



# Global guide to surge protection

Efficient protection against surges for power networks, telephone and data lines



- Protection of power networks
- Protection of data lines
- Protection of telephone lines
- Including QuickSafe® technology

—  
**Transient surges coming from lightning strikes, switching operations on the electrical network or parasitic interference represent the main cause of electrical devices failure and loss of productivity.**

**With its experience gained over the last few decades, ABB is using its technological expertise for lightning and surge protection. ABB's product range of surge protective devices (SPD) offer protection for power and low voltage networks, including power, telephone and data lines.**



# Global guide to surge protection

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# A bit of history...

**1862**  
M. François Soulé  
creates the Soulé  
company (FR).

**1895**  
Creation of Furse  
(UK).

**1932**  
The External  
Lightning  
protection  
company Hérita  
is created.

**1960**  
First SPD by Soulé  
using Silicon  
Carbide.



**1964**  
Creation of Joslyn  
(USA).

**1971**  
Creation  
of Current  
Technologies  
(USA).

**1980**  
First DIN-Rail SPD  
with Metal Oxide  
Varistor (MOV).



**1984**  
Invention of  
the first  
Early Streamer  
Emission Terminal,  
type Pulsar,  
by Hérita and CNRS.

**1989**  
Soulé purchases the  
Hérita company to  
offer a complete  
lightning and,  
overvoltage solution.



**1999**  
New Wavy design  
and phase  
+ neutral version.

**1999**  
Split between MV,  
HV and Low Voltage  
activities. Soulé  
sales non-core  
businesses.



**1990**  
SPD with thermal  
disconnection  
and end of life  
indication.

**2001**

Entrelec® is purchased by ABB. Soulé & Hérita become the Low Voltage lightning protection experts within the ABB group.



**2009**

Self Protected SPD, with MCB or fuse.



**2014**

Launch of the OVR for street lighting protection.



**2007**

Joslyn and Current Technologies are purchased by Thomas&Betts.

**2011**

Fitted as standard with a lightning strike indicator RodCheck®.

**2015**

QuickSafe® launch

**2019**

New OVR T1-T2 PV QS series launch

**2000**

Soulé is purchased by Entrelec®.

**2004**

First Type 1 Spark gap technology. ABB branded.



**2012**

Thomas&Betts is purchased by ABB.

**2016**

OVR SL Data range launch



**2019**

New Type 1, OVR T1-T2 25kA QuickSafe® launch



**2010**

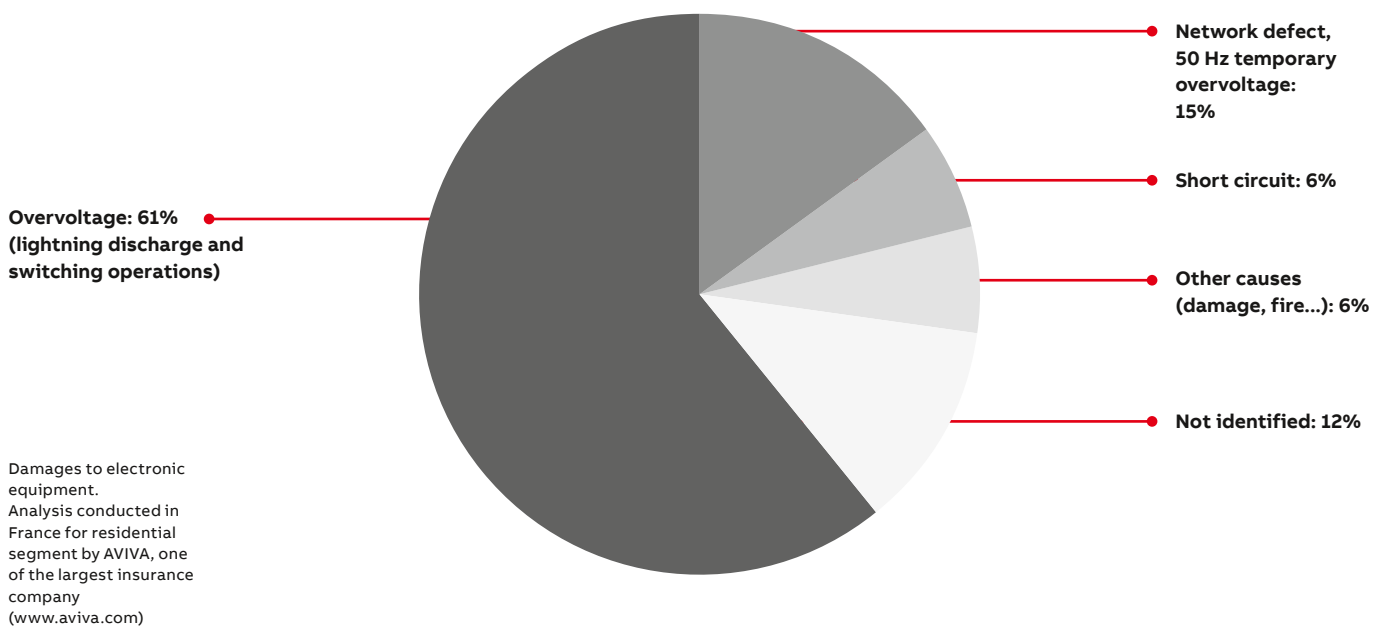
Launch of the System Pro M Compact® range with Safety Reserve System as option. Unique product in the market back then.



# Surges General Information

Surge Protective Devices (SPDs) are designed to protect against transient surge conditions. Lighting and utility power anomalies only account for 20% of transient surges, while 80% are produced internally in a facility.

At a time when electronic equipment has become more and more sensitive residential, commercial and industrial sectors have become more reliable on their computers and telecommunications equipment systems. With miniaturization process of circuit and components electronics modern equipment is now more inclined to be damaged from transient overvoltage. Downtime in one of these computer systems, due to transient surges, can have catastrophic consequences. Loss of operations, loss of service, loss of data and of productivity involved. In most of the cases, there are huge consequences whose cost greatly exceed that of the equipment being protected.



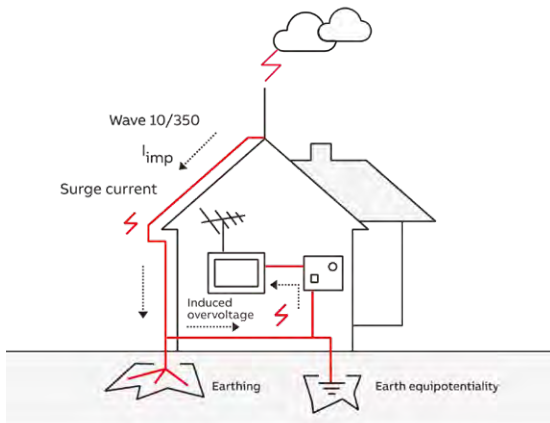
Transient Surges represent the main cause of electrical devices failure and loss of productivity but what is a transient surge? Transient overvoltage is a short duration, high magnitude voltage peaks with fast rising edges, commonly referred to as surges. Often described as a "spike" transient voltages can reach up to 6000 V on a low-voltage consumer network, with no more than a millisecond duration.

**Lightning strikes are the most common source of extreme transient overvoltage.**

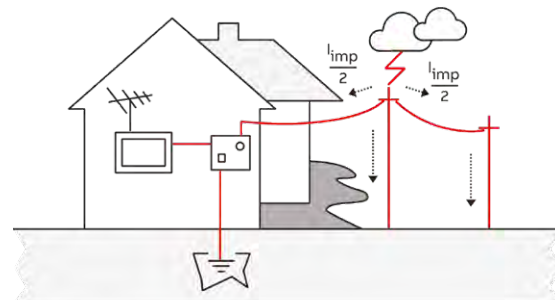
When a lightning strikes directly a building equipped with a lightning protection system (LPS), the lightning current is dissipated to the ground through the down conductors. However, the transient overvoltage can be propagated into the building through the earthing of the electrical installation.

This type of direct effect can cause fire, damage the internal installation and the equipment or even worse can injury living beings.

The same with a lightning strike on external line connected to the building, which can, through the cables, create fire and destruction of the internal electrical installation.



Lightning strike on an external air terminal or on the building

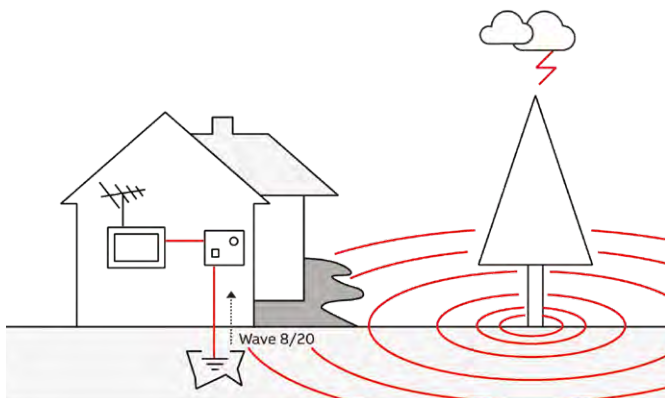


Lightning strike on an overhead line connected to the building

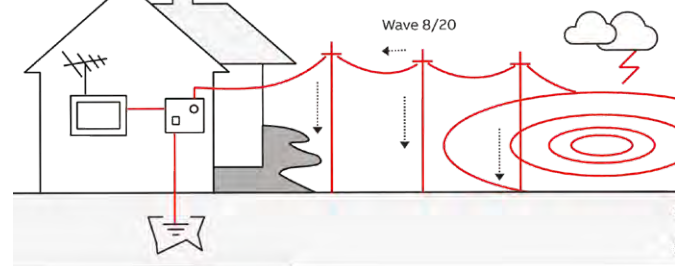
**Transient overvoltages due to indirect lightning effects**

Transient overvoltages can also be the effect of an indirect lightning strike close to the building or close to external lines connected to the building. In that case, the electromagnetic

field created by the lightning current will generate resistive and inductive couplings. As a consequence, these can cause serious malfunction or damages to the internal installation or equipment.



Lightning strike near a building



Lightning strike near an overhead line

However, electrical and electronic equipment is also continually stressed by hundreds of transients that occur every day on the power supply network through switching operations. Although switching transients are of lower magnitude than lightning transients, they occur more frequently, and equipment failures unexpectedly occur often after a time delay; degradation of electronic components within the equipment is accelerated due to the continual stress caused by these switching transients.

Transient overvoltages whether caused by lightning or by electrical switching have similar effects on electronic equipment. Therefore, it is important to install a Surge Protective Device (SPD). SPDs are designed to safeguard electrical systems and equipment against transitory surges and impulses such as those caused by lightning and operation of the electrical grid.

SPDs contain at least one non-linear component. Their function is to divert the discharge or impulse current and limit the overvoltage to the downstream equipment. During normal operation of a SPD it has no influence on the system it is applied to which it is applied. It acts like an open circuit and maintains the isolation between the active conductors and earth ground. When a voltage surge occurs, the SPD reduces its impedance within nanoseconds and diverts the impulse current. The SPD behaves like a closed circuit, the overvoltage is short-circuited and limited to an acceptable value for the electrical equipment connected downstream. Once the impulse surge has stopped, the SPD will return to its original impedance and return to the open circuit condition.

Professionally installed ABB products provide superior protection against transient surges preventing unnecessary downtime and costly repairs.

—  
01  
Transient overvoltage damage  
to a circuit board  
—  
02  
Most damage is barely visible

—  
01—  
02



# Technical reference

## Overvoltage protection overview IEC/EN standards

International safety standards establish a requirement for assessing protection against transient overvoltages (surges) as an integral part of satisfactory electrical system design. A summary is provided within IEC 60364 standard for electrical installations of buildings regarding the requirements of surge protective devices (SPDs)

IEC 60364 assesses the need to protect AC power circuits, although cross-references transient overvoltage or surge protection on other metallic services including data, signal and telecommunications lines, as defined by IEC/EN 62305 Standard for Lightning Protection.

It covers transient overvoltages of atmospheric origin (lightning) or as a result of electrical switching, through two sections:

- **Section 443** which defines the criteria for risk assessment to use SPDs, considering factors such as levels of consequential loss due to overvoltages and the equipment rated impulse voltage
- **Section 534** which outlines the parameters for selection and installation of SPDs as appropriate, to ensure satisfactory protection of the structure itself and its contents, its personnel and electronic systems and electrical equipment.

### Risk assessment

Section 443 establishes that SPD are required where the consequences caused by overvoltage leads to:

- (a) results in serious injury to, or loss of, human life, (e.g. hospitals, care homes, home dialysis equipment)
- (b) results in interruption of public services and/or damage to cultural heritage, (e.g. power stations, data centres, heritage status buildings like museums, castles)
- (c) results in interruption of commercial or industrial activity (e.g. banks, hotels, supermarkets, industrial plants, farms)
- (d) affects a large number of collocated individuals (e.g. offices, universities, schools, residential tower blocks)

For all other cases than above a simplified risk assessment to determine the Calculated Risk Level CRL shall be conducted. Note that a comprehensive risk assessment method to (IEC/EN 62305-2) must be used for high risk installations such as nuclear or chemical sites where the consequences of transient overvoltages could lead to explosions, harmful chemical or radioactive emissions thus affecting the environment.

In all cases, IEC/ EN 62305 which would require installation of equipotential bonding SPDs where a structural lightning protection system (LPS) is installed, or there is a risk of a direct lightning stroke to a service line.

### **Selection & installation of SPDs**

Section 534 provides guidance on the selection and installation of SPDs to limit transient overvoltages.

The selection of an SPD is dependent on its location within the installation, the equipment rated impulse voltage at this location, and the expected transient overvoltage energy that the SPD is required to limit. The largest transient overvoltages are expected at the service entrance, i.e. at the origin of the installation.

Additionally transient overvoltages can be anticipated at sensitive and critical equipment as a result of electrical switching within the installation. SPDs should therefore be installed as appropriate at main distribution board level, subdistribution board level to protect sensitive equipment, and locally to protect critical equipment. Where multiple SPDs are installed on the same conductor, these should coordinate with each other to ensure protection levels are not compromised within the system.

Where SPDs are required they must be tested in line with SPD product standards IEC/EN 61643 series. Power SPDs are classified to IEC/EN 61643-11 by Class /Type respectfully. High energy Class I/Type 1 tested SPDs (Type 1) must be installed at the service entrance where a structural LPS is installed or there is an overhead metallic service line at risk from a direct lightning stroke.

Class I tested/Type I SPDs however do not provide protection to electronic systems. Transient overvoltage SPDs (Class II tested/Type 2 and Class III tested/Type 3) are required downstream to protect sensitive and critical equipment. These SPDs protect against the transient overvoltages caused by indirect lightning (inductive or resistive coupling) and the electrical switching of large inductive loads.

Combined Class/Type SPDs are classified with more than one Class test/Type, e.g. Class I+II tested SPD to IEC or Type 2+3 to EN. Such SPDs can provide both lightning current with overvoltage protection in addition to protection between all conductor combinations (or modes of protection) within a single unit. Combined Type SPDs provide high surge current handling combined with better overvoltage protection levels ( $U_p$ ) a performance parameter of an SPD.

The most important characteristic for an SPD is its voltage protection level ( $U_p$ ) and not its energy withstand (e.g.  $I_{imp}$ ).

SPDs with lower voltage protection levels (or let-through voltage) offer much better protection to sensitive and critical electronic systems, including:

- Minimal equipment stress (i.e. keeping circuit degradation to a minimum)
- Reduced risk from additive inductive voltages on the SPDs connecting leads
- Reduced risk from downstream voltage oscillations

# Technical reference

## IEC/ EN 61643 SPD standard series focus

ABB SPDs meet the performance parameters defined in International & European SPD product standards:

- IEC/EN 61643-11 Surge protective devices connected to low-voltage power systems - requirements and tests
- IEC/EN 61643-21 Surge protective devices connected to telecommunications and signalling networks - performance requirements and testing methods

These parts of the IEC/EN 61643 standard apply for all SPDs providing protection against lightning (direct and indirect) and transient overvoltages.

IEC/EN 61643-11 covers AC mains protection, for 50/60 Hz AC power circuits and equipment rated up to 1000 VRMS AC and 1500 V DC.

IEC/EN 61643-21 covers telecommunications and signalling networks with nominal system voltages up to 1000 VRMS AC and 1500 V DC.

Within these parts to the standard is defined:

- The electrical requirements for SPDs, including voltage protection and current limiting levels, status indication and minimum test performance
- The mechanical requirements for SPDs, to ensure an appropriate quality of connection, and mechanical stability when mounted
- The safety performance of the SPD, including its mechanical strength and its ability to withstand heat, overstress and insulation resistance

The standard establishes the importance of testing SPDs to determine their electrical, mechanical and safety performance.

Electrical tests include impulse durability, current limiting, and transmission tests. Mechanical and safety tests establish levels of protection against direct contact, water, impact, the SPD installed environment etc.

For voltage and current limiting performance, an SPD is tested according to its Type (or Class to IEC), which defines the level of lightning current or transient overvoltage it is expected to limit/divert away from sensitive equipment.

Tests include Class I impulse current (10/350 waveform), Class I & II nominal discharge current (8/20 waveform), Class I & II voltage impulse and Class III combination wave tests for SPDs installed on power lines, and Class D (high energy), C (fast rate of rise), and B (slow rate of rise) for those on data, signal and telecoms lines.

SPDs are tested with the connections or terminations following manufacturer's instructions, as per the expected SPD installation.

Measurements are taken at the connectors/terminals. Three samples of an SPD are tested and all must pass before approval is granted.

SPDs which have been tested to IEC/EN 61643 should be suitably labelled and marked, to include the relevant performance data for their application.

**SPD application and installation standards**

Within IEC/EN 61643 there are two further standards which provide recommendations on the selection and installation of SPDs.

These are:

- IEC/EN 61643-12 Surge protective devices connected to low-voltage power systems - selection and application principles
- IEC/EN 61643-22 Surge protective devices connected to telecommunications and signalling networks - selection and application principle

These application standards should be used with IEC/EN 61643-11 and IEC/EN 61643-21 respectively. Each application standard provides information and guidance on:

- Risk assessment and evaluating the need for SPDs in low-voltage systems, with reference to IEC/EN 62305 Lightning Protection standard and IEC 60364 Electrical installations for buildings
- Important characteristics of an SPD (e.g. voltage protection level) in conjunction with the protection needs of equipment (i.e. its rated impulse voltage or impulse immunity voltage)
- Selection of SPDs considering the entire installation environment, including their classification, function and performance
- Coordination of SPDs throughout the installation (for power and data lines) and between SPDs and RCDs or overcurrent protective devices

Through following the guidance in these documents, appropriate specification of SPDs to meet the installation requirement can be achieved.

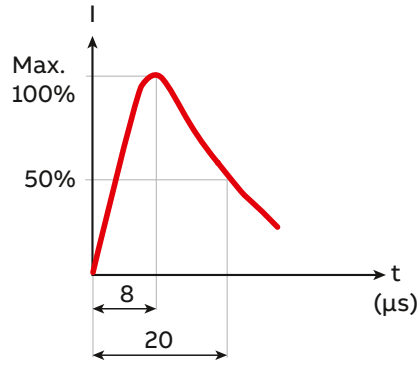
ABB also provide SPDs tested to UL standards - a summary of the differences in between IEC SPD test standards and UL SPD test standards terminology follows.

# IEC and UL SPD test standards terminology

IEC 61643-11 Terminology	Description	UL 1449 Terminology
$I_{imp}$	The maximum surge current rating for an SPD when subjected to a 10 x 350µs wave shape	No equivalent
$I_{max}$	The maximum surge current rating for an SPD when subjected to an 8 x 20µs wave shape	Single surge current rating
$I_n$	Nominal surge discharge current 8 x 20µs wave shape	$I_N$
$I_{SCCR}$	Short Circuit Current Rating (withstand)	SCCR
$U_p$	Voltage Protection Level, let-through voltage level of the SPD when subjected to a test surge	VPR
$U_C$	Maximum Continuous Operational Voltage SPD can be exposed to without failure.	MCOV
$U_N$	Nominal Operational Voltage, or application voltage	Operational voltage

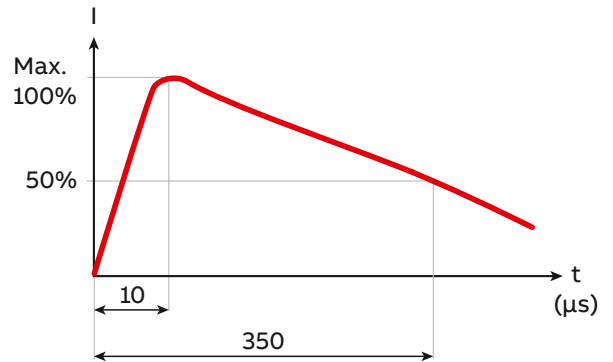
### 8 x 20µs wave shape

- Used for IEC Class II test (EN Type 2)
- $I_{max}$  is the surge current value designation for IEC
- $I_n$  is also tested using this wave shape
- UL single surge current rating



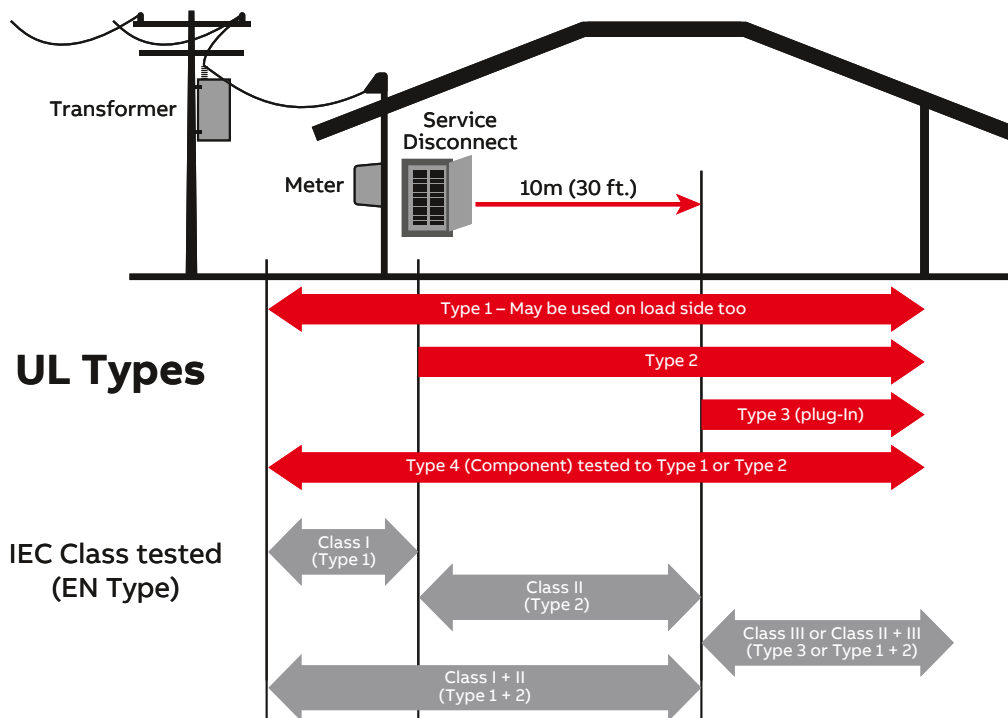
### 10 x 350µs wave shape (IEC only)

- Used for IEC 61643-11/ Class I tested SPD or EN 61643-11 Type 1
- SPD must survive 5 impulses increasing in magnitude to max  $I_{imp}$
- $I_{imp}$  is then the surge current value designation if SPD passes
- There is no equivalent test in the UL standard



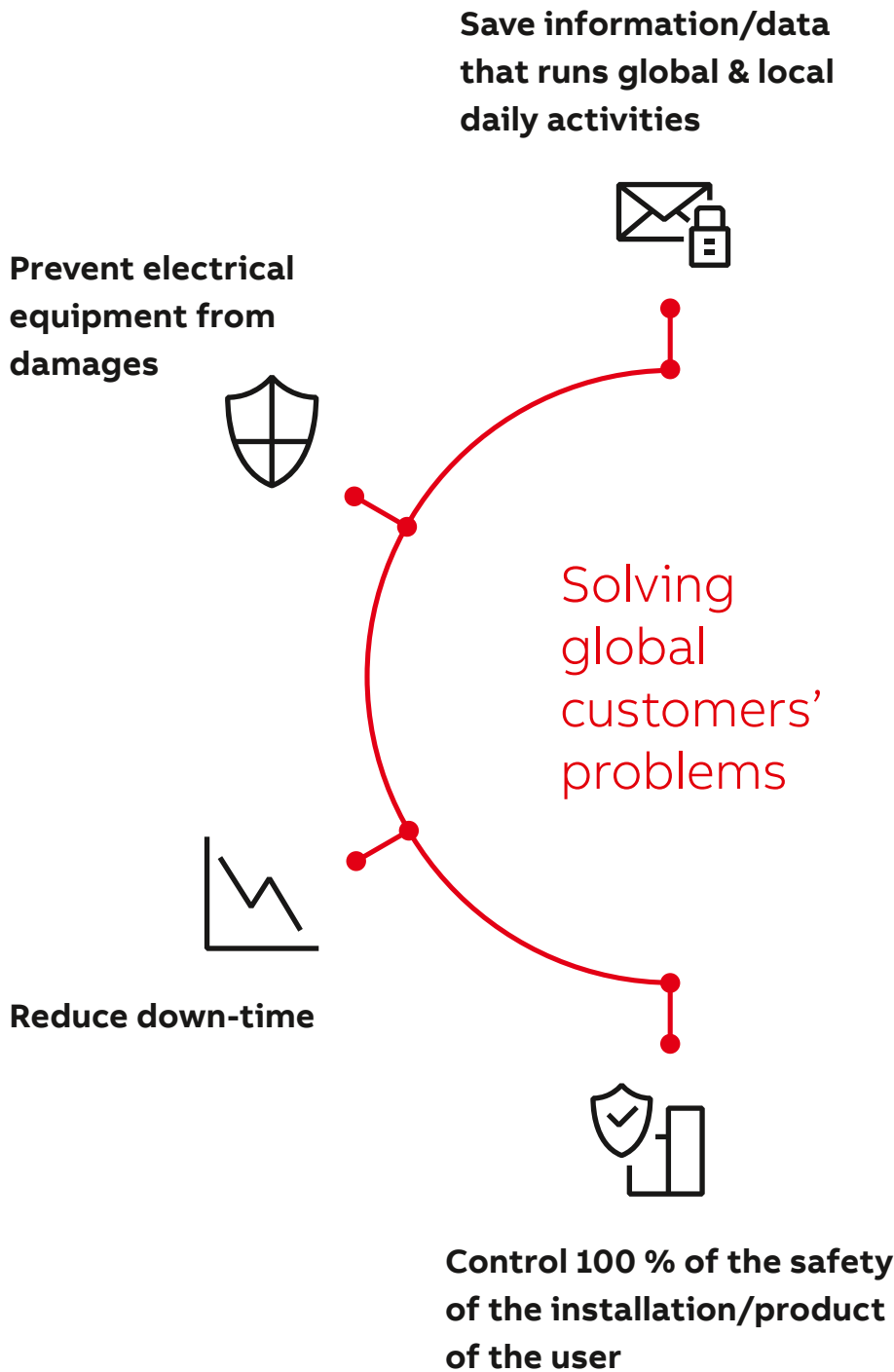


# UL Types vs IEC Class tested SPDs and Locations



# Preamble

## SPDs - Global customers' problem solving



# Preamble

## SPDs - Differentiation



### IEC (&UL) portfolio – DIN-Rail

- Type 1 AC
- Type 1+2
- Type 2
- Type 2+3
- Solar (DC)
- Wind
- ...



furse

### BS portfolio – DIN rail and non-DIN rail

- Combined Type 1+2+3 AC
- DC SPDs
- Special applications
- ...



### UL portfolio – non-DIN-Rail

- Service entrance
- Mid-level distribution
- Panel distribution
- Accessories
- ...



### Global data protection portfolio – DIN-Rail and non-DIN-Rail

- Data signal lines
- CCTV security systems
- Computer networks
- Data centres
- Telecommunication
- PLC power supply
- Process industry
- ...

# SPD Product Overview

## ABB OVR SPDs for IEC/EN 61643-11.

### Power Supply and Special Applications

#### OVR Type 1 and Type 1+2 main entrance lightning protection

- Surge and lightning protection (LPZ 0 to LPZ 1 and 2)
- Protection of the installation against direct lightning
- Impulse discharge current (Iimp) from 12.5 to 100 kA
- Exposed building to lightning surges shall be protected with Type 1 or Type 1+2 surge

Exposed building to lightning surges shall be protected with Type 1 or Type 1+2 surge protective devices (SPDs). With a high impulse current discharge capacity (Iimp), they are located at the service entrance of the installation to avoid the destruction of the main switch board. Building protected against lightning with an external lightning protection (simple rod, meshed cage or ESE) must have at least a Type 1 SPD in the main distribution board.

#### OVR Type 2 and Type 2+3 and OVR Plus surge protective devices

- Surge protection (LPZ 1 to 2...)
- Sub-distribution board installation
- Prolonged life time of sensitive equipment
- Autoprotected surge protective devices with the OVR Plus range.

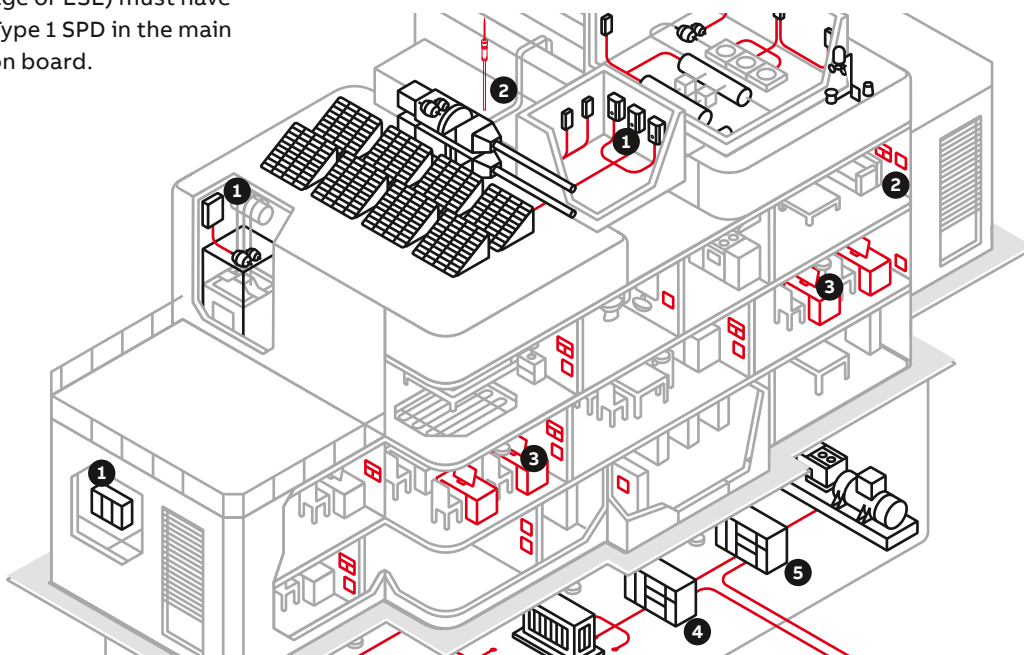
Most of the equipment sustain repetitive transient surges. Generated by indirect lightning strikes or by industrial environment, these transient overvoltages deteriorate and drastically reduce the life time of sensitive equipment like computers.

Located in the sub-distribution boards of the installation, as close as possible to the equipment to protect, they offer a reliable and safe surge.

#### OVR PV , OVR SL and OVR WT specific surge protection solutions

- Dedicated SPDs for solar, street lighting and wind application
- Surge and lightning protection from LPZ 0 to LPZ 2
- Cost saving in avoiding down time of installations

Due to their high exposure to lightning and their specific electrical configuration, solar and wind turbine installations require a dedicated surge and lightning protection which take into consideration their specificities, high DC voltages for solar, high IP and slim dimensions for SL and high repetitive peak voltages for wind turbines. The use of standard surge protection on such installation may lead to down time or even destruction of the installation.



- |                                     |  |  |  |
|-------------------------------------|--|--|--|
| 1. OVR T2 in sub distribution board | 3. OVR PV T1-T2 and OVR PV T2 in combiner/inverter box | 4. OVR Cat 5e protection of Ethernet lines | 5. OVR T1 and OVR T1-T2 in main switch board |
| 2. Lightning rod (ESEAT)            |  |  |  |

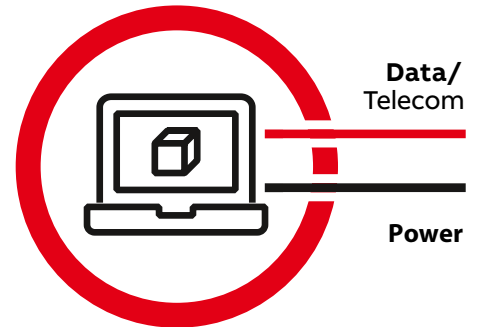
# SPD Product Overview

ABB OVR Data Lines SPD range for IEC/EN 61643-21.

