



# Surge Protection Devices

## OVR Range, System pro *M* compact®

OVR PLUS N1 40  
No upstream MCB or fuse required





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## Causes of transient overvoltages

### Overvoltages due to direct lightning strikes

These can take two forms:

- When lightning **strikes a lightning conductor or the roof of a building** which is earthed, the lightning current is dissipated into the ground. The impedance of the ground and the current flowing through it create large difference of potential: this is the overvoltage. This overvoltage then propagates throughout the building via the cables, damaging equipment along the way.
- When lightning **strikes an overhead low voltage line**, the latter conducts high currents which penetrate into the building creating large overvoltages. The damage caused by this type of overvoltage is usually spectacular (e.g. fire in the electrical switchboard causing the destruction of buildings and industrial equipment) and results in explosions.



Direct lightning strike on a lightning conductor or the roof of a building



Direct lightning strike on an overhead line

### Overvoltages due to the indirect effects of lightning strikes

The overvoltages previously mentioned are also found when lightning strikes in the vicinity of a building, due to the increase in potential of the ground at the point of impact. The electromagnetic fields created by the lightning current generate inductive and capacitive coupling, leading to other overvoltages.

Within a radius up to several kilometres, the electromagnetic field caused by lightning in clouds can also create sudden increases in voltage. Although less spectacular than in the previous case, irreparable damage is also caused to so called sensitive equipment such as fax machines, computer power supplies and safety and communication systems.



Increase in ground potential



Magnetic field



Electrostatic field

## Terminology of SPD electrical characteristics

### Surge arrester:

Device designed to limit transient overvoltages and run-off lightning currents. It consists of at least one non-linear component. It must comply with European standard EN 61643-11.

### 1.2/50 wave:

Standardized overvoltage waveform created on networks and which adds to the network's voltage.

### 8/20 wave:

Current waveform which passes through equipment when subjected to an overvoltage (low energy).

### 10/350 wave:

Current waveform which passes through equipment when subjected to an overvoltage due to a direct lightning strike.

### Type 1 surge arrester:

Surge arrester designed to run-off energy caused by an overvoltage comparable to that of a direct lightning strike. It has successfully passed testing to the standard with the 10/350 wave (class I test).

### Type 2 surge arrester:

Surge arrester designed to run-off energy caused by an overvoltage comparable to that of an indirect lightning strike or an operating overvoltage. It has successfully passed testing to the standard with the 8/20 wave (class II test).

### $U_p$ :

Voltage protection level.

Parameter characterising surge arrester operation by the level of voltage limitation between its terminals and which is selected from the list of preferred values in the standard. This value is greater than the highest value obtained during voltage limitation measurements (at  $I_n$  for class I and II tests).

### $I_n$ :

Nominal discharge current.

Peak current value of an 8/20 waveform (15 times) flowing in the surge arrester. It is used to determine the  $U_p$  value of the surge arrester.

### $I_{max}$ :

Maximum discharge current for class II testing.

Peak current value of an 8/20 waveform flowing in the surge arrester with an amplitude complying with the class II operating test sequence.

$I_{max}$  is greater than  $I_n$ .

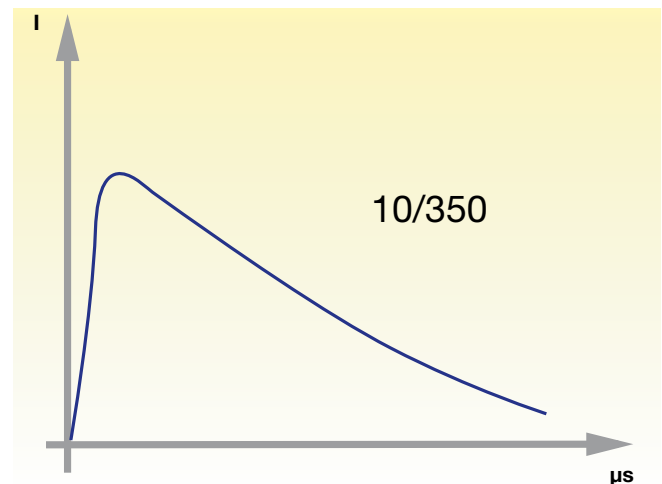
### $I_{imp}$ :

Impulse current for class I testing.

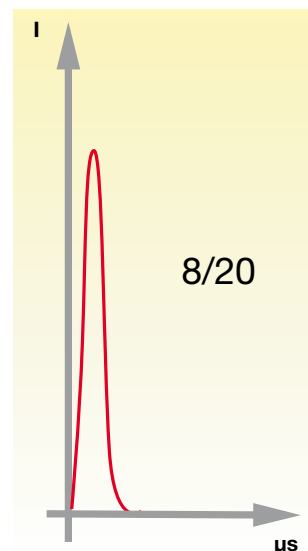
The impulse current  $I_{imp}$  is defined by a peak current  $I_{peak}$  and a charge  $Q$ , and tested in compliance with the operating test sequence. It is used to classify surge arresters for class I testing (the 10/350 wave corresponds to this definition).

### $U_n$ :

Nominal AC voltage of the network : nominal voltage between phase and neutral (AC rms value).



**Type 1 Surge Arresters**  
 $I_{imp}$ : current wave



**Type 2 Surge Arresters**  
 $I_{max}$ : current wave

## Terminology of SPD electrical characteristics

### $U_c$ :

Maximum continuous operating voltage (IEC 61643-1).

Maximum rms or dc voltage which can be continuously applied in surge arrester protection mode. It is equal to the rated voltage.

### $N_g$ :

Lightning strike density expressed as the number of ground lightning strikes per km<sup>2</sup> and per year.

### $U_r$ :

Temporary overvoltage withstand.

Maximum rms or dc overvoltage that the surge arrester can be subjected to and which exceeds the maximum voltage for continuous operation  $U_c$  for a specified time.

### $I_{fi}$ :

Follow current interrupting rating  $I_{fi}$  (kArms).

It is a parameter for spark-gaps and gas discharge tubes (Type 1 SPDs) and does not concern varistors.  $I_{fi}$  is the rms-value of the follow current, which can be interrupted by the SPD under  $U_c$ . It is the prospective short-circuit current that a SPD is able to interrupt by itself.  $I_{fi}$  of the SPD should be equal to or higher than the prospective short-circuit current at the point of installation ( $I_p$ ). If not, the upstream fuse will melt each time the spark-gap ignites.

### $I_p$ :

Prospective short-circuit current of a power supply ( $I_p$ ) (kArms).

$I_p$  is the current which would flow at a given location in case of short-circuit at this location.

## Common mode and / or differential mode protection

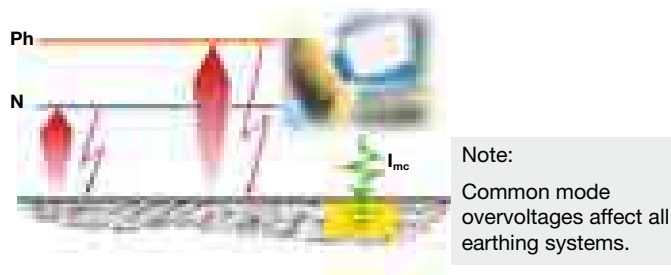
### Common mode

Common mode overvoltages appear between the live conductors and earth, e.g. phase/earth or neutral/earth.

A live conductor not only refers to the phase conductors but also to the neutral conductor.

This overvoltage mode destroys equipment connected to earth (class I equipment) and also equipment not connected to earth (class II equipment) which is located near an earthed mass and which does not have sufficient electrical isolation (a few kilovolts).

Class II equipment not located near an earthed mass is theoretically protected from this type of attack.



### Differential mode

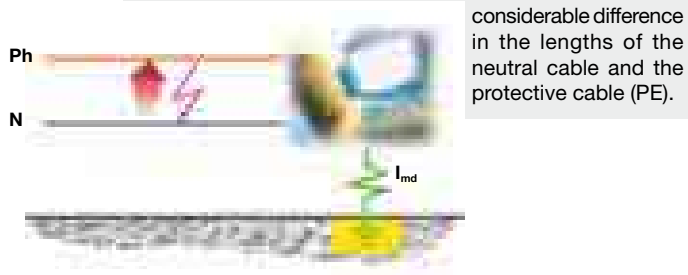
Differential mode overvoltages circulate between live conductors: phase/phase or phase/neutral.

These overvoltages have a potentially high damaging effect for all equipment connected to the electrical network, especially 'sensitive' equipment.

#### Note:

Differential mode overvoltages affect the TT earthing system.

These overvoltages also affect the TN-S earthing system if there is a



## Keraunic world map



### Protection mode

**Common mode (MC):** protection between live conductors and earth.

**Differential mode (MD):** protection between phase and neutral conductors.

2 < Ng ≤ 8

8 < Ng < 18

## Impulse withstand voltage of equipment

Equipment tolerance levels are classified according to 4 categories (as indicated in the following table) according to IEC 60364-4-44, IEC 60664-1 and IEC 60730-1.

Categories	$U_n$		Examples
	230 / 400 V	400 / 690 V	
I	1500 V	2500 V	Equipment containing particularly sensitive electronic circuits : – computer workstations, computers, TV, HiFi, Video, Alarms, etc; – household appliances with electronic programmers, etc.
II	2500 V	4000 V	Domestic electrical equipment with mechanical programmers, portable tools, etc.
III	4000 V	6000 V	Distribution panels, switchgear (circuit-breakers, isolators, power socket bases, etc.), ducting and its accessories (cables, busbars, junction boxes, etc.).
IV	6000 V	8000 V	Equipment for industrial use and equipment such as fixed motors permanently connected to the fixed installation, Electrical meters, principle overcurrent protection equipment, remote measurement devices, etc.

Whatever the type of overvoltage protection used, the maximum voltage corresponds to category II.

$U_p$  max = 2500 V if  $U_n$  = 230 V.

However, it should be noted that some equipment requires a particularly low protection level.

E.g. medical equipment, UPSs (with very sensitive electronics)  $U_n$  < 0.5 kV.

The protection level  $U_p$  is chosen according to the equipment to be protected.

**Note:**

In certain cases, protection components can be integrated into the equipment.

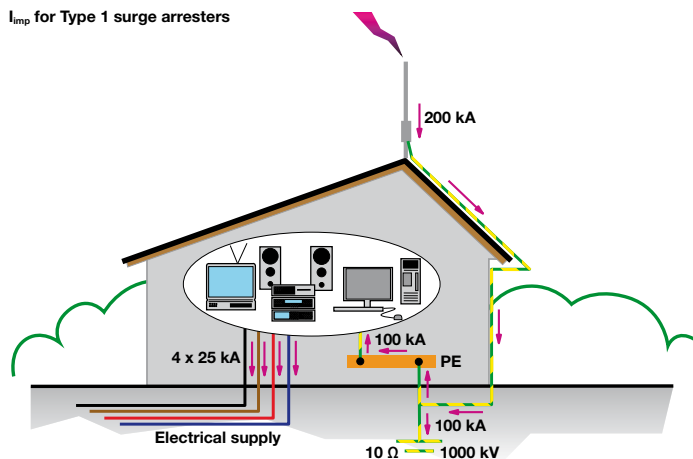
In this case, the manufacturer must communicate the type of protection that has been integrated.

Selection - Choice of  $I_{imp}$  and  $I_{max}$  of the lightning current surge arrester

The run-off capacity of a surge arrester is determined by its electrical characteristics, and must be chosen according to the level of risk.

The choice of  $I_{imp}$  for Type 1 surge arrester in case of a 200 kA direct lightning strike (around 95% of strikes are less than 200 kA: IEC 62 305-1, Basic values of lightning current parameters), is 25 kA for each power line.

$I_{imp}$  for Type 1 surge arresters



**ABB recommends a minimum  $I_{imp}$  of 25 kA for Type 1 surge arresters based on the following calculation :**

- Prospective direct lightning strike current  $I$ : 200 kA (only 1% of discharges > 200 kA).
- Distribution of current within the building: 50 % to ground and 50 % to the electrical network (according to international standards IEC 61 643-12 Annex I-1-2).
- Equal distribution of the current in each of the conductors (3 L + N):

$$I_{imp} = \frac{100 \text{ kA}}{4} = 25 \text{ kA.}$$

 $I_{max}$  for Type 2 surge arresters

Optimization of $I_{max}$ for Type 2 surge arresters				
$N_g$	< 2	$2 \leq N_g < 3$	$3 \leq N_g < 4$	$4 < N_g$
$I_n$ (kA)	5	20	30	60
$I_{max}$ (kA)	15	40	70	120

**Note:**

ABB defines its Type 2 surge arresters according to their maximum current ( $I_{max}$ ).

