



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

INTRODUCTION
P.2

**IEC-POWER DIN-RAIL
PRODUCTS**
P.43

**UL-POWER DIN-RAIL
PRODUCTS**
P.133

**UL-POWER NON-DIN-
RAIL PRODUCTS**
P.153

BS PRODUCTS
P.163

IEC-UL DATA SPDS
P.261

01

02

03

04

05

06

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

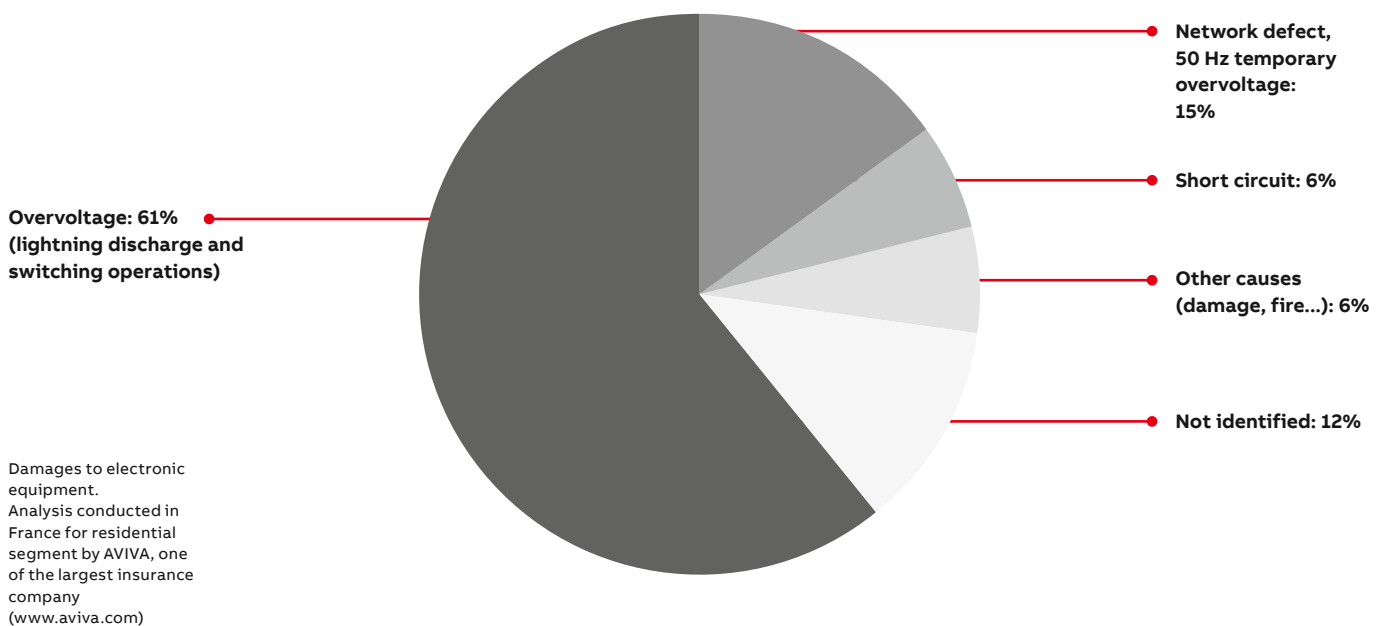
Launch of the System Pro M Compact® range with Safety Reserve System as option. Unique product in the market back then.



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.



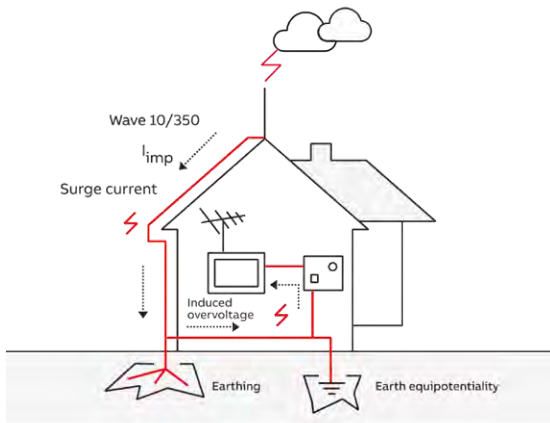
Transient Surges represent the main cause of electrical devices failure and loss of productivity but what is a transient surge? Transient overvoltage is a short duration, high magnitude voltage peaks with fast rising edges, commonly referred to as surges. Often described as a "spike" transient voltages 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.

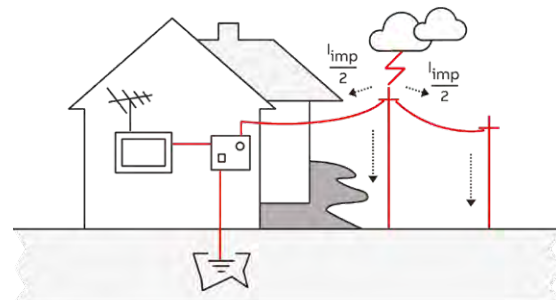
When a lightning strikes directly a building equipped with a lightning protection system (LPS), the lightning current is dissipated to the ground through the down conductors. However, the transient overvoltage can be propagated into the building through the earthing of the electrical installation.

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

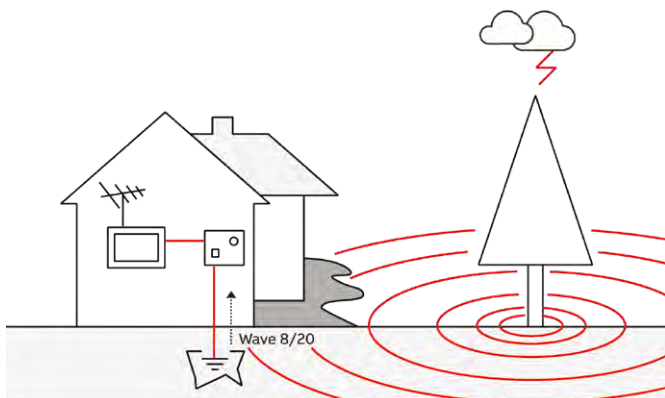


Lightning strike on an overhead line connected to the building

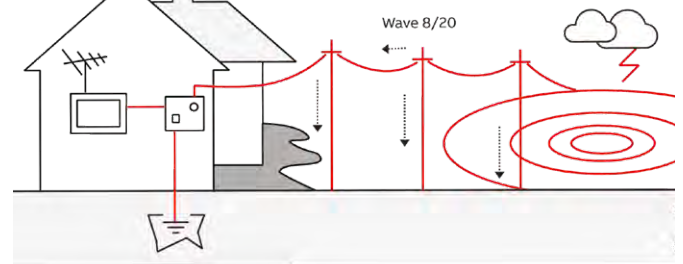
Transient overvoltages due to indirect lightning effects

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.

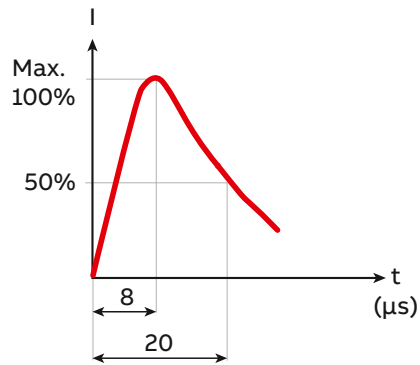
ABB also provide SPDs tested to UL standards - a summary of the differences in between IEC SPD test standards and UL SPD test standards terminology follows.

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

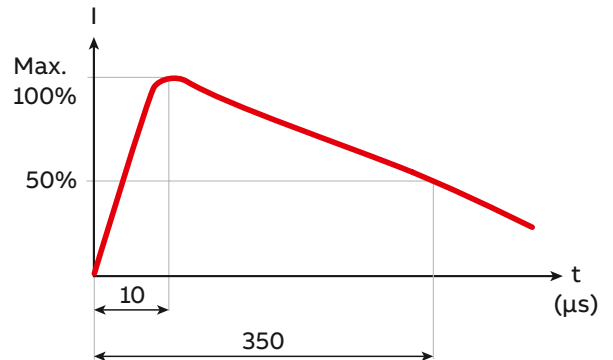
8 x 20µs wave shape

- 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



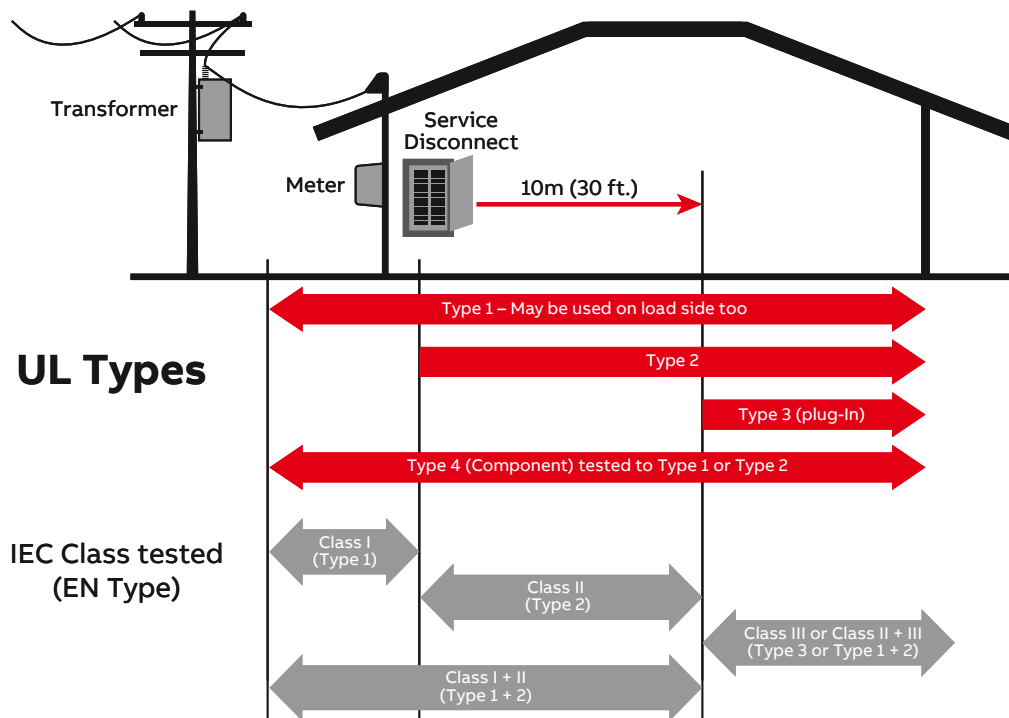
10 x 350µs wave shape (IEC only)

- 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



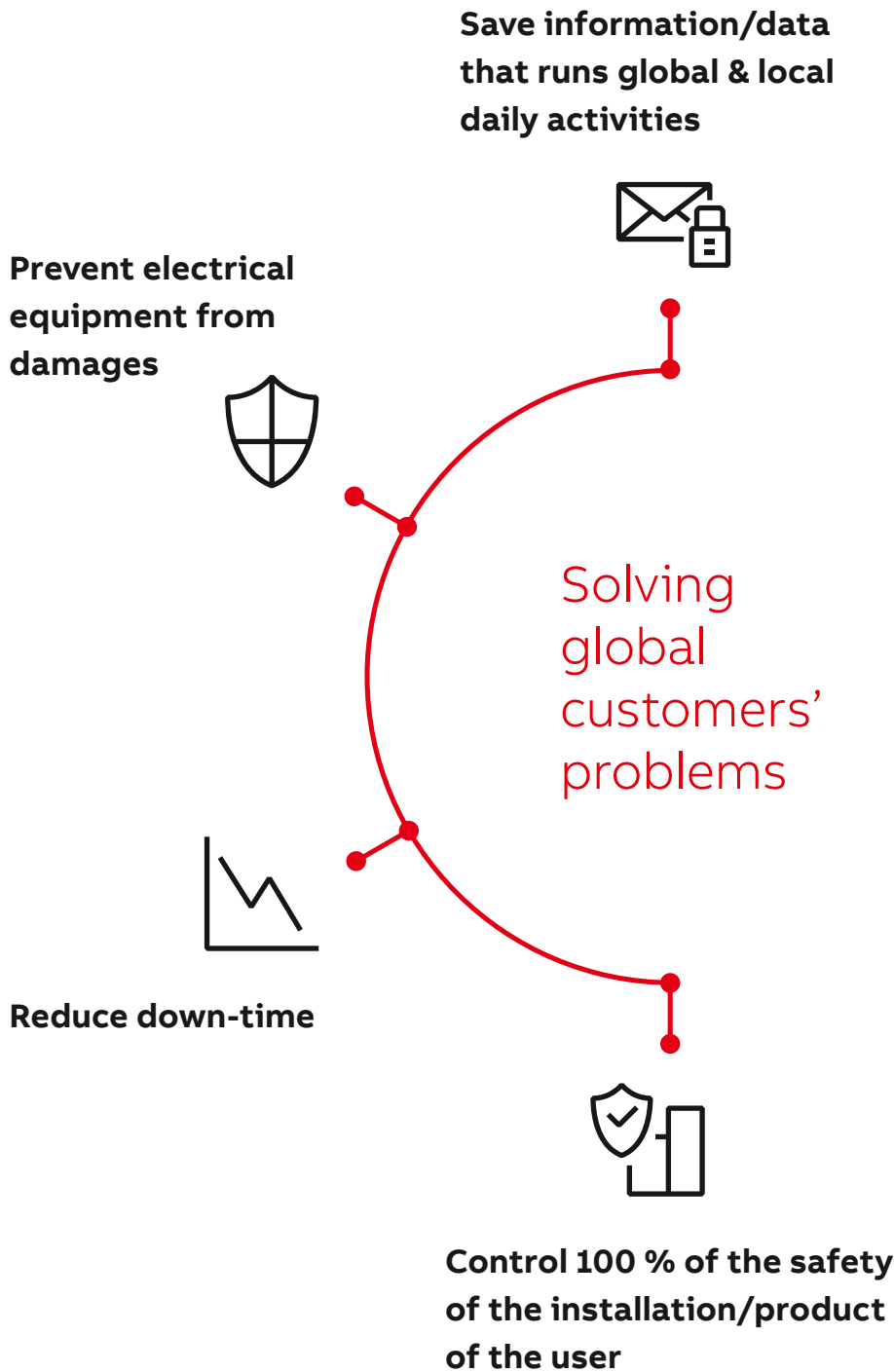


UL Types vs IEC Class tested SPDs and Locations



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.

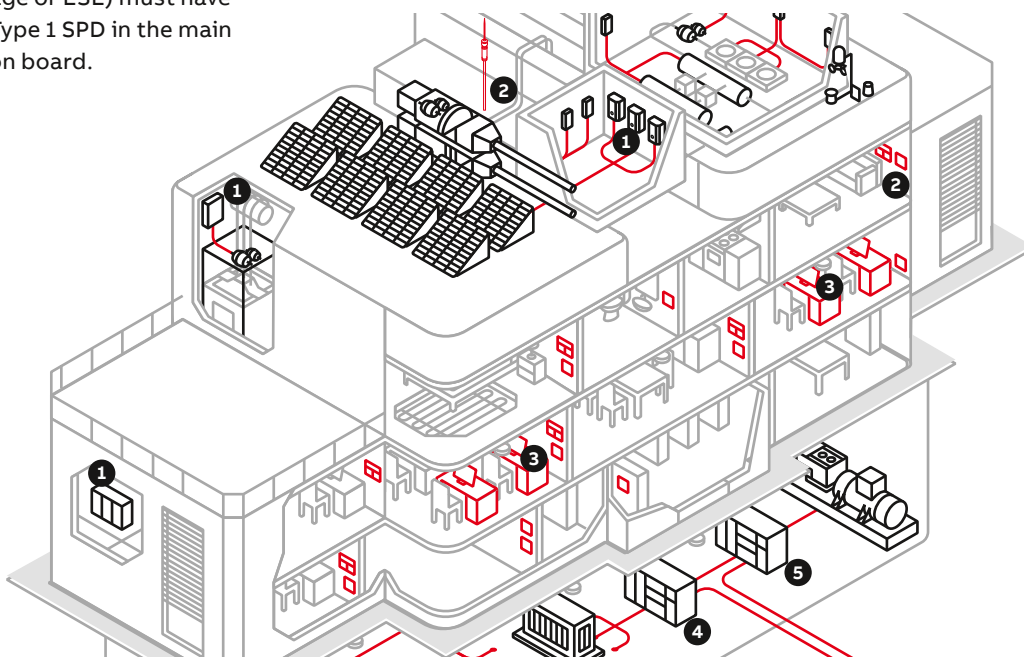
Most of the equipment sustain repetitive transient surges. Generated by indirect lightning strikes or by industrial environment, these transient overvoltages deteriorate and drastically reduce the life time of sensitive equipment like computers.

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
2. Lightning rod (ESEAT)

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

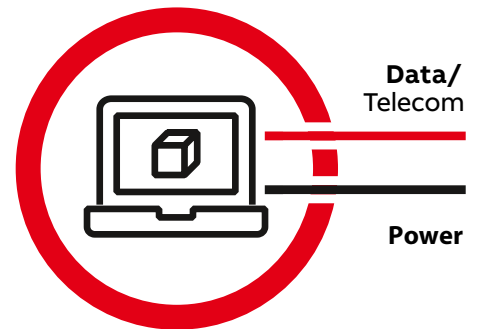
SPD Product Overview

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

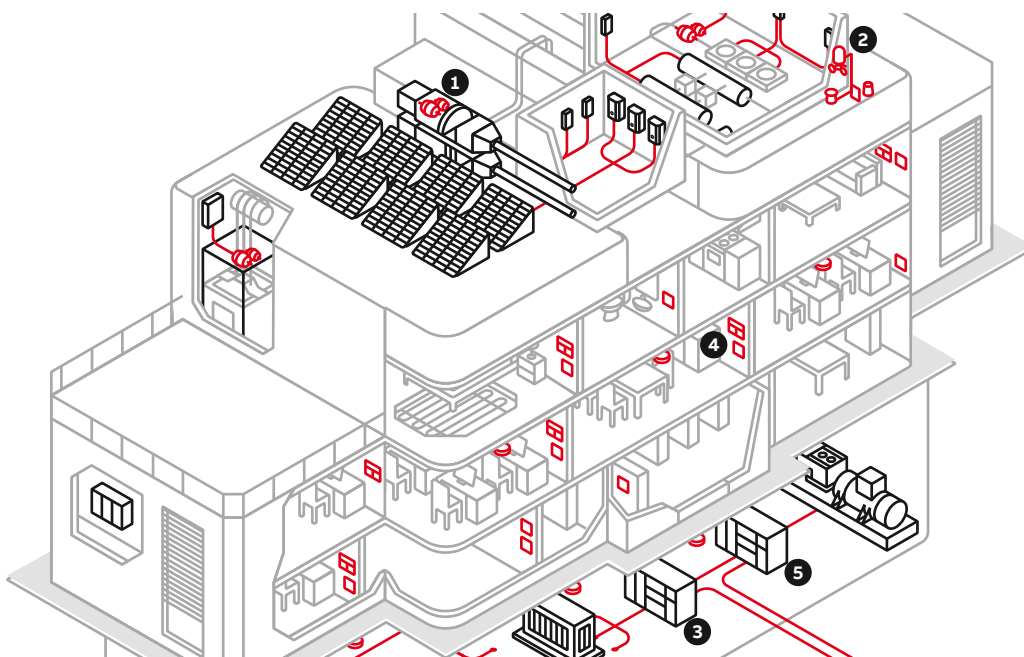
Protecting critical electronic systems

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

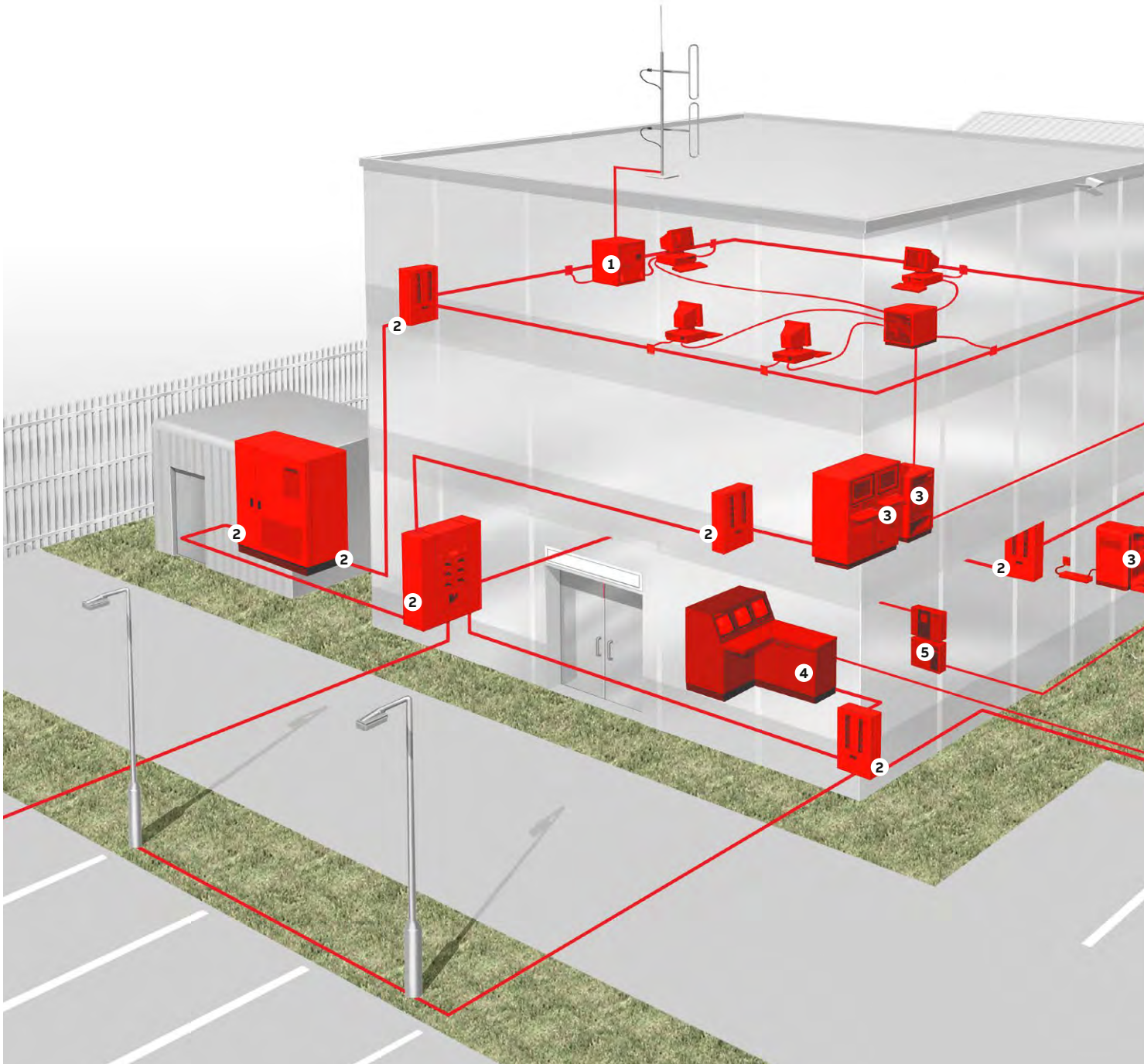
- PBX (OVR KT series)
- RJ11 (OVR TN series)
- RJ45 (OVR ISDN series)
- 2 wire (OVR TN, OVR SLTN)
- 8 wire (OVR TNQ)

5. Main power supply

- See OVR power SPD series

The ABB Furse Surge Protection range overview

Protecting critical electronic systems



- 1. Data & measurement systems**

 - 2 wire (ESP SL series)
 - 2 wire ATEX (ESP SLX series)
 - 2 wire (ESP D/E/H series)
 - 3 wire (ESP SL-3W series)
 - 4-20 mA (ESP SL 4-20)
 - 8 wire (ESP Q series)
 - RTD (ESP RTD series)
- 2. Mains power supply**

See ESP power SPD product selector

 - ESP 240/XXX series
 - ESP 415/XXX series
 - ESP M series
 - ESP D1 series
 - ESP DC series
 - ESP 240D/DS series
 - ESP 5A/BX and 16A/BX series
 - ESP MC series
- 3. Information technology systems**

 - Cat 6 + PoE (ESP Cat-6 series)
 - Cat 5e + PoE (ESP Cat-5e series)
 - RS485/HART/Profibus/Fieldbus (ESP RS485 series)
- 4. Transceiver/CCTV systems**

 - RF (ESP RF series)
 - CCTV (ESP CCTV series with ESP 240-16A in-line power SPD)

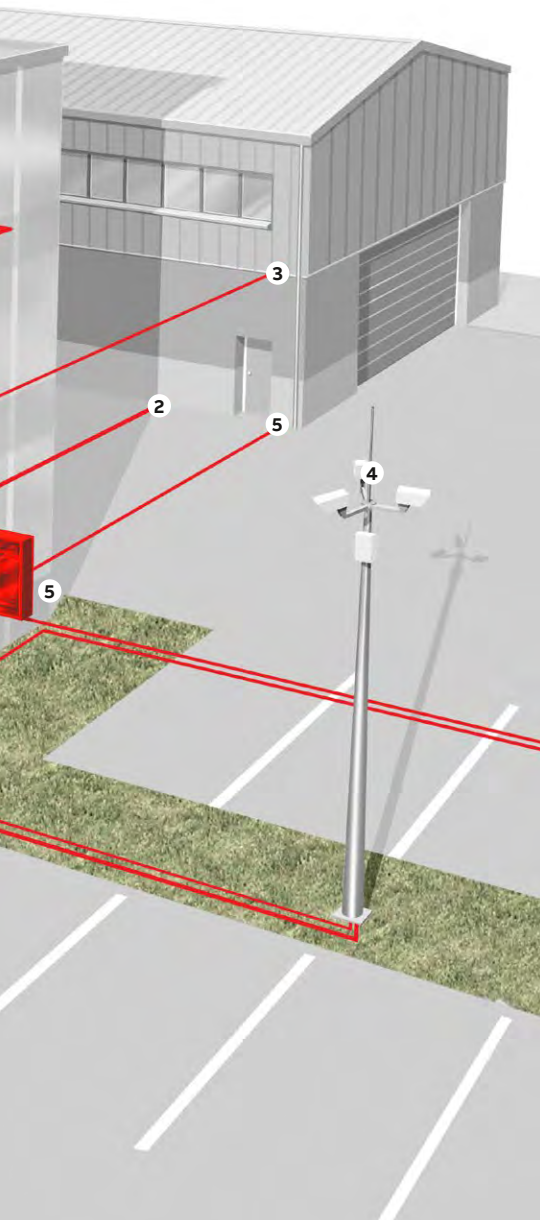


ABB Furse ESP range of SPDs are designed to protect equipment connected to power, data and telephone lines and offer a complete system protection solution against surges.

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.

—
This illustration is designed to demonstrate the main aspects and individual components of a system of Surge Protection methods. It is not intended to represent an actual scheme conforming to a particular code of practice. The drawing is not to scale.

5. **Telecom systems**
- PBX (ESP KT series)
 - RJ11 (ESP TN series)
 - RJ45 (ESP ISDN series)
 - 2 wire (ESP TN, ESP SLTN)
 - 4 pairs 8 wire (ESP TNQ)

SPD Product Overview

ABB OVR SPDs for UL 1449 4ed

The different type designations of surge protective devices

The UL 1449 places SPDs into five different Type categories based on installation location within an electrical system. While Type 1, Type 2 and Type 3 categories refer to different types of SPDs that can be installed at specific locations, Type 4 and Type 5 categories refer to components used in an SPDs configuration.

SPD Types

Type 1 SPD – Line Side: Type 1 SPDs are permanently connected devices that can be installed anywhere between the secondary of the utility service transformer and the main distribution disconnect. A Type1 SPD can also be installed anywhere on the load side of the main distribution and can be installed without the need for external over current protection (does not require an upstream fuse or breaker).

Type 2 SPD – Load Side: Type 2 SPDs are permanently connected devices that must be installed on the load side of the main distribution disconnect. Type 2 devices may, or may not require external over current protection (may or may not require an upstream fuse or breaker).

Type 3 SPD: Type 3 SPDs are installed at a conductor length of 10 meters (30 feet) or more from the electrical panel they are protecting. These de-vices are typically cord connected, direct plug-in, receptacle type SPDs installed at the load equipment being protected.

Type 4 SPD: Type 4 SPDs are considered component SPDs. Component SPDs typically consist of one or more Type 5 components assembled together. Type 4 SPDs are not intended to be used by themselves, and must be integrated into other systems.

- Type 1 component assembly is a Type 4 SPD that once installed inside another piece of equipment would be tested as a Type 1 SPD (would not require external overcurrent protection).
- Type 2 component assembly is Type 4 SPD that once installed inside another piece of equipment would be tested as a Type 2 SPD. (would require external over current protection)

Type 5 SPD: Type 5 SPDs are discrete component surge suppressors (such as MOVs) that may be mounted on a printed circuit board, connected by leads, or provided within an enclosure with mounting means and wiring terminations.

List of OVR T2 UL products according to their certification

Type acc. To UL 1449 Ed4 DIN-Rail Products

Range	Type code	Order code	Type 4 CA	Type 1 CA
T2 U	OVR T2 15-150 P U	2CTB802341R0000	■	
	OVR T2 15-320 P U	2CTB802341R0400	■	
	OVR T2 40-150 P U	2CTB802341R2000	■	
	OVR T2 40-150 P TS U	2CTB802341R2100	■	
	OVR T2 40-320 P U	2CTB802341R2400	■	
	OVR T2 40-320 P TS U	2CTB802341R2500	■	
	OVR T2 40-440 P TS U	2CTB802341R2900	■	
	OVR T2 40-550 P TS U	2CTB802341R3300	■	
	OVR T2 40-660 P TS U	2CTB802341R3700	■	
	OVR T2 70 N P U	2CTB802341R8000	■	
	OVR T2 1N 15-150 P U	2CTB802342R0000	■	
	OVR T2 1N 15-320 P U	2CTB802342R0400	■	
	OVR T2 1N 40-150 P U	2CTB802342R2000	■	
	OVR T2 1N 40-150 P TS U	2CTB802342R2100	■	
	OVR T2 1N 40-320 P TS U	2CTB802342R2500	■	
	OVR T2 1N 40-440 P TS U	2CTB802342R2900	■	
	OVR T2 1N 40-550 P TS U	2CTB802342R3300	■	
	OVR T2 1N 40-660 P TS U	2CTB802342R3700	■	
	OVR T2 2L 15-150 P U	2CTB802343R0000	■	
	OVR T2 2L 15-320 P U	2CTB802343R0400	■	
	OVR T2 2L 40-150 P TS U	2CTB802343R2100	■	
	OVR T2 2L 40-320 P TS U	2CTB802343R2500	■	
	OVR T2 2N 15-150 P U	2CTB802344R0000	■	
	OVR T2 2N 15-320 P U	2CTB802344R0400	■	
	OVR T2 2N 40-150 P TS U	2CTB802344R2100	■	
	OVR T2 2N 40-320 P TS U	2CTB802344R2500	■	
	OVR T2 2N 40-440 P TS U	2CTB802344R2900	■	
	OVR T2 2N 40-550 P TS U	2CTB802344R3300	■	
	OVR T2 2N 40-660 P TS U	2CTB802344R3700	■	
	OVR T2 3L 15-150 P U	2CTB802345R0000	■	
	OVR T2 3L 15-320 P U	2CTB802345R0400	■	
	OVR T2 3L 40-150 P TS U	2CTB802345R2100	■	
	OVR T2 3L 40-320 P TS U	2CTB802345R2500	■	
	OVR T2 3L 40-440 P TS U	2CTB802345R2900	■	
	OVR T2 3L 40-550 P TS U	2CTB802345R3300	■	
	OVR T2 3N 15-150 P U	2CTB802346R0000	■	
	OVR T2 3N 15-320 P U	2CTB802346R0400	■	
	OVR T2 3N 40-150 P TS U	2CTB802346R2100	■	
	OVR T2 3N 40-320 P TS U	2CTB802346R2500	■	
	OVR T2 3N 40-440 P TS U	2CTB802346R2900	■	
	OVR T2 3N 40-550 P TS U	2CTB802346R3300	■	
	OVR T2 3N 40-660 P TS U	2CTB802346R3700	■	
	OVR T2 15-150 C U	2CTB802348R2500	■	
	OVR T2 15-320 C U	2CTB802348R2700	■	
	OVR T2 40-150 C U	2CTB802348R3500	■	
	OVR T2 40-320 C U	2CTB802348R3700	■	
	OVR T2 40-440 C U	2CTB802348R3900	■	
	OVR T2 40-550 C U	2CTB802348R4100	■	
	OVR T2 40-660 C U	2CTB802348R4300	■	
	OVR T2 70 N C U	2CTB802348R6500	■	

Range	Type code	Order code	Type 4 CA	Type 1 CA
T2 PV QS	OVR PV T2 40-600 P QS	2CTB804153R2800	■	
	OVR PV T2 40-600 P TS QS	2CTB804153R2900	■	
	OVR PV T2 40-1000 P QS	2CTB804153R2400	■	
	OVR PV T2 40-1000 P TS QS	2CTB804153R2500	■	
	OVR PV T2 40-1500 P QS	2CTB804153R2600	■	
	OVR PV T2 40-1500 P TS QS	2CTB804153R2700	■	
	OVR PV T2 40-600 C QS	2CTB804153R3100	■	
	OVR PV T2 40-1000 C QS	2CTB804153R3200	■	
	OVR PV T2 40-1500 C QS	2CTB804153R3300	■	
	OVR PV MC C QS	2CTB804153R3500	■	
T1-T2 PV QS	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	■	
	OVR PV T1-T2 5-1000 C QS	2CTB812052R1000		
	OVR PV T1-T2 12.5-1000 C QS	2CTB812122R1000	■	
	OVR PV T1-T2 12.5-1000 MC QS	2CTB812122R1001	■	
	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	2CTB812101R1500	■	
	OVR PV T1-T2 5-1500 C QS	2CTB812052R1500		
	OVR PV T1-T2 10-1500 C QS	2CTB812102R1500	■	
	OVR PV T1-T2 10-1500 MC QS	2CTB812102R1501	■	

OVRH series product range. Not DIN-Rail mounted**Quick reference guide to product features**

SPD type	OVRHSP Type 1	OVRHTE Type 2	OVRHS3 Model dependent	OVRHLD Type 1	DIN-Rail Type 4 for Type 2 locations
Regulatory	<ul style="list-style-type: none"> - ETL – 60, 80, 100kA models only - UL – 120, 160, 200, 240, 300, 400kA models only - CE – All units 	- UL	- UL	- ETL	<ul style="list-style-type: none"> - UL - CE
Warranty	- 5 Years	- 3 Years	- 1 Year	- 1 Year	- 1 Year
Budget	\$\$\$	\$\$	\$	\$	\$
Features	<ul style="list-style-type: none"> - Overcurrent fusing - EMI filter - Surge counter - LED (s) - Dry relay contacts - RoHS - Audible alarm with alarm silence - NEMA 4 	<ul style="list-style-type: none"> - EMI filter - LED (s) - Dry relay contacts – Model dependent - RoHS - NEMA 4 	<ul style="list-style-type: none"> - Thermal fusing - Overcurrent fusing - LED (s) - Dry relay contacts – Model dependent - RoHS – model dependent 	<ul style="list-style-type: none"> - Thermal fusing - Overcurrent fusing - LED (s) - RoHS 	<ul style="list-style-type: none"> - Modular design - Dry relay contacts – Model dependent - Failure indicator - RoHS
Typical application	Main distribution Sub distribution	Sub distribution Point of use	Sub distribution Point of use	Point of use Internally mounted solution	Point of use Internally mounted solution

Quick step guide to purchasing an SPD

SPD location	Protected equipment examples
Main distribution <p>The point of entry for utility power. A unit installed here protects the facility from a large external event, such as lightning or grid switching.</p>	<ul style="list-style-type: none"> - Electrical switchgear - Switchboard - Distribution - MCCs - Emergency power backup - Transfer switch - UPS system
Sub distribution <p>Closer to the critical load. A unit installed here protects from internally generated surges and isolates critical equipment from faults.</p>	<ul style="list-style-type: none"> - Emergency power backup - Transfer switches - Control boxes - Switchgear - Generators - Computer servers - Building management systems - Surveillance equipment - Security systems - HVAC - Building management systems - Fire alarm panels - Copiers - Telephone systems - Fax machines
Point of use <p>Installing surge protection at panel distribution extends unit longevity by absorbing mini surges that reduce equipment life.</p>	<ul style="list-style-type: none"> - X-Ray - CAT-scan - Life support equipment - Medical instrumentation - Computer servers - Elevators - Parking lot lighting - Printers - Communication systems - Motors - Pumps - Drives

Please Note – SPD voltage must match application voltage

In cases where the input voltage to a panel is a Wye voltage configuration, but all of the loads are either L-G or L-L reference, the preferred SPD voltage configuration would be a Delta system.




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 :

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

FURSE ESP SPDs for BS EN 61643 :




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

ABB OVR SPDs for UL 1449 4ed :




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



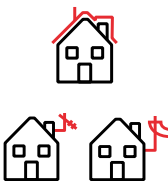





ABB OVR SPDs (SL and Q data SPD versions to UL 497B)

	Data Lines	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	Main Distribution Board T1 (+T2)	Type code	Order code
 <p>Industrial areas, offices, public, big residential buildings</p>		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)	
 <p>Residential building with lightning rod, overhead power line or antenna</p>		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)	
 <p>Residential building without lightning rod, overhead power lines or antenna</p>		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)	
 <p>Protection for photovoltaic (PV) installations</p>		DC voltage Direct current (DC)	
		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**

Distance to sub distribution > 10 meters		
	OVR T2 3N 40-275 P QS	2CTB803973R1100
	OVR T2 3N 40-275 P TS QS	2CTB803973R0500

Distance to sub distribution > 10 meters		
	OVR T2 3L 40-275 P QS	2CTB803873R2400
	OVR T2 3L 40-275 P TS QS	2CTB803873R2500

- Optional Auxiliary contact (TS)



Distance to sub distribution board and loads > 10 meters		
	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)



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

1 Phase	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 _{max} 8/20 kA	I _n kA	I _{fi} kA	U _p kV	U _n V	U _c V		
Type 1 OVR non-pluggable									
Uc 255 V									
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
Neutral									
1	50	100	50	0.1	1.5	230	255	OVR T1 50 N	2CTB815101R0400
Type T1-T2 OVR pluggable									
Uc 255-275 V									
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
Uc 440 V									
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
	limp 10/350	I _{max} 8/20	I _n	I _{fi}	U _p	U _n	U _c		
	kA	kA	kA	kA	kV	V	V		
Neutral									
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
Cartridges									
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
Type 2 OVR non-pluggable									
U_c 275 V									
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
Type 2 OVR pluggable									
U_c 75 V									
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
U_c 275 V									
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 _{imp} 10/350 kA	I _{max} 8/20 kA	I _n kA	I _{fi} kA	U _p kV	U _n V	U _c V		
Neutral									
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
Cartridges									
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
Uc 350V									
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
Neutral									
1	2	80	30	0.1	1.4	230	350	OVR T2 N 80-350 P QS	2CTB803983R1900
Cartridges									
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
Uc 440V									
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 _{max} 8/20	I _n	I _{fi}	U _p	U _n	U _c		
	kA	kA	kA	kA	kV	V	V		
Neutral									
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
Cartridges									
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
Uc 600V									
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
Cartridges									
1	-	40	20	-	2.3	400	600	OVR T2 40-600 C QS	2CTB803886R0400
Uc 760V									
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
Cartridges									
1		40	20	-	2.9	400	440	OVR T2 40-400/690 C	2CTB803854R1100
Type T2-T3 OVR Pluggable									
Uc 275V									
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
Neutral									
1	-	80	30	0.1	1.4	230	275	OVR T2-T3 N 80-275 P QS	2CTB803973R1900
Cartridges									
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
Uc 440V									
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
Neutral									
1		80	30	0.1	1.4	400	440	OVR T2-T3 N 80-440 P QS	2CTB803973R2000
Cartridges									
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
Type T2-T3 OVR non-pluggable Street Light									
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 _{max} 8/20 kA	I _n kA	I _{fi} kA	U _p kV	U _n V	U _c V		
Type T2 OVR autoprotected non-pluggable									
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
Type 2 OVR pluggable PV applications									
Uc 670 V DC									
1+1 DC	2	40	20	0.3 (I _{scpv})	2.8/1.4	600	600	OVR PV T2 40-600 P QS	2CTB804153R2800
1+1 DC	2	40	20	0.3 (I _{scpv})	2.8/1.4	600	600	OVR PV T2 40-600 P TS QS	2CTB804153R2900
1+1 DC	2	40	20	0.3 (I _{scpv})	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 _{scpv})	2.8/1.4	600	600	OVR PV T2 40-600 P TS QS BULK (30)	2CTB804153Z2900
Cartridges									
1+1 DC	2	40	20	10,000 (I _{scpv})	2.8/1.4	600	600	OVR PV T2 40-600 C QS	2CTB804153R3100
1+1 DC	2	40	20	10,000 (I _{scpv})	2.8/1.4	600	600	OVR PV MC C QS	2CTB804153R3500
Uc 1100 V DC									
1+1 DC	-	40	20	10,000 (I _{scpv})	3.8	1000	1100	OVR PV T2 40-1000 P QS	2CTB804153R2400
1+1 DC	2	40	20	10,000 (I _{scpv})	3.8	1000	1100	OVR PV T2 40-1000 P TS QS	2CTB804153R2500
1+1 DC	2	40	20	10,000 (I _{scpv})	3.8	1000	1100	OVR PV T2 40-1000 P QS BULK (30)	2CTB804153Z2400
1+1 DC	2	40	20	10,000 (I _{scpv})	3.8	1000	1100	OVR PV T2 40-1000 P TS QS BULK (30)	2CTB804153Z2500
2+2 DC	2	40	20	10,000 (I _{scpv})	3.8	1000	1100	OVR PV T2 40-1000 P TWIN QS	2CTB804153R3000
2+2 DC	2	40	20	10,000 (I _{scpv})	3.8	1000	1100	OVR PV T2 40-1000 P TS TWIN QS	2CTB804153R2300
2+2 DC	2	40	20	10,000 (I _{scpv})	3.8	1000	1100	OVR PV T2 40-1000 P TS TWIN QS BULK (18)	2CTB804153Z2300
Cartridges									
1+1 DC or 2+2DC	2	40	20	10,000 (I _{scpv})	3.8	1000	1100	OVR PV T2 40-1000 C QS	2CTB804153R3200
Uc 1500 V DC									
1+1 DC	2	40	10	10,000 (I _{scpv})	4.5	1500	1500	OVR PV T2 40-1500 P QS	2CTB804153R2600
1+1 DC	2	40	10	10,000 (I _{scpv})	4.5	1500	1500	OVR PV T2 40-1500 P TS QS	2CTB804153R2700
1+1 DC	2	40	10	10,000 (I _{scpv})	4.5	1500	1500	OVR PV T2 40-1500 P QS BULK (30)	2CTB804153Z2600
1+1 DC	2	40	10	10,000 (I _{scpv})	4.5	1500	1500	OVR PV T2 40-1500 P TS QS BULK (30)	2CTB804153Z2700
Cartridges									
1+1 DC	2	40	10	10,000 (I _{scpv})	4.5	1500	1500	OVR PV T2 40-1500 C QS	2CTB804153R3300

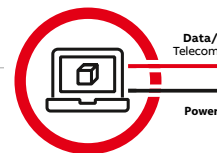
Protected lines	Total Discharge Current	Impulse current	Max. discharge current	Nominal current	Follow current interrupting rating	Voltage protection level	Nominal voltage	Max. cont. operating voltage	Type code	Order code
	I _{total} 10/350 kA	I _{imp} 10/350 kA	I _{max} 8/20 kA	I _n kA	I _{fi} kA	U _p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

ABB OVR data SPD range overview

Product selector - Data line protection



Fieldbus/PRO-FIBUS Systems										
HART Systems RS485	OVR RS485 Flat/DIN Mount 7TCA085400R0311	OVR SL RS485 Slim DIN Mount 7TCA085400R0310	OVR RS485Q Multiple Lines (DIN Mount) 7TCA085400R0312							
Ethernet		Cat-5 (100 Mbps) OVR Cat-5e 7TCA085400R0289	OVR Cat-5e/PoE 7TCA085400R0290	Cat-6 (1000 Mbps) OVR Cat-6 7TCA085400R0291	OVR Cat-6/PoE 7TCA085400R0292					
Video Surveillance CCTV		5V CCTV with BNC connector, power, and telemetry line		OVR CCTV/B Video signal 7TCA085400R0296					OVR WBX4/GS Enclosure 7TCA085410R0049	CCTV Protection is also available for different voltages and twisted pair connections.
4 - 20 mA current loops	Screw terminals 30 V		OVR SL30L/4-20 Product code: 7TCA085400R0371							
Coaxial antennas: GSM, UMTS, Radar, Radio, TV, GPS		RF power = 650 W Female coaxial connector:		OVR RF 441421 BNC 7TCA085450R0066		OVR RF AA1421 7/16 DIN 7TCA085450R0063		OVR RF 111421 N 7TCA085450R0065		
Telephone ISDN DSL G.FAST		2 wire Telecom Screw terminals:		OVR TN Flat Mount 7TCA085400R0345		OVR SL TN Slim Mount 7TCA085400R0323		OVR SL TNL Slim Mount with LED 7TCA085400R0418		OVR TNQ Multiple Lines 7TCA085400R0344
		RJ11, RJ45		OVR TN/RJ11-6/6 6P6C Connector 7TCA085400R0359		OVR ISDN/RJ45-4/8 8P4C Connector 7TCA085400R0359				
		PBX Telecom		OVR KT1 Single module 7TCA085400R0305		OVR K10T1 10 modules 7TCA085400R0307		OVR KE10 Earth Bar 7TCA085400R0304		
TV: Satellite, Cable		OVR CATV/F Cable 7TCA085400R0293		OVR SMATV/F Satellite 7TCA085400R0336		OVR TV/EURO Antenna 7TCA085400R0334				
2 wire systems (30 V)		OVR 30E Flat Mount 7TCA085400R0353		OVR SL30 Slim Mount 7TCA085400R0363		OVR 30Q Multiple Lines 7TCA085400R0341	Protection for different voltages are available	OVR SL and OVR Q products have UL 497B listing		
Hazardous Areas ATEX/IEC Approved		OVR SL15X 15 Volt 7TCA085400R0386		OVR SL30X 30 Volt 7TCA085400R0387			LED and Isolated base options are available			
Resistance Temperature Detectors (RTD) 3 wire systems		OVR RTD Flat/DIN Mount 7TCA085400R0313		OVR SL RTD Slim (DIN Mount) 7TCA085400R0315		OVR RTDQ Multiple Lines (DIN Mount) 7TCA085400R0314				
3 wire systems (30 V)		ESP SL30/3W Slim Mount 7TCA085400R0331	Protection for different voltages are available							



IMPORTANT:
Equipment is ONLY protected against transient overvoltages if all incoming / outgoing mains and data lines have protection fitted.



ABB Furse ESP range of SPDs

Enhanced solutions to BS EN 62305/BS 7671

The Furse ESP range of SPDs (power, data and telecom) are widely specified in all applications to ensure the continuous operation of critical electronic systems. They form part of a complete lightning protection solution to BS EN 62305. Furse ESP M and ESP D power SPD products are Type 1+2+3 devices, making them suitable for installation at the service entrance, whilst giving

superior voltage protection levels (enhanced to BS EN 62305) between all conductors or modes.

The active status indication informs the user of:

- Loss of power
- Loss of phase
- Excessive N-E voltage
- Reduced protection

The SPD and supply status can also be monitored remotely via the volt-free contact.



Protection for 230/400 V TN-S or TN-C-S supplies

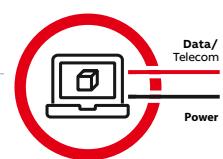
Supply type	Example 1	Example 2	Example 3	Example 4
	No external lightning protection system fitted	No external lightning protection system fitted	External lightning protection system fitted	External lightning protection system fitted
	Underground mains supply feed	Exposed overhead mains supply feed	Multiple connected metallic services	No. of services unknown
Main distribution board (MDB)	Type 1+2+3	Type 1+2 OR Type 1+2+3	Type 1+2+3	Type 1+2 OR Type 1+2+3
3 Phase 400 V Service entrance, after electricity meter (Main distribution board (MDB)). Type 1+2+3 SPDs such as the ESP M and D series are used where the MDB directly feeds critical electronics	OR ESP 415 D1 Series OR ESP 415 M1 Series	OR ESP 415/III/TNS OR ESP 415 M2 Series for critical electronics	OR ESP 415 D1 Series OR ESP 415 M1 Series	 For LPL I & II: OR ESP 415 M4 Series for critical electronics ESP 415/I/TNS For LPL III or IV: ESP 415/III/TNS
Sub-distribution board (SDB)	Type 1+2+3			
Located >10 m from MDB feeding electronic equipment	OR ESP 240 D1 Series, or ESP 240 M1 Series	For 3 Phase 400 V ESP 415 D1 Series, or ESP 415 M1 Series	OR ESP 240 D1 Series, or ESP 240 M1 Series	For 1 Phase 230 V ESP 240 D1 Series, or ESP 240 M1 Series
Final circuit equipment	For 13 A sockets (e.g. servers)	Fused spurs		
Located >10 m from SDB	ESP MC/TN/RJ11 ESP MC/Cat-5e	ESP 240D-10A ESP 240D-32A		
Mains protectors for specific systems				
	ESP PV series For Photovoltaic (solar panels) up to 1000 VDC	ESP WT series For 690V Wind Turbines	ESP DC series For DC systems up to 48V	

ABB ESP data SPD range overview

Product selector - Data line protection



Fieldbus/PRO-FIBUS Systems HART Systems RS485					
	ESP RS485 Flat/DIN Mount 7TCA085400R0191	ESP SL RS485 Slim DIN Mount 7TCA085400R0193	ESP RS485Q Multiple Lines (DIN Mount) 7TCA085400R0192		
Ethernet		Cat-5 (100 Mbps) ESP Cat-5e 7TCA085400R0017	ESP Cat-5e/PoE 7TCA085400R0021	Cat-6 (1000 Mbps) ESP Cat-6 7TCA085400R0023	ESP Cat-6/PoE 7TCA085400R0024
Video Surveillance CCTV					
	5V CCTV with BNC connector, power, and telemetry line	ESP CCTV/B Video signal 7TCA085400R0123	ESP RS485 Telemetry signal 7TCA085400R0191	ESP 240-16A Power line 7TCA085460R0080	ESP CME4 Earth Bar 7TCA085400R0001
4 - 20 mA current loops		ESP SL30L/4-20 Product code: 7TCA085400R0070			
Coaxial antennas: GSM, UMTS, Radar, Radio, TV, GPS		RF power = 650 W Female coaxial connector:	ESP RF 441421 BNC 7TCA085450R0058	ESP RF AA1421 7/16 DIN 7TCA085450R0061	ESP RF 111421 N 7TCA085450R0005
Telephone ISDN DSL G.FAST		Screw terminals:			
		RJ11, RJ45	ESP TN Flat Mount 7TCA085400R0171	ESP SL TN Slim Mount 7TCA085400R0195	ESP SL TNL Slim Mount with LED 7TCA085400R0226
		PBX Telecom	ESP TNQ Multiple Lines 7TCA085400R0183	ESP TN/RJ11-6/6 6P6C Connector 7TCA085400R0180	ESP ISDN/RJ45-4/8 8P4C Connector 7TCA085460R0171
TV: Satellite, Cable		ESP CATV/F Cable 7TCA085400R0122	ESP SMATV/F Satellite 7TCA085450R0026	ESP TV/EURO Antenna 7TCA085450R0027	
2 wire systems (30 V)		ESP 30E Flat Mount 7TCA085400R0104		ESP SL30 Slim Mount 7TCA085400R0067	
				ESP 30Q Multiple Lines 7TCA085400R0107	Protection for different voltages are available
Hazardous Areas ATEX/IEC Approved		ESP SL15X 15 Volt 7TCA085400R0065	ESP SL30X 30 Volt 7TCA085400R0071		
				LED and Isolated base options are available	
Resistance Temperature Detectors (RTD) 3 wire systems		ESP RTD Flat/DIN Mount 7TCA085460R0157		ESP SL RTD Slim (DIN Mount) 7TCA085400R0232	
				ESP RTDQ Multiple Lines (DIN Mount) 7TCA085400R0158	
3 wire systems (30 V)		ESP SL30/3W Slim Mount 7TCA085400R0268	Protection for different voltages are available		



IMPORTANT:
Equipment is ONLY protected against transient overvoltages if all incoming / outgoing mains and data lines have protection fitted.

SPD Selection Guide

UL Power Supply , A.C Power lines SPD enclosures

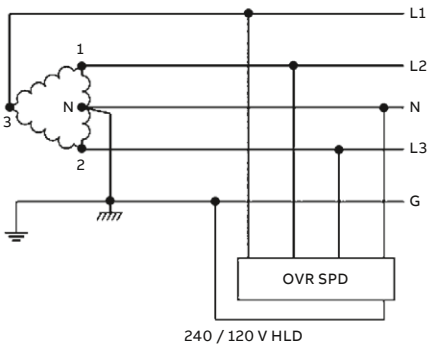
SPD location	Recommended SPD		Protected equipment examples
Service Entrance/Main Distribution (1,000 Amps and higher)			
The point of entry for utility power. A unit installed here protects the facility from a large external event, such as lightning or grid switching.	OVRHSP 400 OVRHSP 300 OVRHSP 240 OVRHSP 200		<ul style="list-style-type: none"> • Electrical switchgear • Switchboard • Distribution • MCCs • Emergency power backup • Transfer switch • UPS system
Sub-Distribution	Mid-Level Distribution (1,000 – 400 Amps)	Panelboard (400 – 100 Amps)	
Closer to the critical load. A unit installed here protects from internally generated surges and isolates critical equipment from faults.	OVRHSP 240 OVRHSP 200 OVRHSP 160 OVRHSP 120 OVRHSR 120 OVRHSR 160 OVRHTE 100 OVRHTE 80	OVRHSP 160 OVRHSP 120 OVRHSP 100 OVRHSP 80 OVRHSP 60 OVRHSR 120 OVRHSR 160 OVRHTE 100 OVRHTE 80 OVRHTE 50 OVRHT3B OVRHT3C OVRHS3U	<ul style="list-style-type: none"> • Emergency power backup • Transfer switches • Control boxes • Switchgear • Generators • Computer servers • Building management systems • Surveillance equipment • Security systems • HVAC • Building management systems • Fire alarm panels • Copiers • Telephone systems • Fax machines
Equipment Level Protection (100 Amps and below)			
Installing surge protection at panel distribution extends unit longevity by absorbing mini surges that reduce equipment life.	OVRHSP 80 OVRHSP 60 OVRHTE 50 OVRHTE 25 OVRHT3B OVRHT3C OVRHS3U OVRHLD 20 OVRHLD 25 OVRHLD 30		<ul style="list-style-type: none"> • X-Ray • CAT-scan • Life support equipment • Medical instrumentation • Computer servers • Elevators • Parking lot lighting • Printers • Communication systems • Motors • Pumps • Drives

SPD Selection Guide

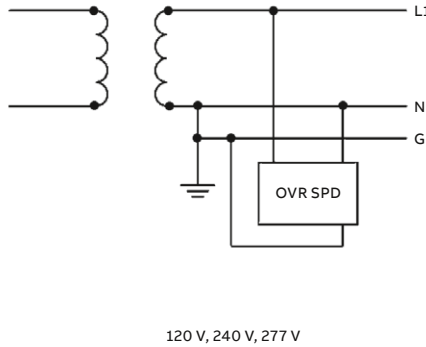
UL Power Supply , A.C Power lines DIN-Rail

General wiring diagrams - DIN-Rail devices

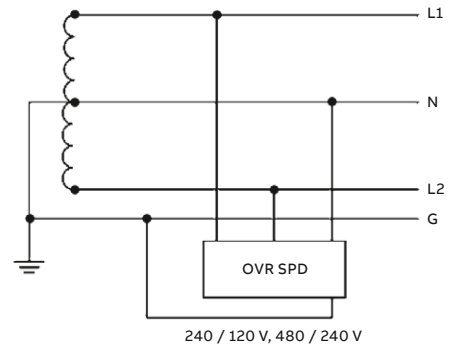
Delta



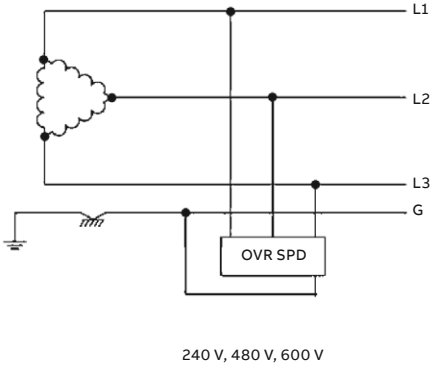
Single phase



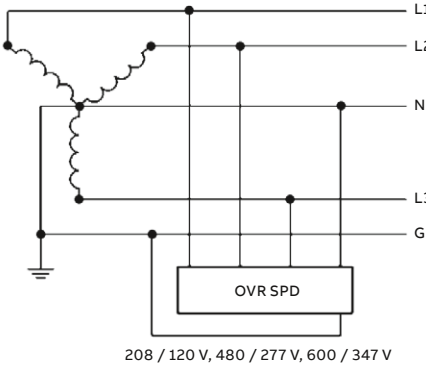
Split phase



Delta



Wye



NOTE: Multiple pole SPDs shown. Wiring diagrams for reference only.

