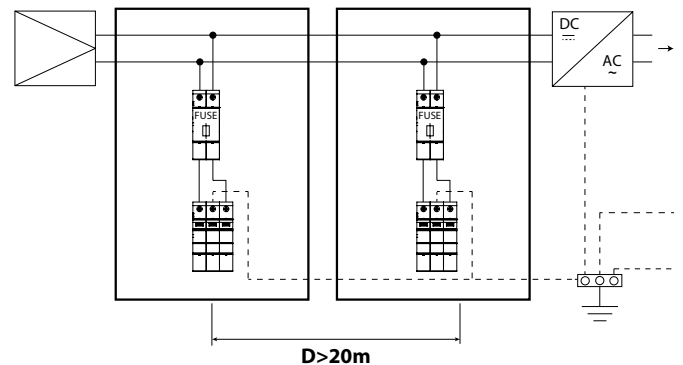
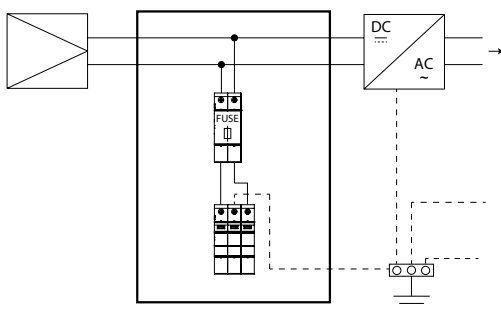
### LST connection for photovoltaics



### Installation rules

The SPDs LST for PV applications are installed near the inverter on the DC side to protect the inverter and the photovoltaic modules.

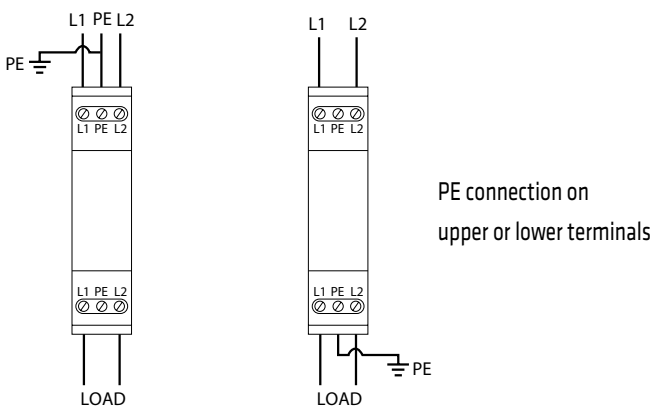
The SPDs LST for PV applications can protect the PV modules placed at a maximum distance of 20m, if they are further away, it's necessary to install an additional SPD.



### Surge protective devices LST for telecom and dataline

TECHNICAL DATA			
Standard		IEC 61643-1, EN 61643-11	
Type		2 (8/20µs) Telecom / Dataline	
Maximum discharge current 8/20µs (Imax):	(kA)	10	
Rated discharge current 8/20µs (In):	(kA)	5	
Rated operational voltage (Un):	(V)	50	
Max continuous operating voltage (Uc):	(V)	180	
Voltage protection level at In (Up):	(kV)	< 0,2	
Band width (fg):	(MHz)	3	
State indicator:		no	
Auxiliary contact type:		no	
Rated tightening torque:	(Nm)	2	
Cable cross sections:	rigid	(mm <sup>2</sup> )	2,5
	flexible	(mm <sup>2</sup> )	2,5
Degree of protection:		IP20	
Operating temperature:	(°C)	-40...+60	