For a given  $I_{max}$  value, there is a corresponding nominal current value ( $I_n$ ).

### End of life indicator of the surge arrester

This option enables indication of the surge arrester's state via a mechanical indicator which changes from white to red as the surge arrester comes to end-of-life. When this occurs, the surge arrester must be changed as protection is no longer guaranteed.

### Safety Reserve (s) system

In case of current surge exceeding the maximum capacity of the device, the surge arrester will switch to the Safety reserve position and the remote indicator (TS) will switch to defect.

Consequently, the user is warned in advance and has more response time to replace the cartridge, because in Safety reserve position the protection is still ensured due to the 2-stage disconnecting system.

### Pluggable

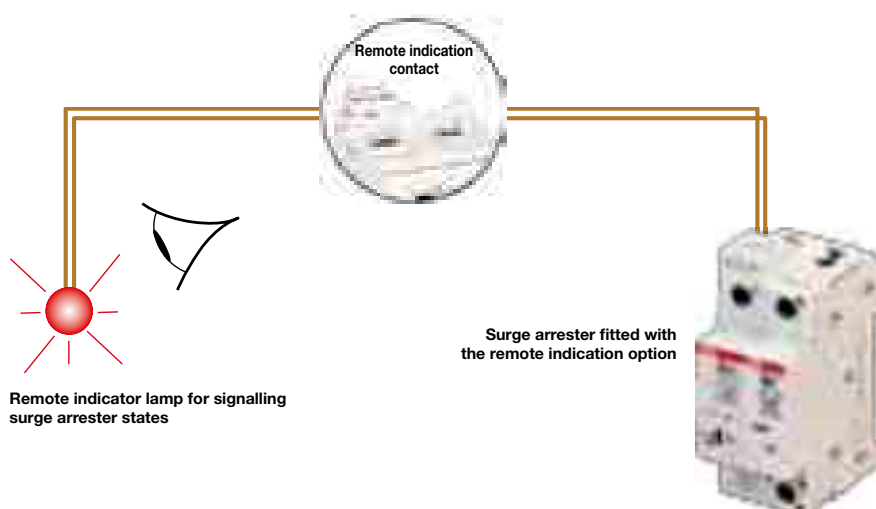
The pluggable feature of ABB surge arresters facilitates maintenance. Should one or more worn cartridges need to be replaced, the electrical circuit does not have to be isolated nor do the wires have to be removed.

### Remote indication (TS)

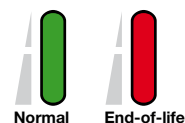
This function, achieved by wiring a 3-point 1A volt-free contact, enables the operational state of the surge arrester to be checked remotely (maintenance premises).

### Technical features of the integrated auxiliary contact

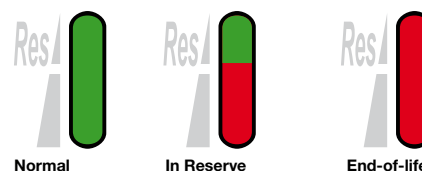
- Contact complement: 1 NO (1 normally open contact), 1 NC (1 normally closed contact).
- Min. load: 12 V D.C. - 10 mA.
- Max. load: 250 V A.C. - 1 A.
- Connection cross-section: 1.5 mm<sup>2</sup>.



### End-of-life indicator



### Safety Reserve system



### NOTE:

A faulty surge arrester does not interrupt continuity of service (if wired such that priority is given to continuity of service), it simply disconnects itself. But, the equipment is no longer protected.



### NOTE:

Pluggable surge arrester cartridges have a foolproof system (Neutral cartridges different to Phase cartridges) preventing incorrect operations when replacing a cartridge.



## Principle of coordination for Surge Protective Devices

After having defined the characteristics of the incoming surge arrester, the protection must be completed with one or more additional surge arresters.

The incoming surge arrester does not provide effective protection for the whole installation by itself. Certain electrical phenomena can double the protection's residual voltage if cable lengths exceed 10m. Surge arresters must be coordinated when they are installed (refer to the tables below).

### Coordination required if:

The incoming surge arrester does not reach the protection voltage ( $U_p$ ) by itself.

The incoming surge arrester is more than 10m away from the equipment to be protected.

### Recommended solution

Use of modular Type 2 surge arresters.

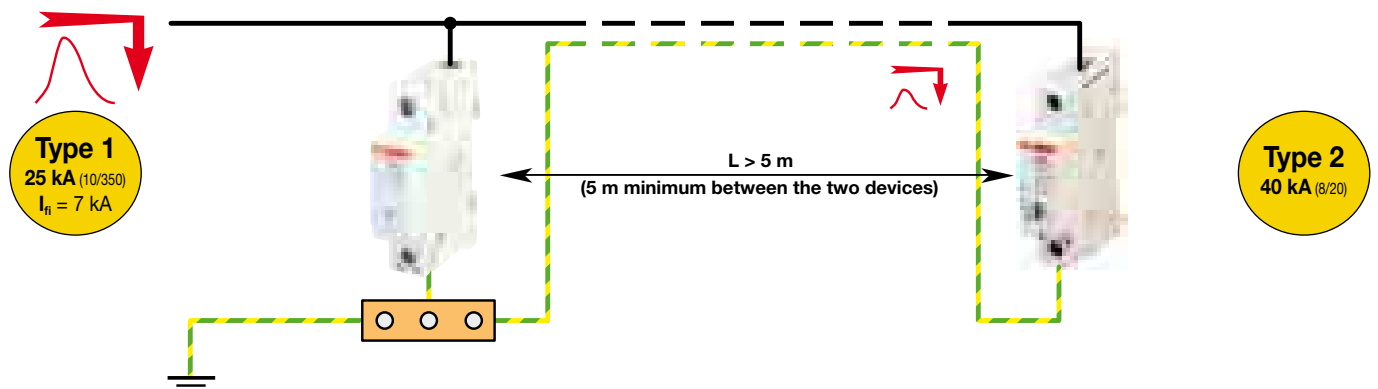
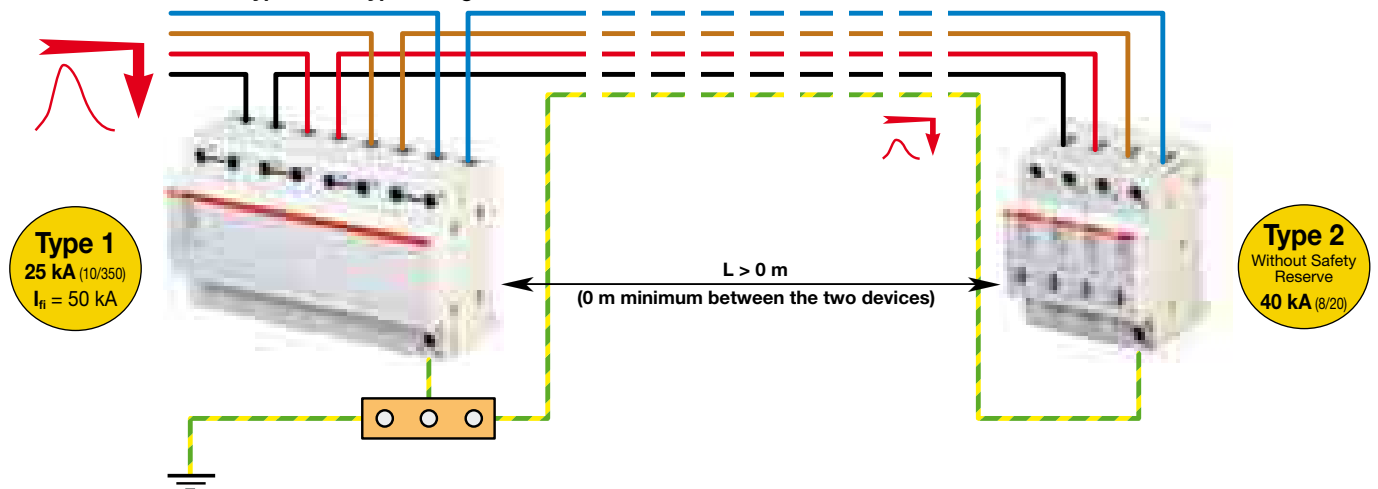
#### Note:

The coordination of Type 2 surge arresters is analysed using their respective maximum discharge currents  $I_{max}$  (8/20) starting from the installation's incoming switchboard and working towards the equipment which is to be protected, taking into account the progressive reduction in  $I_{max}$ .

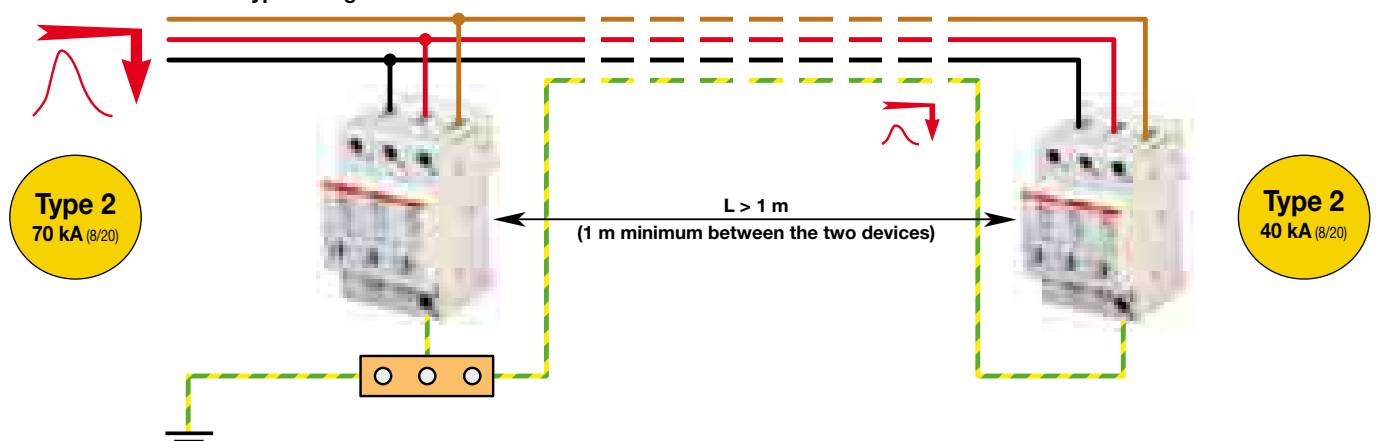
E.g. 70 kA followed by 40 kA.

All ABB Type 2 surge arresters coordinate between each other by respecting a minimum distance of 1m between them.

#### Coordination between Type 1 and Type 2 surge arrester



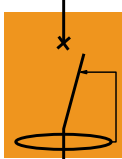
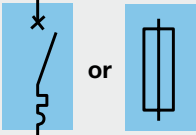

#### Coordination between Type 2 surge arresters



Installation rules for SPDs: choice of associated  
breaking devices (fuse/circuit breaker)

## Choice of disconnecter

Surge arresters must be associated with upstream short-circuit protection and residual current protection against indirect contact (usually already present in the installation).

	Function	Application
	Protection against indirect contact	<ul style="list-style-type: none"> <li>Residual current circuit-breaker compulsory for TT systems</li> <li>Residual current circuit-breaker possible for TN-S, IT and TN-C-S systems</li> <li>Residual current circuit-breaker forbidden for TN-C systems</li> </ul> <p>If a residual current circuit-breaker is used, it is preferable to use a type S.</p> <p>Otherwise there is a risk of nuisance tripping. This does not affect the effectiveness of the surge arrester, but may cause the circuit to be opened.</p>
	Protection against fault currents	<p>The breaking device associated with the surge arrester can be either a circuit breaker or a fuse.</p> <p>Its rating should take into consideration the surge arrester's characteristics and the short-circuit current of the installation.</p>
	Thermal protection	Thermal protection is integrated into the surge arrester.

Maximum circuit breaker or fuse protection rating depending on  $I_{\max}$  or  $I_{\text{imp}}$  of surge arrester and perspective ( $I_p$ ) short circuit current at SPD location .