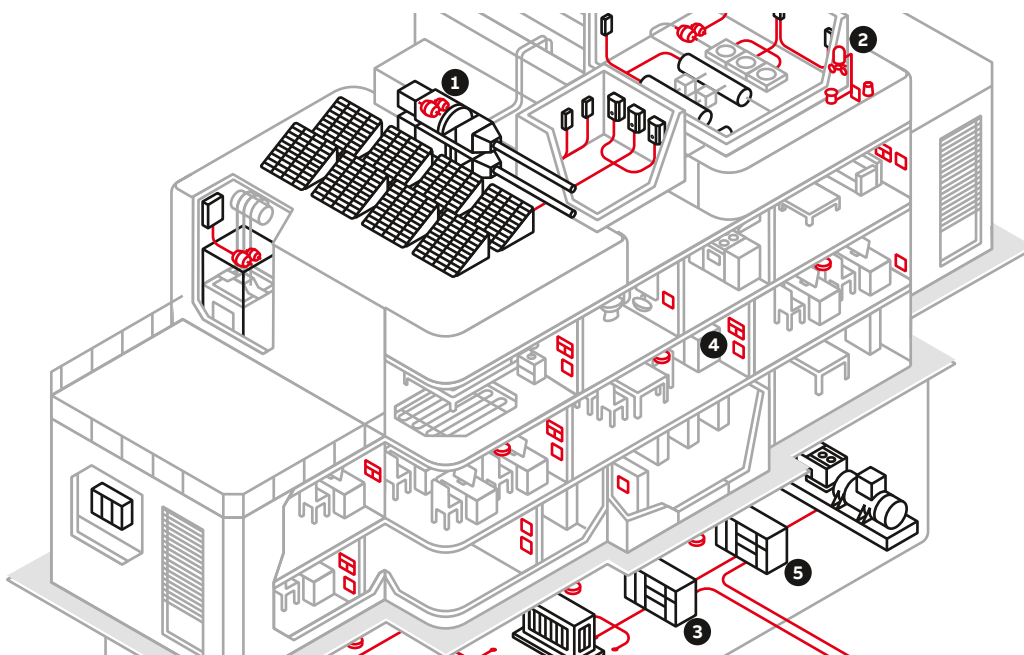
Protecting critical electronic systems

The new ABB OVR data/telecom range of SPDs are designed to protect equipment connected to data and telephone lines to complement the OVR power SPD products and offer a complete system protection solution (power & data) against surges.

The comprehensive range includes protection for twisted pair data lines (including hazardous environments), computer networks, telecom systems including PBX and ISDN, CCTV, TV and RF systems.



**To protect the electronic equipment inside a building, all cables that enter or leave the building must be protected. Cables leaving the building can also provide a route back into the building for transients.**



**1. Data & measurement systems**

- 2 wire (OVR SL series)
- 2 wire ATEX (OVR SLX series)
- 2 wire (OVR D/E/H series)
- 3 wire (OVR SL-3W series)
- 4-20 mA (OVR SL 4-20)
- 8 wire (OVR Q series)
- RTD (OVR RTD series)

**2. Transceiver/CCTV systems**

- RF (OVR RF series)
- CCTV (OVR CCTV series with OVR 240-16A)
- TV (OVR TV series)

**3. Data & measurement systems**

- 2 wire (OVR SL series)
- 2 wire ATEX (OVR SLX series)
- 2 wire (OVR D/E/H series)
- 3 wire (OVR SL-3W series)
- 4-20 mA (OVR SL 4-20)
- 8 wire (OVR Q series)
- RTD (OVR RTD series)

**4. Telecom systems**

- PBX (OVR KT series)
- RJ11 (OVR TN series)
- RJ45 (OVR ISDN series)
- 2 wire (OVR TN, OVR SLTN)
- 8 wire (OVR TNQ)

**5. Main power supply**

- See OVR power SPD series




# SPD Selection Guide

The SPD selection must be done according to the system network where the sensitive equipment is connected and the level of protection required. Then, different systems AC /DC powerlines, Data lines of specific applications need to use dedicated SPD conceptions to guarantee the right protection.




The below section will drive you selecting the solutions depending :

- The products standard you need to fulfill
- The type of system network where the SPD will be installed
- And the technical performances (SPD class, Surge capacity, Nominal voltages...)



## ABB OVR SPDs for IEC/EN 61643 :

	<b>Power supply</b>	AC Power Lines	Pages 24 to 29
	<b>Special applications</b>	Residential (Autoprotected SPD) Photovoltaic Wind Turbine	Page 30 to 31
	<b>Data Lines</b>	Telecommunication Systems, Data Systems	Page 32


## FURSE ESP SPDs for BS EN 61643 :

	<b>Power supply</b>	AC Power Lines	Page 34
	<b>Special applications</b>	D.C. Power Lines	Page 35
	<b>Data Lines</b>	Telecommunication Systems, Data Systems	Page 35

## ABB OVR SPDs for UL 1449 4ed :

	<b>Power supply</b>	AC Power Lines SPD enclosures AC Power lines SPD DIN-Rail	Pages 36 to 38
	<b>Special applications</b>	Photovoltaic	Page 39

## ABB OVR SPDs (SL and Q data SPD versions to UL 497B)

	<b>Data Lines</b>	Telecommunication Systems, Data Systems	Page 32
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# SPD Short Selection Guide

## Power line protection AC

### Detailed product description

#### Type of building to be protected



**Industrial areas, offices, public, big residential buildings**



#### Main Distribution Board T1 (+T2)

#### Type code

#### Order code

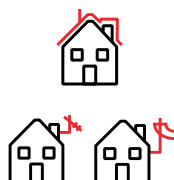
##### TN-S and TT systems with 230/400 V

OVR T1-T2 3N 25-255 P QS	2CTB825101R1600
OVR T1-T2 3N 25-255 P TS QS	2CTB825101R0700

##### TN-C systems with 230/400 V

OVR T1-T2 3L 25-255 P QS	2CTB825101R1300
OVR T1-T2 3L 25-255 P TS QS	2CTB825101R0600

- Optional Auxiliary contact (TS)



**Residential building with lightning rod, overhead power line or antenna**



#### TN and TT systems with 230/400 V

OVR T1-T2 3N 12.5-275s P QS	2CTB825101R1300
OVR T1-T2 3N 12.5-275s P TS QS	2CTB825101R0600

- Extended protection with additional varistor  
- Optional Auxiliary contact (TS)



**Residential building without lightning rod, overhead power lines or antenna**



#### TN and TT systems with 230/400 V

OVR T2 3N 40-275 P QS	2CTB803973R1100
OVR T2 3N 40-275 P TS QS	2CTB803973R0500

- Optional Auxiliary contact (TS)



**Protection for photovoltaic (PV) installations**



#### DC voltage Direct current (DC)

#### Type code

#### Order code

##### 600 V

OVR PV T2 40-600 P QS	2CTB804153R2800
OVR PV T2 40-600 P TS QS	2CTB804153R2900

##### 1100 V

OVR PV T2 40-1000 P QS	2CTB804153R2400
OVR PV T2 40-1000 P TS QS	2CTB804153R2500
OVR PV T1-T2 5-1000 P QS	2CTB812050R1000
OVR PV T1-T2 5-1000 P TS QS	2CTB812051R1000
OVR PV T1-T2 12.5-1000 P QS	2CTB812120R1000
OVR PV T1-T2 12.5-1000 P TS QS	2CTB812121R1000

##### 1500 V

OVR PV T2 40-1500 P QS	2CTB804153R2600
OVR PV T2 40-1500 P TS QS	2CTB804153R2700
OVR PV T1-T2 5-1500 P QS	2CTB812050R1500
OVR PV T1-T2 5-1500 P TS QS	2CTB812051R1500
OVR PV T1-T2 10-1500 P QS	2CTB812100R1500
OVR PV T1-T2 10-1500 P TS QS	2CTB812100R1500

- Optional Auxiliary contact (TS)

Back-up protection MCB/Fuse



**Sub distribution board**                      **Type code**                      **Order code**

<b>Distance to sub distribution &gt; 10 meters</b>		
	OVR T2 3N 40-275 P QS	2CTB803973R1100
	OVR T2 3N 40-275 P TS QS	2CTB803973R0500

<b>Distance to sub distribution &gt; 10 meters</b>		
	OVR T2 3L 40-275 P QS	2CTB803873R2400
	OVR T2 3L 40-275 P TS QS	2CTB803873R2500

- Optional Auxiliary contact (TS)



<b>Distance to sub distribution board and loads &gt; 10 meters</b>		
	OVR T2-T3 3N 20-275 P QS QS	2CTB803973R1200
	OVR T2-T3 3N 20-275 P TS QS	2CTB803973R1600

- Optional Auxiliary contact (TS)

**Distance between sub distribution board and loads < 10 meters**

Not need for extra protection

**Alternating current (AC)**



	<b>Type code</b>	<b>Order code</b>
<b>3 Phases</b>	OVR T2 3N 40-275 P QS	2CTB803973R1100
	OVR T2 3N 40-275 P TS QS	2CTB803973R0500

<b>1 Phase</b>	OVR T2 1N 40-275 P QS	2CTB803972R1100
	OVR T2 1N 40-275 P TS QS	2CTB803972R0500

- Optional Auxiliary contact (TS)

# SPD Selection Guide

## IEC Power Supply , A.C Power lines

Pro- tected lines	Impulse current	Max. dis- charge current	Nominal current	Follow current in- terrupting rating	Voltage protec- tion level	Nominal voltage	Max. cont. op- erating voltage	Type code	Order code
	Iimp 10/350 kA	I <sub>max</sub> 8/20 kA	I <sub>n</sub> kA	I <sub>fi</sub> kA	U <sub>p</sub> kV	U <sub>n</sub> V	U <sub>c</sub> V		
<b>Type 1 OVR non-pluggable</b>									
<b>Uc 255 V</b>									
1	25	60	25	7	2.5	230	255	OVR T1 25-255-7	2CTB815101R8700
3+1	25	60	25	7	2.5	230/400	255	OVR T1 3N 25-255-7	2CTB815101R8800
<b>Neutral</b>									
1	50	100	50	0.1	1.5	230	255	OVR T1 50 N	2CTB815101R0400
<b>Type T1-T2 OVR pluggable</b>									
<b>Uc 255-275 V</b>									
1	25	70	25	100	≤ 1.5	230	255	OVR T1-T2 25-255 P TS QS	2CTB825101R0200
1+1	25	70	25	100	≤ 1.5	230	255	OVR T1-T2 1N 25-255 P TS QS	2CTB825101R1500
3	25	70	25	100	≤ 1.5	230/400	255	OVR T1-T2 3L 25-255 P TS QS	2CTB825101R0600
3+1	25	70	25	100	≤ 1.5	230/400	255	OVR T1-T2 3N 25-255 P TS QS	2CTB825101R0700
4	25	70	25	100	≤ 1.5	230/400	255	OVR T1-T2 4L 25-255 P TS QS	2CTB825101R0800
1	25	70	25	100	≤ 1.5	230	255	OVR T1-T2 25-255 P QS	2CTB825101R0100
1+1	25	70	25	100	≤ 1.5	230	255	OVR T1-T2 1N 25-255 P QS	2CTB825101R1000
3	25	70	25	100	≤ 1.5	230/400	255	OVR T1-T2 3L 25-255 P QS	2CTB825101R1300
3+1	25	70	25	100	≤ 1.5	230/400	255	OVR T1-T2 3N 25-255 P QS	2CTB825101R1600
4	25	70	25	100	≤ 1.5	230/400	255	OVR T1-T2 4L 25-255 P QS	2CTB825101R1400
1	12.5	80	20	-	1.4	230	275	OVR T1-T2 12.5-275s P TS QS	2CTB815710R0000
1+1	12.5	80	20	-	1.4	230	275	OVR T1-T2 1N 12.5-275s P TS QS	2CTB815710R0100
3	12.5	80	20	-	1.4	230/400	275	OVR T1-T2 3L 12.5-275s P TS QS	2CTB815710R0600
3+1	12.5	80	20	-	1.4	230/400	275	OVR T1-T2 3N 12.5-275s P TS QS	2CTB815710R0700
4	12.5	80	20	-	1.4	230/400	275	OVR T1-T2 4L 12.5-275s P TS QS	2CTB815710R1100
1	12.5	80	20	-	1.4	230	275	OVR T1-T2 12.5-275s P QS	2CTB815710R1200
1+1	12.5	80	20	-	1.4	230	275	OVR T1-T2 1N 12.5-275s P QS	2CTB815710R1300
3	12.5	80	20	-	1.4	230/400	275	OVR T1-T2 3L 12.5-275s P QS	2CTB815710R1800
3+1	12.5	80	20	-	1.4	230/400	275	OVR T1-T2 3N 12.5-275s P QS	2CTB815710R1900
4	12.5	80	20	-	1.4	230/400	275	OVR T1-T2 4L 12.5-275s P QS	2CTB815710R2300
<b>Uc 440 V</b>									
1	25	70	25	15	≤ 2.5	400	440	OVR T1-T2 25-440 P TS QS	2CTB825101R5100
3	25	70	25	15	≤ 2.5	400/690	440	OVR T1-T2 3L 25-440 P TS QS	2CTB825101R5400
1	25	70	25	15	≤ 2.5	400	440	OVR T1-T2 25-440 P QS	2CTB825101R5000
3	25	70	25	15	≤ 2.5	400/690	440	OVR T1-T2 3L 25-440 P QS	2CTB825101R5300
1	12.5	80	20	-	1.9	400	440	OVR T1-T2 12.5-440s P TS QS	2CTB815710R2900
1+1	12.5	80	20	-	1.9	400	440	OVR T1-T2 1N 12.5-440s P TS QS	2CTB815710R3000
3	12.5	80	20	-	1.9	400/690	440	OVR T1-T2 3L 12.5-440s P TS QS	2CTB815710R3500
3+1	12.5	80	20	-	1.9	400/690	440	OVR T1-T2 3N 12.5-440s P TS QS	2CTB815710R3600
4	12.5	80	20	-	1.9	400/690	440	OVR T1-T2 4L 12.5-440s P TS QS	2CTB815710R4000
1	12.5	80	20	-	1.9	400	440	OVR T1-T2 12.5-440s P QS	2CTB815710R4100
1+1	12.5	80	20	-	1.9	400	440	OVR T1-T2 1N 12.5-440s P QS	2CTB815710R4200
3	12.5	80	20	-	1.9	400/690	440	OVR T1-T2 3L 12.5-440s P QS	2CTB815710R4700
3+1	12.5	80	20	-	1.9	400/690	440	OVR T1-T2 3N 12.5-440s P QS	2CTB815710R4800
4	12.5	80	20	-	1.9	400/690	440	OVR T1-T2 4L 12.5-440s P QS	2CTB815710R5200

Pro- tected lines	Impulse current	Max. dis- charge current	Nominal current	Follow current in- terrupting rating	Voltage protec- tion level	Nominal voltage	Max. cont. op- erating voltage	Type code	Order code
	I <sub>imp</sub> 10/350	I <sub>max</sub> 8/20	I <sub>n</sub>	I <sub>fi</sub>	U <sub>p</sub>	U <sub>n</sub>	U <sub>c</sub>		
	kA	kA	kA	kA	kV	V	V		
<b>Neutral</b>									
1	100	100	100	0.1	1.5	230	255	OVR T1-T2 N 100-255 P QS	2CTB825101R0500
1	100	100	100	0.1	2.5	400	440	OVR T1-T2 N 100-440 P QS	2CTB825101R5200
1	50	100	50	0.1	1.4	230	275	OVR T1-T2 N 50-275s P QS	2CTB815710R2400
1	50	100	50	0.1	1.9	400	440	OVR T1-T2 N 50-440s P QS	2CTB815710R5300
<b>Cartridges</b>									
1	25	70	25	-	1.5	230	255	OVR T1-T2 25-250 C QS	2CTB825101R8000
1	25	70	25	-	2.5	400	440	OVR T1-T2 25-440 C QS	2CTB825101R8100
1	100	100	100	-	1.5	230	255	OVR T1-T2 N 100-255C QS	2CTB825101R8200
1	100	100	100	-	2.5	400	440	OVR T1-T2 N 100-440C QS	2CTB825101R8300
1	12.5	80	20	-	1.4	230	275	OVR T1-T2 12.5-275s C QS	2CTB815710R2600
1	12.5	80	20	-	1.9	400	440	OVR T1-T2 12.5-440s C QS	2CTB815710R5500
1	50	100	50	-	1.4	230	275	OVR T1-T2 N 50-275s C QS	2CTB815710R2700
1	50	100	50	-	1.9	400	440	OVR T1-T2 N 50-440s C QS	2CTB815710R5600
<b>Type 2 OVR non-pluggable</b>									
<b>Uc 275 V</b>									
1	-	20	5	-	1.0	230	275	OVR T2 20-275	2CTB804200R0100
1	-	40	20	-	1.4	230	275	OVR T2 40-275	2CTB804201R0100
1	-	20	5	-	1.0	230	275	OVR T2 20-275 (x20)	2CTB804200R1100
1	-	40	20	-	1.4	230	275	OVR T2 40-275 (x20)	2CTB804201R1100
<b>Type 2 OVR pluggable</b>									
<b>Uc 75 V</b>									
1	-	20	5	-	0.3	57	75	OVR T2 20-75 P	2CTB803851R2800
1	-	20	5	-	0.3	57	75	OVR T2 20-75 P TS	2CTB803851R2700
2	-	20	5	-	0.3	57	75	OVR T2 2 20-75 P	2CTB803852R1700
2	-	20	5	-	0.3	57	75	OVR T2 2 20-75 P TS	2CTB803852R1600
<b>Uc 275 V</b>									
1	2	40	20	-	1.25	230	275	OVR T2 40-275 P TS QS	2CTB803871R1700
1+1	2	40	20	-	1.25	230	275	OVR T2 1N 40-275 P TS QS	2CTB803972R0500
3	2	40	20	-	1.25	230/400	275	OVR T2 3L 40-275 P TS QS	2CTB803873R2500
4	2	40	20	-	1.25	230/400	275	OVR T2 4L 40-275 P TS QS	2CTB803873R5200
1	2	40	20	-	1.25	230	275	OVR T2 40-275 P QS	2CTB803871R2300
1+1	2	40	20	-	1.25	230	275	OVR T2 1N 40-275 P QS	2CTB803972R1100
3	2	40	20	-	1.25	230/400	275	OVR T2 3L 40-275 P QS	2CTB803873R2400
4	2	40	20	-	1.25	230/400	275	OVR T2 4L 40-275 P QS	2CTB803873R5600
1	2	40	20	-	1.4	230	275	OVR T2 40-275s P TS QS	2CTB815704R0000
1+1	2	40	20	-	1.4	230	275	OVR T2 1N 40-275s P TS QS	2CTB815704R0200
3	2	40	20	-	1.4	230/400	275	OVR T2 3L 40-275s P TS QS	2CTB815704R0600
4	2	40	20	-	1.4	230/400	275	OVR T2 4L 40-275s P TS QS	2CTB815704R1100
1	2	40	20	-	1.4	230	275	OVR T2 40-275s P QS	2CTB815704R1200
1+1	2	40	20	-	1.4	230	275	OVR T2 1N 40-275s P QS	2CTB815704R1400
3	2	40	20	-	1.4	230/400	275	OVR T2 3L 40-275s P QS	2CTB815704R1800
4	2	40	20	-	1.4	230/400	275	OVR T2 4L 40-275s P QS	2CTB815704R2300
1	6.25	80	20	-	1.4	230	275	OVR T2 80-275s P TS QS	2CTB815708R0000
1+1	6.25	80	20	-	1.4	230	275	OVR T2 1N 80-275s P TS QS	2CTB815708R0200
3	6.25	80	20	-	1.4	230/400	275	OVR T2 3L 80-275s P TS QS	2CTB815708R0600
4	6.25	80	20	-	1.4	230/400	275	OVR T2 4L 80-275s P TS QS	2CTB815708R1100
1	6.25	80	20	-	1.4	230	275	OVR T2 80-275s P QS	2CTB815708R1200
1+1	6.25	80	20	-	1.4	230	275	OVR T2 1N 80-275s P QS	2CTB815708R1400
3	6.25	80	20	-	1.4	230/400	275	OVR T2 3L 80-275s P QS	2CTB815708R1800
4	6.25	80	20	-	1.4	230/400	275	OVR T2 4L 80-275s P QS	2CTB815708R2300

Protected lines	Impulse current	Max. discharge current	Nominal current	Follow current interrupting rating	Voltage protection level	Nominal voltage	Max. cont. operating voltage	Type code	Order code
	I <sub>imp</sub> 10/350 kA	I <sub>max</sub> 8/20 kA	I <sub>n</sub> kA	I <sub>fi</sub> kA	U <sub>p</sub> kV	U <sub>n</sub> V	U <sub>c</sub> V		
<b>Neutral</b>									
1	2	80	30	0.1	1.4	230	275	OVR T2-T3 N 80-275 P QS	2CTB803973R1900
1	6.25	80	30	0.1	1.4	230	275	OVR T2 N 80-275s P QS	2CTB815708R2500
<b>Cartridges</b>									
1	2	80	30	-	1.4	230	275	OVR T2-T3 N 80-275 C QS	2CTB803876R0000
1	2	40	20	-	1.25	230	275	OVR T2 40-275 C QS	2CTB803876R1000
1	6.25	40	20	-	1.4	230	275	OVR T2 40-275s C QS	2CTB815704R2600
1	6.25	80	20	-	1.4	230	275	OVR T2 80-275s C QS	2CTB815708R2600
1	6.25	80	30	-	1.4	230	275	OVR T2 N 80-275s C QS	2CTB815708R2800
<b>Uc 350V</b>									
1	2	40	20	-	1.5	230	350	OVR T2 40-350 P QS	2CTB803881R2300
1	2	40	20	-	1.5	230	350	OVR T2 40-350 P TS QS	2CTB803881R1700
1+1	2	40	20	-	1.7	230	350	OVR T2 1N 40-350 P QS	2CTB803982R1100
1+1	2	40	20	-	1.7	230	350	OVR T2 1N 40-350 P TS QS	2CTB803982R0500
3	2	40	20	-	1.5	230/400	350	OVR T2 3L 40-350 P QS	2CTB803883R2400
3	2	40	20	-	1.5	230/400	350	OVR T2 3L 40-350 P TS QS	2CTB803883R2500
3+1	2	40	20	-	1.7	230/400	350	OVR T2 3N 40-350 P QS	2CTB803983R1100
3+1	2	40	20	-	1.7	230/400	350	OVR T2 3N 40-350 P TS QS	2CTB803983R0500
<b>Neutral</b>									
1	2	80	30	0.1	1.4	230	350	OVR T2 N 80-350 P QS	2CTB803983R1900
<b>Cartridges</b>									
1	2	80	30	0.1	1.4	230	350	OVR T2 N 80-350 C QS	2CTB803886R0000
1	2	40	20	-	1.5	230	350	OVR T2 40-350 C QS	2CTB803886R1000
<b>Uc 440V</b>									
1		60	60	-	2.5	400	440	OVR T2 120-440s P TS	2CTB803951R1300
1	2	40	20	-	1.8	400	440	OVR T2 40-440 P QS	2CTB803871R1200
1	2	40	20	-	1.8	400	440	OVR T2 40-440 P TS QS	2CTB803871R0500
3	2	40	20	-	1.8	400/690	440	OVR T2 3L 40-440 P TS QS	2CTB803873R2700
4	2	40	20	-	1.8	400/690	440	OVR T2 4L 40-440 P QS	2CTB803873R5100
4	2	40	20	-	1.8	400/690	440	OVR T2 4L 40-440 P TS QS	2CTB803873R5300
3+1	2	40	20	-	2.1	400/690	440	OVR T2 3N 40-440 P QS	2CTB803973R1400
3+1	2	40	20	-	2.1	400/690	440	OVR T2 3N 40-440 P TS QS	2CTB803973R1500
3	2	40	20	-	1.8	400/690	440	OVR T2 3L 40-440 P QS	2CTB803873R2800
1	2	40	20	-	1.8	400	440	OVR T2 40-440s P TS QS	2CTB815704R2900
3+1	2	40	20	-	1.8	400/690	440	OVR T2 3N 40-440s P TS QS	2CTB815704R3700
1	2	40	20	-	1.8	400	440	OVR T2 40-440s P QS	2CTB815704R4100
1	6.25	80	20	-	1.8	400	440	OVR T2 80-440s P TS QS	2CTB815708R2900
3	6.25	80	20	-	1.8	400/690	440	OVR T2 3L 80-440s P TS QS	2CTB815708R3500
3+1	6.25	80	20	-	1.8	400/690	440	OVR T2 3N 80-440s P TS QS	2CTB815708R3700
4	6.25	80	20	-	1.8	400/690	440	OVR T2 4L 80-440s P TS QS	2CTB815708R4000
1	6.25	80	20	-	1.8	400	440	OVR T2 80-440s P QS	2CTB815708R4100
3	6.25	80	20	-	1.8	400/690	440	OVR T2 3L 80-440s P QS	2CTB815708R4700
3+1	6.25	80	20	-	1.8	400/690	440	OVR T2 3N 80-440s P QS	2CTB815708R4900
4	6.25	80	20	-	1.8	400/690	440	OVR T2 4L 80-440s P QS	2CTB815708R5200
1+1	2	40	20	-	1.9	400	440	OVR T2 1N 40-440 P TS QS	2CTB803972R1400

Pro- tected lines	Impulse current	Max. dis- charge current	Nominal current	Follow current in- terrupting rating	Voltage protec- tion level	Nominal voltage	Max. cont. op- erating voltage	Type code	Order code
	limp 10/350	I <sub>max</sub> 8/20	I <sub>n</sub>	I <sub>fi</sub>	U <sub>p</sub>	U <sub>n</sub>	U <sub>c</sub>		
	kA	kA	kA	kA	kV	V	V		
<b>Neutral</b>									
1	6.25	80	30	0.1	2	400	440	OVR T2 N 80-440s P QS	2CTB815708R5400
1	2	80	30	0.1	1.4	400	440	OVR T2-T3 N 80-440 P QS	2CTB803973R2000
<b>Cartridges</b>									
1	2	80	20	-	1.8	400	440	OVR T2 40-440 C QS	2CTB803876R0400
1	2	40	20	-	1.8	400	440	OVR T2-T3 40-440s C QS	2CTB815704R5500
1	6.25	80	20	-	1.8	400	440	OVR T2 80-440s C QS	2CTB815708R5500
1	6.25	80	30	-	1.4	400	440	OVR T2-T3 N 80-440 C QS	2CTB803886R0100
1	6.25	80	30	-	2	400	440	OVR T2 N 80-440s C QS	2CTB815708R5700
<b>Uc 600V</b>									
1	2	40	20	-	2.3	400	600	OVR T2 40-600 P TS QS	2CTB803881R0500
3	2	40	20	-	2.3	400/690	600	OVR T2 3L 40-600 P TS QS	2CTB803883R2700
4	2	40	20	-	2.3	400/690	600	OVR T2 4L 40-600 P TS QS	2CTB803883R5300
<b>Cartridges</b>									
1	-	40	20	-	2.3	400	600	OVR T2 40-600 C QS	2CTB803886R0400
<b>Uc 760V</b>									
3	-	40	15	-	2.9	400/690	440	OVR T2 3L 40 400/690 P	2CTB803853R4500
3	-	40	15	-	2.9	400/690	440	OVR T2 3L 40 400/690 P TS	2CTB803853R4600
<b>Cartridges</b>									
1		40	20	-	2.9	400	440	OVR T2 40-400/690 C	2CTB803854R1100
<b>Type T2-T3 OVR Pluggable</b>									
<b>Uc 275V</b>									
1	2	20	5	-	0.9	230	275	OVR T2-T3 20-275 P QS	2CTB803871R2400
1	2	20	5	-	0.9	230	275	OVR T2-T3 20-275 P TS QS	2CTB803871R2500
1+1	2	20	5	-	1.4	230	275	OVR T2-T3 1N 20-275 P QS	2CTB803972R1200
1+1	2	20	5	-	1.4	230	275	OVR T2-T3 1N 20-275 P TS QS	2CTB803972R1300
3	2	20	5	-	0.85	230/400	275	OVR T2-T3 3L 20-275 P QS	2CTB803873R3400
3	2	20	5	-	0.85	230/400	275	OVR T2-T3 3L 20-275 P TS QS	2CTB803873R3500
3+1	2	20	5	-	1.4	230/400	275	OVR T2-T3 3N 20-275 P QS	2CTB803973R1200
3+1	2	20	5	-	1.4	230/400	275	OVR T2-T3 3N 20-275 P TS QS	2CTB803973R1600
<b>Neutral</b>									
1	-	80	30	0.1	1.4	230	275	OVR T2-T3 N 80-275 P QS	2CTB803973R1900
<b>Cartridges</b>									
1	-	20	5	-	1.4	230	275	OVR T2 20-275 C QS	2CTB803876R1200
1	-	80	30	-	1.4	230	275	OVR T2-T3 N 80-275 C QS	2CTB803876R0000
<b>Uc 440V</b>									
1	2	20	5	-	1.4	400	440	OVR T2-T3 20-440 P QS	2CTB803871R1100
1	2	20	5	-	1.4	400	440	OVR T2-T3 20-440 P TS QS	2CTB803871R1300
3+1	2	20	5	-	1.4	400/690	440	OVR T2-T3 3N 20-440 P QS	2CTB803973R1300
<b>Neutral</b>									
1		80	30	0.1	1.4	400	440	OVR T2-T3 N 80-440 P QS	2CTB803973R2000
<b>Cartridges</b>									
1	-	80	5	-	1.4	400	440	OVR T2 20-440 C QS	2CTB803876R0600
1	-	80	30	-	1.4	400	440	OVR T2-T3 N 80-440 C QS	2CTB803886R0100
<b>Type T2-T3 OVR non-pluggable Street Light</b>									
1+1	-	15	5	-	1.1	230	275	OVR T2-T3 N1 15-275S SL	2CTB804500R0200
1+1	-	15	5	-	1.1	230	275	OVR T2-T3 N1 15-275S SL (x20)	2CTB804500Z1200

# SPD Selection Guide

## IEC Special applications

Protected lines	Impulse current	Max. discharge current	Nominal current	Follow current interrupting rating	Voltage protection level	Nominal voltage	Max. cont. operating voltage	Type code	Order code
	Iimp 10/350 kA	I <sub>max</sub> 8/20 kA	I <sub>n</sub> kA	I <sub>fi</sub> kA	U <sub>p</sub> kV	U <sub>n</sub> V	U <sub>c</sub> V		
<b>Type T2 OVR autoprotected non-pluggable</b>									
1+1	-	20	5	-	1.3	230	275	OVR PLUS N1 20	2CTB803701R0700
1+1	-	40	20	-	1.6	230	275	OVR PLUS N1 40	2CTB803701R0100
3+1	-	20	5	-	1.3	230/400	275	OVR PLUS N3 20	2CTB803701R0400
3+1	-	40	20	-	1.5	230/400	275	OVR PLUS N3 40	2CTB803701R0300
<b>Type 2 OVR pluggable PV applications</b>									
<b>Uc 670 V DC</b>									
1+1 DC	2	40	20	0.3 (I <sub>scpv</sub> )	2.8/1.4	600	600	OVR PV T2 40-600 P QS	2CTB804153R2800
1+1 DC	2	40	20	0.3 (I <sub>scpv</sub> )	2.8/1.4	600	600	OVR PV T2 40-600 P TS QS	2CTB804153R2900
1+1 DC	2	40	20	0.3 (I <sub>scpv</sub> )	2.8/1.4	600	600	OVR PV T2 40-600 P QS BULK (30)	2CTB804153Z2800
1+1 DC	2	40	20	0.3 (I <sub>scpv</sub> )	2.8/1.4	600	600	OVR PV T2 40-600 P TS QS BULK (30)	2CTB804153Z2900
<b>Cartridges</b>									
1+1 DC	2	40	20	10,000 (I <sub>scpv</sub> )	2.8/1.4	600	600	OVR PV T2 40-600 C QS	2CTB804153R3100
1+1 DC	2	40	20	10,000 (I <sub>scpv</sub> )	2.8/1.4	600	600	OVR PV MC C QS	2CTB804153R3500
<b>Uc 1100 V DC</b>									
1+1 DC	-	40	20	10,000 (I <sub>scpv</sub> )	3.8	1000	1100	OVR PV T2 40-1000 P QS	2CTB804153R2400
1+1 DC	2	40	20	10,000 (I <sub>scpv</sub> )	3.8	1000	1100	OVR PV T2 40-1000 P TS QS	2CTB804153R2500
1+1 DC	2	40	20	10,000 (I <sub>scpv</sub> )	3.8	1000	1100	OVR PV T2 40-1000 P QS BULK (30)	2CTB804153Z2400
1+1 DC	2	40	20	10,000 (I <sub>scpv</sub> )	3.8	1000	1100	OVR PV T2 40-1000 P TS QS BULK (30)	2CTB804153Z2500
2+2 DC	2	40	20	10,000 (I <sub>scpv</sub> )	3.8	1000	1100	OVR PV T2 40-1000 P TWIN QS	2CTB804153R3000
2+2 DC	2	40	20	10,000 (I <sub>scpv</sub> )	3.8	1000	1100	OVR PV T2 40-1000 P TS TWIN QS	2CTB804153R2300
2+2 DC	2	40	20	10,000 (I <sub>scpv</sub> )	3.8	1000	1100	OVR PV T2 40-1000 P TS TWIN QS BULK (18)	2CTB804153Z2300
<b>Cartridges</b>									
1+1 DC or 2+2DC	2	40	20	10,000 (I <sub>scpv</sub> )	3.8	1000	1100	OVR PV T2 40-1000 C QS	2CTB804153R3200
<b>Uc 1500 V DC</b>									
1+1 DC	2	40	10	10,000 (I <sub>scpv</sub> )	4.5	1500	1500	OVR PV T2 40-1500 P QS	2CTB804153R2600
1+1 DC	2	40	10	10,000 (I <sub>scpv</sub> )	4.5	1500	1500	OVR PV T2 40-1500 P TS QS	2CTB804153R2700
1+1 DC	2	40	10	10,000 (I <sub>scpv</sub> )	4.5	1500	1500	OVR PV T2 40-1500 P QS BULK (30)	2CTB804153Z2600
1+1 DC	2	40	10	10,000 (I <sub>scpv</sub> )	4.5	1500	1500	OVR PV T2 40-1500 P TS QS BULK (30)	2CTB804153Z2700
<b>Cartridges</b>									
1+1 DC	2	40	10	10,000 (I <sub>scpv</sub> )	4.5	1500	1500	OVR PV T2 40-1500 C QS	2CTB804153R3300