### Circuit diagrams



## MODULAR ACCESSORIES

### Permanent and transient surge protective devices POP

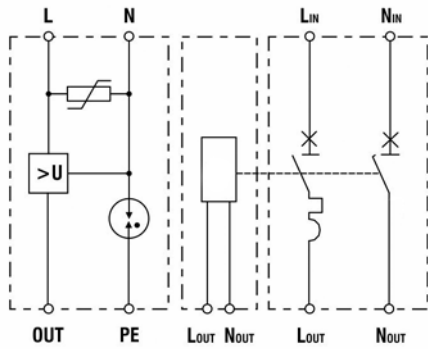
TECHNICAL DATA		
<b>Standard:</b>	IEC 61643-1 (SPD), EN 61643-11 (SPD) - EN 50550 (POP)	
<b>SPD technical data</b>		
<b>SPD type:</b>	2 (8/20 $\mu$ s)	
<b>Maximum discharge current 8/20 <math>\mu</math>s (I<sub>max</sub>):</b>	<b>(kA)</b>	15
<b>Rated discharge current 8/20<math>\mu</math>s (I<sub>n</sub>):</b>	<b>(kA)</b>	3
<b>System:</b>	TT - TN	
<b>Rated operational voltage (U<sub>n</sub>):</b>	<b>(V)</b>	230
<b>Maximum continuous operating voltage (U<sub>c</sub>):</b>	<b>(V)</b>	400 (L-N) 254 (N-PE)
<b>Voltage protection level at I<sub>n</sub> (U<sub>p</sub>):</b>	<b>(kV)</b>	$\leq 1,5$ (L-N) $\leq 1,5$ (N-PE)
<b>Rated frequency:</b>	<b>(Hz)</b>	50
<b>Response time (t<sub>a</sub>):</b>	<b>(ns)</b>	25 (L-N) 100 (N-PE)
<b>Follow current interrupting rating (I<sub>fi</sub>):</b>	<b>(A)</b>	100
<b>State indicator:</b>	yes	
<b>Auxiliary contact type:</b>	no	
<b>Extractable cartridges:</b>	no	
<b>POP technical data</b>		
<b>Maximum operating time (t<sub>a</sub>):</b>	<b>(s)</b>	
	at 255 V	No operating
	at 275 V	15
	at 300 V	5
	at 350 V	0,75
	at 400 V	0,2
<b>Maximum no operating time (t<sub>a</sub>):</b>	<b>(s)</b>	
	at 255 V	No operating
	at 275 V	3
	at 300 V	1
	at 350 V	0,25
	at 400 V	0,07
<b>Circuit breakers technical data</b>		
<b>Coupled circuit breaker:</b>	MT60 (25-32-40-50-63 A) MTC60 (25-32 A)	
<b>Poles number:</b>	1P+N	
<b>Curve:</b>	C	
<b>Breaking capacity EN60898 (I<sub>cn</sub>):</b>	<b>(A)</b>	6000
<b>Coupled shunt trip releases:</b>	GW96012	
<b>Other features</b>		
<b>DIN N. modules:</b>	5 (with MT60), 4 (with MTC60)	
<b>Rated tightening torque:</b>	<b>(Nm)</b>	4
<b>Cable cross sections:</b>	<b>Rigid</b>	<b>(mm<sup>2</sup>)</b>
	<b>Flexible</b>	<b>(mm<sup>2</sup>)</b>
		min 6 max 35
		min 6 max 25
<b>Degree of protection:</b>	IP20	
<b>Operating temperature:</b>	<b>(°C)</b>	-40...+60

## MODULAR ACCESSORIES

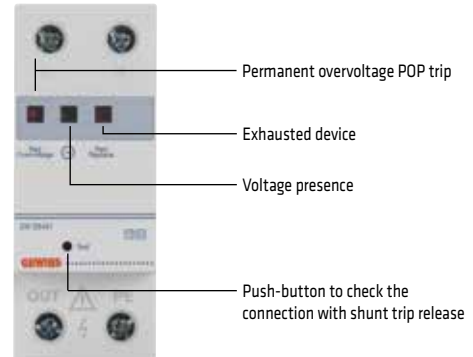
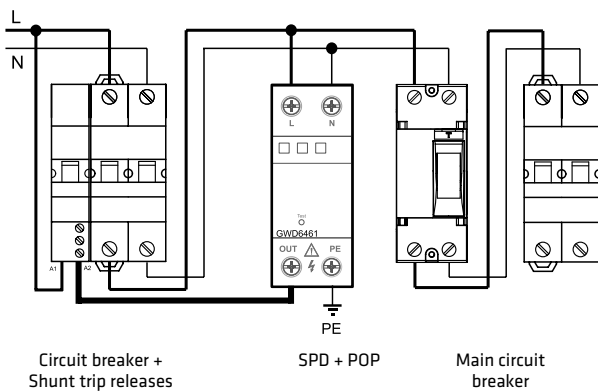
### Circuit diagrams