Type 1 surge arresters OVR T1 / OVR T1+2	Circuit breaker (Curve C)	Fuse (gG)
$I_{\text{imp}}(10/350)$ : 25 kA • $I_p = 0.3 \text{ kA to } I_{\text{scw}}$		$\leq 125 \text{ A}$
Type 1+2 surge arresters OVR T1+2		
$I_{\text{imp}}(10/350)$ : 15 kA • $I_p = 0.3 \text{ kA to } I_{\text{scw}}$		$\leq 125 \text{ A}$
$I_{\text{imp}}(10/350)$ : 7 kA • $I_p = 0.3 \text{ kA to } 2 \text{ kA}$	$\leq 25 \text{ A}$	$\leq 16 \text{ A}$
• $I_p = 2 \text{ kA to } 6 \text{ kA}$	$\leq 32 \text{ A}$	$\leq 25 \text{ A}$
• $I_p = 6 \text{ kA to } I_{\text{scw}}$	$\leq 50 \text{ A}$	$\leq 50 \text{ A}$
Type 2 surge arresters OVR T2 pluggable or T2 & T3 non pluggable		
$I_{\max}(8/20)$ : 10 kA, 15 kA, 40 kA, 70 kA or 120 kA • $I_p = 0.3 \text{ kA to } 2 \text{ kA}$	$\leq 25 \text{ A}$	$\leq 16 \text{ A}$
• $I_p = 2 \text{ kA to } 6 \text{ kA}$	$\leq 32 \text{ A}$	$\leq 25 \text{ A}$
• $I_p = 6 \text{ kA to } I_{\text{scw}}$	$\leq 50 \text{ A}$	$\leq 50 \text{ A}$
Type 2 surge arresters OVR T2 non pluggable		
$I_{\max}(8/20)$ : 15 kA or 40 kA • $I_p = 0.3 \text{ kA to } I_{\text{scw}}$	$\leq 63 \text{ A}$	$\leq 125 \text{ A}$

Possible MCB's: Series S 941 N, SN 200, S 200 L, S 200 / S 200 M, and series S 200 P / S 500 / S 800.

$I_p$ : perspective short circuit at SPD location.

$I_{\text{scw}}$ : short-circuit withstand capacity.

## Residential with OVR PLUS 1N 10 275



### Auto-protected

With its integrated end of life protection by fuse, no need of additional MCB or fuse

### Compact

2 modules only to save space. Easy to install

### State Indicator

2 LEDs give the visual indication of the state of the SPD

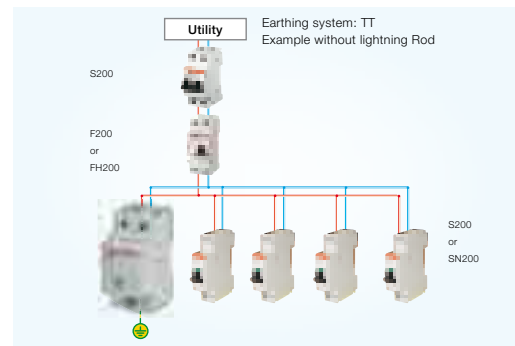
### Discharge current

$I_n=5kA$ : nominal discharge current for residential application according to IEC61643-1

### Long life

The safety reserve system ensures a long protection of your equipments.

### Recommended for low frequency lightning impacts areas



## Commercial building with OVR PLUS N1 40

NEW



No upstream MCB  
or fuse required

### Auto-protected

With its integrated end of life protection by MCB, no need of additional MCB or fuse

### Compact

2 modules only to save space. Easy to install

### State Indicator

Visual indication: The MCB lever position indicates the state of the surge arrester

Option: available auxiliary contact

### Discharge current

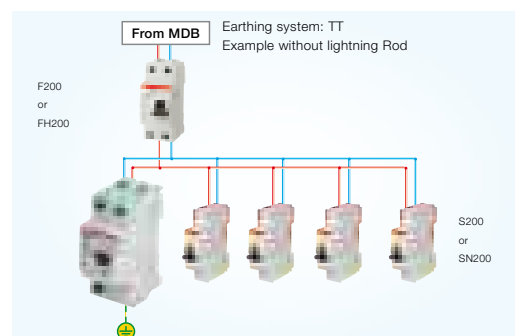
With  $I_m^* 40kA$ , the OVR PLUS can be installed in high risk areas (keraunic level >25)

\*:  $I_{max}$  of the MOV

### Eco-Design and Recycling

Innovative internal design: helps to reduce CO<sub>2</sub> emissions.

### Recommended for high frequency lightning impacts areas



Note: For order codes, see selection tables.

## OVR Surge Protective Devices - Type 1 &amp; Type 1+2



TECHNICAL FEATURES		Type 1 OVR T1 25 TS Triggered spark-gap					
Technology		IEC 61643-1 / EN 61643-11					
Electrical features		1 / I					
Standard		1P 1P 2P 3P 4P 1P+N 3P+N					
Type / test class		IT - TT TT*-TNS-TNC TNC TNS TT - TNS TT - TNS					
Poles		A.C.					
Types of networks							
Type of current							
Nominal voltage Un (L-N/L-L)	V	400	230	230/400	230	230/400	
Max. cont. operating voltage Uc	V	440	255		-	-	
Max. cont. operating voltage Uc (L-N / N-⊥)	V	-	-		255 / 255	255 / 255	
Impulse current Iimp (10/350) per pole	kA	25	25		-	-	
Impulse current Iimp (10/350) (L-N / N-⊥)	kA	-	-		25 / 50	25 / 100	
I <sub>max</sub> discharge current (8/20) per pole (I <sub>max</sub> )	kA	-	-		-	-	
I <sub>max</sub> discharge current (8/20) (L-N/N-terre) (I <sub>max</sub> )	kA	-	-		-	-	
Nominal discharge current In (8/20) per pole	kA	25	25		-	-	
Nominal discharge current In (8/20) (L-N / N-⊥)	kA	-	-		25 / 50	25 / 100	
Voltage protection level Up	kV	2	2.5		-	-	
Voltage protection level Up (L-N / N-⊥)	kV	-	-		2.5 / 2	2.5 / 2	
Follow current interrupting rating If <sub>i</sub>	kArms	50	50		-	-	
Follow current interrupting rating If <sub>i</sub> (L-N / N-⊥)	kArms	-	-		50 / 0.1	50 / 0.1	
TOV (Temporary overvoltage) withstand U <sub>T</sub> (5s.)	V	690	400		-	-	
TOV (Temporary overvoltage) withstand U <sub>T</sub> (L-N: 5s. / N-⊥ : 200ms.)	V	-	-		400 / 1200	400 / 1200	
Continuous operating current I <sub>c</sub>	mA	None					
Short-circuit withstand capability	kArms	50					
Load current I <sub>load</sub> (for V-wiring)	A	125					
Maximum back-up fuse gG/gL		-					
Parallel Connection	A	≤125					
Serial Connection (V-wiring)	A	≤125					
Mechanical features							
Stocking and operating temperature	°C	-40 to +80					
Degree of protection		IP 20					
Fire resistance according to UL 94		V0					
Colour of Housing		Polyarylamide grey RAL 7035					
State indicator		Option (with TS)					
TS remote indicator		Option (TS)					
Installation							
Wire range (L, N, ⊥)							
solid wire	mm²	2.5 ... 50					
stranded wire	mm²	2.5 ... 35					
Stripping length (L, N, ⊥)	mm	15					
Tightening torque (L, N, ⊥)	Nm	3.5					

## TECHNICAL FEATURES OF THE INTEGRATED AUXILIARY CONTACT (TS)

Electrical features			
Contact complement		1NO (1 normally open contact), +1NC (1 normally closed contact)	
Min. load		6 V D.C. - 10 mA	
Max. load		250 V A.C. - 5 A	
Continuous operating current	mA	10	
Installation			
Connection cross-section	mm <sup>2</sup>	1.5	
TT* : in TT network for L/N protection only			

## OVR Surge Protective Devices - Type 1 &amp; Type 1+2



	Type 1 OVR T1 25 255-7 Triggered spark-gap	Type1+2 OVR T1+2 25 255 TS Triggered spark-gap/varistor	Type 1+2 OVR T1+2 15 255-7 Triggered spark-gap	Type 1+2 OVR T1+2 7 275 s P Varistor
	IEC 61643-1 / EN 61643-11 1 / I	IEC 61643-1 / EN 61643-11 1 / I	IEC 61643-1 / EN 61643-11 1 / I	IEC 61643-1 / EN 61643-11 1 / I
	1P 1P 3P+N 3N TT*-TNS-TNC TT - TNS A.C.	TT* - TNS - TNC A.C.	1P 1P 3P+N 3N TT*-TNS-TNC TT - TNS A.C.	1P 1P 3P 3L 4P 4L 1P+N 1N 3P+N 3N TT*-TNS-TNC TNC TNS TT - TNS TT - TNS A.C.
	230 230/400 255 - - 255 / 255 25 - - 25 / 100 - - - - 25 - - 25 / 100 2.5 - - 2.5 / 1.5 7 - - 7 / 0.1 650 - - 650 / 1200 < 2 (LED) 50 - ≤125 NA	230 230/400 255 - - 255 / 255 25 - - 25 / 100 40 - - - 25 - - 25 / 100 1.5 - - 1.5 / 1.5 15 - - 15 / 0.1 334 - - 334 / 1200 < 1 (Varistor leakage) 50 125 ≤125 125	230 230/400 255 - - 255 / 255 15 - - 15 / 50 60 - - 60/60 15 - - 15 / 50 1.5 - - 1.5 / 1.5 7 - - 7 / 0.1 650 - - 650 / 1200 < 2 (LED) 50 - ≤125 NA	230 230/400 275 - 275 7 - - 7 / 12 70 - - 70/70 6 - - 6 0.9 - - 0.9 / 1.4 NA - - NA / 0.1 334 - - 334 / 1200 < 1 50 - ≤50 NA
	-40 to +80 IP 20 V0 Polyarylamide grey RAL 7035 Yes No	-40 to +80 IP 20 V0 Polyarylamide grey RAL 7035 Yes Yes	-40 to +80 IP 20 V0 Polyarylamide grey RAL 7035 Yes No	-40 to +80 IP 20 V0 PC grey RAL 7035 Yes No
	2.5 ... 50 2.5 ... 35 15 3.5	2.5 ... 50 2.5 ... 35 15 3.5	2.5 ... 50 2.5 ... 35 15 3.5	2.5 ... 25 2.5 ... 16 12.5 2.8
	-	1NO (1 normally open contact), +1NC (1 normally closed contact) 12V D.C. - 10 mA 250V A.C. - 1 A None	-	-
	-	1.5	-	-