Protected lines	Total Discharge Current	Impulse current	Max. discharge current	Nominal current	Follow current interrupting rating	Voltage protection level	Nominal voltage	Max. cont. operating voltage	Type code	Order code
	I <sub>total</sub> 10/350 kA	I <sub>imp</sub> 10/350 kA	I <sub>max</sub> 8/20 kA	I <sub>n</sub> kA	I <sub>fi</sub> kA	U <sub>p</sub> kV	U <sub>n</sub> V	U <sub>c</sub> V		
<b>Type T1-T2 OVR pluggable PV application</b>										
<b>Uc 1100 V DC</b>										
1+1 DC	5	5	40	20	11.000 (I <sub>scpv</sub> )	3.8	1000	1100	OVR PV T1-T2 5-1000 P QS	2CTB812050R1000
1+1 DC	5	5	40	20	11.000 (I <sub>scpv</sub> )	3.8	1000	1100	OVR PV T1-T2 5-1000 P TS QS	2CTB812051R1000
1+1 DC	6,25	12.5	40	20	11.000 (I <sub>scpv</sub> )	3.8	1000	1100	OVR PV T1-T2 12.5-1000 P QS	2CTB812120R1000
1+1 DC	6,25	12.5	40	20	11.000 (I <sub>scpv</sub> )	3.8	1000	1100	OVR PV T1-T2 12.5-1000 P TS QS	2CTB812121R1000
<b>Cartridges</b>										
1+1 DC	5	5	40	20	11.000 (I <sub>scpv</sub> )	-	1000	1100	OVR PV T1-T2 5-1000 C QS	2CTB812052R1000
1+1 DC	6,25	6,25	40	20	11.000 (I <sub>scpv</sub> )	-	1000	1100	OVR PV T1-T2 12.5-1000 C QS	2CTB812122R1000
1+1 DC	6,25	6,25	40	20	11.000 (I <sub>scpv</sub> )	-	1000	1100	OVR PV T1-T2 12.5-1000 M C QS	2CTB812122R1001
<b>Uc 1500 V DC</b>										
1+1 DC	5	5	30	20	11.000 (I <sub>scpv</sub> )	5	1500	1500	OVR PV T1-T2 5-1500 P QS	2CTB812050R1500
1+1 DC	5	5	30	20	11.000 (I <sub>scpv</sub> )	5	1500	1500	OVR PV T1-T2 5-1500 P TS QS	2CTB812051R1500
1+1 DC	5	10	30	20	11.000 (I <sub>scpv</sub> )	5	1500	1500	OVR PV T1-T2 10-1500 P QS	2CTB812100R1500
1+1 DC	5	10	30	20	11.000 (I <sub>scpv</sub> )	5	1500	1500	OVR PV T1-T2 10-1500 P TS QS	2CTB812101R1500
<b>Cartridges</b>										
1+1 DC	5	5	30	20	11.000 (I <sub>scpv</sub> )	-	1500	1500	OVR PV T1-T2 5-1500 C QS	2CTB812052R1500
1+1 DC	5	5	30	20	11.000 (I <sub>scpv</sub> )	-	1500	1500	OVR PV T1-T2 10-1500 C QS	2CTB812102R1500
1+1 DC	5	5	30	20	11.000 (I <sub>scpv</sub> )	-	1500	1500	OVR PV T1-T2 10-1500 M C QS	2CTB812102R1501
<b>Type T1-T2 OVR pluggable WT Applications</b>										
<b>Uc 690 V</b>										
3		2	40	20	-	6	400/690	690	OVR WT 3L 690 P TS	2CTB235402R0000
3		2	40	20	-	6	400/690	690	OVR WT 3L 690 P (enclosed)	2CTB235401R0000
<b>Cartridges</b>										
1		2	40	20	-	6	400	440	OVR T2 40 440 C	2CTB803854R0400

# Surge and lightning protection solutions

## ABB expertise

**With its experience gained over the last few decades, ABB is using its technological expertise for lightning and overvoltage protection.**

The ABB laboratory with several generators can simulate the impact of a direct lightning strike (10/350  $\mu$ s impulse wave) or an indirect lightning strike (8/20  $\mu$ s impulse wave) to be able to test the surge protective devices.

Through its wide product range, ABB is able to offer a complete solution to protect power and low voltage networks.

Seminars are organized to the needs of all professionals: design offices, consultants, distributors, electricians, sales staff. These training sessions combine practical and theoretical aspects and cover a varied range of topics such as direct impact protection and overvoltage protection.

**The ABB laboratory is able to handle tests on AC surge protective devices (SPDs) according to IEC 61643-11 (2011) and on PV SPDs according to EN 50539-11 (2013).**

<b>High power lightning generators</b>	Standardized electrical waves 8/20 $\mu$ s and 10/350 $\mu$ s. Maximum shock current 100 kA for the two waves, superposed on the electrical network. Stored energy 800 kJ.
<b>200 kV generator</b>	1.2/50 $\mu$ s impulse wave Maximum voltage 200 kV Stored energy 10 kJ.
<b>Combinated wave generator</b>	Standardized 8/20 - 1.2/50 $\mu$ s impulse wave 30 kV maximum 15 kA maximum Stored energy 5 kJ.
<b>Electrical tests</b>	275 V, 18 000 A and 440 V, 10 000 A short-circuit AC testing. 1500 V, 1000 A short-circuit DC testing.
<b>Climatic tests</b>	Ageing and damp heat tests.
<b>High Speed Camera</b>	Up to 120 000 frames/s



ABB laboratory at Bagnères-de-Bigorre, France



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# IEC-Power DIN-Rail Products

<b>044–065</b>	<b>Surge and lightning protection solutions</b>
<b>044</b> –045	Products standards, IEC 61643
<b>046</b> –049	QuickSafe® technology
<b>050</b> –051	Selection of surge protective devices
<b>052</b> –053	Surge protective device disconnectors
<b>054</b> –056	Installation and wiring of SPDs in an electrical switchboard
<b>057</b>	Example of an electrical switchboard protected by ABB surge protection solutions
<b>058</b>	Mode of surge protection
<b>059</b>	Coordination and wiring principals
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<b>066</b> –069	OVR Type 1
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# Surge and lightning protection solutions

## Products standards, IEC 61643

The new IEC 61643-11:2011 revision is similar to the EN 61643-11:2012 and is the standard for Low-Voltage Surge Protective Devices. These standards exist since the nineties and have gone through different releases improving them. In the last release not only the evaluation of the product performances is under focus, but the stress on safety evaluation.

Regarding performances, **this new edition recognizes the possibility to evaluate and certify a SPD under multiple categories**, option not considered in the previous editions. So in order to certify an SPD under the Type 1 and Type 2 category, two different tests need to be performed to validate the features under each one of them.

Until now, the safety of the SPD was verified reproducing situations that represent the working conditions of the SPD, as for example, the short-circuit test or the temporary over-voltage test. According to the new edition of the standard, **new tests reproducing the potential interruption of the Neutral conductor and the different modes of end of life of the SPD are performed.**

These two additional tests are a real Plus on safety management and they are a guarantee for the final user that the installation will not suffer any stress in case of the end of life of the SPD. The new QuickSafe® range has been specially developed to answer to these new requirements. All this reducing the stress on the back-up protection device.

The new **QuickSafe® technology allows to comply with the end of life tests thanks to a patented internal disconnection system**, this systems disconnects the internal circuit before the internal components (MOVs) go into short-circuit.

The advantage for the customer is that **the product is self-protected up to higher values of current** and this **allows to install back-up protection elements with higher rated current**, as these elements will only intervene in the rear case of a short-circuit on site together with a sudden End of Life of the SPD (this happens when for example the SPD is hit by a current higher than its  $I_{max}$ ). You will find the tables on page 53 indicating the maximum back-up rated current MCB or fuse to use to guarantee the coordination.

This new technology allows as well to increase the prospective withstand short-circuit current at the point of the installation up to  $I_{sc} = 100$  kA with a back up protection of maximum rated current of 125 A (for OVR T2 QS and OVR T2-T3 QS) and 160 A (for OVR T1-T2s QS and OVR T2s QS).

In simple words, the new OVR QuickSafe® can be used in 99.9% of standard installations and becomes an easy replacement to any other SPD ranges.

### What's new in IEC/EN 61643-11:2012?

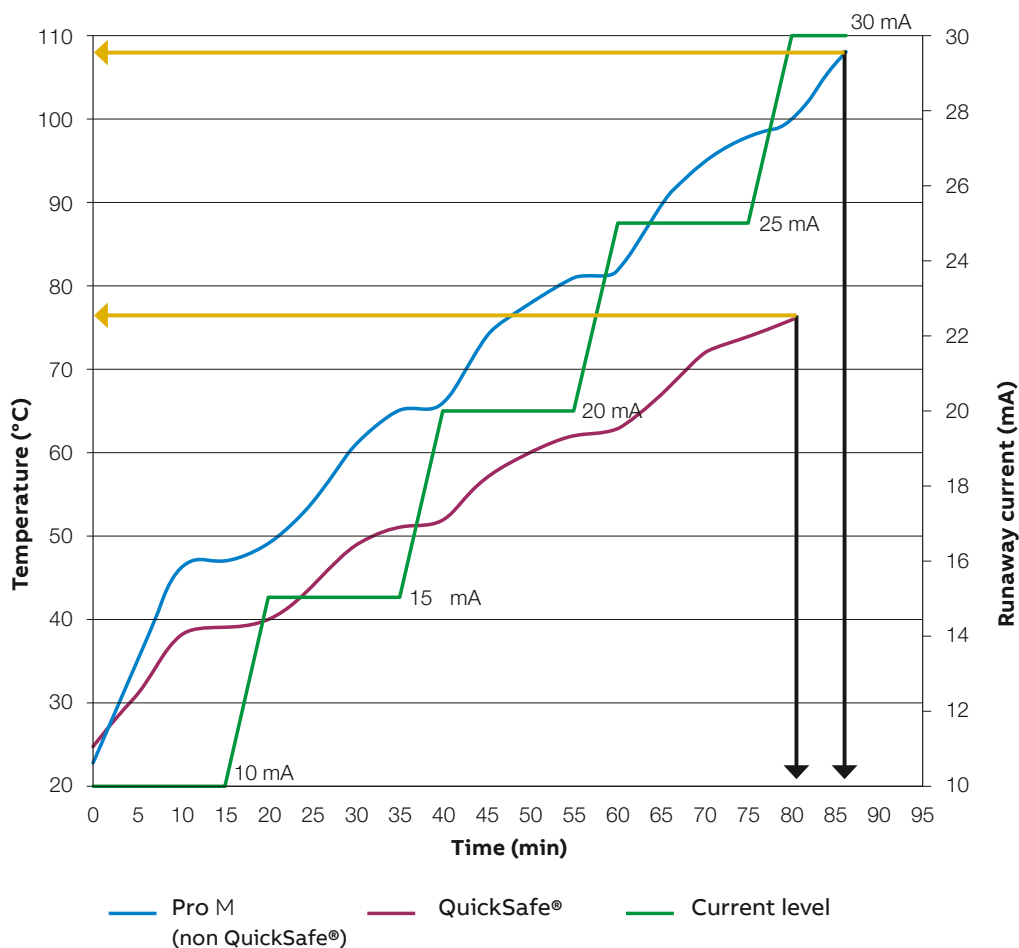
- New test procedure which takes into account the failure behavior of protective equipment in the event of an overload, or when the service life has expired
- The Type 1 operating duty test is conducted with a higher current than that specified in the previous standard
- Recognition of the mixed types, as Type 1+2 and Type 2+3, this allows as to certify the product with more than one category.

Here we can see 2 different curves representing the behavior of the actual OVR T2 range (not QS, blue curve) and the OVR T2 QuickSafe® range (red curve), for the same level of current (the green line represent the evolution of the current with the time, as specified by the IEC 61643-11).

- These curves represent the temperature INCREASE that the MOV suffers when being tested under these values of current for the indicated time. These are NOT absolute temperature, but relatives ones

- As you can see with the black arrows, the time to guarantee the disconnection for the same level of current has been reduced by 6 minutes
- And even better, as you can see with the orange arrows, the maximum reached temperature required to guarantee the disconnection is lower, from 108 to 76 °C.

#### Thermal Disconnection – Temperatures measured at the disconnection point of the MOV



# Surge and lightning protection solutions

## OVR QuickSafe® with MOV technology



In case of an end of life of an MOV in normal conditions, the current passing through the MOV increases progressively creating a quick temperature increase.

This phenomenon will slowly damage the MOV itself until it gets into short-circuit. This phenomenon is called a thermal runaway.

In order to avoid such thermal runaway we have added a thermal disconnection that will detect this temperature increase and will open the circuit.

This disconnection QuickSafe® is directly welded into the surface of the MOV to allow a very fast detection of the raise of temperature, it will react opening the circuit when the temperature achieve the levels considered hazardous for the installation.

This disconnection is guaranteed by a metallic arm linked to a spring guaranteeing a quick disconnection.

This is a phenomenon that happens only after thousands of surge protection interventions in average. Most of SPDs get changed during the installation updates before this ever happens. This is the ultimate protection at the very end of life of the SPD.



1



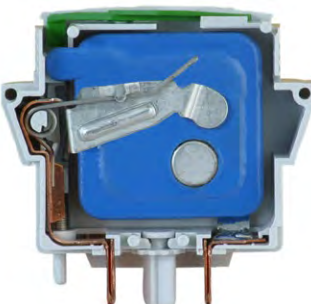
Here the disconnection system is in Close position. During the test simulating an end of life of the SPD, the SPD has to bear a high voltage that forces a current passing through it. In this example, the passing current is 10 A.

2



Few seconds later, the MOV achieves a temperature that is high enough to melt the special metallic alloy that guarantees the contact and the mechanical position of the metallic arm. This releases the metallic arm pushed far away by the junction spring.

3



The tension in the spring is enough to quickly push up the arm and guarantee the insulation of the MOV. The speed of this movement is a key feature to interrupt the electric arc that will appear between the MOV core and the metallic arm. This movement combined with the characteristics of the MOV will guarantee the complete extinction of the arc.

4

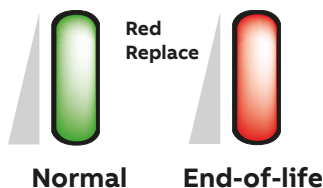


At the end of this movement, the metallic arm will stop without any bouncing. There is no risk of a new electric arc development. At this moment, the MOV has not suffered any thermal runaway, so it is not in short-circuit. The distance between the MOV electrode and the metallic arm guarantees an insulation voltage of over 6000 V, avoiding any risks for the installation.

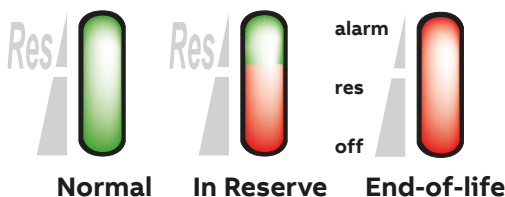
**End of life indicator of the standard surge protective device**

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

End-of-life indicator standard SPD



End-of-life indicator with safety Reserve system



**NOTE:**  
A faulty surge protective device 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.

**End of life of the surge protective device fitting Safety Reserve (s) system**

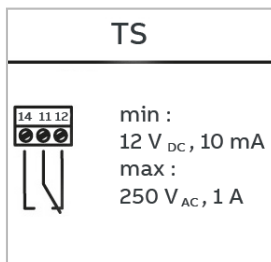
In case of current surge exceeding the maximum capacity of the device, one of the MOVs could achieve the end of life, the surge protective device will switch to the Safety reserve position and the mechanical end of life indicator in the front of the product will switch to the intermediate position. Consequently, the user can see in advance that the protection features of the SPD are degraded, but still guaranteed and has more time to replace the cartridge, because in Safety reserve position the protection is still ensured due to the 2-stage disconnecting system. If the customer wants to be warned in case one of the MOVs achieves its end of life and the product gets into Safety Reserve, the SPD has to be fitted with a Remote Auxiliary contact (TS).

This Auxiliary Contact will change status as soon as one of the MOVs gets damaged.

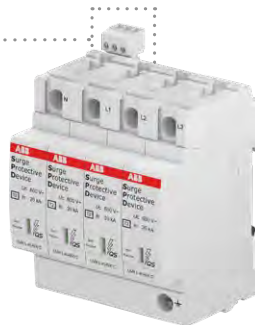
The combination of the Auxiliary contact (TS) and the Safety Reserve System allow to perform **Preventive Maintenance**, as the information about the degradation of the protection features will be received while the protection is still guaranteed, allowing for the schedule of maintenance activities while the site is still protected.



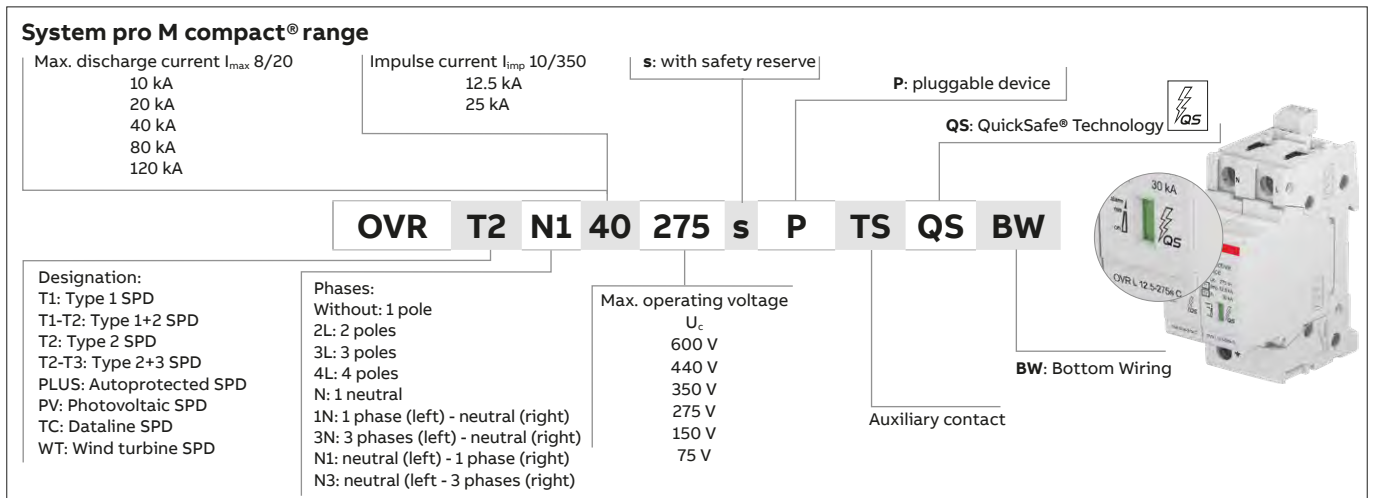
**NOTE:**  
Pluggable surge protective device cartridges have a foolproof system (Neutral cartridges different to Phase cartridges) preventing incorrect operations when replacing a cartridge.



Wiring schematic



Surge protective device fitted with the auxiliary contact option



#### Technical features of the integrated auxiliary contact

- Contacts information: Normally-opened (NO) / Normally-closed (NC)
- Min. load: 12 V DC - 10 mA
- Max. load: 250 V AC - 1 A
- Connection cross-section: 1.5 mm<sup>2</sup>.

#### Pluggable

The pluggable feature of ABB surge protective devices 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.

#### Auxiliary contact (TS)

This function, achieved by wiring a 3-point 1 A volt-free contact, enables the operational state of the surge protective device to be checked remotely (maintenance premises). For standard products, the TS changes status when the cartridge needs to be replaced, protection is not guaranteed. On products fitting the Safety Reserve (s) system, it indicates that one component of the cartridge is damaged, but the protection is still guaranteed.

# Surge and lightning protection solutions

## Selection of surge protective devices

The IEC standard introduced the concept of lightning protection zones (LPZ) to help in selecting the correct surge protection. This concept ensure the gradual reduction by stages of the energies and overvoltage caused by lightning or switching operations. This logic of coordination in the protection is what we call the "stepping protection".

### External Zones:

- LPZ 0A Unprotected zone outside the building subject to direct lightning strikes and therefore may have to handle to the full lightning current and lightning electromagnetic field
- LPZ 0B Zone protected against direct lightning strikes by external air terminal and where the threat is the full lightning electromagnetic field.

### Internal Zones:

Zones inside the building which are protected against direct lightning flashes.

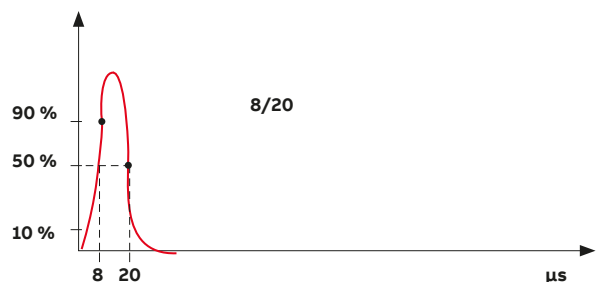
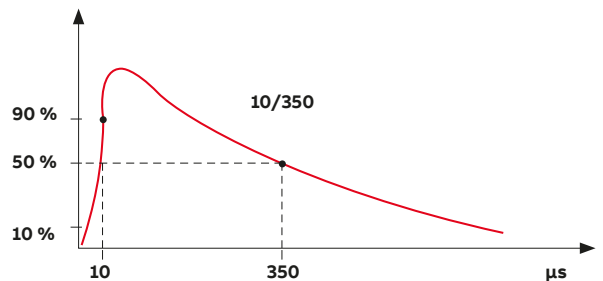
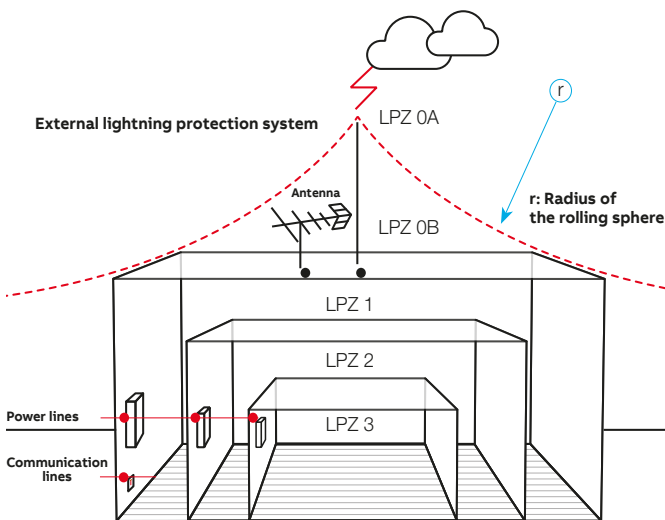
- LPZ 1 Zone subject to partial lightning or surge currents. Type I SPDs shall be installed at the boundary between LPZ 0A and LPZ 1 to reduce the entrance of lightning currents through power lines
- LPZ 2...n Zone where the surge current is limited by current sharing and where the surge energy is reduced by additional surge protection like SPDs. Type 2 SPDs are installed at the boundaries of each zone, i.e. LPZ 1 and LPZ 2, LPZ 2 and LPZ 3, etc.

### Lightning protection zones description (IEC 62305-4):

It consists in dividing a building in several volumes: the protection zone. The objective is to ensure that the LPZ gives enough protection to the equipment inside this zone. To do so, SPDs are installed at the protection zone boundaries. Each time an SPD is installed, a new protection zone is created.

### Current impulse:

The 10/350 and 8/20 impulse waves are used in the Class I and Class II SPDs tests. The first number gives the rising time of the current impulse to reach 90% of the peak level and the second number gives the time to half value in micro-seconds ( $\mu$ s).



### Protection level and impulse withstand voltage

The protection level ( $U_p$ ) of the SPD shall be selected according to the level of overvoltage given to the equipment to be protected against transient surge.

Each equipment is rated with an impulse withstand voltage ( $U_w$ ) depending on its category. An equipment is protected if its  $U_w$  is greater than the expected transient overvoltage between the live conductors and earth (common mode). If not, an SPD must be installed.

The SPD is protecting the equipment if its protection level ( $U_p$ ), which is calculated under the nominal current ( $I_n$ ), is equal or lower to the impulse withstand voltage of the equipment:

$$U_{p/f} \leq U_w$$

The IEC 60364-4-44 defines the required impulse withstand voltage as described in the table below:

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	Equipment subject to special requirements. Distribution panels, switches, breakers, etc.
IV	6000 V	8000 V	Equipment for use at the origin of the installation. Electricity meters, circuit-breakers, etc.

\* IEC 60664-1

### Selection of surge protective device

The selection of the surge capacity of SPDs depends on the surge and lightning risk, determined by the risk analysis according to IEC 62305-2. If there is a direct lightning risk on the structure, a Type 1 SPD will have to be installed at the service entrance and Type 2 and Type 3 SPDs in the sub-distribution boards, as close as possible to the equipment to protect.

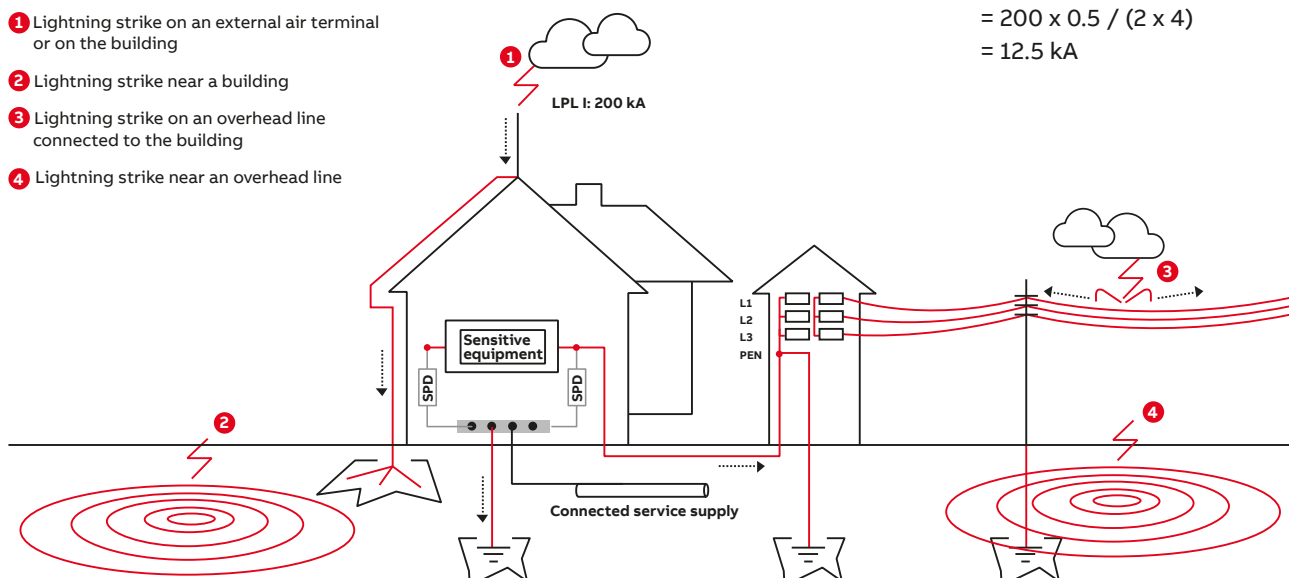
If there is not a direct lightning risk on the structure (no external protection, no aerial lines connected) a Type 2 SPD can be installed at the service entrance and in the sub-distribution boards.

A Type 1 SPD will be selected by its maximum impulse current ( $I_{imp}$ ) characteristics, and a Type 2 SPD by its nominal current ( $I_n$ ) and maximum discharge current ( $I_{max}$ ) characteristics.

#### Basic example for a Type 1 SPD calculation (IEC 62305-4):

- Lightning Protection Level calculated: LPL I
- Maximum peak current:  $I=200$  kA
- Assumption: perfect current sharing
- Number of connected service supply (earthing, water pipe):  $m=2$
- Network configuration: 3 Phases + Neutral ( $n=4$ ).

$$\begin{aligned} \text{Total current } (I_{imp})/\text{phase} &= I \times 0.5 / (m \times n) \\ &= 200 \times 0.5 / (2 \times 4) \\ &= 12.5 \text{ kA} \end{aligned}$$

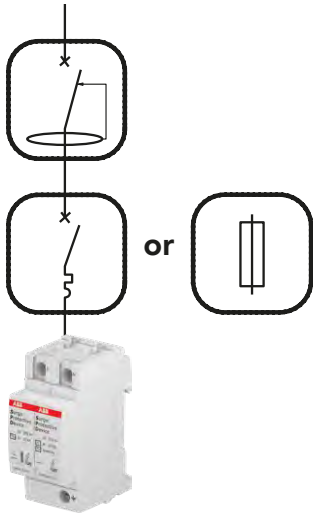


# Surge and lightning protection solutions

## Surge protective device disconnectors

### Choice of backup protection

Surge protective device must have disconnectors which are internal and external. Internal is the so called thermal disconnection which helps to disconnect the SPD at the end of life (varistors technology). External is the backup protection which can be an MCB or a fuse dedicated to the SPD protection in case of short circuit due to very high surge transient current for example.



Designation	Function
<b>Protection against indirect contact</b>	Residual current devices (RCDs) assure a protection to people and installation. When installed with SPDs they must be of selective type "S" to avoid nuisance tripping. In ABB portfolio you can choose the F200 S type range for a safer installation.
<b>Protection against fault currents</b>	Miniature circuit breakers (MCBs) or fuses protect the installation against overload and short circuit. They can be associated with SPDs for the backup protection in agreement with coordination installation rules. You can either choose MCBs from the S200 or S800 series or fuses from the E90 range.
<b>Thermal protection</b>	The thermal disconnection is an internal disconnection which is there to bring a safer protection to the equipment. ABB is always developing new patents and has developed a thermal disconnection mechanism specifically dedicated to PV installation with the OVR PV range for a better and safer protection.

Type of Surge Protective Devices	Miniature circuit breaker maximum ratings * curve B or C				Fuses maximum ratings* (gG)			Moulded Case Circuit Breaker
	Prospective short circuit current at SPD location (Ip)				IP ≤ 7 kA	IP ≤ 50 kA	IP ≤ 100 kA	IP ≤ 50kA
	IP ≤ 6 kA	IP ≤ 10 kA	IP ≤ 15 kA	IP ≤ 50 kA				
<b>Type 1</b>								
OVR T1 25 kA non-pluggable I <sub>imp</sub> = 25 kA/I <sub>fi</sub> = 7 kA; U <sub>c</sub> 255 V	-	-	-	-	125 A fuse	-	-	-
<b>Type 1+2</b>								
OVR T1-T2 25kA QS pluggable I <sub>imp</sub> 25 kA; U <sub>c</sub> 255, 440 V	-	-	-	-	315 A fuse	315 A fuse	315 A fuse	
OVR T1-T2 pluggable Safety Reserve QuickSafe® I <sub>imp</sub> 12.5 kA; U <sub>c</sub> 275, 440V	-	-	-	-	160 A fuse	160 A fuse	160 A fuse	
<b>Type 2</b>								
Type 2 pluggable I <sub>max</sub> 120 kA; U <sub>c</sub> 440V	S 200 M - 50	S 200 M - 50	S 200 P - 50	S 800 S - 50	50 A fuse	50 A fuse	-	-
OVR T2 pluggable Safety Reserve QuickSafe® I <sub>max</sub> 40 and 80 kA; U <sub>c</sub> 275, 440 V	S 200 M - 63	S 200 M - 63	S 200 P - 63	S 800 S - 125	160 A fuse	160 A fuse	160 A fuse	
Type 2 pluggable QuickSafe® I <sub>max</sub> 40 kA; U <sub>c</sub> 275, 350, 440, 600 V	S 200 M - 63	S 200 M - 63	S 200 P - 63	S 800 S - 125	125 A fuse	125 A fuse	125 A fuse	@ U <sub>c</sub> =275V, T <sub>max</sub> XT4S 250, Ekip LSI, I<3 In
OVR T2 non-pluggable I <sub>max</sub> 20 and 40 kA U <sub>c</sub> 275 V	S 200 M - 50	S 200 M - 50	S 200 P - 50	S 800 S - 50	50 A fuse	50 A fuse	-	-
OVR T2 pluggable I <sub>max</sub> 15 kA U <sub>c</sub> 75 V	S 200 M - 16	S 200 M -	-	-	16 A fuse	16 A fuse	-	-
<b>Type 2+3</b>								
OVR T2-T3 pluggable QuickSafe® I <sub>max</sub> 20 kA; U <sub>c</sub> 275, 350, 440, 600 V	S 200 M - 63	S 200 M - 63	S 200 P - 63	S 800 S - 125	125 A fuse	125 A fuse	125 A fuse	@ U <sub>c</sub> =275V, T <sub>max</sub> XT4S 250, Ekip LSI, I<3 In

\* Maximum ratings, must be in accordance with the installation to follow coordination rules with main or upstream short circuit protection(s).