Protected lines	Impulse current limp 10/350 kA	Max. discharge current Imax 8/20 kA	Nominal discharge current In kA	Follow current interrupting rating Ifi kA	Voltage protection Rating VPR kV	Nominal voltage Un V	Max. cont. operating voltage MCOV V	Type code	Order code
Type 2 - Pluggable - Single Pole networks									
1	-	15	5	-	0.6	120	150	OVR T2 15-150 P U	2CTB802341R0000
1	-	15	5	-	1	277 ±15%	320	OVR T2 15-320 P U	2CTB802341R0400
1	-	40	20	-	0.6	120	150	OVR T2 40-150 P U	2CTB802341R2000
1	-	40	20	-	0.6	120	150	OVR T2 40-150 P TS U	2CTB802341R2100
1	-	40	20	-	1	277 ±15%	320	OVR T2 40-320 P U	2CTB802341R2400
1	-	40	20	-	1	277 ±15%	320	OVR T2 40-320 P TS U	2CTB802341R2500
1	-	40	10	-	1.3	347 ±15%	440	OVR T2 40-440 P TS U	2CTB802341R2900
1	-	40	10	-	1.7	480 ±15%	550	OVR T2 40-550 P TS U	2CTB802341R3300
1	-	40	10	-	1.9	600 ±15%	660	OVR T2 40-660 P TS U	2CTB802341R3700
Neutral									
1	-	70	20	0.1	1.2	230	275	OVR T2 70 N P U	2CTB802341R8000
Cartridges									
1	-	-	-	-	-	120 ±15%	175	OVR T2 15-150 C U	2CTB802348R2500
1	-	-	-	-	-	277 ±15%	320	OVR T2 15-320 C U	2CTB802348R2700
1	-	-	-	-	-	120 ±15%	175	OVR T2 40-150 C U	2CTB802348R3500
1	-	-	-	-	-	277 ±15%	320	OVR T2 40-320 C U	2CTB802348R3700
1	-	-	-	-	-	347 ±15%	440	OVR T2 40-440 C U	2CTB802348R3900
1	-	-	-	-	-	480 ±15%	550	OVR T2 40-550 C U	2CTB802348R4100
1	-	-	-	-	-	600 ±15%	660	OVR T2 40-660 C U	2CTB802348R4300
1	-	-	-	-	-	230	275	OVR T2 70 N C U	2CTB802348R6500

SPD Selection Guide

UL Power Supply , A.C Power lines DIN-Rail

Pro- tected lines	Impulse current Iimp 10/350 kA	Max. discharge current Imax 8/20 kA	Nominal discharge current In kA	Follow current interrupting rating Ifi kA	Voltage protection Rating VPR kV	Nominal voltage Un V	Max. cont. operating voltage MCOV V	Type code	Order code
Type 2 - Pluggable - Delta networks									
3	-	15	5	-	1	277 +15%	320	OVR T2 3L 15-320 P U	2CTB802345R0400
3	-	40	20	-	1	277 ±15%	320	OVR T2 3L 40-320 P TS U	2CTB802345R2500
3	-	40	10	-	1.7	480 ±15%	550	OVR T2 3L 40-550 P TS U	2CTB802345R3300
Cartridges									
1	-	-	-	-	-	277 ±15%	320	OVR T2 15-320 C U	2CTB802348R2700
1	-	-	-	-	-	277 ±15%	320	OVR T2 40-320 C U	2CTB802348R3700
1	-	-	-	-	-	480 ±15%	550	OVR T2 40-550 C U	2CTB802348R4100
Type 2 - Pluggable - Single Phase networks									
2	-	15	5	-	1.2	120	150	OVR T2 1N 15-150 P U	2CTB802342R0000
2	-	15	5	-	1.2	277	320	OVR T2 1N 15-320 P U	2CTB802342R0400
2	-	40	20	-	1.2	120	150	OVR T2 1N 40-150 P U	2CTB802342R2000
2	-	40	20	-	1.2	120	150	OVR T2 1N 40-150 P U (x10)	2CTB802342R8000
2	-	40	20	-	1.2	120	150	OVR T2 1N 40-150 P TS U	2CTB802342R2100
2	-	40	20	-	1.2	277	320	OVR T2 1N 40-320 P TS U	2CTB802342R2500
2	-	40	10	-	1.2	347	440	OVR T2 1N 40-440 P TS U	2CTB802342R2900
2	-	40	10	-	1.2	480	550	OVR T2 1N 40-550 P TS U	2CTB802342R3300
2	-	40	10	-	1.2	600	660	OVR T2 1N 40-660 P TS U	2CTB802342R3700
Cartridges									
1	-	-	-	-	-	120 ±15%	175	OVR T2 15-150 C U	2CTB802348R2500
1	-	-	-	-	-	277 ±15%	320	OVR T2 15-320 C U	2CTB802348R2700
1	-	-	-	-	-	120 ±15%	175	OVR T2 40-150 C U	2CTB802348R3500
1	-	-	-	-	-	277 ±15%	320	OVR T2 40-320 C U	2CTB802348R3700
1	-	-	-	-	-	347 ±15%	440	OVR T2 40-440 C U	2CTB802348R3900
1	-	-	-	-	-	480 ±15%	550	OVR T2 40-550 C U	2CTB802348R4100
1	-	-	-	-	-	600 ±15%	660	OVR T2 40-660 C U	2CTB802348R4300
Type 2 - Pluggable - Split Phase networks									
2	-	15	5	-	0.6	120 ±15%	175	OVR T2 2L 15-150 P U	2CTB802343R0000
2	-	15	5	-	1	277 ±15%	320	OVR T2 2L 15-320 P U	2CTB802343R0400
3	-	15	5	-	0.7	120 ±15%	175	OVR T2 2N 15-150 P U	2CTB802344R0000
3	-	15	5	-	1.1	277 ±15%	320	OVR T2 2N 15-320 P U	2CTB802344R0400
2	-	40	20	-	0.6	120 ±15%	175	OVR T2 2L 40-150 P TS U	2CTB802343R2100
2	-	40	20	-	1	277 ±15%	320	OVR T2 2L 40-320 P TS U	2CTB802343R2500
3	-	40	20	-	0.7	120 ±15%	175	OVR T2 2N 40-150 P TS U	2CTB802344R2100
3	-	40	20	-	1.1	277 ±15%	320	OVR T2 2N 40-320 P TS U	2CTB802344R2500
3	-	40	10	-	1.4	347 ±15%	440	OVR T2 2N 40-440 P TS U	2CTB802344R2900
3	-	40	10	-	1.8	480 ±15%	550	OVR T2 2N 40-550 P TS U	2CTB802344R3300
3	-	40	10	-	2	600 ±15%	660	OVR T2 2N 40-660 P TS U	2CTB802344R3700
Cartridges									
1	-	-	-	-	-	120 ±15%	175	OVR T2 15-150 C U	2CTB802348R2500
1	-	-	-	-	-	277 ±15%	320	OVR T2 15-320 C U	2CTB802348R2700
1	-	-	-	-	-	120 ±15%	175	OVR T2 40-150 C U	2CTB802348R3500
1	-	-	-	-	-	277 ±15%	320	OVR T2 40-320 C U	2CTB802348R3700
1	-	-	-	-	-	347 ±15%	440	OVR T2 40-440 C U	2CTB802348R3900
1	-	-	-	-	-	480 ±15%	550	OVR T2 40-550 C U	2CTB802348R4100
Type 2 - Pluggable - Grounded Wye networks									
3	-	15	5	-	0.6	120 ±15%	175	OVR T2 3L 15-150 P U	2CTB802345R0000
4	-	15	5	-	0.6	120 ±15%	175	OVR T2 3N 15-150 P U	2CTB802346R0000
4	-	15	5	-	1.2	277 ±15%	320	OVR T2 3N 15-320 P U	2CTB802346R0400
3	-	40	20	-	0.6	120 ±15%	175	OVR T2 3L 40-150 P TS U	2CTB802345R2100
3	-	40	10	-	1.3	347 ±15%	440	OVR T2 3L 40-440 P TS U	2CTB802345R2900
4	-	40	20	-	1.2	120 ±15%	175	OVR T2 3N 40-150 P TS U	2CTB802346R2100
4	-	40	20	-	1.2	277 ±15%	320	OVR T2 3N 40-320 P TS U	2CTB802346R2500
4	-	40	10	-	1.2	347 ±15%	440	OVR T2 3N 40-440 P TS U	2CTB802346R2900
4	-	40	10	-	1.2	480 ±15%	550	OVR T2 3N 40-550 P TS U	2CTB802346R3300
4	-	40	10	-	1.2	600 ±15%	660	OVR T2 3N 40-660 P TS U	2CTB802346R3700
Cartridges									
1	-	-	-	-	-	120 ±15%	175	OVR T2 15-150 C U	2CTB802348R2500
1	-	-	-	-	-	120 ±15%	175	OVR T2 40-150 C U	2CTB802348R3500
1	-	-	-	-	-	347 ±15%	440	OVR T2 40-440 C U	2CTB802348R3900
1	-	-	-	-	-	277 ±15%	320	OVR T2 15-320 C U	2CTB802348R2700
1	-	-	-	-	-	277 ±15%	320	OVR T2 40-320 C U	2CTB802348R3700
1	-	-	-	-	-	480 ±15%	550	OVR T2 40-550 C U	2CTB802348R4100
1	-	-	-	-	-	600 ±15%	660	OVR T2 40-660 C U	2CTB802348R4300

SPD Selection Guide

UL 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
	I _{imp} 10/350 kA	I _{max} 8/20 kA	I _n kA	I _{fi} kA	U _p kV	U _n V	U _c V		
Uc 1100 V DC									
1+1 DC	-	40	20	10.000 (I _{scpv})	3.8	1000	1100	OVR PV T2 40-1000 P QS	2CTB804153R2400
1+1 DC	2	40	20	10.000 (I _{scpv})	3.8	1000	1100	OVR PV T2 40-1000 P TS QS	2CTB804153R2500
1+1 DC	2	40	20	10.000 (I _{scpv})	3.8	1000	1100	OVR PV T2 40-1000 P QS BULK (30)	2CTB804153Z2400
1+1 DC	2	40	20	10.000 (I _{scpv})	3.8	1000	1100	OVR PV T2 40-1000 P TS QS BULK (30)	2CTB804153Z2500
2+2 DC	2	40	20	10.000 (I _{scpv})	3.8	1000	1100	OVR PV T2 40-1000 P TS TWIN QS	2CTB804153R2300
2+2 DC	2	40	20	10.000 (I _{scpv})	3.8	1000	1100	OVR PV T2 40-1000 P TS TWIN QS BULK (4)	2CTB804153Z2300
Cartridges									
1+1 DC or 2+2DC	2	40	20	10.000 (I _{scpv})	3.8	1000	1100	OVR PV T2 40-1000 C QS	2CTB804153R3200
Uc 1500 V DC									
1+1 DC	2	40	10	10.000 (I _{scpv})	4.5	1500	1500	OVR PV T2 40-1500 P QS	2CTB804153R2600
1+1 DC	2	40	10	10.000 (I _{scpv})	4.5	1500	1500	OVR PV T2 40-1500 P TS QS	2CTB804153R2700
1+1 DC	2	40	10	10.000 (I _{scpv})	4.5	1500	1500	OVR PV T2 40-1500 P QS BULK (30)	2CTB804153Z2600
1+1 DC	2	40	10	10.000 (I _{scpv})	4.5	1500	1500	OVR PV T2 40-1500 P TS QS BULK (30)	2CTB804153Z2700
Cartridges									
1+1 DC	2	40	10	10.000 (I _{scpv})	4.5	1500	1500	OVR PV T2 40-1500 C QS	2CTB804153R3300
Type T1-T2 OVR pluggable PV application									
Uc 1100 V DC									
1+1 DC	5	40	20	11.000 (I _{scpv})	3.8	1000	1100	OVR PV T1-T2 5-1000 P QS	2CTB812050R1000
1+1 DC	5	40	20	11.000 (I _{scpv})	3.8	1000	1100	OVR PV T1-T2 5-1000 P TS QS	2CTB812051R1000
1+1 DC	12.5	40	20	11.000 (I _{scpv})	3.8	1000	1100	OVR PV T1-T2 12.5-1000 P QS	2CTB812120R1000
1+1 DC	12.5	40	20	11.000 (I _{scpv})	3.8	1000	1100	OVR PV T1-T2 12.5-1000 P TS QS	2CTB812121R1000
Cartridges									
1+1 DC	5	40	20	11.000 (I _{scpv})	-	1000	1100	OVR PV T1-T2 5-1000 C QS	2CTB812052R1000
1+1 DC	6,25	40	20	11.000 (I _{scpv})	-	1000	1100	OVR PV T1-T2 12.5-1000 C QS	2CTB812122R1000
1+1 DC	6,25	40	20	11.000 (I _{scpv})	-	1000	1100	OVR PV T1-T2 12.5-1000 MC QS	2CTB812122R1001
Uc 1500 V DC									
1+1 DC	5	30	20	11.000 (I _{scpv})	5	1500	1500	OVR PV T1-T2 5-1500 P QS	2CTB812050R1500
1+1 DC	5	30	20	11.000 (I _{scpv})	5	1500	1500	OVR PV T1-T2 5-1500 P TS QS	2CTB812051R1500
1+1 DC	10	30	20	11.000 (I _{scpv})	5	1500	1500	OVR PV T1-T2 10-1500 P QS	2CTB812100R1500
1+1 DC	10	30	20	11.000 (I _{scpv})	5	1500	1500	OVR PV T1-T2 10-1500 P TS QS	2CTB812101R1500
Cartridges									
1+1 DC	5	30	20	11.000 (I _{scpv})	-	1500	1500	OVR PV T1-T2 5-1500 C QS	2CTB812052R1500
1+1 DC	5	30	20	11.000 (I _{scpv})	-	1500	1500	OVR PV T1-T2 10-1500 C QS	2CTB812102R1500
1+1 DC	5	30	20	11.000 (I _{scpv})	-	1500	1500	OVR PV T1-T2 10-1500 MC QS	2CTB812102R1501

Surge and lightning protection solutions

ABB Furse expertise

ABB Furse have over 125 years of expertise in lightning and overvoltage protection.

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

Additionally the laboratory is able to test products for signalling and telecommunication application with 10/700 μ s, 10/1000 μ s and combination (1.2/50 μ s with 8/20 μ s) generators.

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

ABB Furse UK are specialists in the design and manufacture of 'enhanced' SPDs; for both power and signalling applications, in accordance with IEC/EN 62305. Enhanced SPDs offer superior low protection levels to provide best-in-class protection for critical electronic systems, for continuous business operation during lightning and surge events.

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 Furse UK laboratory is able to handle tests on AC SPDs according to IEC/EN 61643-11, and signalling and telecommunication SPDs according to IEC/EN 61643-21

High power lightning surge generators	Standardized surge waveforms 8/20 μ s and 10/350 μ s. Maximum surge current 25 kA for 8/20 μ s, and 5 kA for 10/350 μ s.
Combination wave generator	Standardized 8/20 μ s current waveform combined with 1.2/50 μ s voltage waveform Maximum surge 8 kV (1.2/50 μ s) / 4 kA (8/20 μ s)
Electrical tests	208/415/480 V limited-current AC testing for 0.125/0.25/2.5/5 A.
Transmission tests	RF Network Analyser, from DC to 13 GHz Insertion Loss / Return Loss / Capacitance
Installation tests	Customer demonstration area, with simulated panel-board and distribution-board arrangement, to showcase product performance and good installation practice to align with BS 7671 18th Edition wiring regulations.

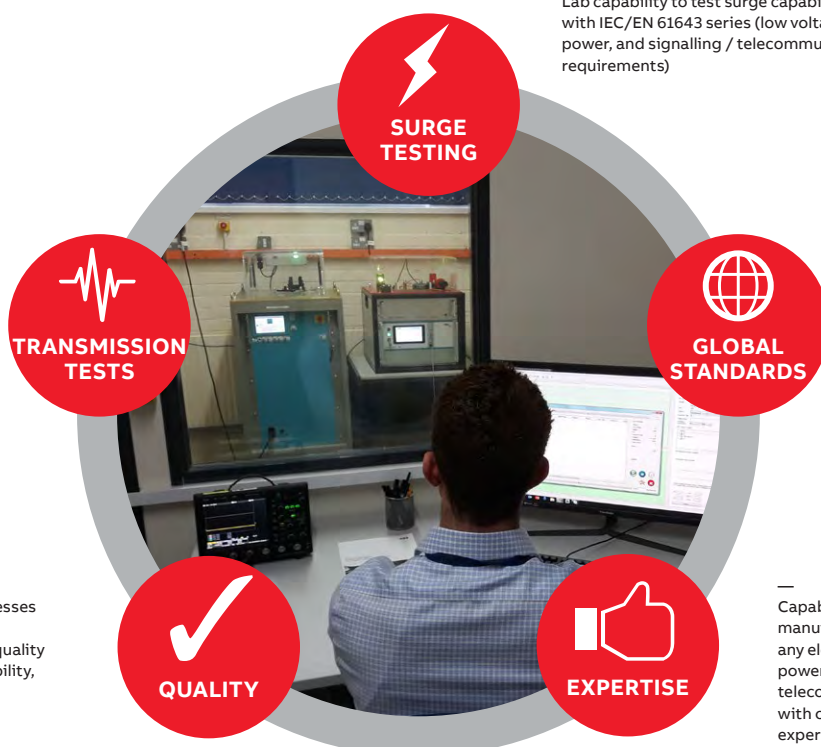
The SPD is designed to be virtually 'invisible' to the system into which it is inserted, only reacting when called upon to protect against a lightning or surge event. Special care is taken for choosing the most suitable solution for each and every application.

Global harmonised processes for product design and manufacture; with high quality products with high reliability, with business continuity essential for customer satisfaction.

Lab capability to test surge capability in line with IEC/EN 61643 series (low voltage power, and signalling / telecommunications requirements)

Global portfolio with focus on International IEC standards, and regional BS EN standards via active membership of standardisation committees.

Capability to design, manufacture and test SPDs for any electrical system, for power and signalling/ telecommunications, backed with over 20 years of experience.



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 μ s impulse wave) or an indirect lightning strike (8/20 μ 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).

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



ABB laboratory at Bagnères-de-Bigorre, France

IEC-Power DIN-Rail Products

044–065	Surge and lightning protection solutions
044 –045	Products standards, IEC 61643
046 –049	QuickSafe® technology
050 –051	Selection of surge protective devices
052 –053	Surge protective device disconnectors
054 –056	Installation and wiring of SPDs in an electrical switchboard
057	Example of an electrical switchboard protected by ABB surge protection solutions
058	Mode of surge protection
059	Coordination and wiring principals
060	General wiring diagrams
061 -065	Selection tools
066–131	Protection and safety devices
066 –069	OVR Type 1
070 –085	OVR Type 1+2
086 –111	OVR Type 2
112 –121	OVR Type T2-T3
122 –123	OVR Plus
124 –127	OVR PV
128 –129	OVR WT
130 –131	Accessories for OVR

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?

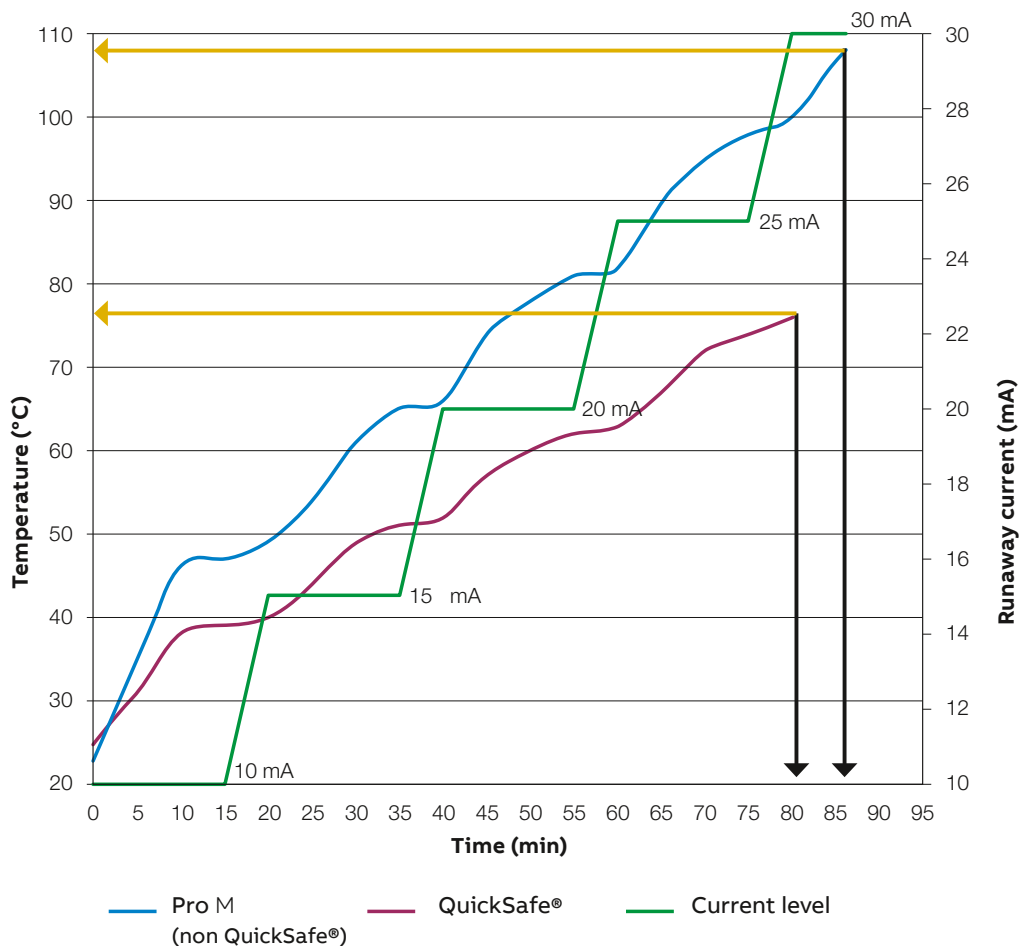
- New test procedure which takes into account the failure behavior of protective equipment in the event of an overload, or when the service life has expired
- The Type 1 operating duty test is conducted with a higher current than that specified in the previous standard
- Recognition of the mixed types, 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.

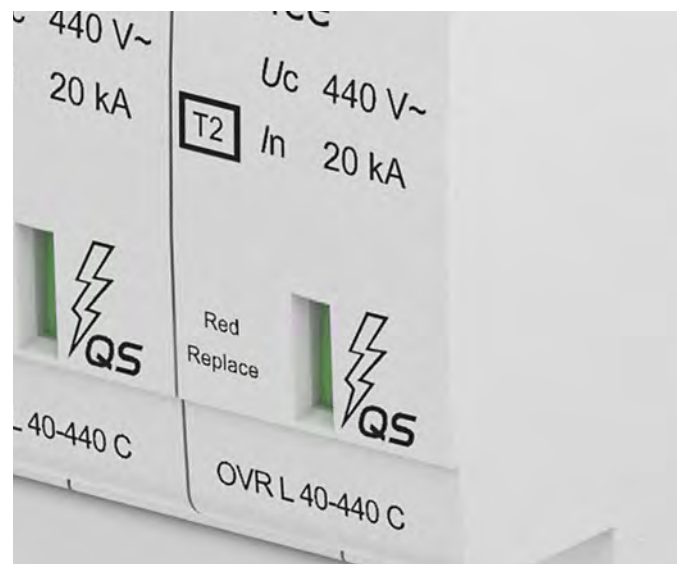
This phenomenon will slowly damage the MOV itself until it gets into short-circuit. This phenomenon is called a thermal runaway.

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



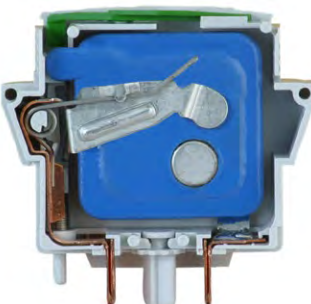
Here the disconnection system is in Close position. During the test simulating an end of life of the SPD, the SPD has to bear a high voltage that forces a current passing through it. In this example, the passing current is 10 A.

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

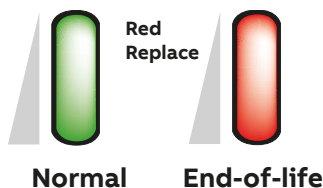


At the end of this movement, the metallic arm will stop without any bouncing. There is no risk of a new electric arc development. At this moment, the MOV has not suffered any thermal runaway, so it is not in short-circuit. The distance between the MOV electrode and the metallic arm guarantees an insulation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

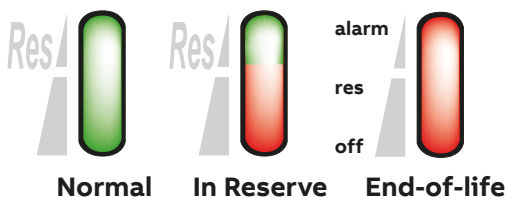
End of life indicator of the standard surge protective device

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

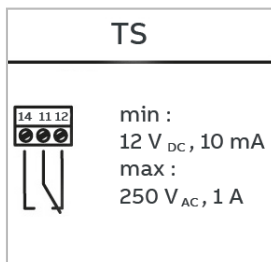
In case of current surge exceeding the maximum capacity of the device, one of the MOVs could achieve the end of life, the surge protective device will switch to the Safety reserve position and the mechanical end of life indicator in the front of the product will switch to the intermediate position. Consequently, 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.

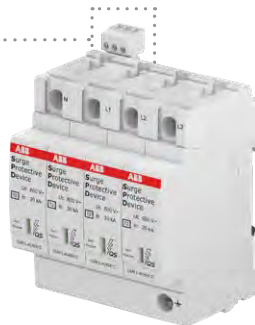
The combination of the Auxiliary contact (TS) and the Safety Reserve System allow to perform **Preventive Maintenance**, as the information about the degradation of the protection features will be received while the protection is still guaranteed, allowing for the schedule of maintenance activities while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



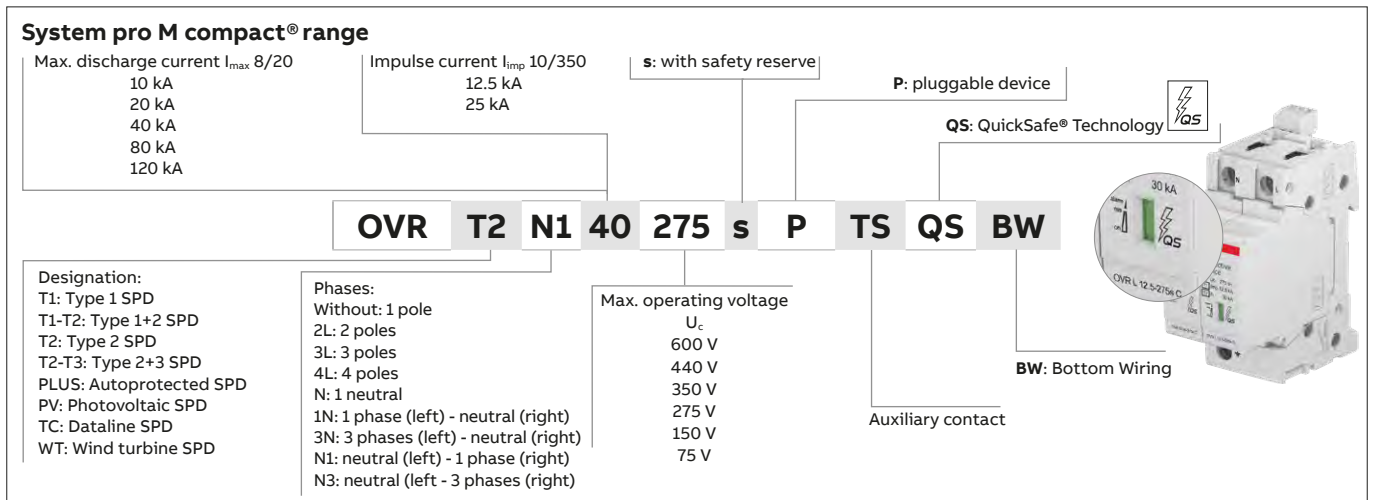
NOTE:
Pluggable surge protective device cartridges have a foolproof system (Neutral cartridges different to Phase cartridges) preventing incorrect operations when replacing a cartridge.



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 mm².

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.

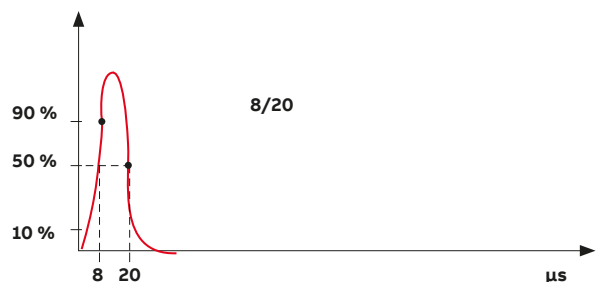
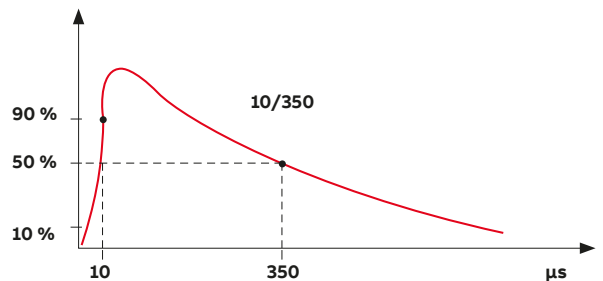
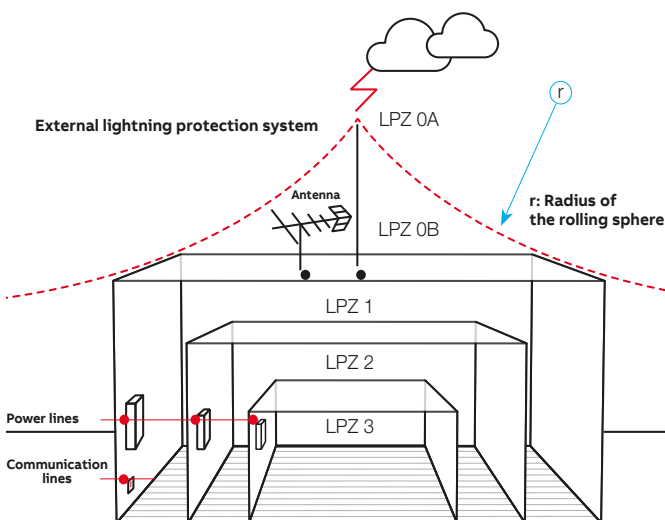
- LPZ 1 Zone subject to partial lightning or surge currents. Type I SPDs shall be installed at the boundary between LPZ 0A and LPZ 1 to reduce the entrance of lightning currents through power lines
- LPZ 2...n Zone where the surge current is limited by current sharing and where the surge energy is reduced 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 (μs).



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.

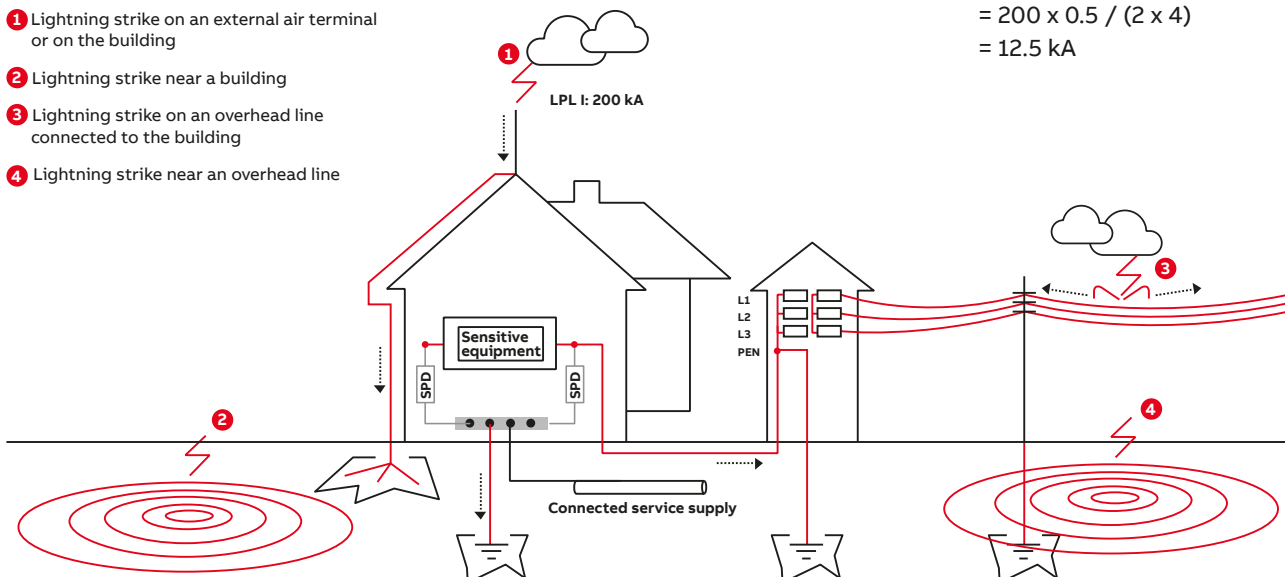
If there is not a direct lightning risk on the structure (no external protection, no aerial lines connected) a Type 2 SPD can be installed at the service entrance and in the sub-distribution boards.

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 ($n=4$).

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

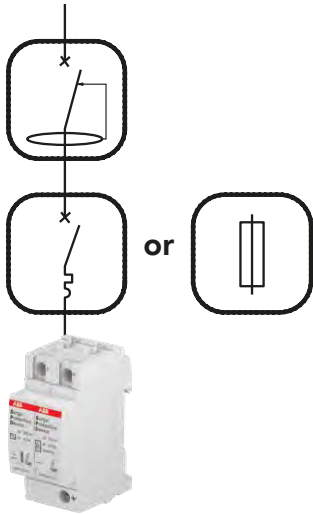


Surge and lightning protection solutions

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
Protection against indirect contact	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.
Protection against fault currents	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.
Thermal protection	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				
Type 1								
OVR T1 25 kA non-pluggable I _{imp} = 25 kA/I _{fi} = 7 kA; U _c 255 V	-	-	-	-	125 A fuse	-	-	-
Type 1+2								
OVR T1-T2 25kA QS pluggable I _{imp} 25 kA; U _c 255, 440 V	-	-	-	-	315 A fuse	315 A fuse	315 A fuse	
OVR T1-T2 pluggable Safety Reserve QuickSafe® I _{imp} 12.5 kA; U _c 275, 440V	-	-	-	-	160 A fuse	160 A fuse	160 A fuse	
Type 2								
Type 2 pluggable I _{max} 120 kA; U _c 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 _{max} 40 and 80 kA; U _c 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 _{max} 40 kA; U _c 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 _c =275V, T _{max} XT4S 250, Ekip LSI, I<3 In
OVR T2 non-pluggable I _{max} 20 and 40 kA U _c 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 _{max} 15 kA U _c 75 V	S 200 M - 16	S 200 M -	-	-	16 A fuse	16 A fuse	-	-
Type 2+3								
OVR T2-T3 pluggable QuickSafe® I _{max} 20 kA; U _c 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 _c =275V, T _{max} 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 ²
Type 1+2	16 mm ²
Type 2	4 mm ²
Type 2+3	4 mm ²

Backup disconnection

Type 2 QuickSafe® Characteristics	Prospective short circuit current at SPD location (Ip)	Circuit breaker* (curve B or C)	Fuses* (gG)
Maximum rating			
In: 5, 20, 30 kA U _c : 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

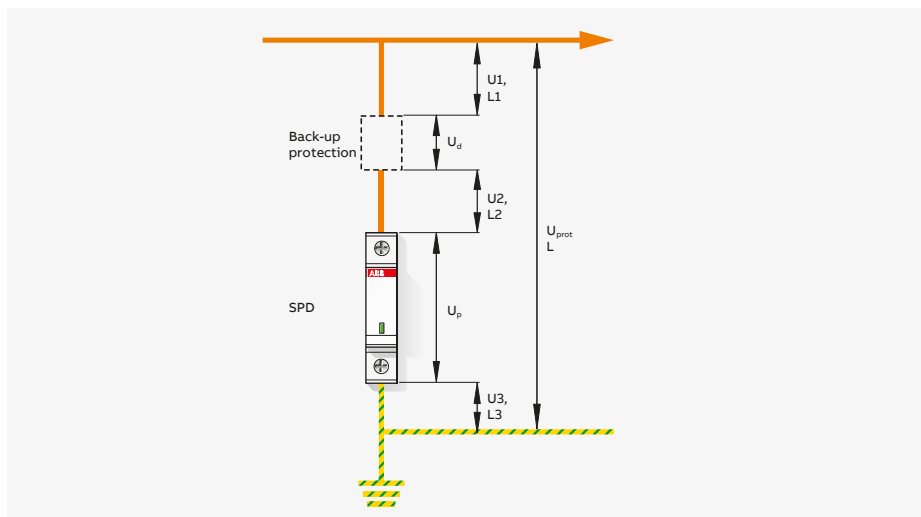
50 cm rule

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

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

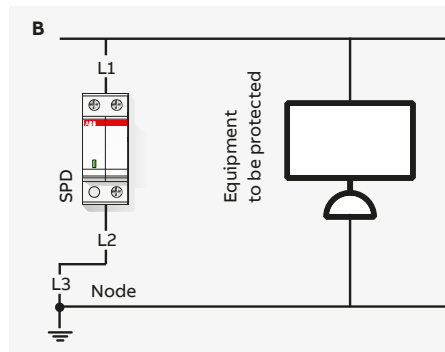
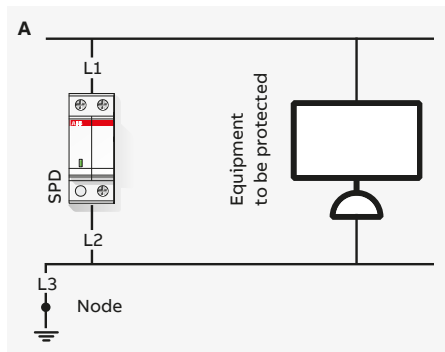
To maintain the level of protection below the impulse withstand voltage (U_w) of the devices to be protected, the total length ($L = L_1 + L_2 + L_3$) of the connecting cables must be as short as possible (less than 0.50 m).



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...
 $L = L_1 + L_2$
 The length L_3 has no effect on the protection of equipment.

B: in this case...
 $L = L_1 + L_2 + L_3$
 If the length of L_3 is several meters, considering that every extra meter of wire increases the protection voltage by 1200 V, the protection loses a lot of effectiveness.

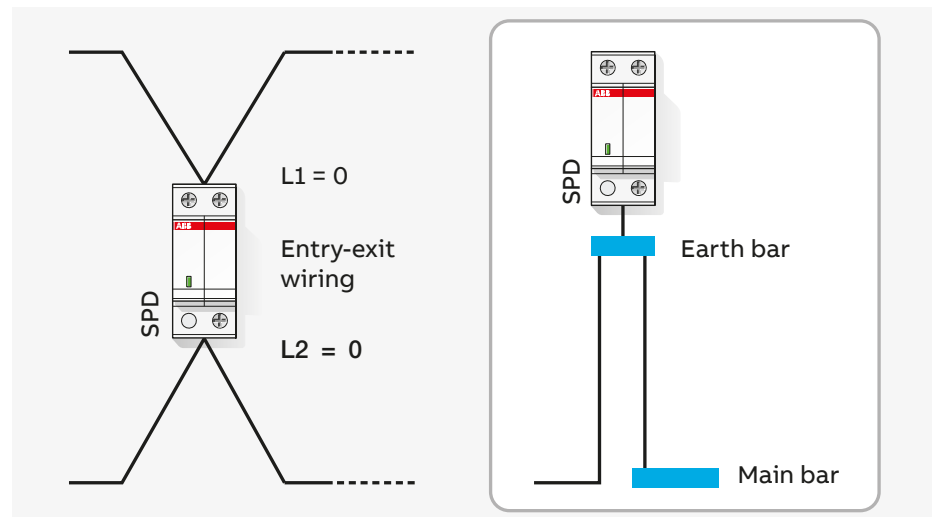


The equipment's earth connection must be distributed, starting from the connection of the SPD which protects it.

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

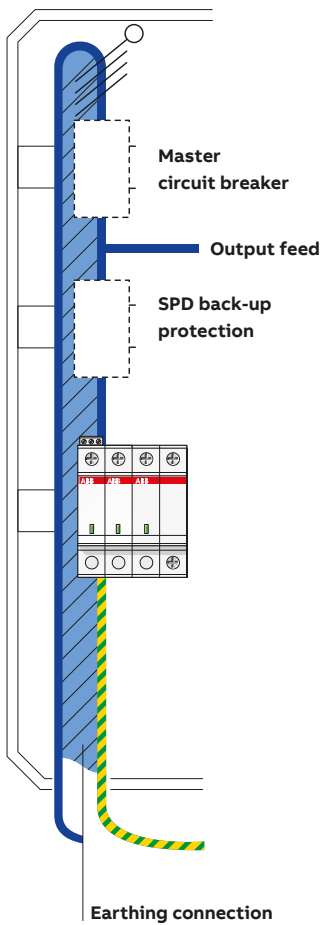
Install a second SPD coordinated with the first as close as possible to the device to be protected, so as to make the level of protection compatible with the impulse withstand voltage of the equipment.

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

02



Electrical lines and connection area

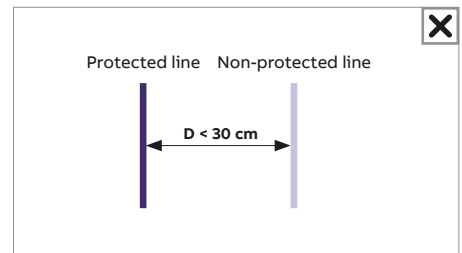
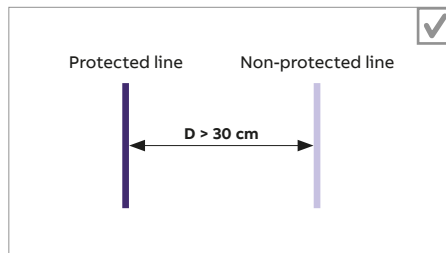
It is necessary to arrange the lines so that the conductors are as close as possible to each other (see figure) to avoid surges induced by inductive coupling of an indirect lightning strike with a large loop contained between the phases, the neutral and the PE conductor.

Cabling of protected and non-protected lines

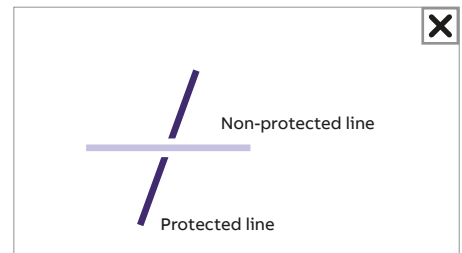
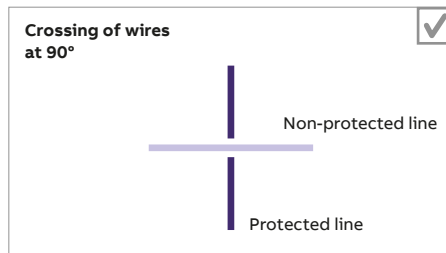
During installation, run the protected and non-protected wiring according to the instructions in the diagrams below.

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_{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 mm² for phase and Neutral and 16 mm² for earth.

Wiring between the SPD and earth

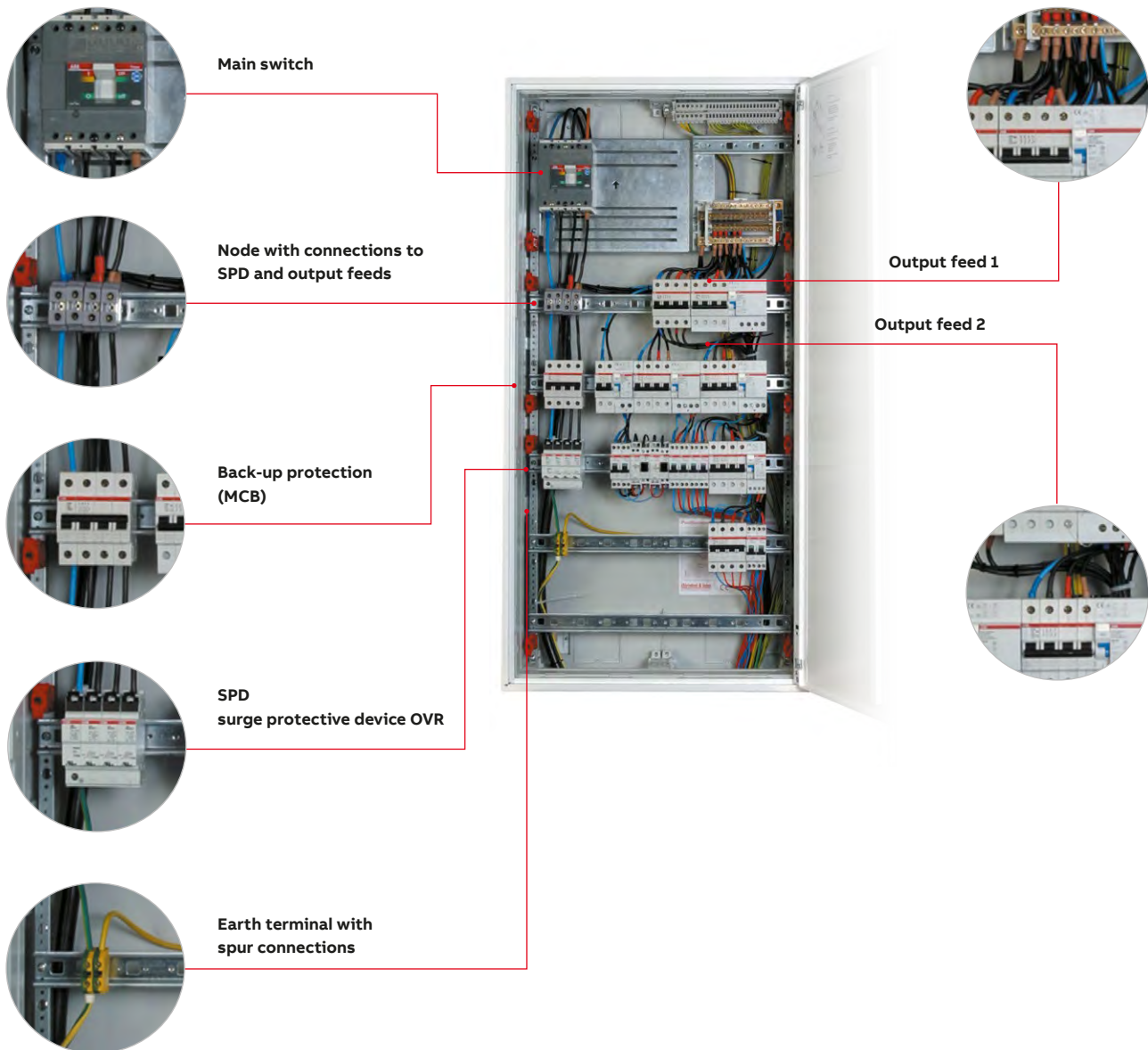
The minimum section is 4 mm² in the case where there is no lightning conductor, and 10 mm² in the case one is installed. It is nevertheless recommended to use a cable with a greater section to leave a safety margin, e.g. 10-20 mm² section.

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.

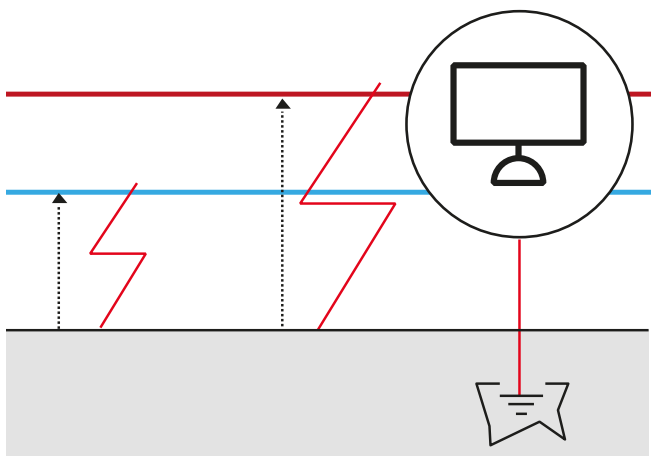
This overvoltage mode destroys not only earthed equipment (Class I), but also non-earthed equipment (Class II) with insufficient electrical insulation (a few kilovolts) located close to an earthed mass.

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

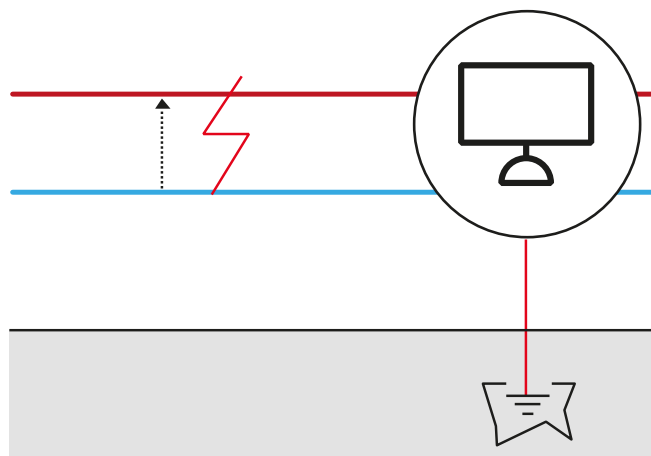
Differential mode

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

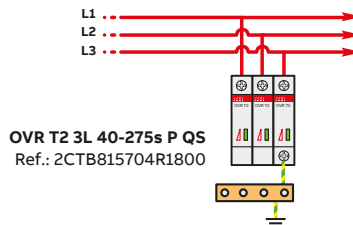
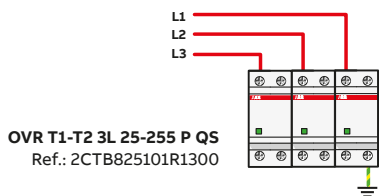


Overvoltages in differential mode

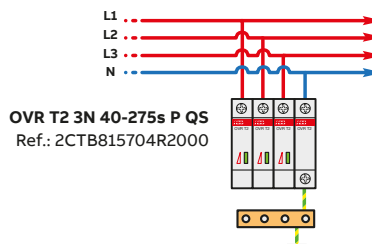
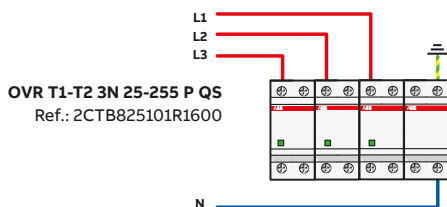
Different types of OVR configuration

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:

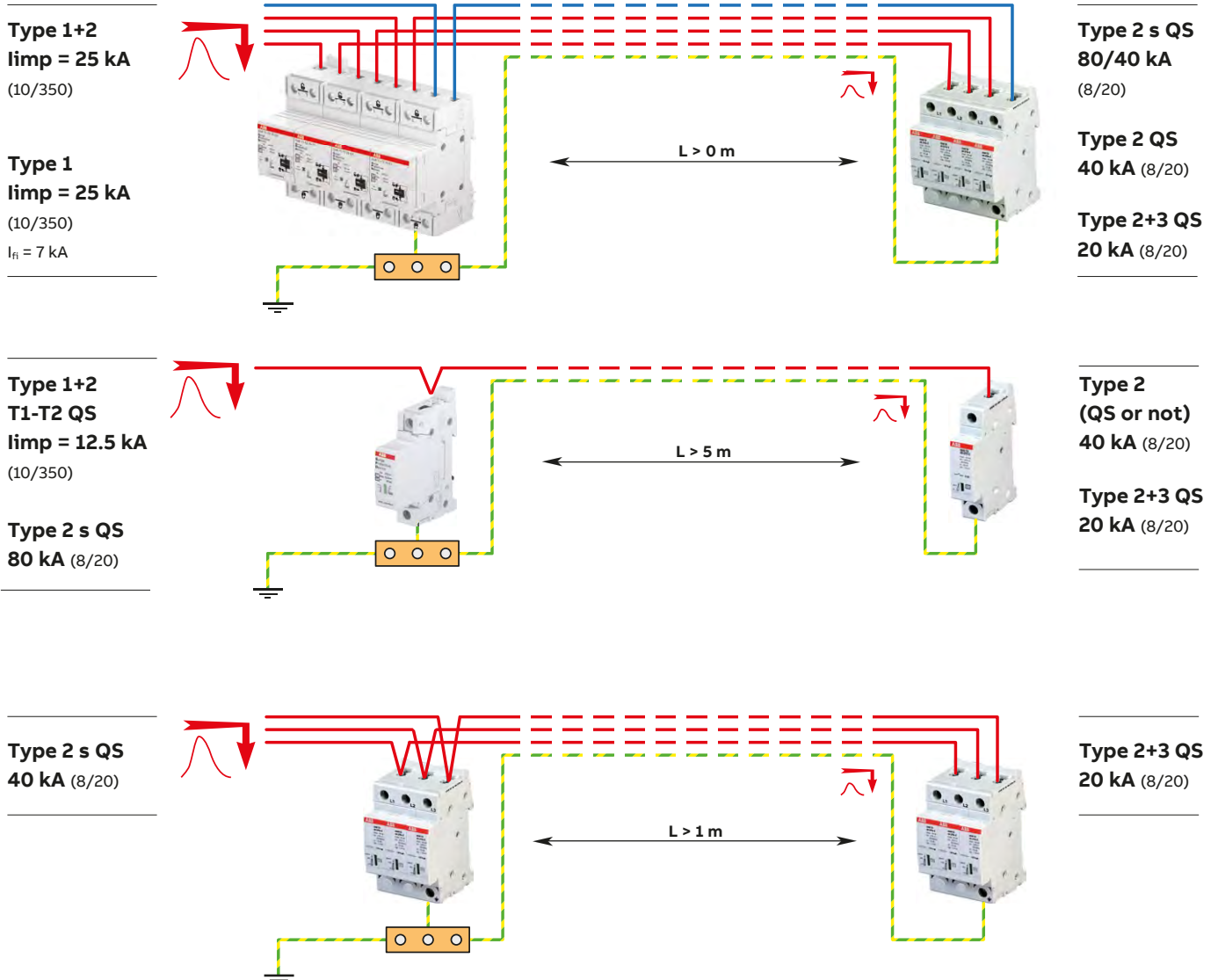
The first SPD is diverting most of the surge current to the ground, and the second SPD will ensure a good protection level to the equipment.

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

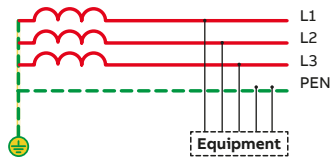
Surge and lightning protection solutions

General wiring diagrams

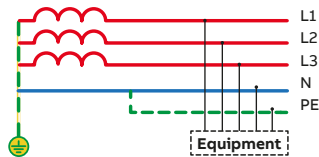
02

Wiring diagrams according to IEC 60364-1

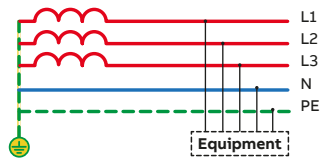
TNC networks
230 / 400 V



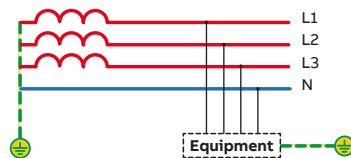
TNC-S networks
230 / 400 V



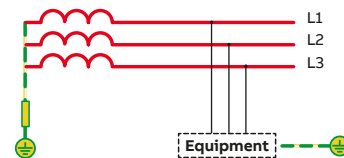
TNS networks
230 / 400 V



TT networks
230 / 400 V

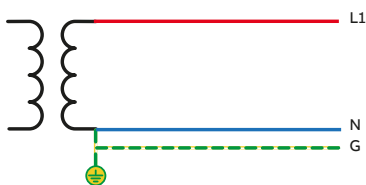


IT networks
230 / 400 / 600 V



Wiring diagrams according to UL 1449

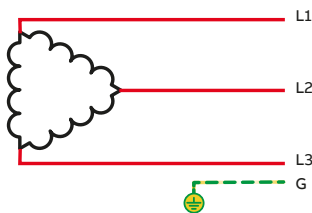
Single phase networks
120 / 240 / 277 V



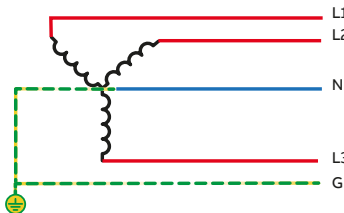
Split phase networks
240 / 120 V, 480 / 240 V



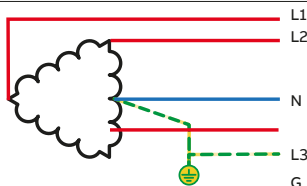
Delta networks
240 / 480 / 600 V



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



High-Leg Delta networks
240 / 1200 V HLD



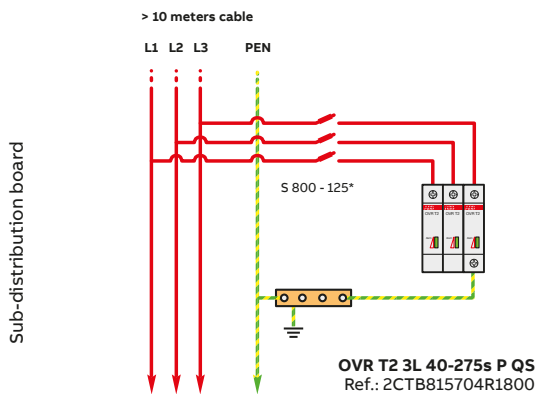
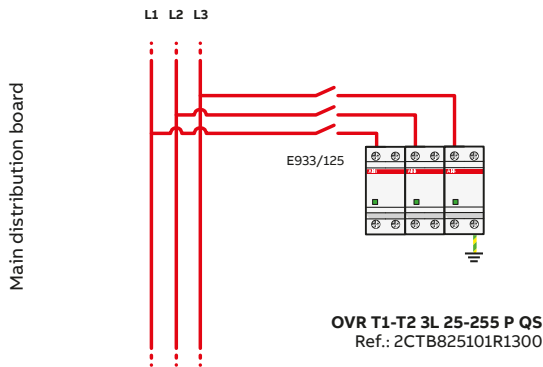
Surge and lightning protection solutions

Selection tool: TNC - 230 / 400 V network

Industry, commercial building

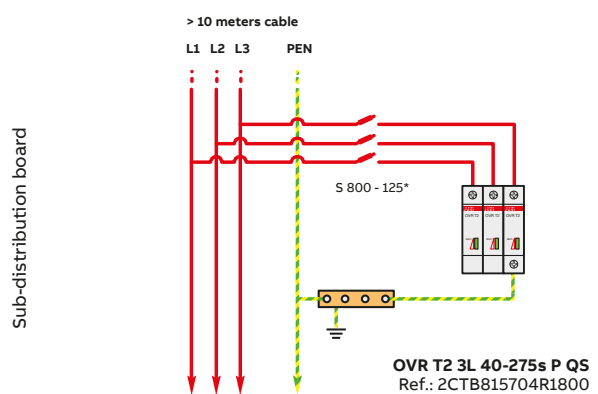
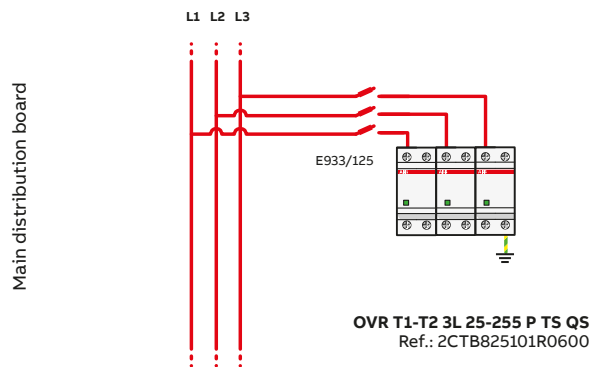
Configuration 1

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



Configuration 2

$I_p \leq 15 \text{ kA}$



I_p : prospective short circuit current of the power supply.

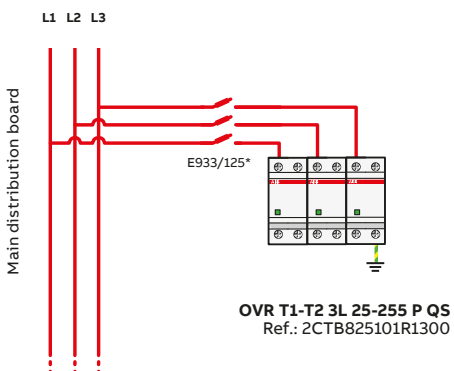
* Must be according to the coordination rules with main or upstream short circuit protection(s).

Surge and lightning protection solutions

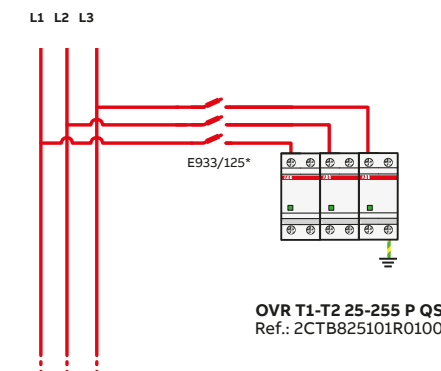
Selection tool: TNC-S - 230 / 400 V network

Industry, commercial building

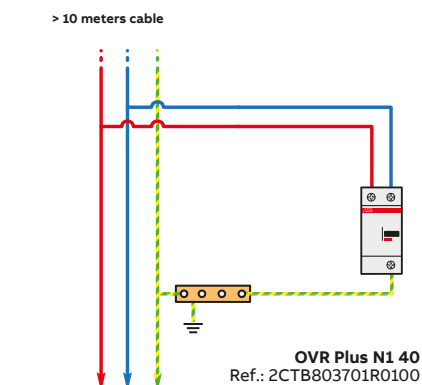
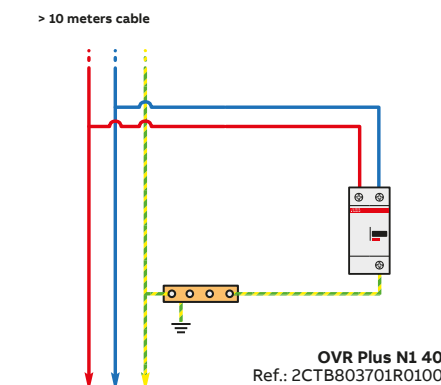
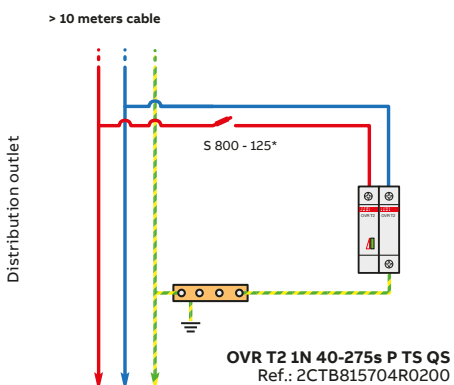
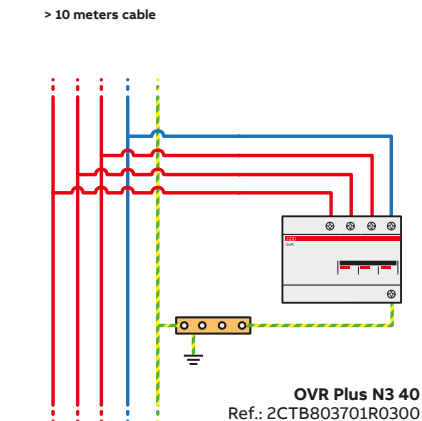
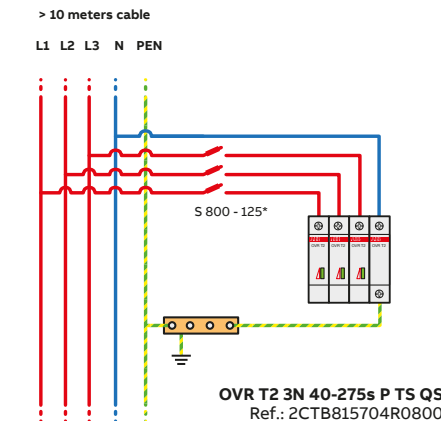
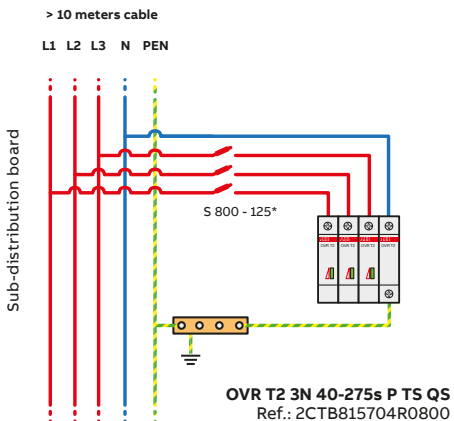
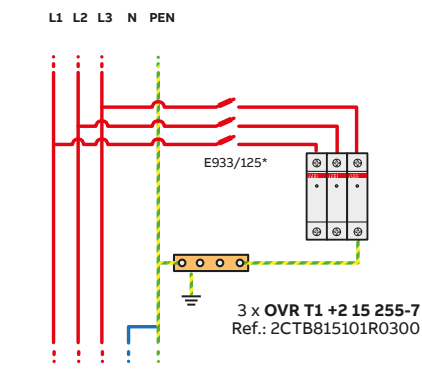
Configuration 1
15 kA ≤ Ip ≤ 50 kA



Configuration 2
7 kA ≤ Ip ≤ 15 kA



Configuration 3
Ip ≤ 7 kA



Ip: prospective short circuit current of the power supply.

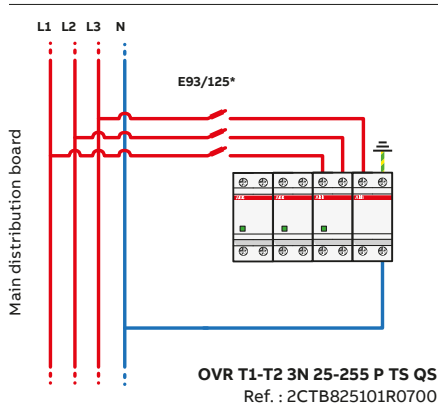
* Must be according to the coordination rules with main or upstream short circuit protection(s).