TT\* : in TT network for L/N protection only



TECHNICAL FEATURES		Type 2 (pluggable) OVR T2 <span style="background-color: #00AEEF; color: white;">■</span> <span style="background-color: #008000; color: white;">■</span> <span style="background-color: #FFA500; color: white;">■</span> (s) P (TS)									
Technology		Varistor									
Electrical features		IEC 61643-1 / EN 61643-11 2 / II									
Standard											
Type / test class											
Poles		1P <span style="background-color: #00AEEF; color: white;">■</span>	3P <span style="background-color: #008000; color: white;">■</span>	4P <span style="background-color: #00AEEF; color: white;">■</span>	3P+N <span style="background-color: #00AEEF; color: white;">■</span>	1P <span style="background-color: #00AEEF; color: white;">■</span>	3P <span style="background-color: #008000; color: white;">■</span>	4P <span style="background-color: #00AEEF; color: white;">■</span>	1P+N <span style="background-color: #00AEEF; color: white;">■</span>	3P+N <span style="background-color: #00AEEF; color: white;">■</span>	
Types of networks		IT - TT	IT-TT**	IT-TT***	TT - TNS - IT	TT-TNS-TNC	TNC	TNS	TT-TNS	TT-TNS	
Type of current		A.C.	A.C.	A.C.	A.C.	A.C.	A.C.	A.C.	A.C.	A.C.	
Nominal voltage Un (L-N/L-L)		V	400	230/400	230/400	230	230	400	230	230/400	
Max. cont. operating voltage Uc		V	<span style="background-color: #FFA500;">440</span>	<span style="background-color: #FFA500;">440</span>	-	<span style="background-color: #FFA500;">275</span>			-		
Max. cont. operating voltage Uc (L-N / N- $\perp$ )		V	-	-	<span style="background-color: #FFA500;">440</span> / 255	-			<span style="background-color: #FFA500;">275</span> / 255		
Maximum discharge current Imax (8/20) per pole		kA	<span style="background-color: #008000;">15</span> <span style="background-color: #008000;">40</span> <span style="background-color: #008000;">70</span>	<span style="background-color: #008000;">40</span> <span style="background-color: #008000;">70</span>	- - -	<span style="background-color: #008000;">15</span> <span style="background-color: #008000;">40</span> <span style="background-color: #008000;">70</span>			- - -		
Maximum discharge current Imax (8/20) (L-N / N- $\perp$ )		kA	- - -	- -	<span style="background-color: #008000;">15</span> /70 <span style="background-color: #008000;">40</span> /70 <span style="background-color: #008000;">70</span> /70	- - -	- - -		<span style="background-color: #008000;">15</span> /70 <span style="background-color: #008000;">40</span> /70 <span style="background-color: #008000;">70</span> /70		
Nominal discharge current In (8/20) per pole		kA	5 20 30	20 30	- - -	5 20 30	- - -		- - -		
Nominal discharge current In (8/20) (L-N / N- $\perp$ )		kA	- - -	- -	5/30 20/30 30/30	- - -	- - -		5/30 20/30 30/30		
Voltage protection level Up		kV	1.5 1.9 2	1.9 2	- - -	1 1.4 1.5	- - -		- - -		
Voltage protection level Up (L-N / N- $\perp$ )		kV	- - -	- -	1.5/1.4 1.9/1.4 2/1.4	- - -	- - -		1/1.4 1.4/1.4 1.5/1.4		
Residual voltage Ures at 3 kA per pole		kV	1.4 1.4 1.3	1.4 1.3	-	0.9 0.9 0.85			-		
Residual voltage Ures at 3kA (L-N / N- $\perp$ )		kV	- - -	- -	1.4/1.2 1.4/1.2 1.3/1.2	-			0.9/1.2 0.9/1.2 0.85/1.2		
Follow current interrupting rating Ifi		kArms	NA	NA	-	NA			-		
Follow current interrupting rating Ifi (L-N / N- $\perp$ )		kArms	-	-	NA / 0.1	-			NA / 0.1		
TOV (Temporary overvoltage) withstand UT (5s.)		V	440 440 440	440	-	334			-		
TOV (Temporary overvoltage) withstand UT (L-N: 5s./N- $\perp$ : 200ms)		V	-	-	440 / 1200	-			334 / 1200		
Continuous operating current Ic		mA	< 1	< 1	< 1	< 1			< 1		
Short-circuit withstand capability		kArms	50	50	50	50			50		
Disconnecter											
gG -gL fuse		A	≤50	≤50	≤50	≤50			≤50		
curve C circuit breaker		A	≤50	≤50	≤50	≤50			≤50		
Mechanical features											
Stocking and operating temperature		°C	-40 to +80								
Degree of protection			IP 20								
Fire resistance according to UL 94			V0								
Material of Housing			PC grey RAL 7035								
Pluggable cartridge			Yes								
Integrated thermal disconnecter			Yes								
State indicator			Yes								
Safety reserve			Option (s)								
TS remote indicator			Option (TS)								
Installation											
Wire range (L, N, $\perp$ )											
solid wire		mm²	2.5 ... 25								
stranded wire		mm²	2.5 ... 16								
Stripping length (L, N, $\perp$ )		mm	12.5								
Tightening torque (L, N, $\perp$ )		Nm	2.8								

## TECHNICAL FEATURES OF THE INTEGRATED AUXILIARY CONTACT (TS)

Electrical features		
Contact complement		1NO (1 make contact), +1NC (1 normally closed contact)
Min. load		12V D.C. - 10 mA
Max. load		250V A.C. - 1 A
Continuous operating current	mA	None
Installation		
Connection cross-section	mm²	1.5

TT\*: in TT network for L/N protection only TT\*\*: for no neutral TT network only TT\*\*\*: for TT network common mode protection only

## OVR Surge Protective Devices - Type 2

NEW



Type 2 (non pluggable) OVR PLUS N1 40	Type 2 (non pluggable) OVR T2 275 Varistor	Type 2 Photovoltaic OVR PV P (TS) Varistor	Telecom / Dataline OVR TC VP
IEC 61643-1 / EN 61643-11		IEC 61643-1 / EN 61643-11	
1P+N N1 TT - TNS	1P 275 TT* - TNS - TNC	3 PV Systems	TC 1 pair Dataline / Telecom
A.C.	A.C.	D.C.	Low current
230	230	600	6 12 24 48 200 200FR
-	275	720	7 14 27 53 220 220
320	-	-	-
Im = 40	15	40	10
20 / 40	-	-	-
-	5	20	5
20	-	-	-
-	1	-	15 20 35 70 700 300
1.6 / 1.5	-	2.8 / 1.4	-
-	1	3.8	-
1/0.6	-	-	-
NA	NA	-	-
-	-	-	-
-	334	-	-
-	-	-	-
< 1	< 1	< 0.05	140
Isc = 15 kA	50	-	-
Integrated MCB	-	-	-
-	≤50	a)	-
-	≤50	-	-
-40 to +80		-40 to +80	
IP 20		IP 20	
V0		V0	
PC grey RAL 7035		PC grey RAL 7035	
No		Yes	
Yes		Yes	Yes
Yes		Yes	Yes
No		No	No
Optional (S2C-H6R) ABB (2CDS200912R0001)		No	
2.5 ... 25		0.5 ... 2.5	
2.5 ... 16		0.5 ... 2.5	
11	12.5	-	
2.8		-	
-		-	
-		-	
-		-	
-		-	
-		-	

TT\*: in TT network for L/N protection only

TT\*\*: for no neutral TT network only

TT\*\*\*: for TT network common mode protection only

a) If Iscstc &gt; 25 A, should choose fuse 4 A gR

T1

## Surge Protective Devices, Type 1 / Type 1+2

**Function:** Type 1 and Type 1+2 SPDs are Lightning Current Arresters. They can handle and divert high energy from lightning.

They are necessary when the installation is exposed to direct lightning (for example when the building is equipped with external lightning protection system or powered by aerial lines). They shall be installed at the line entrance of the installation (meter board or main distribution board).

ABB Type 1 and Type 1+2 SPDs are tested with wave-shape 10/350. Additionally, Type 1+2 SPDs are also tested with wave-shape 8/20 to guarantee protection against overvoltage of low energy from remote lightning stroke or from switching operations.

ABB Type 1+2 SPDs feature a better voltage protection level (**Up**) than Type 1 SPDs which make them suitable for protection of most of electrical and electronic equipment situated within the protective distance (up to 30 meters).

Type 1 Neutral SPDs are for TT networks when used in combination with phase SPDs Type 1 or Type 1+2.

**Application:** residential, commercial, industrial

**Standard:** IEC 61643-1 / EN 61643-11

10/350 current wave for SPDs Type 1, 10/350 & 8/20 for SPDs Type 1+2, spark-gap technology (no blow-out).

Nb. of poles	Impulse current (10/350) kA	Follow current interrupting level Ifi kArms	Voltage protection level Up kV	Nominal voltage Un V	Max. cont. operating voltage Uc V	Order details	Bbn	Price	Price	Weight	Pack
						Type code	Order code	EAN		kg	pc.

## Type 1 (Ifi = 50 kA)

TNS, TNC, TT\*

1	25	50	2.5	230	255	OVR T1 25 255	2CTB815101R0100	510877		0.25	1
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IT (230/400 V), TT, TNC (400/690 V)

1	25	50	2	400	440	OVR T1 25 440-50	2CTB815101R9300	514929		0.27	1
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TNS (1 Ph+N), TT

2	25 <sup>(2)</sup>	50	2.5	230	255	OVR T1 2L 25 255	2CTB815101R1200	510891		0.50	1
2	25 <sup>(2)</sup>	50	2.5	230	255	OVR T1 2L 25 255 TS <sup>(3)</sup>	2CTB815101R1100	510945		0.60	1

TT (1 Ph+N), TNS

1+N	25/50 <sup>(1)</sup>	50/0.1 <sup>(1)</sup>	2.5/2 <sup>(1)</sup>	230	255/255 <sup>(1)</sup>	OVR T1 1N 25 255	2CTB815101R1500	510921		0.50	1
1+N	25/50 <sup>(1)</sup>	50/0.1 <sup>(1)</sup>	2.5/2 <sup>(1)</sup>	230	255/255 <sup>(1)</sup>	OVR T1 1N 25 255 TS <sup>(3)</sup>	2CTB815101R1000	510976		0.60	1

TNC

3	25 <sup>(2)</sup>	50	2.5	230/400	255	OVR T1 3L 25 255	2CTB815101R1300	510907		0.75	1
3	25 <sup>(2)</sup>	50	2.5	230/400	255	OVR T1 3L 25 255 TS <sup>(3)</sup>	2CTB815101R0600	510952		0.85	1

TNS (3 Ph+N)

4	25 <sup>(2)</sup>	50	2.5	230/400	255	OVR T1 4L 25 255	2CTB815101R1400	510914		1.00	1
4	25 <sup>(2)</sup>	50	2.5	230/400	255	OVR T1 4L 25 255 TS <sup>(3)</sup>	2CTB815101R0800	510969		1.10	1

TT, TNS

3+N	25/100 <sup>(1)</sup>	50/0.1 <sup>(1)</sup>	2.5/2 <sup>(1)</sup>	230/400	255/255 <sup>(1)</sup>	OVR T1 3N 25 255	2CTB815101R1600	510938		1.00	1
3+N	25/100 <sup>(1)</sup>	50/0.1 <sup>(1)</sup>	2.5/2 <sup>(1)</sup>	230/400	255/255 <sup>(1)</sup>	OVR T1 3N 25 255 TS <sup>(3)</sup>	2CTB815101R0700	510983		1.10	1

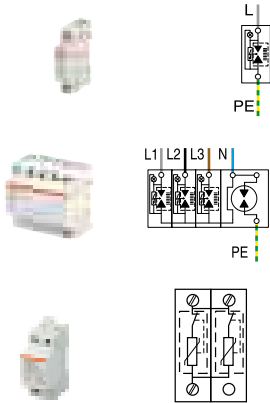
(1) L-N / N- $\neq$ 

(2) per pole.

(3) TS: telesignal contact for remote control of the status of the Surge Protective Device.

TT\*: in TT network for L/N protection only



**T1**

Nb. of poles	Impulse current limp (10/350) kA	Follow current interrupting level $I_{fi}$ kA <sub>rms</sub>	Voltage protection level $U_p$ kV	Nominal voltage $U_n$ V	Max. cont. operating voltage $U_c$ V	Order details	Bbn 3660308	Price 1 piece	Price group	Weight 1 piece	Pack unit
						Type code	Order code	Price		kg	pc.

Type 1 ( $I_{fi} = 7$  kA)

## TNS, TNC, TT\*

1	25	7	2.5	230	255	OVR T1 25 255-7	2CTB815101R8700	514110		0.12	1
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## TT (3 Ph+N), TNS

3+N	25/100 <sup>(1)</sup>	7/0.1 <sup>(1)</sup>	2.5/1.5 <sup>(1)</sup>	230	255/255 <sup>(1)</sup>	OVR T1 3N 25 255-7	2CTB815101R8800	514127		0.60	1
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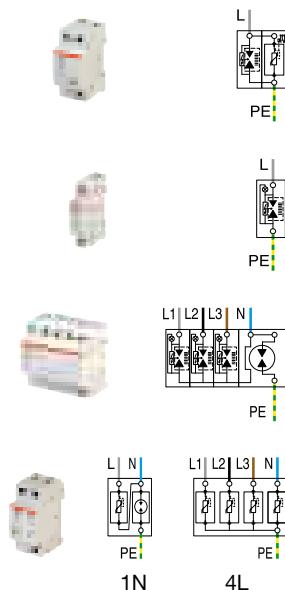
## OVR HL (classic)

## TT, TNS, TNC, IT

1	15	NA	1.4	400	440	OVR HL 15 440 s P TS	2CTB815201R0800	509802		0.25	1
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## TT, TNS

2	15	NA	1.4	400	440	OVR HL 2L 15 440 s P TS	2CTB815303R0400	509826		0.5	1
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**T1 + T2**

## Type 1+2 (limp = 25 kA)

## TNS, TNC, TT\*

1	25	15	1.5	230	255	OVR T1+2 25 255 TS <sup>(3)</sup>	2CTB815101R0300	510884		0.30	1
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## Type 1+2 (limp = 15 kA)

## TNS, TNC, TT\*

1	15	7	1.5	230	255	OVR T1+2 15 255-7	2CTB815101R8900	514134		0.12	1
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## TT (3 Ph+N), TNS

3+N	15/50 <sup>(1)</sup>	7/0.1 <sup>(1)</sup>	1.5/1.5 <sup>(1)</sup>	230	255/255 <sup>(1)</sup>	OVR T1+2 3N 15 255-7	2CTB815101R9000	514141		0.60	1
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## Type 1+2 (limp = 7 kA)

1	7	0	0.9	230	275	OVR T1+2 7 275s P	2CTB815101R3900	513403		0.12	1
2	7	0	0.9/1.4	230	275	OVR T1+2 1N 7 275s P	2CTB815302R1000	515728		0.27	1
4	7	0	0.9/1.4	230	275	OVR T1+2 3N 7 275s P	2CTB815502R1000	515735		0.5	1
3	7	0	0.9	230	275	OVR T1+2 3L 7 275s P	2CTB815101R4000	513410		0.4	1
4	7	0	0.9	230	275	OVR T1+2 4L 7 275s P	2CTB815101R4100	513427		0.5	1
-	7	0	0.9	230	275	OVR T1+2 7 275s C	2CTB815101R3800	513458		0.1	1
-	7	0	1.4	230	275	OVR T1+2 70 NC	2CTB815101R5100	515742		0.05	1

**T1 (N-PE)**

## Type 1 Neutral

For TT networks when used in combination with phase SPDs Type 1 or Type 1+2

1	25	0.1	< 4	-	690	OVR T1 25 N	2CTB815101R9700	517043	NEW	0.25	1
1	50	0.1	1.5	-	255	OVR T1 50 N	2CTB815101R0400	510853		0.25	1
1	100	0.1	2	-	255	OVR T1 100 N	2CTB815101R0500	510860		0.25	1

(1) L-N / N-PE.