Service entrance SPDs	PE connection cable size
Type 1	16 mm <sup>2</sup>
Type 1+2	16 mm <sup>2</sup>
Type 2	4 mm <sup>2</sup>
Type 2+3	4 mm <sup>2</sup>

### Backup disconnection

Type 2 QuickSafe® Characteristics	Prospective short circuit current at SPD location (Ip)	Circuit breaker* (curve B or C)	Fuses* (gG)
<b>Maximum rating</b>			
In: 5, 20, 30 kA U <sub>c</sub> : 275, 350, 440, 600 V	0.625 kA < Ip < 100 kA	S800S B or C - 125 A**	E90/125 125 A fuse (without Safety Reserve System) 160 A fuse (with Safety Reserve System)

\*: The backup disconnection of the SPD shall always be coordinated with the circuit breakers used in the installation

\*\* : up to Ip ≤ 50kA

# Surge and lightning protection solutions

## Installation and wiring of SPDs in an electrical switchboard

### Connection distance

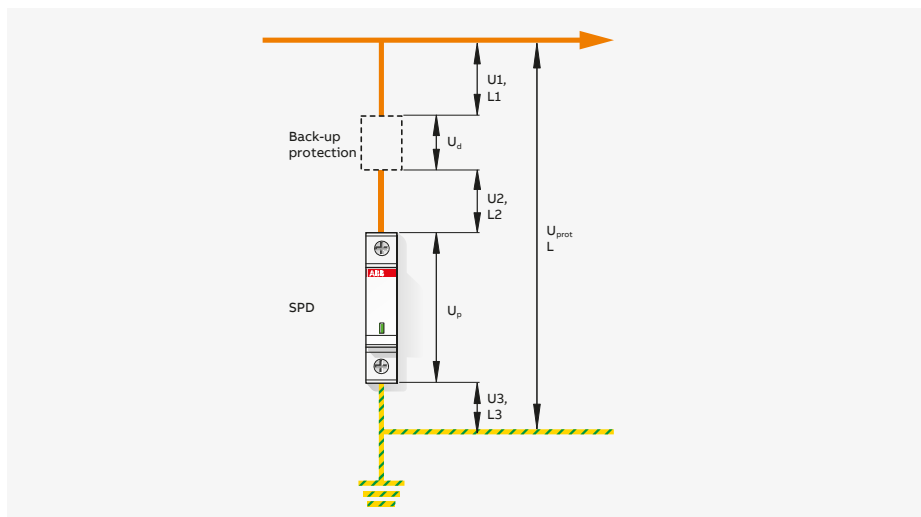
#### 50 cm rule

A lightning current of 10 kA generates a voltage drop of approximately 1200 V in 1 m of cable due to the inductance of the conductor. Equipment protected by a SPD is therefore subject to a voltage of  $U_{prot}$  equal to the sum of:

- Protection level of the SPD  $U_p$
- Voltage at the terminals of the back-up protection  $U_d$
- Voltage in the connections  $U_1, U_2, U_3$

$$U_{prot} = U_p + U_d + U_1 + U_2 + U_3$$

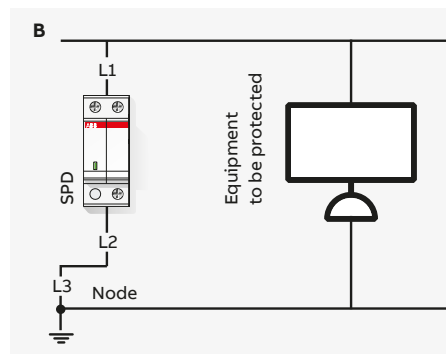
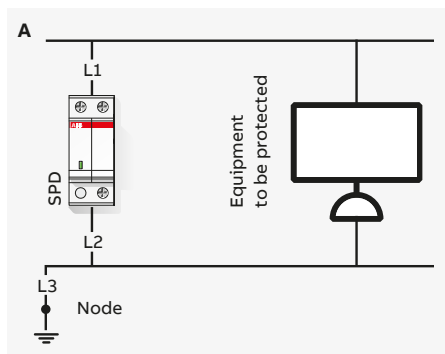
To maintain the level of protection below the impulse withstand voltage ( $U_w$ ) of the devices to be protected, the total length ( $L = L1 + L2 + L3$ ) of the connecting cables must be as short as possible (less than 0.50 m).



It is necessary to pay attention to the actual length of the connections, which must be measured from the SPD's terminals to the point at which the cable is taken off as a spur from the main conductor. Here is an example which demonstrates the importance of the lengths of connections (for simplicity the diagram omits the back-up protection).

**A: in this case...**  
 $L = L1 + L2$   
 The length  $L3$  has no effect on the protection of equipment.

**B: in this case...**  
 $L = L1 + L2 + L3$   
 If the length of  $L3$  is several meters, considering that every extra meter of wire increases the protection voltage by 1200 V, the protection loses a lot of effectiveness.

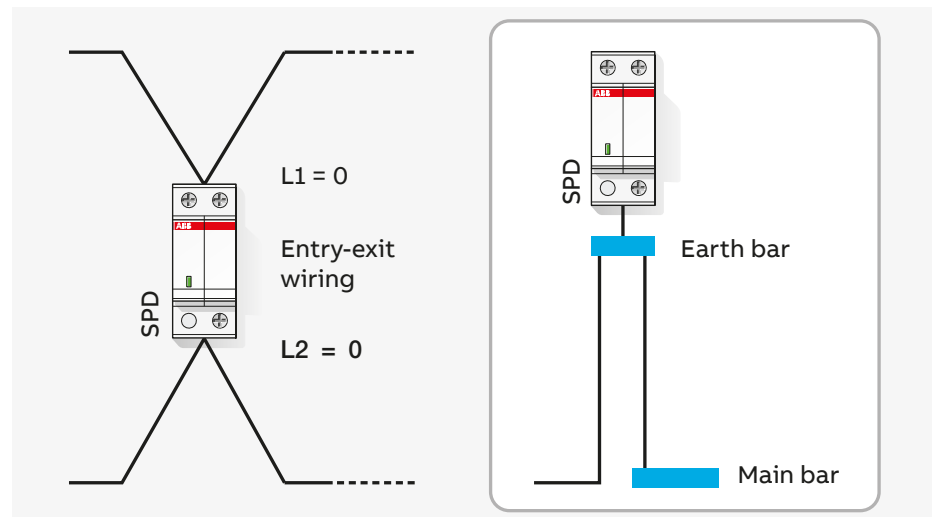


The equipment's earth connection must be distributed, starting from the connection of the SPD which protects it.

In the case where the length of the connection ( $L = L1 + L2 + L3$ ) exceeds 0.50 m, it is recommended to adopt one of the following steps:

1) Reduce the total length L:

- By moving the installation point of the SPD in the switchboard;
- Using V, or "entry-exit" wiring, which allows the lengths of the connections to be reduced to zero (it must, however, be ensured that the rated line current is compatible with the maximum current tolerated by the SPD's terminals);
- In large switchboards, connect the PE coming in to an earth bar near the SPD (the length of the connection is only the spur off from this point, so a few cm); downstream of the connection point, the PE can be taken to the main earth bar.



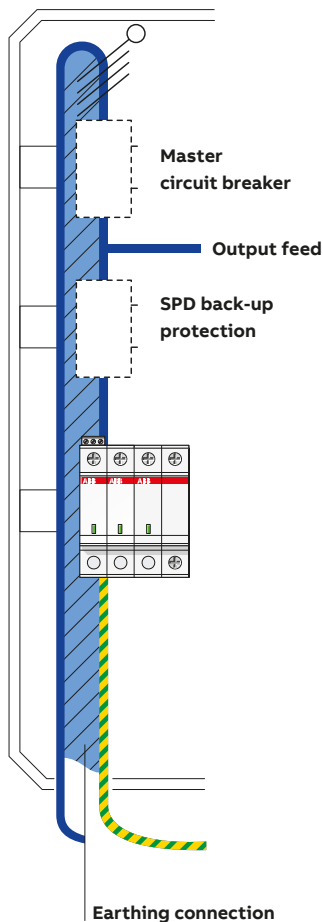
2) Choose a SPD with a lower level of protection  $U_p$

Install a second SPD coordinated with the first as close as possible to the device to be protected, so as to make the level of protection compatible with the impulse withstand voltage of the equipment.

Alternatively, select an enhanced SPD which inherently has a superior lower protection level, such as the ABB Furse range.

# Surge and lightning protection solutions

## Installation and wiring of SPDs in an electrical switchboard



### Electrical lines and connection area

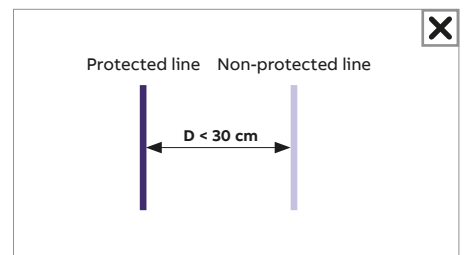
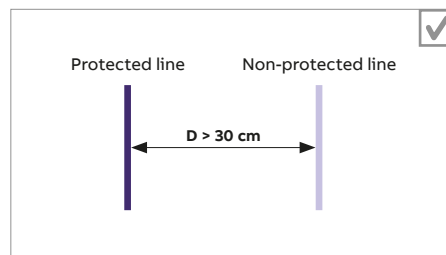
It is necessary to arrange the lines so that the conductors are as close as possible to each other (see figure) to avoid surges induced by inductive coupling of an indirect lightning strike with a large loop contained between the phases, the neutral and the PE conductor.

### Cabling of protected and non-protected lines

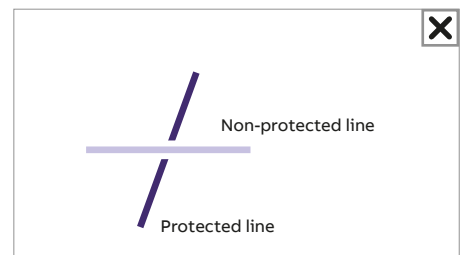
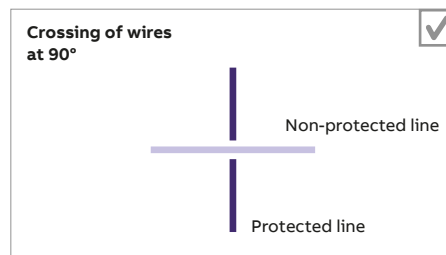
During installation, run the protected and non-protected wiring according to the instructions in the diagrams below.

To avoid the risk of electromagnetic coupling between different types of wires, it is strongly recommended they be kept at a distance from one another ( $> 30$  cm) and that when it is not possible to avoid them crossing, this needs to be performed at a right angle.

Distance between two wires:



Wires crossing:



### Equipotential earthing

It is fundamental to check the equipotentiality of the earths of all the equipment. The equipment's earth connection must also be distributed, starting from the connection of the SPD which protects it.

This allows the connection distances and therefore the voltage  $U_{\text{prot}}$  to be limited.

### Section of the connections

#### Wiring between active network conductors and the SPD

The cable section must be at least the same as the upstream wiring. The shape of wiring is more important than the section. The recommended section for Main Board is  $10 \text{ mm}^2$  for phase and Neutral and  $16 \text{ mm}^2$  for earth.

#### Wiring between the SPD and earth

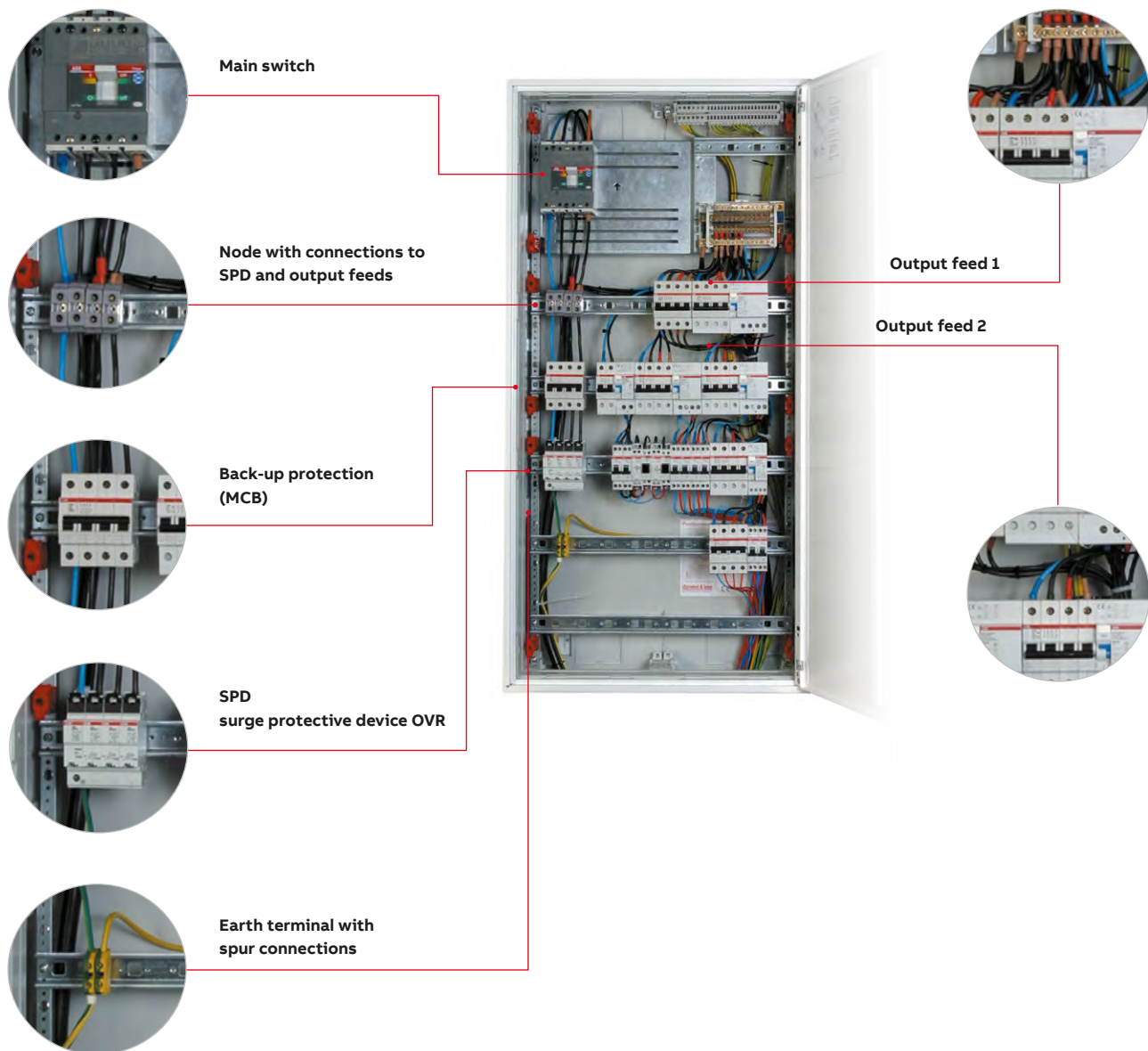
The minimum section is  $4 \text{ mm}^2$  in the case where there is no lightning conductor, and  $10 \text{ mm}^2$  in the case one is installed. It is nevertheless recommended to use a cable with a greater section to leave a safety margin, e.g.  $10\text{-}20 \text{ mm}^2$  section.

# Surge and lightning protection solutions

## Example of an electrical switchboard protected by ABB surge protection solutions

Rules followed by the installer:

- Connection distances < 50 cm
- Earth terminal in proximity to SPD
- Back-up protection dedicated to the SPD
- Protection installed upstream of RCDs
- Reduction of the loop between the phases, neutral and PE



# Surge and lightning protection solutions

## Mode of surge protection

### Protection in common and/or differential mode

#### Common mode

Overvoltages in common mode concern all neutral point connections. They occur between the live conductors and earth (e.g. phase/earth or neutral/earth). The neutral conductor is a live cable, as well as the phase conductors.

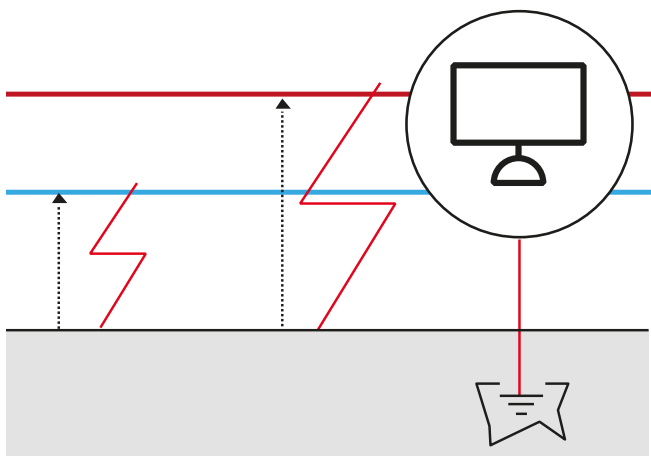
This overvoltage mode destroys not only earthed equipment (Class I), but also non-earthed equipment (Class II) with insufficient electrical insulation (a few kilovolts) located close to an earthed mass.

Class II equipment that is not situated close to an earthed mass is theoretically protected from this type of attack.

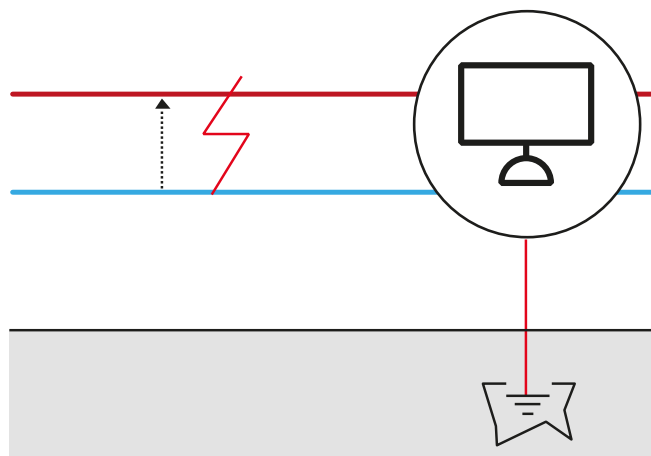
#### Differential mode

Overvoltages in differential mode circulate between the live phase/phase or phase/neutral conductors. They can cause considerable damage to any equipment connected to the electrical network, particularly "sensitive" equipment.

These overvoltages concern TT earthing systems. They also affect TN-S systems if there is a significant difference in length between the neutral cable and the protective cable (PE).



Overvoltages in common mode

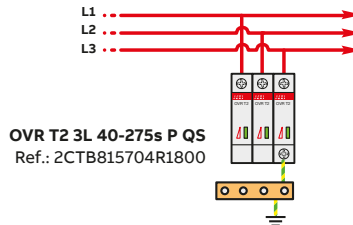
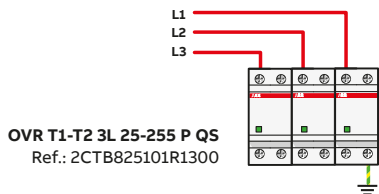


Overvoltages in differential mode

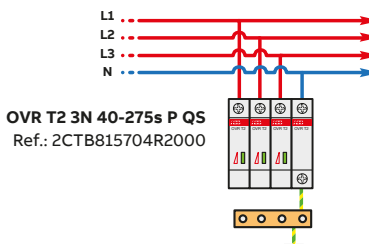
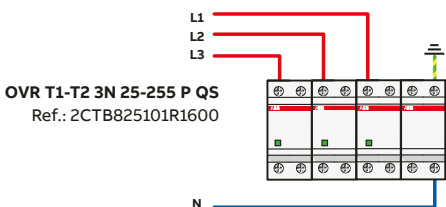
### Different types of OVR configuration

Either Common mode or differential mode of protection are required depending on the system configuration (IT, TNC, TNS, TT). For that purpose, you can find different OVR configuration (single pole, 3L, 4L, 1N, 3N).

#### Common mode configurations (TNC networks)



#### Common and differential mode configurations (TNS, TT networks)



# Surge and lightning protection solutions

## Coordination and wiring principals

The SPD installed at the line entrance of an installation may not ensure an effective protection to the whole system. As a matter of fact, the selection of the voltage protection level ( $U_p$ ) of SPDs depends on many parameters: Type of equipment to be protected, the length of the connections to the SPDs, the length in between the SPDs and the equipment to be protected.

**NOTE:**

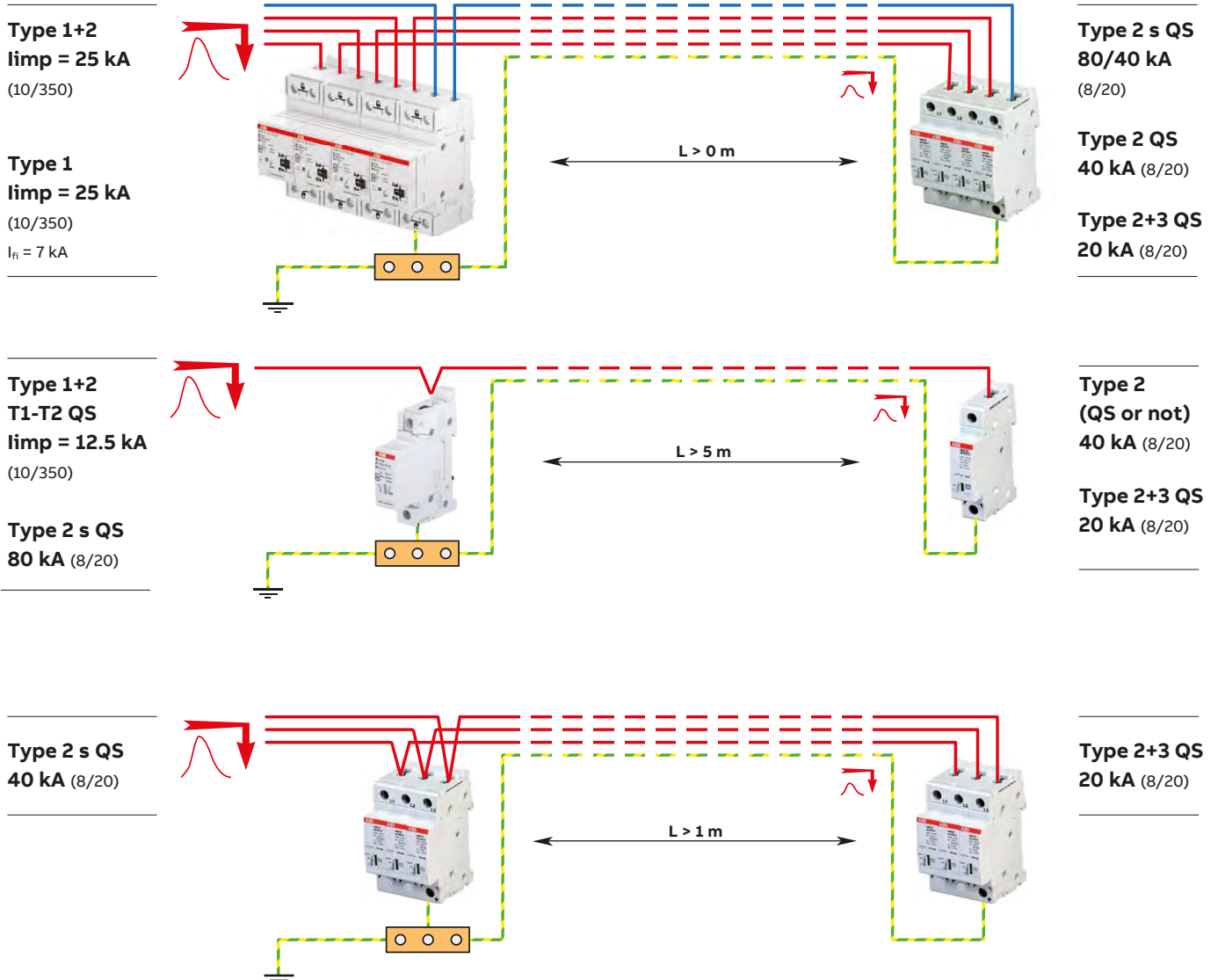
The first SPD is diverting most of the surge current to the ground, and the second SPD will ensure a good protection level to the equipment.

It is what we call the stepping protection.

**Coordination required if :**

The protection level ( $U_p$ ) of the SPDs is not low enough to protect the equipment.

If the distance in between the SPDs and the equipment is  $>10$  m.

**SPDs coordination tables and minimum cable length**

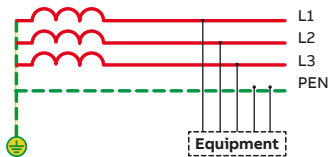
# Surge and lightning protection solutions

## General wiring diagrams

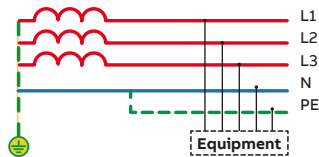
02

### Wiring diagrams according to IEC 60364-1

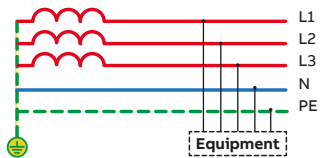
**TNC networks**  
230 / 400 V



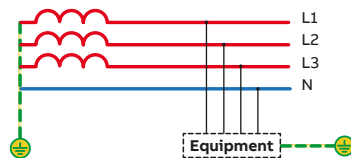
**TNC-S networks**  
230 / 400 V



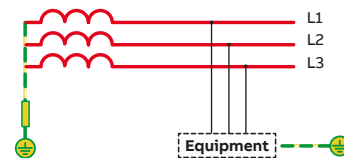
**TNS networks**  
230 / 400 V



**TT networks**  
230 / 400 V

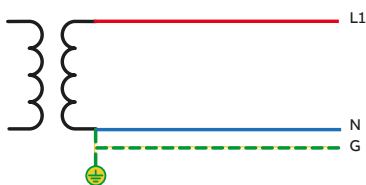


**IT networks**  
230 / 400 / 600 V



### Wiring diagrams according to UL 1449

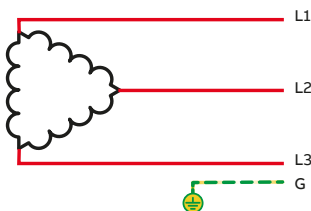
**Single phase networks**  
120 / 240 / 277 V



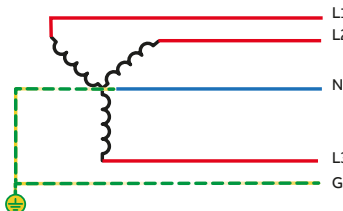
**Split phase networks**  
240 / 120 V, 480 / 240 V



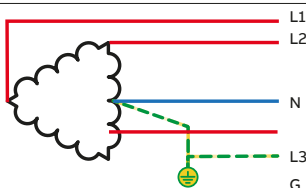
**Delta networks**  
240 / 480 / 600 V



**Grounded Wye networks**  
208 Y / 120 V, 480 Y / 277 V, 600 Y / 347 V



**High-Leg Delta networks**  
240 / 1200 V HLD



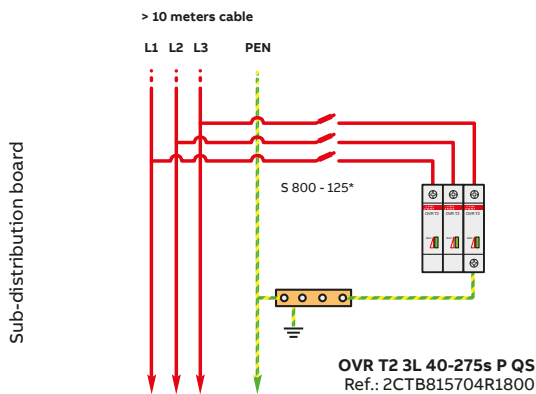
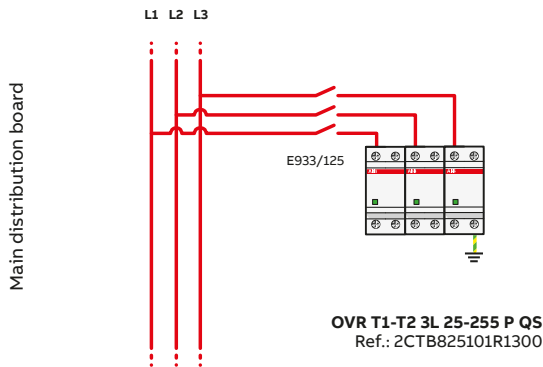
# Surge and lightning protection solutions

## Selection tool: TNC - 230 / 400 V network

Industry, commercial building

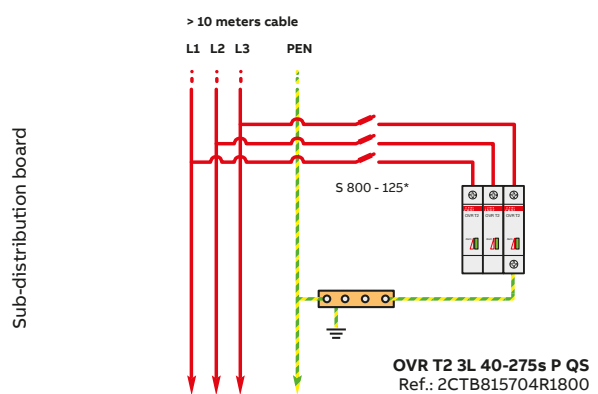
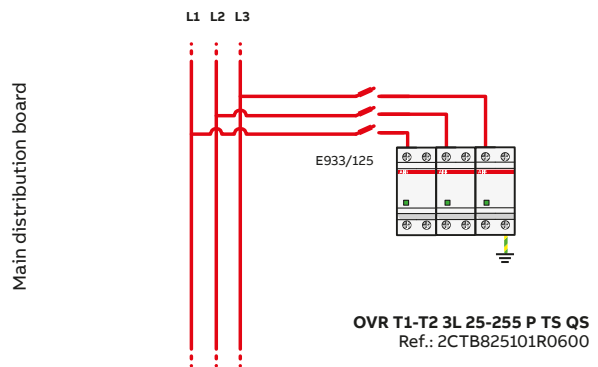
### Configuration 1

$15 \text{ kA} \leq I_p \leq 50 \text{ kA}$



### Configuration 2

$I_p \leq 15 \text{ kA}$



$I_p$ : prospective short circuit current of the power supply.

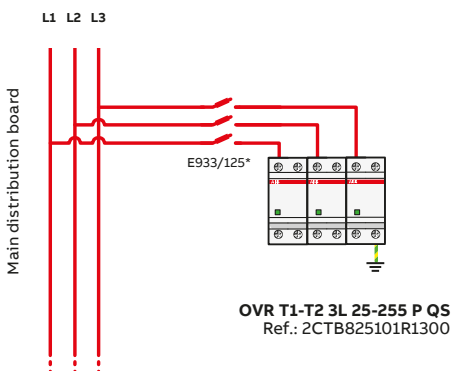
\* Must be according to the coordination rules with main or upstream short circuit protection(s).