Surge and lightning protection solutions

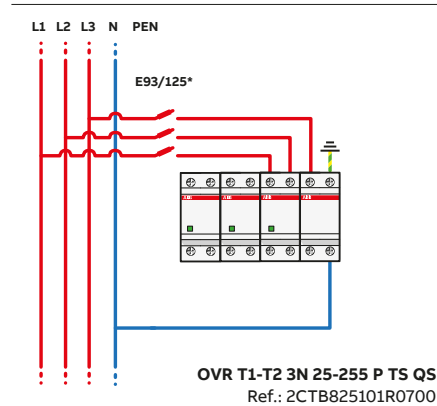
Selection tool: TT network 230/400 V

Industry, commercial building

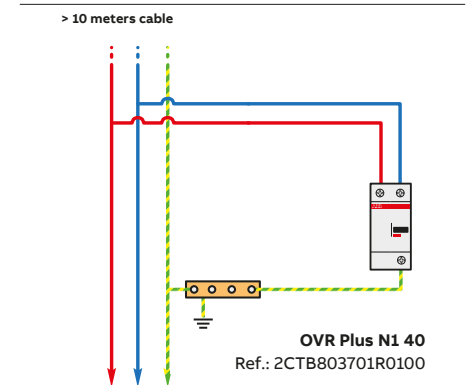
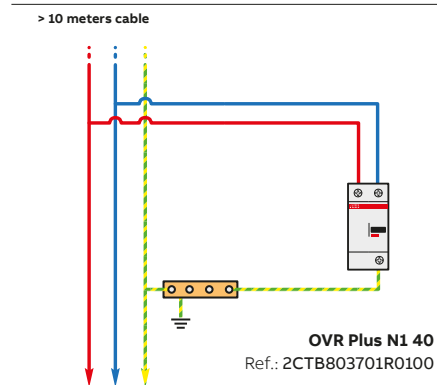
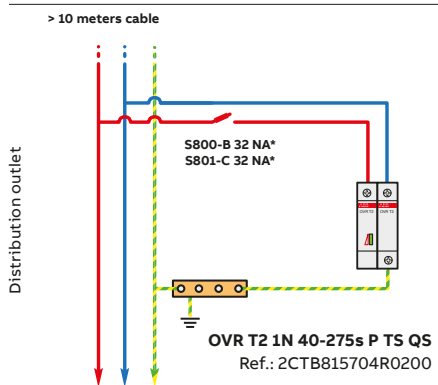
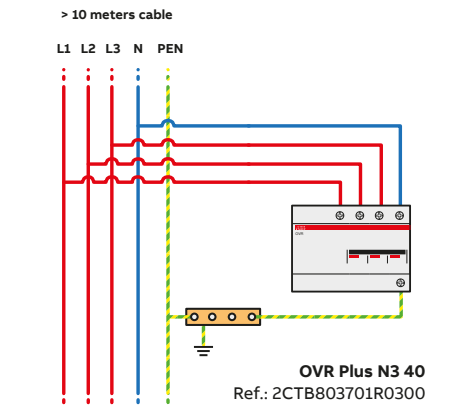
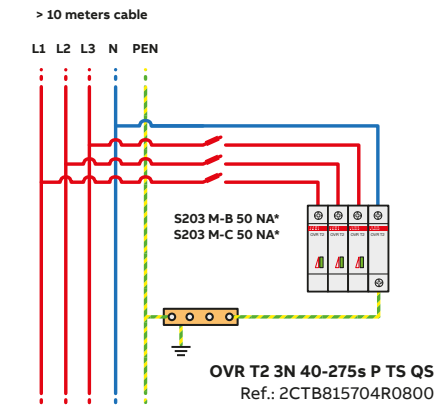
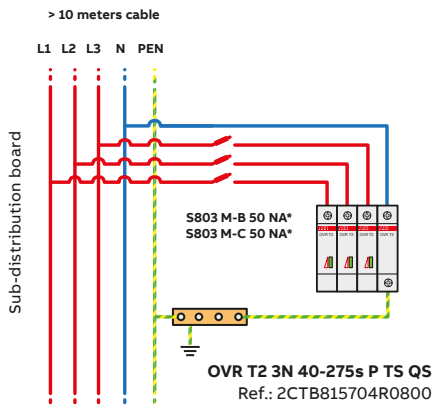
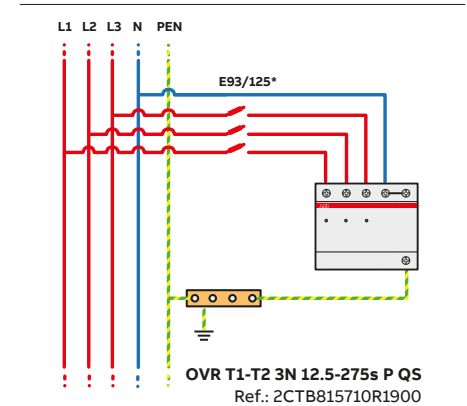
Configuration 1
 $15 \text{ kA} \leq I_p \leq 50 \text{ kA}$



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

02

Commercial, residential

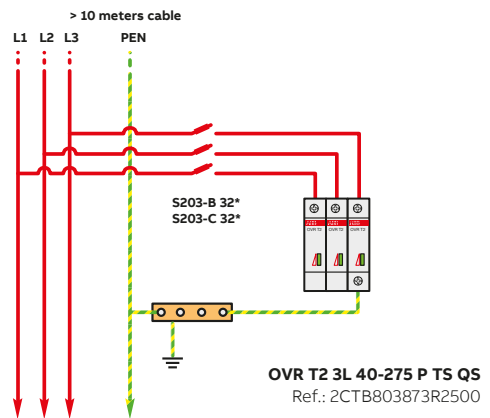
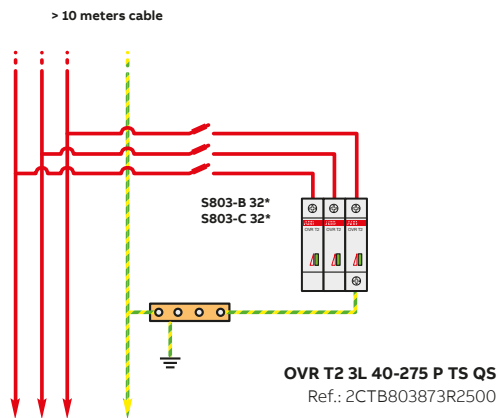
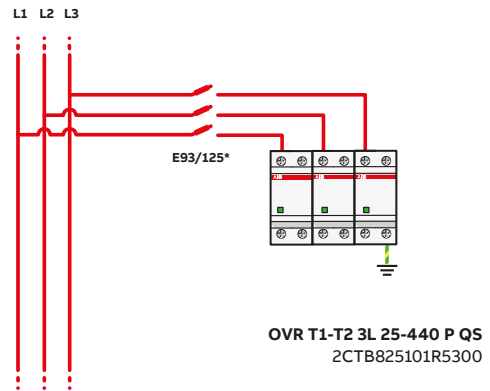
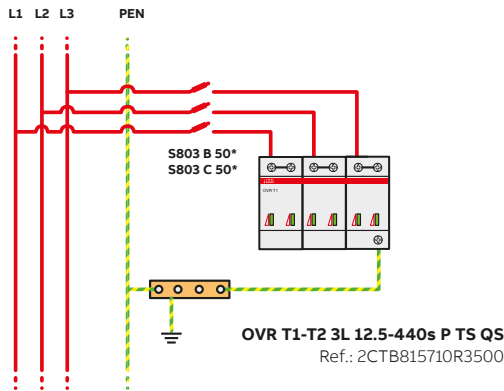
The IT system has all live parts at the source isolated from earth or one part connected to earth with a high impedance.

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

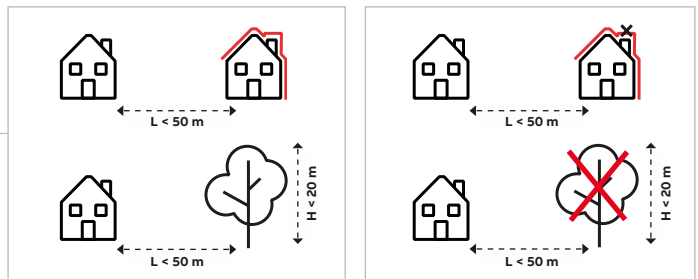
NO



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

YES

NO

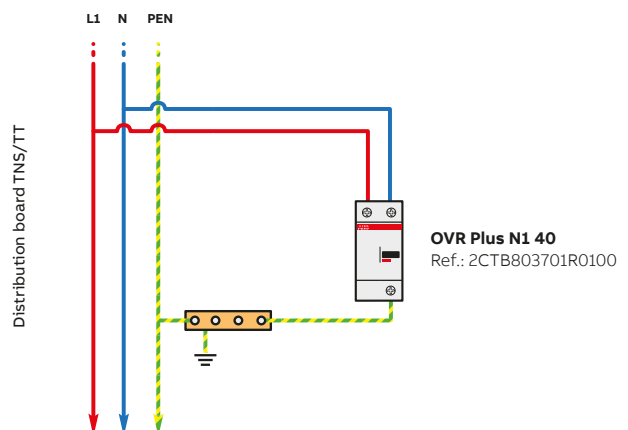
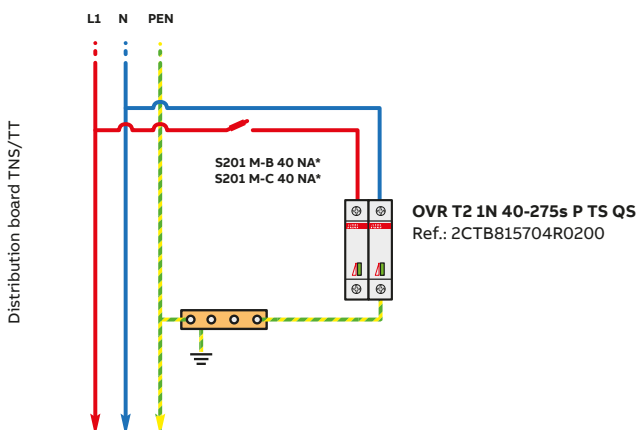
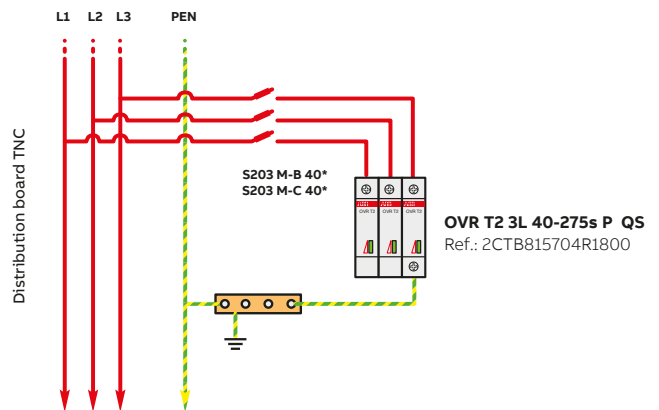
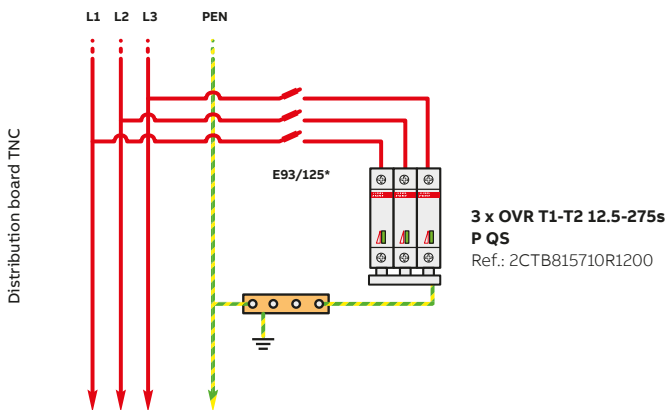


Configuration 1

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

Protection and safety

OVR Type 1 surge protective devices



OVR T1 25-255-7

Technical features

Type codes			OVR T1 25-255-7	OVR T1 3N 25-255-7
with auxiliary contact (TS)			–	–
Technology			Spark-gap	Spark-gap + GDT
Electrical features				
Standard			IEC 61643-1/EN 61643-11	IEC 61643-1/EN 61643-11
Type/test class			T1/I	T1/I
Protected lines			1	3+1
Types of networks			TNC/TT(L-N)-TNS	TNS-TT
Type of current			AC 47-63 Hz	AC 47-63 Hz
Voltage regulation of the system			± 10%	± 10%
Nominal voltage Un		[V]	230	230
Maximum continuous operating voltage Uc		[V]	255	255
Maximum impulse current Iimp (10/350)		[kA]	25	25
Maximum impulse current Tot. Iimp (10/350)		[kA]	25	100
Nominal discharge current In (8/20)		[kA]	25	25
Follow current interrupting rating Ifi		[kA]	7	7
Voltage protection level Up at In		[kV]	≤ 2.5	2.0/2.0/2.0
Voltage protection level Ures at 3 kA		[kV]	≤ 0.9	0.9/0.9/0.9
TOV (Temporary overvoltage) withstand Ut				
	(L-N: 5 s /N-PE: 200 ms)	[V]	650/–	650/1200
Response time		[ns]	≤ 100	≤ 100
Residual current IPE		[μA]	10	1000
Short-circuit withstand capability Isccr		[kA]	50	50
Backup protection	Fuse (gG)	[A]	≤ 125	≤ 125
	Circuit breaker (B or C curve)	[A]	≤ 125	≤ 125
Pluggable cartridge			No	No
Integrated thermal disconnecter			–	–
State indicator			Yes	Yes
Safety reserve			No	No
Auxiliary contact			No	No
Installation				
Wire range (L, N, PE)	Solid wire	[mm ²]	2.5...50	2.5...50
	Stranded wire	[mm ²]	2.5...35	2.5...35
Stripping length (L, N, PE)		[mm]	15	15
Tightening torque (L, N, PE)		[Nm]	3.5	3.5
Auxiliary contact (TS)				
Contact complement			–	–
Minimum load			–	–
Maximum load			–	–
Connection cross-section		[mm ²]	–	–
Miscellaneous characteristics				
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
Dimensions	height x width x depth	[mm]	85 x 17.8 x 70.8	85 x 89 x 70.8
		[inches]	3.34 x 0.70 x 2.78	3.34 x 3.50 x 2.78
Dimensions with auxiliary contact (TS)	height x width x depth	[mm]	–	–
		[inches]	–	–



Type 1 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 μ s wave form which simulate natural lightning current.

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

OVR T1 25-255-7

Follow current interrupting rating 7 kA

Poles	Impulse current limp 10/350 kA	Follow current interrupting rating I _{fi} kA	Voltage protection level U _p kV	Nominal voltage U _n V	Max. cont. operating voltage U _c V	Bbn 3660308 EAN	Ordering details		Price 1 piece	Weight 1 piece kg
							Type code	Order code		
1	25	7	2.5	230	255	514110	OVR T1 25-255-7	2CTB815101R8700		0.16
3+1	25	7	2	230/400	255	514127	OVR T1 3N 25-255-7	2CTB815101R8800		0.80

Protection and safety

OVR Type 1 surge protective devices Single pole neutral



OVR T1 50 N

Technical features

Type codes		OVR T1 50 N	
with auxiliary contact (TS)		-	
Technology		Gas discharge tube (GDT)	
Electrical features			
Standard		IEC 61643-1/EN 61643-11	
Type/test class		T1/I	
Protected lines		1	
Types of networks		TT (N-PE) / TNS (N-PE)	
Type of current		AC 47-63 Hz	
Voltage regulation of the system network		± 10 %	
Nominal voltage Un	[V]	230	
Maximum continuous operating voltage Uc	[V]	255	
Maximum impulse current Iimp (10/350)	[kA]	50	
Maximum impulse current Tot. Iimp (10/350)	[kA]	50	
Nominal discharge current In (8/20)	[kA]	25	
Follow current interrupting rating Ifi	[kA]	0.1	
Voltage protection level Up at In	[kV]	≤ 1.5	
Voltage protection level Ures at 3 kA	[kV]	0.9	
TOV (Temporary overvoltage) withstand Ut (L-N: 5 s /N-PE: 200 ms)	[V]	-/1200	
Response time	[ns]	≤ 100	
Residual current IPE	[μA]	10	
Short-circuit withstand capability Isccr	[kA]	50	
Backup protection	Fuse (gG)	[A]	-
	Circuit breaker (B or C curve)	[A]	-
Pluggable cartridge		No	
Integrated thermal disconnecter			
State indicator		No	
Safety reserve		No	
Auxiliary contact		No	
Installation			
Wire range (L, N, PE)	Solid wire	[mm ²]	2.5...50
	Stranded wire	[mm ²]	2.5...35
Stripping length (L, N, PE)		[mm]	15
Tightening torque (L, N, PE)		[Nm]	3.5
Auxiliary contact (TS)			
Contact complement			-
Minimum load			-
Maximum load			-
Connection cross-section		[mm ²]	-
Miscellaneous characteristics			
Stocking and operating temperature		[°C]	-40 to +80
Maximal Altitude		[m]	2000
Degree of protection			IP20
Fire resistance according to UL 94			V-0
Dimensions	height x width x depth	[mm]	85 x 35.6 x 64.8
		[inches]	3.35 x 1.40 x 2.55
with auxiliary contact (TS)	height x width x depth	[mm]	-
		[inches]	-



2CSC400023F0013

Type 1 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 μ s wave form which simulate natural lightning current.

OVR T1 50 N

Type 1 Neutral

Poles	Impulse current limp 10/350 kA	Follow current interrupting rating I _{fi} kA	Voltage protection level U _p kV	Nominal voltage U _n V	Max. cont. operating voltage U _c V	Bbn 3660308 EAN 510853	Ordering details		Price 1 piece	Weight 1 piece kg
							Type code	Order code		
1	50	0.1	1.5	230	255	510853	OVR T1 50 N	2CTB815101R0400		0.29

Protection and safety

OVR Type 1+2 surge protective devices Single pole



2CTC43104-20000

OVR T1-T2 12.5-275s P QS

Technical features

Type codes		OVR T1-T2 25-255 P QS	OVR T1-T2 25-440 P QS
with auxiliary contact (TS)		OVR T1-T2 25-255 P TS QS	OVR T1-T2 25-440 P TS QS
Technology			
Electrical features			
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
System network		TT (L-N) / TNS / TNC	TT (L-N) / TNS / TNC / IT(230)
Type of current		AC 47-63Hz	AC 47-63Hz
Voltage regulation of the system network		± 10 %	± 10 %
Nominal system voltage Un	[V]	230	400
Max. cont. operating voltage Uc	[V]	255	440
Maximum impulse current Iimp (10/350)	[kA]	25	25
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/-/2.5
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 fuse (gG)	[A]	≤ 315	≤ 315
maximum rating circuit breaker (B or C curve)	[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)
Installation			
Wire range (L, N, PE)	solid wire	[mm ²] 25 ... 50	25 ... 50
	stranded wire	[mm ²] 25 ... 35	25 ... 35
Stripping length (L, N, PE)	[mm]	15	15
Tightening torque (L, N, PE)	[Nm]	2.5	2.5
Auxiliary contact (TS)			
Contacts information		1 N.O. - 1 N.C.	1 N.O. - 1 N.C.
Min. load		12 V DC - 10 mA	12 V DC - 10 mA
Max. load		250 V AC - 1 A	250 V AC - 1 A
Connection cross-section	[mm ²]	0.5 ... 1.5	0.5 ... 1.5
Miscellaneous characteristics			
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
Dimensions			
height x width x depth	[mm]	108.1 × 36 × 86.3	108.1 × 36 × 86.3
	[inches]	4.25 x 1.41 x 3.38	4.25 x 1.41 x 3.38
Dimensions with auxiliary contact (TS)			
height x width x depth	[mm]	109.2 × 36 × 86.3	109.2 × 36 × 86.3
	[inches]	4.29 x 1.41 x 3.38	4.29 x 1.41 x 3.38
Replacement Cartridges			
Phase Product ID		OVR T1-T2 25-255 C QS 2CTB825101R8000	OVR T1-T2 25-440 C QS 2CTB825101R8100
Neutral Product ID		-	-

OVR T1-T2 N 100-255 P QS	OVR T1-T2 N 100-440 P QS	OVR T1-T2 12.5-275s P QS
-	-	OVR T1-T2 12.5-275s P TS QS
		Varistor
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
1	1	1
TT (N-PE) / TNS (N-PE)	TT (N-PE) / TNS (N-PE)	TT (L-N) / TNS / TNC
AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz
± 10 %	± 10 %	± 20 %
230	400	230
255	440	275
100	100	12.5
100	100	20
100	100	80
0.1	0.1	-
≤ 1.5/-/1.5	≤ 2.5/-/2.5	1.4/-/1.4
-	-	0.5
-/1200	-/1200	337/
≤ 100	≤ 100	≤ 25
0.1	0.1	100
-	-	≤ 160
-	-	≤ 125
Yes	Yes	Yes
Yes	Yes	Yes
No	No	Yes
No	No	Yes
No	No	Yes (TS option)
25 ... 50	25 ... 50	2.5 ... 35
25 ... 35	25 ... 35	2.5 ... 25
15	15	12.5
2.5	2.5	2.8
-	-	1 NO - 1 NC
-	-	12 V DC - 10 mA
-	-	250 V AC - 1A
-	-	6.5
-40 to +80	-40 to +80	-40 to +80
2000	2000	5000
IP20	IP20	IP20 - Indoor
V-0	V-0	V-0
108.1 × 36 × 86.3	108.1 × 36 × 86.3	88 × 17.8 × 76.7
4.25 × 1.41 × 3.38	4.25 × 1.41 × 3.38	3.46 × 0.70 × 3.02
-	-	95.8 × 17.8 × 76.7
-	-	3.77 × 0.70 × 3.02
OVR T1-T2 N 100-255 C QS 2CTB825101R8200	OVR T1-T2 N 100-400 C QS 2CTB825101R8300	OVR T1-T2 12.5-275s C QS 2CTB815710R2600
-	-	-

Protection and safety

OVR Type 1+2 surge protective devices Single pole



OVR T1-T2 12.5-275s P QS

Technical features

Type codes		OVR T1-T2 12.5-440s P QS	OVR T1-T2 N 50-275s P QS
with auxiliary contact (TS)		OVR T1-T2 12.5-440s P TS QS	
Technology		Varistor	GDT
Electrical features			
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	N
System network		TT (L-N) / TNS / TNC	TT (N-PE) / TNS (N-PE)
Type of current		AC 47-63 Hz	AC 47-63 Hz
Voltage regulation of the system network		± 10%	± 20%
Nominal system voltage Un	[V]	400	230
Max. cont. operating voltage Uc	[V]	440	275
Maximum impulse current Iimp (10/350)	[kA]	12.5	50
Nominal discharge current In (8/20)	[kA]	20	50
Maximum discharge current Imax (8/20)	[kA]	80	100
Follow current interrupting rating Ifi	[kA]	-	-
Voltage protection level Up at In (L-N/N-PE/L-PE)	[kV]	1.9/-/1.9	-/1.4/-
Voltage protection level Ures at 3 kA	[kV]	0.5	-
TOV (Temporary overvoltage) withstand Ut (L-N: 5s./N-PE: 200ms)	[V]	581/	-/1200
Response time	[ns]	< 25	≤10
Short-circuit withstand capability Iscsr	[kA]	≤ 100	≤100
Backup protection fuse (gG)	[A]	≤ 160	-
maximum rating circuit breaker (B or C curve)	[A]	≤ 125	-
Pluggable cartridge		Yes	Yes
Integrated thermal disconnecter		Yes	No
State indicator		Yes	No
Safety reserve		Yes	No
Auxiliary contact		Yes (TS option)	No
Installation			
Wire range (L, N, PE)	solid wire	[mm ²] 2.5 ... 35	2.5 ... 50
	stranded wire	[mm ²] 2.5 ... 25	2.5 ... 35
Stripping length (L, N, PE)	[mm]	12.5	12.5
Tightening torque (L, N, PE)	[Nm]	2.8	3.5
Auxiliary contact (TS)			
Contacts information		1 NO - 1 NC	
Min. load		12 V DC - 10 mA	
Max. load		250 V AC - 1A	
Connection cross-section	[mm ²]	6.5	
Miscellaneous characteristics			
Stocking and operating temperature	[°C]	-40 to +80	-40 to +80
Maximal Altitude	[m]	5000	5000
Degree of protection		IP20 - Indoor	IP20 - Indoor
Fire resistance according to UL 94		V-0	V-0
Dimensions			
height x width x depth	[mm]	88 x 35.6 x 76.7	88 x 17.8 x 76.7
	[inches]	3.46 x 1.4 x 3.02	3.46 x 0.7 x 3.02
Dimensions with auxiliary contact (TS)			
height x width x depth	[mm]	95.8 x 35.6 x 76.7	
	[inches]	3.77 x 1.4 x 3.02	
Replacement Cartridges			
Phase Product ID		OVR T1-T2 12.5-440s C QS 2CTB815710R5500	
Neutral Product ID		-	OVR T1-T2 N 50-275s C QS 2CTB815710R2700

OVR T1-T2 N 50-440s P QS

GDT

IEC 61643-11/EN 61643-11

T1-T2/I - II

N

TT (N-PE) / TNS (N-PE)

AC 47-63 Hz

± 10 %

400

440

50

50

100

-

-/1.9/-

-

-/1200

≤10

≤100

-

-

Yes

No

No

No

No

2.5 ... 50

2.5 ... 35

12.5

3.5

-40 to +80

5000

IP20 - Indoor

V-0

88 x 17.8 x 76.7

3.46 x 0.7 x 3.02

OVR T1-T2 N 50-440s C QS
2CTB815710R5600



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 μ 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 _{max} 8/20	Follow current interrupting rating I _{fi}	Voltage protection level Up	Nominal voltage U _n	Max. cont. operating voltage U _c	Bbn 3660 308	Ordering details			Weight 1 piece
								EAN	Type code	Order code	
	kA	kA	kA	kV	V	V				kg	
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			
Electrical features			
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 fuse (gG)	[A]	≤ 315	≤ 315
maximum rating 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)
Installation			
Wire range (L, N, PE)	solid wire	[mm ²] 25 ... 50	25 ... 50
	stranded wire	[mm ²] 25 ... 35	25 ... 35
Stripping length (L, N, PE)		[mm] 15	15
Tightening torque (L, N, PE)		[Nm] 2.5	2.5
Auxiliary contact (TS)			
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 ²]	0.5 ... 1.5	0.5 ... 1.5
Miscellaneous characteristics			
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
Dimensions			
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
Dimensions with auxiliary contact (TS)			
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
Replacement Cartridges			
Phase Product ID		OVR T1-T2 25-255 C QS 2CTB825101R8000	OVR T1-T2 25-255 C QS 2CTB825101R8000

OVR T1-T2 3L 12.5-275s P QS	OVR T1-T2 3L 12.5-440s P QS
OVR T1-T2 3L 12.5-275s P TS QS	OVR T1-T2 3L 12.5-440s P TS QS
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
OVR T1-T2 12.5-275s C QS 2CTB815710R2600	OVR T1-T2 12.5-440s C QS 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 μ 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

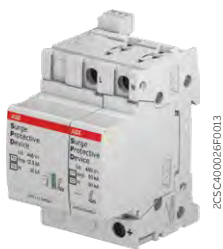
Technical features

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
Electrical features			
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 _{max} (8/20) kA	[kA]	70	80
Follow current interrupting rating I _{fi}	[kA]	100	
Voltage protection level U _p at In (L-N/N-PE/L-PE)	[kV]	337 / 1200	1.4/1.4/1.5
Voltage protection level U _{res} at 3 kA	[kV]		0.5
TOV (Temporary overvoltage) withstand U _t (L-N: 5s./N-PE: 200ms)	[V]		337/1200
Response time	[ns]	≤ 100	≤ 25
Short-circuit withstand capability I _{scrr}	[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)
Installation			
Wire range (L, N, PE) solid wire	[mm ²]	25 ... 50	2.5 ... 35
stranded wire	[mm ²]	25 ... 35	2.5 ... 25
Stripping length (L, N, PE)	[mm]	15	12.5
Tightening torque (L, N, PE)	[Nm]	2.5	2.8
Auxiliary contact (TS)			
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 ²]	0.5 ... 1.5	1.5
Miscellaneous characteristics			
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
Dimensions			
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
Dimensions with auxiliary contact (TS)			
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
Replacement Cartridges			
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

OVR T1-T2 4L 25-255 P QS	OVR T1-T2 3N 25-255 P QS	OVR T1-T2 3N 12.5-275s P QS	OVR T1-T2 4L 12.5-275s P QS
OVR T1-T2 4L 25-255 P TS QS	OVR T1-T2 3N 25-255 P TS QS	OVR T1-T2 3N 12.5-275s P TS QS	OVR T1-T2 4L 12.5-275s P TS QS
		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
OVR T1-T2 25-255 C QS 2CTB825101R8000	OVR T1-T2 25-440 C QS 2CTB825101R8100	OVR T1-T2 12.5-275s C QS 2CTB815710R2600	OVR T1-T2 12.5-275s C QS 2CTB815710R2600
OVR T1-T2 N 100-255 C QS 2CTB825101R8200	OVR T1-T2 N 100-400 C QS 2CTB825101R8300	OVR T1-T2 N 50-275s C QS 2CTB815710R2700	

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

2C5C400026FF013

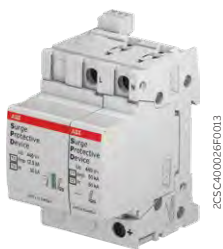
Technical features

Type codes		OVR T1-T2 1N 12.5-440s P QS	
with auxiliary contact (TS)		OVR T1-T2 1N 12.5-440s P TS QS	
Technology		Varistor + GDT	
Electrical features			
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)	
Installation			
Wire range (L, N, PE)	solid wire	[mm ²]	2.5 ... 35
	stranded wire	[mm ²]	2.5 ... 25
Stripping length (L, N, PE)		[mm]	12.5
Tightening torque (L, N, PE)		[Nm]	2.8
Auxiliary contact (TS)			
Contacts information		1 NO - 1 NC	
Min. load		12 V DC - 10 mA	
Max. load		250 V AC - 1 A	
Connection cross-section		[mm ²]	1.5
Miscellaneous characteristics			
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	
Dimensions			
height x width x depth		[mm]	88 x 53.4 x 76.7
		[in]	3.46 x 2.1 x 3.02
Dimensions with auxiliary contact (TS)			
height x width x depth		[mm]	95.8 x 53.4 x 76.7
		[in]	3.77 x 2.1 x 3.02
Replacement Cartridges			
Phase Product ID		OVR T1-T2 12.5-440s C QS 2CTB815710R5500	
Neutral Product ID		OVR T1-T2 N 50-440s C QS 2CTB815710R5600	

OVR T1-T2 3N 12.5-440s P QS	OVR T1-T2 4L 12.5-440s P QS
OVR T1-T2 3N 12.5-440s P TS QS	OVR T1-T2 4L 12.5-440s P TS QS
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 μ 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 _{max} 8/20	Follow current interrupting rating I _{fi}	Voltage protection level Up	Nominal voltage U _n	Max. cont. operating voltage U _c	Bbn 3660 308 EAN	Ordering details		Weight 1 piece
								Type code	Order code	
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 surge protective devices for 57 V networks

Technical features

Type codes		OVR T2 20-75 P	OVR T2 2 20-75 P
with auxiliary contact (TS)		OVR T2 20-75 P TS	OVR T2 2 20-75 P TS
Technology		Varistor	Varistor
Electrical features			
Standard		IEC 61643-1/EN 61643-11	IEC 61643-1/EN 61643-11
Type/test class		T2/II	T2/II
Protected lines		1	2
Types of networks		TT-TNS-TNC	TT-TNS-TNC
Type of current		AC - DC	AC - DC
Nominal AC voltage Un	[V]	57	57
Max. cont. operating AC voltage Uc	[V]	75	75
Maximum discharge current I _{max} (8/20)	[kA]	20	20
Nominal discharge current I _n (8/20)	[kA]	5	5
Voltage protection level Up at I _n	[kV]	0.3	0.3
Voltage protection level Up at 3 kA	[kV]	0.25	0.25
TOV (Temporary overvoltage) withstand Ut (L-N: 5s/N-PE: 200ms)	[V]	75/-	75/-
Response time	[ns]	≤ 25	≤ 25
Residual current IPE	[μA]	25	50
Short-circuit withstand capability I _{sc}	[kA]	50	50
Backup protection maximum rating	fuse (gG)	[A]	≤ 16
	circuit breaker (B or C curve)	[A]	≤ 16
Pluggable cartridge		Yes	Yes
Integrated thermal disconnect		Yes	Yes
State indicator		Yes	Yes
Safety reserve		No	No
Auxiliary contact (TS)		Yes (TS option)	Yes (TS option)
Installation			
Wire range (L, N, PE)	solid wire	[mm ²]	2.5 ... 25
	stranded wire	[mm ²]	2.5 ... 16
Stripping length (L, N, PE)	[mm]	12.5	12.5
Tightening torque (L, N, PE)	[Nm]	2.5	2.5
Auxiliary contact (TS)			
Contact complement		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 - 1 A	250 V AC - 1 A
Connection cross-section	[mm ²]	1.5	1.5
Miscellaneous characteristics			
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 17.8 x 64.8	88 x 35.6 x 64.8
	[in]	3.46 x 0.7 x 2.55	3.46 x 1.4 x 2.55
Dimensions with auxiliary contact (TS)			
height x width x depth	[mm]	96 x 17.8 x 64.8	96 x 35.6 x 64.8
	[in]	3.78 x 0.7 x 2.55	3.78 x 1.4 x 2.55
Replacement Cartridges			
Phase Product ID		OVR T2 20-75 C 2CTB803854R1400	OVR T2 20-75 C 2CTB803854R1400

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 μ s wave form.

Type 2 pluggable - Uc 75 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 EAN	Ordering details		Weight 1 piece kg
							Type code	Order code	
1	20	5	0.3	57	75	518446	OVR T2 20-75 P	2CTB803851R2800	0.12
1	20	5	0.3	57	75	518453	OVR T2 20-75 P TS	2CTB803851R2700	0.12
2	20	5	0.3	57	75	518484	OVR T2 2 20-75 P	2CTB803852R1700	0.23
2	20	5	0.3	57	75	518477	OVR T2 2 20-75 P TS	2CTB803852R1600	0.23

Protection and safety

OVR Type 2 surge protective devices non pluggable

Technical features

Type codes		OVR T2 20-275	OVR T2 40-275
with auxiliary contact (TS)		-	-
Technology		Varistor	Varistor
Electrical features			
Standard		IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11
Type/test class		T2/II	T2/II
Protected lines		1	1
Types of networks		TT(L-N)-TNS-TNC	TT(L-N)-TNS-TNC
Type of current		AC 47-63 Hz	AC 47-63 Hz
Voltage regulation of the system network		± 20 %	± 20 %
Nominal AC voltage Un	[V]	230	230
Max. cont. operating AC voltage Uc	[V]	275	275
Maximum discharge current I _{max} (8/20)	[kA]	20	40
Nominal discharge current I _n (8/20)	[kA]	5	20
Voltage protection level Up at I _n	[kV]	1	1,4
Voltage protection level Up at 3 kA	[kV]	0,9	0,9
TOV (Temporary overvoltage) withstand Ut (L-N: 5s/N-PE: 200ms)	[V]	337/-	337/-
Response time	[ns]	≤ 25	≤ 25
Residual current IPE	[μA]	25	25
Short-circuit withstand capability I _{sc}	[kA]	50	50
Backup protection	fuse (gG)	[A]	≤ 50
maximum rating	circuit breaker (B or C curve)	[A]	≤ 50
Pluggable cartridge		No	No
Integrated thermal disconnecter		Yes	Yes
State indicator		Yes	Yes
Safety reserve		No	No
Auxiliary contact (TS)		No	No
Installation			
Wire range (L, N, PE)	solid wire	[mm ²]	2.5...25
	stranded wire	[mm ²]	2.5...16
Stripping length (L, N, PE)		[mm]	12,2
Tightening torque (L, N, PE)		[Nm]	2,5
Auxiliary contact (TS)			
Contact complement		-	-
Min. load		-	-
Max. load		-	-
Connection cross-section		[mm ²]	-
Miscellaneous characteristics			
Stocking and operating temperature		[°C]	-40 to +80
Maximal Altitude		[m]	2000
Degree of protection			IP20
Fire resistance according to UL 94			V-0
Dimensions			
height x width x depth	[mm]	85 x 17.8 x 64.8	85 x 17.8 x 64.8
	[in]	3.35 x 0.70 x 2.55	3.35 x 0.70 x 2.55

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 μ s wave form.

Type 2 non 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 EAN	Ordering details		Weight 1 piece kg
							Type code	Order code	
1	20	5	1	230/400	275	514882	OVR T2 20-275	2CTB804200R0100	0.12
1	40	20	1.4	230/400	275	514103	OVR T2 40-275	2CTB804201R0100	0.12
1	20	5	1	230/400	275	519382	OVR T2 20-275 (x20)	2CTB804200R1100	0.12
1	40	20	1.4	230/400	275	519412	OVR T2 40-275 (x20)	2CTB804201R1100	0.12

Protection and safety

OVR Type 2 pluggable QuickSafe® surge protective devices Single pole 230 V networks

Technical features

Type codes		OVR T2 40-275 P QS	OVR T2 40-275s P QS	
with auxiliary contact (TS)		OVR T2 40-275 P TS QS	OVR T2 40-275s P TS QS	
Technology		Varistor	Varistor	
Electrical features				
Standard		IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11	
Type/test class		T2/II	T2/II	
Protected lines		1	1	
System network		TT-TNS-TNC	TT-TNS-TNC	
Type of current		AC 47-63 Hz	AC 47-63 Hz	
Voltage regulation of the system network		± 20%	± 20%	
Nominal system voltage Un	[V]	230	230	
Max. cont. operating voltage Uc	[V]	275	275	
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 _{max} (8/20)	[kA]	40	40	
Maximum impulse current I _{imp} (10/350)	[kA]	2	2	
Nominal discharge current I _n (8/20)	[kA]	20	20	
Voltage protection level Up at I _n (L-N/N-PE/L-PE)	[kV]	1.25/-/1.25	1.4/-/1.4	
Voltage protection level Ures at 3kA (L-N)	[kV]	0.8	0.5	
Voltage protection level Ures at 5kA (L-N)	[kV]	0.85	0.7	
Voltage protection level Ures at 10kA (L-N)	[kV]	1	0.9	
TOV (Temporary overvoltage) withstand Ut (L-N: 5s./N-PE: 200ms)	[V]	337/-	337/-	
Response time	[ns]	≤ 25	≤ 25	
Short-circuit withstand capability I _{sc}	[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)	
Installation				
Wire range (L, N, PE)	solid wire	[mm ²]	2.5 ... 35	2.5 ... 35
	stranded wire	[mm ²]	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
Auxiliary contact (TS)				
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 - 1 A	250 V AC - 1 A	
Connection cross-section	[mm ²]	1.5	1.5	
Miscellaneous characteristics				
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 17.8 x 65.3	88 x 17.8 x 76.7	
	[inches]	3.46 x 0.7 x 2.57	3.46 x 0.7 x 3.02	
With Auxiliary Contact (TS)				
height x width x depth	[mm]	95.8 x 17.8 x 65.3	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	
Replacement Cartridges				
Phase Product ID		OVR T2 40-275 C QS 2CTB803876R1000	OVR T2 40-275s C QS 2CTB815704R2600	
Neutral Product ID		-	-	

OVR T2 40-350 P QS	OVR T2 80-275s P QS	OVR T2-T3 N 80-275 P QS	OVR T2 N 80-350 P QS	OVR T2 N 80-275s P QS
OVR T2 40-350 P TS QS	OVR T2 80-275s P TS QS			
Varistor	Varistor	GDT	GDT	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-T3/II-III	T2/II	T2
1	1	1	1	1
TT-TNS-TNC	TT-TNS-TNC	TT (N-PE)-TNS(N-PE)	TT (N-PE)-TNS(N-PE)	TT(N-PE)-TNS(N-PE)
AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz
± 50%	± 20%	± 20%	± 50%	± 20%
230	230	230	230	230
350	275	275	350	275
375	-	-	-	-
415	-	-	-	-
40	80	80	80	80
2	6.25	2	2	6.25
20	20	30	30	30
1.5/-/1.5	1.4/-/1.4	-/1.4/-	-/1.4/-	-/1.4/-
1	0.5	-	-	-
1.05	0.7	-	-	-
1.2	0.9	-	-	-
455/-	337/	-/1200	-/1200	-/1200
≤ 25	≤ 25	< 25	< 25	< 25
100	100	-	-	100
≤ 125	≤ 160	≤ 125	≤ 125	≤ 160
≤ 125	≤ 125	≤ 125	≤ 125	≤ 125
Yes	Yes	Yes	Yes	Yes
Yes	Yes	-	-	-
Yes	Yes	No	No	No
No	Yes	No	No	No
Yes (TS option)	Yes (TS option)	No	No	No
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	15
2.8	2.8	2.8	2.8	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	-40 to +80
5000	5000	5000	5000	5000
IP20	IP20 - Indoor	IP20 - Indoor	IP20 - Indoor	IP20 - Indoor
V-0	V-0	V-0	V-0	V-0
88 x 17.8 x 65.3	88 x 17.8 x 76.7	85 x 17.8 x 64.8	85 x 17.8 x 64.8	
3.46 x 0.7 x 2.57	3.46 x 0.7 x 3.02	3.35 x 0.70 x 2.55	3.35 x 0.70 x 2.55	
95.8 x 17.8 x 65.3	95.8 x 17.8 x 76.7			96 x 17.8 x 69.4
3.77 x 0.7 x 2.57	3.77 x 0.7 x 3.02			3.78 x 0.7 x 2.73
OVR T2 40-350 C QS 2CTB803886R1000	OVR T2 80-275s C QS 2CTB815708R2600	-	-	
-	-	OVR T2-T3 N 80-275 C QS 2CTB803876R0000	OVR T2 N 80-350 C QS 2CTB803886R0000	OVR T2 N 80-275s C QS 2CTB815708R2800

Protection and safety

OVR Type 2 pluggable QuickSafe® surge protective devices Single pole 230 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 μ s wave form.

OVR T2 40-275 P QS

Type 2 pluggable

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	40	20	1.25	230	275	519580	OVR T2 40-275 P QS	2CTB803871R2300	0.12
1	40	20	1.25	230	275	519597	OVR T2 40-275 P TS QS	2CTB803871R1700	0.12
1	40	20	1.4	230	275	525291	OVR T2 40-275s P QS	2CTB815704R1200	0.15
1	40	20	1.4	230	275	525222	OVR T2 40-275s P TS QS	2CTB815704R0000	0.15
1	40	20	1.5	230	350	520609	OVR T2 40-350 P QS	2CTB803881R2300	0.12
1	40	20	1.5	230	350	520562	OVR T2 40-350 P TS QS	2CTB803881R1700	0.12
1	80	20	1.4	230	275	525475	OVR T2 80-275s P QS	2CTB815708R1200	0.15
1	80	20	1.4	230	275	525406	OVR T2 80-275s P TS QS	2CTB815708R0000	0.15
1	80	30	1.4	230	275	519658	OVR T2 N 80-350 P QS	2CTB803983R1900	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	230	275	525536	OVR T2 N 80-275s P QS	2CTB815708R2500	0.12



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
Electrical features				
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 _{max} (8/20)	[kA]	40	40	80
Maximum impulse current I _{imp} (10/350)	[kA]	2	2	6.25
Nominal discharge current I _n (8/20)	[kA]	20	20	20
Voltage protection level Up at I _n (L-N/N-PE/L-PE)	[kV]	1.8/-/1.8	1.8/-/1.8	1.8/-/1.8
Voltage protection level U _{res} at 3kA (L-N)	[kV]	1.25	0.8	0.8
Voltage protection level U _{res} at 5kA (L-N)	[kV]	1.35	1.2	1.2
Voltage protection level U _{res} 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 _{oc}	[kV]	-	-	-
Response time	[ns]	≤ 25	≤ 25	≤ 25
Short-circuit withstand capability I _{sc}	[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)
Installation				
Wire range solid wire	[mm ²]	2.5 ... 35	2.5 ... 35	2.5 ... 35
(L, N, PE) stranded wire	[mm ²]	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
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 ²]	1.5	1.5	1.5
Miscellaneous characteristics				
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
Dimensions of packing				
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
With Auxiliary Contact (TS)				
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
Replacement Cartridges				
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		-	-	-

OVR T2 40-600 P TS QS	OVR T2-T3 N 80-440 P QS	OVR T2 N 80-440s P QS	OVR T2 120-440s P TS
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 μ s wave form.

Type 2 pluggable

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	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
Electrical features					
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 Imax (8/20)	[kA]	40	40	80	40
Maximum impulse current Iimp (10/350)	[kA]	2	2	6.25	2
Nominal discharge current In (8/20)	[kA]	20	20	20	20
Voltage protection level Up at In (L-PE)	[kV]	1.25	1.4	1.4	1.5
Voltage protection level Ures at 3kA	[kV]	0.8	0.5	0.5	1.0
Voltage protection level Ures at 5kA	[kV]	0.85	0.7	0.7	1.05
Voltage protection level Ures at 10kA	[kV]	1.0	0.9	0.9	1.2
TOV (Temporary overvoltage) withstand Ut (L-N: 5s./N-PE: 200ms)	[V]	337/-	337/-	337/-	455/-
Uoc	[kV]	-	-	-	-
Response time	[ns]	≤ 25	≤ 25	≤ 25	≤ 25
Short-circuit withstand capability Isccr	[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)
Installation					
Wire range (L, N, PE)					
solid wire	[mm²]	2.5 ... 35	2.5 ... 35	2.5 ... 35	2.5 ... 35
stranded wire	[mm²]	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
Auxiliary contact (TS)					
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	[mm²]	1.5	1.5	1.5	1.5
Miscellaneous characteristics					
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
Dimensions			
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
With Auxiliary Contact (TS)			
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
Replacement Cartridges			
Phase Product ID		OVR T2 80-275s C QS 2CTB8157084R2600	OVR T2 40-350 C QS 2CTB803886R1000
Neutral Product ID		-	-



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 μ s wave form.

OVR T2 3L 40-275 P QS

Type 2 pluggable

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	
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	
Electrical features						
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 _{max} (8/20)	[kA]	40	80	40	40	
Maximum impulse current I _{imp} (10/350)	[kA]	2	6.25	2	2	
Nominal discharge current I _n (8/20)	[kA]	20	20	15	20	
Voltage protection level Up at I _n (L-PE)	[kV]	1.8	2.1	2.9	2.3	
Voltage protection level U _{res} at 3kA	[kV]	1.25	1.25	2.1	1.6	
Voltage protection level U _{res} at 5kA	[kV]	1.35	1.35	2.2	1.7	
Voltage protection level U _{res} 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 _{scrr}	[kA]	100	100	100	100	
Backup protection maximum rating	fuse (gG)	[A]	≤ 125	≤ 160	≤ 50	≤ 125
	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)	
Installation						
Wire range (L, N, PE)	solid wire	[mm ²]	2.5 ... 35	2.5 ... 35	2.5 ... 36	2.5 ... 36
	stranded wire	[mm ²]	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 ²]				
Miscellaneous characteristics						
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
Dimensions						
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
With Auxiliary Contact (TS)						
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
Replacement Cartridges						
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 μ s wave form.

OVR T2 3L 40-440 P QS

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	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
Electrical features				
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 _{max} (8/20)	[kA]	40	40	80
Nominal discharge current I _n (8/20)	[kA]	20	20	20
Voltage protection level Up at I _n (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 _{sc}	[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)
Installation				
Wire range (L, N, PE)	Solid wire	[mm ²]	2.5 ... 35	2.5 ... 35
	Stranded wire	[mm ²]	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
Auxiliary contact (TS)				
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 ²]	1.5	1.5
Miscellaneous characteristics				
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
Replacement Cartridges				
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		-	-	-



2CSC400000P0013

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 μ s wave form.

OVR T2 4L 40-275 P QS

Type 2 pluggable - Uc 275 V

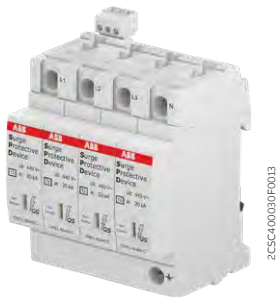
Poles	Max discharge current I_{max} 8/20 kA	Nominal discharge current I_n kA	Voltage protection level U_p kV	Nominal voltage U_n V	Max. cont. operating voltage U_c V	Bbn 3660308	Ordering details			Weight 1 piece kg
							EAN	Type code	Order code	
4	40	20	1.25	230/400	275	20548	OVR T2 4L 40-275 P QS	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
Electrical features				
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 _{max} (8/20)	kA	40	80	40
Maximum impulse current I _{imp} (10/350)	kA	2	6.25	2
Nominal discharge current I _n (8/20)	kA	20	20	20
Follow current interrupting rating I _{fi}	kA	-	-	-
Voltage protection level Up at I _n (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 _{res} at 3 kA	kV	1.25	-	1.6
Voltage protection level U _{res} at 5 kA		1.35	-	1.7
Voltage protection level U _{res} 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 _{sc}	kA	100	100	100
Backup protection maximum rating				
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
Installation				
Wire range (L, N, PE) solid wire	mm ²	2.5 ... 35	2.5 ... 35	2.5 ... 35
stranded wire	mm ²	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 ²	1.5	1.5	1.5
Miscellaneous characteristics				
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
Dimensions				
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	
Dimensions with auxiliary contact (TS)				
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
Replacement Cartridges				
Phase Product ID		OVR T2 40-440 C QS	OVR T2 80-440s C QS	OVR T2 40-600 C QS
		2CTB803876R0400	2CTB815708R5500	2CTB803886R0400



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 μ 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
Electrical features						
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 _{max} (8/20)	[kA]	40	40	80	40	40
Maximum impulse current I _{imp} (10/350)	[kA]	2	2	6.25	2	2
Nominal discharge current I _n (8/20)	[kA]	20	20	20	20	20
Total Current	[kA]	80	80	80	80	80
Voltage protection level U _p at I _n (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 _{res} 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 _{res} 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 _{res} 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 _{oc}	[kV]	-	-	-	-	-
Response time	[ns]	< 25	< 25	< 25	< 25	<25
Short-circuit withstand capability I _{sc}	[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
Installation						
Wire range (L, N, PE) solid wire	[mm ²]	2.5 ... 35	2.5 ... 35	2.5 ... 35	2.5 ... 35	2.5 ... 35
stranded wire	[mm ²]	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
Auxiliary contact (TS)						
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 ²]	1.5	1.5	1.5	1.5	1.5
Miscellaneous characteristics						
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
Dimensions						
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	
With Auxiliary Contact (TS)						
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
Replacement Cartridges						
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



2CSC400031F0013

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 μ 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



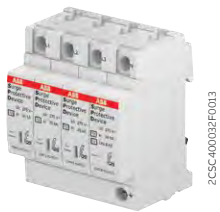
OVR T2 3N 40-
275 P QS

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
Electrical features			
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 _{max} (8/20)	[kA]	40	40
Maximum impulse current I _{imp} (10/350)	[kA]	2	2
Nominal discharge current I _n (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 _{res} 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 _{res} 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 _{res} 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 _{scrr}	[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)
Installation			
Wire range (L, N, PE)	solid wire	[mm ²] 2.5 ... 35	2.5 ... 35
	stranded wire	[mm ²] 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
Auxiliary contact (TS)			
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 ²]	1.5	1.5
Miscellaneous characteristics			
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)	[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
Replacement Cartridges			
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 μ s wave form.

Type 2 pluggable

Protected lines	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	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	
with auxiliary contact (TS)		OVR T2-T3 20-275 P TS QS	OVR T2-T3 20-440 P TS QS	-	-	
Technology		Varistor	Varistor	GDT	GDT	
Electrical features						
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	
Installation						
Wire range (L, N, PE)	solid wire	[mm ²]	2.5 ... 35	2.5 ... 35	2.5 ... 35	2.5 ... 35
	stranded wire	[mm ²]	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
Auxiliary contact (TS)						
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 ²]	1.5	1.5	-	-
Miscellaneous characteristics						
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	
Dimensions of packing						
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	
With Auxiliary Contact (TS)						
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	-	-	
Replacement Cartridges						
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-4003R0013

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 μ 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 μ 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

Type codes		OVR T2-T3 3L 20-275 P QS	
with auxiliary contact (TS)		OVR T2-T3 3L 20-275 P TS QS	
Technology		Varistor + GDT	
Electrical features			
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 _{max} (8/20)		[kA]	20
Nominal discharge current I _n (8/20)		[kA]	5
Total Current		[kA]	60
Voltage protection level Up at I _n (L-N/N-PE /L-PE)		[kV]	0,85/-/-
Voltage protection level U _{res} at 3kA		[kV]	0.8
Voltage protection level U _{res} at 5kA		[kV]	0.85
Voltage protection level U _{res} 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 _{scrr}		[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)	
Installation			
Wire range (L, N, PE)		solid wire [mm ²]	2.5 ... 35
		stranded wire [mm ²]	2.5 ... 25
Stripping length (L, N, PE)		[mm]	12.5
Tightening torque (L, N, PE)		[Nm]	2.8
Auxiliary contact (TS)			
Contacts information		1 NO - 1 NC	
Min. load		12 DC - 10 mA	
Max. load		250 V AC - 1A	
Connection cross-section		[mm ²]	1.5
Miscellaneous characteristics			
Stocking and operating temperature		[°C]	-40 to +80
Maximal Altitude		[m]	5000
Degree of protection		IP20	
Fire resistance according to UL 94		V-0	
Dimensions			
height x width x depth		mm	88 x 53.4 x 65.3
		inches	3.46 x 2.1 x 2.57
With Auxiliary Contact (TS)			
height x width x depth		mm	95.8 x 53.4 x 65.3
		inches	3.77 x 2.1 x 2.57
Replacement Cartridges			
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 μ 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 μ 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

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



2CTB803972R1200

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 μ 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 μ 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
with auxiliary contact (TS)		OVR T2-T3 3N 20-275 P TS QS	
Technology		Varistor + GDT	Varistor + GDT
Electrical features			
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 I _{max} (8/20)	[kA]	20	20
Nominal discharge current I _n (8/20)	[kA]	5	5
Total Current	[kA]	80	80
Voltage protection level Up at I _n (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
U _{oc}	[kV]	6	6
Response time	[ns]	≤ 25	≤ 25
Residual current IPE	[μA]	≤ 10	≤ 10
Short-circuit withstand capability I _{sc}	[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)
Installation			
Wire range (L, N, PE)	solid wire	[mm ²]	2.5 ... 35
	stranded wire	[mm ²]	2.5 ... 25
Stripping length (L, N, PE)		[mm]	12,5
Tightening torque (L, N, PE)		[Nm]	2,8
Auxiliary contact (TS)			
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 ²]	1.5	1.5
Miscellaneous characteristics			
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 65.3
	inches	3.46 x 2.8 x 2.57	3.46 x 2.8 x 2.57
With Auxiliary Contact (TS)			
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
Replacement Cartridges			
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 μ 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 μ 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

Type codes		OVR T2-T3 N1 15-275S SL	
Technology		Varistor + GDT	
Electrical features			
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 _c (L-N)	[V]	275	
Maximum discharge current I _{max} (8/20)	[kA]	15	
Nominal discharge current I _n (8/20)	[kA]	5	
Total Current	[kA]	30	
Voltage protection level U _p at I _n (L-N/L-PE)	[kV]	1.1/1.3	
TOV (Temporary overvoltage) withstand U _t (L-N: 5s.)	[V]	337	
U _{oc}	[kV]	1.1	
Response time	[ns]	< 25	
Short circuit withstand I _{cc}	[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	
Installation			
Wire range : phase and neutral wire		2 x 1.5 mm ² - L 16 cm	
Wire range : Protective Earth wire		[mm ²]	< 6 mm ²
Stripping length (L, N, PE)		[mm]	10
Auxiliary contact (TS)			
Contacts information		-	
Min. load		-	
Max. load		-	
Connection cross-section		[mm ²]	-
Miscellaneous characteristics			
Stocking and operating temperature		[°C]	-40 to +80
Degree of protection		IP32	
Fire resistance according to UL 94		V-0	
Dimensions			
height x width x depth		[mm]	80 x 17.5 x 41
		[inches]	3.15 x 0.69 x 1.62
With Auxiliary Contact (TS)			
height x width x depth		[mm]	-
		[inches]	-



OVR T2 T3 StreetLight

OVR TYPE 2 – TYPE 3 STREET LIGHTING

This is a particular Type 2 and 3 surge protective devices meant to be installed in applications where overall dimensions are critical.

It has the Safety system integrated by default, performed by two varistors in parallel, allowing the customer to perform preventive maintenance.

As soon as one of the Life status windows swap from green to red, we know the product needs to be replaced, but it still guarantees the protection.

It has IP32 and bottom connections to guarantee the best performances in critical and humid environment.

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	15	5	1.3	230	275	524.775	OVR T2-T3 N1 15-275S SL	2CTB804500R0200	0.04
1+1	15	5	1.3	230	275	524799	OVR T2-T3 N1 15-275S SL (x20)	2CTB804500Z1200	0.04

Protection and safety

OVR Plus - Autoprotected surge protective devices TNS/TT 230 V networks

Technical features

Type codes			OVR Plus N1 20	OVR Plus N1 40	OVR Plus N3 20	OVR Plus N3 40
with auxiliary contact (TS)			-	-	-	-
Technology			Varistor + GDT	Varistor + GDT	Varistor + GDT	Varistor + GDT
Electrical features						
Standard			IEC 61643-1/EN 61643-11			
Type/test class			T2/II	T2/II	T2/II	T2/II
Protected lines			1+1	1+1	3+1	3+1
Types of networks			TNS/TT	TNS/TT	TNS/TT	TNS/TT
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%	± 20%
Nominal voltage Un (L-N/L-L)		[V]	230/400	230/400	230/400	230/400
Max. cont. operating voltage Uc		[V]	275	275	275	275
Maximum discharge current I _{max} (8/20)		[kA]	20	40	20	40
Nominal discharge current I _n (8/20)		[kA]	5	20	5	20
Voltage protection level Up at I _n (L-N/N-PE/L-PE)		[kV]	1.3/-/1.3	1.6/-/1.8	1.3/1.3/1.3	2.0/1.5/2.0
Voltage protection level Up at 3 kA (L-N/N-PE/L-PE)		[kV]	1.1/-/1.1	1.1/-/1.1	1.1/1.1/1.1	1.1/1.1/1.1
TOV (Temporary overvoltage) withstand Ut (L-N: 5 s / N-PE: 200 ms)		[V]	334/1200	334/1200	334/1200	334/1200
Response time		[ns]	≤ 25	≤ 25	≤ 25	≤ 25
Residual current IPE		[μA]	10	10	10	10
Short-circuit withstand capability I _{sc}		[kA]	10	15	10	15
Backup protection		Fuse (gG)	[A]	-	-	-
		Circuit breaker (B or C curve)	[A]	integrated	integrated	integrated
Pluggable cartridge			No	No	No	No
Integrated thermal disconnecter			Yes	Yes	Yes	Yes
State indicator			Yes	Yes	Yes	Yes
Safety reserve			No	No	No	No
Auxiliary contact			Yes (S2C-H6R/2CDS200912R0001)			
Installation						
Wire range (L, N, PE)		Solid wire	[mm ²]	2.5...25	2.5...25	2.5...25
		Stranded wire	[mm ²]	2.5...16	2.5...16	2.5...16
Stripping length (L, N, PE)		[mm]	11	11	11	11
Tightening torque (L, N, PE)		[Nm]	2.5	2.5	2.5	2.5
Auxiliary contact (TS)						
Contact complement			-	-	-	-
Minimum load			-	-	-	-
Maximum load			-	-	-	-
Connection cross-section		[mm ²]	-	-	-	-
Miscellaneous characteristics						
Stocking and operating temperature		[°C]	-40 to +70 / -25 to +55	-40 to +70 / -25 to +55	-40 to +70 / -25 to +55	-40 to +70 / -25 to +55
Maximal Altitude		[m]	2000	2000	2000	2000
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]	91 x 35.6 x 74.6	91 x 35.6 x 74.6	100.8 x 106.8 x 74.6	100.8 x 106.8 x 74.6
		[inches]	3.58 x 1.40 x 2.94	3.58 x 1.40 x 2.94	3.97 x 4.20 x 2.94	3.97 x 4.20 x 2.94



OVR PLUS N3 20
OVR PLUS N3 40

OVR PLUS N3 20 and OVR PLUS N3 40 for commercial and industrial applications:

- Auto-protected: Backup miniature circuit breaker integrated and fully coordinated with the surge protective device.
- Easy installation: Fully coordinated unit with easy wiring with the complete ABB pro M modular range.
- High discharge capacity: With I_{max} 20 and 40 kA the OVR Plus N3 insure the protection of your low voltage installations and electric equipment.
- High reliability: No welding inside the module and specific thermal disconnection with the „bilame“ sensor.

OVR PLUS N1 40 for residential applications:

- Auto-protected: Backup miniature circuit breaker integrated and fully coordinated with the surge protective device.
- Compact: Only two modules (36 mm width), means more space and easy wiring with the complete ABB DIN-Rail range.
- High discharge capacity: With I_{max} 20 and 40 kA the OVR PLUS N1 can protect your electric equipment against high surges.
- High reliability: No welding inside the module and specific thermal disconnection.

Type 2 autoprotected

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	1.3	230	275	521286	OVR PLUS N1 20	2CTB803701R0700	0.28
1+1	40	20	1.8	230	275	517005	OVR PLUS N1 40	2CTB803701R0100	0.28
3+1	20	5	1.3	230/400	275	517081	OVR PLUS N3 20	2CTB803701R0400	0.84
3+1	40	20	2.0	230/400	275	517074	OVR PLUS N3 40	2CTB803701R0300	0.84

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
Electrical features					
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 Imax (8/20)	[kA]	40	40	40	40
Nominal discharge current In (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 Iscpv	[A]	300	10,000	10,000	10,000
Short circuit withstand according to (S _{CCR})	[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)
Installation					
Wire range	Solid wire	[mm ²]	2.5...35	2.5...35	2.5...35
(L, N, PE)	Stranded wire	[mm ²]	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
Auxiliary contact (TS)					
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
Miscellaneous characteristics					
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
Replacement Cartridges					
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
Electrical features					
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 _{CCR})	[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)
Installation					
Wire range Solid wire	[mm ²]	2.5....35	2.5....35	2.5....35	2.5....35
(L, N, PE) Stranded wire	[mm ²]	2.5...25	2.5...25	2.5...25	2.5...25
Stripping length (L,N,PE)	[mm ²]	12.5	12.5	12.5	12.5
Tightening torque (L, N, PE)	[N.m]	4.5	4.5	4.5	4.5
Auxiliary contact (TS)					
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
Miscellaneous characteristics					
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
Replacement Cartridges					
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 _{max} 8/20 kA	Nominal current I _n kA	Voltage protection level U _p kV	Max. cont. operating voltage U _{cpv} 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 _{total} 10/350 kA	Max. discharge current I _{max} 8/20 kA	Nominal current I _n kA	Voltage protection level U _p kV	Max. cont. operating voltage U _{cpv} 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

Protection and safety

OVR WT surge protective devices - Wind turbine networks

Technical features

Type codes			
with auxiliary contact (TS)		OVR WT 3L 690 P TS	OVR WT 3L 690
Technology		Varistor + GDT	Varistor + GDT
Electrical features			
Standard		IEC 61643-11/EN 61643-11	IEC 61643-11/EN 61643-11
Type/test class		T1+2/I - II	T1+2/I - II
Protected lines		3	3
System network		TNC-IT	TNC-IT
Type of current		AC 47-63 Hz	AC 47-63 Hz
Nominal system voltage Un	[V]	400/690	400/690
Peak repetitive voltage withstand Urp (L-PE/L-L)	[V]	3000/3400	3000/3400
Max. cont. operating voltage Uc (L-PE/L-L)	[V]	1260/2520	1260/2520
Maximal discharge current I _{max} (8/20)	[kA]	40	40
Maximum impulse current I _{imp} (10/350)	[kA]	2	2
Nominal discharge current I _n (8/20)	[kA]	20	20
Follow current interrupting rating I _{fi}	[kA]	-	-
Voltage protection level Up at I _n	[kV]	6	6
Voltage protection level Up at 3 kA	[kV]	4.4	4.4
Voltage protection level Up at 5 kA		-	-
Voltage protection level Up at 10 kA		-	-
TOV (Temporary overvoltage) withstand Ut (L-N: 5s./N-PE: 200ms)	[V]	-	-
U _{oc}		-	-
Response time	[ns]	≤100	≤100
Short-circuit withstand capability I _{sc}	[kA]	50	50
Backup protection maximum fuse (gG)	[A]	≤125	≤125
rating circuit breaker (B or C curve)	[A]	≤125	≤125
Pluggable cartridge		Yes	Yes
Integrated thermal disconnecter		Yes	Yes
State indicator		Yes	Yes
Safety reserve		No	No
Auxiliary contact (TS)		Yes	Yes
Installation			
Wire range (L, N, PE) solid wire	[mm ²]	2.5 ... 25	2.5 ... 25
stranded wire	[mm ²]	2.5 ... 16	2.5 ... 16
Stripping length (L, N, PE)	[mm]	11	11
Tightening torque (L, N, PE)	[Nm]	2.5	2.5
Contacts information		-	-
Min. load		-	-
Max. load		-	-
Connection cross-section	[mm ²]		
Miscellaneous characteristics			
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]		
	[inches]		
Dimensions with auxiliary contact (TS)			
height x width x depth	[mm]	100 x 178 x 65	220 x 275 x 40
	[inches]	3.94 x 7.01 x 2.56	8.66 x 10.82 x 1.57
Replacement Cartridges			
Phase Product ID		OVR T2 40-440 C/2CTB803854R0400	OVR T2 40-440 C/2CTB803854R0400



OVR WT 3L 690 P TS

2CTC435040F1701



OVR WT 3L 690 P

Due to their height, wind turbines have especially high exposure to lightning, they need high capacity and reliable lightning and surge protection.