(3) TS: telesignal contact for remote control of the status of the Surge Protective Device.

TT\*: in TT network for L/N protection only

## Bus bar

For TT (3Ph+N) networks, this bus bar can be used to connect four single pole Type 1 & Type 1+2 SPDs (except for Type 1 with  $I_{fi} = 7$  kA)

-	-	-	-	-	-	Bus bar 3N	2CTB815102R0400	516091		0.005	50
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## OVR Surge Protective Devices

T2

## Surge Protective Devices, Type 2

**Function:** Type 2 SPDs are surge arresters. They can handle energy from distant/ indirect lightning strikes or from switching operations. Type 2 SPDs can not discharge high energies from direct lightning like Type 1 SPDs but they feature lower protection level (**Up**). They are recommended at the incoming of installation for locations with no exposure to direct lightning impulses.

**Application:** residential, commercial, industrial

**Standard:** IEC 61643-1 / EN 61643-11

8/20 current wave, varistor technology.

Nb. of poles	Maxi. discharge current I <sub>max</sub> (8/20) kA	Nominal discharge current I <sub>n</sub> (8/20) kA	Voltage protection level U <sub>p</sub> kV	Norm. voltage U <sub>n</sub> V	Max. cont. operating voltage U <sub>c</sub> V	Order details	Bbn 3660308	Price 1 piece	Price group	Weight 1 piece	Pack unit
						Type code	Order code	EAN		kg	ppc.

## Type 2 (pluggable)

## TNS, TNC, TT\*

1	15	5	1.0	230	275	OVR T2 15 275 P	2CTB803851R2400	512840		0.12	1
1	40	20	1.4	230	275	OVR T2 40 275 P	2CTB803851R2300	512833		0.12	1
1	40	20	1.4	230	275	OVR T2 40 275s P	2CTB803851R2000	512826		0.12	1
1	40	20	1.4	230	275	OVR T2 40 275 P TS	2CTB803851R1700	514363		0.14	1
1	40	20	1.4	230	275	OVR T2 40 275s P TS <sup>(3)</sup>	2CTB803851R1400	512802		0.15	1
1	70	30	1.5	230	275	OVR T2 70 275 s P	2CTB803851R1900	512819		0.12	1
1	70	30	1.5	230	275	OVR T2 70 275s P TS <sup>(3)</sup>	2CTB803851R1300	512796		0.15	1

## IT (230/400 V), TT

1	15	5	1.5	400	440	OVR T2 15 440 P	2CTB803851R1100	512772		0.12	1
1	40	20	1.9	400	440	OVR T2 40 440 P	2CTB803851R1200	512789		0.12	1
1	40	20	1.9	400	440	OVR T2 40 440 s P	2CTB803851R0800	512765		0.12	1
1	40	20	1.9	400	440	OVR T2 40 440 P TS	2CTB803851R0500	514370		0.14	1
1	40	20	1.9	400	440	OVR T2 40 440s P TS <sup>(3)</sup>	2CTB803851R0200	512741		0.15	1
1	70	30	2	400	440	OVR T2 70 440 s P	2CTB803851R0700	512758		0.12	1
1	70	30	2.0	400	440	OVR T2 70 440s P TS <sup>(3)</sup>	2CTB803851R0100	512734		0.15	1

## TT, TNS, TNC, IT

1	120	60	2.5	400	440	OVR T2 120 440s P TS <sup>(3)</sup>	2CTB803951R1300	517036	NEW	0.12	1
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## TT, TN-S (1 Ph+N) (Common + Differential mode protection)

1+N	15/70 <sup>(1)</sup>	5/30 <sup>(1)</sup>	1.0/1.4 <sup>(1)</sup>	230	275/255 <sup>(1)</sup>	OVR T2 1N 15 275 P	2CTB803952R1200	513106		0.22	1
1+N	40/70 <sup>(1)</sup>	20/30 <sup>(1)</sup>	1.4/1.4 <sup>(1)</sup>	230	275/255 <sup>(1)</sup>	OVR T2 1N 40 275 P	2CTB803952R1100	513250		0.27	1
1+N	40/70 <sup>(1)</sup>	20/30 <sup>(1)</sup>	1.4/1.4	230	275/255 <sup>(1)</sup>	OVR T2 1N 40 275s P	2CTB803952R0800	513090		0.27	1
1+N	40/70 <sup>(1)</sup>	20/30 <sup>(1)</sup>	1.4/1.4 <sup>(1)</sup>	230	275/255 <sup>(1)</sup>	OVR T2 1N 40 275 P TS	2CTB803952R0500	514387		0.27	1
1+N	40/70 <sup>(1)</sup>	20/30 <sup>(1)</sup>	1.4/1.4 <sup>(1)</sup>	230	275/255 <sup>(1)</sup>	OVR T2 1N 40 275s P TS <sup>(3)</sup>	2CTB803952R0200	513076		0.27	1
1+N	70/70 <sup>(1)</sup>	30/30 <sup>(1)</sup>	1.5/1.4	230	275/255 <sup>(1)</sup>	OVR T2 1N 70 275 s P	2CTB803952R0700	513083		0.27	1
1+N	70/70 <sup>(1)</sup>	30/30 <sup>(1)</sup>	1.5/1.4 <sup>(1)</sup>	230	275/255 <sup>(1)</sup>	OVR T2 1N 70 275s P TS <sup>(3)</sup>	2CTB803952R0100	513069		0.27	1

## TNC (Common mode protection)

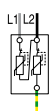
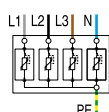
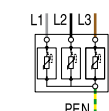
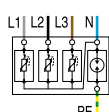
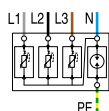
3	15 <sup>(2)</sup>	5 <sup>(2)</sup>	1.0	230	275	OVR T2 3L 15 275 P	2CTB803853R3400	512987		0.35	1
3	40 <sup>(2)</sup>	20 <sup>(2)</sup>	1.4	230	275	OVR T2 3L 40 275 P	2CTB803853R2400	513366		0.35	1
3	40 <sup>(2)</sup>	20 <sup>(2)</sup>	1.4	230	275	OVR T2 3L 40 275sP	2CTB803853R2200	512963		0.35	1
3	40 <sup>(2)</sup>	20 <sup>(2)</sup>	1.4	230	275	OVR T2 3L 40 275 P TS	2CTB803853R2500	514400		0.40	1
3	40 <sup>(2)</sup>	20 <sup>(2)</sup>	1.4	230	275	OVR T2 3L 40 275s P TS <sup>(3)</sup>	2CTB803853R2300	512970		0.40	1
3	70 <sup>(2)</sup>	30 <sup>(2)</sup>	1.5	230	275	OVR T2 3L 70 275 s P	2CTB803853R4100	512994		0.35	1
3	70 <sup>(2)</sup>	30 <sup>(2)</sup>	1.5	230	275	OVR T2 3L 70 275s P TS <sup>(3)</sup>	2CTB803853R4400	513007		0.40	1

## TNS (3 Ph+N)

4	15 <sup>(2)</sup>	5 <sup>(2)</sup>	1.0	230	275	OVR T2 4L 15 275 P	2CTB803853R6000	513038		0.45	1
4	40 <sup>(2)</sup>	20 <sup>(2)</sup>	1.4	230	275	OVR T2 4L 40 275 P	2CTB 803853R5600	513274		0.45	1
4	40 <sup>(2)</sup>	20 <sup>(2)</sup>	1.4	230	275	OVR T2 4L 40 275sP	2CTB803853R5400	513021		0.45	1
4	40 <sup>(2)</sup>	20 <sup>(2)</sup>	1.4	230	275	OVR T2 4L 40 275 P TS	2CTB803853R5200	514417		0.50	1
4	40 <sup>(2)</sup>	20 <sup>(2)</sup>	1.4	230	275	OVR T2 4L 40 275s P TS <sup>(3)</sup>	2CTB803853R5000	513014		0.50	1
4	70 <sup>(2)</sup>	30 <sup>(2)</sup>	1.5	230	275	OVR T2 4L 70 275 s P	2CTB803919R0200	513045		0.45	1
4	70 <sup>(2)</sup>	30 <sup>(2)</sup>	1.5	230	275	OVR T2 4L 70 275s P TS <sup>(3)</sup>	2CTB803919R0400	513052		0.50	1

(1) L-N / N- $\overline{L}$ . (2) per pole. (3) TS: telesignal contact for remote control of the status of the Surge Protective Device. The safety reserve (s) ensures a preventive maintenance of the installation.

TT\*: in TT network for L/N protection only

**T2**

Nb. of poles	Maxi. discharge current I <sub>max</sub> (8/20) kA	Nominal discharge current I <sub>n</sub> (8/20) kA	Voltage protection level U <sub>p</sub> kV	Nom. voltage U <sub>n</sub> V	Max. cont. operating voltage U <sub>c</sub> V	Order details	Bbn 3660308	Price 1 piece	Price group	Weight 1 piece	Pack unit
						Type code	Order code	EAN		kg	ppc.

**TT, TN-S (3 Ph+N) (Common + Differential mode protection)**

3+N	15/70 <sup>(1)</sup>	5/30 <sup>(1)</sup>	1.0/1.4 <sup>(1)</sup>	230	275/255 <sup>(1)</sup>	<b>OVR T2 3N 15 275 P</b>	2CTB803953R1200	<b>513151</b>		0.45	1
3+N	40/70 <sup>(1)</sup>	20/30 <sup>(1)</sup>	1.4/1.4 <sup>(1)</sup>	230	275/255 <sup>(1)</sup>	<b>OVR T2 3N 40 275 P</b>	2CTB803953R1100	<b>513267</b>		0.45	1
3+N	40/70 <sup>(1)</sup>	20/30 <sup>(1)</sup>	1.4/1.4	230	275/255 <sup>(1)</sup>	<b>OVR T2 3N 40 275s P</b>	2CTB803953R0800	<b>513144</b>		0.45	1
3+N	40/70 <sup>(1)</sup>	20/30 <sup>(1)</sup>	1.4/1.4 <sup>(1)</sup>	230	275/255 <sup>(1)</sup>	<b>OVR T2 3N 40 275s P TS</b>	2CTB803953R0500	<b>514394</b>		0.50	1
3+N	40/70 <sup>(1)</sup>	20/30 <sup>(1)</sup>	1.4/1.4 <sup>(1)</sup>	230	275/255 <sup>(1)</sup>	<b>OVR T2 3N 40 275s P TS<sup>(3)</sup></b>	2CTB803953R0200	<b>513120</b>		0.50	1
3+N	70/70 <sup>(1)</sup>	30/30 <sup>(1)</sup>	1.5/1.4	230	275/255 <sup>(1)</sup>	<b>OVR T2 3N 70 275s P</b>	2CTB803953R0700	<b>513137</b>		0.45	1
3+N	70/70 <sup>(1)</sup>	30/30 <sup>(1)</sup>	1.5/1.4 <sup>(1)</sup>	230	275/255 <sup>(1)</sup>	<b>OVR T2 3N 70 275s P TS<sup>(3)</sup></b>	2CTB803953R0100	<b>513113</b>		0.50	1

(1) L-N / N-PE. (2) per pole. (3) TS: telesignal contact for remote control of the status of the Surge Protective Device. The safety reserve (s) ensures a preventive maintenance of the installation.