SPD+POP devices protect electrical system both from voltage transients indirect (produced by discharges from lightning or switching operations on the network) to permanent overvoltages (produced by instable networks or neutral loss). When permanent overvoltages occurs, SPD+POP devices use release coil to open circuit breaker.

Instead, when transient overvoltages occurs, SPD+POP devices work as a common surge protective device without opening the circuit breaker.

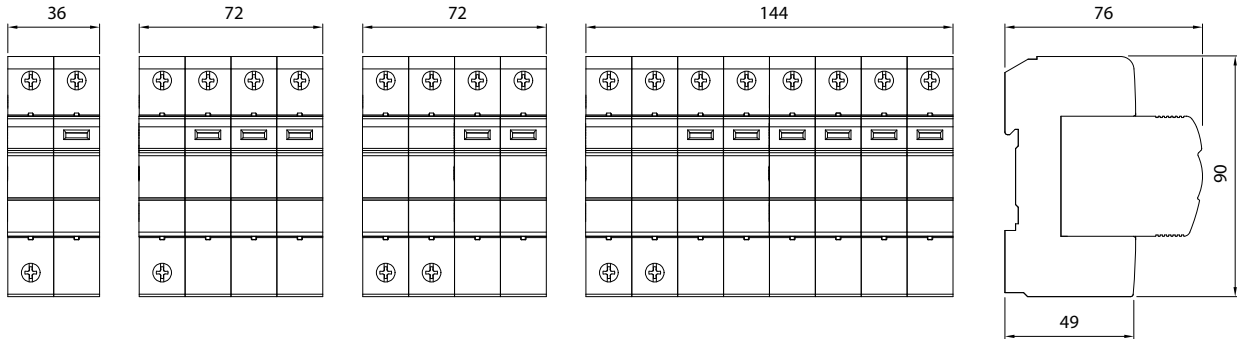


### Connection

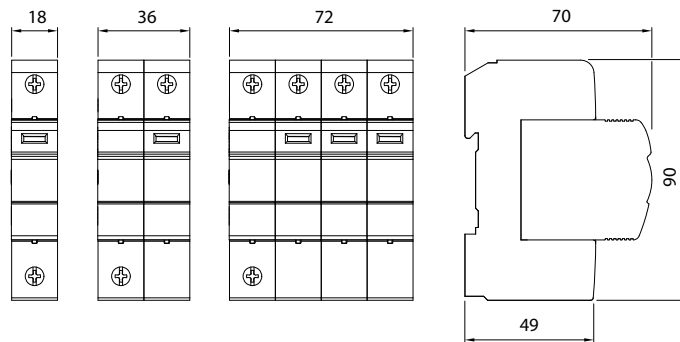


## MODULAR ACCESSORIES

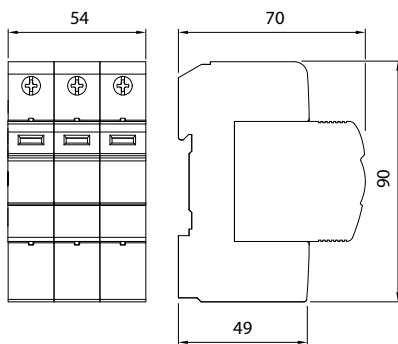
### SURGE PROTECTIVE DEVICES TYPE 1+2



### SURGE PROTECTIVE DEVICES TYPE 2



### DC SURGE PROTECTIVE DEVICES



### SURGE PROTECTIVE DEVICES FOR TELECOM AND DATALINE