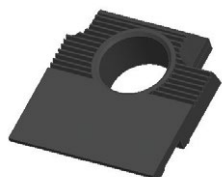
The OVR WT family takes into consideration the specificity of wind installations with a high peak repetitive voltage withstand (U_{rp} up to 3 kV) ensure a safe protection to Wind applications. It can be DIN mounted with the OVR.

Type 1+2 WT

Protected lines	Impulse current I _{imp} 10/350 kA	Max. discharge current I _{max} 8/20 kA	Nominal current I _n kA	Voltage protection level U _p kV	Max. cont. operating voltage U _{cpv} V	Bbn 366030 EAN	Ordering details		Weight 1 piece kg
							Type code	Order code	
3	2	40	20	6	400/690	518507	OVR WT 3L 690 P TS	2CTB235402R0000	1.67
3	2	40	20	6	400/690		OVR WT 3L 690 P (enclosed)	2CTB235401R0000	2.5

Protection and safety

Accessories for OVR



Accessory for
Cartridge Lock

Accessory for Cartridge Lock

This accessory can be fitted into the front of the socket of the SPD of the QS and PV range (for other families please consult us), QS and PV range, to guarantee an even higher withstand to vibrations and shocks, it reinforces mechanical lock between the cartridges and the socket (they are already locked by the pins in the back of the cartridge). It's recommended for stressful environments as the nacelle of the wind turbines. It's sold on packs of 50.

Bbn	Ordering details		Price	Weight
3660308			1	1 piece
	EAN	Type code	Order code	kg
	Accessory for Cartridge Lock (x50)		2CTB814355Z1200	0.01



Accessory for
Auxiliary contact lock

Accessory for Auxiliary contact lock

This accessory can be fitted into the top of the auxiliary contact module and guarantees an even higher withstand to stressful environments. It reinforces the mechanical lock between the auxiliary contact module and the socket of the SPD. It's recommended in environments where the cables of the auxiliary contact can suffer pulls due to the limited length of the auxiliary cables that restrict any potential movements. It's sold on packs of 50. It can not be used on single pole devices. Please order it for multipole versions.

Bbn	Ordering details		Price	Weight
3660308			1	1 piece
	EAN	Type code	Order code	kg
	Accessory for Auxiliary contact lock (x50)		2CTB814355R2700	0.01



Busbar

Label for Surge Protected Installations

This label allows the user to identify the panels where surge protection devices are fitted. It's meant to be used in the inside of the panel door and clearly states that the cartridges need to be removed to perform insulation tests. It's sold in packs of 100.

	Bbn	Ordering details		Price	Weight
	3660308			1 piece	1 piece
	EAN	Type code	Order code	kg	
Label for Surge Protected Installations (x 100)			2CTB813860R1500	0.01	

Bus bar

For TNC, IT, TNS or TT systems using single pole Type 1 SPDs assembled together, we have 2 different bus bars than can be used, as listed here below.

These both products are sold in packs of 50.

	Bbn	Ordering details		Price	Weight
	3660308			1 piece	1 piece
	EAN	Type code	Order code	kg	
Busbar for Type 1, TT/TNS 3+1 configurations (x 50)	516091		2CTB815102R0400	0.03	
Busbar for Type 1, TNC or IT 3-0 configurations (x 50)	524751		2CTB815141R0700	0.03	

UL-Power DIN-Rail Products

134 -147	OVR Type 2 surge protective devices
134	Single pole
135	Single phase networks
136–137	Single pole - Technical data
138–139	Single phase networks Technical data
140	Delta networks
141	Delta networks - Technical data
142	Split phase networks
143	Grounded Wye networks
144–145	Split phase networks Technical data
146–147	Grounded Wye networks Technical data
148–151	OVR PV surge protective devices Photovoltaic networks
148–149	Technical data
150	Type T2 PV
151	Type T1-T2 PV

Protection and safety

OVR Type 2 surge protective devices - Single pole



OVR T2 40-150 P U



OVR T2 40-440 P TS U



OVR T2 70 N P U

Descripton

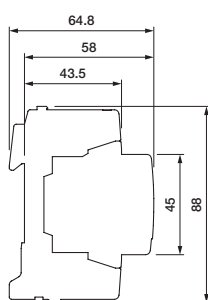
Single pole devices provide great flexibility for any kind of network configuration. OVR T2 devices provide the best protection as they are designed to protect electric installations and sensitive equipment against indirect surges with ensuring a low protection level (VPR). They are characterized by their capacity to safely discharge current with 8/20 μs wave form.

Ordering details

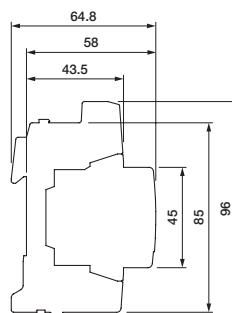
Pro- tected lines	Max dis- charge current I _{max} 8/20	Nomi- nal dis- charge current I _n	Voltage protec- tion rating VPR	Nominal voltage Un	Max. cont. operat- ing voltage MCOV	Bbn 3660308 EAN	Type code	Order code	Weight Pkg (1 pce) kg
Pluggable									
1	15	5	0.6	120	150	518514	OVR T2 15-150 P U	2CTB802341R0000	0.12
1	15	5	1	277 ±15%	320	518521	OVR T2 15-320 P U	2CTB802341R0400	0.12
1	40	20	0.6	120	150	518958	OVR T2 40-150 P U	2CTB802341R2000	0.12
1	40	20	0.6	120	150	518958	OVR T2 40-150 P TS U	2CTB802341R2100	0.12
1	40	20	1	277 ±15%	320	518965	OVR T2 40-320 P U	2CTB802341R2400	0.12
1	40	20	1	277 ±15%	320	518545	OVR T2 40-320 P TS U	2CTB802341R2500	0.12
1	40	10	1.3	347 ±15%	440	518552	OVR T2 40-440 P TS U	2CTB802341R2900	0.12
1	40	10	1.7	480 ±15%	550	518569	OVR T2 40-550 P TS U	2CTB802341R3300	0.12
1	40	10	1.9	600 ±15%	660	518576	OVR T2 40-660 P TS U	2CTB802341R3700	0.12
Neutral - Pluggable									
1	70	20	1.2	230	275	518583	OVR T2 70 N P U	2CTB802341R8000	0.12

Type code	Width mm
OVR T2 15-150 P U	17.8
OVR T2 15-320 P U	17.8
OVR T2 40-150 P U	17.8
OVR T2 40-150 P TS U	17.8
OVR T2 40-320 P U	17.8
OVR T2 40-320 P TS U	17.8
OVR T2 40-440 P TS U	17.8
OVR T2 40-550 P TS U	17.8
OVR T2 40-660 P TS U	17.8
OVR T2 70 N P U	17.8

Main dimensions mm



OVR T2 15-150 P U
OVR T2 15-320 P U
OVR T2 40-150 P U
OVR T2 40-320 P U
OVR T2 70 N P U



OVR T2 40-150 P TS U
OVR T2 40-320 P TS U
OVR T2 40-440 P TS U
OVR T2 40-550 P TS U
OVR T2 40-660 P TS U

Protection and safety

OVR Type 2 surge protective devices - Single phase networks



OVR T2 1N 40-150 P U



OVR T2 1N 40-660 P TS U

Description

Single phase devices are composed by a MOV pole plus a spark gap one. The spark gap pole guarantees the lowest voltage protection rating and has to be connected to the Neutral.

OVR T2 devices provide the best protection as they are designed to protect electric installations and sensitive equipment against indirect surges with ensuring a low protection level (VPR). They are characterized by their capacity to safely discharge current with 8/20 μs wave form.

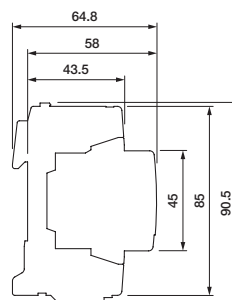
Ordering details

Pro- tected lines	Max dis- charge current I _{max} 8/20	Nominal dis- charge current I _n	Voltage protec- tion rating VPR	Nominal voltage Un	Max. cont. operat- ing voltage MCOV, U _c	Bbn 3660308 EAN	Type code	Order code	Weight Pkg (1 pce) kg
Pluggable									
2	15	5	1.2	120	150	519238	OVR T2 1N 15-150 P U	2CTB802342R0000	0.24
2	15	5	1.2	277	320	519245	OVR T2 1N 15-320 P U	2CTB802342R0400	0.24
2	40	20	1.2	120	150	520869	OVR T2 1N 40-150 P U	2CTB802342R2000	0.24
2	40	20	1.2	120	150	520876	OVR T2 1N 40-150 P U (x10)	2CTB802342R8000	0.24
2	40	20	1.2	120	150	819252	OVR T2 1N 40-150 P TS U	2CTB802342R2100	0.24
2	40	20	1.2	277	320	519269	OVR T2 1N 40-320 P TS U	2CTB802342R2500	0.24
2	40	10	1.2	347	440	519276	OVR T2 1N 40-440 P TS U	2CTB802342R2900	0.24
2	40	10	1.2	480	550	519283	OVR T2 1N 40-550 P TS U	2CTB802342R3300	0.24
2	40	10	1.2	600	660	519290	OVR T2 1N 40-660 P TS U	2CTB802342R3700	0.24

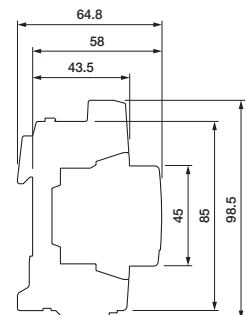
(x10) packaging of 10 pieces.

Type code	Width mm
OVR T2 1N 15-150 P U	35.6
OVR T2 1N 15-320 P U	35.6
OVR T2 1N 40-150 P U	35.6
OVR T2 1N 40-150 P TS U	35.6
OVR T2 1N 40-320 P TS U	35.6
OVR T2 1N 40-440 P TS U	35.6
OVR T2 1N 40-550 P TS U	35.6
OVR T2 1N 40-660 P TS U	35.6

Main dimensions mm



OVR T2 1N 15-150 P U
OVR T2 1N 15-320 P U
OVR T2 1N 40-150 P U



OVR T2 1N 40-150 P TS U
OVR T2 1N 40-320 P TS U
OVR T2 1N 40-440 P TS U
OVR T2 1N 40-550 P TS U
OVR T2 1N 40-660 P TS U

Protection and safety

OVR Type 2 surge protective devices - Single pole



General technical data

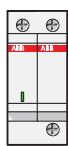
Type code	OVR T2 15-150 P U	OVR T2 15-320 P U	OVR T2 40-150 P U
with auxiliary contact (TS)	-	-	OVR T2 40-150 P TS U
Technology	Varistor	Varistor	Varistor
Electrical features			
Standard	UL 1449	UL 1449	UL 1449
Type / test class (UL 1449)	1	1	1
Protected lines	1	1	1
System network	-	-	-
Type of current / frequency	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz
Voltage regulation of the system network	±15%	±15%	±15%
Nominal system voltage Un	120 V	277 V	120 V
Maximum continuous operating voltage MCOV	150 V	320 V	150 V
Maximal discharge current (8/20) Imax	15 kA	15 kA	40 kA
Nominal discharge current (8/20) In	5 kA	5 kA	20 kA
Voltage protection rating (L-N / N-G / L-G) VPR	0.6 kV	1 kV	0.6 kV
Response time	< 25 ns	< 25 ns	< 25 ns
Short circuit withstand SCCR	200 kA	200 kA	200 kA
Back up protection fuse (gG - gL) maximum rating	≤ 100 A	≤ 100 A	≤ 100 A
circuit breaker (B or C Curve)	≤ 125 A	≤ 125 A	≤ 125 A
Pluggable cartridges	Yes	Yes	Yes
Integrated QuickSafe® technology	Yes	Yes	Yes
State indicator	Yes	Yes	Yes
Safety reserve	-	-	-
Auxiliary contact (TS)	No	No	Yes (TS option)
Installation			
Wire range (L,N,PE)	solid wire	2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²
	stranded wire	2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²
Stripping length (L,N,PE)		12.5 / 0.5 mm	12.5 / 0.5 mm
Tightening torque (L,N,PE)		2.8 / 24.5 Nm	2.8 / 24.5 Nm
Auxiliary contact (TS)			
Contact information	-	-	1 NO – 1 NC
Min. load	-	-	12 V DC – 10 mA
Max. load	-	-	250 V AC – 1 A
Connection cross section	-	-	1.5 / 16 mm ²
Miscellaneous characteristics			
Stocking temperature		-40...+80 °C	-40...+80 °C
Maximal Altitude		5 000 m	5 000 m
Operating temperature		-40...+176 °C	-40...+176 °C
Degree of protection		NEMA 1	NEMA 1
Fire resistance according to UL 94		V0	V0
Dimensions	mm	h x w x d 88 x 17.8 x 64.8 mm	88 x 17.8 x 64.8 mm
	inches	h x w x d 3.46 x 0.7 x 2.55 in	3.46 x 0.7 x 2.55 in
Dimensions with auxiliary contact (TS)	mm	h x w x d -	96 x 17.8 x 64.8 mm
	inches	h x w x d -	3.78 x 0.7 x 2.55 in
Replacement cartridges			
Phase product ID	Type code	OVR T2 15-150 C U	OVR T2 15-320 C U
	Order code	2CTB802348R2500	2CTB802348R2700
Neutral product ID	Type code	-	-
	Order code	-	-



OVR T2 40-320 P U	-	-	-	OVR T2 70 N P U
OVR T2 40-320 P TS U	OVR T2 40-440 P TS U	OVR T2 40-550 P TS U	OVR T2 40-660 P TS U	-
Varistor	Varistor	Varistor	Varistor	Spark gap
UL 1449	UL 1449	UL 1449	UL 1449	UL 1449
1	1	1	1	4
1	1	1	1	1
-	-	-	-	-
AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz
±15%	±15%	±15%	±15%	+15%
277 V	347 V	480 V	600 V	230 V
320 V	440 V	550 V	660 V	275 V
40 kA	40 kA	40 kA	40 kA	70 kA
20 kA	10 kA	10 kA	10 kA	20 kA
1 kV	1.3 kV	1.7 kV	1.9 kV	1.2 kV
< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns
200 kA	200 kA	200 kA	200 kA	200 kA
≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A
≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A
Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	No
Yes	Yes	Yes	Yes	Yes
-	-	-	-	-
Yes (TS option)	Yes	Yes	Yes	No
2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²
2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²
12.5 / 0.5 mm	12.5 / 0.5 mm	12.5 / 0.5 mm	12.5 / 0.5 mm	12.5 / 0.5 mm
2.8 / 24.5 Nm	2.8 / 24.5 Nm	2.8 / 24.5 Nm	2.8 / 24.5 Nm	2.8 / 24.5 Nm
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 - 1 A	250 V AC - 1 A	250 V AC - 1 A	250 V AC - 1 A	-
1.5 / 16 mm ²	1.5 / 16 mm ²	1.5 / 16 mm ²	1.5 / 16 mm ²	-
-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C
5 000 m	5 000 m	5 000 m	5 000 m	5 000 m
-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C
NEMA 1	NEMA 1	NEMA 1	NEMA 1	NEMA 1
V0	V0	V0	V0	V0
88 x 17.8 x 64.8 mm	-	-	-	88 x 17.8 x 64.8 mm
3.46 x 0.7 x 2.55 in	-	-	-	3.46 x 0.7 x 2.55 in
96 x 17.8 x 64.8 mm	96 x 17.8 x 64.8 mm	96 x 17.8 x 64.8 mm	96 x 17.8 x 64.8 mm	-
3.78 x 0.7 x 2.55 in	3.78 x 0.7 x 2.55 in	3.78 x 0.7 x 2.55 in	3.78 x 0.7 x 2.55 in	-
OVR T2 40-320 C U	OVR T2 40-440 C U	OVR T2 40-550 C U	OVR T2 40-660 C U	-
2CTB802348R3700	2CTB802348R3900	2CTB802348R4100	2CTB802348R4300	-
-	-	-	-	OVR T2 70 N C U
-	-	-	-	2CTB802348R6500

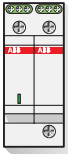
Protection and safety

OVR Type 2 surge protective devices - Single phase networks



General technical data

Type code	OVR T2 1N 15-150 P U		OVR T2 1N 15-320 P U	OVR T2 1N 40-150 P U
with auxiliary contact (TS)	-		-	OVR T2 1N 40-150 P TS U
Electrical features				
Standards	UL 1449		UL 1449	UL 1449
Type / test class (UL 1449)	4		4	4
Protected lines	2		2	2
Type of current / frequency	AC 47-63 Hz		AC 47-63 Hz	AC 47-63 Hz
Voltage regulation of the system network	±15%		±15%	±15%
Nominal system voltage Un	120 V		277 V	120 V
Maximum continuous operating voltage MCOV	150 V		320 V	150 V
Maximal discharge current (8/20) Imax	15 kA		15 kA	40 kA
Nominal discharge current (8/20) In	5 kA		5 kA	20 kA
Voltage protection rating (L-N / N-G / L-G) VPR	1.2 kV		1.2 kV	1.2 kV
Response time	< 25 ns		< 25 ns	< 25 ns
Short circuit withstand	SCCR 200 kA		200 kA	200 kA
Back up protection maximum rating	fuse (gG - gL)	≤ 100 A	≤ 100 A	≤ 100 A
	circuit breaker (B or C curve)	≤ 125 A	≤ 125 A	≤ 125 A
Pluggable cartridges	Yes		Yes	Yes
Integrated QuickSafe® technology	Yes		Yes	Yes
State indicator	Yes		Yes	Yes
Safety reserve	-		-	-
Auxiliary contact (TS)	No		No	Yes (TS option)
Installation				
Wire range (L,N,PE)	solid wire	2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²
	stranded wire	2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²
Stripping length (L,N,PE)	12.5 / 0.5 mm		12.5 / 0.5 mm	12.5 / 0.5 mm
Tightening torque (L,N,PE)	2.8 / 24.5 Nm		2.8 / 24.5 Nm	2.8 / 24.5 Nm
Auxiliary contact (TS)				
Contact information				2 NO – 2 NC
Min. load				12 V DC – 10 mA
Max. load				250 V AC – 1 A
Connection cross section				1.5 / 16 mm ²
Miscellaneous characteristics				
Stocking temperature	-40...+80 °C		-40...+80 °C	-40...+80 °C
Maximal Altitude	5 000 m		5 000 m	5 000 m
Operating temperature	-40...+176 °C		-40...+176 °C	-40...+176 °C
Degree of protection	NEMA 1		NEMA 1	NEMA 1
Fire resistance according to UL 94	V0		V0	V0
Dimensions	mm	h x w x d 90.5 x 35.6 x 64.8 mm	90.5 x 35.6 x 64.8 mm	90.5 x 35.6 x 64.8 mm
	inches	h x w x d 3.56 x 1.4 x 2.55 in	3.56 x 1.4 x 2.55 in	3.56 x 1.4 x 2.55 in
Dimensions with auxiliary contact (TS)	mm	h x w x d –	–	98.5 x 35.6 x 64.8 mm
	inches	h x w x d –	–	3.88 x 1.4 x 2.55 in
Replacement cartridges				
Phase product ID	Type code	OVR T2 15-150 C U	OVR T2 15-320 C U	OVR T2 40-150 C U
	Order code	2CTB802348R2500	2CTB802348R2700	2CTB802348R3500
Neutral product ID	Type code	OVR T2 70 N C U	OVR T2 70 N C U	OVR T2 70 N C U
	Order code	2CTB802348R6500	2CTB802348R6500	2CTB802348R6500



-	-	-	-
OVR T2 1N 40-320 P TS U	OVR T2 1N 40-440 P TS U	OVR T2 1N 40-550 P TS U	OVR T2 1N 40-660 P TS U
UL 1449	UL 1449	UL 1449	UL 1449
4	4	4	4
2	2	2	2
AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz
±15%	±15%	±15%	±15%
277 V	347 V	480 V	600 V
320 V	440 V	550 V	660 V
40 kA	40 kA	40 kA	40 kA
20 kA	10 kA	10 kA	10 kA
1.2 kV	1.2 kV	1.2 kV	1.2 kV
< 25 ns	< 25 ns	< 25 ns	< 25 ns
200 kA	200 kA	200 kA	200 kA
≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A
≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A
Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes
-	-	-	-
Yes	Yes	Yes	Yes
2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²
2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²
12.5 / 0.5 mm	12.5 / 0.5 mm	12.5 / 0.5 mm	12.5 / 0.5 mm
2.8 / 24.5 Nm	2.8 / 24.5 Nm	2.8 / 24.5 Nm	2.8 / 24.5 Nm
2 NO – 2 NC	2 NO – 2 NC	2 NO – 2 NC	2 NO – 2 NC
12 V DC – 10 mA	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	250 V AC – 1 A
1.5 / 16 mm ²	1.5 / 16 mm ²	1.5 / 16 mm ²	1.5 / 16 mm ²
-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C
5 000 m	5 000 m	5 000 m	5 000 m
-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C
NEMA 1	NEMA 1	NEMA 1	NEMA 1
V0	V0	V0	V0
-	-	-	-
-	-	-	-
98.5 x 35.6 x 64.8 mm	98.5 x 35.6 x 64.8 mm	98.5 x 35.6 x 64.8 mm	98.5 x 35.6 x 64.8 mm
3.88 x 1.4 x 2.55 in	3.88 x 1.4 x 2.55 in	3.88 x 1.4 x 2.55 in	3.88 x 1.4 x 2.55 in
OVR T2 40-320 C U	OVR T2 40-440 C U	OVR T2 40-550 C U	OVR T2 40-660 C U
2CTB802348R3700	2CTB802348R3900	2CTB802348R4100	2CTB802348R4300
OVR T2 70 N C U	OVR T2 70 N C U	OVR T2 70 N C U	OVR T2 70 N C U
2CTB802348R6500	2CTB802348R6500	2CTB802348R6500	2CTB802348R6500

Protection and safety

OVR Type 2 surge protective devices - Delta networks



2CTC432-131F1701

OVR T2 3L 15-320 P U



2CTC432-133F1701

OVR T2 3L 40-320 P TS U

Description

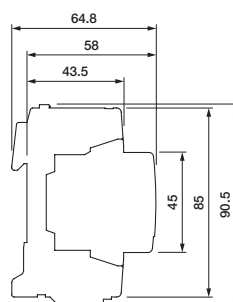
Delta devices provide the protection required by the three phases of a Delta network system. OVR T2 devices provide the best protection as they are designed to protect electric installations and sensitive equipment against indirect surges with ensuring a low protection level (VPR). They are characterized by their capacity to safely discharge current with 8/20 μs wave form.

Ordering details

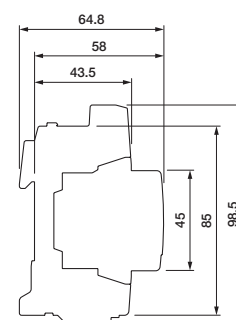
Pro- tected lines	Max dis- charge current I _{max} 8/20	Nominal dis- charge current I _n	Voltage protec- tion rating VPR	Nominal voltage U _n	Max. cont. operat- ing voltage MCOV, U _c	Bbn 3660308	Type code	Order code	Weight Pkg (1 pce)
	kA	kA	kV	V	V	EAN			kg
Pluggable									
3	15	5	1	277 ±15%	320	518644	OVR T2 3L 15-320 P U	2CTB802345R0400	0.36
3	40	20	1	277 ±15%	320	518668	OVR T2 3L 40-320 P TS U	2CTB802345R2500	0.36
3	40	10	1.7	480 ±15%	550	518682	OVR T2 3L 40-550 P TS U	2CTB802345R3300	0.36

Type code	Width mm
OVR T2 3L 15-320 P U	53.4
OVR T2 3L 40-320 P TS U	53.4
OVR T2 3L 40-550 P TS U	53.4

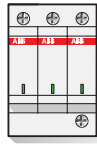
Main dimensions mm



OVR T2 3L 15-320 P U



OVR T2 3L 40-320 P TS U
OVR T2 3L 40-550 P TS U



General technical data

Type code	OVR T2 3L 15-320 P U		-	-
with auxiliary contact (TS)	-		OVR T2 3L 40-320 P TS U	OVR T2 3L 40-550 P TS U
Electrical features				
Standards	UL 1449		UL 1449	UL 1449
Type / test class (UL 1449)	1		1	1
Protected lines	3		3	3
Type of current / frequency	AC 47-63 Hz		AC 47-63 Hz	AC 47-63 Hz
Voltage regulation of the system network	±15%		±15%	±15%
Nominal system voltage Un	277 V		277 V	480 V
Maximum continuous operating voltage MCOV	320 V		320 V	550 V
Maximal discharge current (8/20) I _{max}	15 kA		40 kA	40 kA
Nominal discharge current (8/20) I _n	5 kA		20 kA	10 kA
Voltage protection rating (L-N / N-G / L-G) VPR	1 kV		1 kV	1.7 kV
Response time	< 25 ns		< 25 ns	< 25 ns
Short circuit withstand	SCCR	200 kA	200 kA	200 kA
Back up protection maximum rating	fuse (gG - gL)	≤ 100 A	≤ 100 A	≤ 100 A
	circuit breaker (B or C curve)	≤ 125 A	≤ 125 A	≤ 125 A
Pluggable cartridges	Yes		Yes	Yes
Integrated QuickSafe® technology	Yes		Yes	Yes
State indicator	Yes		Yes	Yes
Safety reserve	-		-	-
Auxiliary contact (TS)	No		Yes	Yes
Installation				
Wire range (L,N,PE)	solid wire	2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²
	stranded wire	2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²
Stripping length (L,N,PE)	12.5 / 0.5 mm		12.5 / 0.5 mm	12.5 / 0.5 mm
Tightening torque (L,N,PE)	2.8 / 24.5 Nm		2.8 / 24.5 Nm	2.8 / 24.5 Nm
Auxiliary contact (TS)				
Contact information	-		3 NO – 3 NC	3 NO – 3 NC
Min. load	-		12 V DC – 10 mA	12 V DC – 10 mA
Max. load	-		250 V AC – 1 A	250 V AC – 1 A
Connection cross section	-		1.5 / 16 mm ²	1.5 / 16 mm ²
Miscellaneous characteristics				
Stocking temperature	-40...+80 °C		-40...+80 °C	-40...+80 °C
Maximal Altitude	5 000 m		5 000 m	5 000 m
Operating temperature	-40...+176 °C		-40...+176 °C	-40...+176 °C
Degree of protection	NEMA 1		NEMA 1	NEMA 1
Fire resistance according to UL 94	V0		V0	V0
Dimensions	mm	h x w x d 90.5 x 53.4 x 64.8 mm	-	-
	inches	h x w x d 3.56 x 2.1 x 2.55 in	-	-
Dimensions with auxiliary contact (TS)	mm	h x w x d -	98.5 x 53.4 x 64.8 mm	98.5 x 53.4 x 64.8 mm
	inches	h x w x d -	3.88 x 2.1 x 2.55 in	3.88 x 2.1 x 2.55 in
Replacement cartridges				
Phase product ID	Type code	OVR T2 15-320 C U	OVR T2 40-320 C U	OVR T2 40-550 C U
	Order code	2CTB802348R2700	2CTB802348R3700	2CTB802348R4100
Neutral product ID	Type code	-	-	-
	Order code	-	-	-

Protection and safety

OVR T2 surge protective devices - Split phase networks



2CTC4321265FT01

OVR T2 2L 15-320 P U

Description

Split phase devices are composed by two MOV poles or two MOV poles plus a spark gap one, depending on the number of lines the customer wants to protect. The spark gap pole guarantees the lowest voltage protection rating and has to be connected to the neutral.

OVR T2 devices provide the best protection as they are designed to protect electric installations and sensitive equipment against indirect surges with ensuring a low protection level (VPR). They are characterized by their capacity to safely discharge current with 8/20 μ s wave form.



2CTC4321299FT01

OVR T2 2L 40-320 P TS U



2CTC4321799FT01

OVR T2 2N 15-320 P U



2CTC4321825FT01

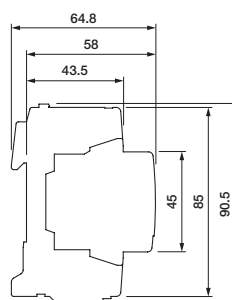
OVR T2 2N 40-440 P TS U

Ordering details

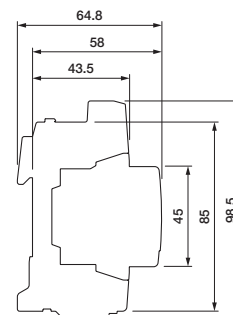
Pro- tected lines	Max dis- charge current I _{max} 8/20	Nominal dis- charge current I _n	Voltage protec- tion rating VPR	Nominal voltage U _n	Max. cont. operat- ing voltage MCOV, U _c	Bbn 3660308	Type code	Order code	Weight Pkg (1 pce)
	kA	kA	kV	V	V	EAN			kg
Pluggable									
2	15	5	0.6	120 ±15%	175	518590	OVR T2 2L 15-150 P U	2CTB802343R0000	0.24
2	15	5	1	277 ±15%	320	518606	OVR T2 2L 15-320 P U	2CTB802343R0400	0.24
2	40	20	0.6	120 ±15%	175	518613	OVR T2 2L 40-150 P TS U	2CTB802343R2100	0.24
2	40	20	1	277 ±15%	320	518620	OVR T2 2L 40-320 P TS U	2CTB802343R2500	0.24
3	15	5	0.7	120 ±15%	175	519306	OVR T2 2N 15-150 P U	2CTB802344R0000	0.36
3	15	5	1.1	277 ±15%	320	519313	OVR T2 2N 15-320 P U	2CTB802344R0400	0.36
3	40	20	0.7	120 ±15%	175	519320	OVR T2 2N 40-150 P TS U	2CTB802344R2100	0.36
3	40	20	1.1	277 ±15%	320	519337	OVR T2 2N 40-320 P TS U	2CTB802344R2500	0.36
3	40	10	1.4	347 ±15%	440	519344	OVR T2 2N 40-440 P TS U	2CTB802344R2900	0.36
3	40	10	1.8	480 ±15%	550	519351	OVR T2 2N 40-550 P TS U	2CTB802344R3300	0.36
3	40	10	2	600 ±15%	660	519368	OVR T2 2N 40-660 P TS U	2CTB802344R3700	0.36

Type code	Width mm
OVR T2 2L 15-150 P U	35.6
OVR T2 2L 15-320 P U	35.6
OVR T2 2L 40-150 P TS U	35.6
OVR T2 2L 40-320 P TS U	35.6
OVR T2 2N 15-150 P U	53.4
OVR T2 2N 15-320 P U	53.4
OVR T2 2N 40-150 P TS U	53.4
OVR T2 2N 40-320 P TS U	53.4
OVR T2 2N 40-440 P TS U	53.4
OVR T2 2N 40-550 P TS U	53.4
OVR T2 2N 40-660 P TS U	53.4

Main dimensions mm



OVR T2 2L 15-150 P U
OVR T2 2L 15-320 P U
OVR T2 2N 15-150 P U
OVR T2 2N 15-320 P U



OVR T2 2L 40-150 P TS U
OVR T2 2L 40-320 P TS U
OVR T2 2N 40-150 P TS U
OVR T2 2N 40-320 P TS U
OVR T2 2N 40-440 P TS U
OVR T2 2N 40-550 P TS U
OVR T2 2N 40-660 P TS U

Protection and safety

OVR T2 surge protective devices - Grounded Wye networks



2CTC432139F1701

OVR T2 3L 40-440
P TS U

Description

Wye devices are composed by three MOV poles or three MOV poles plus a spark gap one, depending on the number of lines the customer wants to protect. The spark gap pole guarantees the lowest voltage protection rating and has to be connected to the Neutral.

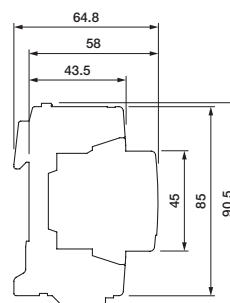
OVR T2 devices provide the best protection as they are designed to protect electric installations and sensitive equipment against indirect surges with ensuring a low protection level (VPR). They are characterized by their capacity to safely discharge current with 8/20 μ s wave form.

Ordering details

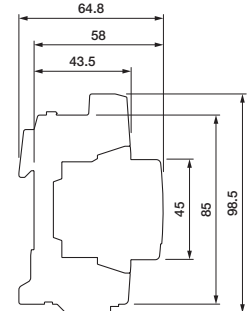
Pro- tected lines	Max dis- charge current I _{max} 8/20	Nominal dis- charge current I _n	Voltage protec- tion rating VPR	Nominal voltage U _n	Max. cont. operat- ing voltage MCOV, U _c	Bbn 3660308 EAN	Type code	Order code	Weight
									Pkg (1 pce)
									kg
Pluggable									
3	15	5	0.6	120 ±15%	175	518637	OVR T2 3L 15-150 P U	2CTB802345R0000	0.36
3	40	20	0.6	120 ±15%	175	518651	OVR T2 3L 40-150 P TS U	2CTB802345R2100	0.36
3	40	10	1.3	347 ±15%	440	518675	OVR T2 3L 40-440 P TS U	2CTB802345R2900	0.36
4	15	5	1.2	120 ±15%	175	518699	OVR T2 3N 15-150 P U	2CTB802346R0000	0.48
4	15	5	1.2	277 ±15%	320	518705	OVR T2 3N 15-320 P U	2CTB802346R0400	0.48
4	40	20	1.2	120 ±15%	175	518712	OVR T2 3N 40-150 P TS U	2CTB802346R2100	0.48
4	40	20	1.2	277 ±15%	320	518729	OVR T2 3N 40-320 P TS U	2CTB802346R2500	0.48
4	40	10	1.2	347 ±15%	440	518736	OVR T2 3N 40-440 P TS U	2CTB802346R2900	0.48
4	40	10	1.2	480 ±15%	550	518743	OVR T2 3N 40-550 P TS U	2CTB802346R3300	0.48
4	40	10	1.2	600 ±15%	660	518750	OVR T2 3N 40-660 P TS U	2CTB802346R3700	0.48

Type code	Width mm
OVR T2 3L 15-150 P U	53.4
OVR T2 3L 40-150 P TS U	53.4
OVR T2 3L 40-440 P TS U	53.4
OVR T2 3N 15-150 P U	71.2
OVR T2 3N 15-320 P U	71.2
OVR T2 3N 40-150 P TS U	71.2
OVR T2 3N 40-320 P TS U	71.2
OVR T2 3N 40-440 P TS U	71.2
OVR T2 3N 40-550 P TS U	71.2
OVR T2 3N 40-660 P TS U	71.2

Main dimensions mm



OVR T2 3L 15-150 P U
OVR T2 3N 15-150 P U
OVR T2 3N 15-320 P U



OVR T2 3L 40-150 P TS U
OVR T2 3L 40-440 P TS U
OVR T2 3N 40-150 P TS U
OVR T2 3N 40-320 P TS U
OVR T2 3N 40-440 P TS U
OVR T2 3N 40-550 P TS U
OVR T2 3N 40-660 P TS U

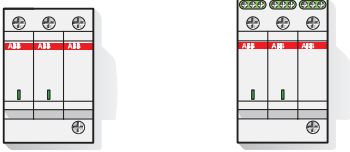
Protection and safety

OVR Type 2 surge protective devices - Split phase networks



General technical data

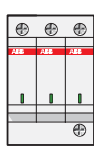
Type code	OVR T2 2L 15-150 P U	OVR T2 2L 15-320 P U	–	–	OVR T2 2N 15-150 P U	
with auxiliary contact (TS)	–	–	OVR T2 2L 40- 150 P TS U	OVR T2 2L 40- 320 P TS U	–	
Electrical features						
Standards	UL 1449	UL 1449	UL 1449	UL 1449	UL 1449	
Type / test class (UL 1449)	1	1	1	1	4	
Protected lines	2	2	2	2	3	
Type of current / frequency	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	±15%	±15%	±15%	±15%	±15%	
Nominal system voltage Un	120 V	277 V	120 V	277 V	120 V	
Maximum continuous operating voltage MCOV	175 V	320 V	175 V	320 V	175 V	
Maximal discharge current (8/20) Imax	15 kA	15 kA	40 kA	40 kA	15 kA	
Nominal discharge current (8/20) In	5 kA	5 kA	20 kA	20 kA	5 kA	
Voltage protection rating (L-N / N-G / L-G) VPR	0.6 kV	1 kV	0.6 kV	1 kV	0.7 kV	
Response time	< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns	
Short circuit withstand SCCR	200 kA	200 kA	200 kA	200 kA	200 kA	
Back up protection maximum rating	fuse (gG - gL)	≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A	
	circuit breaker (B or C curve)	≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A	
Pluggable cartridges	Yes	Yes	Yes	Yes	Yes	
Integrated QuickSafe® technology	Yes	Yes	Yes	Yes	Yes	
State indicator	Yes	Yes	Yes	Yes	Yes	
Safety reserve	–	–	–	–	–	
Auxiliary contact (TS)	No	No	Yes	Yes	No	
Installation						
Wire range (L,N,PE)	solid wire	2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²
	stranded wire	2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²
Stripping length (L,N,PE)		12.5 / 0.5	12.5 / 0.5	12.5 / 0.5	12.5 / 0.5	12.5 / 0.5
Tightening torque (L,N,PE)		2.8 / 24.5 Nm	2.8 / 24.5 Nm	2.8 / 24.5 Nm	2.8 / 24.5 Nm	2.8 / 24.5 Nm
Auxiliary contact (TS)						
Contact information	–	–	2 NO – 2 NC	2 NO – 2 NC	–	
Min. load	–	–	12 V DC – 10 mA	12 V DC – 10 mA	–	
Max. load	–	–	250 V AC – 1 A	250 V AC – 1 A	–	
Connection cross section	–	–	1.5 / 16 mm ²	1.5 / 16 mm ²	–	
Miscellaneous characteristics						
Stocking temperature		-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C	
Maximal Altitude		5 000 m	5 000 m	5 000 m	5 000 m	
Operating temperature		-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C	
Degree of protection		NEMA 1	NEMA 1	NEMA 1	NEMA 1	
Fire resistance according to UL 94		V0	V0	V0	V0	
Dimensions	mm	h x w x d 90.5 x 35.6 x 64.8 mm	90.5 x 35.6 x 64.8 mm	–	–	90.5 x 53.4 x 64.8 mm
	inches	h x w x d 3.56 x 1.4 x 2.55 in	3.56 x 1.4 x 2.55 in	–	–	3.56 x 2.1 x 2.55 in
Dimensions with auxiliary contact (TS)	mm	h x w x d –	–	98.5 x 35.6 x 64.8 mm	98.5 x 35.6 x 64.8 mm	–
	inches	h x w x d –	–	3.88 x 1.4 x 2.55 in	3.88 x 1.4 x 2.55 in	–
Replacement cartridges						
Phase product ID	Type code	OVR T2 15-150 C U	OVR T2 15-320 C U	OVR T2 40-150 C U	OVR T2 40-320 C U	OVR T2 15-150 C U
	Order code	2CTB802348R2500	2CTB802348R2700	2CTB802348R3500	2CTB802348R3700	2CTB802348R2500
Neutral product ID	Type code	–	–	–	–	OVR T2 70 N C U
	Order code	–	–	–	–	2CTB802348R6500



OVR T2 2N 15-320 P U	-	-	-	-	-
-	OVR T2 2N 40-150 P TS U	OVR T2 2N 40-320 P TS U	OVR T2 2N 40-440 P TS U	OVR T2 2N 40-550 P TS U	OVR T2 2N 40-660 P TS U
UL 1449	UL 1449	UL 1449	UL 1449	UL 1449	UL 1449
4	4	4	4	4	4
3	3	3	3	3	3
AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz
±15%	±15%	±15%	±15%	±15%	±15%
277 V	120 V	277 V	347 V	480 V	600 V
320 V	175 V	320 V	440 V	550 V	660 V
15 kA	40 kA	40 kA	40 kA	40 kA	40 kA
5 kA	20 kA	20 kA	10 kA	10 kA	10 kA
1.1 kV	0.7 kV	1.1 kV	1.4 kV	1.8 kV	2 kV
< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns
200 kA	200 kA	200 kA	200 kA	200 kA	200 kA
≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A
≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes
-	-	-	-	-	-
No	Yes	Yes	Yes	Yes	Yes
2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²
2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²
12.5 / 0.5	12.5 / 0.5	12.5 / 0.5	12.5 / 0.5	12.5 / 0.5	12.5 / 0.5
2.8 / 24.5 Nm	2.8 / 24.5 Nm	2.8 / 24.5 Nm	2.8 / 24.5 Nm	2.8 / 24.5 Nm	2.8 / 24.5 Nm
-	3 NO - 3 NC	3 NO - 3 NC	3 NO - 3 NC	3 NO - 3 NC	3 NO - 3 NC
-	12 V DC - 10 mA	12 V DC - 10 mA	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	250 V AC - 1 A	250 V AC - 1 A
-	1.5 / 16 mm ²	1.5 / 16 mm ²	1.5 / 16 mm ²	1.5 / 16 mm ²	1.5 / 16 mm ²
-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C
5 000 m	5 000 m	5 000 m	5 000 m	5 000 m	5 000 m
-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C
NEMA 1	NEMA 1	NEMA 1	NEMA 1	NEMA 1	NEMA 1
V0	V0	V0	V0	V0	V0
90.5 x 53.4 x 64.8 mm	-	-	-	-	-
3.56 x 2.1 x 2.55 in	-	-	-	-	-
-	98.5 x 53.4 x 64.8 mm	98.5 x 53.4 x 64.8 mm	98.5 x 53.4 x 64.8 mm	98.5 x 53.4 x 64.8 mm	98.5 x 53.4 x 64.8 mm
-	3.88 x 2.1 x 2.55 in	3.88 x 2.1 x 2.55 in	3.88 x 2.1 x 2.55 in	3.88 x 2.1 x 2.55 in	3.88 x 2.1 x 2.55 in
-	1 NO - 1 NC	1 NO - 1 NC	1 NO - 1 NC	1 NO - 1 NC	1 NO - 1 NC
OVR T2 15-320 C U	OVR T2 40-150 C U	OVR T2 40-320 C U	OVR T2 40-440 C U	OVR T2 40-550 C U	OVR T2 40-660 C U
2CTB802348R2700	2CTB802348R3500	2CTB802348R3700	2CTB802348R3900	2CTB802348R4100	2CTB802348R4300
OVR T2 70 N C U	OVR T2 70 N C U	OVR T2 70 N C U	OVR T2 70 N C U	OVR T2 70 N C U	OVR T2 70 N C U
2CTB802348R6500	2CTB802348R6500	2CTB802348R6500	2CTB802348R6500	2CTB802348R6500	2CTB802348R6500

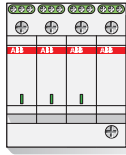
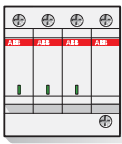
Protection and safety

OVR Type 2 surge protective devices - Grounded Wye networks



General technical data

Type code	OVR T2 3L 15-150 P U	-	-	OVR T2 3N 15-150 P U
with auxiliary contact (TS)	-	OVR T2 3L 40-150 P TS U	OVR T2 3L 40-440 P TS U	-
Electrical features				
Standards	UL 1449	UL 1449	UL 1449	UL 1449
Type / test class (UL 1449)	1	1	1	4
Protected lines	3	3	3	4
Type of current / frequency	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz
Voltage regulation of the system network	±15%	±15%	±15%	±15%
Nominal system voltage Un	120 V	120 V	347 V	120 V
Maximum continuous operating voltage MCOV	175 V	175 V	440 V	175 V
Maximal discharge current (8/20) I _{max}	15 kA	40 kA	40 kA	15 kA
Nominal discharge current (8/20) I _n	5 kA	10 kA	10 kA	5 kA
Voltage protection rating (L-N / N-G / L-G VPR)	0.6 kV	0.6 kV	1.3 kV	0.6 kV
Response time	< 25 ns	< 25 ns	< 25 ns	< 25 ns
Short circuit withstand	SCCR 200 kA	200 kA	200 kA	200 kA
Back up protection	fuse (gG - gL) ≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A
maximum rating	circuit breaker (B or C curve) ≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A
Pluggable cartridges	Yes	Yes	Yes	Yes
Integrated QuickSafe® technology	Yes	Yes	Yes	Yes
State indicator	Yes	Yes	Yes	Yes
Safety reserve	-	-	-	-
Auxiliary contact (TS)	No	Yes	Yes	No
Installation				
Wire range (L,N,PE)	solid wire 2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²
	stranded wire 2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²
Stripping length (L,N,PE)	12.5 / 0.5 mm	12.5 / 0.5 mm	12.5 / 0.5 mm	12.5 / 0.5 mm
Tightening torque (L,N,PE)	2.8 / 24.5 Nm	2.8 / 24.5 Nm	2.8 / 24.5 Nm	2.8 / 24.5 Nm
Auxiliary contact (TS)				
Contact information	-	4 NO – 4 NC	4 NO – 4 NC	-
Min. load	-	12 V DC – 10 mA	12 V DC – 10 mA	-
Max. load	-	250 V AC – 1 A	250 V AC – 1 A	-
Connection cross section	-	1.5 / 16 mm ²	1.5 / 16 mm ²	-
Miscellaneous characteristics				
Stocking temperature	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C
Maximal Altitude	5 000 m	5 000 m	5 000 m	5 000 m
Operating temperature	-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C
Degree of protection	NEMA 1	NEMA 1	NEMA 1	NEMA 1
Fire resistance according to UL 94	V0	V0	V0	V0
Dimensions	mm h x w x d 90.5 x 53.4 x 64.8 mm	-	-	90.5 x 71.2 x 64.8 mm
	inches h x w x d 3.56 x 2.1 x 2.55 in	-	-	3.56 x 2.8 x 2.55 in
Dimensions with auxiliary contact (TS)	mm h x w x d -	98.5 x 53.4 x 64.8 mm	98.5 x 53.4 x 64.8 mm	-
	inches h x w x d -	3.88 x 2.1 x 2.55 in	3.88 x 2.1 x 2.55 in	-
Replacement cartridges				
Phase product ID	Type code	OVR T2 15-150 C U	OVR T2 40-150 C U	OVR T2 40-440 C U
	Order code	2CTB802348R2500	2CTB802348R3500	2CTB802348R3900
Neutral product ID	Type code	-	-	OVR T2 70 N C U
	Order code	-	-	2CTB802348R6500



OVR T2 3N 15-320 P U	-	-	-	-	-
-	OVR T2 3N 40-150 P TS U	OVR T2 3N 40-320 P TS U	OVR T2 3N 40-440 P TS U	OVR T2 3N 40-550 P TS U	OVR T2 3N 40-660 P TS U
UL 1449	UL 1449	UL 1449	UL 1449	UL 1449	UL 1449
4	4	4	4	4	4
4	4	4	4	4	4
AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz
±15%	±15%	±15%	±15%	±15%	±15%
277 V	120 V	277 V	347 V	480 V	600 V
320 V	175 V	320 V	440 V	550 V	660 V
15 kA	40 kA	40 kA	40 kA	40 kA	40 kA
5 kA	20 kA	20 kA	10 kA	10 kA	10 kA
1 kV	1.2 kV	1.2 kV	1.2 kV	1.2 kV	1.2 kV
< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns
200 kA	200 kA	200 kA	200 kA	200 kA	200 kA
≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A
≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes
-	-	-	-	-	-
No	Yes	Yes	Yes	Yes	Yes
2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²	2.5...25 / 4...14 mm ²
2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²	2.5...16 / 6...14 mm ²
12.5 / 0.5 mm	12.5 / 0.5 mm	12.5 / 0.5 mm	12.5 / 0.5 mm	12.5 / 0.5 mm	12.5 / 0.5 mm
2.8 / 24.5 Nm	2.8 / 24.5 Nm	2.8 / 24.5 Nm	2.8 / 24.5 Nm	2.8 / 24.5 Nm	2.8 / 24.5 Nm
-	4 NO - 4 NC	4 NO - 4 NC	4 NO - 4 NC	4 NO - 4 NC	4 NO - 4 NC
-	12 V DC - 10 mA	12 V DC - 10 mA	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	250 V AC - 1 A	250 V AC - 1 A
-	1.5 / 16 mm ²	1.5 / 16 mm ²	1.5 / 16 mm ²	1.5 / 16 mm ²	1.5 / 16 mm ²
-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C
5 000 m	5 000 m	5 000 m	5 000 m	5 000 m	5 000 m
-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C
NEMA 1	NEMA 1	NEMA 1	NEMA 1	NEMA 1	NEMA 1
V0	V0	V0	V0	V0	V0
90.5 x 71.2 x 64.8 mm	-	-	-	-	-
3.56 x 2.8 x 2.55 in	-	-	-	-	-
-	98.5 x 71.2 x 64.8 mm	98.5 x 71.2 x 64.8 mm	98.5 x 71.2 x 64.8 mm	98.5 x 71.2 x 64.8 mm	98.5 x 71.2 x 64.8 mm
-	3.88 x 2.8 x 2.55 in	3.88 x 2.8 x 2.55 in	3.88 x 2.8 x 2.55 in	3.88 x 2.8 x 2.55 in	3.88 x 2.8 x 2.55 in
OVR T2 15-320 C U	OVR T2 40-150 C U	OVR T2 40-320 C U	OVR T2 40-440 C U	OVR T2 40-550 C U	OVR T2 40-660 C U
2CTB802348R2700	2CTB802348R3500	2CTB802348R3700	2CTB802348R3900	2CTB802348R4100	2CTB802348R4300
OVR T2 70 N C U	OVR T2 70 N C U	OVR T2 70 N C U	OVR T2 70 N C U	OVR T2 70 N C U	OVR T2 70 N C U
2CTB802348R6500	2CTB802348R6500	2CTB802348R6500	2CTB802348R6500	2CTB802348R6500	2CTB802348R6500

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
Electrical features						
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 Ⓜ (MCOV)			[V] 600	1100	1100	1500
Impulse current Iimp (10/350)			2	2	2	2
Maximum discharge current Imax (8/20)			[kA] 40	40	40	40
Nominal discharge current In (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 Ⓜ (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 Iscpv			[A] 300	10,000	10,000	10,000
Short circuit withstand according Ⓜ (S _{CCR})			[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)
Installation						
Wire range (L, N, PE)	Solid wire	[mm ²]	2.5...35	2.5...35	2.5...35	2.5...35
	Stranded wire	[mm ²]	2.5...25	2.5...25	2.5...25	2.5...25
Stripping length (L, N, PE)			12.2	12.2	12.2	12.2
Tightening torque (L, N, PE)			2.5	2.5	2.5	2.5
Auxiliary contact (TS)						
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 - 1 A
Connection cross-section			1.5	1.5	1.5	1.5
Miscellaneous characteristics						
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	IP 20
Fire resistance according to UL 94			V0	V0	V0	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	88 x 53.4 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	3.46 x 2.10 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	95 x 53.4 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	3.46 x 2.10 x 2.56
Replacement Cartridges						
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
Electrical features					
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 _{CCR})	[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)
Installation					
Wire range Solid wire	[mm ²]	2.5....35	2.5....35	2.5....35	2.5....35
(L, N, PE) Stranded wire	[mm ²]	2.5...25	2.5...25	2.5...25	2.5...25
Stripping length (L,N,PE)	[mm ²]	12.5	12.5	12.5	12.5
Tightening torque (L, N, PE)	[N.m]	4.5	4.5	4.5	4.5
Auxiliary contact (TS)					
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
Miscellaneous characteristics					
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		IP 20	IP 20	IP 20	IP 20
Fire resistance according to UL 94		V0	V0	V0	V0
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
Replacement Cartridges					
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 Imax 8/20 kA	Nominal current In kA	Voltage protection level Up kV	Max. cont. operating voltage Ucpv 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 _{total} 10/350 kA	Max. discharge current I _{max} 8/20 kA	Nominal current I _n kA	Voltage protection level U _p kV	Max. cont. operating voltage U _{cpv} 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

UL-Power non-DIN-Rail Products

154 -155	OVRHSP/OVRHSR
156	OVRHTE
157	OVRHT3B
158	OVRHT3C
160 -161	OVRHS3U

OVRHSP/OVRHSR

Facility Wide Protection – 4,000A and below



Available configurations

Type code	Voltage	Configuration OVRHSP and OVRHSR
OVRHSP(SR)xxx1201P	120V	1-phase, 2-wire + ground
OVRHSP(SR)xxx2401P	240V	1-phase, 2-wire + ground
OVRHSP(SR)xxx1202S	120/240V	2-phase, 3-wire + ground
OVRHSP(SR)xxx1203Y	120/208V	3-phase Wye, 4-wire + ground
OVRHSP(SR)xxx2203Y	220/380V	3-phase Wye, 4-wire + ground
OVRHSP(SR)xxx2403Y	240/415V	3-phase Wye, 4-wire + ground
OVRHSP(SR)xxx2773Y	277/480V	3-phase Wye, 4-wire + ground
OVRHSP(SR)xxx3473Y*	347/600	3-phase Wye, 4-wire + ground
OVRHSP(SR)xxx1203H	120/240V	3-phase High-Leg, 4-wire + ground
OVRHSP(SR)xxx2403D	240V	3-phase Delta, 3-wire + ground
OVRHSP(SR)xxx3803D*	380V	3-phase Delta, 3-wire + ground
OVRHSP(SR)xxx4803D*	480V	3-phase Delta, 3-wire + ground
OVRHSP(SR)xxx6003D*	600V	3-phase Delta, 3-wire + ground

OVRHSP: Where "xxx" can be 60, 80, 100, 120, 160, 200, 240, 300 or 400

OVRHSR: Where "xxx" can be 120 or 160

*Voltages not available with 60, 80 or 100kA units

Available options	Type code*
Add applicable suffix to end of Type codes	
Advanced monitoring (available in 60–100kA units only) (Includes dry relay contacts, audible alarm, alarm silence button, fault light)	1
Transient filter* and advanced monitoring	A
Stainless steel enclosure and advanced monitoring	M
Stainless steel enclosure, transient filter* and advanced monitoring	N
Transient filter* (meets UL 1283) (All models)	3
Stainless steel enclosure (All models)	4
Transient filter* and surge counter (SP 120–400kA only)	B
Transient filter* and stainless steel enclosure (All models)	C
Surge counter and stainless steel enclosure (SP 120–400kA only)	D
Transient filter*, surge counter and stainless steel enclosure (SP 120–400kA only)	T

*Not recommended when using telecommunication rectifiers.

OVRHSR stand alone option (To be ordered as a separate item)

Flush-mount plate kit OVRHSR-FMP-120/160

EMI/RFI filter attenuation

Max. attenuation frequency 41dB @ 106kHz

Warranty

5-years

Product features

- Listed to UL 1449 4th Edition for Type 1 and Type 2 SPD applications.
- Fail-safe design with individually fused Metal Oxide Varistors (MOVs) eliminating single point failure, protecting against both overcurrent and overvoltage events.
- 200kAIC short circuit rating permits direct bus connection to most electrical services.
- Low let through voltage ensured by the lowest possible impedance path to ground and equal current sharing during surge events.
- All weather sealed, powder-coated NEMA 4/IP65 housing is designed for any orientation and indoor/outdoor applications.
- 5-year standard warranty.

Product specifications

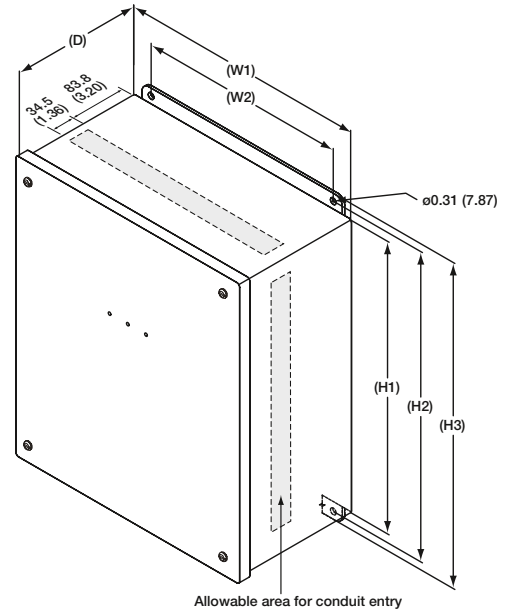
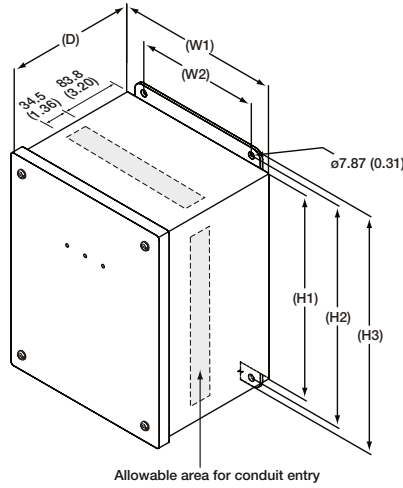
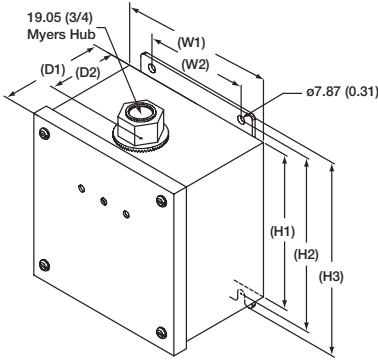
Electrical	
Nominal discharge current rating (I-n)	10kA (60–100) 20kA (120–400)
Operating frequency	47–63Hz
Connection method	Parallel to electrical distribution system
Modes of protection	All modes (L-N, L-G, N-G, L-L)
Fault rating (SCCR)	200kAIC–no upstream over-current protection device (breaker or fuse) required
Response time	Less than 1 nanosecond
Standard monitoring (120–400kA)	Status indicator lights (one per phase) Standard dry (Form "C") relay contacts Audible alarm with silence button

Mechanical	
Weight	60, 80, 100kA: 4.5 kg (10 lbs.) 120, 160kA: 9 kg (20 lbs.) 200, 240, 300, 400kA: 18 kg (40 lbs.)
Enclosure type	Powder coated, impact-resistance steel, weather-proof NEMA 4
Installation location	Indoor/outdoor
Mounting method	Dual mounting flanges
Operating environment	-40° to +70°C (-40° to +185°F)
Altitude	Up to 4000 m (13,000 ft.)
Product design	Parallel design with individually fused MOVs

Regulatory	
UL 1449 4th Edition Type	Type 1
UL 1283	Yes
IEEE C62.41.1, .2, C62.45	Yes
Listed by	ETL: 60–100kA models UL: 120–400kA models CE: 120–400kA models



Dimensional specifications



**OVRHSP
60, 80, 100kA
400A and below**

Dim	Millimeters (Inches)
H1	152.4 (6.00)
H2	171.5 (6.75)
H3	190.5 (7.50)
W1	152.4 (6.00)
W2	101.6 (4.00)
D1	105.7 (4.16)
D2	50.8 (2.00)

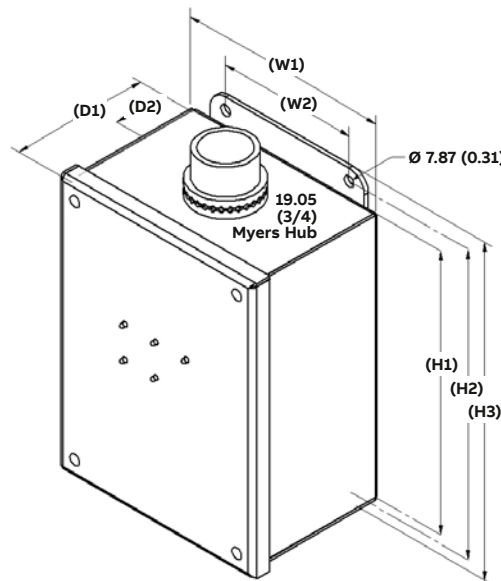
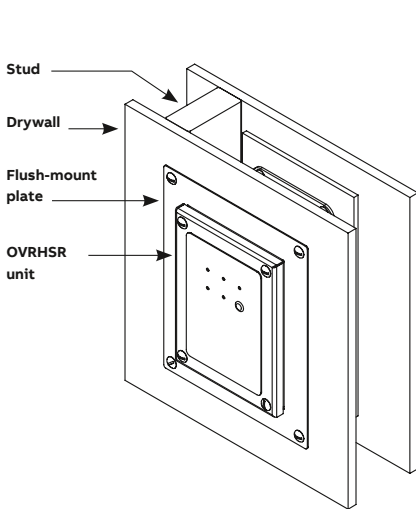
**OVRHSP
120, 160kA
1,000A and below**

Dim	Millimeters (Inches)
H1	254.0 (10.00)
H2	273.1 (10.75)
H3	292.1 (11.50)
W1	203.2 (8.00)
W2	152.4 (6.00)
D	157.5 (6.20)

**OVRHSP
200, 240, 300, 400kA
1,000A and higher**

Dim	Millimeters (Inches)
H1	355.6 (14.00)
H2	374.7 (14.75)
H3	393.7 (15.50)
W1	304.8 (12.00)
W2	254.0 (10.00)
D	157.5 (6.20)

The OVRHSR compact design allows for it to be recessed into the wall.



**OVRHSR
120, 160kA
1,000A and below**

Dim	Millimeters (Inches)
H1	254.0 (10.00)
H2	273.1 (10.75)
H3	292.1 (11.50)
W1	203.2 (8.00)
W2	152.4 (6.00)
D1	106.9 (4.20)
D2	50.8 (2.00)

OVRHTE

Sub and Mid-Level Distribution – 1,000A and below



Available configurations

Type code	Voltage	Configuration
OVRHTExx1201P	120V	1-phase, 2-wire + ground
OVRHTExx2401P	240V	1-phase, 2-wire + ground
OVRHTExx1202S	120/240V	2-phase, 3-wire + ground
OVRHTExx1203Y	120/208V	3-phase Wye, 4-wire + ground
OVRHTExx2203Y	220/380V	3-phase Wye, 4-wire + ground
OVRHTExx2403Y	240/415V	3-phase Wye, 4-wire + ground
OVRHTExx2773Y	277/480V	3-phase Wye, 4-wire + ground
OVRHTExx3473Y	347/600V	3-phase Wye, 4-wire + ground
OVRHTExx1203H	120/240V	3-phase Hi-Leg, 4-wire + ground
OVRHTExx2403D	240V	3-phase Delta, 3-wire + ground
OVRHTExx3803D	380V	3-phase Delta, 3-wire + ground
OVRHTExx4803D	480V	3-phase Delta, 3-wire + ground

Type code: Where “xx” can be 25, 50, 80, or 100
 OVRHTE/100–80kA/1,000A and below
 OVRHTE/50kA/400A and below
 OVRHTE/25kA/100A and below

Available option	Type code*
Dry Form “C” relay contacts	5

*Add applicable suffix to the end of Type code.
 Example: OVRHTE251201P5

EMI/RFI filter attenuation	
Max. attenuation frequency	50dB @ 100kHz

Warranty	
3-years	

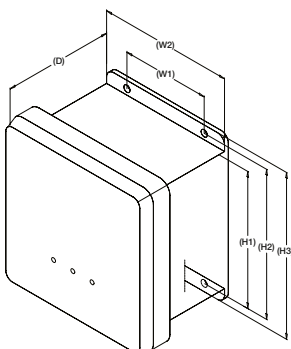
Product features

- Listed to UL 1449 4th edition for Type 2 SPD applications.
- Protects facilities and equipment against the harmful effects of lightning strikes and internally generated electrical transients.
- Includes pre-wired pigtail conductors to streamline installation.
- Features internal copper bus conduction path to minimize system impedances, lowering clamping voltage and increasing protection.