**TT (3 Ph+N), TNS, IT**

3+N	15	5	1.5/1.4 <sup>(1)</sup>	230	440/255 <sup>(1)</sup>	<b>OVR T2 3N 15-440 P</b>	2CTB803953R1300	<b>516800</b>		0.45	1
3+N	40	20	1.9/1.4 <sup>(1)</sup>	230	440/255 <sup>(1)</sup>	<b>OVR T2 3N 40-440 P</b>	2CTB803953R1400	<b>516817</b>		0.45	1
3+N	40	20	1.9/1.4 <sup>(1)</sup>	230	440/255 <sup>(1)</sup>	<b>OVR T2 3N 40-440 P TS<sup>(3)</sup></b>	2CTB803953R1500	<b>516824</b>		0.45	1
3+N	40	20	1.9/1.4 <sup>(1)</sup>	230	440/255 <sup>(1)</sup>	<b>OVR T2 3N 40-440s P TS<sup>(3)</sup></b>	2CTB803953R1600	<b>516831</b>		0.45	1
3+N	70	30	2/1.4 <sup>(1)</sup>	230	440/255 <sup>(1)</sup>	<b>OVR T2 3N 70-440s P</b>	2CTB803953R1700	<b>516848</b>		0.45	1
3+N	70	30	2/1.4 <sup>(1)</sup>	230	440/255 <sup>(1)</sup>	<b>OVR T2 3N 70-440s P TS<sup>(3)</sup></b>	2CTB803953R1800	<b>516855</b>		0.23	1

**TNC (3 Ph), TT\*\*, IT**

3	40	20	1.9	230	440	<b>OVR T2 3L 40-440 P</b>	2CTB803853R2600	<b>516879</b>		0.35	1
3	40	20	1.9	230	440	<b>OVR T2 3L 40-440 P TS</b>	2CTB803853R2700	<b>516886</b>		0.40	1
3	70	30	2	230	440	<b>OVR T2 3L 70-440s P</b>	2CTB803853R4200	<b>516893</b>		0.35	1
3	70	30	2	230	440	<b>OVR T2 3L 70-440s P TS</b>	2CTB803853R4300	<b>516909</b>		0.40	1

**TNS, IT (3 Ph+N), TT\*\*\***

4	40	20	1.9/1.4 <sup>(1)</sup>	230	440	<b>OVR T2 4L 40-440 P</b>	2CTB803853R5100	<b>516916</b>		0.45	1
4	40	20	1.9/1.4 <sup>(1)</sup>	230	440	<b>OVR T2 4L 40-440 P TS</b>	2CTB803853R5300	<b>516923</b>		0.50	1
4	70	30	2/1.4 <sup>(1)</sup>	230	440	<b>OVR T2 4L 70-440s P</b>	2CTB803853R7000	<b>516930</b>		0.45	1
4	70	30	2/1.4 <sup>(1)</sup>	230	440	<b>OVR T2 4L 70-440s P TS</b>	2CTB803853R7100	<b>516947</b>		0.50	1

**Type 2 Neutral**

1	70	30	1.4	230	255	<b>OVR T2 70 N P</b>	2CTB803953R1900	<b>516862</b>			
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**OVR Type 2 Special 24/48V AC & DC**

These type 2 SPD's can be used in very low voltages & data lines for current higher than 140mA.

1	15	5	0.3	57	75	<b>OVR 15 75 P</b>	2CTB813851R2800	<b>504647</b>		0.12	1
1	15	5	0.3	57	75	<b>OVR 15 75 P TS</b>	2CTB813851R2700	<b>504630</b>		0.13	1
2	15	5	0.3/0.6	57	75	<b>OVR 2 15 75 P</b>	2CTB813852R1700	<b>504609</b>		0.22	1
2	15	5	0.3/0.6	57	75	<b>OVR 2 15 75 P TS</b>	2CTB813852R1600	<b>504593</b>		0.23	1
2	15	5	0.3/0.6	57	75	<b>OVR 2 15 75s P TS</b>	2CTB813852R1300	<b>504579</b>		0.23	1

Back-up protection by fuse: 16A gG under AC, 16A gR under DC

**Replacement cartridges for Surge Protective Devices Type 2****Phase cartridge, 75 V**

-	15	5	0.3	57	75	<b>OVR 15 75 C</b>	2CTB813854R1400	<b>508892</b>		0.10	1
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**Phase cartridge, 275 V**

-	15	5	1.0	230	275	<b>OVR T2 15 275 C</b>	2CTB803854R1200	<b>513168</b>		0.10	1
-	40	20	1.4	230	275	<b>OVR T2 40 275 C</b>	2CTB803854R1000	<b>513182</b>		0.10	1
-	40	20	1.4	230	275	<b>OVR T2 40 275s C<sup>(1)</sup></b>	2CTB803854R0900	<b>513199</b>		0.10	1
-	70	30	1.5	230	275	<b>OVR T2 70 275s C<sup>(1)</sup></b>	2CTB803854R0700	<b>513229</b>		0.10	1

**Neutral cartridge for products OVR T2 1N (.) & OVR T2 3N (.), 275 V**

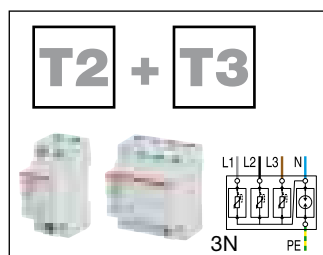
-	70	30	1.4	-	440	<b>OVR T2 70 N C</b>	2CTB803854R0000	<b>513243</b>		0.05	1
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**Phase cartridge, 440 V**

-	15	5	1.5	400	440	<b>OVR T2 15 440 C</b>	2CTB803854R0600	<b>513175</b>		0.10	1
-	40	20	1.9	400	440	<b>OVR T2 40 440 C</b>	2CTB803854R0400	<b>513205</b>		0.10	1
-	40	20	1.9	400	440	<b>OVR T2 40 440s C<sup>(1)</sup></b>	2CTB803854R0300	<b>513212</b>		0.10	1
-	70	30	2.0	400	440	<b>OVR T2 70 440s C<sup>(1)</sup></b>	2CTB803854R0100	<b>513236</b>		0.10	1

TT\*\*: for no neutral TT network only

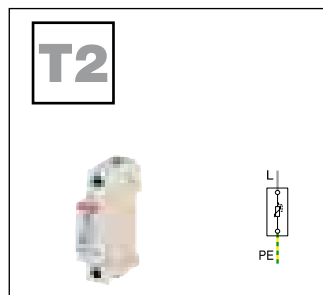
TT\*\*\*: for TT network common mode protection only



Nb. of poles	Maxi. discharge current I <sub>max</sub> (8/20) kA	Nominal discharge current I <sub>n</sub> (8/20) kA	Voltage protection level U <sub>p</sub> kV	Voltage protection level U <sub>p</sub> at U <sub>oc</sub> kV	Voltage wave combination U <sub>oc</sub> kV	Nom. voltage U <sub>n</sub> V	Max. cont. operating voltage U <sub>c</sub> V	Order details	Bbn 3660308	Price 1 piece	Price group	Weight 1 piece	Pack unit
								Type code	Order code	EAN		kg	ppc.

## Type 2 &amp; Type 3 (non pluggable), TT, TNS

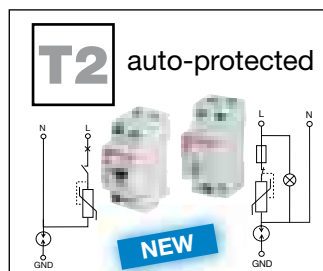
1+N	10	3	0.9/1.4	0.9/1.4	6	230	275	<b>OVR 1N 10 275</b>	2CTB813912R1000	<b>509208</b>		0.25	1
3+N	10	3	0.9/1.4	0.9/1.4	6	230	275	<b>OVR 3N 10 275</b>	2CTB813913R1000	<b>509215</b>		0.45	1



Nb. of poles	Maxi. discharge current I <sub>max</sub> (8/20) kA	Nominal discharge current I <sub>n</sub> (8/20) kA	Voltage protection level U <sub>p</sub> kV	Nom. voltage U <sub>n</sub> V	Max. cont. operating voltage U <sub>c</sub> V	Order details	Bbn 3660308	Price 1 piece	Price group	Weight 1 piece	Pack unit
						Type code	Order code	EAN		kg	ppc.

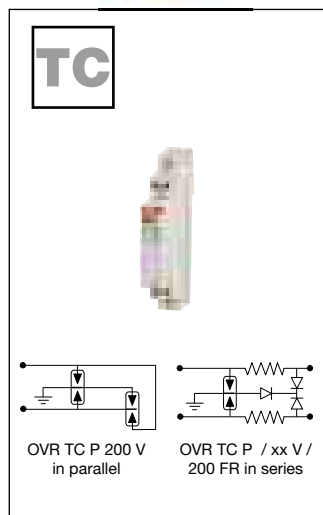
## Type 2 (non pluggable), TT, TNS

1	15	5	1	230	275	<b>OVR T2 15 275</b>	2CTB804200R0100	<b>514882</b>		0.12	1
1	40	20	1.4	230	275	<b>OVR T2 40 275</b>	2CTB804201R0100	<b>514103</b>		0.12	1
4	15	5	1	230	275	<b>OVR T2 4L 15 275</b>	2CTB804600R0500	<b>515612</b>		0.45	1
4	40	20	1.4	230	275	<b>OVR T2 4L 40 275</b>	2CTB804601R0500	<b>515988</b>		0.45	1



## OVR Plus with integrated end of life protection (auto-protected), TT, TNS

1+N	10/10	5/5	1/1.4	230	275/255	<b>OVR Plus 1N 10 275</b>	2CTB813812R2600	<b>516770</b>		0.3	1
N+1	40*/40	20/40	1.6/1.5	230	320/255	<b>OVR Plus N1 40</b>	2CTB803701R0100	<b>517005</b>		0.26	1

\*I<sub>m</sub> = I<sub>max</sub> MOV

## Surge Protective Devices, Low current

The transmission line pluggable surge arresters (OVR TC P) provide protection against transient overvoltages for equipment connected to telephone lines (digital or analog), computer links or current loops, for applications such as RS-485, or 4-20 mA.

1	10	5	0.015	6		<b>OVR TC 6V P</b>	2CTB804820R0000	<b>515230</b>		0.05	1
1	10	5	0.02	12		<b>OVR TC 12V P</b>	2CTB804820R0100	<b>515247</b>		0.05	1
1	10	5	0.035	24		<b>OVR TC 24V P</b>	2CTB804820R0200	<b>515254</b>		0.05	1
1	10	5	0.07	48		<b>OVR TC 48V P</b>	2CTB804820R0300	<b>515261</b>		0.05	1
1	10	5	0.7	200		<b>OVR TC 200V P</b>	2CTB804820R0400	<b>515278</b>		0.05	1
1	10	5	0.3	200		<b>OVR TC 200FR P</b>	2CTB804820R0500	<b>515285</b>		0.05	1
-	10	5	0.015	7		<b>OVR TC 6V C</b>	2CTB804821R0000	<b>515292</b>		0.02	1
-	10	5	0.02	14		<b>OVR TC 12V C</b>	2CTB804821R0100	<b>515308</b>		0.02	1
-	10	5	0.035	27		<b>OVR TC 24V C</b>	2CTB804821R0200	<b>515315</b>		0.02	1
-	10	5	0.07	53		<b>OVR TC 48V C</b>	2CTB804821R0300	<b>515322</b>		0.02	1
-	10	5	0.7	220		<b>OVR TC 200V C</b>	2CTB804821R0400	<b>515339</b>		0.02	1
-	10	5	0.3	220		<b>OVR TC 200FR C</b>	2CTB804821R0500	<b>515346</b>		0.02	1
1	-	-	-	-	-	<b>Base OVR TC RJ11</b>	2CTB804840R1000	<b>515599</b>		0.02	1
2	-	-	-	-	-	<b>Base OVR TC RJ45</b>	2CTB804840R1100	<b>515605</b>		0.04	1

## Surge Protective Devices, Photovoltaic

The photovoltaic pluggable surge arresters OVR PV provide protection for equipment on photovoltaic system (connected), against transient overvoltages that occur on the electrical network.