# Surge and lightning protection solutions

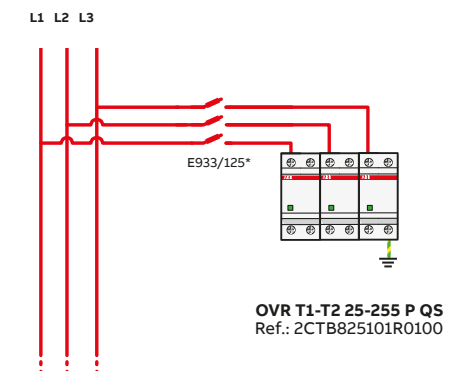
## Selection tool: TNC-S - 230 / 400 V network

Industry, commercial building

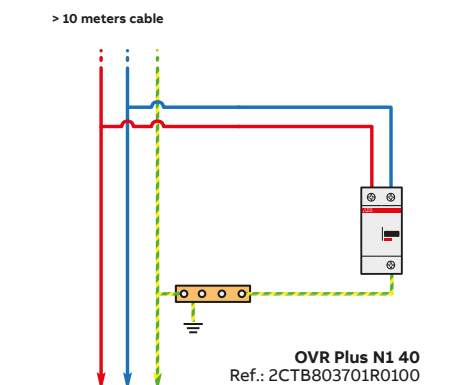
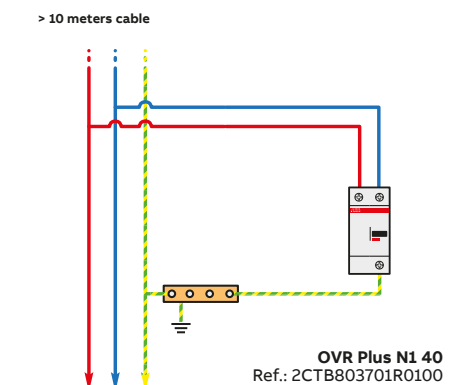
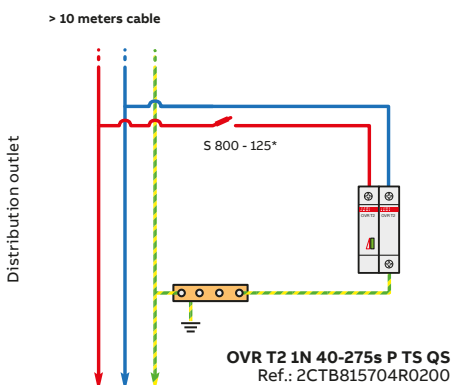
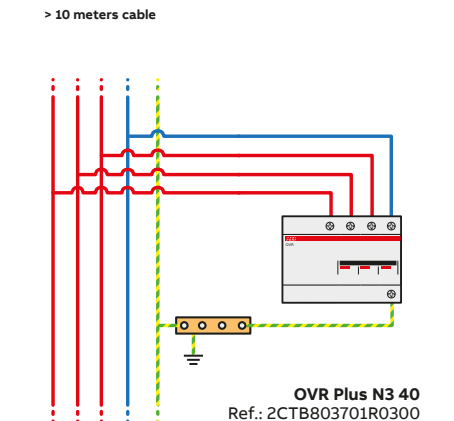
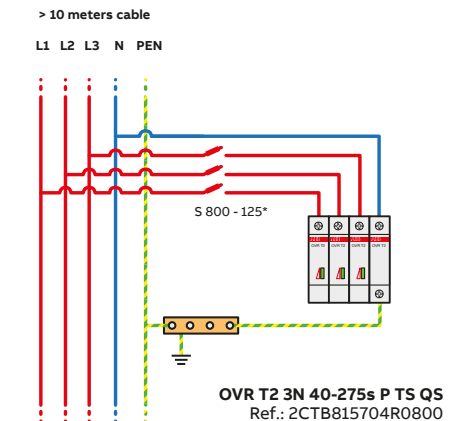
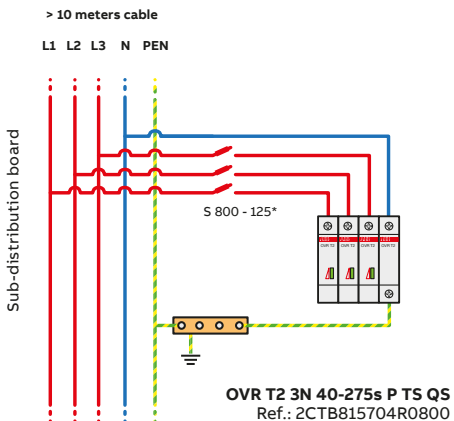
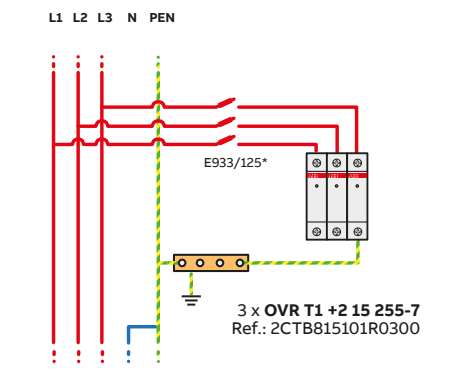
**Configuration 1**  
15 kA ≤ Ip ≤ 50 kA



**Configuration 2**  
7 kA ≤ Ip ≤ 15 kA



**Configuration 3**  
Ip ≤ 7 kA



Ip: prospective short circuit current of the power supply.

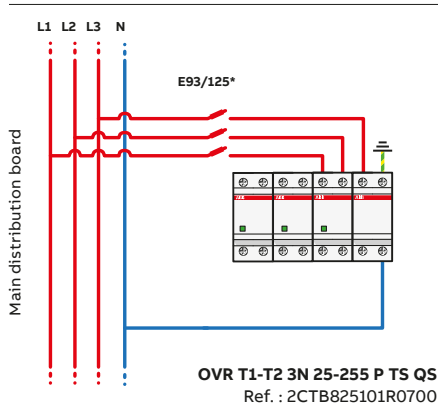
\* Must be according to the coordination rules with main or upstream short circuit protection(s).

# Surge and lightning protection solutions

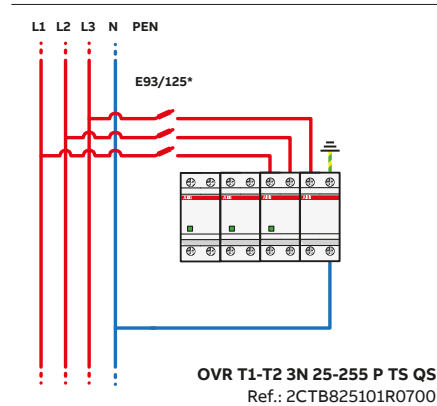
## Selection tool: TT network 230/400 V

Industry, commercial building

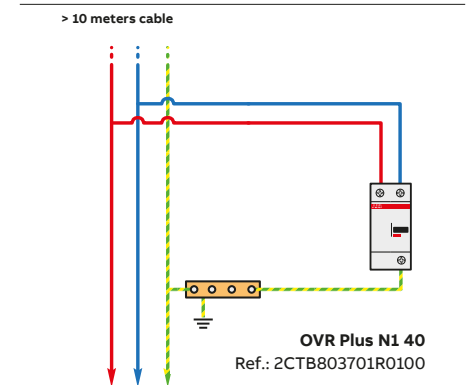
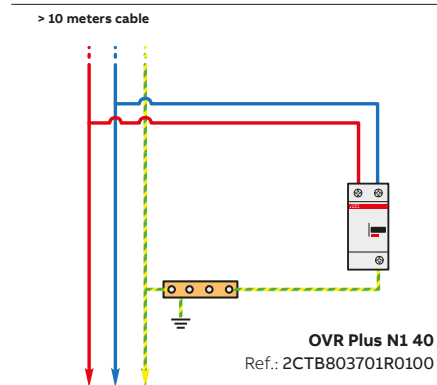
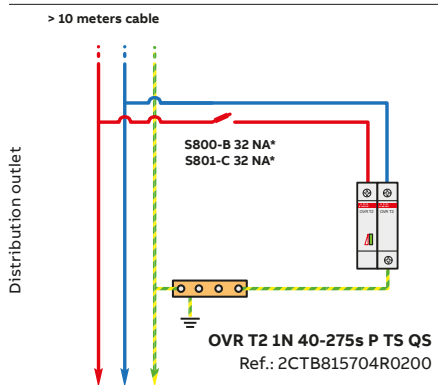
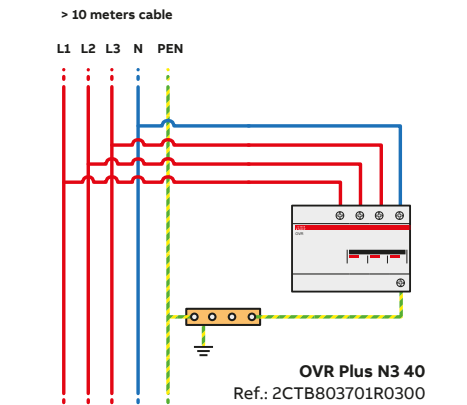
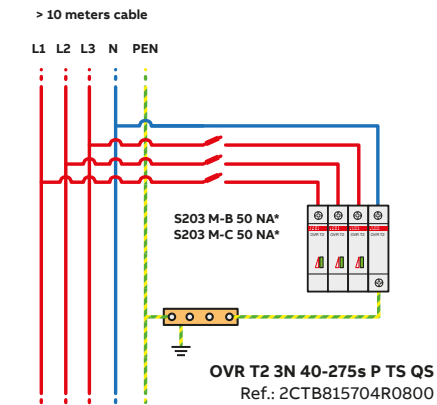
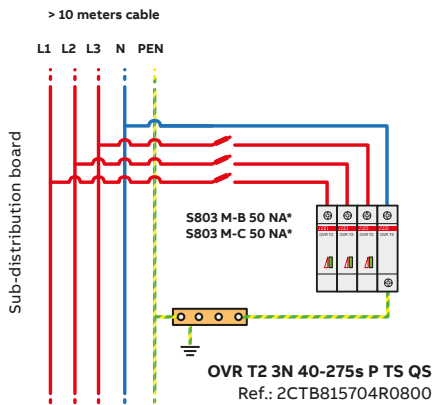
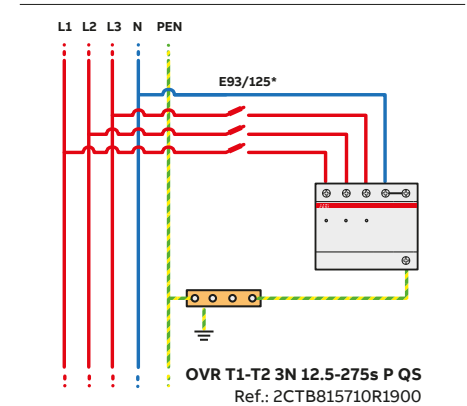
**Configuration 1**  
 $15 \text{ kA} \leq I_p \leq 50 \text{ kA}$



**Configuration 2**  
 $7 \text{ kA} \leq I_p \leq 15 \text{ kA}$



**Configuration 3**  
 $I_p \leq 7 \text{ kA}$



$I_p$ : prospective short circuit current of the power supply

\* Must be according to the coordination rules with main or upstream short circuit protection(s).

# Surge and lightning protection solutions

## Selection tool: IT network 230 V without neutral

### Commercial, residential

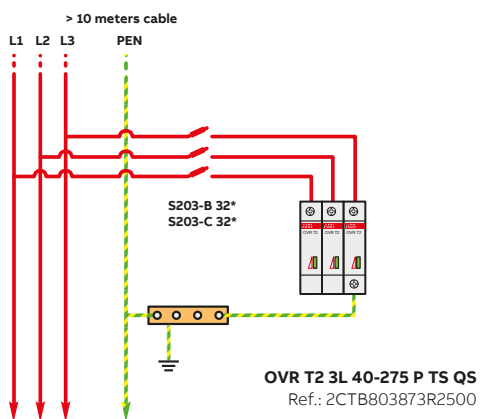
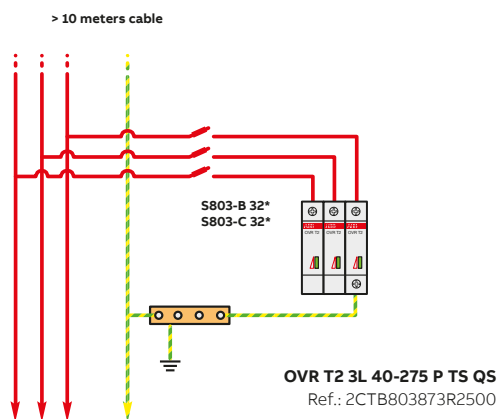
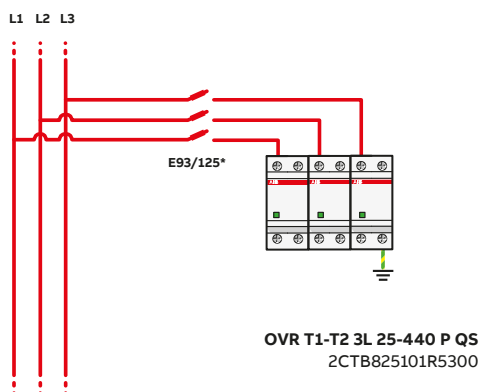
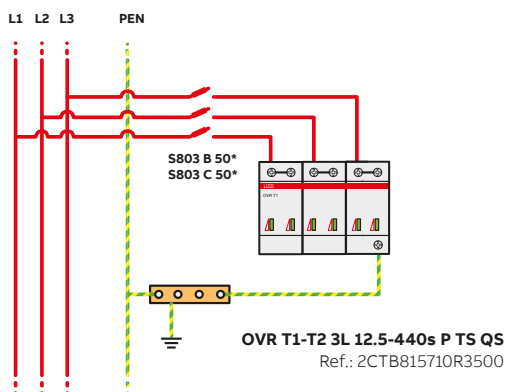
The IT system has all live parts at the source isolated from earth or one part connected to earth with a high impedance.

#### Configuration 1

$I_p \leq 50 \text{ kA}$

#### Configuration 2

$I_p \leq 100 \text{ kA}$



$I_p$ : prospective short circuit current of the power supply  
 \* Must be according to the coordination rules with main or upstream short circuit protection(s).

# Surge and lightning protection solutions

## Selection tool: TNC, TNS/TT networks

### 230/400 V

#### Residential

With external conductive parts (external lightning protection air terminal, antenna...) or powered by aerial lines

YES

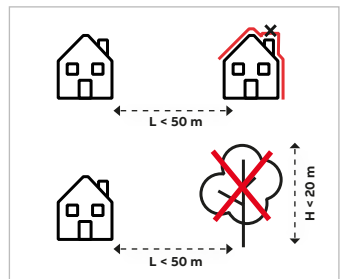
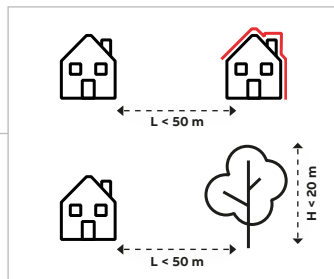
NO



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

YES

NO

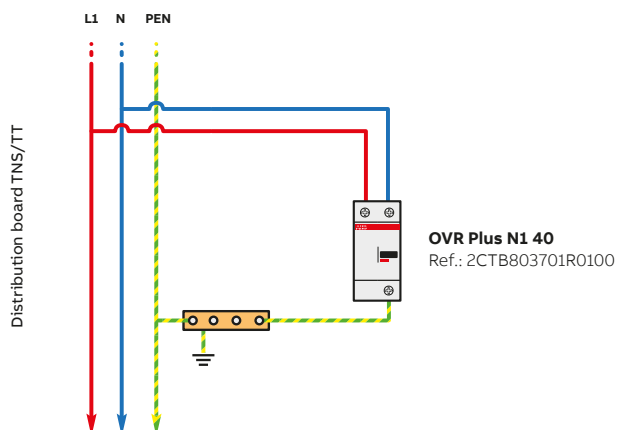
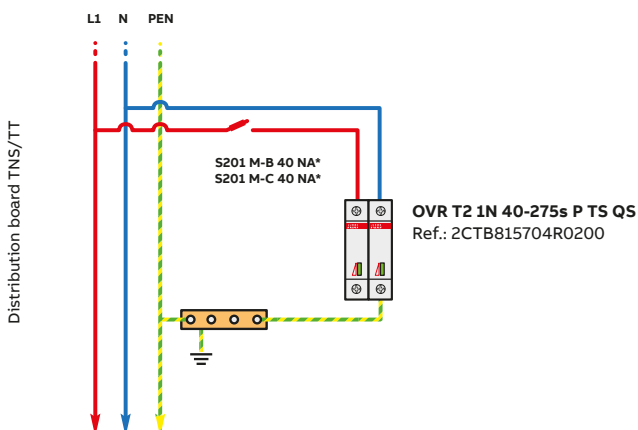
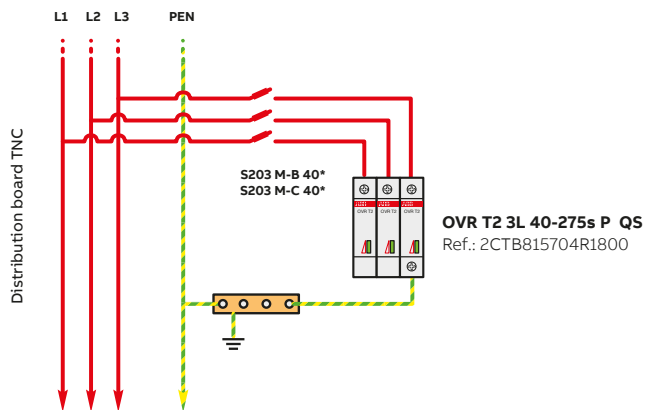
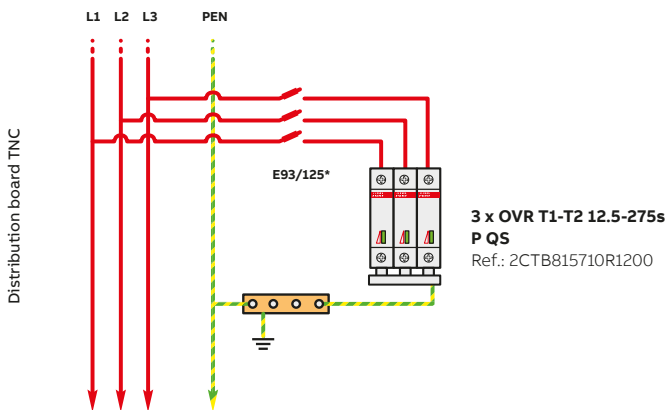


#### Configuration 1

With risk of direct lightning current (external protection, aerial lines...)

#### Configuration 2

With risk of indirect lightning current, transient surges



\* Should be according to the coordination rules with installed main breakers



OVR T1-T2 12.5-275s P QS

Type 1 and Type 1+2 surge protective devices are designed to discharge high current surges without any destruction of the installation. These surge protective devices are characterized by their capacity to withstand impulse current with 10/350  $\mu$ s wave form which simulate natural lightning current.

Type 1+2 ABB surge protective devices have a high impulse current withstand capacity with ensuring a low protection level (Up).

Type 1 and Type 1+2 SPDs can be installed at the entrance in the main switch board for a global protection of the electrical installation.

Poles	Impulse current limp 10/350	Max. discharge current I <sub>max</sub> 8/20	Follow current interrupting rating I <sub>fi</sub>	Voltage protection level Up	Nominal voltage U <sub>n</sub>	Max. cont. operating voltage U <sub>c</sub>	Bbn 3660 308	Ordering details		Weight 1 piece
								EAN	Type code	
1	100	100	0.1	≤ 1.5	230/400	255	526274	OVR T1-T2 N 100-255 P QS	2CTB825101R0500	0.29
1	100	100	0.1	≤ 2.5	400/690	440	526427	OVR T1-T2 N 100-440 P QS	2CTB825101R5200	0.29
1	25	70	100	≤ 1.5	230/400	255	526250	OVR T1-T2 25-255 P QS	2CTB825101R0100	0.356
1	25	70	100	≤ 1.5	230/400	255	526267	OVR T1-T2 25-255 P TS QS	2CTB825101R0200	0.36
1	25	70	15	≤ 2.5	400/690	440	526403	OVR T1-T2 25-440 P QS	2CTB825101R5000	0.356
1	25	70	15	≤ 2.5	400/690	440	526410	OVR T1-T2 25-440 P TS QS	2CTB825101R5100	0.36
1	12.5	80	-	1.4	230	275	524881	OVR T1-T2 12.5-275s P TS QS	2CTB815710R0000	0.15
1	12.5	80	-	1.4	230	275	524959	OVR T1-T2 12.5-275s P QS	2CTB815710R1200	0.15
1	12.5	80	-	1.9	400	440	525055	OVR T1-T2 12.5-440s P TS QS	2CTB815710R2900	0.30
1	12.5	80	-	1.9	400	440	525123	OVR T1-T2 12.5-440s P QS	2CTB815710R4100	0.30
1	50	100	-	1.4	230	275	525024	OVR T1-T2 N 50-275s P QS	2CTB815710R2400	0.15
1	50	100	-	1.9	400	440	525192	OVR T1-T2 N 50-440s P QS	2CTB815710R5300	0.14



## Protection and safety

### OVR Type 1+2 surge protective devices TNC 230 and 400 V networks

#### Technical features

Type codes		OVR T1-T2 3L 25-255 P QS	OVR T1-T2 3L 25-440 P QS
with auxiliary contact (TS)		OVR T1-T2 3L 25-255 P TS QS	OVR T1-T2 3L 25-440 P TS QS
Technology			
<b>Electrical features</b>			
Standard		IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11
Type/test class		T1-T2/I - II	T1-T2/I - II
Protected lines		3	3
System network		TNC	TNC
Type of current		AC 47-63 Hz	AC 47-63 Hz
Voltage regulation of the system network		± 10 %	± 10 %
Nominal system voltage Un	[V]	230/400	400/690 TNC, 230/400 (IT)
Max. cont. operating voltage Uc	[V]	255	440
Maximum impulse current Iimp (10/350)	[kA]	25	25
Max. Imp current Tot Iimp (10/350)	[kA]	-	-
Nominal discharge current In (8/20)	[kA]	25	25
Maximum discharge current Imax (8/20)	[kA]	70	70
Follow current interrupting rating Ifi	[kA]	100	15
Voltage protection level Up at In (L-N..)	[kV]	≤ 1.5/-/1.5	≤ 2.5/-/1.5
Voltage protection level Ures at 3 kA	[kV]	-	-
TOV (Temporary overvoltage) withstand Ut (L-N..)	[V]	337/-	581 / -
Response time	[ns]	≤ 100	≤ 100
Short-circuit withstand capability Isccr	[kA]	100	15
Backup protection maximum rating	fuse (gG)	[A]	≤ 315
	circuit breaker (B or C)	[A]	-
Pluggable cartridge		Yes	Yes
Integrated thermal disconnecter		Yes	Yes
State indicator		Yes	Yes
Safety reserve		No	No
Auxiliary contact		Yes (TS option)	Yes (TS option)
<b>Installation</b>			
Wire range (L, N, PE)	solid wire	[mm <sup>2</sup> ]	25 ... 50
	stranded wire	[mm <sup>2</sup> ]	25 ... 35
Stripping length (L, N, PE)		[mm]	15
Tightening torque (L, N, PE)		[Nm]	2.5
<b>Auxiliary contact (TS)</b>			
Contacts information		1 NO - 1 NC	1 NO - 1 NC
Min. load		12 DC - 10 mA	12 DC - 10 mA
Max. load		250 V AC - 1A	250 V AC - 1A
Connection cross-section	[mm <sup>2</sup> ]	0.5 ... 1.5	0.5 ... 1.5
<b>Miscellaneous characteristics</b>			
Stocking and operating temperature	[°C]	-40 to +80	-40 to +80
Maximal Altitude	[m]	2000	2000
Degree of protection		IP20	IP20
Fire resistance according to UL 94		V-0	V-0
<b>Dimensions</b>			
height x width x depth	[mm]	108.1 × 108 × 86.3	108.1 × 108 × 86.3
	[inches]	4.25 x 1.41 x 3.38	4.25 x 1.41 x 3.38
<b>Dimensions with auxiliary contact (TS)</b>			
height x width x depth	[mm]	109.2 × 108 × 86.3	109.2 × 108 × 86.3
	[inches]	4.29 x 1.41 x 3.38	4.29 x 1.41 x 3.38
<b>Replacement Cartridges</b>			
Phase Product ID		OVR T1-T2 25-255 C QS 2CTB825101R8000	OVR T1-T2 25-255 C QS 2CTB825101R8000

<b>OVR T1-T2 3L 12.5-275s P QS</b>	<b>OVR T1-T2 3L 12.5-440s P QS</b>
<b>OVR T1-T2 3L 12.5-275s P TS QS</b>	<b>OVR T1-T2 3L 12.5-440s P TS QS</b>
Varistor	Varistor
IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11
T1-T2/I - II	T1-T2/I - II
3	3
TNC	TNC
AC 47-63 Hz	AC 47-63 Hz
± 20%	± 10%
230/400	400/690
275	440
12.5	12.5
37.5	37.5
20	20
80	80
-	-
-/-/1.4	-/-/2
0.5	0.8
337/-	581/-
≤ 25	≤ 25
100	100
≤ 160	≤ 160
≤ 125	≤ 125
Yes	Yes
Yes	Yes
Yes	Yes
Yes	Yes
Yes (TS option)	Yes (TS option)
2.5 ... 35	2.5 ... 35
2.5 ... 25	2.5 ... 25
12.5	12.5
2.8	2.8
1 NO - 1 NC	1 NO - 1 NC
12 DC - 10 mA	12 DC - 10 mA
250 V AC - 1A	250 V AC - 1A
1.5	1.5
-40 to +80	-40 to +80
5000	5000
IP20 - Indoor	IP20 - Indoor
V-0	V-0
88 x 53.4 x 76.7	88 x 106.8 x 76.7
3.46 x 2.1 x 3.02	3.46 x 4.2 x 3.02
95.8 x 53.4 x 76.7	95.8 x 106.8 x 76.7
3.77 x 2.1 x 3.02	3.77 x 4.2 x 3.02
<b>OVR T1-T2 12.5-275s C QS</b> 2CTB815710R2600	<b>OVR T1-T2 12.5-440s C QS</b> 2CTB815710R5500

Type 1 and Type 1+2 surge protective devices are designed to discharge high current surges without any destruction of the installation. These surge protective devices are characterized by their capacity to withstand impulse current with 10/350  $\mu$ s wave form which simulate natural lightning current.

Type 1+2 ABB surge protective devices have a high impulse current withstand capacity with ensuring a low protection level (Up). Type 1 and Type 1+2 SPDs can be installed at the entrance in the main switch board for a global protection of the electrical installation.

Poles	Impulse current limp 10/350 kA	Max discharge current Imax 8/20 kA	Voltage protection level Up kV	Nominal voltage Un V	Max. cont. operating voltage Uc V	Bbn 3660308 EAN	Ordering details		Weight 1 piece kg
							Type code	Order code	
3	25	70	≤ 1.5	230/400	255	526298	OVR T1-T2 3L 25-255 P QS	2CTB825101R1300	1.065
3	25	70	≤ 1.5	230/400	255	526281	OVR T1-T2 3L 25-255 P TS QS	2CTB825101R0600	1.070
3	25	70	≤ 2.5	400/690	440	527639	OVR T1-T2 3L 25-440 P QS	2CTB825101R5300	1.065
3	25	70	≤ 2.5	400/690	440	527653	OVR T1-T2 3L 25-440 P TS QS	2CTB825101R5400	1.070
3	12.5	80	1.4	230/400	275	524911	OVR T1-T2 3L 12.5-275s P TS QS	2CTB815710R0600	0.45
3	12.5	80	1.4	230/400	275	524980	OVR T1-T2 3L 12.5-275s P QS	2CTB815710R1800	0.45
3	12.5	80	1.9	400/690	440	525086	OVR T1-T2 3L 12.5-440s P TS QS	2CTB815710R3500	0.90
3	12.5	80	2	400/690	440	525154	OVR T1-T2 3L 12.5-440s P QS	2CTB815710R4700	0.90
3	25	60	1.5	230/400	255	513397	OVR T1+2 3L 25-255 TS	2CTB815101R4300	0.85



## Protection and safety

### OVR Type 1+2 surge protective devices TNS/TT 230 1Ph+N and 3Ph+N networks

#### Technical features

Type codes		OVR T1-T2 1N 25-255 P QS	OVR T1-T2 1N 12.5-275s P QS
with auxiliary contact (TS)		OVR T1-T2 1N 25-255 P TS QS	OVR T1-T2 1N 12.5-275s P TS QS
Technology			Varistor + GDT
<b>Electrical features</b>			
Standard		IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11
Type/test class		T1-T2/I - II	T1-T2/I - II
Protected lines		1+1	1+1
System network		TNS / TT	TNS / TT
Type of current		AC 47-63 Hz	AC 47-63 Hz
Voltage regulation of the system network			± 20%
Nominal system voltage Un	[V]	230 / 400	230
Max. cont. operating voltage Uc	[V]	255	275
Maximum impulse current Iimp (10/350)	[kA]	25	12.5
Max. Imp current Tot Iimp (10/350)	[kA]	50	25
Nominal discharge current In (8/20)	[kA]	25	20
Maximal discharge current I <sub>max</sub> (8/20) kA	[kA]	70	80
Follow current interrupting rating I <sub>fi</sub>	[kA]	100	
Voltage protection level Up at In (L-N/N-PE/L-PE)	[kV]	337 / 1200	1.4/1.4/1.5
Voltage protection level U <sub>res</sub> at 3 kA	[kV]		0.5
TOV (Temporary overvoltage) withstand Ut (L-N: 5s./N-PE: 200ms)	[V]		337/1200
Response time	[ns]	≤ 100	≤ 25
Short-circuit withstand capability I <sub>scrr</sub>	[kA]	100	100
Backup protection fuse (gG)	[A]	≤ 315	≤ 160
maximum rating circuit breaker (B or C curve)	[A]	-	≤ 125
Pluggable cartridge		Yes	Yes
Integrated thermal disconnecter		Yes	Yes
State indicator		Yes	Yes
Safety reserve		No	Yes
Auxiliary contact		Yes (TS option)	Yes (TS option)
<b>Installation</b>			
Wire range (L, N, PE) solid wire	[mm <sup>2</sup> ]	25 ... 50	2.5 ... 35
stranded wire	[mm <sup>2</sup> ]	25 ... 35	2.5 ... 25
Stripping length (L, N, PE)	[mm]	15	12.5
Tightening torque (L, N, PE)	[Nm]	2.5	2.8
<b>Auxiliary contact (TS)</b>			
Contacts information		1 NO - 1 NC	1 NO - 1 NC
Min. load		12 V DC - 10 mA	12 V DC - 10 mA
Max. load		250 V AC - 1A	250 V AC - 1A
Connection cross-section	[mm <sup>2</sup> ]	0.5 ... 1.5	1.5
<b>Miscellaneous characteristics</b>			
Stocking and operating temperature	[°C]	-40 to +80	-40 to +80
Maximal Altitude	[m]	2000	5000
Degree of protection		IP20	IP20 - Indoor
Fire resistance according to UL 94		V-0	V-0
<b>Dimensions</b>			
height x width x depth	[mm]	108.1 × 72 × 86.3	88 × 35.6 × 76.7
	[in]	4.25 × 2.83 × 3.38	3.46 × 1.4 × 3.02
<b>Dimensions with auxiliary contact (TS)</b>			
height x width x depth	[mm]	108.1 × 72 × 86.3	95.8 × 35.6 × 76.7
	[in]	4.25 × 2.83 × 3.38	3.46 × 1.4 × 3.02
<b>Replacement Cartridges</b>			
Phase Product ID		OVR T1-T2 25-255 C QS 2CTB825101R8000	OVR T1-T2 12.5-275s C QS 2CTB815710R2600
Neutral Product ID		OVR T1-T2 N 100-255 C QS 2CTB825101R8200	OVR T1-T2 N 50-275s C QS 2CTB815710R2700

<b>OVR T1-T2 4L 25-255 P QS</b>	<b>OVR T1-T2 3N 25-255 P QS</b>	<b>OVR T1-T2 3N 12.5-275s P QS</b>	<b>OVR T1-T2 4L 12.5-275s P QS</b>
<b>OVR T1-T2 4L 25-255 P TS QS</b>	<b>OVR T1-T2 3N 25-255 P TS QS</b>	<b>OVR T1-T2 3N 12.5-275s P TS QS</b>	<b>OVR T1-T2 4L 12.5-275s P TS QS</b>
		Varistor + GDT	Varistor
IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11
T1-T2/I - II	T1-T2/I - II	T1-T2/I - II	T1-T2/I - II
4	3+1	3+1	3+N
TNS	TNS / TT	TNS / TT	TNS
AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz
		± 20%	± 20%
230 / 400	230 / 400	230/400	230/400
255	255	275	275
25	25	12.5	12.5
25	25	50	50
70	70	20	20
		80	80
100	100		-
≤ 1.5	≤ 1.5	1.4/1.4/1.5	2.8/1.4/1.4
		0.5	0.5
337 / -	337 / 1200	337/1200	337/
≤ 100	≤ 100	≤ 25	≤ 25
100	100	100	100
≤ 315	≤ 315	≤ 160	≤ 160
-	-	≤ 125	≤ 125
Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes
No	No	Yes	Yes
Yes (TS option)	Yes (TS option)	Yes (TS option)	Yes (TS option)
25 ... 50	25 ... 50	2.5 ... 35	2.5 ... 35
25 ... 35	25 ... 35	2.5 ... 25	2.5 ... 25
15	15	12.5	12.5
2.5	2.5	2.8	2.8
1 NO - 1 NC	1 NO - 1 NC	1 NO - 1 NC	1 NO - 1 NC
12 V DC - 10 mA	12 V DC - 10 mA	12 V DC - 10 mA	12 V DC - 10 mA
250 V AC - 1A	250 V AC - 1A	250 V AC - 1A	250 V AC - 1A
0.5 ... 1.5	0.5 ... 1.5	1.5	1.5
-40 to +80	-40 to +80	-40 to +80	-40 to +80
2000	2000	5000	5000
IP20	IP20	IP20 - Indoor	IP20 - Indoor
V-0	V-0	V-0	V-0
108.1 × 144 × 86.3	108.1 × 144 × 86.3	88 × 71.2 × 76.7	88 × 71.2 × 76.7
4.25 × 5.66 × 3.38	4.25 × 5.66 × 3.38	3.46 × 2.8 × 3.02	3.46 × 2.8 × 3.02
109.2 × 144 × 86.3	109.2 × 144 × 86.3	95.8 × 71.2 × 76.7	95.8 × 71.2 × 76.7
4.29 × 5.66 × 3.38	4.29 × 5.66 × 3.38	3.77 × 2.8 × 3.02	3.77 × 2.8 × 3.02
<b>OVR T1-T2 25-255 C QS</b> <b>2CTB825101R8000</b>	<b>OVR T1-T2 25-440 C QS</b> <b>2CTB825101R8100</b>	<b>OVR T1-T2 12.5-275s C QS</b> <b>2CTB815710R2600</b>	<b>OVR T1-T2 12.5-275s C QS</b> <b>2CTB815710R2600</b>
<b>OVR T1-T2 N 100-255 C QS</b> <b>2CTB825101R8200</b>	<b>OVR T1-T2 N 100-400 C QS</b> <b>2CTB825101R8300</b>	<b>OVR T1-T2 N 50-275s C QS</b> <b>2CTB815710R2700</b>	