Product specifications

Electrical	
Nominal discharge current rating (I-n)	20kA
Operating frequency	47–63Hz
Connection methods	Parallel to load (shunt) 609.6mm (24") 5mm ² (#10 AWG) wires through 20A (max) breaker
Modes of protection	L-L, L-N, L-G, N-G
Fault rating (SCCR)	65kAIC–upstream over-current protection device (breaker or fuse required)
Response time	Less than 1 nanosecond (one per phase)
Standard monitoring	LED status indicator lights
Mechanical	
Weight	5.8 kg (12.7 lbs.)
Enclosure type	NEMA 4X fiberglass-reinforced polyester (FRP) surface-mount, non-removable cover
Installation location	Indoor/outdoor
Mounting methods	Dual mounting flanges
Operating environment	40° to +60°C (-40° to +140°F)
Altitude	Up to 5000 m (16,400 ft.)
Product design	No internal fusing
Regulatory	
UL 1449 4th edition type	Type 2
UL 1283	Yes
IEEE C62.41.1, .2, C62.45	Yes
Listed by	UL

Dimensional specifications



Dim	Millimeters (Inches)
H1	156.7 (6.17)
H2	171.5 (6.75)
H3	190.4 (7.50)
W1	101.9 (4.01)
W2	155.4 (6.12)
D	127.5 (5.01)



OVRHT3B

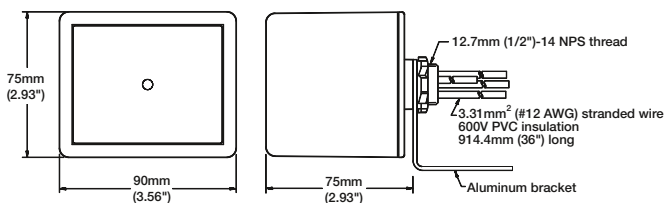
Sub Distribution and Panelboard – 400A and below



Available configurations

Type code	kA per phase	Voltage	Configuration
OVRHT3B501201P	50kA	120V	1-phase, 2-wire + ground
OVRHT3B502401P	50kA	240V	1-phase, 2-wire + ground
OVRHT3B502771P	50kA	277V	1-phase, 2-wire + ground
OVRHT3B504801P	50kA	480V	1-phase, 2-wire + ground
OVRHT3B501202S	50kA	120/240V	2-phase, 3-wire + ground
OVRHT3B502402S	50kA	240/480V	2-phase, 3-wire + ground
OVRHT3B502403H	50kA	120/240V	3-phase High-Leg, 4-wire + ground
OVRHT3B501203Y	50kA	120/208V	3-phase Wye, 4-wire + ground
OVRHT3B502203Y	50kA	220/380V	3-phase Wye, 4-wire + ground
OVRHT3B502303Y	50kA	230/400V	3-phase Wye, 4-wire + ground
OVRHT3B502403Y	50kA	240/415V	3-phase Wye, 4-wire + ground
OVRHT3B502773Y	50kA	277/480V	3-phase Wye, 4-wire + ground
OVRHT3B503473Y	50kA	347/600V	3-phase Wye, 4-wire + ground
OVRHT3B502403D	50kA	240V	3-phase Delta, 3-wire + ground
OVRHT3B503803D	50kA	380V	3-phase Delta, 3-wire + ground
OVRHT3B504003D	50kA	400V	3-phase Delta, 3-wire + ground
OVRHT3B504803D	50kA	480V	3-phase Delta, 3-wire + ground
OVRHT3B506003D	50kA	600V	3-phase Delta, 3-wire + ground
Earthing Systems			
OVRHT3B502301PI	50kA	230V	1-phase, 2-wire + ground (for TNC earthing systems)
OVRHT3B502301PJ	50kA	230V	1-phase, 2-wire + ground (for TNS earthing systems)
OVRHT3B502301PK	50kA	230V	1-phase, 2-wire + ground (for IT earthing systems)
OVRHT3B502301PL	50kA	230V	1-phase, 2-wire + ground (for TT earthing systems)
Warranty			
3-year			

Dimensional specifications



Product features

- Listed to UL 1449 4th Edition for Type 1 SPD applications.
- 50kA per phase protection.
- Individual thermally fused and protected MOVs.
- Includes pre-wired pigtail conductors.
- Multiple MOVs per phase eliminates single point failure.

Product specifications

Electrical	
Nominal discharge current rating (I-n)	20kA (Earthing Systems 10kA)
Operating frequency	47–63Hz
Connection methods	Parallel to load 914.4mm (36") of 3.31mm ² (#12 AWG) wires
Modes of protection	Model dependent
Fault rating (SCCR)	100 kAIC
Response time	Less than 1 nanosecond (one per phase)
Standard monitoring	LED status indicator lights
Mechanical	
Weight	.23 kg (.5 lbs.)
Enclosure type	NEMA 4X, non-metallic
Installation location	Indoor/Outdoor
Mounting method	12.7mm (1/2")–14 NPT thread
Operating environment	-35° to +80°C (-31° to +176°F)
Altitude	Up to 5000 m (16,400 ft.)
Product design	Individual thermally fused and protected MOVs
Regulatory	
UL 1449 4th edition type	Type 1
UL 96A	Yes
IEEE C62.41.1, .2, C62.45	Yes
Listed by	UL



Dim	Millimeters (Inches)
W	90.0 (3.36)
D	75.0 (2.93)
H	75.0 (2.93)

OVRHT3C

Sub Distribution and Panelboard – 400A and below



Available configurations

Type code	kA per phase	Voltage	Configuration
OVRHT3C501201P	50kA	120V	1-phase, 2-wire + ground
OVRHT3C502401P	50kA	240V	1-phase, 2-wire + ground
OVRHT3C502771P	50kA	277V	1-phase, 2-wire + ground
OVRHT3C504801P	50kA	480V	1-phase, 2-wire + ground
OVRHT3C501202S	50kA	120/240V	2-phase, 3-wire + ground
OVRHT3C502402S	50kA	240/480V	2-phase, 3-wire + ground
OVRHT3C502403H	50kA	120/240V	3-phase High-Leg, 4-wire + ground
OVRHT3C501203Y	50kA	120/208V	3-phase Wye, 4-wire + ground
OVRHT3C502203Y	50kA	220/380V	3-phase Wye, 4-wire + ground
OVRHT3C502303Y	50kA	230/400V	3-phase Wye, 4-wire + ground
OVRHT3C502403Y	50kA	240/415V	3-phase Wye, 4-wire + ground
OVRHT3C502773Y	50kA	277/480V	3-phase Wye, 4-wire + ground
OVRHT3C503473Y	50kA	347/600V	3-phase Wye, 4-wire + ground
OVRHT3C502403D	50kA	240V	3-phase Delta, 3-wire + ground
OVRHT3C503803D	50kA	380V	3-phase Delta, 3-wire + ground
OVRHT3C504003D	50kA	400V	3-phase Delta, 3-wire + ground
OVRHT3C504803D	50kA	480V	3-phase Delta, 3-wire + ground
OVRHT3C506003D	50kA	600V	3-phase Delta, 3-wire + ground

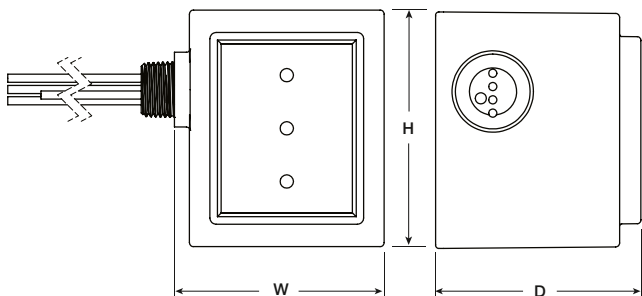
Earthing Systems

OVRHT3C502301PI	50kA	230V	1-phase, 2-wire + ground (for TNC earthing systems)
OVRHT3C502301PJ	50kA	230V	1-phase, 2-wire + ground (for TNS earthing systems)
OVRHT3C502301PK	50kA	230V	1-phase, 2-wire + ground (for IT earthing systems)
OVRHT3C502301PL	50kA	230V	1-phase, 2-wire + ground (for TT earthing systems)

Warranty

3-year

Dimensional specifications



Product features

- Listed to UL 1449 4th Edition for Type 1 SPD applications.
- 50kA per phase protection.
- Individual thermally fused and protected MOVs.
- Includes pre-wired pigtail conductors.
- Multiple MOVs per phase eliminates single point failure.

Product specifications

Electrical

Nominal discharge current rating (I-n)	20kA (Earthing Systems 10kA)
Operating frequency	47–63Hz
Connection methods	Parallel to load 914.4mm (36") of 3.31mm ² (#12 AWG) wires
Modes of protection	Model dependent
Fault rating (SCCR)	100 kAIC
Response time	Less than 1 nanosecond (one per phase)
Standard monitoring	LED status indicator lights

Mechanical

Weight	.23 kg (.5 lbs.)
Enclosure type	NEMA 4X, non-metallic
Installation location	Indoor/Outdoor
Mounting method	12.7mm (1/2")–14 NPT thread
Operating environment	-35° to +80°C (-31° to +176°F)
Altitude	Up to 5000 m (16,400 ft.)
Product design	Individual thermally fused and protected MOVs

Regulatory

UL 1449 4th edition type	Type 1
UL 96A	Yes
IEEE C62.41.1, .2, C62.45	Yes
Listed by	UL



Dim	Millimeters (Inches)
H	90.4 (3.56)
W	80.8 (3.18)
D	78.7 (3.10)



OVRHS3U

Sub Distribution and Panelboard – 400A and below



Available configurations

Type code	kA per Phase	Voltage	Configuration
Type 1			
OVRHS3U401201P	40kA	120V	1-phase, 2-wire + ground
OVRHS3U401202S	40kA	120/240V	2-phase, 3-wire + ground
OVRHS3U402403D	40kA	240V	3-phase Delta, 4-wire + ground
OVRHS3U401203Y	40kA	120/208V	3-phase Wye, 4-wire + ground
Type 2			
OVRHS3U402401P	40kA	240V	1-phase, 2-wire + ground
OVRHS3U801202SR	80kA	120/240V	2-phase, 3-wire + ground
OVRHS3U404803D	40kA	480V	3-phase Delta, 3-wire + ground
OVRHS3U401203H	40kA	120/240V	3-phase High-Leg, 4-wire + ground
OVRHS3U402773Y	40kA	277/480V	3-phase Wye, 4-wire + ground
OVRHS3U402303Y	40kA	230/400V	3-phase Wye, 4-wire + ground
Available options (Not available on OVRHS3U802402SR unit)			Type code*
1 set of dry relay contacts (all models)			5
1 set of dry relay contacts + mounting bracket (only on OVRHS3U402401P and OVRHS3U402303Y models)			P
*Add applicable suffix to the end of Type code Example: OVRHS3U401201P5			
Warranty			
1-year			

Product features

- Listed to UL 1449 4th Edition for Type 1 and Type 2 SPD applications.
- Individual fusing for each Metal Oxide Varistors (MOVs).
- LED indicates proper functioning of L-N and N-G MOVs.

Product specifications

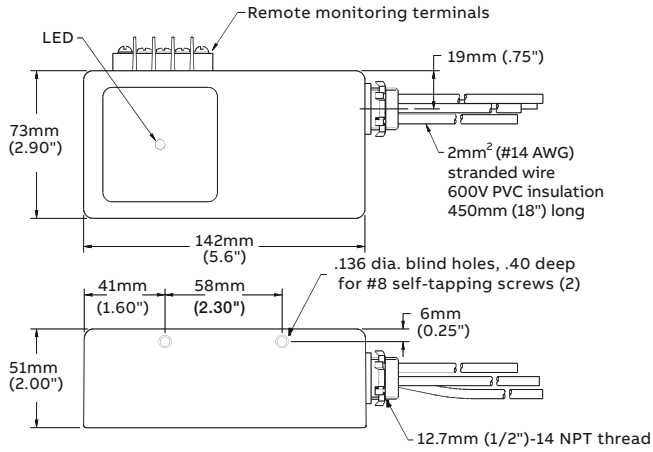
Electrical	
Nominal discharge current rating (I-n)	20kA
Operating frequency	47–63Hz
Connection methods	Parallel to load (shunt) 2mm ² (#14 AWG) wires
Modes of protection	Model dependent
Fault rating (SCCR)	100kAIC
Response time	Less than 1 nanosecond (one per phase)
Standard monitoring	LED status indicator lights
Mechanical	
Weight	.9 kg (2 lbs.)
Enclosure type	NEMA 1, non-metallic
Installation location	Indoor
Mounting method	12.7mm (1/2")–14 NPT thread (Aluminum bracket optional)
Operating environment	-40° to +80°C (-40° to +176°F)
Altitude	Up to 5000 m (16,400 ft.)
Product design	Individually fused MOVs
Regulatory	
UL 1449 4th edition type	Type 1 and Type 2
UL 1283	Only for Type code OVRHS3U802402SR
IEEE C62.41.1, .2, C62.45	Yes
Listed by	UL



See Dimensional specifications on following page.

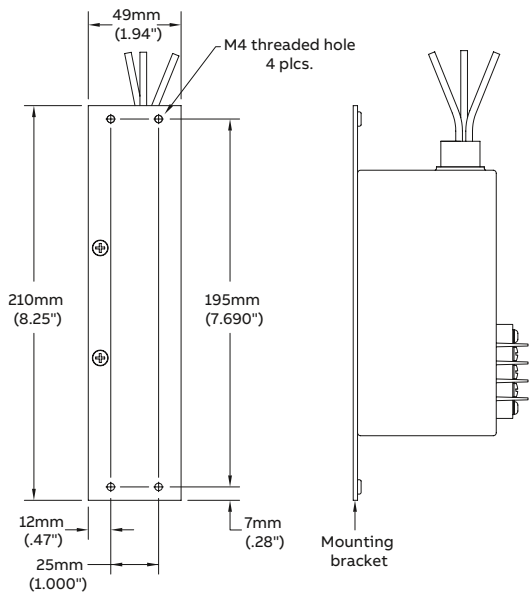
OVRHS3U Dimensional specifications

DRY RELAY CONTACTS, 5 OPTION



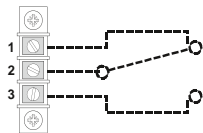
Dim	Millimeters (Inches)
W	73.0 (2.90)
D	51.0 (2.00)
H	142.0 (5.60)

MOUNTING BRACKET AND DRY RELAY CONTACTS, P OPTION

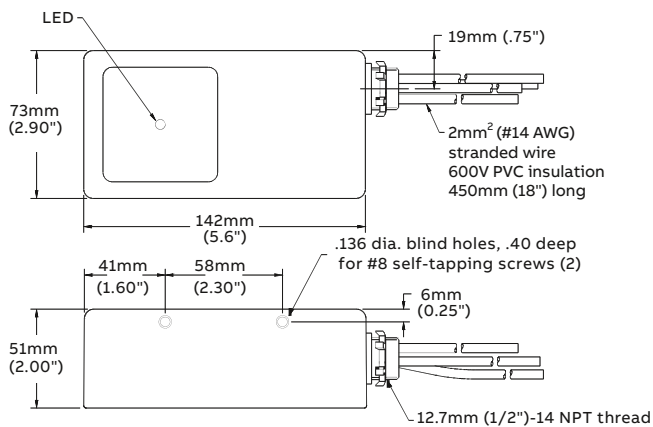


Dim	Millimeters (Inches)
W	49.0 (1.94)
H	210.0 (8.25)

Alarm relay contacts shown with power on



MODELS WITHOUT DRY RELAY CONTACTS



Dim	Millimeters (Inches)
W	73.0 (2.90)
D	51.0 (2.00)
H	142.0 (5.60)

BS products

164	Furse overview
165	ABB Furse ESP range of SPDs
166–197	Mains power protection devices
198–199	ABB ESP SPD data range overview
200–233	Data and signal protection devices
234–245	Telecom & computer line protection devices
246–257	Specific systems protection devices
258–259	Protector accessories

Furse overview

Our reach & expertise

Furse is a leading brand of ABB and provides critical solutions for Earthing, Lightning Protection and Electronic Systems Protection for over 125 years.

With a heritage of over 125 years, the Furse brand is synonymous with earthing and lightning protection, and is recognized worldwide for its Total Solution.

The Furse Total Solution incorporates all customer needs for earthing and lightning protection, including:

- Structural lightning protection systems
- Earthing for lightning protection, power and telecommunications systems
- Transient overvoltage protection
- Customer project consultations, technical guidance and system design

The Total Solution delivers the most complete and effective protection against lightning and earth fault current risk, both safeguarding life and ensuring continuous, normal operation of electrical and electronic systems.

Acquired by the ABB Group in 2012, and benefitting from ABB's wider network, the Furse brand has now become an established world leader in earthing and lightning protection, with products specified and installed in many prestigious projects globally.

Why choose Furse products and services?

Being an integral part of ABB reinforces our commitment to quality, service and to providing solutions which deliver safety and protection of people, structures and electrical services within the built environment.

Furse products and services aim to deliver customer value in key areas:

- **Reliability & ease of installation**
Furse products are manufactured from high quality materials within an ISO 9001 environment, to ensure long lasting performance, and are designed for easiest possible installation.
- **Convenience & support**
Furse products are readily available through our distributors worldwide, and our sales are supported both locally and globally by technical guidance and support.
- **Expertise & experience**
Our time served technical engineers provide specific advice on customers' earthing and lightning protection concerns, and can provide drawings and system designs to any recognized standard.

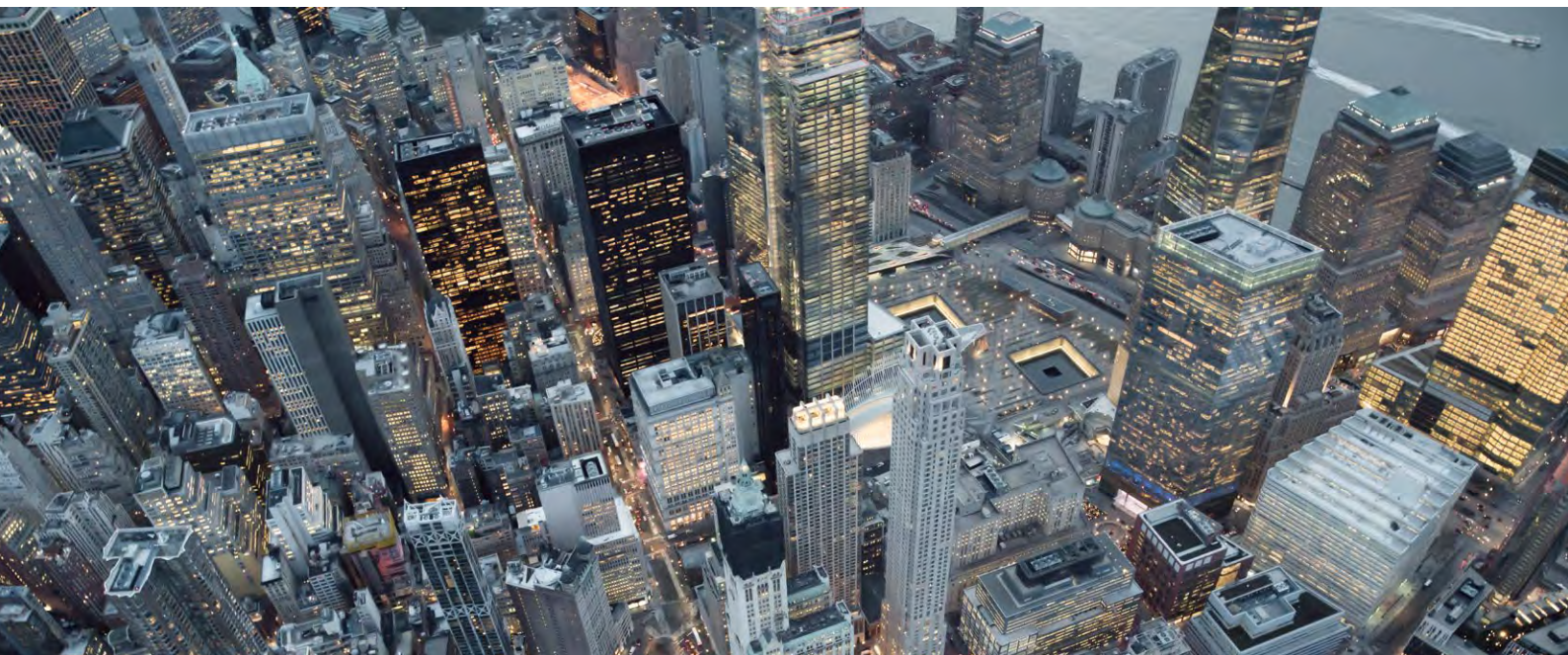


ABB Furse ESP range of SPDs

Enhanced solutions to BS EN 62305/BS 7671

The Furse ESP range of SPDs (power, data and telecom) are widely specified in all applications to ensure the continuous operation of critical electronic systems. They form part of a complete lightning protection solution to BS EN 62305. Furse ESP M and ESP D power SPD products are Type 1+2+3 devices, making them suitable for installation at the service entrance, whilst giving

superior voltage protection levels (enhanced to BS EN 62305) between all conductors or modes.

The active status indication informs the user of:

- Loss of power
- Loss of phase
- Excessive N-E voltage
- Reduced protection

The SPD and supply status can also be monitored remotely via the volt-free contact.



Protection for 230/400 V TN-S or TN-C-S supplies

Supply type	Example 1	Example 2	Example 3	Example 4
	No external lightning protection system fitted	No external lightning protection system fitted	External lightning protection system fitted	External lightning protection system fitted
	Underground mains supply feed	Exposed overhead mains supply feed	Multiple connected metallic services	No. of services unknown
Main distribution board (MDB)	Type 1+2+3	Type 1+2 OR Type 1+2+3	Type 1+2+3	Type 1+2 OR Type 1+2+3
3 Phase 400 V Service entrance, after electricity meter (Main distribution board (MDB)). Type 1+2+3 SPDs such as the ESP M and D series are used where the MDB directly feeds critical electronics	 ESP 415 D1 Series	 ESP 415 M1 Series	 ESP 415/III/TNS Series	 ESP 415 M2 Series for critical electronics
	OR	OR	OR	OR
	 ESP 415 M1 Series	 ESP 415 D1 Series	 ESP 415 M1 Series	 ESP 415 M4 Series for critical electronics
		For 3 Phase 400 V ESP 415 D1 Series, or ESP 415 M1 Series		For 1 Phase 230 V ESP 240 D1 Series, or ESP 240 M1 Series
Sub-distribution board (SDB)	Type 1+2+3			
Located >10 m from MDB feeding electronic equipment	 ESP 240 D1 Series	OR	 ESP 240 M1 Series	
			OR	
			 ESP 240 D1 Series	
Final circuit equipment	For 13 A sockets (e.g. servers)	Fused spurs		
Located >10 m from SDB	 ESP MC ESP MC/TN/RJ11 ESP MC/Cat-5e	 ESP 240D-10A ESP 240D-32A		
Mains protectors for specific systems	 ESP PV series For Photovoltaic (solar panels) up to 1000 VDC	 ESP WT series For 690V Wind Turbines	 ESP DC series For DC systems up to 48V	

Mains power protection

ESP 240/XXX Series

- LPZ 0→2**
- COMMON MODE Equipotential Bonding**
- MAINS TEST TYPE 1 + 2**
- ENHANCED Low let-through voltage**
- STATUS INDICATION + VOLT-FREE CONTACT**



Combined Type 1 and 2 tested protector (to BS EN 61643) for use on the main distribution board, particularly where a structural Lightning Protection System (LPS) is employed, for equipotential bonding. For use at boundaries up to LPZ 0 to protect against flashover (typically the main distribution board location) through to LPZ 2 to protect electrical equipment from damage.

Features & benefits

- Enhanced protection (to IEC/BS EN 62305) offering low let-through voltage further minimizing the risk of flashover creating dangerous sparking or electric shock
- Repeated protection in lightning intense environments
- Compact, space saving design
- The varistor based design eliminates the high follow current (If) associated with spark gap based surge protection
- Indicator shows when the protector requires replacement
- Remote signal contact can indicate the protector's status through interfacing with a building management system

Application

- Use on single phase mains supplies and power distribution systems for protection against partial direct or indirect lightning strikes
- ESP 240/I/XXX versions for use with Class I or II LPS
- ESP 240/III/XXX versions for use with Class III or IV LPS; or exposed overhead single phase power lines where no LPS is fitted
- ESP 240/X/TNS versions also cover TN-C-S earthing systems

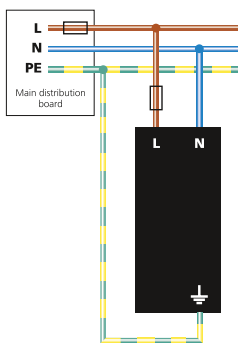
Installation

Protector to be installed in the main distribution board with connecting leads of minimal length. The protector should be fused and is suitable for attachment to a 35 mm top hat DIN-Rail. The diagrams below illustrate how to wire the appropriate ESP protector according to your chosen electrical system.

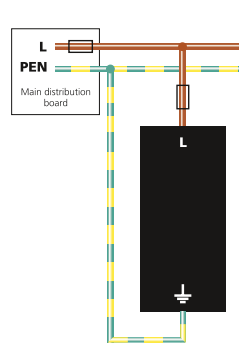
Accessories

Weatherproof enclosure:
WBX D4
 Order code:
 7TCA085410R0032

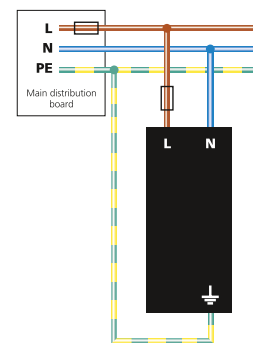
TN-S earthing system



TN-C earthing system



TT earthing system



IMPORTANT: The primary purpose of lightning current or equipotential bonding mains Type 1 Surge Protective Devices (SPDs) is to prevent dangerous sparking caused by flashover to protect against the loss of human life. In order to protect electronic equipment and ensure the continual operation of systems, transient overvoltage mains Type 2 and 3 SPDs such as the ESP M1 Series or ESP D1 Series are further required, typically installed at downstream subdistribution boards feeding sensitive equipment. IEC/BS EN 62305 refers to the correct application of mains Type 1, 2 and 3 SPDs as a coordinated set. For further information, please refer to the Furse Guide to BS EN 62305 Protection against Lightning.

ESP 240/XXX Series - Technical specification

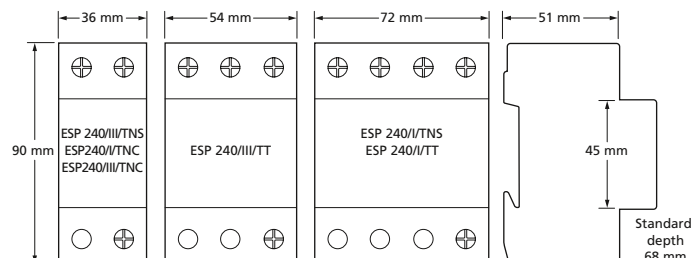
Electrical specification	ESP 240/I/TNS	ESP 240/III/TNS	ESP 240/I/TNC	ESP 240/III/TNC	ESP 240/I/TT	ESP 240/III/TT
Order code	7TCA085460R0019	7TCA085460R0022	7TCA085460R0018	7TCA085460R0021	7TCA085460R0020	7TCA085460R0023
Nominal voltage - Phase-Neutral U_0 (RMS)	240 V					
Maximum voltage - Phase-Neutral U_c (RMS/DC)	320 V/420 V					
Temporary Overvoltage TOV $U_T^{(1)}$	350 V					
Short circuit withstand capability	25 kA/50 Hz					
Frequency range	47-63 Hz					
Max. back-up fuse (see installation instructions)	≤ 250 A					
Leakage current (to earth)	< 2.5 mA	< 2.5 mA	< 2.5 mA	< 2.5 mA	0	0
Volt free contact:	Screw terminal					
– Current rating	0.5 A					
– Nominal voltage (RMS)	250 V					
Transient specification	ESP 240/I/TNS	ESP 240/III/TNS	ESP 240/I/TNC	ESP 240/III/TNC	ESP 240/I/TT	ESP 240/III/TT
Type 1 (BS EN/EN), Class I (IEC)						
Nominal discharge current 8/20 μ s (per mode) I_n	25 kA	25 kA	25 kA	25 kA	25 kA/100 kA (N-E)	25 kA/50 kA (N-E)
Let-through voltage U_p at $I_n^{(2)}$	< 1.4 kV	< 1.4 kV	< 1.4 kV	< 1.4 kV	< 1.4 kV	< 1.4 kV
Impulse discharge current 10/350 μ s i_{imp} (per mode) ⁽²⁾	50 kA	25 kA	50 kA	25 kA	50 kA/100 kA (N-E)	25 kA/50 kA (N-E)
Let-through voltage U_p at $i_{imp}^{(2)}$	< 1.2 kV	< 1.2 kV	< 1.2 kV	< 1.2 kV	< 1.2 kV	< 1.2 kV
Let-through voltage U_p at 1.2/50 μ s (N-E, TT system)	–	–	–	–	< 1.2 kV	< 1.2 kV
Type 2 (BS EN/EN), Class II (IEC)						
Nominal discharge current 8/20 μ s (per mode) I_n	25 kA	25 kA	25 kA	25 kA	25 kA/100 kA (N-E)	25 kA/50 kA (N-E)
Let-through voltage U_p at $I_n^{(2)}$	< 1.4 kV	< 1.4 kV	< 1.4 kV	< 1.4 kV	< 1.4 kV	< 1.4 kV
Maximum discharge current I_{max} (per mode) ⁽³⁾	100 kA	100 kA	100 kA	100 kA	100 kA/160 kA (N-E)	100 kA/100 kA (N-E)
Mechanical specification	ESP 240/I/TNS	ESP 240/III/TNS	ESP 240/I/TNC	ESP 240/III/TNC	ESP 240/I/TT	ESP 240/III/TT
Temperature range	-40 to +80 °C					
Connection type	Screw terminal - maximum torque 4.5 Nm					
Conductor size (stranded)	25 mm ²					
Earth connection	Screw terminal - maximum torque 4.5 Nm					
Degree of protection (IEC 60529)	IP20					
Volt free contact	Connect via screw terminal with conductor up to 1.5 mm ² (stranded) - maximum torque 0.25 Nm					
Case material	FR Polymer UL-94 V-0					
Mounting	Indoor, 35 mm top hat DIN-Rail					
Weight: – Unit	0.84 kg	0.44 kg	0.44 kg	0.29 kg	0.68 kg	0.44 kg
– Packaged	0.94 kg	0.54 kg	0.54 kg	0.39 kg	0.78 kg	0.54 kg
Dimensions to DIN 43880 - HxDxW ⁽⁴⁾	90 mm x 68 mm x 72 mm (4TE)	90 mm x 68 mm x 36 mm (2TE)	90 mm x 68 mm x 36 mm (2TE)	90 mm x 68 mm x 36 mm (2TE)	90 mm x 68 mm x 72 mm (4TE)	90 mm x 68 mm x 54 mm (3TE)

⁽¹⁾ Temporary Overvoltage rating is for a maximum duration of 5 seconds tested to BS EN/EN/IEC 61643

⁽²⁾ The maximum transient voltage let-through of the protector throughout the test, phase to earth and neutral to earth

⁽³⁾ The electrical system, external to the unit, may constrain the actual current rating achieved in a particular installation

⁽⁴⁾ The remote signal contact (removable) adds 10 mm to height



Mains power protection

ESP 415/XXX Series



Combined Type 1 and 2 tested protector (to BS EN 61643) for use on the main distribution board, particularly where a structural Lightning Protection System (LPS) is employed, for equipotential bonding. For use at boundaries up to LPZ 0 to protect against flashover (typically the main distribution board location) through to LPZ 2 to protect electrical equipment from damage.

Features & benefits

- Enhanced protection (to IEC/BS EN 62305) offering low let-through voltage further minimizing the risk of flashover creating dangerous sparking or electric shock
- Repeated protection in lightning intense environments
- The varistor based design eliminates the high follow current (if) associated with spark gap based surge protection
- Compact, space saving design
- Indicator shows when the protector requires replacement
- Remote signal contact can indicate the protector's status through interfacing with a building management system

Application

- Use on three phase mains supplies and power distribution systems for protection against partial direct or indirect lightning strikes
- ESP 415/I/XXX versions for use with Class I or II LPS
- ESP 415/III/XXX versions for use with Class III or IV LPS; or exposed overhead three phase power lines where no LPS is fitted
- ESP 415/X/TNS versions also cover TN-C-S earthing systems

Installation

Protector to be installed in the main distribution board with connecting leads of minimal length. The protector should be fused and is suitable for attachment to a 35 mm top hat DIN-Rail. The diagrams below illustrate how to wire the appropriate ESP protector according to your chosen electrical system.

Accessories

Weatherproof enclosure:

WBX D4

Order code:

7TCA085410R0032

Use with TN-S,

TN-C versions and

ESP 415/III/TT

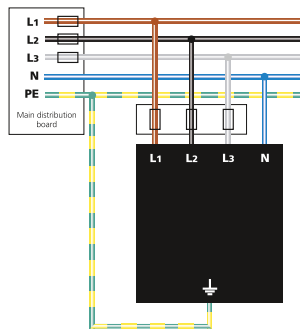
WBX D8

Order code:

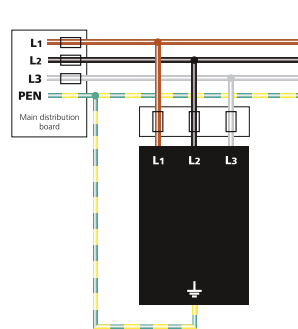
7TCA085410R0033

Use with ESP 415/I/TT

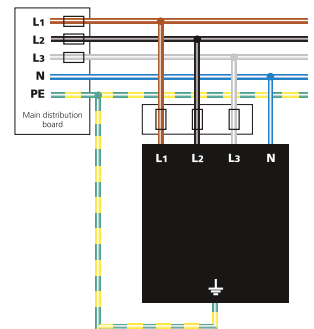
TN-S earthing system



TN-C earthing system



TT earthing system



IMPORTANT: The primary purpose of lightning current or equipotential bonding mains Type 1 Surge Protective Devices (SPDs) is to prevent dangerous sparking caused by flashover to protect against the loss of human life. In order to protect electronic equipment and ensure the continual operation of systems, transient overvoltage mains Type 2 and 3 SPDs such as the ESP M1 Series or ESP D1 Series are further required, typically installed at downstream subdistribution boards feeding sensitive equipment. IEC/BS EN 62305 refers to the correct application of mains Type 1, 2 and 3 SPDs as a coordinated set. For further information, please refer to the Furse Guide to BS EN 62305 Protection against lightning.

ESP 415/XXX Series - Technical specification

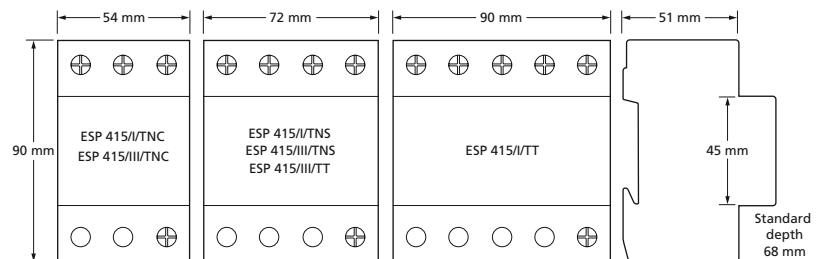
Electrical specification	ESP 415/I/TNS	ESP 415/III/TNS	ESP 415/I/TNC	ESP 415/III/TNC	ESP 415/I/TT	ESP 415/III/TT
Order code	7TCA085460R0101	7TCA085460R0103	7TCA085460R0024	7TCA085460R0025	7TCA085460R0102	7TCA085460R0026
Nominal voltage - Phase-Neutral U_0 (RMS)	240 V					
Maximum voltage - Phase-Neutral U_c (RMS/DC)	320 V/420 V					
Temporary Overvoltage TOV $U_T^{(1)}$	350 V					
Short circuit withstand capability	25 kA/50 Hz					
Frequency range	47-63 Hz					
Max. back-up fuse (see installation instructions)	≤ 250 A					
Leakage current (to earth)	< 2.5 mA	< 2.5 mA	< 2.5 mA	< 2.5 mA	0	0
Volt free contact ⁽²⁾	Screw terminal					
– Current rating	0.5 A					
– Nominal voltage (RMS)	250 V					
Transient specification	ESP 415/I/TNS	ESP 415/III/TNS	ESP 415/I/TNC	ESP 415/III/TNC	ESP 415/I/TT	ESP 415/III/TT
Type 1 (BS EN/EN), Class I (IEC)						
Nominal discharge current 8/20 μ s (per mode) I_n	25 kA	20 kA	25 kA	20 kA	25 kA/100 kA (N-E)	20 kA/50 kA (N-E)
Let-through voltage U_p at $I_n^{(2)}$	< 1.4 kV	< 1.5 kV	< 1.4 kV	< 1.5 kV	< 1.4 kV	< 1.5 kV
Impulse discharge current 10/350 μ s I_{imp} (per mode) ⁽³⁾	25 kA	12.5 kA	25 kA	12.5 kA	25 kA/100 kA (N-E)	12.5 kA/50 kA (N-E)
Let-through voltage U_p at $I_{imp}^{(2)}$	< 1.3 kV	< 1.2 kV	< 1.3 kV	< 1.2 kV	< 1.3 kV	< 1.2 kV
Let-through voltage U_p at 1.2/50 μ s (N-E, TT system)	–	–	–	–	< 1.2 kV	< 1.2 kV
Type 2 (BS EN/EN), Class II (IEC)						
Nominal discharge current 8/20 μ s (per mode) I_n	25 kA	20 kA	25 kA	20 kA	25 kA/100 kA (N-E)	20 kA/50 kA (N-E)
Let-through voltage U_p at $I_n^{(2)}$	< 1.4 kV	< 1.5 kV	< 1.4 kV	< 1.5 kV	< 1.4 kV	< 1.5 kV
Maximum discharge current I_{max} (per mode) ⁽³⁾	100 kA	50 kA	100 kA	50 kA	100 kA/160 kA (N-E)	50 kA/200 kA (N-E)
Mechanical specification	ESP 415/I/TNS	ESP 415/III/TNS	ESP 415/I/TNC	ESP 415/III/TNC	ESP 415/I/TT	ESP 415/III/TT
Temperature range	-40 to +80 °C					
Connection type	Screw terminal					
Conductor size (stranded)	25 mm ²					
Earth connection	Screw terminal					
Volt free contact	Connect via screw terminal with conductor up to 1.5 mm ² (stranded)					
Degree of protection (IEC 60529)	IP20					
Case material	FR Polymer UL-94 V-0					
Mounting	Indoor, 35 mm top hat DIN-Rail					
Weight: – Unit	0.84 kg	0.59 kg	0.64 kg	0.44 kg	0.9 kg	0.67 kg
Packaged	0.94 kg	0.69 kg	0.74 kg	0.54 kg	1.0 kg	0.77 kg
Dimensions to DIN 43880 - HxDxW(4)	90 mm x 68 mm x 72 mm (4TE)	90 mm x 68 mm x 72 mm (4TE)	90 mm x 68 mm x 54 mm (3TE)	90 mm x 68 mm x 54 mm (3TE)	90 mm x 68 mm x 90 mm (5TE)	90 mm x 68 mm x 72 mm (4TE)

(1) Temporary Overvoltage rating is for a maximum duration of 5 seconds tested to BS EN/EN/IEC 61643

(2) The maximum transient voltage let-through of the protector throughout the test, phase to earth and neutral to earth

(3) The electrical system, external to the unit, may constrain the actual current rating achieved in a particular installation

(4) The remote signal contact (removable) adds 10 mm to height



Mains power protection

ESP D1 Series (Single phase)



Combined Type 1, 2 and 3 tested protector (to BS EN 61643) for use on single phase mains power distribution systems primarily to protect connected electronic equipment from transient overvoltages on the mains supply, e.g. computer, communications or control equipment. For use at boundaries up to LPZ 0 to protect against flashover (typically the main distribution board location, with multiple metallic services entering) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all sets of conductors (phase to neutral, phase to earth, neutral to earth - Full Mode protection)
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Innovative multiple thermal disconnect technology for safe disconnection from faulty or abnormal supplies (without compromising protective performance)
- Three way visual indication of protection status and advanced pre-failure warning so you need never be unprotected
- Remote indication facility allows pre-failure warning to be linked to a building management system, buzzer or light
- Changeover active volt-free contact enables the protector to be used to warn of phase loss (i.e. power failure, blown fuses etc)
- Flashing warning of potentially fatal neutral to earth supply faults (due to incorrect earthing, wiring errors or unbalanced conditions)
- Through terminal facility allows series connection on low current supplies to eliminate high additive voltage associated with connecting leads on units installed in parallel
- Compact space saving DIN housing

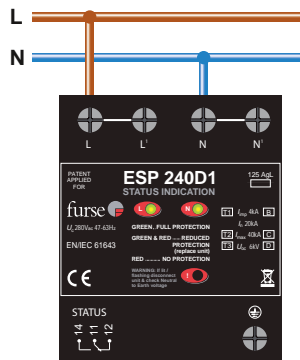
Installation

Install in parallel, within the power distribution board or directly (via fuses) on to the supply feeding equipment. Can be installed in series for low current supplies - see installation instructions. At distribution boards, the protector can be installed either on the load side of the incoming isolator, or on the closest outgoing way to the incoming supply. Connect, with very short connecting leads, to live, neutral and earth.

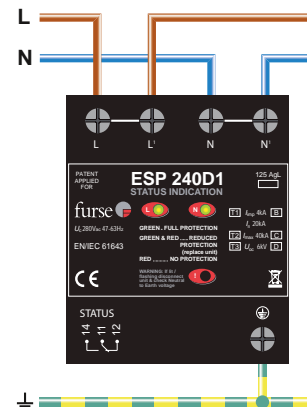
Accessories

Weatherproof enclosure:
WBX D4
 Order code: 7TCA085410R0032

Parallel connection of ESP 120 D1, ESP 240 D1 and ESP 277 D1 series to single phase supplies (fuses not shown for clarity)



Series connection of ESP 120 D1, ESP 240 D1 and ESP 277 D1 to single phase supplies up to 125 A (fuses not shown for clarity)



NOTE: If you desire a protector with an extra high maximum surge current use the ESP M2 or ESP M4 series. If your supply is fused at 16 Amps, or less, the in-line protectors (and their ready-boxed derivatives) may be more suitable.

ESP D1 Series (Single phase) - Technical specification

Electrical specification	ESP 120 D1	ESP 240 D1	ESP 277 D1
Order code	7TCA085460R0069	7TCA085460R0086	7TCA085460R0096
Nominal voltage - Phase-Neutral U_o (RMS)	120 V	240 V	277 V
Maximum voltage - Phase-Neutral U_c (RMS)	150 V	280 V	350 V
Temporary Overvoltage TOV $U_T^{(1)}$	175 V	350 V	402 V
Short circuit withstand capability	25 kA/50 Hz		
Working voltage (RMS)	90-150 V	200-280 V	232-350 V
Frequency range	47-63 Hz		
Max. back-up fuse (see installation instructions)	≤ 125 A		
Leakage current (to earth)	< 250 μ A		
Indicator circuit current	< 10 mA		
Volt free contact: ⁽²⁾	Screw terminal		
- Current rating	1 A		
- Nominal voltage (RMS)	250 V		
Transient specification	ESP 120 D1	ESP 240 D1	ESP 277 D1
Type 1 (BS EN/EN, Class I (IEC))			
Nominal discharge current 8/20 μ s (per mode) I_n	20 kA		
Let-through voltage U_p at I_n	< 1 kV	< 1.3 kV	< 1.4 kV
Impulse discharge current 10/350 μ s I_{imp} (to earth) ⁽⁵⁾	6.25 kA		
Let-through voltage U_p at I_{imp}	< 1 kV	< 1.2 kV	< 1.3 kV
Total discharge current 10/350 μ s I_{total} (total to earth) ^(4,5)	12.5 kA		
Type 2 (BS EN/EN, Class II (IEC))			
Nominal discharge current 8/20 μ s (per mode) I_n	20 kA		
Let-through voltage U_p at I_n	< 1 kV	< 1.3 kV	< 1.4 kV
Maximum discharge current I_{max} (L/N-E, L-N) ⁽⁴⁾	40 kA, 40 kA		
Type 3 (BS EN/EN, Class III (IEC))			
Let-through voltage at U_{oc} of 6 kV 1.2/50 μ s and I_{sc} of 3 kA 8/20 μ s (per mode) ^(3,6)	400 V	600 V	680 V
Mechanical specification	ESP 120 D1	ESP 240 D1	ESP 277 D1
Temperature range	-40 to +80 °C		
Connection type	Screw terminal - maximum torque 4.5Nm		
Conductor size (stranded)	25 mm ²		
Earth connection	Screw terminal - maximum torque 4.5Nm		
Volt free contact	Connect via screw terminal with conductor up to 1.5 mm ² (stranded) - maximum torque 0.25 Nm		
Degree of protection (IEC 60529)	IP20		
Case material	FR Polymer UL-94 V-0		
Weight: - Unit	0.4 kg		
- Packaged	0.5 kg		
Dimensions to DIN 43880 - HxDxW(7)	90 mm x 88 mm x 72 mm (4TE)		

⁽¹⁾ Temporary Overvoltage rating is for a maximum duration of 5 seconds tested to BS EN/EN/IEC 61643

⁽²⁾ Minimum permissible load is 5 V DC, 10 mA to ensure reliable operation

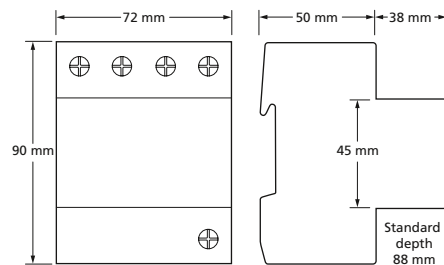
⁽³⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), phase to neutral, phase to earth and neutral to earth

⁽⁴⁾ Rating is considered as the current capability of the protector for equipotential bonding near the service entrance

⁽⁵⁾ The electrical system, external to the unit, may constrain the actual current rating achieved in a particular installation

⁽⁶⁾ Combination wave test within IEC/BS EN 61643, IEEE C62.41-2002 Location Cats C1 & B3, SS 555:2010, AS/NZS 1768-2007, UL 1449 mains wire-in

⁽⁷⁾ The remote signal contact (removable) adds 10 mm to height



Mains power protection

ESP D1 Series (Three phase)



Combined Type 1, 2 and 3 tested protector (to BS EN 61643) for use on three phase mains power distribution systems primarily to protect connected electronic equipment from transient overvoltages on the mains supply, e.g. computer, communications or control equipment. Innovative remote display options allow both protector and display to be mounted in their optimum position. For use at boundaries up to LPZ 0 to protect against flashover (typically the main distribution board location, with multiple metallic services entering) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all sets of conductors (phase to neutral, phase to earth, neutral to earth - Full Mode protection)
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Innovative multiple thermal disconnect technology for safe disconnection from faulty or abnormal supplies (without compromising protective performance)
- Three way visual indication of protection status and advanced pre-failure warning so you need never be unprotected
- ESP XXX D1R or ESP XXX D1R/LCD units (where XXX = 208, or 415, or 480) have a remote display that allows the protector to be mounted close to the incoming feed or distribution board with the display being mounted in a visible
- ESP XXX D1/LCD or ESP XXX D1R/LCD units have backlit LCD intelligent display offering clear status information that can be rotated for side mounting to facilitate short connecting leads
- Remote indication facility allows pre-failure warning to be linked to a building management system, buzzer or light
- Changeover active volt-free contact enables the protector to be used to warn of phase loss (i.e. power failure, blown fuses etc)
- Flashing warning of potentially fatal neutral to earth supply faults (due to incorrect earthing, wiring errors or unbalanced conditions)
- Through terminal facility allows series connection on low current supplies to eliminate high additive voltage associated with connecting leads on units installed in parallel
- Compact space saving DIN housing

Installation

Install in parallel, within the power distribution board or directly (via fuses) on to the supply feeding equipment. Can be installed in series for low current supplies - see installation instructions. For ESP D1R or D1R/LCD units, position remote display, making sure that the cable is long enough, is unimpeded within the cabinet, and allows a minimum of 60 mm behind the panel front (for the

interconnection cable). At distribution boards, the protector can be installed either on the load side of the incoming isolator, or on the closest outgoing way to the incoming supply. Connect, with very short connecting leads, to phases, neutral and earth. For TT installations, contact Furze.

Accessories

Weatherproof enclosure:

WBX D8

ABB Order code: 7TCA085410R0033

ESP RLA HD-1

ABB Order code: 7TCA085460R0304

Spare 1 m cable assembly for ESP XXX D1R or ESP XXX D1R/LCD

ESP RLA HD-2

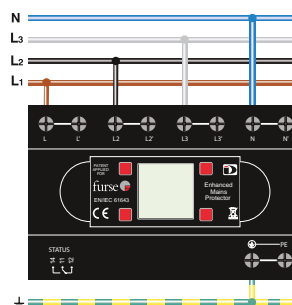
ABB Order code: 7TCA085460R0305

Spare 2 m cable assembly for ESP XXX D1R or ESP XXX D1R/LCD

ESP RLA HD-4

ABB Order code: 7TCA085460R0156

Spare 4 m cable assembly for ESP XXX D1R or ESP XXX D1R/LCD



Parallel connection of ESP 415 D1, ESP 208 D1 and ESP 480 D1 series to three phase star (4 wire and earth) supplies (fuses not shown for clarity)



NOTE: If you desire a protector with an extra high maximum surge current use the ESP M2 or ESP M4 series. If your supply is fused at 32 Amps, or less, the in-line protectors (and their ready-boxed derivatives) may be more suitable.

ESP D1 Series (Three phase) - Technical specification

Electrical specification	ESP 208 D1 ⁽¹⁾	ESP 415 D1 ⁽¹⁾	ESP 480 D1 ⁽¹⁾
Order code	7TCA085460R0077	7TCA085460R0105	7TCA085460R0133
Nominal voltage - Phase-Neutral U_0 (RMS)	120 V	240 V	277 V
Maximum voltage - Phase-Neutral U_c (RMS)	150 V	280 V	350 V
Temporary Overvoltage TOV $U_T^{(2)}$	175 V	350 V	402 V
Short circuit withstand capability	25 kA/50 Hz		
Working voltage (RMS)	156-260 V	346-484 V	402-600 V
Frequency range	47-63 Hz		
Max. back-up fuse (see installation instructions)	≤ 125 A		
Leakage current (to earth)	< 250 μ A		
Indicator circuit current	< 10 mA		
Volt free contact: ⁽³⁾	Screw terminal		
- Current rating	1 A		
- Nominal voltage (RMS)	250 V		
Transient specification	ESP 208 D1	ESP 415 D1	ESP 480 D1
Type 1 (BS EN/EN), Class I (IEC)			
Nominal discharge current 8/20 μ s (per mode) I_n	20 kA		
Let-through voltage U_p at I_n	< 1 kV	< 1.3 kV	< 1.4 kV
Impulse discharge current 10/350 μ s I_{imp} (to earth) ⁽⁵⁾	6.25 kA		
Let-through voltage U_p at I_{imp}	< 1 kV	< 1.2 kV	< 1.3 kV
Total discharge current 10/350 μ s I_{total} (total to earth) ^(5,6)	25 kA		
Type 2 (BS EN/EN), Class II (IEC)			
Nominal discharge current 8/20 μ s (per mode) I_n	20 kA		
Let-through voltage U_p at I_n	< 1 kV	< 1.3 kV	< 1.4 kV
Maximum discharge current I_{max} (L/N-E, L-N) ⁽⁵⁾	40 kA, 40 kA		
Type 3 (BS EN/EN), Class III (IEC)			
Let-through voltage at U_{oc} of 6 kV 1.2/50 μ s and I_{sc} of 3 kA 8/20 μ s (per mode) ^(4,7)	400 V	600 V	680 V
Mechanical specification	ESP 120 D1	ESP 240 D1	ESP 277 D1
Temperature range	-40 to +80 °C		
Connection type	Screw terminal - maximum torque 4.5Nm		
Conductor size (stranded)	25 mm ²		
Earth connection	Screw terminal - maximum torque 4.5Nm		
Volt free contact	Connect via screw terminal with conductor up to 1.5 mm ² (stranded) - maximum torque 0.25 Nm		
Display connection (D1R & D1R/LCD versions)	HD-D Type 1 metre interconnection cable / 2 metre cable (ESP RLA HD-2) or 4 metre cable (ESP RLA HD-4) optional		
Degree of protection (IEC 60529)	IP20		
Case material	FR Polymer UL-94 V-0		
Weight: - Unit	0.85 kg		
- Packaged	0.95 kg		
Dimensions to DIN 43880 - HxDxW(8)	90 mm x 88 mm x 144 mm (8TE)		

⁽¹⁾ Three phase series (208 V, 415 V or 480 V) include fixed (D1) or remote (D1R) LED or LCD options, e.g. ESP 415 D1, ESP 415 D1/LCD, ESP 415 D1R, ESP 415 D1R/LCD

⁽²⁾ Temporary Overvoltage rating is for a maximum duration of 5 seconds tested to IEC/BS EN 61643

⁽³⁾ Min. permissible load is 5 V DC, 10 mA to ensure reliable operation

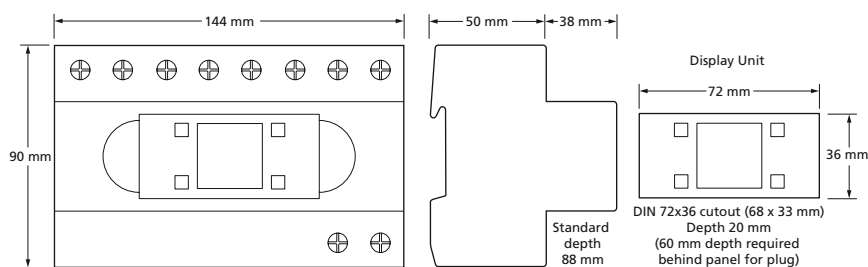
⁽⁴⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), phase to neutral, phase to earth and neutral to earth

⁽⁵⁾ The electrical system, external to the unit, may constrain the actual current rating achieved in a particular installation

⁽⁶⁾ Rating is considered as the current capability of the protector for equipotential bonding near the service entrance

⁽⁷⁾ Combination wave test within IEC/BS EN 61643, IEEE C62.41-2002 Location Cats C1 & B3, SS 555:2010, AS/NZS 1768-2007, UL 1449 mains wire-in

⁽⁸⁾ The remote signal contact (removable) adds 10 mm to height

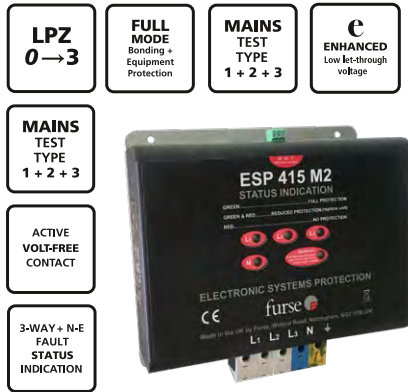


Order codes

Type code	Order code	Type code	Order code	Type code	Order code
ESP 208 D1	7TCA085460R0077	ESP 415 D1	7TCA085460R0105	ESP 480 D1	7TCA085460R0133
ESP 208 D1R	7TCA085460R0337	ESP 415 D1R	7TCA085460R0107	ESP 480 D1R	7TCA085460R0339
ESP 208 D1/LCD	7TCA085460R0338	ESP 415 D1/LCD	7TCA085460R0106	ESP 480 D1/LCD	7TCA085460R0134
ESP 208 D1R/LCD	7TCA085460R0336	ESP 415 D1R/LCD	7TCA085460R0108	ESP 480 D1R/LCD	7TCA085460R0135

Mains power protection

ESP M2/M4 Series



Combined Type 1, 2 and 3 tested protector (to BS EN 61643) for use on the main distribution board directly feeding electronic equipment such as computers, communication and control equipment, particularly where a structural Lightning Protection System (LPS) is employed. For use at boundaries up to LPZ 0 to protect against flashover (typically the main distribution board location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all sets of conductors (phase to neutral, phase to earth and neutral to earth - Full Mode protection)
- Full Mode design capable of handling high energy partial lightning currents as well as allowing continual operation of protected equipment
- Innovative multiple thermal disconnect technology, for safe disconnection from faulty or abnormal supplies (without compromising protective performance)
- Three way visual indication of protection status
- Advanced pre-failure warning so you need never be unprotected
- Remote indication facility allows pre-failure warning to be linked to a building management system, buzzer or light
- Changeover active volt-free contact enables the protector to be used to warn of phase loss (i.e. power failure, blown fuses, etc)
- Unique flashing warning of potentially fatal neutral to earth supply faults (caused by incorrect earthing, wiring errors or unbalanced conditions)
- Robust steel housing
- Protector base provides ultra low inductance earth bond to metal panels
- Convenient holes for flat mounting

Application

Use ESP M2 versions on main distribution board for buildings with a Class III or IV structural LPS fitted or exposed 3 phase power lines where no LPS is fitted. Use ESP M4 versions on main distribution board for buildings with a Class I or II LPS fitted.

Accessories

Weatherproof enclosures:

WBX M2

Order code: 7TCA085410R0034

For use with the ESP XXX M2

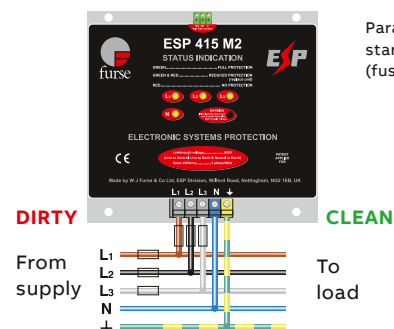
WBX M4

Order code: 7TCA085410R0035

For use with the ESP XXX M4

Installation

Install in parallel, within the power distribution board, either on the load side of the incoming isolator, or on the closest outgoing way to the incoming supply. Connect, with very short connecting leads, to phase(s), neutral and earth. Phase/live connecting leads should be fused with HRC fuses, a switchfuse, MCCB or type 'C' MCB. For TT installations, contact Furse.



Parallel connection to three phase star (4 wire and earth) supplies (fuses not shown for clarity)



NOTE: For main distribution boards with multiple metallic services (gas, water, telecom/data lines) entering and for sub-distribution boards, the ESP M1 Series are more suited. If your supply is fused at 16 Amps, or less, the in-line protection (ESP 240 or 120-5A (or -16A) and ready-boxed derivatives) may be suitable. If you need to mount the display panel separately from the main protector unit, use the ESP XXX M2R or ESP XXX M4R.

ESP M2/M4 Series - Technical specification

Electrical specification	ESP 415 M2	ESP 415 M4	ESP 480 M2	ESP 480 M4
Order code	7TCA085460R0119	7TCA085460R0124	7TCA085460R0138	7TCA085460R0140
Nominal voltage - Phase-Neutral U_0 (RMS)	240 V	240 V	277 V	277 V
Maximum voltage - Phase-Neutral U_c (RMS)	280 V	280 V	350 V	350 V
Temporary Overvoltage TOV $UT^{(1)}$	350 V	350 V	402 V	402 V
Short circuit withstand capability	25 kA/50 Hz			
Working voltage (RMS)	346-484 V	346-484 V	402-600 V	402-600 V
Frequency range	47-63 Hz			
Max. back-up fuse (see installation instructions)	≤ 200 A	≤ 315 A	≤ 200 A	≤ 315 A
Leakage current (to earth) ⁽⁷⁾	< 250 μA			
Indicator circuit current ⁽⁷⁾	< 5 mA	< 10 mA	< 5 mA	< 10 mA
Volt free contact: ⁽²⁾	Screw terminal			
– Current rating	1 A			
– Nominal voltage (RMS)	250 V			
Transient specification	ESP 415 M2	ESP 415 M4	ESP 480 M2	ESP 480 M4
Type 1 (BS EN/EN, Class I (IEC))				
Nominal discharge current 8/20 μs (per mode) I_n	20 kA	25 kA	20 kA	25 kA
Let-through voltage U_p at $I_n^{(3)}$	< 1.3 kV	< 1.3 kV	< 1.4 kV	< 1.4 kV
Impulse discharge current 10/350 μs I_{imp} (to earth) ⁽⁴⁾	12.5 kA	25 kA	12.5 kA	25 kA
Total discharge current 10/350 μs I_{total} (total to earth) ^(4,5)	50 kA	100 kA	50 kA	100 kA
Type 2 (BS EN/EN, Class II (IEC))				
Nominal discharge current 8/20 μs (per mode) I_n	20 kA	25 kA	20 kA	25 kA
Let-through voltage U_p at $I_n^{(3)}$	< 1.3 kV	< 1.3 kV	< 1.4 kV	< 1.4 kV
Maximum discharge current I_{max} (L/N-PE, L-N) ⁽⁴⁾	80 kA, 40 kA	150 kA, 40 kA	80 kA, 40 kA	150 kA, 40 kA
Type 3 (BS EN/EN, Class III (IEC))				
Let-through voltage at U_{oc} of 6 kV 1.2/50 μs and I_{sc} of 3 kA 8/20 μs (per mode) ^(3,6)	< 600 V	< 600 V	< 680 V	< 680 V
Mechanical specification	ESP 415 M2	ESP 415 M4	ESP 480 M2	ESP 480 M4
Temperature range	-40 to +80 °C			
Connection type	Screw terminal - maximum torque 2.65 Nm			
Conductor size (stranded)	25 mm ²			
Earth connection	Screw terminal - maximum torque 2.65 Nm			
Volt free contact	Connect via screw terminal with conductor up to 2.5 mm ² (stranded) - maximum torque 0.25 Nm			
Degree of protection (IEC 60529)	IP20			
Case material	Steel			
Weight: – Unit	2.35 kg	3.9 kg	2.35 kg	3.9 kg
– Packaged	2.5 kg	4.2 kg	2.5 kg	4.2 kg
Dimensions	226 mm x 204 mm x 74 mm	226 mm x 204 mm x 138 mm	226 mm x 204 mm x 74 mm	226 mm x 204 mm x 138 mm

⁽¹⁾ Temporary Overvoltage rating is for a maximum duration of 5 seconds tested to BS EN/EN/IEC 61643

⁽²⁾ Minimum permissible load is 5 V DC, 10 mA to ensure reliable operation

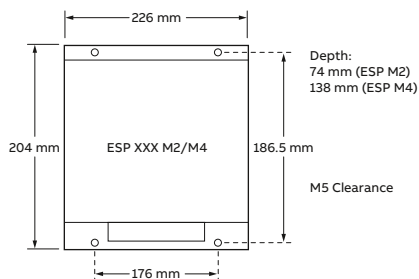
⁽³⁾ The maximum transient voltage let-through of the protector throughout the test (±10%), phase to neutral, phase to earth and neutral to earth

⁽⁴⁾ The electrical system, external to the unit, may constrain the actual current rating achieved in a particular installation

⁽⁵⁾ Rating is considered as the current capability of the protector for equipotential bonding near the service entrance

⁽⁶⁾ Combination wave test within IEC/BS EN 61643, IEEE C62.41-2002 Location Cats C1 & B3, S5 555:2010, AS/NZS 1768-2007, UL 1449 mains wire-in

⁽⁷⁾ Measured at Nominal Voltage U_0



Mains power protection

ESP M1 Series

- LPZ 0→3**
- FULL MODE**
Bonding + Equipment Protection
- ENHANCED**
Low let-through voltage
- MAINS TEST TYPE 1 + 2 + 3**
- ACTIVE VOLT-FREE CONTACT**
- 3-WAY + N-E FAULT STATUS INDICATION**



Combined Type 1, 2 and 3 tested protector (to BS EN 61643) for use on mains power distribution systems primarily to protect connected electronic equipment from transient overvoltages on the mains supply, e.g. computer, communications or control equipment. For use at boundaries up to LPZ 0 to protect against flashover (typically the main distribution board location, with multiple metallic services entering) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all sets of conductors (phase to neutral, phase to earth, neutral to earth - Full Mode protection)
- Full mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Innovative multiple thermal disconnect technology for safe disconnection from faulty or abnormal supplies (without compromising protective performance)
- Three way visual indication of protection status and advanced pre-failure warning so you need never be unprotected
- Remote indication facility allows pre-failure warning to be linked to a building management system, buzzer or light
- Changeover active volt-free contact enables the protector to be used to warn of phase loss (i.e. power failure, blown fuses etc)
- Flashing warning of potentially fatal neutral to earth supply faults (due to incorrect earthing, wiring errors or unbalanced conditions)
- Robust steel housing
- Base provides ultra-low inductance earth bond to metal panels
- Compact size for installation in the power distribution board
- ESP 120 M1 and ESP 240 M1 have Network Rail Approval PA05/02700 and PA05/01832 respectively. NRS PADS reference 086/000556 (ESP 120 M1) and 086/047149 (ESP 240 M1)

Installation

Install in parallel, within the power distribution board or directly (via fuses) on to the supply feeding equipment. At distribution boards, the protector can be installed either on the load side of the incoming isolator, or on the

closest outgoing way to the incoming supply. Connect, with very short connecting leads, to phase(s), neutral and earth. For TT installations, contact Furze.