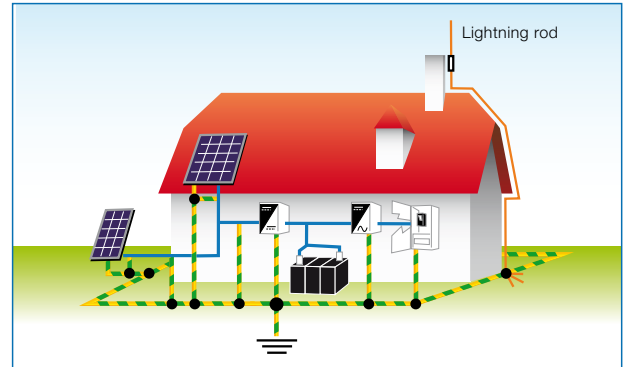
3	40	20	2.8/1.4	600	720	<b>OVR PV 40 600 P</b>	2CTB803953R5300	<b>516510</b>		0.27	1
3	40	20	2.8/1.4	600	720	<b>OVR PV 40 600 P TS</b>	2CTB803953R5400	<b>516527</b>		0.27	1
3	40	20	3.8	1000	1200	<b>OVR PV 40 1000 P</b>	2CTB803953R6400	<b>516534</b>		0.27	1
3	40	20	3.8	1000	1200	<b>OVR PV 40 1000 P TS</b>	2CTB803953R6500	<b>516541</b>		0.27	1

## Replacement cartridges for Surge Protective Devices OVR PV

-	40	20	1.4	600	720	<b>OVR PV 40-600 C</b>	2CTB803950R0000	<b>516558</b>		0.10	1
-	40	20	1.9	1000	1200	<b>OVR PV 40-1000 C</b>	2CTB803950R0100	<b>516565</b>		0.10	1
-	70	30	1.4	1000	-	<b>OVR PV MC*</b>	2CTB803950R0300	<b>516756</b>		0.10	1

### Systems with battery

- Photovoltaic standalone applications
- Possibility of installation between batteries and charger
- Data line if the current is higher than 140 mA



### Telecoms, wind turbines, industrial applications under very low voltage

Between transformer 230/48V or 24V (AC-DC) and equipment to be protected, for example:

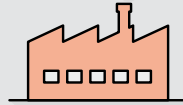
- PLC's
- Sensors



Available products for very low voltage applications

Description	Max discharge current I <sub>max</sub> (8/20)	Nominal discharge current I <sub>n</sub>	Nominal Voltage U <sub>n</sub>	Protection level U <sub>p</sub>
OVR 15 75 P <b>2CTB813851R2800</b>	15 kA	5 kA	57 V	0.3 kV
OVR 15 75 P TS <b>2CTB813851R2700</b>	15 kA	5 kA	57 V	0.3 kV
OVR 2 15 75 P <b>2CTB813852R1700</b>	15 kA	5 kA	57 V	0.3/0.6 kV
OVR 2 15 75 P TS <b>2CTB813852R1600</b>	15 kA	5 kA	57 V	0.3/0.6 kV
OVR 2 15 75s P TS <b>2CTB813852R1300</b>	15 kA	5 kA	57 V	0.3/0.6 kV

Industry, Commercial Building,  
Apartment Building



Sensitive equipment is directly connected downstream of the SPD ?

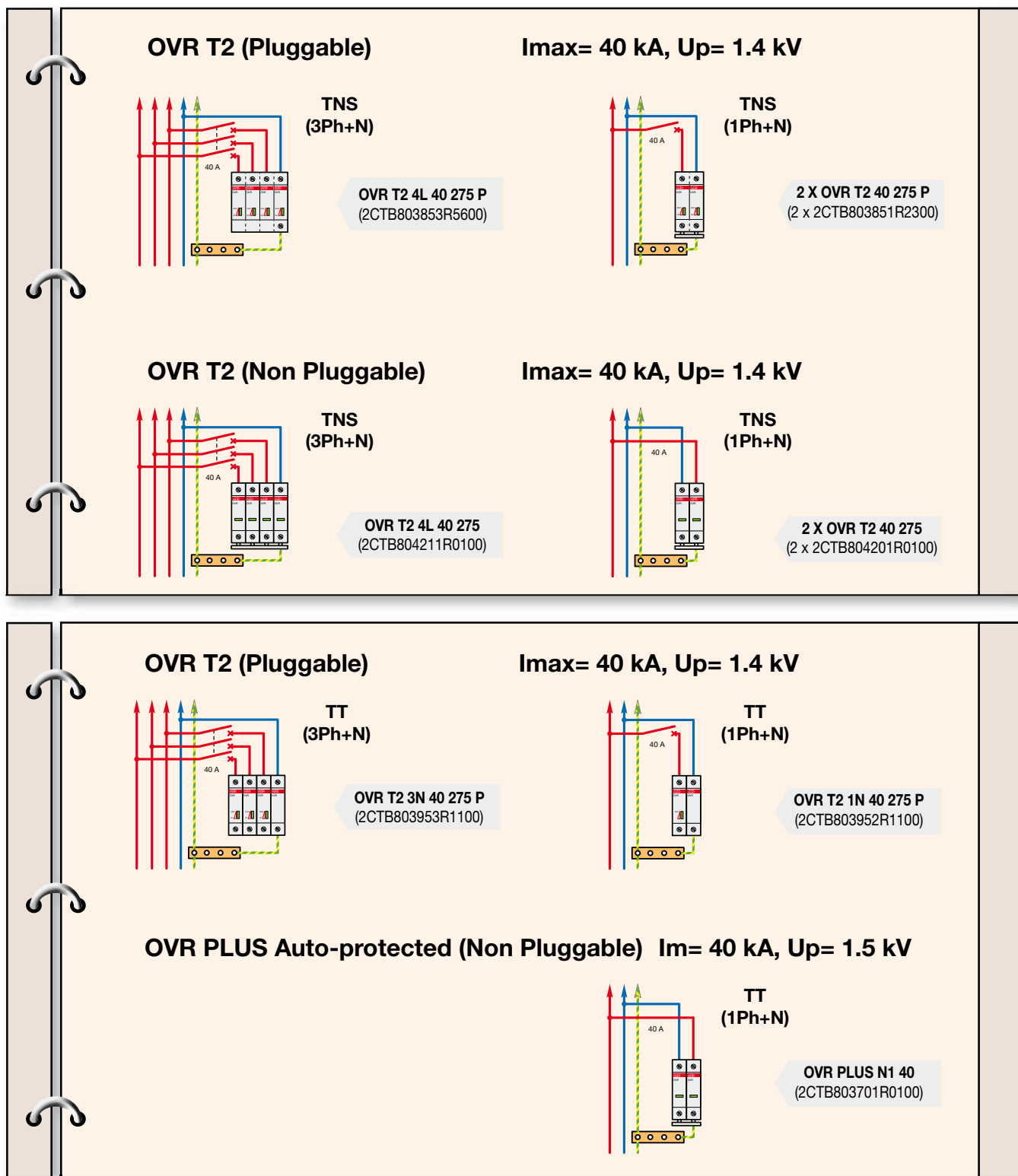
No

Yes

<p><b>No tripping of the upstream fuse for Ip up to 7 kArms <sup>(1)</sup></b></p> <p><b>SPD Type 1, Iimp= 25 kA/ pole, Up= 2.5 kV, Ift= 7 kArms <sup>(1)</sup></b> <b>OVR T1</b></p> <p><b>TNC</b></p> <p>3 x OVR T1 25 255-7 (3 x 2CTB815101R8700)</p> <p><b>TNS</b></p> <p>4 x OVR T1 25 255-7 (4 x 2CTB815101R8700)</p> <p><b>TT (3 Ph + N)</b></p> <p>OVR T1 3N 25 255-7 (2CTB815101R8800)</p>	<p><b>No tripping of the upstream fuse for Ip up to 15 kArms <sup>(1)</sup></b></p> <p><b>SPD Type 1+2, Iimp= 25 kA/ pole, Up= 1.5 kV, Ift= 15 kArms <sup>(1)</sup></b> <b>OVR T1+2</b></p> <p><b>TNC</b></p> <p>3 x OVR T1+2 25 255 TS (3 x 2CTB815101R0300)</p> <p><b>TNS</b></p> <p>4 x OVR T1+2 25 255 TS (4 x 2CTB815101R0300)</p> <p><b>TT (3 Ph + N)</b></p> <p>3 x OVR T1+2 25 255 TS (2CTB815101R0300) + OVR T1 100 N (2CTB815101R0500)</p>
<p><b>No tripping of the upstream fuse for Ip up to 50 kArms <sup>(1)</sup></b></p> <p><b>SPD Type 1, Iimp= 25 kA/ pole, Up= 2.5 kV, Ift= 50 kArms <sup>(1)</sup></b> <b>OVR T1</b></p> <p><b>TNC</b></p> <p>OVR T1 3L 25 255 (2CTB815101R1300) or OVR T1 3L 25 255 TS (2CTB815101R0600)</p> <p><b>TNS</b></p> <p>OVR T1 4L 25 255 (2CTB815101R1400) or OVR T1 4L 25 255 TS (2CTB815101R0800)</p> <p><b>TT (3 Ph + N)</b></p> <p>OVR T1 3N 25 255 (2CTB815101R1600) or OVR T1 3N 25 255 TS (2CTB815101R0700)</p>	<p><b>No tripping of the upstream fuse for Ip up to 50 kArms <sup>(1)</sup></b></p> <p><b>SPD Type 1, Iimp= 25 kA/ pole, Up= 2.5 kV, Ift= 50 kArms <sup>(1)</sup></b> <b>+ SPD Type 2, Imax= 40 kA/pole, Up= 1.4 kV</b> <b>OVR T1 + OVR T2</b></p> <p><b>TNC</b></p> <p>OVR T1 3L 25 255 (2CTB815101R1300) or OVR T1 3L 25 255 TS (2CTB815101R0600)</p> <p>+</p> <p>OVR T2 3L 40 275 P (2CTB803853R2400)</p> <p><b>TNS</b></p> <p>OVR T1 4L 25 255 (2CTB815101R1400) or OVR T1 4L 25 255 TS (2CTB815101R0800)</p> <p>+</p> <p>OVR T2 4L 40 275 (2CTB804211R0100) or OVR T2 4L 40 275 P (2CTB803853R5600)</p> <p><b>TT (3 Ph + N)</b></p> <p>OVR T1 3N 25 255 (2CTB815101R1600) or OVR T1 3N 25 255 TS (2CTB815101R0700)</p> <p>+</p> <p>OVR T2 3N 40 275 P (2CTB803953R1100)</p>

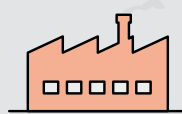
**Additional SPD Type 2 in sub-distribution boards (for industry and big houses), or in each apartment (for apartment buildings) or at each floor/in each office (for office buildings).**

- Needed when the voltage protection level of the upstream Type 1 SPD is too high with regards to the withstand capability to overvoltage of the equipment to protect. No minimum distance for coordination is required between Type 1 SPD and Type 2 SPD, excepted between OVR T1xx xx 255-7 and Type 2, minimum distance required is 5 meters.
- Needed when the distance between the upstream SPD (Type 1, Type 1+2 or Type 2) and the equipment to be protected is too high. Additional Type 2 SPD close to the equipment to protect is recommended when this distance overcomes 10 meters and compulsory above 30 meters. Additional Type 2 SPD is not necessary when the distance is less than 10 meters and it shall not be installed for coordination reasons.