## Protection and safety

OVR Type 1+2 surge protective devices TNS/TT 400 V 1Ph+N and 3Ph+N networks



OVR T1-T2 1N  
12.5-440s P TS QS

2CSC400026FF0013

### Technical features

<b>Type codes</b>		<b>OVR T1-T2 1N 12.5-440s P QS</b>	
<b>with auxiliary contact (TS)</b>		<b>OVR T1-T2 1N 12.5-440s P TS QS</b>	
Technology		Varistor + GDT	
<b>Electrical features</b>			
Standard		IEC 61643-11/EN 61643-11	
Type/test class		T1-T2/I - II	
Protected lines		1+1	
System network		TT- TNS	
Type of current		AC 47-63 Hz	
Voltage regulation of the system network		± 10%	
Nominal system voltage Un	[V]	400	
Max. cont. operating voltage Uc	[V]	440	
Maximum impulse current Iimp (10/350)	[kA]	12.5	
Max. Imp current Tot Iimp (10/350)	[kA]	25	
Nominal discharge current In (8/20)	[kA]	20	
Maximal discharge current Imax (8/20) kA	[kA]	80	
Follow current interrupting rating Ifi	[kA]		
Voltage protection level Up at In (L-N/N-PE/L-PE)	[kV]	1.9/1.9/2	
Voltage protection level Ures at 3 kA	[kV]	0.8	
TOV (Temporary overvoltage) withstand Ut (L-N: 5s./N-PE: 200ms)	[V]	581/1200	
Response time	[ns]	≤ 25	
Short-circuit withstand capability Isccr	[kA]	100	
Backup protection maximum rating	fuse (gG)	[A]	≤ 160
	circuit breaker (B or C curve)	[A]	≤ 125
Pluggable cartridge		Yes	
Integrated thermal disconnecter		Yes	
State indicator		Yes	
Safety reserve		Yes	
Auxiliary contact		Yes (TS option)	
<b>Installation</b>			
Wire range (L, N, PE)	solid wire	[mm <sup>2</sup> ]	2.5 ... 35
	stranded wire	[mm <sup>2</sup> ]	2.5 ... 25
Stripping length (L, N, PE)		[mm]	12.5
Tightening torque (L, N, PE)		[Nm]	2.8
<b>Auxiliary contact (TS)</b>			
Contacts information		1 NO - 1 NC	
Min. load		12 V DC - 10 mA	
Max. load		250 V AC - 1 A	
Connection cross-section		[mm <sup>2</sup> ]	1.5
<b>Miscellaneous characteristics</b>			
Stocking and operating temperature		[°C]	-40 to +80
Maximal Altitude		[m]	5000
Degree of protection		IP20 - Indoor	
Fire resistance according to UL 94		V-0	
<b>Dimensions</b>			
height x width x depth		[mm]	88 x 53.4 x 76.7
		[in]	3.46 x 2.1 x 3.02
<b>Dimensions with auxiliary contact (TS)</b>			
height x width x depth		[mm]	95.8 x 53.4 x 76.7
		[in]	3.77 x 2.1 x 3.02
<b>Replacement Cartridges</b>			
Phase Product ID		OVR T1-T2 12.5-440s C QS 2CTB815710R5500	
Neutral Product ID		OVR T1-T2 N 50-440s C QS 2CTB815710R5600	

<b>OVR T1-T2 3N 12.5-440s P QS</b>	<b>OVR T1-T2 4L 12.5-440s P QS</b>
<b>OVR T1-T2 3N 12.5-440s P TS QS</b>	<b>OVR T1-T2 4L 12.5-440s P TS QS</b>
Varistor + GDT	Varistor
IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11
T1-T2/I - II	T1-T2/I - II
3+1	4
TT- TNS	TNS
AC 47-63 Hz	AC 47-63 Hz
± 10%	± 10%
400/690	400/690
440	440
12.5	12.5
50	50
20	20
80	80
1.9/1.9/2	3.8/1.9/1.9
0.8	0.8
581/1200	581/
≤ 25	≤ 25
100	100
≤ 160	≤ 160
≤ 125	≤ 125
Yes	Yes
Yes	Yes
Yes	Yes
Yes	Yes
Yes (TS option)	Yes (TS option)
2.5 ... 35	2.5 ... 35
2.5 ... 25	2.5 ... 25
12.5	12.5
2.8	2.8
1 NO - 1 NC	1 NO - 1 NC
12 V DC - 10 mA	12 V DC - 10 mA
250 V AC - 1 A	250 V AC - 1 A
1.5	1.5
-40 to +80	-40 to +80
5000	5000
IP20 - Indoor	IP20 - Indoor
V-0	V-0
88 x 124.6 x 76.7	88 x 142.4 x 76.7
3.46 x 4.91 x 3.02	3.46 x 5.61 x 3.02
95.8 x 124.6 x 76.7	95.8 x 142.4 x 76.7
3.77 x 4.91 x 3.02	3.77 x 5.61 x 3.02
OVR T1-T2 12.5-440s C QS 2CTB815710R5500	OVR T1-T2 12.5-440s C QS 2CTB815710R5500
OVR T1-T2 N 50-440s C QS 2CTB815710R5600	

## Protection and safety

### OVR Type 1+2 surge protective devices TNS/TT 400 V 1Ph+N and 3Ph+N networks



OVR T1-T2 1N  
12.5-440s P TS QS

Type 1 and Type 1+2 surge protective devices are designed to discharge high current surges without any destruction of the installation. These surge protective devices are characterized by their capacity to withstand impulse current with 10/350  $\mu$ s wave form which simulate natural lightning current.

Type 1+2 ABB surge protective devices have a high impulse current withstand capacity with ensuring a low protection level (Up).

Type 1 and Type 1+2 SPDs can be installed at the entrance in the main switch board for a global protection of the electrical installation.

Poles	Impulse current limp 10/350	Max. discharge current I <sub>max</sub> 8/20	Follow current interrupting rating I <sub>fi</sub>	Voltage protection level Up	Nominal voltage U <sub>n</sub>	Max. cont. operating voltage U <sub>c</sub>	Bbn 3660 308 EAN	Ordering details		Weight 1 piece
	kA	kA	kA	kV	V	V		Type code	Order code	kg
4	25	70	100	≤ 1.5	230/400	255	526335	OVR T1-T2 4L 25-255 P QS	2CTB825101R1400	1.425
4	25	70	100	≤ 1.5	230/400	255	526328	OVR T1-T2 4L 25-255 P TS QS	2CTB825101R0800	1.430
3+1	25	70	100	≤ 1.5	230/400	255	526311	OVR T1-T2 3N 25-255 P QS	2CTB825101R1600	1.355
3+1	25	70	100	≤ 1.5	230/400	255	526304	OVR T1-T2 3N 25-255 P TS QS	2CTB825101R0700	1.400
1+1	12.5	80	-	1.4	230	275	524966	OVR T1-T2 1N 12.5-275s P QS	2CTB815710R1300	0.30
1+1	12.5	80	-	1.4	230	275	524898	OVR T1-T2 1N 12.5-275s P TS QS	2CTB815710R0100	0.30
1+1	12.5	80	-	1.9	400	440	525130	OVR T1-T2 1N 12.5-440s P QS	2CTB815710R4200	0.45
1+1	12.5	80	-	1.9	400	440	525062	OVR T1-T2 1N 12.5-440s P TS QS	2CTB815710R3000	0.45
3+1	12.5	80	-	1.4	230/400	275	524997	OVR T1-T2 3N 12.5-275s P QS	2CTB815710R1900	0.60
3+1	12.5	80	-	1.4	230/400	275	524928	OVR T1-T2 3N 12.5-275s P TS QS	2CTB815710R0700	0.60
3+1	12.5	80	-	1.9	400/690	440	525161	OVR T1-T2 3N 12.5-440s P QS	2CTB815710R4800	1.05
3+1	12.5	80	-	1.9	400/690	440	525093	OVR T1-T2 3N 12.5-440s P TS QS	2CTB815710R3600	1.05
4	12.5	80	-	1.4	230/400	275	525017	OVR T1-T2 4L 12.5-275s P QS	2CTB815710R2300	0.60
4	12.5	80	-	1.4	230/400	275	524942	OVR T1-T2 4L 12.5-275s P TS QS	2CTB815710R1100	0.60
4	12.5	80	-	1.9	400/690	440	525185	OVR T1-T2 4L 12.5-440s P QS	2CTB815710R5200	1.20
4	12.5	80	-	1.9	400/690	440	525116	OVR T1-T2 4L 12.5-440s P TS QS	2CTB815710R4000	1.20





## Protection and safety

### OVR Type 2 pluggable QuickSafe® surge protective devices Single pole 400 V networks

#### Technical features

Type codes		OVR T2 40-440 P QS	OVR T2 40-440s P QS	OVR T2 80-440s P QS
with auxiliary contact (TS)		OVR T2 40-440 P TS QS	OVR T2 40-440s P TS QS	OVR T2 80-440s P TS QS
Technology		Varistor	Varistor	Varistor
<b>Electrical features</b>				
Standard		IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11
Type/test class		T2/II	T2/II	T2/II
Protected lines		1	1	1
System network		TNC - TT - TNS - IT (230 V)	TNC - TT - TNS - IT (230 V)	TNC -TT(L-N) - TNS - IT (230 V)
Type of current		AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz
Voltage regulation of the system network		± 10%	± 10%	± 10%
Nominal system voltage Un	[V]	400	400	400
Max. cont. operating voltage Uc	[V]	440	440	440
Nominal dc voltage Un dc L-PE	[V dc]	495	-	-
Max. dc. cont. operating voltage Ucdc L-PE	[V dc]	545	-	-
Maximum discharge current I <sub>max</sub> (8/20)	[kA]	40	40	80
Maximum impulse current I <sub>imp</sub> (10/350)	[kA]	2	2	6.25
Nominal discharge current I <sub>n</sub> (8/20)	[kA]	20	20	20
Voltage protection level Up at I <sub>n</sub> (L-N/N-PE/L-PE)	[kV]	1.8/-/1.8	1.8/-/1.8	1.8/-/1.8
Voltage protection level U <sub>res</sub> at 3kA (L-N)	[kV]	1.25	0.8	0.8
Voltage protection level U <sub>res</sub> at 5kA (L-N)	[kV]	1.35	1.2	1.2
Voltage protection level U <sub>res</sub> at 10kA (L-N)	[kV]	1.55	1.55	-
TOV (Temporary overvoltage) withstand Ut (L-N: 5s./N-PE: 200ms)	[V]	581/-	581/-	581/-
U <sub>oc</sub>	[kV]	-	-	-
Response time	[ns]	≤ 25	≤ 25	≤ 25
Short-circuit withstand capability I <sub>sc</sub>	[kA]	100	100	100
Backup fuse (gG)	[A]	≤ 125	≤ 160	≤ 160
protection circuit breaker (B or C curve)	[A]	≤ 125	≤ 125	≤ 125
maximum rating				
Pluggable cartridge		Yes	Yes	Yes
Integrated QuickSafe® technology		Yes	Yes	Yes
State indicator		Yes	Yes	Yes
Safety reserve		No	Yes	Yes
Auxiliary contact		Yes (TS option)	Yes (TS option)	Yes (TS option)
<b>Installation</b>				
Wire range solid wire	[mm <sup>2</sup> ]	2.5 ... 35	2.5 ... 35	2.5 ... 35
(L, N, PE) stranded wire	[mm <sup>2</sup> ]	2.5 ... 25	2.5 ... 25	2.5 ... 25
Stripping length (L, N, PE)	[mm]	12.5	12.5	12.5
Tightening torque (L, N, PE)	[Nm]	2.8	2.8	2.8
<b>Auxiliary contact (TS)</b>				
Contacts information		1 NO - 1 NC	1 NO - 1 NC	1 NO - 1 NC
Min. load		12 V DC - 10 mA	12 V DC - 10 mA	12 V DC - 10 mA
Max. load		250 V AC - 1 A	250 V AC - 1A	250 V AC - 1A
Connection cross-section	[mm <sup>2</sup> ]	1.5	1.5	1.5
<b>Miscellaneous characteristics</b>				
Stocking and operating temperature	[°C]	-40 to +80	-40 to +80	-40 to +80
Maximal Altitude	[m]	5000	5000	5000
Degree of protection		IP20	IP20	IP20
Fire resistance according to UL 94		V-0	V-0	V-0
<b>Dimensions of packing</b>				
height x width x depth	[mm]	88 x 17.8 x 65.3	88 x 17.8 x 76.7	88 x 17.8 x 76.7
	[inches]	3.46 x 0.7 x 2.57	3.46 x 0.7 x 3.02	3.46 x 0.7 x 3.02
<b>With Auxiliary Contact (TS)</b>				
height x width x depth	[mm]	95.8 x 17.8 x 65.3	95.8 x 17.8 x 76.7	95.8 x 17.8 x 76.7
	[inches]	3.77 x 0.7 x 2.57	3.77 x 0.7 x 3.02	3.77 x 0.7 x 3.02
<b>Replacement Cartridges</b>				
Phase Product ID		OVR T2 40-440 C 2CTB803876R0400	OVR T2 40-440s C QS 2CTB815704R5500	OVR T2 80-440s C QS 2CTB815708R5500
Neutral Product ID		-	-	-

<b>OVR T2 40-600 P TS QS</b>	<b>OVR T2-T3 N 80-440 P QS</b>	<b>OVR T2 N 80-440s P QS</b>	<b>OVR T2 120-440s P TS</b>
Varistor	GDT	GDT	Varistor
IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11
T2/II	T2-T3/II-III	T2	T2
1	1	1	1
TNC - TT(L-N) - TNS - IT (230 V)	TT (N-PE)-TNS(N-PE)	TT(N-PE)-TNS(N-PE)	TNC - TT(L-N) - TNS - IT (230 V)
AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz
± 50%	± 10%	± 10%	± 10%
400	400	400	400
600	440	440	440
650	-	-	-
715	-	-	-
40	80	80	120
2	2	6.25	-
20	30	30	60
2.3/-/-	-/1.4/-	-/2/-	2.5
1.6	-	-	1.1
1.7	-	-	-
1.9	-	-	-
792/-	-/1200	-/1200	440/-
-	-	-	-
≤ 25	< 25	< 25	< 25
100	-	100	50
≤ 125	≤ 125	≤ 160 A	≤ 50
≤ 125	≤ 125	≤ 160 A	≤ 50
Yes	Yes	No	Yes
Yes	Yes	-	No
Yes	Yes	No	Yes
No	No	No	Yes
Yes	No	No	Yes
2.5 ... 35	2.5 ... 35	2.5 ... 35	2.5 ... 50
2.5 ... 25	2.5 ... 25	2.5 ... 25	2.5 ... 35
12.5	12.5	15	15
2.8	2.8	3.5	3.5
1 NO - 1 NC		1 NO - 1 NC	1 NO - 1 NC
12 V DC - 10 mA		12 V DC - 10 mA	12 V DC - 10 mA
250 V AC - 1 A		250 V AC - 1 A	250 V AC - 1 A
1.5		1.5	1.5
-40 to +80	-40 to +80	-40 to +80	-40 to +80
5000	5000	5000	2000
IP20	IP20	IP20	IP20
V-0	V-0	V-0	V-0
85 x 17.8 x 64.8	88 x 17.8 x 65.3	88 x 17.8 x 76.7	
3.35 x 0.70 x 2.55	3.46 x 0.7 x 2.57	3.46 x 0.7 x 3.02	
95.8 x 17.8 x 65.3			96 x 35.6 x 64.8
3.77 x 0.7 x 2.57			3.78 x 1.4 x 2.55
OVR T2 40-600 C QS 2CTB803886R0400	-		OVR T2 70 440s C 2CTB803854R0100
-	OVR T2-T3 N 80-440 C QS 2CTB803886R0100	OVR T2 N 80-440s C QS 2CTB815708R2800	

## Protection and safety

### OVR Type 2 pluggable QuickSafe® surge protective devices Single pole 400 V networks

Type 2 surge protective devices are designed to protect electric installations and sensitive equipment against indirect surges with ensuring a low protection level (Up). They are characterized by their capacity to safely discharge current with 8/20  $\mu$ s wave form.

#### Type 2 pluggable

Poles	Max discharge current I <sub>max</sub> 8/20 kA	Nominal discharge current I <sub>n</sub> kA	Voltage protection level U <sub>p</sub> kV	Nominal voltage U <sub>n</sub> V	Max. cont. operating voltage U <sub>c</sub> V	Bbn 3660308 EAN	Ordering details		Weight 1 piece kg
							Type code	Order code	
1	40	20	1.8	400	440	519627	OVR T2 40-440 P QS	2CTB803871R1200	0.12
1	40	20	2	400	440	519634	OVR T2 40-440 P TS QS	2CTB803871R0500	0.12
1	40	20	1.8	400	440	525338	OVR T2 40-440s P QS	2CTB815704R4100	0.30
1	40	20	1.8	400	440	525369	OVR T2 40-440s P TS QS	2CTB815704R2900	0.30
1	80	20	1.8	400	440	525567	OVR T2 80-440s P QS	2CTB815708R4100	0.30
1	80	20	1.8	400	440	525567	OVR T2 80-440s P TS QS	2CTB815708R2900	0.30
1	40	20	2.3	400	600	520579	OVR T2 40-600 P TS QS	2CTB803881R0500	0.12
1	80	30	1.4	400	440	519665	OVR T2-T3 N 80-440 P QS	2CTB803973R2000	0.12
1	80	30	2	400	440	525642	OVR T2 N 80-440s P QS	2CTB815708R5400	0.12
1	120	60	2.5	400	440	517067	OVR T2 120-440S P TS	2CTB803951R1300	0.25



## Protection and safety

### OVR Type 2 pluggable QuickSafe® surge protective devices TNC 230 V networks

#### Technical features

Type codes		OVR T2 3L 40-275 P QS	OVR T2 3L 40-275s P QS	OVR T2 3L 80-275s P QS	OVR T2 3L 40-350 P QS
with auxiliary contact (TS)		OVR T2 3L 40-275 P TS QS	OVR T2 3L 40-275s P TS QS	OVR T2 3L 80-275s P TS QS	OVR T2 3L 40-350 P TS QS
Technology		Varistor	Varistor	Varistor	Varistor
<b>Electrical features</b>					
Standard		IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11
Type/test class		T2/II	T2/II	T2/II	T2/II
Protected lines		3	3	3	3
System network		TNC	TNC	TNC	TNC
Type of current		AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz
Voltage regulation of the system network		± 20%	± 20%	± 20%	± 50%
Nominal system voltage Un (L-PEN/L-L)	[V]	230/400	230/400	230/400	230/400
Max. cont. operating voltage Uc	[V]	275	275	275	350
Nominal dc voltage Un dc L-PE/Un dc L-L	[V dc]	320/640	-	-	375/750
Max. dc. cont. operating voltage Ucdc L-PE/Ucdc L-L	[V dc]	355/710	-	-	415/830
Maximum discharge current I <sub>max</sub> (8/20)	[kA]	40	40	80	40
Maximum impulse current I <sub>imp</sub> (10/350)	[kA]	2	2	6.25	2
Nominal discharge current I <sub>n</sub> (8/20)	[kA]	20	20	20	20
Voltage protection level U <sub>p</sub> at I <sub>n</sub> (L-PE)	[kV]	1.25	1.4	1.4	1.5
Voltage protection level U <sub>res</sub> at 3kA	[kV]	0.8	0.5	0.5	1.0
Voltage protection level U <sub>res</sub> at 5kA	[kV]	0.85	0.7	0.7	1.05
Voltage protection level U <sub>res</sub> at 10kA	[kV]	1.0	0.9	0.9	1.2
TOV (Temporary overvoltage) withstand U <sub>t</sub> (L-N: 5s./N-PE: 200ms)	[V]	337/-	337/-	337/-	455/-
U <sub>oc</sub>	[kV]	-	-	-	-
Response time	[ns]	≤ 25	≤ 25	≤ 25	≤ 25
Short-circuit withstand capability I <sub>sc</sub>	[kA]	100	100	100	100
Backup protection maximum rating					
fuse (gG)	[A]	≤ 125	≤ 160	≤ 160	≤ 125
circuit breaker (B or C curve)	[A]	≤ 125	≤ 125	≤ 125	≤ 125
Pluggable cartridge		Yes	Yes	Yes	Yes
Integrated QuickSafe® technology		Yes	Yes	Yes	Yes
State indicator		Yes	Yes	Yes	Yes
Safety reserve		No	Yes	Yes	No
Auxiliary contact		Yes (TS option)	Yes (TS option)	Yes (TS option)	Yes (TS option)
<b>Installation</b>					
Wire range (L, N, PE)					
solid wire	[mm <sup>2</sup> ]	2.5 ... 35	2.5 ... 35	2.5 ... 35	2.5 ... 35
stranded wire	[mm <sup>2</sup> ]	2.5 ... 25	2.5 ... 25	2.5 ... 25	2.5 ... 25
Stripping length (L, N, PE)	[mm]	12.5	12.5	12.5	12.5
Tightening torque (L, N, PE)	[Nm]	2.8	2.8	2.8	2.8
<b>Auxiliary contact (TS)</b>					
Contacts information		1 NO - 1 NC	1 NO - 1 NC	1 NO - 1 NC	1 NO - 1 NC
Min. load		12 DC - 10 mA	12 DC - 10 mA	12 DC - 10 mA	12 DC - 10 mA
Max. load		250 V AC - 1A	250 V AC - 1A	250 V AC - 1A	250 V AC - 1A
Connection cross-section	[mm <sup>2</sup> ]	1.5	1.5	1.5	1.5
<b>Miscellaneous characteristics</b>					
Stocking and operating temperature	[°C]	-40 to +80	-40 to +80	-40 to +80	-40 to +80
Maximal Altitude	[m]	5000	5000	5000	5000
Degree of protection		IP20	IP20	IP20	IP20
Fire resistance according to UL 94		V-0	V-0	V-0	V-0

## Protection and safety

OVR Type 2 surge protective devices TNC 230 V networks, pluggable and non-pluggable versions

### Technical features

Type codes		OVR T2 3L 80-275s P QS	OVR T2 3L 40-350 P QS
with auxiliary contact (TS)		OVR T2 3L 80-275s P TS QS	OVR T2 3L 40-350 P TS QS
<b>Dimensions</b>			
height x width x depth	[mm]	88 x 53.4 x 76.7	85 x 53.4 x 64.8
	[inches]	3.46 x 2.1 x 3.02	3.35 x 2.10 x 2.55
<b>With Auxiliary Contact (TS)</b>			
height x width x depth	[mm]	95.8 x 53.4 x 76.7	96 x 53.4 x 64.8
	[inches]	3.77 x 2.1 x 3.02	3.78 x 2.10 x 2.55
<b>Replacement Cartridges</b>			
Phase Product ID		OVR T2 80-275s C QS 2CTB8157084R2600	OVR T2 40-350 C QS 2CTB803886R1000
Neutral Product ID		-	-



2CSC40029F0013

Type 2 surge protective devices are designed to protect electric installations and sensitive equipment against indirect surges with ensuring a low protection level (Up). They are characterized by their capacity to safely discharge current with 8/20  $\mu$ s wave form.

OVR T2 3L 40-275 P QS

### Type 2 pluggable

Poles	Max discharge current I <sub>max</sub> 8/20 kA	Nominal discharge current I <sub>n</sub> kA	Voltage protection level U <sub>p</sub> kV	Nominal voltage U <sub>n</sub> V	Max. cont. operating voltage U <sub>c</sub> V	Bbn 3660308 EAN	Ordering details		Weight 1 piece kg
							Type code	Order code	
3	40	20	1.25	230/400	275	519825	OVR T2 3L 40-275 P QS	2CTB803873R2400	0.36
3	40	20	1.25	230/400	275	519832	OVR T2 3L 40-275 P TS QS	2CTB803873R2500	0.36
3	40	20	1.4	230/400	275	525253	OVR T2 3L 40-275s P TS QS	2CTB815704R0600	0.45
3	40	20	1.4	230/400	275	525314	OVR T2 3L 40-275s P QS	2CTB815704R1800	0.45
3	80	20	1.4	230/400	275	525437	OVR T2 3L 80-275s P TS QS	2CTB815708R0600	0.45
3	80	20	1.4	230/400	275	525499	OVR T2 3L 80-275s P QS	2CTB815708R1800	0.45
3	40	20	1.5	230/400	350	519849	OVR T2 3L 40-350 P QS	2CTB803883R2400	0.36
3	40	20	1.5	230/400	350	519856	OVR T2 3L 40-350 P TS QS	2CTB803883R2500	0.36

## Protection and safety

### OVR Type 2 pluggable QuickSafe® surge protective devices TNC 400 V networks

#### Technical features

Type codes		OVR T2 3L 40-440 P QS	OVR T2 3L 80-440s P QS	OVR T2 3L 40 400/690 P	OVR T2 3L 40-400/690 P
with auxiliary contact (TS)		OVR T2 3L 40-440 P TS QS	OVR T2 3L 80-440s P TS QS	OVR T2 3L 40 400/690 P TS	OVR T2 3L 40-600 P TS QS
Technology		Varistor	Varistor	Varistor	Varistor
<b>Electrical features</b>					
Standard		IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11
Type/test class		T2/II	T2/II	T2/II	T2/II
Protected lines		3	3	3	3
System network		TNC - IT (230)	TNC - IT (230)	TNC - IT (400)	TNC - IT (230)
Type of current		AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz
Voltage regulation of the system network		± 10%	± 10%	± 10%	± 50%
Nominal system voltage Un (L-PEN/L-L)	[V]	400/690	400/690	400/690	400/690
Max. cont. operating voltage Uc	[V]	440	440	440	600
Nominal dc voltage Un dc L-PE/Un dc L-L	[V dc]	495/990	-	-	650/990
Max. dc. cont. operating voltage Ucdc L-PE/ Ucdc L-L	[V dc]	545/1090	-	-	715/1090
Maximum discharge current I <sub>max</sub> (8/20)	[kA]	40	80	40	40
Maximum impulse current I <sub>imp</sub> (10/350)	[kA]	2	6.25	2	2
Nominal discharge current I <sub>n</sub> (8/20)	[kA]	20	20	15	20
Voltage protection level Up at I <sub>n</sub> (L-PE)	[kV]	1.8	2.1	2.9	2.3
Voltage protection level U <sub>res</sub> at 3kA	[kV]	1.25	1.25	2.1	1.6
Voltage protection level U <sub>res</sub> at 5kA	[kV]	1.35	1.35	2.2	1.7
Voltage protection level U <sub>res</sub> at 10kA	[kV]	1.55	1.55	2.3	1.9
TOV (Temporary overvoltage) withstand Ut (L-N: 5s./N-PE: 200ms)	[V]	581/-	581/-	910/-	792/-
Response time	[ns]	< 25	< 25	< 25	< 25
Short-circuit withstand capability I <sub>scrr</sub>	[kA]	100	100	100	100
Backup protection fuse (gG)	[A]	≤ 125	≤ 160	≤ 50	≤ 125
maximum rating circuit breaker (B or C curve)	[A]	≤ 125	≤ 125	≤ 50	≤ 125
Pluggable cartridge		Yes	Yes	Yes	Yes
Integrated QuickSafe® technology		Yes	Yes	No	Yes
State indicator		Yes	Yes	Yes	Yes
Safety reserve		No	Yes	No	No
Auxiliary contact		Yes (TS option)	Yes (TS option)	Yes (TS option)	Yes (TS option)
<b>Installation</b>					
Wire range (L, N, PE) solid wire	[mm <sup>2</sup> ]	2.5 ... 35	2.5 ... 35	2.5 ... 36	2.5 ... 36
stranded wire	[mm <sup>2</sup> ]	2.5 ... 25	2.5 ... 25	2.5 ... 25	2.5 ... 25
Stripping length (L, N, PE)	[mm]	2.8	2.8	2.8	2.8
Tightening torque (L, N, PE)	[Nm]				
Auxiliary contact (TS)		1 NO - 1 NC	1 NO - 1 NC	1 NO - 1 NC	1 NO - 1 NC
Contacts information		12 DC - 10 mA	12 DC - 10 mA	12 DC - 10 mA	12 DC - 10 mA
Min. load		250 V AC - 1A	250 V AC - 1A	250 V AC - 1A	250 V AC - 1A
Max. load		1.5	1.5	1.5	1.5
Connection cross-section	[mm <sup>2</sup> ]				
<b>Miscellaneous characteristics</b>					
Stocking and operating temperature	°C	-40 to +80	-40 to +80	-40 to +80	-40 to +80
Maximal Altitude	[m]	5000	5000	5000	5000
Degree of protection		IP20	IP20	IP20	IP20
Fire resistance according to UL 94		V-0	V-0	V-0	V-0
<b>Dimensions</b>					
height x width x depth	mm	88 x 53.4 x 65.3	88 x 53.4 x 76.7	88 x 53.4 x 64.8	88 x 53.4 x 64.8
	inches	3.46 x 2.1 x 2.57	3.46 x 2.1 x 3.02	3.46 x 2.1 x 2.55	3.46 x 2.1 x 2.55
<b>With Auxiliary Contact (TS)</b>					
height x width x depth	mm	95.8 x 53.4 x 65.3	95.8 x 53.4 x 76.7	96 x 53.4 x 64.8	95.8 x 53.4 x 65.3
	inches	3.77 x 2.1 x 2.57	3.77 x 2.1 x 3.02	3.78 x 2.1 x 2.55	3.77 x 2.1 x 2.57
<b>Replacement Cartridges</b>					
Phase Product ID		OVR T2 40-440 C QS 2CTB803876R0400	OVR T2 80-440s C QS 2CTB815708R5500	OVR T2 40 400/690 C 2CTB803854R1100	OVR T2 40-600 C QS 2CTB803886R0400
Neutral Product ID		-	-	-	-



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Type 2 surge protective devices are designed to protect electric installations and sensitive equipment against indirect surges with ensuring a low protection level (Up). They are characterized by their capacity to safely discharge current with 8/20  $\mu$ s wave form.

**OVR T2 3L 40-440 P QS**

Poles	Max discharge current I <sub>max</sub> 8/20 kA	Nominal discharge current I <sub>n</sub> kA	Voltage protection level U <sub>p</sub> kV	Nominal voltage U <sub>n</sub> V	Max. cont. operating voltage U <sub>c</sub> V	Bbn 3660308 EAN	Ordering details		Weight 1 piece kg
							Type code	Order code	
3	40	20	1.8	400	440	519894	OVR T2 3L 40-440 P QS	2CTB803873R2800	0.45
3	40	20	1.8	400	440	519900	OVR T2 3L 40-440 P TS QS	2CTB803873R2700	0.45
3	80	20	2.1	400	440	525598	OVR T2 3L 80-440s P TS QS	2CTB815708R3500	0.45
3	80	20	2.1	400	440	525635	OVR T2 3L 80-440s P QS	2CTB815708R4700	0.45
3	40	20	2.3	400	600	520685	OVR T2 3L 40-600 P TS QS	2CTB803883R2700	0.45
3	40	15	2.9	400/690	440	515629	OVR T2 3L 40-400/690 P	2CTB803853R4500	0.48
3	40	15	2.9	400/690	440	515636	OVR T2 3L 40-400/690 P TS	2CTB803853R4600	0.48

## Protection and safety

### OVR Type 2 pluggable QuickSafe® surge protective devices TNS 230 V networks

#### Technical features

Type codes		OVR T2 4L 40-275 P QS	OVR T2 4L 40-275s P QS	OVR T2 4L 80-275s P QS
with auxiliary contact (TS)		OVR T2 4L 40-275 P TS QS	OVR T2 4L 40-275s P TS QS	OVR T2 4L 80-275s P TS QS
Technology		Varistor	Varistor	Varistor
<b>Electrical features</b>				
Standard		IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11
Type/test class		T2/II	T2/II	T2/II
Protected lines		4	4	4
Types of networks		TNS	TNS	TNS
Type of current		AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz
Voltage regulation of the system network		± 20%	± 20%	± 20%
Nominal voltage Un (L-N/L-L)	[V]	230/400	230/400	230/400
Max. cont. operating AC voltage Uc	[V]	275	275	275
Nominal dc voltage Un dc L-PE/Un dc L-L	V dc	320/640	-	-
Max. dc. cont. operating voltage Ucdc L-PE/ Ucdc L-L	V dc	355/710	-	-
Maximum discharge current I <sub>max</sub> (8/20)	[kA]	40	40	80
Nominal discharge current I <sub>n</sub> (8/20)	[kA]	20	20	20
Voltage protection level Up at I <sub>n</sub> (L-N/N-PE/L-PE)	[kA]	2.5/1.25/1.25	2.8/1.4/1.4	2.8/1.4/1.4
Voltage protection level Up at 3 kA	[kA]	0.8	0.5	0.8
TOV (Temporary over-voltage) withstand Ut (L-N: 5 s /N-PE: 200 ms)	[V]	334/-	337	334/-
Response time	[ns]	≤ 25	≤25	≤ 25
Residual current IPE	[μA]	100	200	200
Short-circuit withstand capability I <sub>sc</sub>	[kA]	100	100	100
Backup protection	Fuse (gG)	[A]	≤ 125	≤ 160
	Circuit breaker (B or C curve)	[A]	≤ 125	≤ 125
Pluggable cartridge		Yes	Yes	Yes
Integrated thermal disconnecter		Yes	Yes	Yes
State indicator		Yes	Yes	Yes
Safety reserve		No	Yes	Yes
Auxiliary contact		Yes (TS option)	Yes (TS option)	Yes (TS option)
<b>Installation</b>				
Wire range (L, N, PE)	Solid wire	[mm <sup>2</sup> ]	2.5 ... 35	2.5 ... 35
	Stranded wire	[mm <sup>2</sup> ]	2.5 ... 25	2.5 ... 25
Stripping length (L, N, PE)		[mm]	12.5	12.5
Tightening torque (L, N, PE)		[Nm]	2.5	2.5
<b>Auxiliary contact (TS)</b>				
Contact complement		1 NO - 1 NC	1 NO - 1 NC	1 NO - 1 NC
Minimum load		12 V DC - 10 mA	12 V DC - 10 mA	12 V DC - 10 mA
Maximum load		250 V AC - 1 A	250 V AC - 1 A	250 V AC - 1 A
Connection cross-section		[mm <sup>2</sup> ]	1.5	1.5
<b>Miscellaneous characteristics</b>				
Stocking and operating temperature		[°C]	-40 to +80	-40 to +80
Maximal Altitude		[m]	5000	5000
Degree of protection			IP20	IP20
Fire resistance according to UL 94			V-0	V-0
Dimensions	height x width x depth	[mm]	88 x 71.2 x 65.3	88 x 71.2 x 76.7
		[inches]	3.46 x 2.8 x 2.57	3.46 x 2.8 x 3.02
with auxiliary contact (TS)	height x width x depth	[mm]	95.8 x 71.2 x 65.3	95.8 x 71.2 x 76.7
		[inches]	3.77 x 2.8 x 2.57	3.77 x 2.8 x 3.02
<b>Replacement Cartridges</b>				
Phase Product ID		OVR T2 40-275 C QS 2CTB803876R1000	OVR T2 40-275s C QS 2CTB8157084R2600	OVR T2 80-275s C QS 2CTB815708R2600
Neutral Product ID		-	-	-



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Type 2 surge protective devices are designed to protect electric installations and sensitive equipment against indirect surges with ensuring a low protection level (Up). They are characterized by their capacity to safely discharge current with 8/20  $\mu$ s wave form.