Accessories

Weatherproof enclosures:

WBX 3

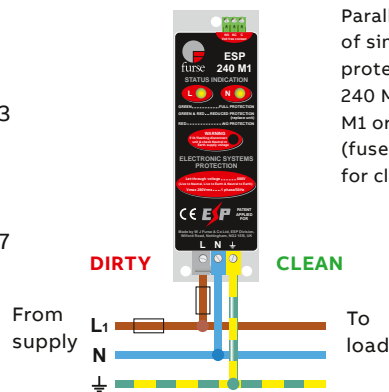
Order code: 7TCA085410R0023

Use with single phase protectors

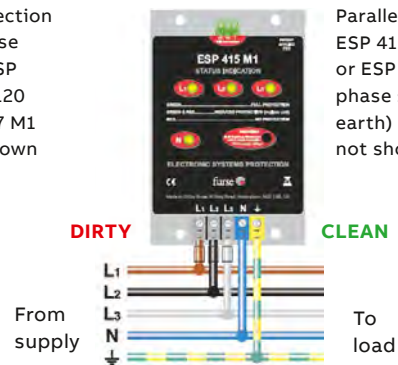
WBX 4

Order code: 7TCA085410R0027

Use with three phase protectors



Parallel connection of single phase protectors ESP 240 M1, ESP 120 M1 or ESP 277 M1 (fuses not shown for clarity)



Parallel connection of ESP 415 M1, ESP 208 M1 or ESP 480 M1 to three phase star (4 wire and earth) supplies (fuses not shown for clarity)



NOTE: If you desire a protector with an extra high maximum surge current use the ESP M2 or ESP M4 series. If your supply is fused at 16 amps, or less, the in-line protectors (ESP 240 or 120-5A (or -16A) and their ready-boxed derivatives) may be more suitable. If you need to mount the display panel separately from the main protector unit, use the ESP M1R series.

ESP M1 Series - Technical specification

Electrical specification	ESP 120 M1	ESP 208 M1	ESP 240 M1	ESP 415 M1	ESP 277 M1	ESP 480 M1
Order code	7TCA085460R0070	7TCA085460R0078	7TCA085460R0089	7TCA085460R0112	7TCA085460R0097	7TCA085460R0136
Nominal voltage - Phase-Neutral U_0 (RMS)	120 V	120 V	240 V	240 V	277 V	277 V
Maximum voltage - Phase-Neutral U_c (RMS)	150 V	150 V	280 V	280 V	350 V	350 V
Temporary Overvoltage TOV $U_T^{(1)}$	175 V	175 V	350 V	350 V	402 V	402 V
Short circuit withstand capability	25 kA/50 Hz	25 kA/50 Hz	25 kA/50 Hz	25 kA/50 Hz	25 kA/50 Hz	25 kA/50 Hz
Working voltage (RMS)	90-150 V	156-260 V	200-280 V	346-484 V	232-350 V	402-600 V
Frequency range	47-63 Hz					
Max. back-up fuse (see installation instructions)	≤ 125 A					
Leakage current (to earth)	< 250 μ A					
Indicator circuit current	< 10 mA					
Volt free contact: ⁽²⁾	Screw terminal					
- Current rating	1 A					
- Nominal voltage (RMS)	250 V					
Transient specification	ESP 120 M1	ESP 208 M1	ESP 240 M1	ESP 415 M1	ESP 277 M1	ESP 480 M1
Type 1 (BS EN/EN), Class I (IEC)						
Nominal discharge current 8/20 μ s (per mode) I_n	20 kA					
Let-through voltage U_p at I_n	< 1 kV	< 1 kV	< 1.3 kV	< 1.3 kV	< 1.4 kV	< 1.4 kV
Impulse discharge current 10/350 μ s I_{imp} (to earth) ^(4,7)	6.25 kA					
Let-through voltage U_p at I_{imp}	< 1 kV	< 1 kV	< 1.3 kV	< 1.3 kV	< 1.4 kV	< 1.4 kV
Total discharge current 10/350 μ s I_{total} (total to earth) ^(4,5)	12.5 kA	25 kA	12.5 kA	25 kA	12.5 kA	25 kA
Type 2 (BS EN/EN), Class II (IEC)						
Nominal discharge current 8/20 μ s (per mode) I_n	20 kA					
Let-through voltage U_p at I_n	< 1 kV	< 1 kV	< 1.3 kV	< 1.3 kV	< 1.4 kV	< 1.4 kV
Maximum discharge current I_{max} (L/N-PE, L-N) ⁽⁴⁾	40 kA, 40 kA					
Type 3 (BS EN/EN), Class III (IEC)						
Let-through voltage at U_{oc} of 6 kV 1.2/50 μ s and I_{sc} of 3 kA 8/20 μ s (per mode) ^(3,6)	390 V	390 V	600 V	600 V	680 V	680 V
Mechanical specification	ESP 120 M1	ESP 208 M1	ESP 240 M1	ESP 415 M1	ESP 277 M1	ESP 480 M1
Temperature range	-40 to +80 °C					
Connection type	Screw terminal - maximum torque 2.65 Nm					
Conductor size (stranded)	35 mm ²					
Earth connection	Screw terminal - maximum torque 2.65 Nm					
Volt free contact	Connect via screw terminal with conductor up to 2.5 mm ² (stranded) - maximum torque 0.25 Nm					
Degree of protection (IEC 60529)	IP20					
Case material	Steel					
Weight: - Unit	0.6 kg	1.0 kg	0.6 kg	1.0 kg	0.6 kg	1.0 kg
- Packaged	0.7 kg	1.1 kg	0.7 kg	1.1 kg	0.7 kg	1.1 kg
Dimensions	See diagrams below					

⁽¹⁾ Temporary Overvoltage rating is for a maximum duration of 5 seconds tested to BS EN/EN/IEC 61643

⁽²⁾ Minimum permissible load is 5 V DC, 10 mA to ensure reliable operation

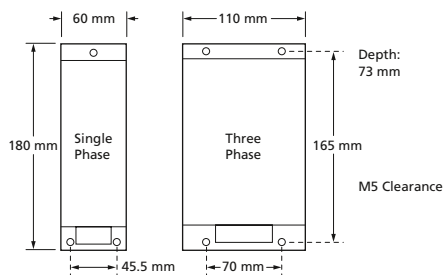
⁽³⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), phase to neutral, phase to earth and neutral to earth

⁽⁴⁾ The electrical system, external to the unit, may constrain the actual current rating achieved in a particular installation

⁽⁵⁾ Rating is considered as the current capability of the protector for equipotential bonding near the service entrance

⁽⁶⁾ Combination wave test within IEC/BS EN 61643, IEEE C62.41-2002 Location Cats C1 & B3, SS 555:2010, AS/NZS 1768-2007, UL 1449 mains wire-in

⁽⁷⁾ Total Discharge Current I_{imp} 10/350 μ s is 4 kA L-N



Mains power protection

ESP M1R, M2R & M4R Series



Combined Type 1, 2 and 3 tested protector (to BS EN 61643) for use on mains power distribution systems primarily to protect connected electronic equipment from transient overvoltages on the mains supply, e.g. computer, communications or control equipment. Remote display allows both display and protector unit to be mounted in their optimum positions. For use at boundaries up to LPZ 0 to protect against flashover (typically the main distribution board location, with multiple metallic services entering) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- The remote display means the protector can be mounted close to the incoming feed or first way on the distribution board and the display in an easily visible position, e.g. on front of cabinet
- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all sets of conductors (phase to neutral, phase to earth, neutral to earth - Full Mode protection)
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Innovative multiple thermal disconnect technology for safe disconnection from abnormal or faulty supplies
- Remote display gives three way visual indication of protection status
- Plug-in cable connections between protector and display enable easy connection (1 m cable supplied as standard)
- Advanced pre-failure warning so you need never be unprotected
- Remote indication facility allows pre-failure warning to be linked to a building management system, buzzer or light
- Changeover active volt-free contact enables the protector to be used to warn of phase loss (i.e. power failure, blown fuses, etc)
- Unique flashing warning of potentially fatal neutral to earth supply faults (caused by incorrect earthing, wiring errors or unbalanced conditions)
- Robust steel housing (protector), and sturdy ABS housing (display)
- Base provides ultra-low inductance earth bond to metal panels
- Remote display comes with integral fixings and a panel drilling template

Application

ESP M1R: main distribution board for buildings with multiple metallic services (e.g. gas, water, telecoms) and sub-distribution boards feeding sensitive equipment. ESP M2R: main distribution board for buildings with Class III or IV LPS fitted or exposed 3-ph power lines where no LPS is fitted. ESP M4R: main distribution board for buildings with a Class I or II LPS.

Accessories

ESP RLA-1

Order code: 7TCA085460R0153

Spare 1 metre cable assembly

ESP RLA-2

Order code: 7TCA085460R0154

Spare 2 metre cable assembly

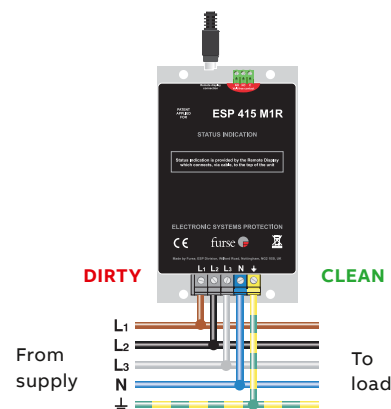
ESP RLA-4

Order code: 7TCA085460R0155

Spare 4 metre cable assembly

Installation

Installation of the protector unit is identical to the ESP M1, M2 or M4. Position remote display, making sure that the cable is long enough, is unimpeded within the cabinet, and allows a minimum of 60 mm behind the panel front (for the interconnection cable). For TT installations, contact Fursec.



Parallel connection of ESP 415 M1R to three phase star (4 wire and earth) supplies (fuses not shown for clarity)



Simple plug and socket connection between the protector unit and the remote display



NOTE: For three phase applications where a remote display is unnecessary, use the respective ESP M1, M2 or M4 Series.

ESP M1R, M2R & M4R Series - Technical specification

Electrical specification	ESP 415 M1R	ESP 480 M1R	ESP 415 M2R	ESP 480 M2R	ESP 415 M4R	ESP 480 M4R
Order code	7TCA085460R0115	7TCA085460R0137	7TCA085460R0123	7TCA085460R0078	7TCA085460R0126	7TCA085460R0340
Nominal voltage - Phase-Neutral U_0 (RMS)	240 V	277 V	240 V	277 V	240 V	277 V
Maximum voltage - Phase-Neutral U_c (RMS)	280 V	350 V	280 V	350 V	280 V	350 V
Temporary Overvoltage TOV $UT^{(1)}$	350 V	402 V	350 V	402 V	350 V	402 V
Short circuit withstand capability	25 kA/50 Hz					
Working voltage (RMS)	346-484 V	402-600 V	346-484 V	402-600 V	346-484 V	402-600 V
Frequency range	47-63 Hz					
Max. back-up fuse (see installation instructions)	≤ 125 A	≤ 125 A	≤ 200 A	≤ 200 A	≤ 315 A	≤ 315 A
Leakage current (to earth)	< 250 μ A					
Indicator circuit current	< 5 mA	< 10 mA	< 5 mA	< 10 mA	< 5 mA	< 10 mA
Volt free contact: ⁽²⁾	Screw terminal					
– Current rating	1 A					
– Nominal voltage (RMS)	250 V					
Transient specification	ESP 415 M1R	ESP 480 M1R	ESP 415 M2R	ESP 480 M2R	ESP 415 M4R	ESP 480 M4R
Type 1 (BS EN/EN), Class I (IEC)						
Nominal discharge current 8/20 μ s (per mode) I_n	20 kA	20 kA	20 kA	20 kA	25 kA	25 kA
Let-through voltage U_p at I_n	< 1.3 kV	< 1.4 kV	< 1.3 kV	< 1.4 kV	< 1.3 kV	< 1.4 kV
Impulse discharge current 10/350 μ s I_{imp} (to earth) ⁽⁴⁾	6.25 kA	6.25 kA	12.5 kA	12.5 kA	25 kA	25 kA
Total discharge current 10/350 μ s I_{total} (total to earth) ^(4,5)	25 kA	25 kA	50 kA	50 kA	100 kA	100 kA
Type 2 (BS EN/EN), Class II (IEC)						
Nominal discharge current 8/20 μ s (per mode) I_n	20 kA	20 kA	20 kA	20 kA	25 kA	25 kA
Let-through voltage U_p at I_n ⁽³⁾	< 1.3 kV	< 1.4 kV	< 1.3 kV	< 1.4 kV	< 1.3 kV	< 1.4 kV
Maximum discharge current I_{max} (L/N-PE, L-N) ⁽⁴⁾	40 kA, 40 kA	40 kA, 40 kA	80 kA, 40 kA	80 kA, 40 kA	150 kA, 40 kA	150 kA, 40 kA
Type 3 (BS EN/EN), Class III (IEC)						
Let-through voltage at U_{oc} of 6 kV 1.2/50 μ s and I_{sc} of 3 kA 8/20 μ s (per mode) ^(3,6)	< 600 V	< 680 V	< 600 V	< 680 V	< 600 V	< 680 V
Mechanical specification	ESP 415 M1R	ESP 480 M1R	ESP 415 M2R	ESP 480 M2R	ESP 415 M4R	ESP 480 M4R
Temperature range	-40 to +80 °C					
Connection type	Screw terminal - maximum torque 2.65 Nm					
Conductor size (stranded)	25 mm ²					
Earth connection	Screw terminal - maximum torque 2.65 Nm					
Volt free contact	Connect via screw terminal with conductor up to 2.5 mm ² (stranded) - maximum torque 0.25 Nm					
Degree of protection (IEC 60529)	IP20					
Display connection	6 way 1 metre interconnection cable - 2 or 4 metre cable optional					
Case material	Unit - Steel, Display - FR Polymer UL-94 V0					
Weight: – Unit	1.0 kg	1.0 kg	2.35 kg	2.35 kg	3.9 kg	3.9 kg
– Packaged	1.1 kg	1.1 kg	2.5 kg	2.5 kg	4.2 kg	4.2 kg
Dimensions	See diagrams below					

⁽¹⁾ Temporary Overvoltage rating is for a maximum duration of 5 seconds tested to BS EN/EN/IEC 61643

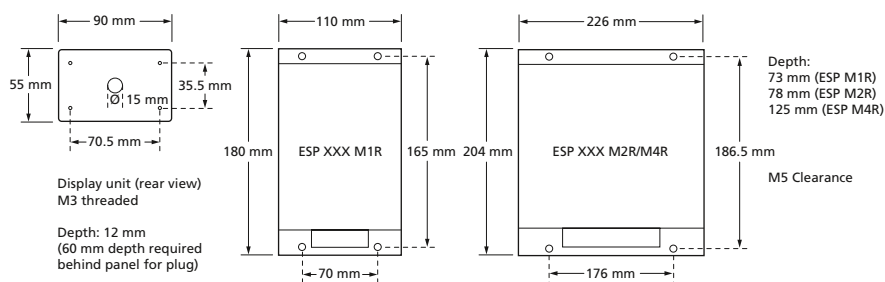
⁽²⁾ Minimum permissible load is 5 V DC, 10 mA to ensure reliable operation. Under fault conditions, the remote display will go blank if the L1 phase loses power or becomes faulty. This is due to the isolation requirements needed for circuitry mounted externally to the main protector unit

⁽³⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), phase to neutral, phase to earth and neutral to earth

⁽⁴⁾ The electrical system, external to the unit, may constrain the actual current rating achieved in a particular installation

⁽⁵⁾ Rating is considered as the current capability of the protector for equipotential bonding near the service entrance

⁽⁶⁾ Combination wave test within IEC/BS EN 61643, IEEE C62.41-2002 Location Cats C1 & B3, SS 555:2010, AS/NZS 1768-2007, UL 1449 mains wire-in



Mains power protection

ESP DC Series



Combined Type 2 and 3 tested protector (to BS EN 61643) for use on DC systems to protect connected electronic equipment from transient overvoltages on the mains supply, e.g. control equipment. Available for 12, 24, 36 and 48 V DC systems. For use at boundaries LPZ 1 through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Low let-through voltage (enhanced protection to IEC/BS EN 62305) between all sets of conductors (positive to negative, positive to earth and negative to earth - Full Mode protection) allowing continuous operation of equipment
- Repeated protection in lightning intense environments
- Visual indication of protector status
- Advanced pre-failure warning so you need never be unprotected
- Remote indication facility allows pre-failure warning to be linked to a building management system, buzzer or light
- Robust steel housing
- Simple parallel connection
- Base provides ultra-low inductance earth bond to metal panels
- Compact size for installation in the power distribution board
- Maintenance free

Installation

Install in parallel, within the power distribution board or directly on the supply feeding the equipment. At distribution boards, the protector can be installed either on the load side of the incoming isolator, or on the closest outgoing way to the incoming supply. Connect, with very short connecting leads, to positive, negative and earth.

Application

Use on DC power distribution systems to protect connected electronic equipment from transient overvoltages on the DC supply, e.g. DC fed communications or control equipment.

Parallel connection of ESP 48 DC



Accessories

Weatherproof enclosure:
WBX 3
 Order code: 7TCA085410R0023



NOTE: For low current applications, the ESP H Series (4 A), ESP E Series (1.25 A) or ESP D Series (300 mA) protectors may be suitable. For protection of photovoltaic (PV) systems up to 1000 Vdc, see our ESP PV Series.

ESP DC Series - Technical specification

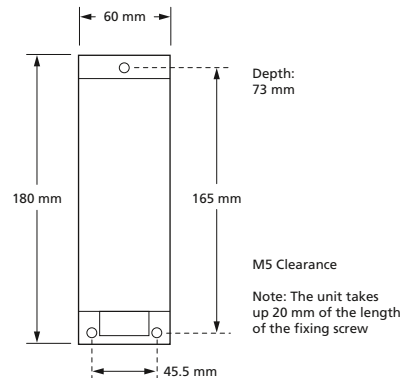
Electrical specification	ESP 12 DC	ESP 24 DC	ESP 36 DC	ESP 48 DC
Order code	7TCA085460R0073	7TCA085460R0091	7TCA085460R0100	7TCA085460R0142
Nominal voltage (DC)	12 V	24 V	36 V	48 V
Maximum voltage (DC)	15 V	30 V	45 V	60 V
Working voltage (DC)	9-15 V	18-30 V	27-45 V	36-60 V
Max. back-up fuse (see installation instructions)	≤ 63 A			
Leakage current (to earth)	< 250 μA			
Indicator circuit current	< 10 mA			
Volt free contact: ⁽¹⁾	Screw terminal			
– Current rating	1 A			
– Nominal voltage (RMS)	250 V			
Transient specification	ESP 12 DC	ESP 24 DC	ESP 36 DC	ESP 48 DC
Type 2 (BS EN/EN), Class II (IEC)				
Nominal discharge current 8/20 μs (per mode) I_n	5 kA			
Let-through voltage U_p at I_n ⁽²⁾	250 V			
Maximum discharge current I_{max} (per mode) ⁽³⁾	20 kA			
Type 3 (BS EN/EN), Class III (IEC)				
Let-through voltage at U_{oc} of 6 kV 1.2/50 μs and I_{sc} of 3 kA 8/20 μs (per mode) ^(2,4)	190 V			
Mechanical specification	ESP 12 DC	ESP 24 DC	ESP 36 DC	ESP 48 DC
Temperature range	-40 to +80 °C			
Connection type	Screw terminal - maximum torque 1.5 Nm			
Conductor size (stranded)	16 mm ²			
Earth connection	Screw terminal - maximum torque 1.5 Nm			
Volt free contact	Connect via screw terminal with conductor up to 2.5 mm ² (stranded) - maximum torque 0.25 Nm			
Degree of protection (IEC 60529)	IP20			
Case material	Steel			
Weight: – Unit	0.6 kg			
– Packaged	0.7 kg			
Dimensions	180 mm x 60mm x 73 mm			

⁽¹⁾ Minimum permissible load is 5 V DC, 10 mA to ensure reliable operation

⁽²⁾ The maximum transient voltage let-through of the protector throughout the test (±10%) per mode

⁽³⁾ The electrical system, external to the unit, may constrain the actual current rating achieved in a particular installation

⁽⁴⁾ Combination wave test within IEC/BS EN 61643, IEEE C62.41-2002 Location Cats C1 & B3, SS 555:2010, AS/NZS 1768-2007, UL 1449 mains wire-in



DC power protection

ESP DCD1 Series



Combined Type 1, 2 and patented Enhanced Type 3 tested protector (to BS EN 61643) for use on DC power distribution systems primarily to protect connected electronic equipment from transient overvoltages on the mains supply, e.g. computer, communications or control equipment. For use at boundaries up to LPZ 0 to protect against flashover (typically the main distribution board location, with multiple metallic services entering) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all sets of conductors (positive to negative, positive to earth, negative to earth - Full Mode protection)
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Innovative multiple thermal disconnect technology for safe disconnection from faulty or abnormal supplies (without compromising protective performance)
- Three way visual indication of protection status and advanced pre-failure warning so you need never be unprotected
- Remote indication facility allows pre-failure warning to be linked to a building management system, buzzer or light
- Changeover active volt-free contact enables the protector to be used to warn of phase loss (i.e. power failure, blown fuses etc)
- Through terminal facility allows series connection on low current supplies to eliminate high additive voltage associated with connecting leads on units installed in parallel
- Compact space saving DIN housing

Installation

Install in parallel, within the power distribution board or directly (via fuses) on to the supply feeding equipment. Can be installed in series for low current supplies - see installation instructions. At distribution boards, the

protector can be installed either on the load side of the incoming isolator, or on the closest outgoing way to the incoming supply. Connect, with very short connecting leads, to positive, negative and earth.

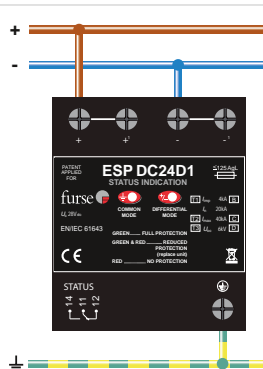
Accessories

Weatherproof enclosure:

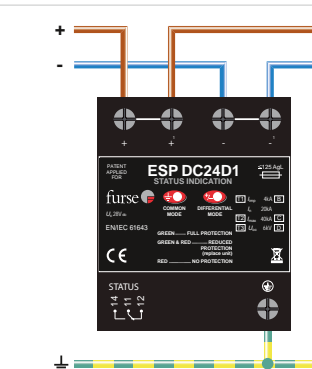
WBX D4

Order code: 7TCA085410R0032

Parallel connection of ESP DC05D1, ESP DC12D1 and ESP DC24D1 series to DC supplies (fuses not shown for clarity)



Series connection of ESP DC05D1, ESP DC12D1 and ESP DC24D1 series to DC supplies (fuses not shown for clarity)



ESP DCD1 Series - Technical specification

Electrical specification	ESP DC05 D1	ESP DC12 D1	ESP DC24 D1
Order code	7TCA085460R0355	7TCA085460R0356	7TCA085460R0357
Nominal voltage - Positive-Negative U _o (DC)	5 V	12 V	24 V
Maximum voltage - Positive-Negative U _c (DC)	6.5 V	15 V	28 V
Short circuit withstand capability	25 k A/50 Hz		
Working voltage (DC)	4.0-6.5 V	9-15 V	20-28 V
Max. back-up fuse (see installation instructions)	≤ 125 A		
Leakage current (to earth)	< 250 μA		
Indicator circuit current	< 50 mA		
Volt free contact: ⁽²⁾	Screw terminal		
– Current rating	1 A		
– Nominal voltage (RMS)	250 V		
Transient specification			
Type 1 (BS EN/EN), Class I (IEC)			
Nominal discharge current 8/20 μs (per mode) I _n	5 k A		
Let-through voltage U _p at I _n (+ to -, +/- to E) ⁽⁸⁾	< 110V, < 250V	< 125V, < 250V	< 170V, < 250V
Impulse discharge current 10/350 μs /i _{imp} (to earth) ⁽⁵⁾	4 k A		
Let-through voltage U _p at i _{imp} (to earth) ⁽⁸⁾	< 300 V	< 300 V	< 300 V
Total discharge current 10/350 μs /total (total to earth) ^(4,5)	8 k A		
Type 2 (BS EN/EN), Class II (IEC)			
Nominal discharge current 8/20 μs (per mode) I _n	5 k A		
Let-through voltage U _p at I _n (+ to -, +/- to E) ⁽⁸⁾	< 110V, < 250V	< 125V, < 250V	< 170V, < 250V
Maximum discharge current I _{max} (+ to -, +/- to E) ⁽⁸⁾	5 kA, 5 kA / 40 kA		
Type 3 (BS EN/EN), Class III (IEC)			
Let-through voltage at U _{oc} of 6 kV 1.2/50 μs and I _{sc} of 3 k A 8/20 μs (per mode) ^(3,6)	70 V	85 V	120 V
Mechanical specification			
Temperature range	-40 to +80 °C		
Connection type	Screw terminal - maximum torque 4.5 Nm		
Conductor size (stranded)	25 mm ²		
Earth connection	Screw terminal - maximum torque 4.5 Nm		
Volt free contact	Connect via screw terminal with conductor up to 1.5 mm ² (stranded) - maximum torque 0.25 Nm		
Degree of protection (IEC 60529)	IP20		
Case material	FR Polymer UL-94 V-0		
Weight: – Unit	0.4 kg		
– Packaged	0.5 kg		
Dimensions to DIN 43880 - HxDxW ⁽⁷⁾	90 mm x 88 mm x 72 mm (4TE)		

⁽¹⁾ Temporary Overvoltage rating is for a maximum duration of 5 seconds tested to BS EN/EN/IEC 61643

⁽²⁾ Minimum permissible load is 5 V DC, 10 mA to ensure reliable operation

⁽³⁾ The maximum transient voltage let-through of the protector throughout the test (±10%), positive to negative, positive to earth, negative to earth

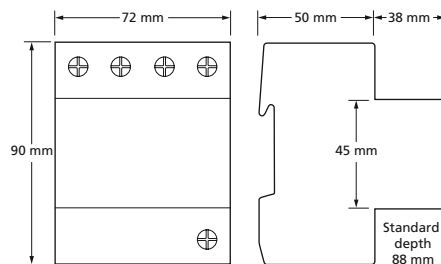
⁽⁴⁾ Rating is considered as the current capability of the protector for equipotential bonding near the service entrance

⁽⁵⁾ The electrical system, external to the unit, may constrain the actual current rating achieved in a particular installation

⁽⁶⁾ Combination wave test within IEC/BS EN 61643, IEEE C62.41-2002 Location Cats C1 & B3, SS 555:2010, AS/NZS 1768-2007, UL 1449 mains wire-in

⁽⁷⁾ The remote signal contact (removable) adds 10 mm to height

⁽⁸⁾ Primary (low U_p) circuit / secondary 'reserve'



Mains power protection

ESP D/DS 10A & 32A Series (Single phase)



Combined Type 1, 2 and 3 tested protector (to BS EN 61643) for use on low current (up to 10 or 32 A) single phase systems to protect connected electronic equipment from transient overvoltages on the mains supply, e.g. fire/intruder alarm panels. Available for 90-150 Volts, 200-280 Volts and 232-350 Volts supplies. For use at boundary LPZ 0 through to LPZ 3 boundaries to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all sets of conductors (phase to neutral, phase to earth, neutral to earth - Full Mode protection)
- Repeated protection in lightning intense environments
- Compact space saving DIN housing for easy incorporation in the protected system
- Innovative multiple thermal disconnect technology for safe disconnection from faulty or abnormal supplies (without compromising protective performance)

- Three way visual indication of protection status and advanced pre-failure warning so you need never be unprotected
- Advanced status (DS) version has remote indication facility to a BMS via an active changeover volt-free contact to show pre-failure warnings and potential phase loss (i.e. power failure, blown fuses etc), and a flashing warning of potentially fatal neutral to earth supply volts

Installation

Connect in-line with the power supply usually either within the equipment panel (or for CCTV cameras, in an enclosure close by), or on the fused connection that supplies equipment.

Application

Use these protectors on low current mains power supplies, e.g. CCTV cameras, alarm panels, industrial battery chargers and telemetry equipment.

To protect equipment inside a building from transients entering on an outgoing feed (e.g. to CCTV cameras or to site lighting) the protector should be installed as close to where the cable leaves the building as possible.

Connect in-line on supplies fused up to 10 A (ESP 120D-10A, ESP 120DS-10A, ESP 240D-10A, ESP 240DS-10A, ESP 277D-10A or ESP 277DS-10A) or 32 A (ESP 120D-32A, ESP 120DS-32A, ESP 240D-32A, ESP 240DS-32A, ESP 277D-32A or ESP 277DS-32A)

Protectors should be installed either within an existing cabinet/cubicle or in a separate enclosure.

Accessories

Weatherproof enclosure:
WBX D4
 Order code: 7TCA085410R0032



NOTE: If your supply is fused at more than 32 Amps the ESP 120 M1, ESP 240 M1 or ESP 277 M1 are suitable.

ESP D/DS 10A & 32A Series (Single phase) - Technical specification

Electrical specification	ESP 120D-10A ESP 120DS-10A	ESP 120D-32A ESP 120DS-32A	ESP 240D-10A ESP 240DS-10A	ESP 240D-32A ESP 240DS-32A	ESP 277D-10A ESP 277DS-10A	ESP 277D-32A ESP 277DS-32A
Order code	7TCA085460R0328 7TCA085460R0326	7TCA085460R0327 7TCA085460R0325	7TCA085460R0323 7TCA085460R0317	7TCA085460R0322 7TCA085460R0318	7TCA085460R0319 7TCA085460R0321	7TCA085460R0320 7TCA085460R0324
Nominal voltage - Phase-Neutral U_0 (RMS)	120 V		240 V		277 V	
Maximum voltage - Phase-Neutral U_c (RMS)	150 V		280 V		350 V	
Temporary Overvoltage TOV $U_T^{(1)}$	175 V		350 V		402 V	
Short circuit withstand capability	10 kA/50 Hz					
Working voltage (RMS)	90-150 V		200-280 V		232-350 V	
Frequency range	47-63 Hz					
Current rating (supply)	10 A or less	32 A or less	10 A or less	32 A or less	10 A or less	32 A or less
Max. back-up fuse (see installation instructions)	10 A	32 A	10 A	32 A	10 A	32 A
Leakage current (to earth)	Zero					
Indicator circuit current	< 10 mA					
Volt free contact (DS versions only): ⁽²⁾	Screw terminal					
– Current rating	1 A					
– Nominal voltage (RMS)	250 V					
Transient specification	ESP 120D-10A ESP 120DS-10A	ESP 120D-32A ESP 120DS-32A	ESP 240D-10A ESP 240DS-10A	ESP 240D-32A ESP 240DS-32A	ESP 277D-10A ESP 277DS-10A	ESP 277D-32A ESP 277DS-32A
Type 1 (BS EN/EN), Class I (IEC)						
Nominal discharge current 8/20 μ s (per mode) I_n	20 kA					
Let-through voltage U_p at I_n	< 1 kV		< 1.3 kV		< 1.4 kV	
Impulse discharge current 10/350 μ s I_{imp} (L-N/E, N-E) ⁽⁴⁾	4 kA, 12.5 kA					
Total discharge current (total to earth) I_{total} ^(4,5)	6.25 kA					
Type 2 (BS EN/EN), Class II (IEC)						
Nominal discharge current 8/20 μ s (per mode) I_n	20 kA					
Let-through voltage U_p at I_n	< 1 kV		< 1.3 kV		< 1.4 kV	
Maximum discharge current I_{max} (L-N/E, N-E) ⁽⁴⁾	40 kA, 40 kA					
Type 3 (BS EN/EN), Class III (IEC)						
Let-through voltage at U_{oc} of 6 kV 1.2/50 μ s and I_{sc} of 3 kA 8/20 μ s (per mode) ^(3,6)	400 V		600 V		680 V	
Mechanical specification	ESP 120D-10A ESP 120DS-10A	ESP 120D-32A ESP 120DS-32A	ESP 240D-10A ESP 240DS-10A	ESP 240D-32A ESP 240DS-32A	ESP 277D-10A ESP 277DS-10A	ESP 277D-32A ESP 277DS-32A
Temperature range	-40 to +80 °C					
Connection type	Screw terminal - maximum torque 0.8 Nm ⁽⁷⁾					
Conductor size (stranded)	6 mm ²					
Earth connection	Screw terminal - maximum torque 0.8 Nm ⁽⁷⁾					
Volt free contact (DS versions only)	Connect via screw terminal with conductor up to 1.5 mm ² (stranded) - maximum torque 0.25 Nm ⁽⁷⁾					
Degree of protection (IEC 60529)	IP20					
Case material	FR Polymer UL-94 V-0					
Weight: – Unit	0.23 kg					
– Packaged	0.25 kg					
Dimensions to DIN 43880 - HxDxW ⁽⁸⁾	90 mm x 75 mm x 36 mm (2TE)					

*To enclose the products to IP65, fit within a WDX D4, available from Furse

⁽¹⁾ Temporary Overvoltage rating is for a maximum duration of 5 seconds tested to BS EN/EN/IEC 61643

⁽²⁾ Minimum permissible load is 5 V DC, 10 mA to ensure reliable operation

⁽³⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$)

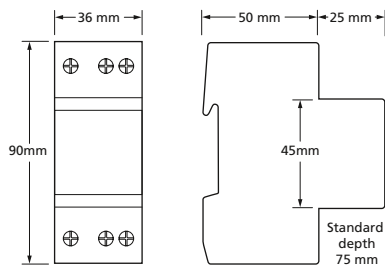
⁽⁴⁾ The electrical system, external to the unit, may constrain the actual current rating achieved in a particular installation

⁽⁵⁾ Rating is considered as the current capability of the protector for equipotential bonding near the service entrance

⁽⁶⁾ Combination wave test within IEC/BS EN 61643, IEEE C62.41-2002 Location Cats C1 & B3, SS 555:2010, AS/NZS 1768-2007, UL 1449 mains wire-in

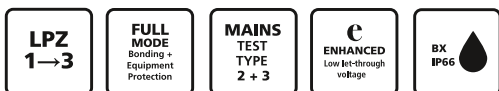
⁽⁷⁾ Torque should typically be 50% to 75% of the maximum value

⁽⁸⁾ The remote signal contact (removable) adds 10 mm to height



Mains power protection

ESP 5A/BX & 16A/BX Series



Combined Type 2 and 3 tested protector (to BS EN 61643) for use on low current (up to 5 or 16 A) single phase systems to protect connected electronic equipment from transient overvoltages on the mains supply, e.g. fire/intruder alarm panels. Protectors with BX suffix come ready-boxed, to IP66, for use in dirty or damp environments. Available for 90-150 Volts, 200-280 Volts and 232-350 Volts supplies. For use at boundaries LPZ 1 through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all sets of conductors (phase to neutral, phase to earth, neutral to earth - Full Mode protection) allowing continuous operation of equipment
- Repeated protection in lightning intense environments
- Compact size for easy incorporation in the protected system
- Removable DIN-Rail foot for simple clip-on mounting to top hat DIN-Rails (unboxed versions)
- Colour coded terminals give a quick and easy installation check - grey for the dirty (line) end and green for the clean end
- Available ready-boxed to IP66 for use in dirty or damp environments (protectors with /BX suffix)
- Robust housing and substantial earth stud fixing holes ready for flat mounting
- Maintenance free
- ESP 240-5A/BX has Network Rail Approval PA05/02896. NRS PADS reference 087/037285

Installation

Connect in-line with the power supply usually either within the equipment panel (or for CCTV cameras, in an enclosure close by), or on the fused connection that supplies equipment.

To protect equipment inside a building from transients entering on an outgoing feed (e.g. to CCTV cameras or to site lighting) the protector should be installed as close to where the cable leaves the building as possible.

Unless ready boxed, protectors should be installed either within an existing cabinet/cubicle or in a separate enclosure.

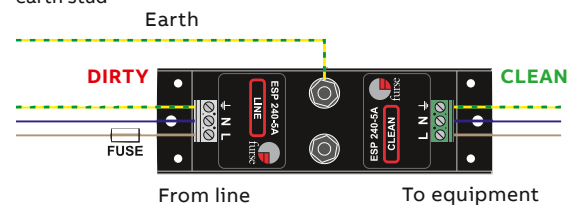
Accessories

If several **ESP 120-5A** or **16A**, **ESP 240-5A** or **16A** or **ESP 277-5A** or **16A** protectors are to be installed together, or if one is in use alongside Lightning Barriers for video or signal lines, these can be simultaneously mounted and earthed on a CME kit and housed in a suitable WBX enclosure.

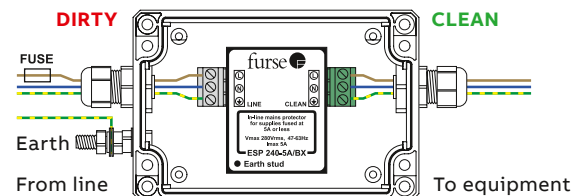
Application

Use these protectors on low current mains power supplies, e.g. CCTV cameras, alarm panels and telemetry equipment.

Connect in-line on supplies fused up to 5 A (ESP 120-5A/BX, ESP 240-5A/BX or ESP 277-5A/BX) or 16 A (ESP 120-16A/BX, ESP 240-16A/BX or ESP 277-16A/BX). Note how the protector can also be earthed from its earth stud



Connect in-line on supplies fused up to 5 A (ESP 120-5A, ESP 240-5A or ESP 277-5A) or 16 A (ESP 120-16A, ESP 240-16A or ESP 277-16A). Note how the protector can also be earthed from its earth stud

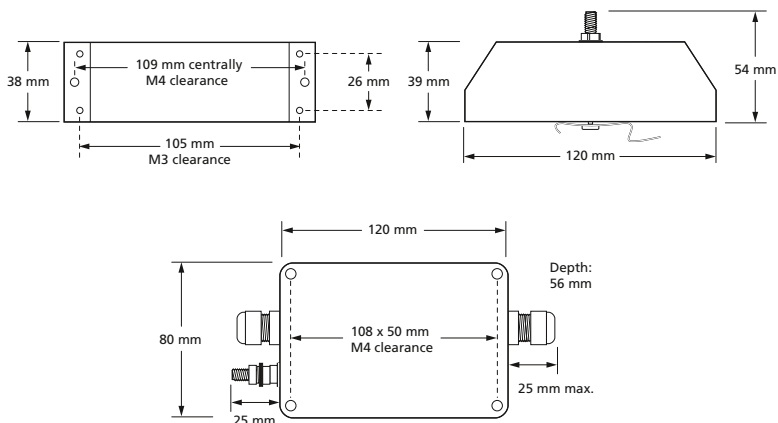


NOTE: If your supply is fused at more than 16 Amps the ESP 120 M1, ESP 240 M1 or ESP 277 M1 are suitable.

ESP 5A/BX & 16A/BX Series - Technical specification

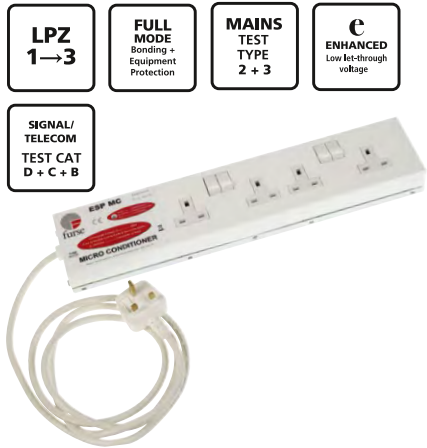
Electrical specification	ESP 120-5A ESP 120-5A/BX	ESP 120-16A ESP 120-16A/BX	ESP 240-5A ESP 240-5A/BX	ESP 240-16A ESP 240-16A/BX	ESP 277-5A ESP 277-5A/BX	ESP 277-16A ESP 277-16A/BX
Order code	7TCA085460R0066 7TCA085460R0067	7TCA085460R0064 7TCA085460R0065	7TCA085460R0083 7TCA085460R0084	7TCA085460R0080 7TCA085460R0081	7TCA085460R0095 7TCA085460R0348	7TCA085460R0093 7TCA085460R0094
Nominal voltage - Phase-Neutral U_0 (RMS)	120 V	120 V	240 V	240 V	277 V	277 V
Maximum voltage - Phase-Neutral U_c (RMS)	150 V	150 V	280 V	280 V	350 V	350 V
Working voltage (RMS)	90-150 V	90-150 V	200-280 V	200-280 V	232-350 V	232-350 V
Frequency range	47-63 Hz					
Current rating (supply)	5 A or less	16 A or less	5 A or less	16 A or less	5 A or less	16 A or less
Max. back-up fuse (see installation instructions)	≤ 5 A	≤ 16 A	≤ 5 A	≤ 16 A	≤ 5 A	≤ 16 A
Leakage current (to earth)	< 0.5 mA					
Transient specification	120 Volt protectors	240 Volt protectors	277 Volt protectors			
Type 2 (BS EN/EN), Class II (IEC)						
Nominal discharge current 8/20 μ s (per mode) I_n	5 kA					
Let-through voltage U_p at $I_n^{(1)}$	450 V	750 V	790 V			
Maximum discharge current I_{max} (per mode) ⁽²⁾	10 kA					
Type 3 (BS EN/EN), Class III (IEC)						
Let-through voltage at U_{oc} of 6 kV 1.2/50 μ s and I_{sc} of 3 kA 8/20 μ s (per mode) ^(1,3)	400 V	600 V	680 V			
Electrical specification	ESP 120-5A ESP 120-5A/BX	ESP 120-16A ESP 120-16A/BX	ESP 240-5A ESP 240-5A/BX	ESP 240-16A ESP 240-16A/BX	ESP 277-5A ESP 277-5A/BX	ESP 277-16A ESP 277-16A/BX
Temperature range	-40 to +80 °C					
Connection type	Screw terminal - maximum torque 0.5 Nm					
Conductor size (stranded)	4 mm ²					
Earth connection	Via M6 stud or earth terminal -maximum torque 0.5 Nm					
Cable glands	-			5A/BX 4.8-8 mm cable (PG9)		
Degree of protection (IEC 60529)	IP20			IP66		
Case material	Steel			PVC		
Weight: – Unit	0.23 kg			0.26 kg		
– Packaged	0.25 kg			0.31 kg		
Dimensions	See diagrams below					

⁽¹⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), phase to neutral, phase to earth and neutral to earth
⁽²⁾ The electrical system, external to the unit, may constrain the actual current rating achieved in a particular installation
⁽³⁾ Combination wave test within IEC/BS EN 61643, IEEE C62.41-2002 Location Cats C1 & B3, SS 555:2010, AS/NZS 1768-2007, UL 1449 mains wire-in



Mains power protection

ESP MC Series



Combined Type 2 and 3 tested protector (to BS EN 61643) with telecom or network protection options. Suitable for use on 220/230/240 Volts supplies. Available with British style (three square pin) plugs and sockets with double-pole action. For use at boundaries LPZ 1 through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Low let-through voltage between all sets of conductors
- Three way visual indication of protection status
- Protects against radio frequency interference
- TN and Cat-5e versions can conveniently protect both mains and telecom/data lines in one unit

- Rugged, heavy duty construction
- Bracket kit ESP MC/19BK available for rear or 19" rack mounting
- Maintenance free

Installation

Simply plug the ESP MC series into the mains and your equipment into the ESP MC.

Application

ESP MC series can be used to protect all sorts of plug-in equipment, including hospital laboratory equipment, modems, fax machines and PCs.

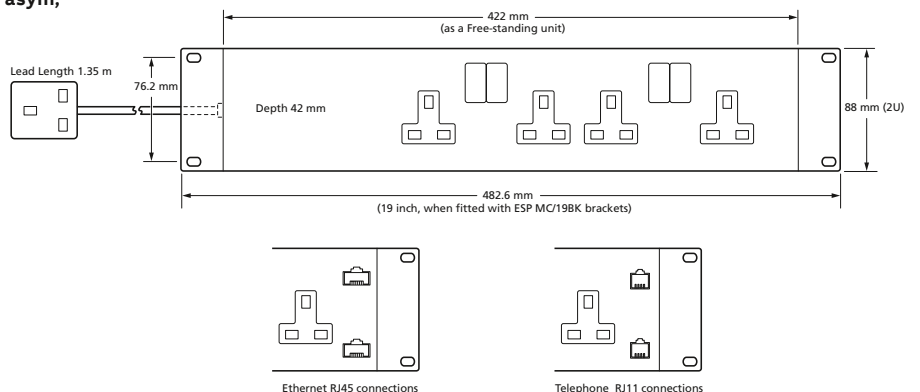
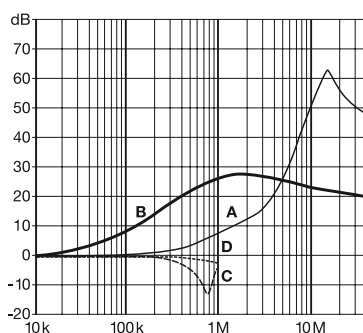
Accessories

ESP MC/19BK bracket kit can be used for rear mounting, or reversed for use in 19" cabinets. All fixings supplied. Order code: 7TCA085460R0034



RFI performance

Per CISPR 17: A = 50 Ω/50 Ω sym, B = 50 Ω/50 Ω asym, C = 0.1 Ω/100 Ω sym, D = 100 Ω/0.1 Ω sym



NOTE: For wire-in applications up to 16 amps, the ESP 16A/BX Series may be more suitable. For all other supplies, consider the ESP M1 Series.

ESP MC Series - Technical specification			
Electrical specification - mains	ESP MC	ESP MC/TN/RJ11	ESP MC/Cat-5e
Order code	7TCA085430R0003	7TCA085430R0005	7TCA085430R0004
Nominal voltage - Phase-Neutral U_0 (RMS)	220/230/240 V		
Maximum voltage - Phase-Neutral U_c (RMS)	280 V		
Frequency range	47-63 Hz		
Current rating (supply)	13 A		
Leakage current (to earth)	< 0.5 mA		
Electrical specification - telecom/data	ESP MC	ESP MC/TN/RJ11	ESP MC/Cat-5e
Nominal voltage	–	296 V	5 V
Maximum working voltage $U_c^{(1)}$	–	296 V	5 V ⁽²⁾
Current rating (signal)	–	300 mA	300 mA
In-line resistance (per line $\pm 10\%$)	–	4.4 Ω	1 Ω
Bandwidth (-3 dB 50 Ω system)	–	20 MHz	–
Maximum data rate	–	–	100 Mbps
Transient specification - mains	ESP MC	ESP MC/TN/RJ11	ESP MC/Cat-5e
Type 2 (BS EN/EN), Class II (IEC)			
Nominal discharge current 8/20 μ s (per mode) I_n	5 kA		
Let-through voltage U_p at $I_n^{(3)}$	850 V		
Maximum discharge current I_{max} (per mode) ⁽⁴⁾	10 kA		
Type 3 (BS EN/EN), Class III (IEC)			
Let-through voltage at U_{oc} of 6 kV 1.2/50 μ s and I_{sc} of 3 kA 8/20 μ s (per mode) ^(3,5)	680 V		
Let-through voltage at U_{oc} of 6 kV 1.2/50 μ s and I_{sc} of 500 A 8/20 (per mode) ^(3,5)	555 V		
Transient specification - telecom/data	ESP MC	ESP MC/TN/RJ11	ESP MC/Cat-5e
Let-through voltage (all conductors)⁽⁶⁾ U_p			
C2 test 4 kV 1.2/50 μ s, 2 kA 8/20 μ s to BS EN/EN/IEC 61643-21 - line to line / line to earth	–	390 V/390 V	120 V/700 V(8)
C1 test 1 kV, 1.2/50 μ s, 0.5 kA 8/20 μ s to BS EN/EN/IEC 61643-21 - line to line / line to earth	–	395 V/395 V	74 V/600 V(8)
B2 test 4 kV 10/700 μ s to BS EN/EN/IEC 61643-21 - line to line / line to earth	–	295 V/295 V	21 V/550 V(8)
5 kV, 10/700 μ s ⁽⁷⁾ - line to line / line to earth	–	300 V/300 V	25 V/600 V(8)
Maximum surge current⁽⁹⁾			
D1 test 10/350 μ s to BS EN/EN/IEC 61643-21	–	1 kA	1 kA
8/20 μ s to ITU (formerly CCITT), BS 6651:1999 Appendix C	–	10 kA	10 kA
Mechanical specification	ESP MC	ESP MC/TN/RJ11	ESP MC/Cat-5e
Temperature range	-40 °C to +80 °C		
Connection type	Via British style three square pin plug and socket to BS 1363		
Conductor size (solid)	–	RJ11	RJ45
Earth connection	Via plug and socket		
Case material	Steel		
Weight: – Unit	1.70 kg	1.75 kg	1.75 kg
– Packaged	1.75 kg	1.8 kg	1.8 kg

⁽¹⁾ Maximum working voltage (DC or AC peak) of telecom/data protection measured at <10 μ A leakage for ESP MC/TN/RJ11 and 1 mA for ESP MC/Cat-5e

⁽²⁾ Maximum working voltage is 5 V for data pairs 1/2 & 3/6

⁽³⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), phase to neutral, phase to earth and neutral to earth

⁽⁴⁾ The electrical system, external to the unit, may constrain the actual current rating achieved in a particular installation

⁽⁵⁾ Combination wave test within IEC/BS EN 61643, IEEE C62.41-2002 Location Cats C1 & B3, SS 555:2010, AS/NZS 1768-2007, UL 1449 mains wire-in

⁽⁶⁾ The maximum transient voltage let-through the protector throughout the test ($\pm 10\%$), line to line & line to earth. Response time < 10 ns

⁽⁷⁾ Test to IEC/BS EN 61643, IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002,

ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)

⁽⁸⁾ The interfaces used in Cat-5/5e systems incorporate an isolation transformer that inherently provides an inbuilt immunity to transients between line and earth of 1,500 Volts or more

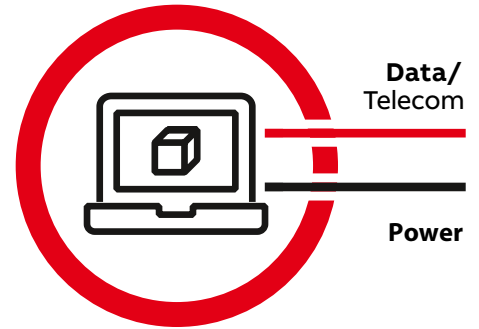
⁽⁹⁾ The installation and connectors external to the protector may limit the capability of the protector

ABB ESP SPD data range overview

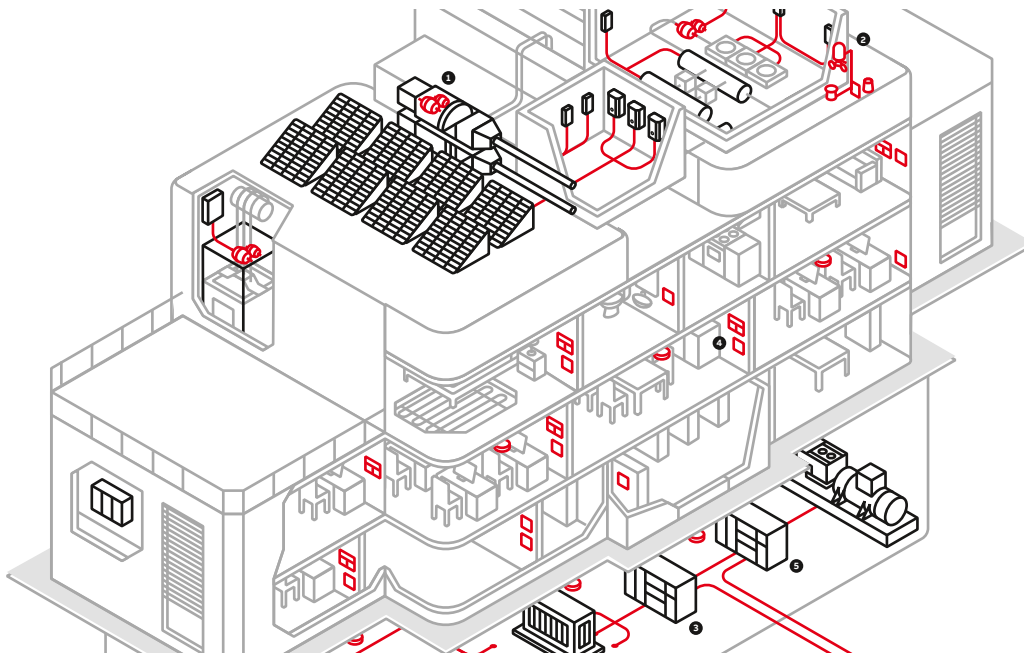
Protecting critical electronic systems

The ABB ESP data/telecom range of SPDs are designed to protect equipment connected to data and telephone lines to complement the ESP 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 (ESP SL series)
- 2 wire ATEX (ESP SLX series)
- 2 wire (ESP D/E/H series)
- 3 wire (ESP SL-3W series)
- 4-20 mA (ESP SL 4-20)
- 8 wire (ESP Q series)
- RTD (ESP RTD series)

2. Transceiver/CCTV systems

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

3. Data & measurement systems

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

4. Telecom systems

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

5. Main power supply

- See ESP power SPD series

Product selector - Data line protection



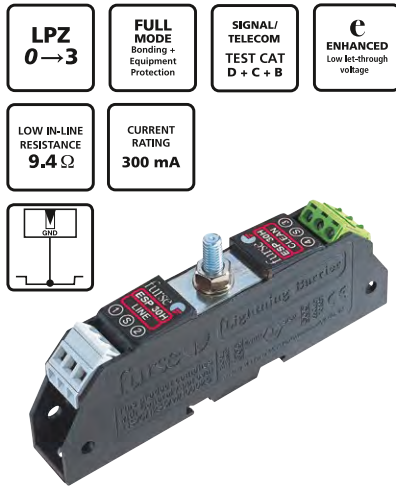
Fieldbus/ PROFIBUS Systems						
HART Systems RS485	ESP RS485 Flat/DIN Mount 7TCA085400R0191	ESP SL RS485 Slim DIN Mount 7TCA085400R0193	ESP RS485Q Multiple Lines (DIN Mount) 7TCA085400R0192			
Ethernet		Cat-5 (100 Mbps) ESP Cat-5e 7TCA085400R0017	ESP Cat-5e/PoE 7TCA085400R0021	Cat-6 (1000 Mbps) ESP Cat-6 7TCA085400R0023	ESP Cat-6/PoE 7TCA085400R0024	
Video Surveillance						
CCTV	5V CCTV with BNC connector, power, and telemetry line	ESP CCTV/B Video signal 7TCA085400R0123	ESP RS485 Telemetry signal 7TCA085400R0191	ESP 240-16A Power line 7TCA085460R0080	ESP CME4 Earth Bar 7TCA085400R0001	ESP WBX4/GS Enclosure 7TCA085410R0028
4 - 20 mA current loops						
	Screw terminals 30 V	ESP SL30L/4-20 Product code: 7TCA085400R0070				
Coaxial antennas: GSM, UMTS, Radar, Radio, TV, GPS		RF power = 650 W Female coaxial connector:	ESP RF 441421 BNC 7TCA085450R0058	ESP RF AA1421 7/16 DIN 7TCA085450R0061	ESP RF 111421 N 7TCA085450R0005	
Telephone ISDN DSL G.FAST		Screw terminals:				
	2 wire Telecom		ESP TN Flat Mount 7TCA085400R0171	ESP SL TN Slim Mount 7TCA085400R0195	ESP SL TNL Slim Mount with LED 7TCA085400R0226	ESP TNQ Multiple Lines 7TCA085400R0183
		RJ11, RJ45	RJ11 telephone units	ESP TN/RJ11-6/6 6P6C Connector 7TCA085400R0180	RJ45 network units	ESP ISDN/RJ45-4/8 8P4C Connector 7TCA085460R0171
		PBX Telecom	LSA-PLUS connection	ESP KT1 Single module 7TCA085400R0135	ESP K10T1 10 modules 7TCA085400R0130	ESP KE10 Earth Bar 7TCA085400R0134
TV: Satellite, Cable		ESP CATV/F Cable 7TCA085400R0122	ESP SMATV/F Satellite 7TCA085450R0026	ESP TV/EURO Antenna 7TCA085450R0027		
2 wire systems (30 V)		ESP 30E Flat Mount 7TCA085400R0104		ESP SL30 Slim Mount 7TCA085400R0067		ESP 30Q Multiple Lines 7TCA085400R0107
					Protection for different voltages are available	
Hazardous Areas ATEX/IEC Approved		ESP SL15X 15 Volt 7TCA085400R0065	ESP SL30X 30 Volt 7TCA085400R0071		LED and Isolated base options are available	
Resistance Temperature Detectors (RTD) 3 wire systems		ESP RTD Flat/DIN Mount 7TCA085460R0157		ESP SL RTD Slim (DIN Mount) 7TCA085400R0232		ESP RTDQ Multiple Lines (DIN Mount) 7TCA085400R0158
3 wire systems (30 V)		ESP SL30/3W Slim Mount 7TCA085400R0268	Protection for different voltages are available			



IMPORTANT:
Equipment is ONLY
protected against
transient overvoltages if
all incoming / outgoing
mains and data lines
have protection fitted.

Data and signal protection

ESP D & TN Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable for most twisted pair signaling applications. Available for working voltages of up to 6, 15, 30, 50 and 110 Volts. ESP TN suitable for Broadband, POTS, dial-up, T1/E1, lease line and *DSL telephone applications. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Low in-line resistance minimizes unnecessary reductions in signal strength
- Strong, flame retardant, ABS housing
- Supplied ready for flat mounting on base or side
- Built-in DIN-Rail foot for simple clip-on mounting to top hat DIN-Rails
- Colour coded terminals give a quick and easy installation check - grey for the dirty (line) end and green for the clean end
- Screen terminal enables easy connection of cable screen to earth
- Substantial earth stud to enable effective earthing
- Integral earthing plate for enhanced connection to earth via a CME kit
- ESP 06D and ESP 50D have PADS reference 086/000551 (ESP 06D) and 086/000553 (ESP 50D)
- ESP TN is suitable for telecommunication applications in accordance with Telcordia and ANSI Standards (see Application Note AN005)

Installation

Connect in series with the data communication or signal line either near where it enters or leaves the building or close to the equipment being protected (e.g. within its control panel). Either way, it must be very close to the system's earth star point. Install protectors either within an existing cabinet/cubicle or in a separate enclosure.

Accessories

Combined Mounting/Earthing kits:

- CME 4** Mount & earth up to 4 protectors
- CME 8** Mount & earth up to 8 protectors
- CME 16** Mount & earth up to 16 protectors
- CME 32** Mount & earth up to 32 protectors

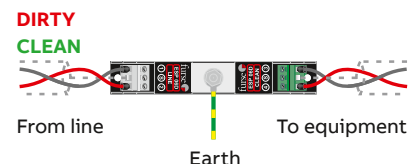
Weatherproof enclosures:

- WBX 2/G**
For use with up to 2 protectors
- WBX 3, WBX 3/G**
For use with up to 3 protectors
- WBX 4, WBX 4/GS**
For use with a CME 4 and up to 4 protectors
- WBX 8, WBX 8/GS**
For use with a CME 8 and up to 8 protectors
- WBX 16/2/G**
For use with one or two CME 16 and up to 32 protectors

Application

Use on twisted pair lines, e.g. those found in process control equipment, modems and computer communications interfaces.

Install in series (in-line)

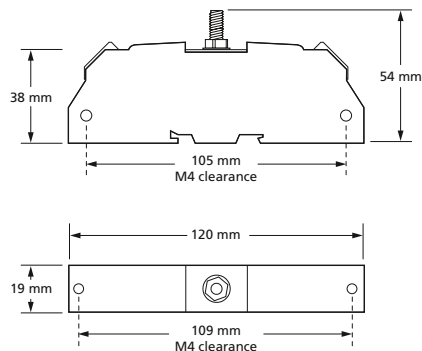


NOTE: Derivatives of these protectors are available ready-boxed to IP66, for use in damp or dirty environments. Slim Line (ESP SL), ATEX (ESP SLX) and PCB mount (ESP PCB) versions are also available. If your system requires a protector with a very low resistance or higher current, see the ESP E & H Series. Also use the ESP E Series for systems needing a higher bandwidth. Protectors for 3-wire (ESP SL/3W) and RTD (ESP RTD, ESP SL RTD) are available, as are the space saving protectors (ESP Q, ESP SL Series). The ESP KT and TN Series are additional protectors specifically for telephone lines. The ESP KS Series are protectors for data and signal lines on an LSA-PLUS module.