Industry



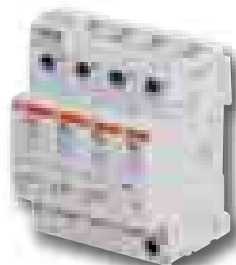
Lightning  
rod



Low current  
protection



OVR TC 48 V P  
2CTB804820R0300



OVR T2 3N 40 275 P TS  
2CTB803953R1100






Sub-distribution  
board

Main-distribution  
board



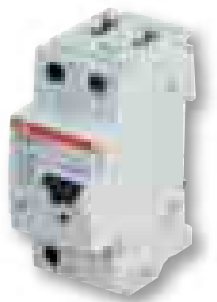
OVR T1 3N 25 255 TS  
2CTB815101R0700

Equipment protection in industrial sector

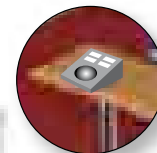
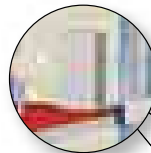
	Description	Impulse current $I_{imp}$ (10/350)	Follow current $I_{fi}$	Max. discharge current $I_{max}$ (8/20)	Nominal discharge current $I_n$	Nominal voltage $U_n$ (L/N-LL)	Protection level $U_p$
	OVR T1 3N 25 255 TS 2CTB815101R0700	25 kA	50 kA	/	25 kA	230/400 V	2.5 kV
	OVR T2 3N 40 275 P TS 2CTB803953R1100	/	/	40 kA	20 kA	230/400 V	1.4 kV
	OVR TC 48 V P 2CTB804820R0300	/	/	10 kA	5 kA	48 V	70 V
	Lightning rod OPR 30 stainless steel with mast 2CTB899800R7300	Please contact us and ask for leaflet 2CTC 432 004 B0202					
	Lightning rod OPR 60 stainless steel with mast 2CTB899800R7400	Please contact us and ask for leaflet 2CTC 432 004 B0202					



Commercial Building,  
Apartment Building



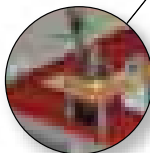
OVR PLUS N1 40  
**2CTB803701R0100**  
No upstream MCB or fuse  
required



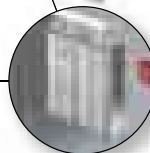
OVR TC 24 V P  
**2CTB804820R0200**

Interphone  
protection

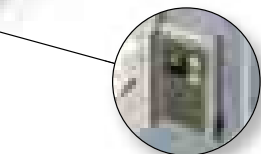
Telephone  
protection



OVR TC 48 V P - ISDN (S<sub>0</sub>)  
**2CTB804820R0300**







Automatic  
exchange  
protection



OVR T1 3N 25 255 TS  
**2CTB815101R0700**

Equipment protection in commercial sector

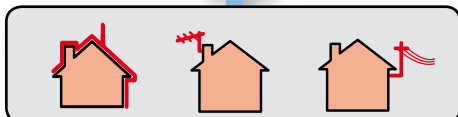
	Description	Impulse current $I_{imp}$ (10/350)	Follow current $I_{fi}$	Max. discharge current $I_{max}$ (8/20)	C <sub>2</sub> nominal discharge current $I_n$	Nominal voltage $U_n$	Protection level $U_p$
	OVR TC 24 V P <b>2CTB804820R0200</b>	/	/	10 kA	5 kA	24 V	35 V
	OVR TC 48 V P <b>2CTB804820R0300</b>	/	/	10 kA	5 kA	48 V	70 V
	OVR T1 3N 25 255 TS <b>2CTB815101R0700</b>	25 kA	50 kA	/	25 kA	230 V	2.5 kV
	OVR PLUS N1 40 <b>2CTB803701R0100</b>	/	/	$I_m = 40$ kA $I_{max} = 20$ kA	20 kA	230 V	1.6 kV

## Residential

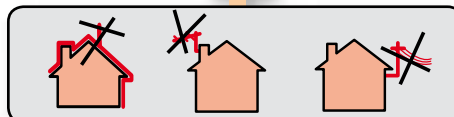


with extraneous conductive parts (with external lightning protection system, with antenna...) or powered by aerial lines

Yes

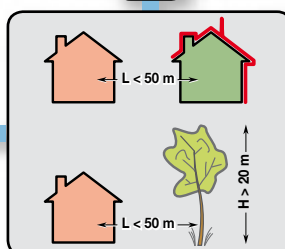


No

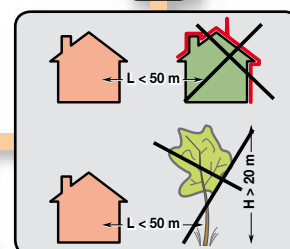


Neighbor with external lightning protection system (or generally with earthed extraneous conductive parts), or proximity of high point

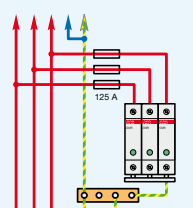
Yes



No

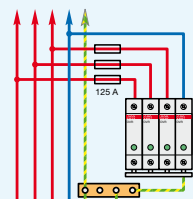


SPD Type 1+2,  $I_{imp} = 15 \text{ kA/ pole}$ ,  $U_p = 1.5 \text{ kV}$ ,  $I_{fi} = 7 \text{ kA rms}$  <sup>(1)</sup>  
OVR T1+2



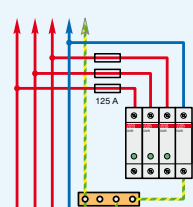
TNC

3 x OVR T1+2 15 255-7  
(3 x 2CTB815101R8900)



TNS

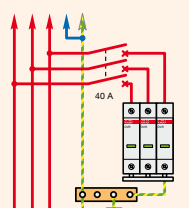
4 x OVR T1+2 15 255-7  
(4 x 2CTB815101R8900)



TT (3 Ph + N)

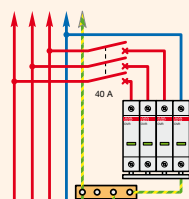
OVR T1+2 3N 15 255-7  
(2CTB815101R9000)

SPD Type 2,  $I_{max} = 40 \text{ kA/ pole}$ ,  $U_p = 1.4 \text{ kV}$   
OVR T2



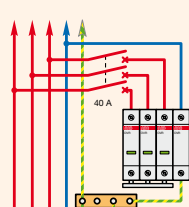
TNC pluggable

OVR T2 3L 40 275 P  
(2CTB803853R2400)



TNS pluggable

OVR T2 4L 40 275 P  
(2CTB803853R5600)



TT (3 Ph + N) pluggable

OVR T2 3N 40 275 P  
(2CTB803953R1100)

(1) Taking into consideration of the prospective short-circuit current of the power supply ( $I_p$ ):

For Type 1 Products based on spark-gap technology when overvoltage reaches the SPD, an electrical arc is created between the electrodes of the spark-gap. This arc will short-circuit the phase to earth and will enable the surge to be discharged. Once the surge has been discharged, current from the mains (follow-current) will still flow through the SPD as the spark-gap is short-circuiting the phase to earth. If not interrupted by the SPD, this follow-current will cause the upstream fuse to melt.

The proposed Type 1 products in this selection table are able to interrupt the follow-current by themselves without tripping of the upstream fuse. For these solutions  $I_{fi} \geq I_p$  ( $I_{fi}$  is the follow-current interrupting rating of the SPD: it is the follow-current which can be interrupted by the SPD alone).

- Only required if a fuse of the same or a lower nominal value is not already provided in the upstream power supply.
- Maximum value allowed (fuse or MCB of lower value can be used). Only required if a fuse or MCB of the same or smaller nominal value is not provided in the upstream power supply.

Residential



**Telephone protection**

OVR TC 200 FR P  
2CTB804820R0400

**Enclosure**

OVR PLUS 1N 10 275  
2CTB813812R2600  
No upstream MCB or fuse required

**Equipment protection in the domestic sector**

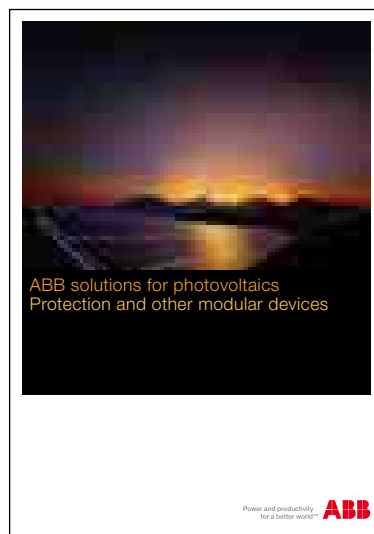
	Description	Max. discharge current $I_{max}$ (8/20)	$C_2$ nominal discharge current $I_n$	Nominal voltage $U_n$	Protection level $U_p$
	OVR TC 200 FR P 2CTB804820R0400	10 kA	5 kA	200 V	400 V
	OVR PLUS 1N 10 275 2CTB813812R2600	10 kA	5 kA	230 V	1 kV

ABB offers a complete list of documentation including our surge arresters with an environment of ABB components.

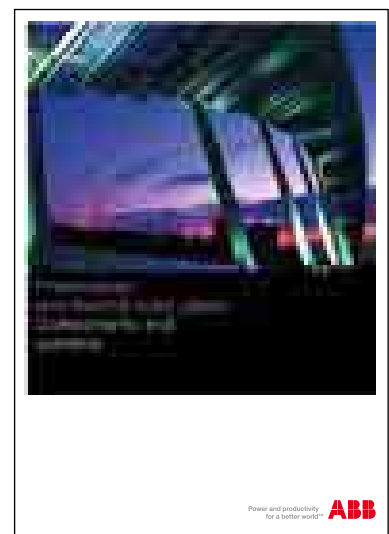
- ABB Technical catalogue for Din rail products
- ABB Din rail solutions for photovoltaics
- ABB complete offer for photovoltaic & thermal solar



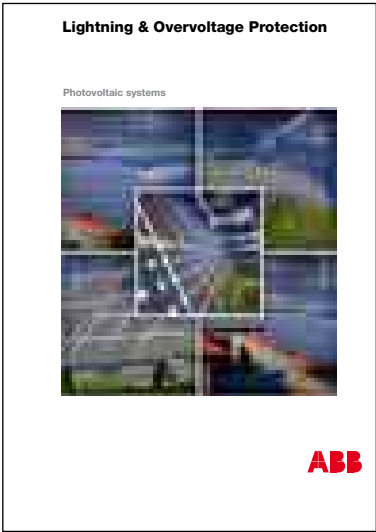
**Technical catalogue**  
System pro M compact®  
and other modular devices  
for low voltage installation



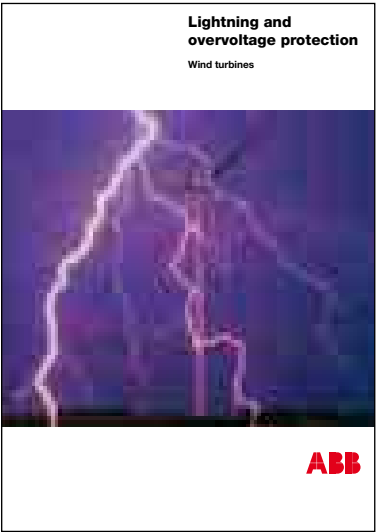
**Brochure**  
ABB solutions for photovoltaics  
Protection and other  
modular devices



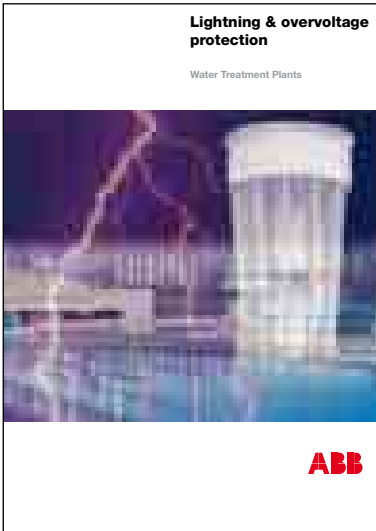
**Brochure**  
Photovoltaic and  
thermal solar plants  
Components and systems



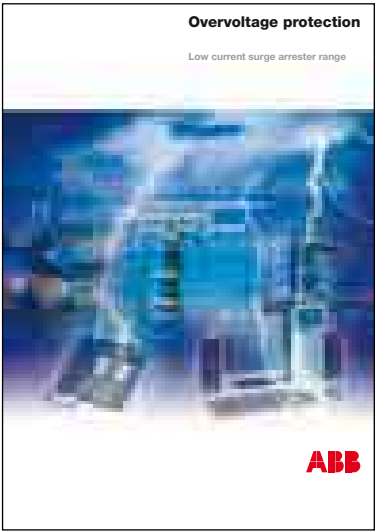
Photovoltaic



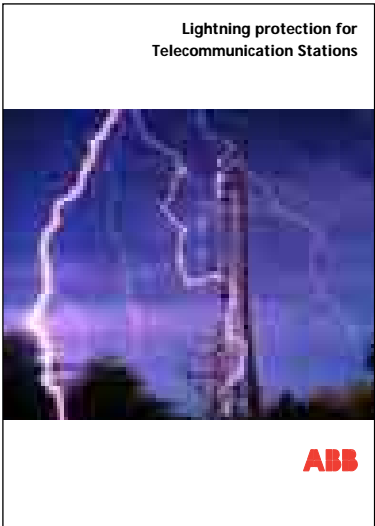
Wind turbine



Water



Low current



Telecom

# Notes





# Contact us

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