### OVR T2 4L 40-275 P QS

#### Type 2 pluggable - Uc 275 V

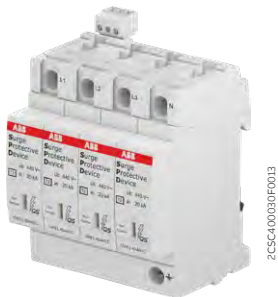
Poles	Max discharge current $I_{max}$ 8/20 kA	Nominal discharge current $I_n$ kA	Voltage protection level $U_p$ kV	Nominal voltage $U_n$ V	Max. cont. operating voltage $U_c$ V	Bbn 3660308	Ordering details			Weight 1 piece kg
							EAN	Type code	Order code	
4	40	20	1.25	230/400	275	20548	OVR T2 4L 40-275 P QS	2CTB803873R5600	0.45	
4	40	20	1.25	230/400	275	20555	OVR T2 4L 40-275 P TS QS	2CTB803873R5200	0.45	
4	40	20	1.4	230/400	275	25345	OVR T2 4L 40-275s P QS	2CTB815704R2300	0.45	
4	40	20	1.4	230/400	275	25284	OVR T2 4L 40-275s P TS QS	2CTB815704R1100	0.45	
4	80	20	1.4	230/400	275	25529	OVR T2 4L 80-275s P QS	2CTB815708R2300	0.45	
4	80	20	1.4	230/400	275	25468	OVR T2 4L 80-275s P TS QS	2CTB815708R1100	0.45	

## Protection and safety

### OVR Type 2 pluggable QuickSafe® surge protective devices TNS 400 V networks

#### Technical features

Type codes		OVR T2 4L 40-440 P QS	OVR T2 4L 80-440s P QS	
with auxiliary contact (TS)		OVR T2 4L 40-440 P TS QS	OVR T2 4L 80-440s P TS QS	OVR T2 4L 40-600 P TS QS
Technology		Varistor	Varistor	Varistor
<b>Electrical features</b>				
Standard		IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11
Type/test class		T2/II	T2/II	T2/II
Protected lines		4	4	4
System network		TNS	TNS	TNS
Type of current		AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz
Voltage regulation of the system network		± 10%	± 10%	± 50%
Nominal system voltage Un (L-N/L-L)	V	400/690	400/690	400/690
Max. cont. operating AC voltage Uc	V	440	440	600
Nominal dc voltage Un dc L-PE/Un dc L-L		495/990	-	650/990
Max. dc cont. Operating voltage Ucdc L-PE/ Ucdc L-L		545/1090	-	715/1090
Maximal discharge current I <sub>max</sub> (8/20)	kA	40	80	40
Maximum impulse current I <sub>imp</sub> (10/350)	kA	2	6.25	2
Nominal discharge current I <sub>n</sub> (8/20)	kA	20	20	20
Follow current interrupting rating I <sub>fi</sub>	kA	-	-	-
Voltage protection level Up at I <sub>n</sub> (L-N/N-PE/L-PE)	kV	3.6/1.8/1.8	3.6/1.8/1.8	4.6/2.3/2.3
Voltage protection level U <sub>res</sub> at 3 kA	kV	1.25	-	1.6
Voltage protection level U <sub>res</sub> at 5 kA		1.35	-	1.7
Voltage protection level U <sub>res</sub> at 10 kA		1.55	-	1.9
TOV (Temporary overvoltage) withstand Ut (L-N: 5s./N-PE: 200ms)	V	581/	581/	792/
Response time	ns	≤25	≤25	≤25
Short-circuit withstand capability I <sub>sc</sub>	kA	100	100	100
<b>Backup protection maximum rating</b>				
fuse (gG)	A	≤125	≤160	≤125
circuit breaker (B or C curve)	A	≤125	≤125	≤125
Pluggable cartridge		Yes	Yes	Yes
Integrated thermal disconnecter		Yes	Yes	Yes
State indicator		Yes	Yes	Yes
Safety reserve		No	Yes	No
Auxiliary contact		Yes (TS option)	Yes (TS option)	Yes
<b>Installation</b>				
Wire range (L, N, PE) solid wire	mm <sup>2</sup>	2.5 ... 35	2.5 ... 35	2.5 ... 35
stranded wire	mm <sup>2</sup>	2.5 ... 25	2.5 ... 25	2.5 ... 25
Stripping length (L, N, PE)	mm	12.5	12.5	12.5
Tightening torque (L, N, PE)	Nm	2.5	2.5	2.5
Auxiliary contact (TS)		-	-	-
Contacts information		1 NO - 1 NC	1 NO - 1 NC	1 NO - 1 NC
Min. load		12 V DC - 10 mA	12 V DC - 10 mA	12 V DC - 10 mA
Max. load		250 V AC - 1 A	250 V AC - 1 A	250 V AC - 1 A
Connection cross-section	mm <sup>2</sup>	1.5	1.5	1.5
<b>Miscellaneous characteristics</b>				
Stocking and operating temperature	°C	-40 to +80	-40 to +80	-40 to +80
Maximal Altitude	[m]	5000	5000	5000
Degree of protection		IP20	IP20	IP20
Fire resistance according to UL 94		V-0	V-0	V-0
<b>Dimensions</b>				
height x width x depth	mm	88 x 71.2 x 65.3	88 x 71.2 x 69.4	
	inches	3.46 x 2.8 x 2.57	3.46 x 2.8 x 2.57	
<b>Dimensions with auxiliary contact (TS)</b>				
height x width x depth	mm	95.8 x 142.4 x 69	95 x 71.2 x 69.4	95.8 x 71.2 x 65.3
	inches	3.77 x 2.8 x 2.57	3.77 x 2.8 x 2.57	3.77 x 2.8 x 2.57
<b>Replacement Cartridges</b>				
Phase Product ID		OVR T2 40-440 C QS	OVR T2 80-440s C QS	OVR T2 40-600 C QS
		2CTB803876R0400	2CTB815708R5500	2CTB803886R0400



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Type 2 surge protective devices are designed to protect electric installations and sensitive equipment against indirect surges with ensuring a low protection level (Up). They are characterized by their capacity to safely discharge current with 8/20  $\mu$ s wave form.

### OVR T2 4L 20-275

#### OVR T2 Pluggable

Protected lines	Max discharge current Imax 8/20 kA	Nominal current In 8/20 kA	Voltage protection level Up kV	Nominal voltage Un V	Max. cont. operating voltage Uc V	Bbn 3660308  EAN	Ordering details		Weight 1 piece  kg
							Type code	Order code	
4	40	20	1,8	440	440	519894	OVR T2 4L 40-440 P QS	2CTB803873R5100	0.45
4	40	20	1,8	440	440	519900	OVR T2 4L 40-440 P TS QS	2CTB803873R5300	0.45
4	80	20	1,8	440	440	525635	OVR T2 4L 80-440s P QS	2CTB815708R5200	0.6
4	80	20	1,8	440	440	525598	OVR T2 4L 80-440s P TS QS	2CTB815708R4000	0.6
4	40	20	2,3	440	600	520685	OVR T2 4L 40-600 P TS QS	2CTB803883R5300	0.45

## Protection and safety

OVR Type 2 pluggable QuickSafe® surge protective devices TNS/TT  
230 and 400 V 1Ph+N networks

### Technical features

Type codes		OVRT21N40-275PQS	OVRT21N40-275sPQS	OVRT21N80-275sPQS	OVRT21N40-350PQS	
with auxiliary contact (TS)		OVRT21N40-275PTSQS	OVRT21N40-275sPTSQS	OVRT21N80-275sP TSQS	OVRT21N40-350PTSQS	OVRT21N40-440PTSQS
Technology		Varistor + GDT	Varistor + GDT	Varistor + GDT	Varistor + GDT	Varistor + GDT
<b>Electrical features</b>						
Standard		IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11	IEC 61643-11/EN61643-11
Type/test class		T2/II	T2/II	T2/II	T2/II	T2/II
Protected lines		1+1	1+1	1+1	1+1	1+1
System network		TT - TNS	TT - TNS	TT - TNS	TT - TNS	TT-TNS
Type of current		AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz
Voltage regulation of the system network		± 20 %	± 20 %	± 20 %	± 50 %	±10 %
Nominal system voltage Un	[V]	230	230	230	230	400
Max. cont. operating voltage Uc	[V]	275	275	275	350	440
Maximum discharge current I <sub>max</sub> (8/20)	[kA]	40	40	80	40	40
Maximum impulse current I <sub>imp</sub> (10/350)	[kA]	2	2	6.25	2	2
Nominal discharge current I <sub>n</sub> (8/20)	[kA]	20	20	20	20	20
Total Current	[kA]	80	80	80	80	80
Voltage protection level U <sub>p</sub> at I <sub>n</sub> (L-N/N-PE/L-PE)	[kV]	1.25/1.4/1.5	1.4/1.4/1.5	1.4/1.4/1.5	1.5/1.4/1.6	1,8/1,4/1,9
Voltage protection level U <sub>res</sub> at 3 kA	[kV]	0.8/1.4/0.85	0.8/1.4/0.85	0.8/1.4/0.85	1.0/1.4/1.05	1,25/1,4/1,45
Voltage protection level U <sub>res</sub> at 5 kA	[kV]	0.85/1.4/0.95	0.85/1.4/0.95	0.85/1.4/0.95	1.05/1.4/1.1	1,35/1,4/1,55
Voltage protection level U <sub>res</sub> at 10 kA	[kV]	1/1.4/1.15	1/1.4/1.15	1/1.4/1.15	1.2/1.4/1.3	1,55/1,4/1,65
TOV (Temporary overvoltage) withstand Ut (L-N: 5s./N-PE: 200ms)	[V]	337/1200	337/1200	337/1200	455/1200	581/1200
U <sub>oc</sub>	[kV]	-	-	-	-	-
Response time	[ns]	< 25	< 25	< 25	< 25	<25
Short-circuit withstand capability I <sub>scrr</sub>	[kA]	100	100	100	100	100
Backup protection fuse (gG)	[A]	≤ 125	≤ 160	≤ 160	≤ 125	≤ 125
maximum rating circuit breaker (B or C curve)	[A]	≤ 125	≤ 125	≤ 125	≤ 125	≤ 125
Pluggable cartridge		Yes	Yes	Yes	Yes	Yes
Integrated QuickSafe® technology		Yes	Yes	Yes	Yes	Yes
State indicator		Yes	Yes	Yes	Yes	Yes
Safety reserve		No	Yes	Yes	No	No
Auxiliary contact		Yes (TS option)	Yes (TS option)	Yes (TS option)	Yes (TS option)	Yes
<b>Installation</b>						
Wire range (L, N, PE) solid wire	[mm <sup>2</sup> ]	2.5 ... 35	2.5 ... 35	2.5 ... 35	2.5 ... 35	2.5 ... 35
stranded wire	[mm <sup>2</sup> ]	2.5 ... 25	2.5 ... 25	2.5 ... 25	2.5 ... 25	2.5 ... 25
Stripping length (L, N, PE)	[mm]	12.5	12.5	12.5	12.5	12.5
Tightening torque (L, N, PE)	[Nm]	2.8	2.8	2.8	2.8	2.8
<b>Auxiliary contact (TS)</b>						
Contacts information		1 NO - 1 NC	1 NO - 1 NC	1 NO - 1 NC	1 NO - 1 NC	1 NO - 1 NC
Min. load		12 DC - 10 mA	12 DC - 10 mA	12 DC - 10 mA	12 DC - 10 mA	12 DC - 10 mA
Max. load		250 V AC - 1A	250 V AC - 1A	250 V AC - 1A	250 V AC - 1A	250 V AC - 1A
Connection cross-section	[mm <sup>2</sup> ]	1.5	1.5	1.5	1.5	1.5
<b>Miscellaneous characteristics</b>						
Stocking and operating temperature	°C	-40 to +80	-40 to +80	-40 to +80	-40 to +80	-40 to +80
Maximal Altitude	[m]	5000	5000	5000	5000	5000
Degree of protection		IP20	IP20	IP20	IP20	IP20
Fire resistance according to UL 94		V-0	V-0	V-0	V-0	V-0
<b>Dimensions</b>						
height x width x depth	mm	88 x 35.6 x 65.3	88 x 35.6 x 76.7	88 x 35.6 x 76.7	88 x 35.6 x 65.3	
	inches	3.46 x 1.4 x 2.57	3.46 x 1.4 x 3.02	3.46 x 1.4 x 3.02	3.46 x 1.4 x 2.57	
<b>With Auxiliary Contact (TS)</b>						
height x width x depth	mm	95.8 x 35.6 x 65.3	95.8 x 35.6 x 76.7	95.8 x 35.6 x 76.7	95.8 x 35.6 x 65.3	95.8 x 35.6 x 65.3
	inches	3.77 x 1.4 x 2.57	3.77 x 1.4 x 3.02	3.77 x 1.4 x 3.02	3.77 x 1.4 x 2.57	3.77 x 1.4 x 2.57
<b>Replacement Cartridges</b>						
Phase Product ID		OVR T2 40-275 C QS 2CTB803876R1000	OVR T2 40-275s C QS 2CTB815704R2600	OVR T2 80-275s C QS 2CTB815708R2600	OVR T2 40-350 C QS 2CTB803886R1000	OVR T2 40-440 C QS 2CTB803876R0400
Neutral Product ID		OVRT2-T3N80-275 C QS 2CTB803876R0000	OVRT2N80-275s C QS 2CTB815708R2800	OVRT2N80-275s C QS 2CTB815708R2800	OVR T2 N 80-350 C QS 2CTB803886R0000	OVR T2 N 80-440 C QS 2CTB803886R0100



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OVR T2 1N 40-275 P QS

Type 2 surge protective devices are designed to protect electric installations and sensitive equipment against indirect surges with ensuring a low protection level (Up). They are characterized by their capacity to safely discharge current with 8/20  $\mu$ s wave form.

### Type 2 pluggable

Poles	Impulse current Iimp 10/350 kA	Max discharge current Imax 8/20 kA	Nominal current In kA	Voltage protection level Up kV	Nominal voltage Un V	Max. cont. operating voltage Uc V	Bbn 3660308 EAN	Ordering details		Weight 1 piece kg
								Type code	Order code	
1+1	2	40	20	1.25	230	275	519696	OVR T2 1N 40-275 P QS	2CTB803972R1100	0.24
1+1	2	40	20	1.25	230	275	519702	OVR T2 1N 40-275 P TS QS	2CTB803972R0500	0.24
1+1	2	40	20	1.4	230	275	525239	OVR T2 1N 40-275s P TS QS	2CTB815704R0200	0.30
1+1	2	40	20	1.4	230	275	525307	OVR T2 1N 40-275s P QS	2CTB815704R1400	0.30
1+1	2	80	20	1.4	230	275	525413	OVR T2 1N 80-275s P TS QS	2CTB815708R0200	0.30
1+1	2	80	20	1.4	230	275	525482	OVR T2 1N 80-275s P QS	2CTB815708R1400	0.30
1+1	2	40	20	1.5	230	350	519719	OVR T2 1N 40-350 P QS	2CTB803982R1100	0.24
1+1	2	40	20	1.5	230	350	519726	OVR T2 1N 40-350 P TS QS	2CTB803982R0500	0.24
1+1	2	40	20	1.9	400	440	524577	OVR T2 1N 40-440 P TS QS	2CTB803972R1400	0.24

## Protection and safety

OVR Type 2 pluggable QuickSafe® surge protective devices TNS/TT  
230 and 400 V 3Ph+N networks



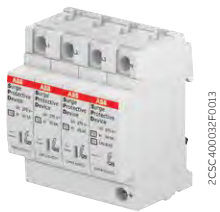
OVR T2 3N 40-  
275 P QS

2CTB803876R1000

### Technical features

Type codes		OVR T2 3N 40-275 P QS	OVR T2 3N 40-275s P QS
with auxiliary contact (TS)		OVR T2 3N 40-275 P TS QS	OVR T2 3N 40-275s P TS QS
Technology		Varistor + GDT	Varistor + GDT
<b>Electrical features</b>			
Standard		IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11
Type/test class		T2/II	T2/II
Protected lines		3+1	3+1
System network		TT - TNS	TT - TNS
Type of current		AC 47-63 Hz	AC 47-63 Hz
Voltage regulation of the system network		± 20%	± 20%
Nominal system voltage Un (L-N/L-L)	[V]	230/400	230/400
Max. cont. operating voltage Uc (L-N/L-L)	[V]	275/440	275/440
Maximum discharge current I <sub>max</sub> (8/20)	[kA]	40	40
Maximum impulse current I <sub>imp</sub> (10/350)	[kA]	2	2
Nominal discharge current I <sub>n</sub> (8/20)	[kA]	20	20
Total Current	[kA]	80	80
Voltage protection level Up at In (L-N/N-PE/L-PE)	[kV]	1.25/1.4/1.5	1.4/1.4/1.5
Voltage protection level U <sub>res</sub> at 3kA (L-N/N-PE /L-PE)	[kV]	0.8/1.4/0.85	0.8/1.4/0.85
Voltage protection level U <sub>res</sub> at 5kA (L-N/N-PE /L-PE)	[kV]	0.85/1.4/0.95	0.85/1.4/0.95
Voltage protection level U <sub>res</sub> at 10kA (L-N/N-PE /L-PE)	[kV]	1/1.4/1.15	1/1.4/1.15
TOV (Temporary overvoltage) withstand Ut (L-N: 5s./N-PE: 200ms)	[V]	337/1200	337/1200
Response time	[ns]	< 25	< 25
Short-circuit withstand capability I <sub>scrr</sub>	[kA]	100	100
Backup protection maximum rating	fuse (gG) [A]	≤ 125	≤ 160
	circuit breaker (B or C curve) [A]	≤ 125	≤ 125
Pluggable cartridge		Yes	Yes
Integrated QuickSafe® technology		Yes	Yes
State indicator		Yes	Yes
Safety reserve		No	Yes
Auxiliary contact		Yes (TS option)	Yes (TS option)
<b>Installation</b>			
Wire range (L, N, PE)	solid wire	[mm <sup>2</sup> ] 2.5 ... 35	2.5 ... 35
	stranded wire	[mm <sup>2</sup> ] 2.5 ... 25	2.5 ... 25
Stripping length (L, N, PE)	[mm]	12.5	12.5
Tightening torque (L, N, PE)	[Nm]	2.8	2.8
<b>Auxiliary contact (TS)</b>			
Contacts information		1 NO - 1 NC	1 NO - 1 NC
Min. load		12 DC - 10 mA	12 DC - 10 mA
Max. load		250 V AC - 1A	250 V AC - 1A
Connection cross-section	[mm <sup>2</sup> ]	1.5	1.5
<b>Miscellaneous characteristics</b>			
Stocking and operating temperature	[°C]	-40 to +80	-40 to +80
Maximal Altitude	[m]	5000	5000
Degree of protection		IP20	IP20
Fire resistance according to UL 94		V-0	V-0
<b>Dimensions</b>			
height x width x depth	[mm]	88 x 71.2 x 65.3	88 x 71.2 x 76.7
	[inches]	3.46 x 2.8 x 2.57	3.46 x 2.8 x 3.02
With Auxiliary Contact (TS)	[mm]	95.8 x 71.2 x 65.3	95.8 x 71.2 x 76.7
	[inches]	3.77 x 2.8 x 2.57	3.77 x 2.8 x 3.02
<b>Replacement Cartridges</b>			
Phase Product ID		OVR T2 40-275 C QS 2CTB803876R1000	OVR T2 40-275s C QS 2CTB815704R2600
Neutral Product ID		OVR T2-T3 N 80-275 C QS 2CTB803876R0000	OVR T2 N 80-275s C QS 2CTB815708R2800

OVR T2 3N 80-275s P QS	OVR T2 3N 40-350 P QS	OVR T2 3N 40-440 P QS	OVR T2 3N 80-440s P QS	
OVR T2 3N 80-275s P TS QS	OVR T2 3N 40-350 P TS QS	OVR T2 3N 40-440 P TS QS	OVR T2 3N 40-440s P TS QS	OVR T2 3N 80-440s P TS QS
Varistor + GDT	Varistor + GDT	Varistor + GDT	Varistor + GDT	Varistor + GDT
IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11
T2/II	T2/II	T2/II	T2/II	T2/II
3+1	3+1	3+1	3+1	3+1
TT - TNS	TT - TNS	TT - TNS	TT - TNS	TT - TNS
AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz
± 20%	± 50%	± 10%	± 10%	± 10%
230/440	230/400	400/690	400/690	400/690
275/440	350/600	440/760	440/760	440/760
80	40	40	40	80
6.25	2	2	2	6.25
20	20	20	20	20
80	80	80	80	80
1.4/1.4/1.5	1.5/1.4/1.7	1.8/1.4/2.1	1.8/2/2.1	1.8/2/2.1
0.8/1.4/0.85	1.0/1.4/1.05	1.25/1.4/1.45	1.25/1.4/1.45	1.25/1.4/1.45
0.85/1.4/0.95	1.05/1.4/1.1	1.35/1.4/1.45	1.35/1.4/1.45	1.35/1.4/1.45
1/1.4/1.15	1.2/1.4/1.3	1.55/1.4/1.65	1.55/1.4/1.65	1.55/1.4/1.65
337/1200	455/1200	581/1200	581/1200	581/1200
< 25	< 25	< 25	< 26	< 25
100	100	100	100	100
≤ 160	≤ 125	≤ 125	≤ 160	≤ 160
≤ 125	≤ 125	≤ 125	≤ 125	≤ 125
Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes
Yes	No	No	Yes	Yes
Yes (TS option)	Yes (TS option)	Yes (TS option)	Yes	Yes (TS option)
2.5 ... 35	2.5 ... 35	2.5 ... 35	2.5 ... 35	2.5 ... 35
2.5 ... 25	2.5 ... 25	2.5 ... 25	2.5 ... 25	2.5 ... 25
12.5	12.5	12.5	12.5	12.5
2.8	2.8	2.8	2.8	2.8
1 NO - 1 NC	1 NO - 1 NC	1 NO - 1 NC	1 NO - 1 NC	1 NO - 1 NC
12 DC - 10 mA	12 DC - 10 mA	12 DC - 10 mA	12 DC - 10 mA	12 DC - 10 mA
250 V AC - 1A	250 V AC - 1A	250 V AC - 1A	250 V AC - 1A	250 V AC - 1A
1.5	1.5	1.5	1.5	1.5
-40 to +80	-40 to +80	-40 to +80	-40 to +80	-40 to +80
5000	5000	5000	5000	5000
IP20	IP20	IP20	IP20	IP20
V-0	V-0	V-0	V-0	V-0
88 x 71.2 x 76.7	88 x 71.2 x 65.3	88 x 71.2 x 65.3	88 x 71.2 x 76.7	88 x 71.2 x 76.7
3.46 x 2.8 x 3.02	3.46 x 2.8 x 2.57	3.46 x 2.8 x 2.57	3.46 x 2.8 x 3.02	3.46 x 2.8 x 3.02
95.8 x 71.2 x 76.7	95.8 x 71.2 x 65.3	95.8 x 71.2 x 65.3	95.8 x 71.2 x 76.7	95.8 x 71.2 x 76.7
3.77 x 2.8 x 3.02	3.77 x 2.8 x 2.57	3.77 x 2.8 x 2.57	3.77 x 2.8 x 3.02	3.77 x 2.8 x 3.02
OVR T2 80-275s C QS 2CTB815708R2600	OVR T2 40-350 C QS 2CTB803886R1000	OVR T2 40-440 C QS 2CTB803876R0400	OVR T2 40-440s C QS 2CTB815704R5500	OVR T2 80-440s C QS 2CTB815708R5500
OVR T2 N 80-275s C QS 2CTB815708R2800	OVR T2 N 80-350 C QS 2CTB803886R0000	OVR T2-T3 N 80-440 C QS 2CTB803886R0100	OVR T2 N 80-440s C QS 2CTB815708R5700	OVR T2 N 80-440s C QS 2CTB815708R5700



OVR T2 3N 40-275 P QS

Type 2 surge protective devices are designed to protect electric installations and sensitive equipment against indirect surges with ensuring a low protection level (Up). They are characterized by their capacity to safely discharge current with 8/20  $\mu$ s wave form.

### Type 2 pluggable

Protected lines	Max discharge current I <sub>max</sub> 8/20 kA	Nominal discharge current I <sub>n</sub> kA	Voltage protection level U <sub>p</sub> kV	Nominal voltage U <sub>n</sub> V	Max. cont. operating voltage U <sub>c</sub> V	Bbn 3660308 EAN	Ordering details		Weight 1 piece kg
							Type code	Order code	
3+1	40	20	1.5	230/400	275	519.931	OVR T2 3N 40-275 P QS	2CTB803973R1100	0.48
3+1	40	20	1.5	230/400	275	519.948	OVR T2 3N 40-275 P TS QS	2CTB803973R0500	0.48
3+1	40	20	1.4	230/400	275	52526 0	OVR T2 3N 40-275s P TS QS	2CTB815704R0800	0.60
3+1	40	20	1.4	230/400	275	52532 1	OVR T2 3N 40-275s P QS	2CTB815704R2000	0.60
3+1	80	20	1.4	230/400	275	52544 4	OVR T2 3N 80-275s P TS QS	2CTB815708R0800	0.60
3+1	80	20	1.4	230/400	275	52550 5	OVR T2 3N 80-275s P QS	2CTB815708R2000	0.60
3+1	40	20	1.5	230/400	350	519.962	OVR T2 3N 40-350 P QS	2CTB803983R1100	0.48
3+1	40	20	1.5	230/400	350	519.979	OVR T2 3N 40-350 P TS QS	2CTB803983R0500	0.48
3+1	40	20	1.8	400/690	440	519.993	OVR T2 3N 40-440 P QS	2CTB803973R1400	0.48
3+1	40	20	1.8	400/690	440	520.005	OVR T2 3N 40-440 P TS QS	2CTB803973R1500	0.48
3+1	40	20	1.8	400/690	440	52537 6	OVR T2 3N 40-440s P TS QS	2CTB815704R3700	1.05
3+1	80	20	1.8	400/690	440	52558 1	OVR T2 3N 80-440s P TS QS	2CTB815708R3700	1.05
3+1	80	20	1.8	400/690	440	52562 8	OVR T2 3N 80-440s P QS	2CTB815708R4900	1.05



## Protection and safety

OVR Type T2-T3 pluggable QuickSafe® surge protective devices  
Single pole - 230 V and 440 V networks

### Technical features

Type codes		OVR T2-T3 20-275 P QS	OVR T2-T3 20-440 P QS	OVR T2-T3 N 80-275 P QS	OVR T2-T3 N 80-440 P QS	
<b>with auxiliary contact (TS)</b>		<b>OVR T2-T3 20-275 P TS QS</b>	<b>OVR T2-T3 20-440 P TS QS</b>	-	-	
Technology		Varistor	Varistor	GDT	GDT	
<b>Electrical features</b>						
Standard		IEC 61643-11/ EN 61643-11	IEC 61643-11/ EN 61643-11	IEC 61643-11/ EN 61643-11	IEC 61643-11/ EN 61643-11	
Type/test class		T2-T3/II-III	T2-T3/II-III	T2-T3/II-III	T2-T3/II-III	
Protected lines		1	1	1	1	
System network		TNC - TT(L-N) - TNS	TNC - TT(L-N) - TNS	TT (N-PE)-TNS(N-PE)	TT (N-PE)-TNS(N-PE)	
Type of current		AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz	
Voltage regulation of the system network		± 20 %	± 10 %	± 20 %	± 10 %	
Nominal system voltage Un	[V]	230	400	230	400	
Max. cont. operating voltage Uc	[V]	275	440	275	440	
Nominal dc voltage Un dc L-PE	[V dc]	320	320	-	-	
Max. dc. cont. operating voltage Ucdc L-PE	[V dc]	355	355	-	-	
Maximum discharge current Imax (8/20)	[kA]	20	20	80	80	
Nominal discharge current In (8/20)	[kA]	5	5	2	2	
Voltage protection level Up at In (L-N)	[kV]	0.9/-/-	1.4/-/-	30	30	
Voltage protection level Ures at 3kA (L-N)	[kV]	0.8	1.25	-/-/1.4	-/-/1.4	
Voltage protection level Ures at 5kA (L-N)	[kV]	0.85	1.35	-	-	
Voltage protection level Ures at 10kA (L-N)	[kV]	1	1.55	-	-	
TOV (Temporary overvoltage) withstand Ut (L-N: 5s./N-PE: 200ms)	[V]	337/-	581/-	-	-	
Uoc	[kV]	6	6	-	-	
Response time	[ns]	≤ 25	≤ 25	-/1200	-/1200	
Short-circuit withstand capability Isccr	[kA]	100	100	0.1	0.1	
Backup protection fuse (gG)	[A]	≤ 125	≤ 125	<125	<125	
maximum rating circuit breaker (B or C curve)	[A]	≤ 125	≤ 125	<125	<125	
Pluggable cartridge		Yes	Yes	Yes	Yes	
Integrated QuickSafe® technology		Yes	Yes	-	-	
State indicator		Yes	Yes	No	No	
Safety reserve		No	No	No	No	
Auxiliary contact		Yes (TS option)	Yes (TS option)	No	No	
<b>Installation</b>						
Wire range (L, N, PE)	solid wire	[mm <sup>2</sup> ]	2.5 ... 35	2.5 ... 35	2.5 ... 35	2.5 ... 35
	stranded wire	[mm <sup>2</sup> ]	2.5 ... 25	2.5 ... 25	2.5 ... 25	2.5 ... 25
Stripping length (L, N, PE)		[mm]	12.5	12.5	12.5	12.5
Tightening torque (L, N, PE)		[Nm]	2.8	2.8	2.8	2.8
<b>Auxiliary contact (TS)</b>						
Contacts information		1 NO - 1 NC	1 NO - 1 NC	-	-	
Min. load		12 DC - 10 mA	12 DC - 10 mA	-	-	
Max. load		250 V AC - 1A	250 V AC - 1A	-	-	
Connection cross-section		[mm <sup>2</sup> ]	1.5	1.5	-	-
<b>Miscellaneous characteristics</b>						
Stocking and operating temperature		[°C]	-40 to +80	-40 to +80	-40 to +80	-40 to +80
Maximal Altitude		[m]	5000	5000	5000	5000
Degree of protection			IP20	IP20	IP20 - Indoor	IP20 - Indoor
Fire resistance according to UL 94			V-0	V-0	V-0	V-0
<b>Dimensions of packing</b>						
height x width x depth		[mm]	88 x 17.8 x 65.3	88 x 17.8 x 65.3	85 x 17.8 x 64.8	85 x 17.8 x 64.8
		[inches]	3.46 x 0.7 x 2.57	3.46 x 0.7 x 2.57	3.35 x 0.70 x 2.55	3.35 x 0.70 x 2.55
<b>With Auxiliary Contact (TS)</b>						
height x width x depth		[mm]	95.8 x 17.8 x 65.3	95.8 x 17.8 x 65.3	-	-
		[inches]	3.77 x 0.7 x 2.57	3.77 x 0.7 x 2.57	-	-
<b>Replacement Cartridges</b>						
Phase Product ID		OVR T2-T3 20-275 C QS 2CTB803876R1200	OVR T2-T3 20-440 C QS 2CTB803876R0600	OVR T2-T3 N 80-275 C QS 2CTB803876R0000	OVR T2-T3 N 80-275 C QS 2CTB803876R0000	
Neutral Product ID		-	-	-	-	



2CSC-4003RFP0013

OVR T2 T3 20- 275 P QS

Type 2 and 3 surge protective devices shall be installed as close as possible to the sensitive equipment to protect. As Type 2 they have been characterized by their capacity to safely discharge current with a 8/20  $\mu$ s wave form and they guarantee the coordination with Type 1 SPDs or other Type 2 respecting coordination distances. As Type 3 they are characterized by their capacity to safely discharge current with 1.2/50  $\mu$ s wave form, with a very low level of Voltage Protection level.