ESP D & TN Series - Technical specification

Electrical specification	ESP 06D	ESP 15D	ESP 30D	ESP 50D	ESP 110D	ESP TN
Order code	7TCA085400R0079	7TCA085400R0089	7TCA085400R0099	7TCA085400R0109	7TCA085400R0005	7TCA085400R0171
Nominal voltage ⁽¹⁾	6 V	15 V	30 V	50 V	110 V	-
Maximum working voltage U_c (RMS/DC) ⁽²⁾	5 V / 7.79 V	13 V / 19 V	26 V / 37.1 V	41 V / 58 V	93 V / 132 V	- / 296 V
Current rating (signal)	300 mA					
In-line resistance (per line $\pm 10\%$)	9.4 Ω	9.4 Ω	9.4 Ω	9.4 Ω	9.4 Ω	4.4 Ω
Bandwidth (-3 dB 50 Ω system)	800 kHz	2.5 MHz	4 MHz	6 MHz	9 MHz	20 MHz
Transient specification	ESP 06D	ESP 15D	ESP 30D	ESP 50D	ESP 110D	ESP TN
Let-through voltage (all conductors)⁽³⁾ Up						
C2 test 4 kV 1.2/50 μ s, 2 kA 8/20 μ s to BS EN/EN/IEC 61643-21	12.0 V	25.0 V	44.0 V	78.0 V	155 V	395 V
C1 test 1 kV, 1.2/50 μ s, 0.5 kA 8/20 μ s to BS EN/EN/IEC 61643-21	11.5 V	24.5 V	43.5 V	76.0 V	150 V	390 V
B2 test 4 kV 10/700 μ s to BS EN/EN/IEC 61643-21	10.0 V	23.0 V	42.5 V	73.0 V	145 V	298 V
5 kV, 10/700 μ s ⁽⁴⁾	10.5 V	23.8 V	43.4 V	74.9 V	150 V	300 V
Maximum surge current						
D1 test 10/350 μ s to BS EN/EN/IEC 61643-21:	- Per signal wire	2.5 kA		5 kA		
	- Per pair					
8/20 μ s to ITU-T K.45:2003, IEEE C62.41.2:2002:	- Per signal wire	10 kA		20 kA		
	- Per pair					
Mechanical specification	ESP 06D	ESP 15D	ESP 30D	ESP 50D	ESP 110D	ESP TN
Temperature range	-40 to +80 °C					
Connection type	Screw terminal - maximum torque 0.5 Nm					
Conductor size (stranded)	2.5 mm ²					
Earth connection	M6 stud					
Case material	FR Polymer UL-94 V-0					
Weight: - Unit	0.08 kg					
Dimensions	See diagram below					

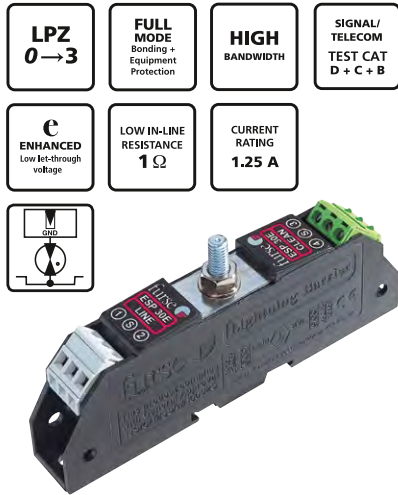
- ⁽¹⁾ Nominal voltage (RMS/DC or AC peak) measured at < 5 μ A (ESP 15D, ESP 30D, ESP 50D, ESP 110D) and <200 μ A (ESP 06D)
- ⁽²⁾ Maximum working voltage (RMS/DC or AC peak) measured at < 1 mA leakage (ESP 15D, ESP 30D, ESP 50D, ESP 110D), < 10 mA (ESP 06D) and < 10 μ A (ESP TN)
- ⁽³⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), line to line & line to earth, both polarities. Response time < 10 ns
- ⁽⁴⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)

**Order codes**

Type code	Order code	Type code	Order code	Type code	Order code
CME4	7TCA085400R0001	CME8	7TCA085400R0002	CME16	7TCA085410R0002
CME32	7TCA085410R0003	WBX 2/G	7TCA085410R0022	WBX 3	7TCA085410R0023
WBX 3/G	7TCA085410R0024	WBX 4	7TCA085410R0027	WBX 4/GS	7TCA085410R0028
WBX 8	7TCA085410R0030	WBX 8/GS	7TCA085410R0031	WBX 16/2/G	7TCA085410R0020

Data and signal protection

ESP E Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable for twisted pair signaling applications which require either a lower in-line resistance, an increased current or a higher bandwidth than the ESP D Series. Also suitable for DC power applications less than 1.25 Amps. Available for working voltages of up to 6, 15, 30, 50 and 110 Volts. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Very low (1 Ω) in-line resistance allows resistance critical applications (e.g. alarm loops) to be protected
- High (1.25 A) maximum running current
- High bandwidth enables higher frequency (high traffic or bit rate) data communications
- Screen terminal enables easy connection of cable screen to earth
- Strong, flame retardant, ABS housing
- Built-in DIN-Rail foot for simple clip-on mounting to top hat DIN-Rails
- Colour coded terminals give a quick and easy installation check - grey for the dirty (line) end and green for clean
- Substantial earth stud to enable effective earthing
- Supplied ready for flat mounting on base or side
- Integral earthing plate for enhanced connection to earth via CME kit
- ESP 06E and ESP 15E have Network Rail Approval PA05/02047. NRS PADS reference 086/000201 (ESP 06E) and 086/000200 (ESP 15E)

Installation

Connect in series with the data communication or signal line either near where it enters or leaves the building or close to the equipment being protected (e.g. within its control panel). Either way, it must be very close to the system's earth star point. Install protectors either within an existing cabinet/cubicle or in a separate enclosure.

Application

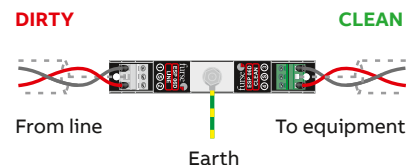
Use these units to protect resistance sensitive, higher frequency or running current systems, e.g. high speed digital communications equipment or systems with long signal lines.

Accessories

- Combined Mounting/Earthing kits:
- CME 4** Mount & earth up to 4 protectors
 - CME 8** Mount & earth up to 8 protectors
 - CME 16** Mount & earth up to 16 protectors
 - CME 32** Mount & earth up to 32 protectors

- Weatherproof enclosures:
- WBX 2/G**
For use with up to 2 protectors
 - WBX 3, WBX 3/G**
For use with up to 3 protectors
 - WBX 4, WBX 4/GS**
For use with a CME 4 and up to 4 protectors
 - WBX 8, WBX 8/GS**
For use with a CME 8 and up to 8 protectors
 - WBX 16/2/G**
For use with one or two CME 16 and up to 32 protectors

Install in series (in-line)



NOTE: Slim Line (ESP SL), ATEX (ESP SLX) and PCB mount (ESP PCB) are available. For many twisted pair data and signal applications, the lower cost ESP D Series may be suitable. For applications requiring higher current (1.25 A to 4 A) or ultra-low in-line resistance, the ESP H Series protectors may be more suitable. For data and signal lines on LSA-PLUS modules, use the ESP KS Series.

ESP E Series - Technical specification

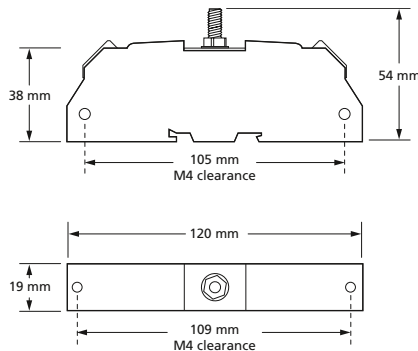
Electrical specification	ESP 06E	ESP 15E	ESP 30E	ESP 50E	ESP 110E
Order code	7TCA085400R0084	7TCA085400R0095	7TCA085400R0104	7TCA085400R0116	7TCA085400R0007
Nominal voltage ⁽¹⁾	6 V	15 V	30 V	50 V	110 V
Maximum working voltage U_c (RMS/DC) ⁽²⁾	5 V / 7.79 V	11 V / 16.7 V	25 V / 36.7 V	40 V / 56.7 V	93 V / 132 V
Current rating (signal)	1.25 A				
In-line resistance (per line $\pm 10\%$)	1.0 Ω				
Bandwidth (-3 dB 50 Ω system)	45 MHz				
Transient specification	ESP 06E	ESP 15E	ESP 30E	ESP 50E	ESP 110E
Let-through voltage (all conductors)⁽³⁾ Up					
C2 test 4 kV 1.2/50 μ s, 2 kA 8/20 μ s to BS EN/EN/IEC 61643-21	36.0 V	39.0 V	60.0 V	86.0 V	180 V
C1 test 1 kV, 1.2/50 μ s, 0.5 kA 8/20 μ s to BS EN/EN/IEC 61643-21	26.2 V	28.0 V	49.0 V	73.5 V	170 V
B2 test 4 kV 10/700 μ s to BS EN/EN/IEC 61643-21	16.0 V	25.5 V	43.5 V	65.0 V	160 V
5 kV, 10/700 μ s(4)	17.0 V	26.2 V	44.3 V	65.8 V	165 V
Maximum surge current					
D1 test 10/350 μ s to BS EN/EN/IEC 61643-21: - Per signal wire	2.5 kA				
- Per pair	5 kA				
8/20 μ s to ITU-T K.45:2003, - Per signal wire	10 kA				
IEEE C62.41.2:2002: - Per pair	20 kA				
Mechanical specification	ESP 06E	ESP 15E	ESP 30E	ESP 50E	ESP 110E
Temperature range	-40 to +80 °C				
Connection type	Screw terminal - maximum torque 0.5 Nm				
Conductor size (stranded)	2.5 mm ²				
Earth connection	M6 stud				
Case material	FR Polymer UL-94 V-0				
Weight: - Unit	0.08 kg				
Dimensions	See diagram below				

⁽¹⁾ Nominal voltage (RMS/DC or AC peak) measured at < 10 μ A (ESP 15E, ESP 30E, ESP 50E, ESP 110E) and < 200 μ A (ESP 06E)

⁽²⁾ Maximum working voltage (RMS/DC or AC peak) measured at < 5 mA leakage (ESP 15E, ESP 30E, ESP 50E, ESP 110E) and < 10 mA (ESP 06E)

⁽³⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), line to line & line to earth, both polarities. Response time < 10 ns

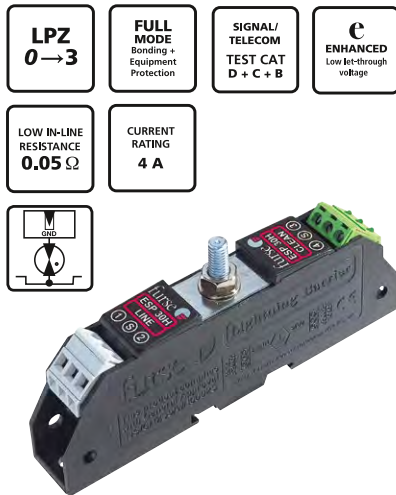
⁽⁴⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)

**Order codes**

Type code	Order code	Type code	Order code	Type code	Order code
CME4	7TCA085400R0001	CME8	7TCA085400R0002	CME16	7TCA085410R0002
CME32	7TCA085410R0003	WBX 2/G	7TCA085410R0022	WBX 3	7TCA085410R0023
WBX 3/G	7TCA085410R0024	WBX 4	7TCA085410R0027	WBX 4/GS	7TCA085410R0028
WBX 8	7TCA085410R0030	WBX 8/GS	7TCA085410R0031	WBX 16/2/G	7TCA085410R0020

Data and signal protection

ESP H Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable for twisted pair signaling applications which require either a lower in-line resistance or an increased current than the ESP D or E Series. Also suitable for DC power applications less than 4 Amps. Available for working voltages of up to 6, 15, 30, 50 and 110 Volts. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Ultra-low (< 0.05 Ω) in-line resistance allows resistance critical applications (e.g. alarm loops) to be protected
- Very high (4 A) maximum running current
- Strong, flame retardant ABS housing
- Supplied ready for flat mounting on base or side
- Built-in DIN-Rail foot for simple clip-on mounting to top hat DIN-Rails
- Colour coded terminals give a quick and easy installation check - grey for the dirty (line) end and green for clean
- Screen terminal enables easy connection of cable screen to earth
- Substantial earth stud to enable effective earthing
- Integral earth plate enables enhanced connection to earth via CME kit

Installation

Connect in series with the data communication or signal line either near where it enters or leaves the building or close to the equipment being protected (e.g. within its control panel). Either way, it must be very close to the system's earth star point. Install protectors either within an existing cabinet/cubicle or in a separate enclosure.

Accessories

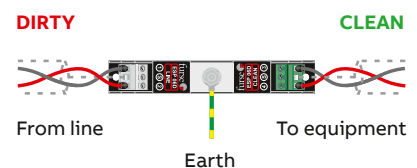
Combined Mounting/Earthing kits:
CME 4 Mount & earth up to 4 protectors
CME 8 Mount & earth up to 8 protectors
CME 16 Mount & earth up to 16 protectors
CME 32 Mount & earth up to 32 protectors

Weatherproof enclosures:
WBX 2/G
 For use with up to 2 protectors
WBX 3, WBX 3/G
 For use with up to 3 protectors
WBX 4, WBX 4/GS
 For use with a CME 4 and up to 4 protectors
WBX 8, WBX 8/GS
 For use with a CME 8 and up to 8 protectors
WBX 16/2/G
 For use with one or two CME 16 and up to 32 protectors

Application

Use these applications to protect resistance sensitive or higher running current systems, e.g. systems with long signal lines, or DC power applications.

Install in series (in-line)

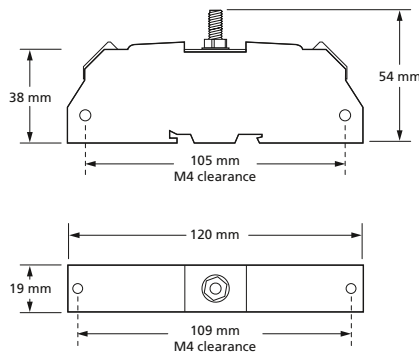


NOTE: For some data and signal applications with lower current, higher in-line resistance or higher bandwidth requirements, the ESP D or E Series protectors or the Slim Line ESP SL Series may be more suitable. If the protector is to be mounted directly onto a PCB, use the ESP PCB/**D or ESP PCB/**E protectors.

ESP H Series - Technical specification

Electrical specification	ESP 06H	ESP 15H	ESP 30H	ESP 50H	ESP 110H
Order code	7TCA085400R0003	7TCA085400R0009	7TCA085400R0011	7TCA085400R0012	7TCA085400R0008
Nominal voltage ⁽¹⁾	6 V	15 V	30 V	50 V	110 V
Maximum working voltage U_c (RMS/DC) ⁽²⁾	5 V / 7.79 V	11 V / 16.7 V	25 V / 36.7 V	40 V / 56.7 V	93 V / 132 V
Current rating (signal)	4 A				
In-line resistance (per line $\pm 10\%$)	0.05 Ω				
Bandwidth (-3 dB 50 Ω system)	160 KHz	140 KHz	130 KHz	120 KHz	120 KHz
Transient specification	ESP 06H	ESP 15H	ESP 30H	ESP 50H	ESP 110H
Let-through voltage (all conductors)⁽³⁾ Up					
C2 test 4 kV 1.2/50 μ s, 2 kA 8/20 μ s to BS EN/EN/IEC 61643-21	12.0 V	27.5 V	46.0 V	67.0 V	150 V
C1 test 1 kV, 1.2/50 μ s, 0.5 kA 8/20 μ s to BS EN/EN/IEC 61643-21	11.0 V	26.5 V	45.0 V	66.5 V	145 V
B2 test 4 kV 10/700 μ s to BS EN/EN/IEC 61643-21	10.5 V	25.5 V	43.5 V	65.0 V	140 V
5 kV, 10/700 μ s ⁽⁴⁾	10.8 V	26.2 V	44.3 V	65.8 V	145 V
Maximum surge current					
D1 test 10/350 μ s to BS EN/EN/IEC 61643-21:	- Per signal wire - Per pair	2.5 kA 5 kA			
8/20 μ s to ITU-T K.45:2003, IEEE C62.41.2:2002:	- Per signal wire - Per pair	10 kA 20 kA			
Mechanical specification	ESP 06E	ESP 15E	ESP 30E	ESP 50E	ESP 110E
Temperature range	-40 to +80 °C				
Connection type	Screw terminal - maximum torque 0.5 Nm				
Conductor size (stranded)	2.5 mm ²				
Earth connection	M6 stud - maximum torque 0.5 Nm				
Case material	FR Polymer UL-94 V-0				
Weight: - Unit	0.08 kg				
Dimensions	See diagram below				

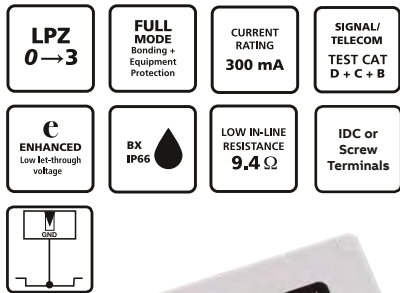
- ⁽¹⁾ Nominal voltage (RMS/DC or AC peak) measured at < 10 μ A (ESP 15H, ESP 30H, ESP 50H, ESP 110H) and < 200 μ A (ESP 06H)
- ⁽²⁾ Maximum working voltage (RMS/DC or AC peak) measured at < 5 mA leakage (ESP 15H, ESP 30H, ESP 50H, ESP 110H) and < 10 mA (ESP 06H)
- ⁽³⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), line to line & line to earth, both polarities. Response time < 10 ns
- ⁽⁴⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)

**Order codes**

Type code	Order code	Type code	Order code	Type code	Order code
CME4	7TCA085400R0001	CME8	7TCA085400R0002	CME16	7TCA085410R0002
CME32	7TCA085410R0003	WBX 2/G	7TCA085410R0022	WBX 3	7TCA085410R0023
WBX 3/G	7TCA085410R0024	WBX 4	7TCA085410R0027	WBX 4/GS	7TCA085410R0028
WBX 8	7TCA085410R0030	WBX 8/GS	7TCA085410R0031	WBX 16/2/G	7TCA085410R0020

Data and signal protection

ESP D/BX Series



Combined Category D, C, B tested protector (to BS EN 61643) based on the ESP D Series and ESP TN but ready-boxed to IP66 for use in damp or dirty environments. Suitable for most twisted pair signaling applications. Available for working voltages of up to 6, 15, 30, 50 and 110 Volts. ESP TN suitable for Broadband, POTS, dial-up, T1/E1, lease line and *DSL telephone applications. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Low in-line resistance minimizes unnecessary reductions in signal strength
- Ready-boxed to IP66 and supplied ready for flat mounting
- Available with screw terminals or with IDC terminals (by adding /I suffix to type)
- Colour coded terminals for quick and easy installation check - grey for the dirty (line) end and green for clean
- Screen terminal enables easy connection of cable screen to earth
- Substantial earth stud to enable effective earthing
- ESP TN/BX and ESP TN/2BX are suitable for telecommunication applications in accordance with Telcordia and ANSI Standards (see Application Note AN005)
- Supplied as standard with screw terminals - for IDC terminals order type code plus /I (e.g. ESP TN/BX/I)
- ESP TN/BX has Network Rail Approval PA05/02877. NRS PADS reference 087/037286

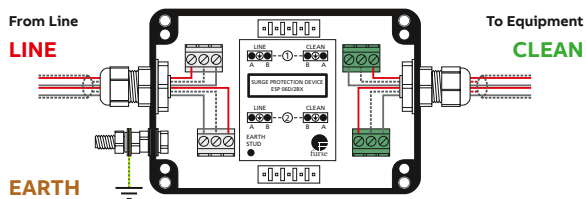
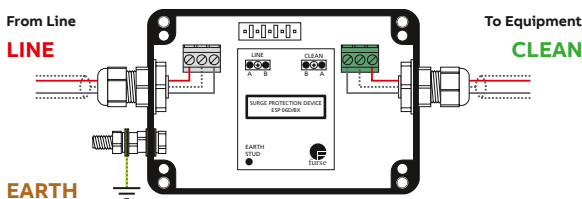
Installation

Connect in series with the data communication, signal or telephone line either near where it enters/leaves the building or close to the equipment being protected. Either way, it must be very close to the system's earth star point.

Application

Use these ready-boxed protectors on twisted pair lines in dirty or damp environments. For two wire lines, use /BX versions. For four wire lines, use /2BX versions.

Install in series (in-line)



NOTE: For some data and signal applications with lower current, higher in-line resistance or higher bandwidth requirements, the ESP D or E Series protectors or the Slim Line ESP SL Series may be more suitable. If the protector is to be mounted directly onto a PCB, use the ESP PCB/**D or ESP PCB/**E protectors.

ESP D/BX Series - Technical specification

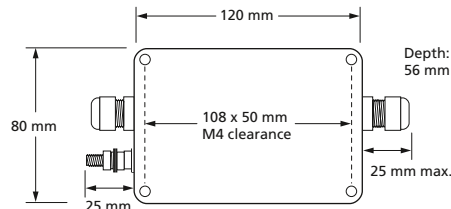
Electrical specification	ESP 06D/BX ESP 06D/2BX	ESP 15D/BX ESP 15D/2BX	ESP 30D/BX ESP 30D/2BX	ESP 50D/BX ESP 50D/2BX	ESP 110D/BX ESP 110D/2BX	ESP TN/BX ESP TN/2BX
Nominal voltage ⁽¹⁾	6 V	15 V	30 V	50 V	110 V	–
Maximum working voltage U _c (RMS/DC) ⁽²⁾	5 V / 7.79 V	13 V / 19 V	26 V / 37.1 V	41 V / 58 V	93 V / 132 V	– / 296 V
Current rating (signal)	300 mA					
In-line resistance (per line ±10%)	9.4 Ω	9.4 Ω	9.4 Ω	9.4 Ω	9.4 Ω	4.4 Ω
Bandwidth (-3 dB 50 Ω system)	800 kHz	2.5 MHz	4 MHz	6 MHz	9 MHz	20 MHz
Transient specification	ESP 06D/BX ESP 06D/2BX	ESP 15D/BX ESP 15D/2BX	ESP 30D/BX ESP 30D/2BX	ESP 50D/BX ESP 50D/2BX	ESP 110D/BX ESP 110D/2BX	ESP TN/BX ESP TN/2BX
Let-through voltage (all conductors) ⁽³⁾ U _p						
C2 test 4 kV 1.2/50 μs, 2 kA 8/20 μs to BS EN/EN/IEC 61643-21	12.0 V	25.0 V	44.0 V	78.0 V	155 V	395 V
C1 test 1 kV, 1.2/50 μs, 0.5 kA 8/20 μs to BS EN/EN/IEC 61643-21	11.5 V	24.5 V	43.5 V	76.0 V	150 V	390 V
B2 test 4 kV 10/700 μs to BS EN/EN/IEC 61643-21	10.0 V	23.0 V	42.5 V	73.0 V	145 V	298 V
5 kV, 10/700 μs ⁽⁴⁾	10.5 V	23.8 V	43.4 V	74.9 V	150 V	300 V
Maximum surge current						
D1 test 10/350 μs to BS EN/EN/IEC 61643-21: – Per signal wire	2.5 kA					
– Per pair	5 kA					
8/20 μs to ITU-T K.45:2003, – Per signal wire	10 kA					
IEEE C62.41.2:2002: – Per pair	20 kA					
Mechanical specification	ESP 06D/BX ESP 06D/2BX	ESP 15D/BX ESP 15D/2BX	ESP 30D/BX ESP 30D/2BX	ESP 50D/BX ESP 50D/2BX	ESP 110D/BX ESP 110D/2BX	ESP TN/BX ESP TN/2BX
Temperature range	-40 to +80 °C					
Connection type	Screw terminal - maximum torque 0.5 Nm (for IDC terminal use type with added suffix /I)					
Conductor size (stranded)	1.5 mm ²					
Earth connection	M6 stud - maximum torque 0.5 Nm					
Cable glands	Accommodate 2.3-6.7 mm diameter cable (PG7)					
Degree of protection (IEC 60529)	M6 stud					
Case material	PVC					
Weight: – Unit	0.3 kg					
Dimensions	See diagram below					

⁽¹⁾ Nominal voltage (RMS/DC or AC peak) measured at < 10 μA (ESP 15D/BX, ESP 15D/2BX, ESP 30D/BX, ESP 30D/2BX, ESP 50D/BX, ESP 50D/2BX, ESP 110D/BX, ESP 110D/2BX) and < 200 μA (ESP 06D/BX & ESP 06D/2BX), and /I variants

⁽²⁾ Maximum working voltage (RMS/DC or AC peak) measured at < 1 mA leakage (ESP 15D/BX, ESP 15D/2BX, ESP 30D/BX, ESP 30D/2BX, ESP 50D/BX, ESP 50D/2BX, ESP 110D/BX, ESP 110D/2BX), < 10 mA (ESP 06D/BX, ESP 06D/2BX) and < 10 μA (ESP TN/BX, ESP TN/2BX), and /I variants

⁽³⁾ The maximum transient voltage let-through of the protector throughout the test (±10%), line to line & line to earth, both polarities. Response time < 10 ns

⁽⁴⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)

**Order codes (screw terminal)**

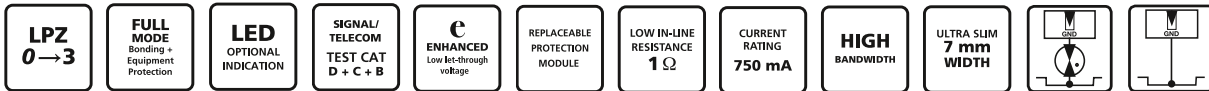
Type code	Order code	Type code	Order code	Type code	Order code
ESP 06D/BX	7TCA085400R0081	ESP 15D/BX	7TCA085400R0091	ESP 30D/BX	7TCA085400R0101
ESP 06D/2BX	7TCA085400R0080	ESP 15D/2BX	7TCA085400R0090	ESP 30D/2BX	7TCA085400R0100
ESP 50D/BX	7TCA085400R0113	ESP 110D/BX	7TCA085400R0006	ESP TN/BX	7TCA085400R0175
ESP 50D/2BX	7TCA085400R0111	ESP 110D/2BX	7TCA085460R0343	ESP TN/2BX	7TCA085400R0172

Order codes (IDC connection)

Type code	Order code	Type code	Order code	Type code	Order code
ESP 06D/BX/I	7TCA085400R0275	ESP 15D/BX/I	7TCA085400R0277	ESP 30D/BX/I	7TCA085400R0274
ESP 06D/2BX/I	7TCA085400R0276	ESP 15D/2BX/I	7TCA085400R0278	ESP 30D/2BX/I	7TCA085400R0273
ESP 50D/BX/I	7TCA085400R0272	ESP 110D/BX/I	7TCA085460R0342	ESP TN/BX/I	7TCA085400R0176
ESP 50D/2BX/I	7TCA085400R0112	ESP 110D/2BX/I	7TCA085460R0344	ESP TN/2BX/I	7TCA085400R0173

Data and signal protection

ESP SL Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable for twisted pair signaling applications which require either a lower in-line resistance, an increased current and/or higher bandwidth. Also suitable for DC power applications less than 0.75 Amps. Available for working voltages of up to 6, 15, 30, 50, 110 and 180 Volts. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Ultra slim 7 mm width ideal for compact protection of large numbers of lines (e.g. process control installations)
- Optional LED status indication versions available for low current DC power applications - add L suffix to type - e.g. ESP SL30L
- Two stage removable protection module with simple quick release mechanism allowing partial removal for easy line commissioning and maintenance as well as full removal for protection replacement
- Strong, flame retardant, polycarbonate housing
- High (750 mA) maximum running current
- High bandwidth enables higher frequency (high traffic or bit rate) data communications
- Screen terminal enables easy connection of cable screen to earth
- Suitable for earthed or isolated screen systems - add /I suffix to type for versions that require isolated screens - e.g. ESP SL30/I
- Built-in innovative DIN-Rail foot with locking feature for simple positioning and clip-on mounting to top hat DIN-Rails
- 4 mm² terminals allow for larger cross section wiring, stranded wires terminated with ferrules or fitting two wires into a single terminal
- Convenient earthing through DIN foot and/or earth terminal
- Very low (1 Ω) in-line resistance (for products from 6V to 110V) allows resistance critical applications (e.g. alarm loops) to be protected

Application

Use these protectors where installation space is at a premium and large numbers of lines require protection (e.g. process control, high speed digital communication equipment or systems with long signal lines).

Accessories

Replacement modules:

ESP SLXX/M

Standard module replacement where XX is voltage rating (06, 15, 30, 50, 110 or 180)

ESP SLXXL/M

LED module replacement where XX is voltage rating, as above

ESP SL/B

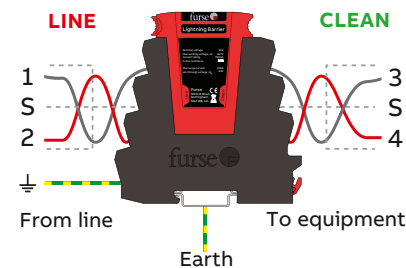
Base replacement (common for standard and LED modules)

ESP SL/I/B

Base replacement with isolated screen from earth

Installation

Connect in series with the data communication or signal line either near where it enters or leaves the building or close to the equipment being protected (e.g. within its control panel). Either way, it must be very close to the system's earth star point. Install protectors either within an existing cabinet/cubicle or in a separate enclosure.



NOTE: The ESP SL 'Slim Line' Series is also available for protection of 3-wire, RS 485 and RTD applications (ESP SL/3W, ESP SL RS485 & ESP SL RTD). The ESP SL X Series has approvals for use in hazardous areas.

ESP SL Series - Technical specification

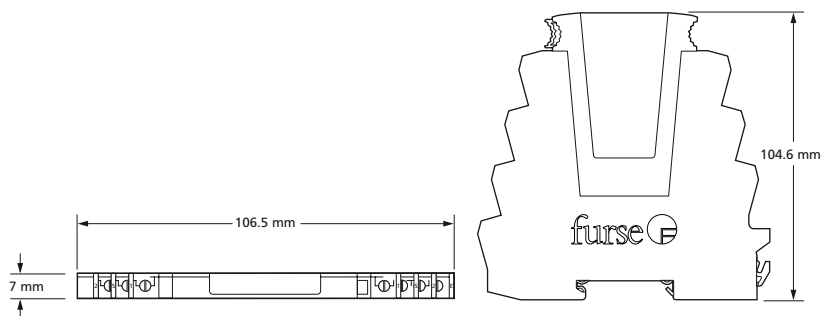
Electrical specification	ESP SL06	ESP SL15	ESP SL30	ESP SL50	ESP SL110	ESP SL180	ESP SL TN
Order code	7TCA085400R0058	7TCA085400R0063	7TCA085400R0067	7TCA085400R0074	7TCA085400R0061	7TCA085400R0420	7TCA085400R0195
Nominal voltage ⁽¹⁾	6 V	15 V	30 V	50 V	110 V	180 V	-
Maximum working voltage U _c (RMS/DC) ⁽²⁾	5 V / 7.79 V	11 V / 16.7 V	25 V / 36.7 V	40 V / 56.7 V	93 V / 132 V	130 V/190 V	- / 296 V
Current rating (signal)	750 mA					250 mA	300 mA
In-line resistance (per line ±10%)	1.0 Ω				3.3 Ω	6.8 Ω	4.5 Ω
Bandwidth (-3 dB 50 Ω system)	45 MHz	45 MHz	45 MHz	45 MHz	45 MHz	45 MHz	20 MHz
Transient specification	ESP SL06	ESP SL15	ESP SL30	ESP SL50	ESP SL110	ESP SL180	ESP SL TN
Let-through voltage (all conductors)⁽³⁾ Up							
C2 test 4 kV 1.2/50 μs, 2 kA 8/20 μs to BS EN/EN/IEC 61643-21	36.0 V	38.4 V	63.0 V	90.3 V	185 V	215 V	395 V
C1 test 1 kV, 1.2/50 μs, 0.5 kA 8/20 μs to BS EN/EN/IEC 61643-21	26.2 V	29.4 V	51.3 V	77.2 V	175 V	205 V	390 V
B2 test 4 kV 10/700 μs to BS EN/EN/IEC 61643-21	16.0 V	26.8 V	45.4 V	68.3 V	165 V	203 V	298 V
5 kV, 10/700 μs ⁽⁴⁾	17.0 V	27.5 V	46.3 V	69.1 V	170 V	200 V	300 V
Maximum surge current							
D1 test 10/350 μs to BS EN/EN/IEC 61643-21: - Per signal wire	1.25 kA						
- Per pair	2.5 kA						
8/20 μs to ITU-T K.45:2003, IEEE C62.41.2:2002: - Per signal wire	5 kA						
- Per pair	10 kA						
Mechanical specification	ESP SL06	ESP SL15	ESP SL30	ESP SL50	ESP SL110	ESP SL180	ESP SL TN
Temperature range	-40 to +80 °C						
Connection type	Screw terminal - maximum torque 0.8 Nm						
Conductor size (stranded)	4 mm ²						
Earth connection	Via DIN-Rail or 4 mm ² earth terminal - maximum torque 0.8 Nm						
Case material	FR Polymer UL-94 V-0						
Weight: - Unit	0.08 kg						
Dimensions	See diagram below						

⁽¹⁾ Nominal voltage (RMS/DC or AC peak) measured at < 10 μA (ESP SL15, ESP SL30, ESP SL50, ESP SL110, ESP SL180 and LED variants) and < 200 μA (ESP SL06 and ESP SL06L)

⁽²⁾ Maximum working voltage (RMS/DC or AC peak) measured at < 1 mA leakage

⁽³⁾ The maximum transient voltage let-through of the protector throughout the test (±10%), line to line & line to earth, both polarities. Response time < 10 ns

⁽⁴⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)

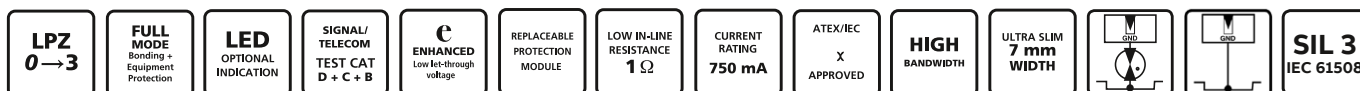


Order codes

Type code	Order code	Type code	Order code	Type code	Order code
ESP SL06	7TCA085400R0058	ESP SL15	7TCA085460R0058	ESP SL30	7TCA085400R0067
ESP SL06/I	7TCA085400R0265	ESP SL15/I	7TCA085400R0264	ESP SL30/I	7TCA085400R0068
ESP SL06L	7TCA085400R0060	ESP SL15L	7TCA085460R0058	ESP SL30L	7TCA085400R0069
ESP SL06L/I	7TCA085400R0280	ESP SL15L/I	7TCA085400R0064	ESP SL30L/I	7TCA085400R0234
ESP SL06/M	7TCA085400R0243	ESP SL15/M	7TCA085400R0198	ESP SL30/M	7TCA085400R0197
ESP SL06L/M	7TCA085400R0240	ESP SL15L/M	7TCA085400R0249	ESP SL30L/M	7TCA085400R0199
ESP SL50	7TCA085400R0074	ESP SL110	7TCA085400R0061	ESP SL/B	7TCA085400R0194
ESP SL50/I	7TCA085400R0075	ESP SL110/I	7TCA085400R0279	ESP SL/I/B	7TCA085400R0261
ESP SL50L	7TCA085400R0076	ESP SL110L	7TCA085400R0062	ESP WBX SLQ	7TCA085400R0326
ESP SL50L/I	7TCA085400R0201	ESP SL110L/I	7TCA085400R0284	ESP WBX SLQ/G	7TCA085400R0327
ESP SL50/M	7TCA085400R0254	ESP SL110/M	7TCA085400R0245		
ESP SL50L/M	7TCA085400R0256	ESP SL110L/M	7TCA085400R0248		
ESP SL180L	7TCA085400R0419	ESP SL 180/I	7TCA085400R0422		
ESP SL180	7TCA085400R0420	ESP SL180L/M	7TCA085400R0427		
ESP SL180L/I	7TCA085400R0421	ESP SL180/M	7TCA085400R0428		

Data and signal protection

ESP SL X Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable for twisted pair signaling applications within hazardous environments (ATEX/IECEx approved). Available for working voltages of up to 15 and 30 Volts. For use at boundaries up to LPZ 0 to protect against flashover through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Approved for use in hazardous environments for the protection of Intrinsically Safe circuits (Classification: II 2(1)G, Ex ia (ia Ga) IIC T4 Gb)
- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Ultra slim 7 mm width ideal for compact protection of large numbers of lines (e.g. process control installations)
- Optional LED status indication versions available for low current DC power applications
- Negligible self-capacitance and self-inductance offering minimal interference when protecting Intrinsically Safe circuits
- Very low (1 Ω) in-line resistance allows resistance critical applications (e.g. alarm loops) to be protected
- High (750 mA) maximum running current
- High bandwidth enables higher frequency (high traffic or bit rate) data communications
- Screen terminal enables easy connection of cable screen to earth
- Suitable for earthed or isolated screen systems - add /I suffix to type for versions that require isolated screens
- Built-in innovative DIN-Rail foot with locking feature for simple positioning and clip-on mounting to top hat DIN-Rails
- 4 mm² terminals allow for larger cross section wiring, stranded wires terminated with ferrules or fitting two wires into a single terminal
- Approval references for ESP SL X Series: IECEx SIR 10.0030X, Sira 10ATEX2063X
- Evaluated for SIL to IEC 61508

Application

Use these protectors in hazardous environments where installation space is at a premium and large numbers of lines require protection (e.g. process control, 4-20 mA loops, fire and gas detectors and shut-down systems). Suitable for high speed digital communication equipment or systems with long signal lines. See Furse Application Note AN013.

Accessories

Replacement modules:

ESP SL15X/M, ESP30X/M
Standard module replacement for 15 and 30 V protectors respectively

ESP SL15XL/M, ESP30XL/M
LED module replacement for 15 and 30 V protectors respectively

ESP SLX/B

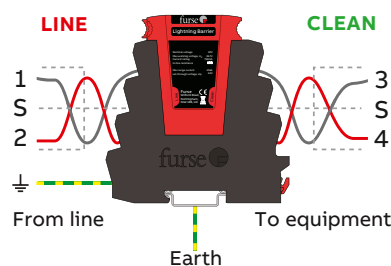
Base replacement (common for standard and LED modules)

ESP SLX/I/B

Base replacement with isolated screen from earth

Installation

Connect in series with the data communication or signal line either near where it enters or leaves the building or close to the equipment being protected (e.g. within its control panel). Either way, it must be very close to the system's earth star point. Install protectors either within an existing cabinet/cubicle or in a separate enclosure.



NOTE: Use the standard ESP SL 'Slim Line' Series for non-hazardous areas. The ESP SL Series is also available for protection of 3-wire, RS 485, RTD & telecommunication applications (ESP SL/3W, ESP SL RS485, ESP SL RTD & ESP SL TN).

ESP SL X Series - Technical specification

Electrical specification	ESP SL15X	ESP SL30X
Order code	7TCA085400R0065	7TCA085400R0071
Nominal voltage ⁽¹⁾	15 V	30 V
Maximum working voltage U_c (RMS/DC) ⁽²⁾	11 V / 16.7 V	25 V / 36.7 V
Current rating (signal)	750 mA	
In-line resistance (per line $\pm 10\%$)	1.0 Ω	
Bandwidth (-3 dB 50 Ω system)	45 MHz	
Intrinsically safe specification	ESP SL15X	ESP SL30X
Maximum voltage U_i	30 V	
Maximum power P_i :		
– Per $-40\text{ }^\circ\text{C} < T_a < 40\text{ }^\circ\text{C}$	1.3 W	
– Per $-40\text{ }^\circ\text{C} < T_a < 60\text{ }^\circ\text{C}$	1.2 W	
– Per $-40\text{ }^\circ\text{C} < T_a < 80\text{ }^\circ\text{C}$	1.0 W	
Capacitance C_i	0 μF	
Inductance L_i	0 μH	
Certificate number	IECEX SIR 10.0030X, Sira 10ATEX2063X	
Classification	Ex II 2 (1) G, Ex ia (ia Ga) IIC T4 Gb	
Transient specification	ESP SL15X	ESP SL30X
Let-through voltage (all conductors)⁽³⁾ U_p		
C2 test 4 kV 1.2/50 μs , 2 kA 8/20 μs to BS EN/EN/IEC 61643-21	38.4 V	63.0 V
C1 test 1 kV, 1.2/50 μs , 0.5 kA 8/20 μs to BS EN/EN/IEC 61643-21	29.4 V	51.3 V
B2 test 4 kV 10/700 μs to BS EN/EN/IEC 61643-21	26.8 V	45.4 V
5 kV, 10/700 μs ⁽⁴⁾	27.5 V	46.3 V
Maximum surge current		
D1 test 10/350 μs to BS EN/EN/IEC 61643-21:		
– Per signal wire	1.25 kA	
– Per pair	2.5 kA	
8/20 μs to ITU-T K.45:2003, IEEE C62.41.2:2002:		
– Per signal wire	5 kA	
– Per pair	10 kA	
Mechanical specification	ESP SL15X	ESP SL30X
Temperature range	-40 to $+80\text{ }^\circ\text{C}$	
Connection type	Screw terminal – maximum torque 0.8 Nm	
Conductor size (stranded)	4 mm ²	
Earth connection	Via DIN-Rail or 4 mm ² earth terminal - maximum torque 0.8 Nm	
Case material	FR Polymer UL-94 V-0	
Weight: – Unit	0.08 kg	
SIL (Safety Integrity Level) to IEC 61508	SIL 3 ⁽⁵⁾	
Dimensions	See diagram below	

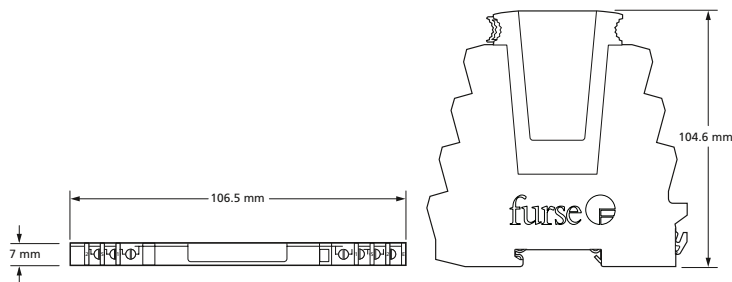
⁽¹⁾ Nominal voltage (RMS/DC or AC peak) measured at $< 10\text{ }\mu\text{A}$

⁽²⁾ Maximum working voltage (RMS/DC or AC peak) measured at $< 1\text{ mA}$ leakage

⁽³⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), line to line & line to earth, both polarities. Response time $< 10\text{ ns}$

⁽⁴⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)

⁽⁵⁾ Assessed as a Type A device, with HFT=1 (assumes line short-circuits and short-circuits to GND are detectable or do not have an effect). SFF = 73%, to be used to determine the overall Safe Failure Fraction. For HFT=0 (worst-case analysis), SIL 2 applies.

**Order codes**

Type code	Order code	Type code	Order code
ESP SL15X	7TCA085400R0065	ESP SL30X	7TCA085400R0071
ESP SL15X/I	7TCA085400R0233	ESP SL30X/I	7TCA085400R0196
ESP SL15XL	7TCA085400R0066	ESP SL30XL	7TCA085400R0073
ESP SL15XL/I	7TCA085400R0235	ESP SL30XL/I	7TCA085400R0236
ESP SL15X/M	7TCA085400R0250	ESP SL30X/M	7TCA085400R0252
ESP SL15XL/M	7TCA085400R0257	ESP SL30XL/M	7TCA085400R0253
ESP SLX/B	7TCA085400R0242	ESP SLX/I/B	7TCA085400R0285

Data and signal protection

ESP SL LED 4-20 mA Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable for twisted pair 4-20 mA loop systems with innovative LED protector status indication. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment (e.g. transmitters, monitors, controllers).

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Innovative LED indication of protection status provides easy visual checking and quick maintenance
- Ultra slim 7 mm width ideal for compact protection of large numbers of lines (e.g. process control installations)
- Two stage removable protection module with simple quick release mechanism allowing partial removal for easy line commissioning and maintenance as well as full removal for protection replacement
- Very low (1Ω) in-line resistance for minimal system interference
- High (75 mA) maximum running current - can also be used on 10-50 mA systems (e.g. process control)
- Screen terminal enables easy connection of cable screen to earth
- Strong, flame retardant, polycarbonate housing
- Built-in innovative DIN-Rail foot with locking feature for simple positioning and clip-on mounting to top hat DIN-Rails
- 4 mm^2 terminals allow for larger cross section wiring, stranded wires terminated with ferrules or fitting two wires into a single terminal
- Convenient earthing through DIN foot and/or earth terminal

Application

Use these protectors on 4-20 mA loop systems - ideal where installation space is at a premium and large numbers of lines require protection, or for systems with long signal lines.

Installation

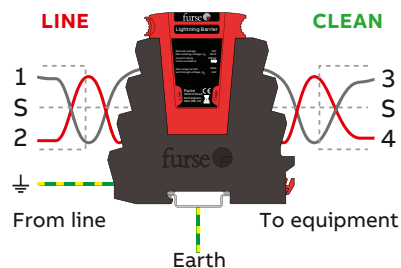
Connect in series with the 4-20 mA current loop either near where it enters or leaves the building or close to the equipment being protected (e.g. within its control panel). Either way, it must be very close to the system's earth star point. Install protectors either within an existing cabinet/cubicle or in a separate enclosure.

Accessories

ESP SL30L/4-20/M
Module replacement

ESP SL/B
Base replacement

TECHNICAL NOTE: 4-20 mA current loops can serve multiple devices over a long distance. The devices and wiring produce a voltage drop (also known as “loop drops”) but these do not reduce the 4-20 mA current as long as the power supply voltage is greater than the sum of the voltage drops around the loop at the maximum signaling current of 20 mA. For design considerations, each ESP SL30L/4-20 device installed within the loop introduces a 1.7 V loop drop.



NOTE: The ESP SL ‘Slim Line’ Series is also available for protection of systems up to 110 V as well as 3-wire, RS 485, RTD & telecommunication applications (ESP SL/3W, ESP SL RS485, ESP SL RTD & ESP SL TN). The ESP SL X Series has approvals for use in hazardous areas.

ESP SL LED 4-20 mA Series - Technical specification

Electrical specification		ESP SL30L/4-20	
Order code		7TCA085400R0070	
Nominal voltage ⁽¹⁾		30 V	
Maximum working voltage U_c (RMS/DC) ⁽²⁾		25 V / 36.7 V	
Current rating (signal) ⁽³⁾		75 mA	
In-line resistance (per line $\pm 10\%$)		1.0 Ω	
Series voltage drop ⁽⁴⁾		1.7 V	
Bandwidth (-3 dB 50 Ω systems)		45 MHz	
Transient specification		ESP SL30L/4-20	
Let-through voltage (all conductors)⁽⁵⁾ U_p			
C2 test 4 kV 1.2/50 μ s, 2 kA 8/20 μ s to BS EN/EN/IEC 61643-21		63.0 V	
C1 test 1 kV, 1.2/50 μ s, 0.5 kA 8/20 μ s to BS EN/EN/IEC 61643-21		51.3 V	
B2 test 4 kV 10/700 μ s to BS EN/EN/IEC 61643-21		45.4 V	
5 kV, 10/700 μ s ⁽⁶⁾		46.3 V	
Maximum surge current			
D1 test 10/350 μ s to BS EN/EN/IEC 61643-21:	- Per signal wire	1.25 kA	
	- Per pair	2.5 kA	
8/20 μ s to ITU-T K.45:2003,	- Per signal wire	5 kA	
IEEE C62.41.2:2002:	- Per pair	10 kA	
Mechanical specification		ESP SL30L/4-20	
Temperature range		-40 to +80 °C	
Connection type		Screw terminal - maximum torque 0.8 Nm	
Conductor size (stranded)		4 mm ²	
Earth connection		Via DIN-Rail or 4 mm ² earth terminal - maximum torque 0.8 Nm	
Case material		FR Polymer UL-94 V-0	
Weight: - Unit		0.08 kg	
Dimensions		See diagram below	

⁽¹⁾ Nominal voltage (RMS/DC or AC peak) measured at < 10 μ A

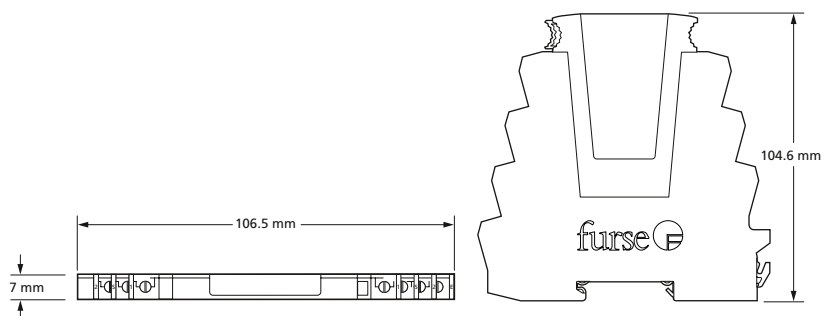
⁽²⁾ Maximum working voltage (RMS/DC or AC peak) measured at < 1 mA leakage

⁽³⁾ The minimum current for LED indicator operation is 2 mA

⁽⁴⁾ At 20 mA

⁽⁵⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), line to line & line to earth, both polarities. Response time < 10 ns

⁽⁶⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)

**Order codes**

Type code	Order code	Type code	Order code
ESP SL30L/4-20	7TCA085400R0070	ESP SL30L/4-20/I	7TCA085400R0237
ESP SL30L/4-20/M	7TCA085400R0164	ESP SL/I/B	7TCA085400R0261
ESP SL/B	7TCA085400R0194		

Data and signal protection

ESP SL 3-Wire Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable for 3-wire signaling applications which require either a lower in-line resistance, an increased current and/or higher bandwidth. Also suitable for DC power applications less than 0.5 Amps. Available for working voltages of up to 6, 15, 30, 50 and 110 Volts. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Ultra slim 7 mm width ideal for compact protection of large numbers of lines (e.g. process control installations)
- Two stage removable protection module with simple quick release mechanism allowing partial removal for easy line commissioning and maintenance as well as full removal for protection replacement
- Very low (1 Ω) in-line resistance allows resistance critical applications (e.g. alarm loops) to be protected
- High (500 mA) maximum running current
- High bandwidth enables higher frequency (high traffic or bit rate) data communications
- Strong, flame retardant, polycarbonate housing
- Built-in innovative DIN-Rail foot with locking feature for simple positioning and clip-on mounting to top hat DIN-Rails
- 4 mm² terminals allow for larger cross section wiring, stranded wires terminated with ferrules or fitting two wires into a single terminal
- Convenient earthing through DIN foot and/or earth terminal.

Application

Use these protectors for 3-wire systems where installation space is at a premium and large numbers of lines require protection (e.g. process control, high speed digital communication equipment or systems with long signal lines).

Accessories

Replacement modules:

ESP SLXX/3W/M

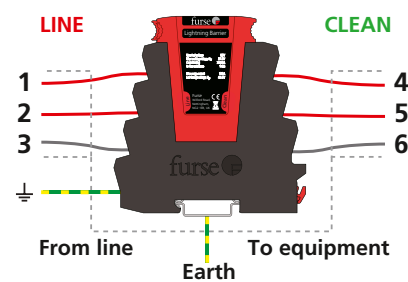
Standard module replacement where XX is voltage rating (06, 15, 30, 50 or 110)

ESP SL/3W/B

Base replacement

Installation

Connect in series with the data communication or signal line either near where it enters or leaves the building or close to the equipment being protected (e.g. within its control panel). Either way, it must be very close to the system's earth star point. Install protectors either within an existing cabinet/cubicle or in a separate enclosure.



NOTE: The ESP SL 'Slim Line' Series is also available for protection of 2-wire systems up to 110 V, RS 485, RTD and telecommunication applications (ESP SL Series, ESP SL RS485, ESP SL RTD and ESP SL TN). The ESP SL X Series has approvals for use in hazardous areas.

ESP SL 3-Wire Series - Technical specification

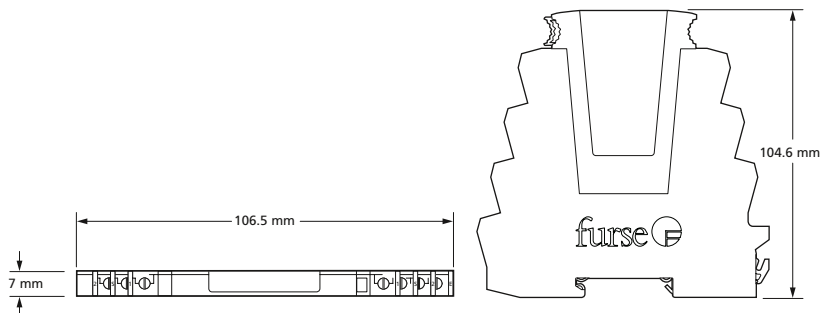
Electrical specification	ESP SL06/3W	ESP SL15/3W	ESP SL30/3W	ESP SL50/3W	ESP SL110/3W
Order code	7TCA085400R0238	7TCA085400R0269	7TCA085400R0268	7TCA085400R0267	7TCA085400R0266
Nominal voltage ⁽¹⁾	6 V	15 V	30 V	50 V	110 V
Maximum working voltage U_c (RMS/DC) ⁽²⁾	5 V / 7.79 V	11 V / 16.7 V	25 V / 36.7 V	40 V / 56.7 V	93 V / 132 V
Current rating (signal)	500 mA				
In-line resistance (per line $\pm 10\%$)	1.0 Ω				
Bandwidth (-3 dB 50 Ω system)	45 MHz				
Transient specification	ESP SL06/3W	ESP SL15/3W	ESP SL30/3W	ESP SL50/3W	ESP SL110/3W
Let-through voltage (all conductors)⁽³⁾ Up					
C2 test 4 kV 1.2/50 μ s, 2 kA 8/20 μ s to BS EN/EN/IEC 61643-21	36.0 V	38.4 V	63.0 V	90.3 V	185 V
C1 test 1 kV, 1.2/50 μ s, 0.5 kA 8/20 μ s to BS EN/EN/IEC 61643-21	26.2 V	29.4 V	51.3 V	77.2 V	175 V
B2 test 4 kV 10/700 μ s to BS EN/EN/IEC 61643-21	16.0 V	26.8 V	45.4 V	68.3 V	165 V
5 kV, 10/700 μ s ⁽⁴⁾	17.0 V	27.5 V	46.3 V	69.1 V	170 V
Maximum surge current					
D1 test 10/350 μ s to BS EN/EN/IEC 61643-21:					
- Per signal wire	1.25 kA				
- Per pair	2.5 kA				
8/20 μ s to ITU-T K.45:2003, IEEE C62.41.2:2002:					
- Per signal wire	5 kA				
- Per pair	10 kA				
Mechanical specification	ESP SL06/3W	ESP SL15/3W	ESP SL30/3W	ESP SL50/3W	ESP SL110/3W
Temperature range	-40 to +80 °C				
Connection type	Screw terminal - maximum torque 0.8 Nm				
Conductor size (stranded)	4 mm ²				
Earth connection	Via DIN-Rail or 4 mm ² earth terminal - maximum torque 0.8 Nm				
Case material	FR Polymer UL-94 V-0				
Weight: - Unit	0.08 kg				
Dimensions	See diagram below				

⁽¹⁾ Nominal voltage (RMS/DC or AC peak) measured at < 10 μ A (ESP SL15/3W, ESP SL30/3W, ESP SL50/3W, ESP SL110/3W) and < 200 μ A (ESP SL06/3W)

⁽²⁾ Maximum working voltage (RMS/DC or AC peak) measured at < 1 mA leakage

⁽³⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), line to line & line to earth, both polarities. Response time < 10 ns

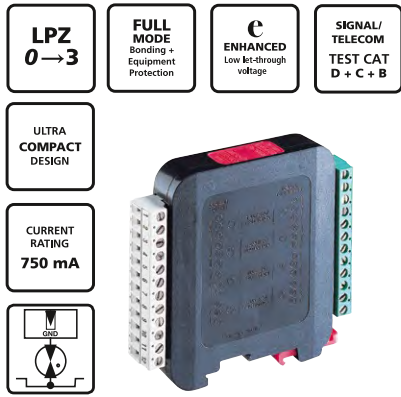
⁽⁴⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)

**Order codes**

Type code	Order code	Type code	Order code
ESP SL06/3W	7TCA085400R0238	ESP SL50/3W	7TCA085400R0267
ESP SL06/3W/M	7TCA085400R0244	ESP SL50/3W/M	7TCA085400R0255
ESP SL15/3W	7TCA085400R0269	WBX SLQ/G	7TCA085410R0036
ESP SL15/3W/M	7TCA085400R0247	ESP SL110/3W	7TCA085400R0266
WBX SLQ	7TCA085410R0037	ESP SL110/3W/M	7TCA085400R0246
ESP SL30/3W	7TCA085400R0268	ESP SL/B	7TCA085400R0194
ESP SL30/3W/M	7TCA085400R0251	ESP SL/I/B	7TCA085400R0261

Data and signal protection

ESP Q & TNQ Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable for 4 twisted pair lines. Available for working voltages of up to 6, 15, 30, 50, 110 and 180 Volts. ESP TNQ suitable for Broadband, POTS, dial-up, T1/E1, lease line and *DSL telephone applications. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Almost twice as space efficient as smallest competitor
- Standard DIN module (18 mm) depth
- Removable (plug-in) terminals allow pre-wiring of cable looms, for easier installation
- Suitable for earthed or isolated screen systems
- Built-in DIN-Rail foot for clip-on mounting to top hat or G DIN-Rails
- Optional flat mounting on side
- 2.5 mm² terminals allow for larger cross section wiring,

- stranded wires terminated with ferrules or fitting two wires into a single terminal
- Very low resistance to minimize unwanted signal strength reductions
- Strong, flame retardant, ABS housing
- Colour coded terminals (grey for line, green for clean) give a quick and easy installation check
- Screen terminal enables easy connection of cable screen to earth
- Simple, yet substantial, connection to earth via DIN-Rail
- ESP TNQ is suitable for telecommunication applications in accordance with Telcordia and ANSI Standards (see Application Note AN005)
- Available as a 'UL Listed' version, add /UL to type code (ESP 06Q, ESP 15Q, ESP 30Q, 50Q and 110Q only)

Application

Use these protectors where installation space is at a premium and large numbers of lines require protection.

Installation

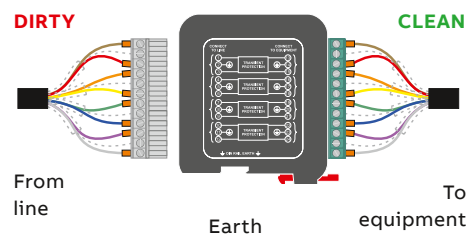
Connect in series with the signal or data line either near where it enters or leaves the building or close to the equipment being protected. Install in a cabinet/cubicle close to the system's earth star point.

Accessories

For suitable enclosures for the ESP Q & TNQ Series, consider WBX SLQ, or contact Furse.

Order codes	
Type code	Order code
WBX SLQ	7TCA085410R0037
WBX SLQ/G	7TCA085410R0036

ESP 06Q, ESP 15Q, ESP 30Q, ESP 50Q, ESP 110Q, ESP 180Q and ESP TNQ installed in series (in-line)



NOTE: The ESP Q Series is also available for protection of RS 485 and RTD applications (ESP RS485Q, ESP RTDQ). Protectors for individual data and signal lines are available (ESP D Series and Slim Line ESP SL Series), or ready-boxed to IP66 (ESP **D/BX etc). Alternatively, for individual protectors with higher current or bandwidth use the ESP E and ESP H Series.

ESP Q & TNQ Series - Technical specification

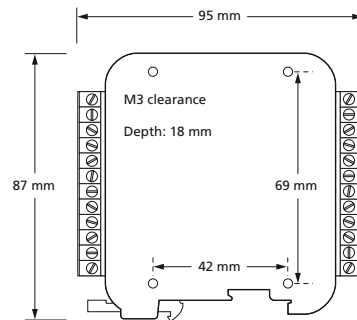
Electrical specification	ESP 06Q	ESP 15Q	ESP 30Q	ESP 50Q	ESP 110Q	ESP 180Q	ESP TNQ
Order code	7TCA085400R0087	7TCA085400R0098	7TCA085400R0107	7TCA085400R0118	7TCA085400R0088	7TCA085400R0462	7TCA085400R0183
Nominal voltage ⁽¹⁾	6 V	15 V	30 V	50 V	110 V	180 V	–
Maximum working voltage U_c (RMS/DC) ⁽²⁾	5 V / 7.79 V	13 V / 18.8 V	26 V / 37.8 V	41 V / 57.8 V	93 V / 132 V	130 V/190 V	– / 296 V
Current rating (signal)	750 mA	750 mA	750 mA	750 mA	500 mA	250 mA	300 mA
In-line resistance (per line $\pm 10\%$)	1.0 Ω	1.0 Ω	1.0 Ω	1.0 Ω	3.3 Ω	6.8 Ω	4.3 Ω
Bandwidth (-3 dB 50 Ω system)	45 MHz	55 MHz	45 MHz	45 MHz	45 MHz	45 MHz	20 MHz
Transient specification	ESP 06Q	ESP 15Q	ESP 30Q	ESP 50Q	ESP 110Q	ESP 180Q	ESP TNQ
Let-through voltage (all conductors)⁽³⁾							
U_p							
C2 test 4 kV 1.2/50 μ s, 2 kA 8/20 μ s to BS EN/EN/IEC 61643-21	15.0 V	28.0 V	53.0 V	84.0 V	188 V	215 V	395 V
C1 test 1 kV, 1.2/50 μ s, 0.5 kA 8/20 μ s to BS EN/EN/IEC 61643-21	12.5 V	26.5 V	48.0 V	76.0 V	175 V	205 V	390 V
B2 test 4 kV 10/700 μ s to BS EN/EN/IEC 61643-21	10.0 V	23.0 V	43.5 V	64.5 V	145 V	203 V	298 V
5 kV, 10/700 μ s ⁽⁴⁾	10.8 V	26.2 V	44.3 V	65.8 V	150 V	200 V	300 V
Maximum surge current							
D1 test 10/350 μ s to wire – Per signal BS EN/EN/IEC 61643-21:	2.5 kA					1.25 kA	2.5 kA
– Per pair	5 kA					2.5 kA	5 kA
8/20 μ s to ITU-T K.45:2003, – Per signal wire	10 kA						
IEEE C62.41.2:2002: – Per pair	20 kA						
Mechanical specification	ESP 06Q	ESP 15Q	ESP 30Q	ESP 50Q	ESP 110Q	ESP 180Q	ESP TNQ
Temperature range	-40 to +80 °C						
Connection type	Pluggable 12 way screw terminal - maximum torque 0.6 Nm						
Conductor size (stranded)	2.5 mm ²						
Earth connection	Via DIN-Rail or M5 threaded hole in base of unit						
Case material	FR Polymer UL-94 V-0						
Weight: – Unit	0.1 kg						
– Packaged (each)	0.12 kg						
Dimensions	See diagram below						

⁽¹⁾ Nominal voltage (RMS/DC or AC peak) measured at < 5 μ A (ESP 15Q, ESP 30Q, ESP 50Q, ESP 110Q, ESP 180Q) and < 200 μ A (ESP 06Q)

⁽²⁾ Maximum working voltage (RMS/DC or AC peak) measured at < 5 mA leakage (ESP 15Q, ESP 30Q, ESP 50Q, ESP 110Q, ESP 180Q) and < 10 μ A (ESP TNQ)

⁽³⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), line to line & line to earth, both polarities. Response time < 10 ns

⁽⁴⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)



Data and signal protection

ESP RTD, RTDQ & SL RTD Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable for 3-wire RTD systems to protect monitoring equipment. For use at boundaries up to LPZ 0 (ESP RTD & ESP RTDQ) or LPZ 0 (ESP SL RTD) to protect against flashover (typically the service entrance location) through to LPZ 3. Available as standard ESP RTD format, or compact ESP RTDQ and Slim Line ESP SL RTD versions for installations where a high number of lines require protection.