Poles	Max discharge current $I_{max}$ 8/20 kA	Nominal discharge current $I_n$ kA	Voltage protection level $U_p$ kV	Nominal voltage $U_n$ V	Max. cont. operating voltage $U_c$ V	Bbn 3660308  EAN	Ordering details		Weight 1 piece  kg
							Type code	Order code	
1	20	5	0.9	230	275	519.566	OVR T2-T3 20-275 P QS	2CTB803871R2400	0.12
1	20	5	0.9	230	275	519.573	OVR T2-T3 20-275 P TS QS	2CTB803871R2500	0.12
1	20	5	1.4	400	440	519.603	OVR T2-T3 20-440 P QS	2CTB803871R1100	0.12
1	20	5	1.4	400	440	519.610	OVR T2-T3 20-440 P TS QS	2CTB803871R1300	0.12
1	80	30	1.4	230	275	519641	OVR T2-T3 N 80-275 P QS	2CTB803973R1900	0.12
1	80	30	1.4	400	440	519641	OVR T2-T3 N 80-440 P QS	2CTB803973R2000	0.12

## Protection and safety

OVR Type T2-T3 pluggable QuickSafe® surge protective devices  
TNC - 230 V 3Ph + PEN networks

### Technical features

<b>Type codes</b>		<b>OVR T2-T3 3L 20-275 P QS</b>	
<b>with auxiliary contact (TS)</b>		<b>OVR T2-T3 3L 20-275 P TS QS</b>	
Technology		Varistor + GDT	
<b>Electrical features</b>			
Standard		IEC 61643-11/EN 61643-11 / UL 1449 4th Ed	
Type/test class		T2-T3/II-III	
Protected lines		3	
System network		TNC	
Type of current		AC 47-63 Hz	
Voltage regulation of the system network		± 20%	
Nominal system voltage Un (L-PEN/L-L)		[V]	230/400
Max. cont. operating voltage Uc (L-PEN/L-L)		[V]	275/440
Nominal dc voltage Un dc L-PE		[V dc]	320
Max. dc. cont. operating voltage Ucdc L-PE		[V dc]	355
Maximum discharge current I <sub>max</sub> (8/20)		[kA]	20
Nominal discharge current I <sub>n</sub> (8/20)		[kA]	5
Total Current		[kA]	60
Voltage protection level Up at I <sub>n</sub> (L-N/N-PE /L-PE)		[kV]	0,85/-/-
Voltage protection level U <sub>res</sub> at 3kA		[kV]	0.8
Voltage protection level U <sub>res</sub> at 5kA		[kV]	0.85
Voltage protection level U <sub>res</sub> at 10kA		[kV]	1.0
TOV (Temporary overvoltage) withstand Ut (L-N: 5s./N-PE: 200ms)		[V]	337/-
Uoc		[kV]	6
Response time		[ns]	≤ 25
Short-circuit withstand capability I <sub>scrr</sub>		[kA]	100
Backup protection maximum rating		fuse (gG) [A]	≤ 125
		circuit breaker (B or C curve) [A]	≤ 125
Pluggable cartridge		Yes	
Integrated QuickSafe® technology		Yes	
State indicator		Yes	
Safety reserve		No	
Auxiliary contact		Yes (TS option)	
<b>Installation</b>			
Wire range (L, N, PE)		solid wire [mm <sup>2</sup> ]	2.5 ... 35
		stranded wire [mm <sup>2</sup> ]	2.5 ... 25
Stripping length (L, N, PE)		[mm]	12.5
Tightening torque (L, N, PE)		[Nm]	2.8
<b>Auxiliary contact (TS)</b>			
Contacts information		1 NO - 1 NC	
Min. load		12 DC - 10 mA	
Max. load		250 V AC - 1A	
Connection cross-section		[mm <sup>2</sup> ]	1.5
<b>Miscellaneous characteristics</b>			
Stocking and operating temperature		[°C]	-40 to +80
Maximal Altitude		[m]	5000
Degree of protection		IP20	
Fire resistance according to UL 94		V-0	
<b>Dimensions</b>			
height x width x depth		mm	88 x 53.4 x 65.3
		inches	3.46 x 2.1 x 2.57
<b>With Auxiliary Contact (TS)</b>			
height x width x depth		mm	95.8 x 53.4 x 65.3
		inches	3.77 x 2.1 x 2.57
<b>Replacement Cartridges</b>			
Phase Product ID		OVR T2-T3 20-275 C QS 2CTB803876R1200	
Neutral Product ID		-	



OVR T2 T3 3L 20-275 P TS QS

Type 2 and 3 surge protective devices shall be installed as close as possible to the sensitive equipment to protect. As Type 2 they have been characterized by their capacity to safely discharge current with a 8/20  $\mu$ s wave form and they guarantee the coordination with Type 1 SPDs or other Type 2 respecting coordination distances. As Type 3 they are characterized by their capacity to safely discharge current with 1.2/50  $\mu$ s wave form, with a very low level of Voltage Protection level.

Poles	Max discharge current $I_{max}$ 8/20 kA	Nominal discharge current $I_n$ kA	Voltage protection level $U_p$ kV	Nominal voltage $U_n$ V	Max. cont. operating voltage $U_c$ V	Bbn 3660308	Ordering details			Weight 1 piece kg
							EAN	Type code	Order code	
3	20	5	0.85	230/400	275	519.818	OVR T2-T3 3L 20-275 P QS	2CTB803873R3400	0.36	
3	20	5	0.85	230/400	275	520.661	OVR T2-T3 3L 20-275 P TS QS	2CTB803873R3500	0.36	

## Protection and safety

### OVR Type T2-T3 QuickSafe® surge protective devices TNS/TT - 230 V 1Ph+N networks

#### Technical features

<b>Type codes</b>		<b>OVR T2-T3 1N 20-275 P QS</b>	
<b>with auxiliary contact (TS)</b>		<b>OVR T2-T3 1N 20-275 P TS QS</b>	
<b>Electrical features</b>			
Standard		IEC 61643-11/EN 61643-11	
Type/test class		T2-T3/II-III	
Protected lines		1+1	
System network		TT - TNS	
Type of current		AC 47-63 Hz	
Voltage regulation of the system network		± 20%	
Nominal system voltage Un	[V]	230	
Max. cont. operating voltage Uc	[V]	275	
Maximum discharge current I <sub>max</sub> (8/20)	[kA]	20	
Nominal discharge current I <sub>n</sub> (8/20)	[kA]	5	
Total Current	[kA]	40	
Voltage protection level U <sub>p</sub> at I <sub>n</sub> (L-N/N-PE/L-PE)	[kV]	0.9/1.4/1.4	
Voltage protection level U <sub>res</sub> at 3kA (L-N/N-PE /L-PE)	[kV]	0.8/1.4/0.85	
Voltage protection level U <sub>res</sub> at 5kA(L-N/N-PE /L-PE)	[kV]	0.85/1.4/0.95	
Voltage protection level U <sub>res</sub> at 10kA (L-N/N-PE /L-PE)	[kV]	1/1.4/1.15	
TOV (Temporary overvoltage) withstand U <sub>t</sub> (L-N: 5s./N-PE: 200ms)	[V]	337/1200	
U <sub>oc</sub>	[kV]	6	
Response time	[ns]	≤ 25	
Residual current I <sub>PE</sub>	[μA]	≤ 10	
Short-circuit withstand capability I <sub>scrr</sub>	[kA]	100	
Backup protection maximum rating	fuse (gG)	≤ 125	
	circuit breaker (B or C curve)	≤ 125	
Pluggable cartridge		Yes	
Integrated QuickSafe® technology		Yes	
State indicator		Yes	
Safety reserve		No	
Auxiliary contact		Yes (TS option)	
<b>Installation</b>			
Wire range (L, N, PE)	solid wire	[mm <sup>2</sup> ]	2.5 ... 35
	stranded wire	[mm <sup>2</sup> ]	2.5 ... 25
Stripping length (L, N, PE)		[mm]	12.5
Tightening torque (L, N, PE)		[Nm]	2.8
<b>Auxiliary contact (TS)</b>			
Contacts information			1 NO - 1 NC
Min. load			12 DC - 10 mA
Max. load			250 V AC - 1A
Connection cross-section		[mm <sup>2</sup> ]	1.5
<b>Miscellaneous characteristics</b>			
Stocking and operating temperature	[°C]		-40 to +80
Maximal Altitude	[m]		5000
Degree of protection			IP20
Fire resistance according to UL 94			V-0
<b>Dimensions</b>			
height x width x depth	[mm]		88 x 35.6 x 65.3
	[inches]		3.46 x 1.4 x 2.57
<b>With Auxiliary Contact (TS)</b>			
height x width x depth	mm		95.8 x 35.6 x 65.3
	inches		3.77 x 1.4 x 2.57
<b>Replacement Cartridges</b>			
Phase Product ID			OVR T2-T3 20-275 C QS 2CTB803876R1200
Neutral Product ID			OVR T2-T3 N 80-275 C QS 2CTB803876R0000



OVR T2 T3 1N 20-275 P QS

Type 2 and 3 surge protective devices shall be installed as close as possible to the sensitive equipment to protect. As Type 2 they have been characterized by their capacity to safely discharge current with a 8/20  $\mu$ s wave form and they guarantee the coordination with Type 1 SPDs or other Type 2 respecting coordination distances. As Type 3 they are characterized by their capacity to safely discharge current with 1.2/50  $\mu$ s wave form, with a very low level of Voltage Protection level.

Poles	Max discharge current $I_{max}$ 8/20 kA	Nominal discharge current $I_n$ kA	Voltage protection level $U_p$ kV	Nominal voltage $U_n$ V	Max. cont. operating voltage $U_c$ V	Bbn 3660308  EAN	Ordering details		Weight 1 piece  kg
							Type code	Order code	
1+1	20	5	1.4	230	275	519.689	OVR T2-T3 1N 20-275 P QS	2CTB803972R1200	0.24
1+1	20	5	1.4	230	275	520.654	OVR T2-T3 1N 20-275 P TS QS	2CTB803972R1300	0.24

## Protection and safety

### OVR Type T2-T3 QuickSafe® surge protective devices TT - 230 V and 400 V 3Ph+N networks

#### Technical features

Type codes		OVR T2-T3 3N 20-275 P QS	OVR T2-T3 3N 20-440 P QS
<b>with auxiliary contact (TS)</b>		<b>OVR T2-T3 3N 20-275 P TS QS</b>	
Technology		Varistor + GDT	Varistor + GDT
<b>Electrical features</b>			
Standard		IEC 61643-11/EN 61643-11	IEC 61643-11 /EN 61643-11
Type/test class		T2-T3/II-III	T2-T3 /II-III
Protected lines		3+1	3+1
System network		TT - TNS	TT - TNS
Type of current		AC 47-63 Hz	AC 47-63 Hz
Voltage regulation of the system network		± 20%	± 10%
Nominal system voltage Un (L-N/L-L)	[V]	230/400	400/690
Max. cont. operating voltage Uc (L-N/L-L)	[V]	275/440	440/750
Maximum discharge current Imax (8/20)	[kA]	20	20
Nominal discharge current In (8/20)	[kA]	5	5
Total Current	[kA]	80	80
Voltage protection level Up at In (L-N/N-PE/L-PE)	[kV]	0.9/1.4/1.4	1.4/1.4/1.4
Voltage protection level Ures at 3kA (L-N/N-PE /L-PE)	[kV]	0.8/1.4/0.85	1.25/1.4/1.4
Voltage protection level Ures at 5kA (L-N/N-PE /L-PE)	[kV]	0.85/1.4/0.95	1.35/1.4/1.45
Voltage protection level Ures at 10kA (L-N/N-PE /L-PE)	[kV]	1/1.4/1.15	1.35/1.4/1.65
TOV (Temporary overvoltage) withstand Ut (L-N: 5s./ N-PE: 200ms)	[V]	337/1200	581/1200
Uoc	[kV]	6	6
Response time	[ns]	≤ 25	≤ 25
Residual current IPE	[µA]	≤ 10	≤ 10
Short-circuit withstand capability Iscrr	[kA]	100	100
Backup protection maximum rating	fuse (gG)	[A]	≤ 125
	circuit breaker (B or C curve)	[A]	≤ 125
Pluggable cartridge		Yes	Yes
Integrated QuickSafe® technology		Yes	Yes
State indicator		Yes	Yes
Safety reserve		No	No
Auxiliary contact		Yes (TS option)	Yes (TS option)
<b>Installation</b>			
Wire range (L, N, PE)	solid wire	[mm <sup>2</sup> ]	2.5 ... 35
	stranded wire	[mm <sup>2</sup> ]	2.5 ... 25
Stripping length (L, N, PE)		[mm]	12,5
Tightening torque (L, N, PE)		[Nm]	2,8
<b>Auxiliary contact (TS)</b>			
Contacts information		1 NO- 1 NC	1 NO- 1 NC
Min. load		12 DC - 10 mA	12 DC - 10 mA
Max. load		250 V AC - 1A	250 V AC - 1A
Connection cross-section	[mm <sup>2</sup> ]	1.5	1.5
<b>Miscellaneous characteristics</b>			
Stocking and operating temperature	[°C]	-40 to +80	-40 to +80
Maximal Altitude	[m]	5000	5000
Degree of protection		IP20	IP20
Fire resistance according to UL 94		V-0	V-0
<b>Dimensions</b>			
height x width x depth	mm	88 x 71.2 x 65.3	88 x 71.2 x 65.3
	inches	3.46 x 2.8 x 2.57	3.46 x 2.8 x 2.57
<b>With Auxiliary Contact (TS)</b>			
height x width x depth	mm	95.8 x 71.2 x 65.3	96 x 71.2 x 64.8
	inches	3.77 x 2.8 x 2.57	3.35 x 2.81 x 2.55
<b>Replacement Cartridges</b>			
Phase Product ID		OVR T2-T3 20-275 C QS 2CTB803876R1200	OVR T2-T3 20-440 C QS 2CTB803876R0600
Neutral Product ID		OVR T2-T3 N 80-275 C QS 2CTB803876R0000	OVR T2-T3 N 80-440 C QS 2CTB803886R0100



OVR T2 T3 3N 20-275 P TS QS

Type 2 and 3 surge protective devices shall be installed as close as possible to the sensitive equipment to protect. As Type 2 they have been characterized by their capacity to safely discharge current with a 8/20  $\mu$ s wave form and they guarantee the coordination with Type 1 SPDs or other Type 2 respecting coordination distances. As Type 3 they are characterized by their capacity to safely discharge current with 1.2/50  $\mu$ s wave form, with a very low level of Voltage Protection level.

Poles	Max discharge current $I_{max}$ 8/20 kA	Nominal discharge current $I_n$ kA	Voltage protection level $U_p$ kV	Nominal voltage $U_n$ V	Max. cont. operating voltage $U_c$ V	Bbn 3660308 EAN	Ordering details		Weight 1 piece kg
							Type code	Order code	
3+1	20	5	1.4	230/400	275	519.924	OVR T2-T3 3N 20-275 P QS	2CTB803973R1200	0.48
3+1	20	5	1.4	230/400	275	520.692	OVR T2-T3 3N 20-275 P TS QS	2CTB803973R1600	0.48
3+1	20	5	1.5	400/690	440	519986	OVR T2-T3 3N 20-440 P QS	2CTB803973R1300	0.48

## Protection and safety

### OVR Type T2-T3 StreetLight surge protective devices TT TN - 230 V

#### Technical features

<b>Type codes</b>		<b>OVR T2-T3 N1 15-275S SL</b>	
Technology		Varistor + GDT	
<b>Electrical features</b>			
Standard		IEC 61643-11/EN 61643-11	
Type/test class		T2-T3/II-III	
System network		TT, TNS	
Protection mode		Common/Differential	
Number of pole/Type of current		1+1	
Nominal system voltage Un	[V]	230	
Max. cont. operating voltage U <sub>c</sub> (L-N)	[V]	275	
Maximum discharge current I <sub>max</sub> (8/20)	[kA]	15	
Nominal discharge current I <sub>n</sub> (8/20)	[kA]	5	
Total Current	[kA]	30	
Voltage protection level U <sub>p</sub> at I <sub>n</sub> (L-N/L-PE)	[kV]	1.1/1.3	
TOV (Temporary overvoltage) withstand U <sub>t</sub> (L-N: 5s.)	[V]	337	
U <sub>oc</sub>	[kV]	1.1	
Response time	[ns]	< 25	
Short circuit withstand I <sub>cc</sub>	[kA]	15	
Backup protection maximum rating	fuse (gG)	[A]	< 20 A
	circuit breaker (B or C curve)	[A]	< 20 A
Pluggable cartridge		No	
Integrated QuickSafe® technology		No	
State indicator		Yes	
Safety reserve		Yes	
<b>Installation</b>			
Wire range : phase and neutral wire		2 x 1.5 mm <sup>2</sup> - L 16 cm	
Wire range : Protective Earth wire		[mm <sup>2</sup> ]	< 6 mm <sup>2</sup>
Stripping length (L, N, PE)		[mm]	10
<b>Auxiliary contact (TS)</b>			
Contacts information		-	
Min. load		-	
Max. load		-	
Connection cross-section		[mm <sup>2</sup> ]	-
<b>Miscellaneous characteristics</b>			
Stocking and operating temperature		[°C]	-40 to +80
Degree of protection		IP32	
Fire resistance according to UL 94		V-0	
<b>Dimensions</b>			
height x width x depth		[mm]	80 x 17.5 x 41
		[inches]	3.15 x 0.69 x 1.62
<b>With Auxiliary Contact (TS)</b>			
height x width x depth		[mm]	-
		[inches]	-

## Protection and safety

### OVR PV surge protective devices Photovoltaic networks

#### Technical features

Type codes		OVR PV T2 40-600 P QS	OVR PV T2 40-1000 P QS	OVR PV T2 40-1000 P TWIN QS	OVR PV T2 40-1500 P QS
with auxiliary contact (TS)		OVR PV T2 40-600 P TS QS	OVR PV T2 40-1000 P TS QS	OVR PV T2 40-1000 P TS TWIN QS	OVR PV T2 40-1500 P TS QS
Technology		Varistor	Varistor	Varistor	Varistor
<b>Electrical features</b>					
Standard		EN 50539 UL 1449 4th Ed	EN 50539 UL 1449 4th Ed	EN 50539 UL 1449 4th Ed	EN 50539 UL 1449 4th Ed
Type/test class		T2/II	T2/II	T2/II	T2/II
Protected lines		2	2	4	2
Types of networks		Photovoltaic	Photovoltaic	Photovoltaic	Photovoltaic
Type of current		DC	DC	DC	DC
Nominal voltage Un (L-N/L-L)	[V]	600	1000	1000	1500
Max. cont. operating voltage Ucpv	[V]	600	1100	1100	1500
Max. cont. operating voltage according to (MCOV)	[V]	600	1100	1100	1500
Impulse current Iimp (10/350)		2	2	2	2
Maximum discharge current I <sub>max</sub> (8/20)	[kA]	40	40	40	40
Nominal discharge current I <sub>n</sub> (8/20)	[kA]	20	20	20	10
Voltage protection level Up at In (L-L/L-PE)	[kV]	2.8/1.4	3.8/3.8	3.8/3.8	4.5/4.5
Voltage protection rating according to (VPR (L+/G, L-/G, L+/L-))	[kV]	1.2/1.2/1.8	2.5/2.5/2.5	2.5/2.5/2.5	4/4/4
Response time	[ns]	≤ 25	≤ 25	≤ 25	≤ 25
Residual current IPE	[μA]	10	75	75	<30
Short-circuit DC current I <sub>scpv</sub>	[A]	300	10,000	10,000	10,000
Short circuit withstand according to (S <sub>CCR</sub> )	[kA]	10	10	10	10
Disconnectors	Fuse	no need up to 0.3 kA	no need up to 10 kA	no need up to 10 kA	no need up to 10 kA
	Circuit breaker	no need up to 0.3 kA	no need up to 10 kA	no need up to 10 kA	no need up to 10 kA
Pluggable cartridge		Yes	Yes	Yes	Yes
Integrated specific thermal disconnectors		Yes	Yes	Yes	Yes
State indicator		Yes	Yes	Yes	Yes
Safety reserve		No	No	No	No
Auxiliary contact		Yes (TS option)	Yes (TS option)	Yes (TS option)	Yes (TS option)
<b>Installation</b>					
Wire range	Solid wire	[mm <sup>2</sup> ]	2.5...35	2.5...35	2.5...35
(L, N, PE)	Stranded wire	[mm <sup>2</sup> ]	2.5...25	2.5...25	2.5...25
Stripping length (L, N, PE)			12.2	12.2	12.2
Tightening torque (L, N, PE)			2.5	2.5	2.5
<b>Auxiliary contact (TS)</b>					
Contact complement		1 NO - 1 NC	1 NO - 1 NC	1 NO - 1 NC	1 NO - 1 NC
Minimum load		12 V DC - 10 mA	12 V DC - 10 mA	12 V DC - 10 mA	12 DC - 10 mA
Maximum load		250 V AC - 1 A	250 V AC - 1 A	250 V AC - 1 A	250 V AC - 1A
Connection cross-section		1.5	1.5	1.5	1.5
<b>Miscellaneous characteristics</b>					
Stocking and operating temperature	[°C]	-40 to +80	-40 to +80	-40 to +80	-40 to +80
Maximal Altitude	[m]	5000	5000	5000	5000
Humidity Rate HR		95%	95%	95%	95%
Degree of protection		IP20	IP20	IP20	IP20
Fire resistance according to UL 94		V-0	V-0	V-0	-V0
Dimensions	height x width x depth	[mm]	88 x 53.4 x 65	88 x 53.4 x 65	88 x 88,33 x 65
		[inches]	3.46 x 2.10 x 2.56	3.46 x 2.10 x 2.56	3.46 x 3,5 x 2.56
with auxiliary contact (TS)	height x width x depth	[mm]	95 x 53.4 x 65	95 x 53.4 x 65	95 x 88,33 x 65
		[inches]	3.46 x 2.10 x 2.56	3.77 x 2.1 x 2.55	3.46 x 3,5 x 2.56
<b>Replacement Cartridges</b>					
Phase Product ID		OVR PV T2 40-600 C QS 2CTB804153R3100	OVR PV T2 40-1000 C QS 2CTB804153R3200	OVR PV T2 40-1000 C QS 2CTB804153R3200	OVR PV T2 40-1500 C QS 2CTB804153R3300
		OVR PV MC C QS 2CTB804153R3500			

**Technical features**

Type codes		OVR PV T1-T2 5-1000 P QS	OVR PV T1-T2 12.5-1000 P QS	OVR PV T1-T2 5-1500 P QS	OVR PV T1-T2 10-1500 P QS
with auxiliary contact (TS)		OVR PV T1-T2 5-1000 P TS QS	OVR PV T1-T2 12.5- 1000 P TS QS	OVR PV T1-T2 5-1500 P TS QS	OVR PV T1-T2 10-1500 P TS QS
Technology		Varistor	Varistor	Varistor	Varistor
<b>Electrical features</b>					
Standard		IEC61643-11/ IEC 61643-31/	IEC61643-11/ IEC 61643-31/ UL 1449 4th Ed.	IEC61643-11/ IEC 61643-31/	IEC61643-11/ IEC 61643-31/ UL 1449 4th Ed.
Type/test class		T1-T2/I-II	T1-T2/I-II	T1-T2/I-II	T1-T2/I-II
Protected lines		2	2	2	2
Types of networks		Photovoltaic	Photovoltaic	Photovoltaic	Photovoltaic
Type of current		DC	DC	DC	DC
Nominal Voltage Un (L-N)/L-L		[V] 1000	1000	1500	1500
Max. cont. Operating voltage Ucpv		[V] 1100	1100	1500	1500
Max.cont.operating voltage according Ⓜ (MCOV)		1100	1100	1500	1500
Impulse current Iimp (10/350)		[kA] 5	6.26	5	5
Total discharge current Itotal (10/350)		[kA] 5	12.5	5	10
Maximum discharge current Imax (8/20)		[kA] 40	40	30	30
Nominal discharge current In (8/20)		[kA] 20	20	20	20
Voltage protection level Up at In (L-L/L-N)		[kV] -	3.8	-	5
Voltage protection rating according Ⓜ (VPR (L+/G, L-/G, L+/L-))		[kV] -	2.5/2.5/2.5	-	4/4/4
Response time		[ns] <25	<25	<25	<25
Short circuit DC current Iscpv		[A] 11	11	11	11
Short circuit withstand according Ⓜ (S <sub>CCR</sub> )		[kA] -	50	-	65
Disconnecter Fuse		no need up to 11 kA	no need up to 11 kA	no need up to 11 kA	no need up to 11 kA
Circuit breaker		no need up to 11 kA	no need up to 11 kA	no need up to 11 kA	no need up to 11 kA
Pluggable cartridge		Yes	Yes	Yes	Yes
Integrated specific thermal disconnecter		Yes	Yes	Yes	Yes
State indicator		Yes	Yes	Yes	Yes
Safety Reserve		No	No	No	No
Auxiliary contact		Yes (TS option)	Yes (TS option)	Yes (TS option)	Yes (TS option)
<b>Installation</b>					
Wire range Solid wire		[mm <sup>2</sup> ] 2.5....35	2.5....35	2.5....35	2.5....35
(L, N, PE) Stranded wire		[mm <sup>2</sup> ] 2.5...25	2.5...25	2.5...25	2.5...25
Stripping length (L,N,PE)		[mm <sup>2</sup> ] 12.5	12.5	12.5	12.5
Tightening torque (L, N, PE)		[N.m] 4.5	4.5	4.5	4.5
<b>Auxiliary contact (TS)</b>					
Contact complement		1 NO - 1 NC	1 NO - 1 NC	1 NO - 1 NC	1 NO - 1 NC
Minimum load		12 V DC - 0,5 mA	12 V DC - 0,5 mA	12 V DC - 0,5 mA	12 V DC - 0,5 mA
Maximum load		250 V AC - 1 A	250 V AC - 1 A	250 V AC - 1 A	250 V AC - 1 A
Connection cross-section		1.5	1.5	1.5	1.5
<b>Miscellaneous characteristics</b>					
Stocking and operating temperature		[°C] -40 to +85	-40 to +85	-40 to +85	-40 to +85
Maximal Altitude		[m] 4000	4000	4000	4000
Humidity Rate HR		95%	95%	95%	95%
Degree of protection		IP20	IP20	IP20	IP20
Fire resistance according to UL 94		V-0	V-0	V-0	V-0
Dimensions height x width x depth		[mm] 95 x 54 x 86	95 x 54 x 86	95 x 54 x 86	95 x 54 x 86
		[inches] 3.74 x 2.12 x 3.38	3.74 x 2.12 x 3.38	3.74 x 2.12 x 3.38	3.74 x 2.12 x 3.38
with auxiliary contact (TS) height x width x depth		[mm] 110 x 54 x 86	110 x 54 x 86	110 x 54 x 86	110 x 54 x 86
		[inches] 4.33 x 2.12 x 3.38	4.33 x 2.12 x 3.38	4.33 x 2.12 x 3.38	4.33 x 2.12 x 3.38
<b>Replacement Cartridges</b>					
Phase Product ID		OVR PV T1-T2 5- 1000 C QS 2CTB812052R1000	OVR PV T1-T2 12.5- 1000 C QS 2CTB812122R1000	OVR PV T1-T2 5- 1500 C QS 2CTB812052R1500	OVR PV T1-T2 10- 1500 C QS 2CTB812102R1500
		-	OVR PV T1-T2 12.5- 1000 M C QS 2CTB812122R1001	-	OVR PV T1-T2 10- 1500 M C QS 2CTB812102R1501

Specifically designed for photovoltaic DC installations, the OVR PV family provide a safe and reliable surge and lightning protection of solar panels and converters.

The OVR PV QS surge protective devices comply with UTE C 61-740-51, prEN 50539-11 and UL 1449 4th Edition.



OVR PV T2 40-600 P QS



OVR PV T2 40-600 P QS

### Type T2 PV

Protected lines	Impulse current Iimp 10/350  kA	Max. discharge current I <sub>max</sub> 8/20  kA	Nominal current I <sub>n</sub>  kA	Voltage protection level U <sub>p</sub>  kV	Max. cont. operating voltage U <sub>cpv</sub>  V	Bbn 3660308  EAN	Ordering details		Weight 1 piece  kg
							Type code	Order code	
1+1 DC	2	40	20	2.8/1.4	600	526502	OVR PV T2 40-600 P QS	2CTB804153R2800	0.38
1+1 DC	2	40	20	2.8/1.4	600	526519	OVR PV T2 40-600 P TS QS	2CTB804153R2900	0.39
1+1 DC	2	40	20	2.8/1.4	600	527318	OVR PV T2 40-600 P QS BULK (30)	2CTB804153Z2800	0.38
1+1 DC	2	40	20	2.8/1.4	600	527325	OVR PV T2 40-600 P TS QS BULK (30)	2CTB804153Z2900	0.39
1+1 DC	-	40	20	3.8	1100	526243	OVR PV T2 40-1000 P QS	2CTB804153R2400	0.38
1+1 DC	2	40	20	3.8	1100	526434	OVR PV T2 40-1000 P TS QS	2CTB804153R2500	0.39
1+1 DC	2	40	20	3.8	1100	526748	OVR PV T2 40-1000 P QS BULK (30)	2CTB804153Z2400	0.36
1+1 DC	2	40	20	3.8	1100	526755	OVR PV T2 40-1000 P TS QS BULK (30)	2CTB804153Z2500	0.39
2+2 DC	2	40	20	3.8	1100	526199	OVR PV T2 40-1000 P TS TWIN QS	2CTB804153R2300	0.65
2+2 DC	2	40	20	3.8	1100	527295	OVR PV T2 40-1000 P TS TWIN QS BULK (4)	2CTB804153Z2300	0.65
1+1 DC	2	40	10	4.5	1500	526465	OVR PV T2 40-1500 P QS	2CTB804153R2600	0.47
1+1 DC	2	40	10	4.5	1100	526472	OVR PV T2 40-1500 P TS QS	2CTB804153R2700	0.48
1+1 DC	2	40	10	4.5	1500	527332	OVR PV T2 40-1500 P QS BULK (30)	2CTB804153Z2600	0.47
1+1 DC	2	40	10	4.5	1500	527301	OVR PV T2 40-1500 P TS QS BULK (30)	2CTB804153Z2700	0.48



OVR PV T1-T2 5-1000 P TS QS



OVR PV T1-T2 10-1500 P TS QS

## Type T1-T2 PV

Protected lines	Impulse current limp 10/350  kA	Total discharge current I <sub>total</sub> 10/350  kA	Max. discharge current I <sub>max</sub> 8/20  kA	Nominal current I <sub>n</sub>  kA	Voltage protection level U <sub>p</sub>  kV	Max. cont. operating voltage U <sub>cpv</sub>  V	Bbn 4053546  EAN	Ordering details		Weight 1 piece  kg
								Type code	Order code	
1+1 DC	5	5	40	20	3.8/3.8	1100	034615	OVR PV T1-T2 5-1000 P QS	2CTB812050R1000	0,40
1+1 DC	5	5	40	20	3.8/3.8	1100	034639	OVR PV T1-T2 5-1000 P TS QS	2CTB812051R1000	0,41
1+1 DC	6,25	12.5	40	20	3.8/3.8	1100	034660	OVR PV T1-T2 12.5-1000 P QS	2CTB812120R1000	0,45
1+1 DC	6,25	12.5	40	20	3.8/3.8	1100	034677	OVR PV T1-T2 12.5-1000 P TS QS	2CTB812121R1000	0,46
1+1 DC	5	5	30	20	5/5	1500	034646	OVR PV T1-T2 5-1500 P QS	2CTB812050R1500	0,49
1+1 DC	5	5	30	20	5/5	1500	034653	OVR PV T1-T2 5-1500 P TS QS	2CTB812051R1500	0,50
1+1 DC	5	10	30	20	5/5	1500	034684	OVR PV T1-T2 10-1500 P QS	2CTB812100R1500	0,49
1+1 DC	5	10	30	20	5/5	1500	034691	OVR PV T1-T2 10-1500 P TS QS	2CTB812101R1500	0,50





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