Features & benefits

- Protects all three wires on a 3-wire RTD system with a single protector
- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Low in-line resistance minimizes reductions in signal strength
- Built-in DIN-Rail foot for simple mounting to top hat DIN-Rails
- Convenient earthing through DIN foot and/or earth terminal
- ESP RTD can be flat mounted on base or side
- ESP RTD and ESP RTDQ have colour coded terminals for quick and easy installation check

- ESP SL RTD has ultra slim 7 mm width ideal for compact protection of large numbers of lines (e.g. process control installations)
- ESP SL RTD includes two stage removable protection module with simple quick release mechanism allowing partial removal for easy line commissioning and maintenance as well as full removal for protection replacement

For further information on RTD applications, see separate Application Note AN001 (contact us for a copy).

Installation

Connect in series with the signal line either near where it enters or leaves the building or close to the equipment being protected ensuring it is very close to the system's earth star point. Install protectors either within an existing cabinet/cubicle or in a separate enclosure.

Accessories

Replacement module for ESP SL RS485:

ESP SLRTD/M

Standard module replacement

ESP SLRTD/B

Base replacement

Combined Mounting/Earthing kits for ESP RTD:

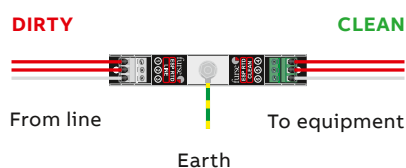
CME 4 For up to 4 x ESP RTD

CME 8 For up to 8 x ESP RTD

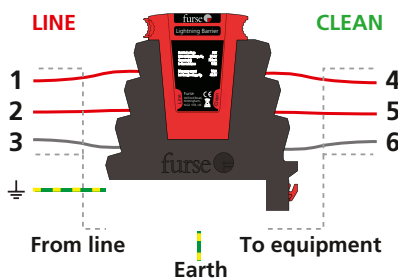
CME 16 For up to 16 x ESP RTD

CME 32 For up to 32 x ESP RTD

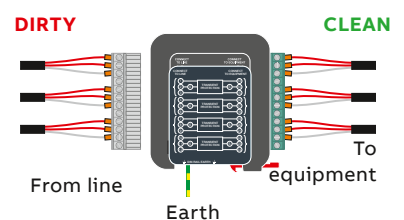
ESP RTD installed in series



ESP SL RTD installed in series



ESP RTDQ installed in series (in-line)



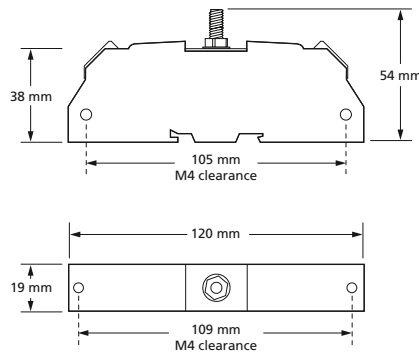
NOTE: For 2-wire or 4-wire RTD applications, use one or two ESP 06D or ESP SL06 protectors respectively.

ESP RTD, RTDQ & SL RTD Series - Technical specification

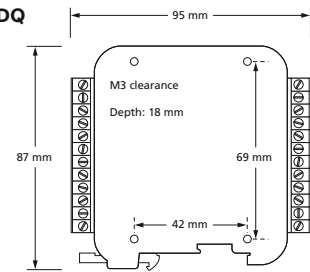
Electrical specification	ESP RTD	ESP SL RTD	ESP RTDQ
Order code	7TCA085460R0157	7TCA085400R0232	7TCA085400R0158
Nominal voltage ⁽¹⁾	6 V		
Maximum working voltage U_c (RMS/DC) ⁽²⁾	5 V / 7.79 V		
Current rating (signal)	200 mA	500 mA	700 mA
In-line resistance (per line $\pm 10\%$)	10 Ω	1.0 Ω	1.0 Ω
Bandwidth (-3 dB 50 Ω system)	800 kHz	1.5 MHz	800 kHz
Transient specification	ESP RTD	ESP SL RTD	ESP RTDQ
Let-through voltage (all conductors)(3) Up			
C2 test 4 kV 1.2/50 μs , 2 kA 8/20 μs to BS EN/EN/IEC 61643-21	12.0 V	17.9 V	15.0 V
C1 test 1 kV, 1.2/50 μs , 0.5 kA 8/20 μs to BS EN/EN/IEC 61643-21	11.5 V	12.1 V	12.5 V
B2 test 4 kV 10/700 μs to BS EN/EN/IEC 61643-21	10.0 V	11.0 V	10.0 V
5 kV, 10/700 μs ⁽⁴⁾	10.5 V	11.3 V	10.5 V
Maximum surge current			
D1 test 10/350 μs to BS EN/EN/IEC 61643-21: - Per signal wire 2.5 kA	2.5 kA	1.25 kA	2.5 kA
- Per pair 5 kA	5 kA	2.5 kA	5 kA
8/20 μs to ITU-T K.45:2003, - Per signal wire IEEE C62.41.2:2002: - Per pair 10 kA	10 kA	5 kA	10 kA
- Per pair 20 kA	20 kA	10 kA	20 kA
Mechanical specification	ESP RTD	ESP SL RTD	ESP RTDQ
Temperature range	-40 to +80 $^{\circ}C$		
Connection type	Screw terminal - max. torque 0.5 Nm	Screw terminal - max. torque 0.8 Nm	Pluggable 12 way screw terminal
Conductor size (stranded)	2.5 mm ²	4 mm ²	2.5 mm ²
Earth connection	M6 stud - max. torque 0.5 Nm	Via DIN-Rail or 4 mm ² earth terminal - max. torque 0.8 Nm	Via DIN-Rail or M5 threaded hole in base of unit - max. torque 0.6 Nm
Case Material	FR Polymer UL-94 V-0		
Weight: - Unit	0.08 kg	0.08 kg	0.1 kg
Dimensions	See diagram below		

⁽¹⁾ Nominal voltage (RMS/DC or AC peak) measured at < 200 μA
⁽²⁾ Maximum working voltage (RMS/DC or AC peak) measured at < 10 mA
⁽³⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), line to line & line to earth, both polarities. Response time < 10 ns
⁽⁴⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)

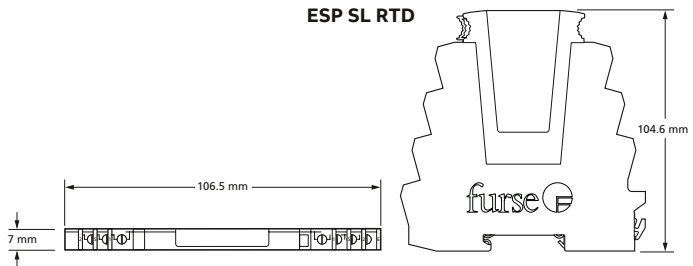
ESP RTD



ESP RTDQ



ESP SL RTD

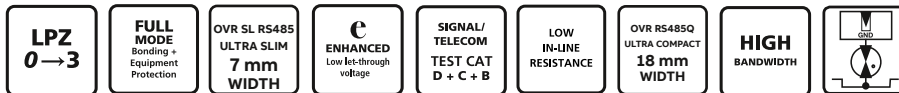


Order codes

Type code	Order code	Type code	Order code	Type code	Order code
ESPSLRTD/M	7TCA085400R0258	CME16	7TCA085410R0002	WBXSLQ	7TCA085410R0037
ESPSLRTD/B	7TCA085400R0263	CME8	7TCA085400R0002	WBXSLQ/G	7TCA085410R0036
CME4	7TCA085400R0001	CME32	7TCA085410R0003		

Data and signal protection

ESP RS485, RS485Q & SL RS485 Series



Combined Category D, C, B tested protector (to BS EN 61643) specifically designed for RS 485 and Fieldbus applications, such as Profibus DP.

For use at boundaries up to LPZ 0 protect against flashover (typically the service entrance location) through to LPZ 3. Available as standard ESP RS485 format, or compact ESP RS485Q and Slim Line ESP SL RS485 versions for installations where a high number of lines require protection.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- 45 MHz bandwidth greatly exceeds 12 Mbps maximum speeds
- Low in-line resistance minimizes reductions in signal strength
- Suitable for earthed or isolated screen systems
- Built-in DIN-Rail foot for simple mounting to top hat DIN-Rails
- Convenient earthing through DIN foot and/or earth terminal
- Connect screen connection 'S' as the 0V ground on RS485 systems
- ESP RS485 can be flat mounted on base or side
- ESP RS485 and ESP RS485Q have colour coded terminals for quick and easy installation check
- ESP SL RS485 has ultra slim 7 mm width ideal for compact protection of large numbers of lines (e.g. process control installations)
- ESP SL RS485 includes two stage removable protection module with simple quick release mechanism allowing partial removal for easy line commissioning and maintenance as well as full removal for protection replacement
- ESP SL RS485 includes optional LED status indication. Add L suffix to type - i.e. ESP SL RS485L

Application

Connect in series with the signal line either near where it enters or leaves the building or close to the equipment being protected ensuring it is very close to the system's earth star point. Install protectors either within an existing cabinet/cubicle or in a separate enclosure.

Accessories

Replacement module for ESP SL RS485:

ESP SLRS485/M

Standard module replacement

ESP SLRS485/B

Base replacement

Combined Mounting/Earthing kits for ESP RS485:

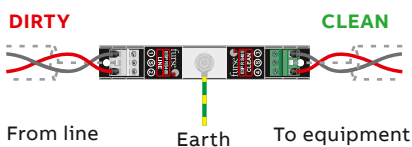
CME 4 For up to 4 x ESP RS485

CME 8 For up to 8 x ESP RS485

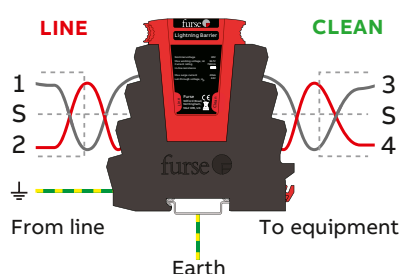
CME 16 For up to 16 x ESP RS485

CME 32 For up to 32 x ESP RS485

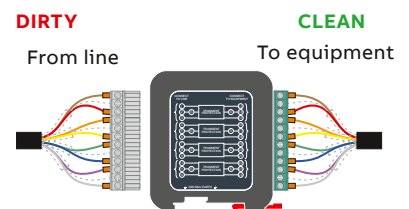
ESP RS485 installed in series



ESP SL RS485 installed in series



ESP RS485Q installed in series (in-line)

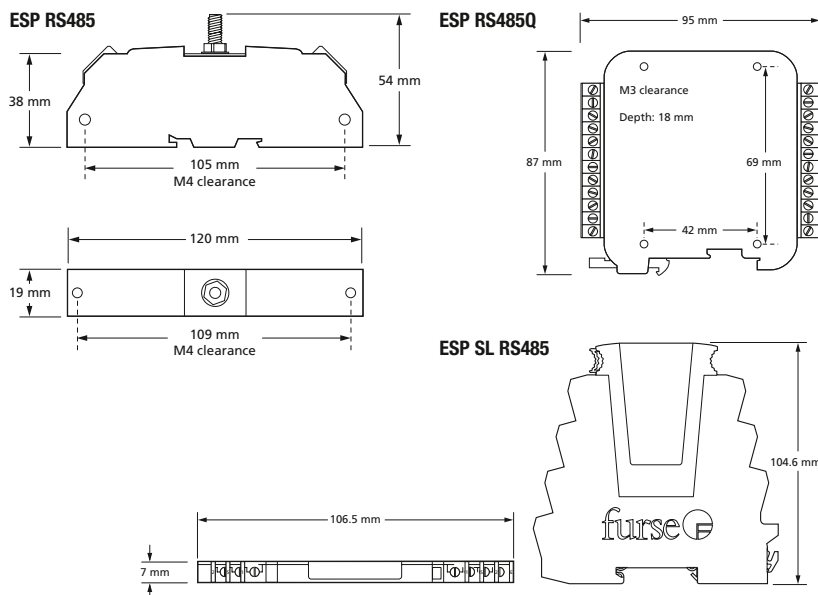


NOTE: The ESP SL 'Slim Line' Series is also available for protection of 3-wire and RTD applications (ESP SL/3W & ESP SL RTD). The ESP SL X Series has approvals for use in hazardous areas.

ESP RS485, RS485Q & SL RS485 Series - Technical specification

Electrical specification	ESP RS485	ESP SL RS485 / ESP SL RS485L	ESP RS485Q
Order code	7TCA085400R0191	7TCA085400R0193 / 7TCA085400R0230	7TCA085400R0192
Nominal voltage ⁽¹⁾	15 V		
Maximum working voltage U_c (RMS/DC) ⁽²⁾	11 V / 16.7 V		
Current rating (signal)	300 mA		
In-line resistance (per line $\pm 10\%$)	1 Ω		
Bandwidth (-3 dB 50 Ω system)	45 MHz		
Transient specification	ESP RS485	ESP SL RS485 / ESP SL RS485L	ESP RS485Q
Let-through voltage (all conductors)⁽³⁾ U_p			
C2 test 4 kV 1.2/50 μs , 2 kA 8/20 μs to BS EN/EN/IEC 61643-21	55.0 V		
C1 test 1 kV, 1.2/50 μs , 0.5 kA 8/20 μs to BS EN/EN/IEC 61643-21	42.0 V		
B2 test 4 kV 10/700 μs to BS EN/EN/IEC 61643-21	27.2 V		
5 kV, 10/700 μs ⁽⁴⁾	28.2 V		
Maximum surge current			
D1 test 10/350 μs to BS EN/EN/IEC 61643-21:	- Per signal wire 2.5 kA - Per pair 5 kA	2.5 kA 5 kA	1.25 kA 2.5 kA 2.5 kA 5 kA
8/20 μs to ITU-T K.45:2003, IEEE C62.41.2:2002:	- Per signal wire - Per pair	10 kA 20 kA	5 kA 10 kA 5 kA 10 kA 10 kA 20 kA
Mechanical specification	ESP RS485	ESP SL RS485 / ESP SL RS485L	ESP RS485Q
Temperature range	-40 to +80 °C		
Connection type	Screw terminal - max. torque 0.5 Nm	Screw terminal - max. torque 0.8 Nm	Pluggable 12 way screw terminal
Conductor size (stranded)	2.5 mm ²		
Earth connection	M6 stud	Via DIN-Rail or 4 mm ² earth terminal - max. torque 0.8 Nm	Via DIN-Rail or M5 threaded hole in base of unit
Case Material	FR Polymer UL-94 V-0		
Weight: – Unit	0.08 kg		
Dimensions	See diagrams below		

⁽¹⁾ Nominal voltage (RMS/DC or AC peak) measured at < 10 μA
⁽²⁾ Maximum working voltage (RMS/DC or AC peak) measured at < 5 mA
⁽³⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), line to line & line to earth, both polarities. Response time < 10 ns
⁽⁴⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)



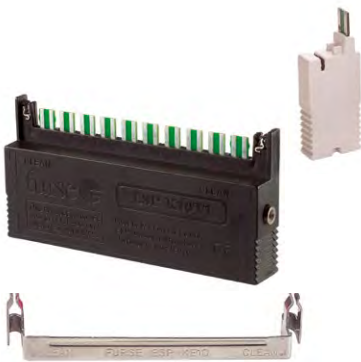
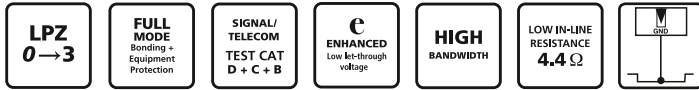
Order codes

Type code	Order code	Type code	Order code	Type code	Order code
ESP RS485	7TCA085400R0191	ESP SLRS485	7TCA085400R0193	ESP RS485Q	7TCA085400R0192
ESP SLRS485/B	7TCA085400R0262	ESP SLRS485L	7TCA085400R0230	ESP SLRS485/M	7TCA085400R0259
CME4	7TCA085400R0001	CME8	7TCA085400R0002	WBXSLQ	7TCA085410R0037
CME16	7TCA085410R0002	CME32	7TCA085410R0003	WBXSLQ/G	7TCA085410R0036



Telecom and computer line protection

ESP KT & KE Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable for use on ten line LSA-PLUS disconnection modules to PBX telephone exchanges, ISDN and other telecoms equipment with LSA-PLUS disconnection modules. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Low cost protection for large numbers of data and signal lines
- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Colour of housing distinguishes electrically different protectors - avoids confusion when installed together on the same distribution frame
- Quick and easy plug-in installation, with 'bump' location feedback
- Under power line cross conditions /PTC versions offer safe disconnection during fault duration. Unit auto-resets once fault corrected
- At larger installations ESP K10T1/2 and ESP K10T1/PTC provide all in one protection for all ten lines on LSA-PLUS disconnection modules
- Use the ESP KE10 to provide trouble free earthing for up to ten ESP KT1/2 and ESP KT1/PTC (per disconnection module)
- ESP K10T1/2 and ESP K10T1/PTC have an integral earth connection, and an external M4 earth bush for use with non-metallic LSA-Plus frames
- ESP KT1/PTC and ESP K10T1/PTC have resettable overcurrent protection and are rated for power cross faults
- ESP KT1, ESP KT1/PTC, ESP K10T1 and ESP K10T1/PTC are suitable for telecoms applications in accordance with Telcordia and ANSI Standards

Application

- For PSTN (e.g POTS, dial-up, lease line, T1/E1, *DSL and Broadband) and U interface ISDN lines, use ESP KT1 (or ESP KT1/PTC) and ESP K10T1 (or ESP K10T1/PTC)
- For S/T interface ISDN lines, use ESP KT2 and ESP K10T2
- Protect single lines with ESP KT1, ESP KT2 or ESP KT1/PTC
- Protect all ten lines on a disconnection module with ESP K10T1/2

Installation

Install protectors on all lines that enter or leave each building (including extensions to other buildings). Identify the lines requiring protection and plug-in the protector (ensuring the correct orientation) for a series connection. Plug ESP K10T1/2 directly into each disconnection module requiring protection.

ESP KT1/2 and ESP KT1/PTC must be installed via the ESP KE10 earth bar. Clip an ESP KE10 on to the disconnection module and plug an ESP KT1/2 or ESP KT1/PTC in to each line on the module that needs protecting. In the unlikely situation that the protector is damaged, it will sacrifice itself and fail short circuit, taking the line out of commission, indicating it needs replacing and preventing subsequent transients from damaging equipment.

For further information on global telephony applications, see separate Application Note AN005 (contact us for a copy).



NOTE: For individual telephone lines and lines at unmanned sites the high performance ESP TN, ready-boxed derivative ESP TN/BX or ESP TN/2BX, or plug-in ESP TN/JP or ESP TN/RJ11 Series should be used. For plug-in S/T interface ISDN protection, use the ESP TN or ISDN Series protectors.

ESP KT & KE Series - Technical specification

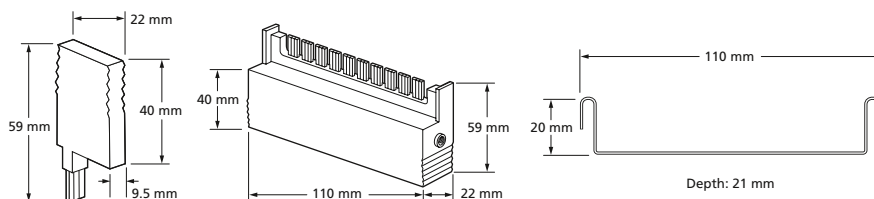
Electrical specification		ESP KT1	ESP KT1/PTC	ESP KT2	ESP K10T1	ESP K10T1/PTC	ESP K10T2
Order code		7TCA085400R0135	7TCA085400R0034	7TCA085400R0136	7TCA085400R0130	7TCA085400R0131	7TCA085400R0133
Maximum working voltage $U_c^{(1)}$	- line to line	296 V	296 V	5 V	296 V	296 V	5 V
	- line to earth	296 V	296 V	58 V	296 V	296 V	58 V
Current rating (signal)		300 mA	145 mA	300 mA	300 mA	145 mA	300 mA
In-line resistance (per line $\pm 10\%$)		4.4 Ω					
Bandwidth (-3 dB 50 Ω system)		20 MHz	20 MHz	19 MHz	20 MHz	20 MHz	19 MHz
Electrical specification		ESP KT1	ESP KT1/PTC	ESP KT2	ESP K10T1	ESP K10T1/PTC	ESP K10T2
Let-through voltage (all conductors)⁽²⁾ Up							
C2 test 4 kV 1.2/50 μ s,	- line to line	395 V	395 V	28 V	395 V	395 V	28 V
2 kA 8/20 μ s to BS EN/EN/IEC 61643-21	- line to earth	395 V	395 V	88 V	395 V	395 V	88 V
C1 test 1 kV, 1.2/50 μ s,	- line to line	390 V	390 V	23 V	390 V	390 V	23 V
0.5 kA 8/20 μ s to BS EN/EN/IEC 61643-21	- line to earth	390 V	390 V	63 V	390 V	390 V	63 V
B2 test 4 kV 10/700 μ s to BS EN/EN/IEC 61643-21	- line to line	298 V	298 V	26 V	298 V	298 V	26 V
	- line to earth	298 V	298 V	65 V	298 V	298 V	65 V
5 kV, 10/700 μ s ⁽³⁾	- line to line	300 V	300 V	27 V	300 V	27 V	27 V
	- line to earth	300 V	300 V	80 V	300 V	80 V	80 V
Maximum surge current⁽⁴⁾							
D1 test 10/350 μ s to BS EN/EN/IEC 61643-21:	- line to line	1 kA					
	- line to earth	2 kA					
8/20 μ s to ITU-T K.45:2003,	- line to line	5 kA					
IEEE C62.41.2:2002:	- line to earth	10 kA					
Power Faults specification		ESP KT1	ESP KT1/PTC	ESP KT2	ESP K10T1	ESP K10T1/PTC	ESP K10T2
Power/Line Cross and Power Induction - tests to: ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, UL 60950/IEC 950							
Power/line cross	-		110/230 Vac (15 min)	-	-	110/230 Vac (15 min)	-
Power induction	-		600 V, 1 A (0.2 sec)	-	-	600 V, 1 A (0.2 sec)	-
Mechanical specification		ESP KT1, ESP KT2, ESP KT1/PTC		ESP K10T1, ESP K10T2, ESP K10T1/PTC		ESP KE10	
Temperature range		-40 to +80 °C				-	
Connection type		To LSA-PLUS disconnection modules (BT type 237A)				-	
Earth connection		Via ESP KE10 earth bar		Via integral earth clip/external M4 bush		-	
Material		FR Polymer UL-94 V-0				Stainless Steel	
Weight: - Unit		0.01 kg		0.10 kg		0.01 kg	
Dimensions		See diagram below					

⁽¹⁾ Maximum working voltage (DC or AC peak) at 10 μ A for ESP KT1, ESP KT1/PTC, ESP K10T1, ESP K10T1/PTC and at 5 μ A for ESP KT2 and ESP K10T2

⁽²⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), line to line & line to earth, both polarities. Response time < 10 ns

⁽³⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)

⁽⁴⁾ The installation and connections external to the protector may limit the capability of the protector.



Telecom and computer line protection

ESP ESP TN/JP, TN/RJ11 & ISDN/RJ45 Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable to protect telephony equipment plugged into a BT telephone (BS 6312), Modem (RJ11) or ISDN (RJ45) socket. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Substantial earth connection to enable effective earthing
- Supplied in a sturdy ABS housing ready for flat mounting, or vertically via TS35 'Top Hat' DIN-Rail
- ESP TN/JP, ESP TN/RJ11-2/6, ESP TN/RJ11-4/6 and ESP TN/RJ11-6/6 are suitable for telecommunication applications in accordance with Telcordia and ANSI Standards (see Application Note AN005)

Application

- For PSTN (e.g. POTS, dial-up, lease line, T1/E1, *DSL and Broadband) use ESP TN/JP or TN/RJ11
 - ESP TN/JP and ESP TN/RJ11... are suitable for use on telephone lines with a maximum (or ringing) voltage of up to 296 Volts
 - For telephone lines with a British style, jack plug and socket connection, use ESP TN/JP
 - For telephone lines with RJ11 connections protect the middle 2 (of 6) conductors with ESP TN/RJ11-2/6, the middle 4 (of 6) with ESP TN/RJ11-4/6 or all 6 with ESP TN/RJ11-6/6
 - For S/T interface ISDN lines, use ESP ISDN/RJ45-4/8 and ESP ISDN/RJ45-8/8
 - For S/T interface ISDN lines with RJ45 connections protect the middle 4 (of 8) conductors (paired 3&6, 4&5) with ESP ISDN/RJ45-4/8, or all 8 (outside pairs 1&2, 7&8) with ESP ISDN/RJ45-8/8
- For further information on RJ45 ISDN applications, see separate Application Note AN002 and for global telephony applications, see separate Application Note AN005 (contact us for a copy).

Installation

Connect in series with the telephone or ISDN line. These units are usually installed close to the equipment being protected and within a short distance of a good electrical earth.

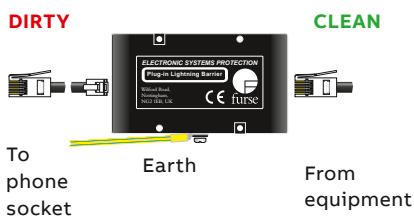
Accessories

ESP CAT5e/UTP-1

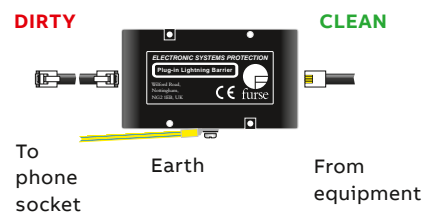
Order code: 7TCA085400R0294

1 metre cable with RJ45 connections

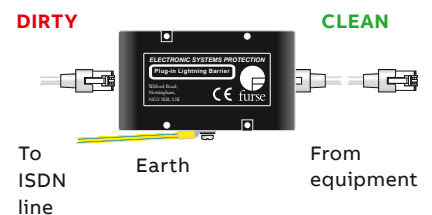
Plug-in series connection for ESP TN/JP



Plug-in series connection for ESP TN/RJ11-2/6, 4/6 & 6/6



Plug-in series connection for ESP ISDN/RJ45-4/8 & 8/8



NOTE: For non-ISDN wire-in applications the high performance ESP TN or readyboxed derivative ESP TN/BX or ESP TN/2BX can be used. Protect PBX telephone exchanges and other equipment with LSA-PLUS connections.

ESP TN/JP, TN/RJ11 & ISDN/RJ45 Series - Technical specification

Electrical specification	ESP TN/JP	ESP TN/ RJ11-2/6	ESP TN/ RJ11-4/6	ESP TN/ RJ11-6/6	ESP ISDN/ RJ45-4/8	ESP ISDN/ RJ45-8/8	
Order code	7TCA085400R0177	7TCA085400R0178	7TCA085400R0179	7TCA085400R0180	7TCA085460R0170	7TCA085460R0171	
Nominal voltage	296 V	296 V	296 V	296 V	5 V	5 V/58 V ⁽²⁾	
Maximum working voltage Uc(1)	296 V	296 V	296 V	296 V	58 V	58 V	
Current rating (signal)	300 mA						
In-line resistance (per line ±10%)	4.4 Ω						
Bandwidth (-3 dB 50 Ω system)	20 MHz	20 MHz	20 MHz	20 MHz	19 MHz	19 MHz	
Transient specification	ESP TN/JP	ESP TN/ RJ11-2/6	ESP TN/ RJ11-4/6	ESP TN/ RJ11-6/6	ESP ISDN/ RJ45-4/8	ESP ISDN/ RJ45-8/8	
Let-through voltage (all conductors)⁽³⁾ Up							
C2 test 4 kV 1.2/50 μs, 2 kA 8/20 μs to BS EN/EN/IEC 61643-21	- line to line	395 V	395 V	395 V	395 V	28 V	28 V/88 V ⁽⁵⁾
	- line to earth	395 V	395 V	395 V	395 V	88 V	88 V
C1 test 1 kV, 1.2/50 μs, 0.5 kA 8/20 μs to BS EN/EN/IEC 61643-21	- line to line	390 V	390 V	390 V	390 V	23 V	23 V/63 V ⁽⁵⁾
	- line to earth	390 V	390 V	390 V	390 V	63 V	63 V
B2 test 4 kV 10/700 μs to BS EN/EN/IEC 61643-21	- line to line	298 V	298 V	298 V	298 V	26 V	26 V/65 V ⁽⁵⁾
	- line to earth	298 V	298 V	298 V	298 V	65 V	65 V
5 kV, 10/700 μs4	- line to line	300 V	300 V	300 V	300 V	27 V	27 V/80 V ⁽⁵⁾
	- line to earth	300 V	300 V	300 V	300 V	80 V	80 V
Maximum surge current(6)							
D1 test 10/350 μs to BS EN/EN/IEC 61643-21	1 kA						
8/20 μs to ITU-T K.45:2003, IEEE C62.41.2:2002:	10 kA						
Mechanical specification	ESP TN/JP	ESP TN/ RJ11-2/6	ESP TN/ RJ11-4/6	ESP TN/ RJ11-6/6	ESP ISDN/ RJ45-4/8	ESP ISDN/ RJ45-8/8	
Temperature range	-40 to +80 °C						
Connection type	BT603A plug and socket	RJ11 plug and socket	RJ11 plug and socket	RJ11 plug and socket	RJ45 plug and socket	RJ45 plug and socket	
Earth connection	M4/DIN-Rail						
Case Material	FR Polymer UL-94 V-0						
Weight: - Unit	0.15 kg						
- Packaged	0.2 kg						
Dimensions	See diagram below						

⁽¹⁾ Maximum working voltage (DC or AC peak) measured at < 10 μA leakage for ESP TN/JP and ESP TN/RJ11 products and μA for ESP ISDN/RJ45 products

⁽²⁾ Maximum working voltage is 5 V for pairs 3/6 & 4/5, and 58 V for pairs 1/2 & 7/8

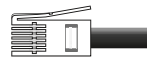
⁽³⁾ The maximum transient voltage let-through of the protector throughout the test (±10%), line to line & line to earth, both polarities. Response time < 10 ns

⁽⁴⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)

⁽⁵⁾ The first let-through voltage value is for pairs 3/4 & 5/6, and the second value is for pairs 1/2 & 7/8

⁽⁶⁾ The installation and connectors external to the protector may limit the capability of the protector

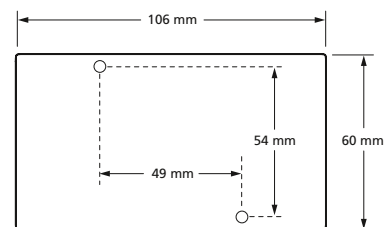
ESP TN/JP
cable length: 1 m



ESP ISDN/RJ45-4/8, 8/8
cable length: 0.5 m



ESP TN/RJ11-2/6, 4/6, 6/6
cable length: 1 m



Depth: 24 mm
Fixing centres 49 x 54 mm, M3 clearance

Telecom and computer line protection

ESP Cat-5 & Cat-6 Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable to protect twisted pair Ethernet networks, including Power over Ethernet (PoE), with RJ45 connections. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Suitable for systems signaling on up to eight wires of either shielded or unshielded twisted pair cable
- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Unlike some competing devices, the ethernet SPDs provide effective protection without impairing the system's normal operation
- Low capacitance circuitry prevents the start-up signal degradation associated with other types of network protector
- Low in-line resistance minimizes unnecessary reductions in signal strength to maximize signaling distance
- Sturdy ABS housing with convenient holes for flat mounting, or vertically via TS35 'Top Hat' DIN-Rail
- Substantial earth connection to enable effective earthing
- Will protect all PoE powering modes A and B.

Application

Use these protectors on network cables that travel between buildings to prevent damage to equipment, e.g. computers, servers, repeaters and hubs. Suitable for computer networks up to Cat-6A cabling.

- To protect up to 100baseT networks with Cat-5/Cat-5e cabling use ESP Cat-5e
- To protect up to 1000baseT/ 10GbaseT networks with Cat-6/Cat-6A cabling use ESP Cat-6

- To protect up to 100baseT Power over Ethernet (PoE) networks with Cat-5/Cat-5e use ESP Cat-5e/PoE
- To protect up to 1000baseT/ 10GbaseT Power over Ethernet (PoE) networks with Cat-6/Cat-6A cabling use ESP Cat-6/PoE

For further application information, see separate Application Note ESP AN004 (contact us for a copy).

Installation

Connect in series with the network cable, either:

- Near to where it enters or leaves the building, or
- As it enters the network hub, or
- Close to the equipment being protected

This should be close to the system's earth star point (to enable a good connection to earth).

Accessories

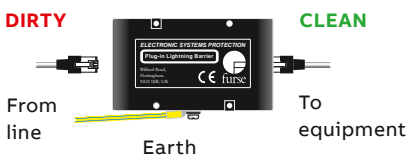
ESP CAT5e/UTP-1

Order code:
7TCA085400R0026
1 metre cable with unshielded RJ45 connections

ESP CAT6/STP-2

Order code:
7TCA085400R0231
2 metre screened cable with shielded RJ45 connections

Plug-in series connection



TECHNICAL NOTE: The interfaces used in Ethernet networks incorporate an isolation transformer which gives these systems an inbuilt immunity to transients between line and earth of 1,500 Volts or more.



NOTE: To protect datacomms systems based on twisted pairs, use the ESP D, E or H Series. Local protection for networked equipment is also available.

ESP Cat-5 & Cat-6 Series - Technical specification					
Electrical Specification		ESP Cat-5e	ESP Cat-5e/PoE	ESP Cat-6	ESP Cat-6/PoE
Order code		7TCA085400R0017	7TCA085400R0021	7TCA085400R0023	7TCA085400R0024
Maximum working voltage $U_c^{(1)}$	- data ⁽²⁾	5 V			
	- power ⁽³⁾	-	58 V	-	58 V
Current rating		300 mA	600 mA ⁽⁴⁾	300 mA	600 mA ⁽⁴⁾
In-line resistance (per line $\pm 25\%$)	- data ⁽²⁾	1.5 Ω			
	- power	-	1.5 Ω	-	-
Maximum data rate		100 Mbps	100 Mbps	1000 Mbps	1000 Mbps
Networking standards:		10/100baseT	10/100baseT	10/100/1000/10GbaseT	10/100/1000/10GbaseT
		TIA Cat-5e	TIA Cat-5/PoE	TIA Cat-6	TIA Cat-6
		IEEE 802.3i	IEEE 802.3i	IEEE 802.3i	IEEE 802.3i
		IEEE 802.3u	IEEE 802.3u	IEEE 802.3u	IEEE 802.3u
		-	IEEE 802.3af	IEEE 802.3ab	IEEE 802.3ab
		-	IEEE 802.3at	IEEE 802.3an	IEEE 802.3an
		-	-	-	IEEE 802.3af
		-	-	-	IEEE 802.3at
Transient specification		ESP Cat-5e	ESP Cat-5e/PoE	ESP Cat-6	ESP Cat-6/PoE
Let-through voltage (all conductors)⁽⁵⁾ Up					
C2 test 4 kV 1.2/50 μ s,	- line to line	120 V	120 V/116 V ⁽⁶⁾	120 V	120 V/116 V ⁽⁶⁾
	- line to earth ⁽⁶⁾	700 V			
2 kA 8/20 μ s to BS EN/EN/IEC 61643-21	- line to line	74 V	74 V/95 V ⁽⁶⁾	74 V	74 V/95 V ⁽⁶⁾
	- line to earth ⁽⁶⁾	600 V			
B2 test 4 kV 10/700 μ s to BS EN/EN/IEC 61643-21	- line to line	21 V	21 V/87 V ⁽⁶⁾	21 V	21 V/87 V ⁽⁶⁾
	- line to earth ⁽⁶⁾	550 V			
5 kV, 10/700 μ s ⁽⁷⁾	- line to line	25 V	25 V/90 V ⁽⁶⁾	25 V	25 V/90 V ⁽⁶⁾
	- line to earth ⁽⁶⁾	600 V			
Maximum surge current⁽⁹⁾					
D1 test 10/350 μ s to BS EN/EN/IEC 61643-21		1 kA			
8/20 μ s to ITU-T K.45:2003, IEEE C62.41.2:2002		10 kA			
Mechanical specification		ESP Cat-5e, ESP Cat-5e/PoE		ESP Cat-6, ESP Cat-6/PoE	
Temperature range		-40 to +80°C			
Connection type		RJ45 sockets			
Cable (supplied)		0.25 m Cat-5e UTP patch lead		0.5 m Cat-6 STP patch lead	
Earth connection		M4/DIN-Rail			
Case Material		FR Polymer UL-94 V-0			
Weight: - Unit		0.15 kg			
- Packaged		0.2 kg			
Dimensions		See diagram below			

⁽¹⁾ Maximum working voltage (DC or AC peak) measured at 1 mA leakage

⁽²⁾ Data pairs 1/2 and 3/6 are protected as standard. Pairs 4/5 and 7/8 are also protected on Cat-6 barriers

⁽³⁾ PoE protectors transmit power Mode A and Mode B power

⁽⁴⁾ Based on 30W of transmitted PSE power, to IEEE 802.3at.

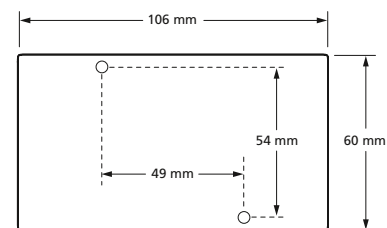
⁽⁵⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), line to line & line to earth. Response time <10 ns (on all protected pairs)

⁽⁶⁾ The interfaces used in network systems incorporate an isolation transformer that inherently provides an inbuilt immunity to transients between line and earth of 1,500 Volts or more

⁽⁷⁾ Test to IEC 61000-4-5:2014, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 6:2011, ANSI TIA/EIA/IS-968-A:2005 (formerly FCC Part 68).

⁽⁸⁾ The first number is for the data pair, with the second number for the power pair

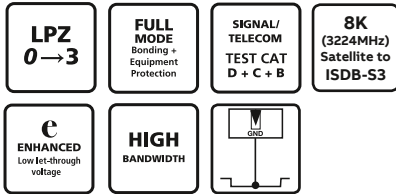
⁽⁹⁾ The installation and connectors may limit the capability of the protector



Depth: 24 mm
Fixing centres
49 x 54 mm,
M3 clearance

Specific systems protection

ESP TV Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable to protect Cable, Terrestrial and Satellite TV systems. For use on lines running within buildings at boundaries up to LPZ 0 to through to LPZ 3 to protect sensitive electronic equipment.



Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Low attenuation and high return loss over a wide range of frequencies ensures the protectors do not impair system performance
- Substantial earth termination
- Supplied ready for flat mounting
- Strong metal housing
- 8K (3224 MHz) ready to ISDB-S3 satellite digital broadcast standard

Application

Use to protect analogue and digital Cable, Terrestrial and Satellite TV installations. ESP CATV/F, ESP MATV/F, ESP SMATV/F and ESP TV/F are suitable for systems using F connectors. ESP TV/EURO is suitable for systems using EURO-TV connectors.

- For protecting terrestrial antenna feeds use ESP TV/F or ESP TV/EURO
- For protecting satellite feeds use ESP SMATV/F

- For protecting distributed combined TV feeds use ESP MATV/F
- For protecting cable TV feeds use ESP CATV/F

For further information on TV applications, see separate Application Note AN006 (contact us for a copy).

Installation

Connect in series with the coaxial cable either near where it enters or leaves each building or close to equipment being protected.

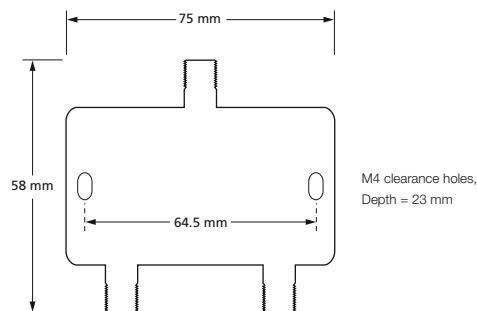


NOTE: Protectors for coaxial (or twisted pair) CCTV Lines are available. For coaxial RF lines, use the ESP RF Series. Transients can also be conducted TV systems via the mains power supplies - use suitable ESP mains protection.

ESP TV Series - Technical specification

Electrical specification	ESP CATV/F	ESP MATV/F	ESP SMATV/F	ESP TV/F	ESP TV/EURO
Order code	7TCA085400R0122	7TCA085450R0000	7TCA085450R0026	7TCA085450R0028	7TCA085450R0027
Maximum working voltage ⁽¹⁾	140 V	18.9 V	18.9 V	6.4 V	6.4 V
Maximum operating current	4 A	800 mA	800 mA	300 mA	300 mA
Characteristic impedance	75 Ω				
Bandwidth	5-860 MHz	5-3224 MHz	860-3224 MHz	5-860 MHz	5-860 MHz
Insertion loss: – 5-860 MHz	< 0.5 dB	< 0.3 dB	–	< 0.3 dB	< 0.3 dB
– 860-2150 MHz	–	< 1.5 dB	< 1.5 dB	–	–
– 2150-3224 MHz	–	< 2.2 dB	< 2.2 dB	–	–
Return loss (VSWR): – 5-860 MHz	> 20 dB (< 1.2:1)	> 32 dB (< 1.05:1)	–	> 32 dB (< 1.05:1)	> 32 dB (< 1.05:1)
– 860-2150 MHz	–	> 20 dB (< 1.2:1)	> 20 dB (< 1.2:1)	–	–
– 2150-3224 MHz	–	< 2.2 dB	< 2.2 dB	–	–
Transient specification	ESP CATV/F	ESP MATV/F	ESP SMATV/F	ESP TV/F	ESP TV/EURO
Let-through voltage (all conductors)⁽²⁾ Up					
C2 test 4 kV 1.2/50 μs, 2 kA 8/20 μs to BS EN/EN/IEC 61643-21	270 V	70 V	70 V	65 V	65 V
C1 test 1 kV 1.2/50 μs, 0.5 kA 8/20 μs to BS EN/EN/IEC 61643-21	265 V	60 V	60 V	50 V	50 V
B2 test 4 kV 10/700 μs to BS EN/EN/IEC 61643-21	245 V	45 V	45 V	30 V	30 V
5 kV, 10/700 μs ⁽³⁾	250 V	50 V	50 V	35 V	35 V
Maximum surge current					
8/20 μs to ITU-T K.45:2003, IEEE C62.41.2:2002	3 kA				
D1 test 10/350 μs to BS EN/EN/IEC 61643-21	500 A	750 A	750 A	750 A	750 A
Mechanical specification	ESP CATV/F	ESP MATV/F	ESP SMATV/F	ESP TV/F	ESP TV/EURO
Temperature range	–40 to +80 °C				
Connection type	F female				Euro-TV
Earth connection	~ 9.5 mm (3/8") diameter earth stud				
Case Material	Diecast				
Weight: – Unit	0.14 kg				
– Packaged	0.15 kg				
Dimensions	See diagram below				

- ⁽¹⁾ Maximum working voltage (DC or AC peak) measured at < 5 μA (ESP CATV/F) and < 50 mA (ESP MATV/F, ESP SMATV/F, ESP TV/EURO, ESP TV/F)
- ⁽²⁾ The maximum transient voltage let-through of the protector throughout the test (±10%), line to line & line to earth. Response time < 10 ns
- ⁽³⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)



Specific systems protection

ESP CCTV Series

- LPZ 0→3**
- FULL MODE**
Bonding + Equipment Protection
- HIGH BANDWIDTH**
- SIGNAL/TELECOM TEST CAT D + C + B**
- LOW IN-LINE RESISTANCE 1 Ω**
- CURRENT RATING 300 mA**
- e ENHANCED**
Low let-through voltage
-
-



Combined Category D, C, B tested protector (to BS EN 61643) suitable for coaxial CCTV cables with BNC connectors (ESP CCTV/B) or twisted pair CCTV lines (ESP CCTV/T) on systems with either an earthed or an isolated screen. Not suitable for use on broadcast, satellite or cable TV systems. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- 100 MHz bandwidth prevents the degradation of high frequency signals
- Low in-line resistance to minimize unnecessary reductions in signal strength and maximizes signaling distance
- Very low reflection coefficient/VSWR ensure that the protector doesn't disrupt system operations
- Suitable for either earthed or isolated screen systems
- Sturdy, conductive ABS housing for 2 way shielding - preventing emissions & providing signals with immunity from external interference
- Convenient holes for flat mounting on base or side
- Built-in DIN-Rail foot for easy installation on a top hat DIN-Rail
- ESP CCTV/T has colour coded terminals for a quick and easy installation check - grey for the dirty (line) end and green for the clean end
- Substantial earth stud to enable effective earthing
- Integral earthing plate for enhanced connection to earth via CME kit
- ESP CCTV/B has Network Rail Approval PA05/02510. NRS PADS reference 086/023410

Application

Use these protectors on the video cable to outdoor CCTV cameras and central control and monitoring equipment.

Accessories

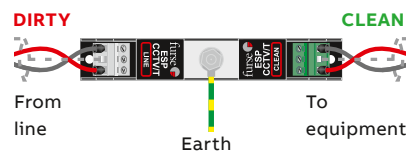
When CCTV protectors are installed in groups, or alongside protectors for signal and mains power lines, these can be mounted and earthed simultaneously on a CME kit. A CME 4 will accommodate the video, telemetry and power protectors to a camera. If protectors cannot be incorporated within an existing panel or enclosure, WBX enclosures are available for up to 4, 8, 16 or 32 protectors and their associated CME kit. The WBX 4/GS is a secure IP66 enclosure suitable for a CME 4 and associated protectors.

Installation

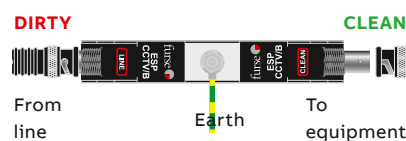
Connect in series with the CCTV cable in a convenient place close to the equipment being protected. For outdoor CCTV cameras, protectors should be mounted in the junction box, or in a separate enclosure, close to the camera. Protect central control and monitoring equipment inside the building by installing protectors on all incoming or outgoing lines, either:

- near where they enter or leave the building, or
- close to the equipment being protected (or actually within its control panel).

Series connection for ESP CCTV/T



Series connection for ESP CCTV/B

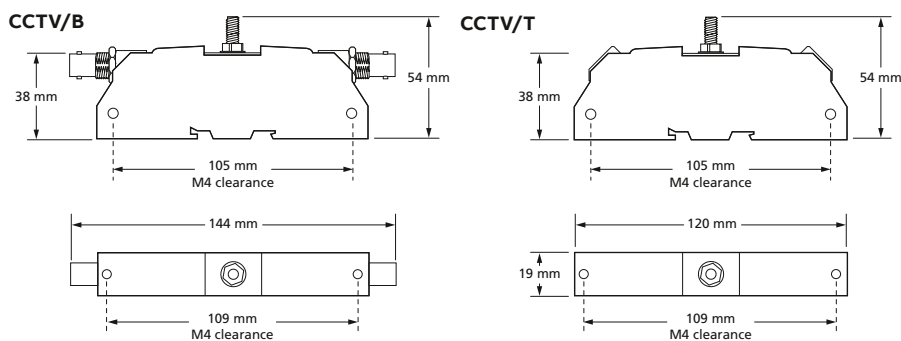


NOTE: Camera telemetry or control lines should be protected with a suitable Lightning Barrier from the ESP D or E Series. Protectors for the power supply to individual cameras (e.g. ESP 240-16A) and the mains supply to the control room (e.g. ESP 240 D1) are available. For coaxial RF (ESP RF Series) cable protectors and CATV systems (ESP CATV/F) are also available.

ESP CCTV Series - Technical specification

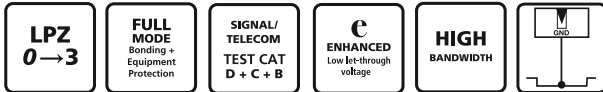
Electrical specification	ESP CCTV/B	ESP CCTV/B -15V	ESP CCTV/B -30V	ESP CCTV/B -50V	ESP CCTV/T	ESP CCTV/T -15V	ESP CCTV/T -30V	ESP CCTV/T -50V
Order code	7TCA085400R0123	7TCA085400R0124	7TCA085400R0125	7TCA085400R0126	7TCA085400R0129	7TCA085400R0270	7TCA085400R0271	7TCA085400R0027
Nominal voltage ⁽¹⁾ (peak-peak)	1 V				2 V			
Maximum working voltage $U_c^{(2)}$ (peak)	7.79 V	16.7 V	36.7 V	56.7 V	7.79 V	16.7 V	36.7 V	56.7 V
Current rating (signal)	300 mA							
In-line resistance ($\pm 10\%$)	1 Ω inserted in coax inner				1 Ω per line			
Bandwidth (-3 dB 75 Ω system) ⁽³⁾	> 100 MHz							
Voltage standing wave ratio	< 1.2:1							
Transient specification	ESP CCTV/B	ESP CCTV/B -15V	ESP CCTV/B -30V	ESP CCTV/B -50V	ESP CCTV/T	ESP CCTV/T -15V	ESP CCTV/T -30V	ESP CCTV/T -50V
Let-through voltage (all conductors)⁽⁴⁾ Up								
C2 test 4 kV 1.2/50 μ s, 2 kA 8/20 μ s to BS EN/EN/IEC 61643-21	39.5 V	55.0 V	78.0 V	105.0 V	39.5 V	55.0 V	78.0 V	105.0 V
C1 test 1 kV 1.2/50 μ s, 0.5 kA 8/20 μ s to BS EN/EN/IEC 61643-21	26.0 V	42.0 V	66.5 V	93.5 V	26.0 V	42.0 V	66.5 V	93.5 V
B2 test 4 kV 10/700 μ s to BS EN/EN/IEC 61643-21	16.0 V	27.2 V	47.5 V	73.6 V	16.0 V	27.2 V	47.5 V	73.6 V
5 kV, 10/700 μ s ⁽⁵⁾	17.0 V	28.2 V	49.5 V	76.2 V	17.0 V	28.2 V	49.5 V	76.2 V
Maximum surge current⁽⁶⁾								
D1 test 10/350 μ s to BS EN/EN/IEC 61643-21:	2.5 kA (per signal wire) -				2.5 kA (per signal wire) 5 kA (per pair)			
8/20 μ s to ITU (formerly CCITT):	10 kA (per signal wire) -				10 kA (per signal wire) 20 kA (per pair)			
Mechanical specification	ESP CCTV/B variants				ESP CCTV/T variants			
Temperature range	-40 to +80°C							
Connection type	Coaxial BNC female				Screw terminal			
Conductor size (stranded)	Not applicable				2.5 mm ²			
Earth connection	M6 stud							
Case Material	Conductive ABS UL94 V-0							
Weight: – Unit	0.08 kg							
Dimensions	See diagram below							

⁽¹⁾ Nominal voltage (DC or AC peak) measured at <10 μ A leakage
⁽²⁾ Maximum working voltage (DC or AC peak) measured at 5 mA leakage
⁽³⁾ Capacitance < 30 pF
⁽⁴⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), line to line & line to earth. Screen to earth let-through voltage will be up to 600 V (with 5 kV 10/700 test), when protector is configured for use with non-earthed or isolated screen systems. Response time < 10 ns
⁽⁵⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)
⁽⁶⁾ The installation and connectors external to the protector may limit the capability of the protector



Specific systems protection

ESP RF Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable for RF systems using coaxial cables at frequencies between DC and 2.7 GHz and where DC power is present. Suitable for RF systems with power up to 1.9 kW. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Superior transient protection to both Gas Discharge Tube (GDT) and Quarter Wave Stub (QWS) based protectors
- Wide bandwidth means a single product is suitable for a range of applications

Application

Use on coaxial cables to protect RF transmitter and receiver systems, including electronics located at the antenna or dish. Typical examples include cell sites, military communications, satellite earth stations, pager systems and emergency services communications systems.

Accessories

ESP RF BK1 Straight mounting plates

ESP RF BK2 90° angled mounting plates

ESP RF BK3 Bulkhead through mounting plate (single)

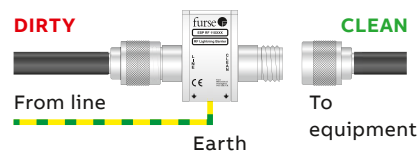
ESP RF BK4 Bulkhead through mounting plate (for 4 products)
ESP RF GDT-x Replacement gas discharge tubes (Where x is the correct GDT type code digit for your system).

- Very low attenuation and near unity VSWR over a wide range of frequencies ensure the protectors do not impair system performance
- Available with N, 7/16 DIN and BNC connectors
- Easily mounted and earthed via fixtures on the base of the unit that accept M3 and M5 screws or via mounting brackets
- Additional mounting plates give increased flexibility
- Robust aluminium housing

Application

In a building, connect in series with the coaxial cable near where it enters or leaves the structure, or close to the equipment being protected. This should be as close as possible to the system's earth star point (to enable a good connection to earth). On a mast, connect in series with the coaxial cable near the antenna/dish being protected. Install in a radio communications room, an existing cabinet or a suitable enclosure.

ESP RF 111A21 with N female connectors installed in series



TYPE CODE SYSTEM: Furuse RF protectors have six digit type codes, prefixed with ESP RF. The selected digits define the exact specification of the required protector, e.g. **ESP RF AABCDE**
Connector type - ESP RF AAxxxx The first 2 digits refer to the connector type: **11** - N type female, **AA** - 7/16 DIN type female, **44** - BNC female
Line impedance - ESP RF xxBxxx 3rd digit refers to the line impedance. Currently only one option: **1** - 50 Ω transmission line.
Gas Discharge Tube (GDT) selection - ESP RF xxxCxx Select the 4th digit from the table at the bottom (opposite). Selection of the correct GDT is critical in the effectiveness of using these protectors. For the correct GDT, take the maximum RF power or voltage of the

system and select a GDT with a voltage/power handling greater than the system.

IMPORTANT NOTE: When using the peak RF voltage to select the GDT, if the system is a multi-carrier system the (in phase) peak RF voltage can be calculated as the total of all the single carrier peak voltages on the transmission line.

Protector type - ESP RF xxxxDx 5th digit specifies the protector type:

Select **2** - DC-pass (Option **1** is filter type, see alternative range)

Case plating - ESP RF xxxxE 6th digit specifies the case plating: Currently only one option: **1** - White bronze (connectors), Nickel (body)

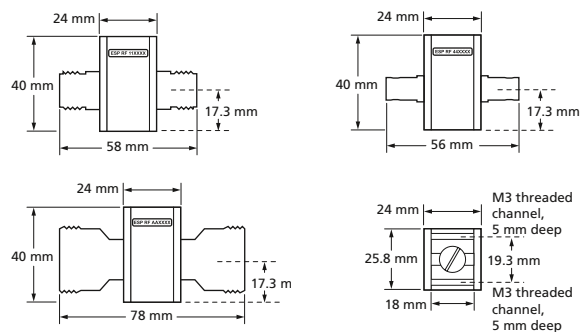


NOTE: These protectors are based on a continuous transmission line with a GDT connected between this line and screen/earth, and are suited for applications where DC is required to pass to the equipment. For RF applications where the connected equipment is very sensitive to transient overvoltages, use the higher specification RF protectors. ESP CCTV/B and ESP CCTV/T are suitable for use on coaxial (or twisted pair) CCTV lines. For coaxial CATV lines, use the CATV/F.

ESP RF Series - Technical specification

Electrical specification	ESP RF xx1x21					
Order code	** See below					
Gas Discharge Tube voltage	90 V	150 V	230 V	350 V	470 V	600 V
Maximum working voltage U_c (RMS) ⁽¹⁾	51 V	85 V	130 V	200 V	265 V	340 V
Characteristic impedance	50 Ω					
Capacitance (@ 1 MHz)	< 5 pF					
Bandwidth	DC-2.7 GHz					
Voltage standing wave ratio	≤ 1.1					
Insertion loss over bandwidth	≤ 0.1 dB					
Maximum power ⁽³⁾	40 W	120 W	280 W	650 W	1.15 kW	1.90 kW
Transient specification	ESP RF xx1x21					
Let-through voltage (all conductors)⁽²⁾ U_p						
C2 test 4 kV 1.2/50 μs, 2 kA 8/20 μs to BS EN/EN/IEC 61643-21	< 1 kV	< 900 V	< 1 kV	< 1.2 kV	< 1.4 kV	< 1.6 kV
C1 test 1 kV 1.2/50 μs, 0.5 kA 8/20 μs to BS EN/EN/IEC 61643-21	< 1 kV	< 900 V	< 1 kV	< 1.2 kV	< 1.4 kV	< 1.6 kV
B2 test 4 kV 10/700 μs to BS EN/EN/IEC 61643-21	< 1 kV	< 900 V	< 1 kV	< 1.2 kV	< 1.4 kV	< 1.6 kV
5 kV, 10/700 μs ⁽³⁾	< 1 kV	< 900 V	< 1 kV	< 1.2 kV	< 1.4 kV	< 1.6 kV
Maximum surge current⁽⁴⁾						
D1 test 10/350 μs to BS EN/EN/IEC 61643-21	2.5 kA					
8/20 μs to ITU-T K.45:2003, IEEE C62.41.2:2002	20 kA					
Mechanical specification	ESP RF 111x21	ESP RF AA1x21		ESP RF 441x21		
Temperature range	-40 to +80 °C					
Connection type	N female	7/16 DIN female		BNC female		
Conductor size (stranded)	Via mounting fixtures					
Case Material	Aluminium body, nickel plated. Brass connectors, white bronze plated					
Weight: – Unit	120 g	190 g		90 g		
– Packaged	140 g	210 g		110 g		
Dimensions	See diagram below					

- (1) The maximum RF working voltage and maximum power for the protectors is dependent on the GDT selected, with the power levels derated based on real life 'worst case' conditions with VSWR=2:1. See 'Gas Discharge Tube selection' below
- (2) The maximum transient voltage let-through of the protector throughout the test (±10%) (±10%). Response time < 10 ns. This let-through voltage represents a deviation from the applied signal voltage, present at the time of the test
- (3) Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)
- (4) The installation and connections external to the protector may limit the capability of the protector



- ESP RF BK1 (Order code: 7TCA085450R0017)**
Straight mounting bracket, 53 x 26.3 x 3 mm
2 x M4 clearance mounting holes, 16.3 mm apart
- ESP RF BK2 (Order code: 7TCA085450R0018)**
90° mounting bracket, 33 x 26.3 x 3 mm, 20 x 26.3 x 3 mm
2 x M4 clearance mounting holes, 16.3 mm apart, 14 mm from fold line
- ESP RF BK3 (Order code: 7TCA085450R0020)**
90° mounting bracket, 50 x 24 x 1.5 mm, 60 x 24 x 1.5 mm
2 x M5 clearance mounting holes, 40 mm apart
- ESP RF BK4 (Order code: 7TCA085450R0046)**
90° quad mounting bracket, 50 x 24 x 1.5 mm, 210 x 24 x 1.5 mm
5 x M5 clearance mounting holes, various spacings
Mounting brackets supplied with screws for fixing to protector

Gas Discharge Tube selection

Max RF voltage	Max RF power	GDT voltage	GDT type
V_{Peak}	V_{RMS}	code	digit
50 Ω system (Prms) with VSWR = 2:1			
72 V	40 W	90 V	1
120 V	120 W	150 V	2
185 V	280 W	230 V	3
280 V	650 W	350 V	4
375 V	1.15 kW	470 V	5
480 V	1.90 kW	600 V	6

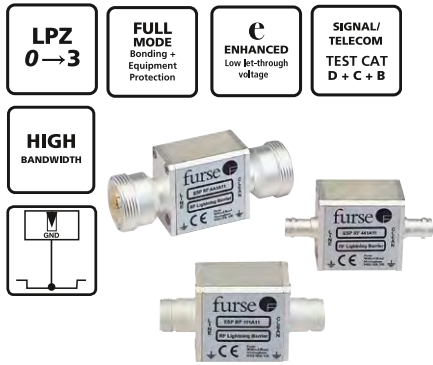
Power levels have been de-rated to allow for real life 'worst case' conditions, calculated with VSWR as 2:1

Order codes

Type code	Order code	Type code	Order code
ESP RF111121	7TCA085450R0002	ESP RFAA1421	7TCA085450R0061
ESP RF111221	7TCA085450R0003	ESP RFAA1521	7TCA085450R0062
ESP RF111321	7TCA085450R0004	ESP RFAA1621	7TCA085450R0287
ESP RF111421	7TCA085450R0005	ESP RF441121	7TCA085450R0010
ESP RF111521	7TCA085450R0006	ESP RF441221	7TCA085450R0011
ESP RF111621	7TCA085450R0057	ESP RF441321	7TCA085450R0012
ESP RFAA1121	7TCA085450R0060	ESP RF441421	7TCA085450R0058
ESP RFAA1221	7TCA085450R0015	ESP RF441521	7TCA085450R0059
ESP RFAA1321	7TCA085450R0286	ESP RF441621	7TCA085450R0013

Specific systems protection

ESP RF Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable for RF systems (of power up to 150 W) using coaxial cables at frequencies between 50 MHz and 2.7 GHz to provide effective protection without impairing system performance. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Superior transient protection to both Gas Discharge Tube (GDT) and Quarter Wave Stub (QWS) based protectors
- Very low attenuation and near unity VSWR over a wide range of frequencies ensure the protectors do not impair system performance
- Wide bandwidth means a single product is suitable for a range of applications
- Available with N, 7/16 DIN and BNC connectors
- Easily mounted and earthed via fixtures on the base of the unit that accept M3 and M5 screws or via mounting brackets
- Additional mounting plates give increased flexibility
- Robust aluminum housing

Application

Use on coaxial cables to protect RF transmitter and receiver systems, including electronics located at the antenna or dish. Typical examples include cell sites, military communications, satellite earth stations, pager systems and emergency services communications systems.

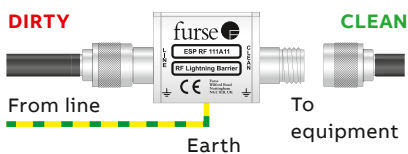
Application

In a building, connect in series with the coaxial cable near where it enters or leaves the structure, or close to the equipment being protected. This should be as close as possible to the system's earth star point (to enable a good connection to earth). On a mast, connect in series with the coaxial cable near the antenna/dish being protected. Install in a radio communications room, an existing cabinet or a suitable enclosure.

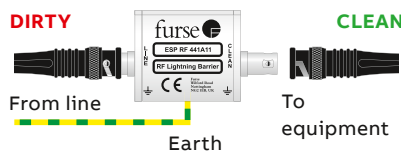
Accessories

- | | | | |
|---|---|---|---|
| ESP RF BK1
Straight mounting plates | ESP RF BK3
Bulkhead through mounting plate (single) | ESP RF BK4
Bulkhead through mounting plate (for 4 products) | ESP RF GDT-A
Replacement gas discharge tube |
| ESP RF BK2
90° angled mounting plates | | | |

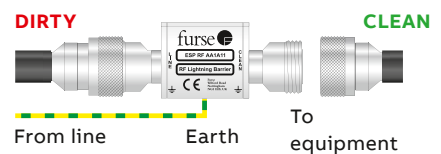
ESP RF 111A11 with N female connectors installed in series



ESP RF 441A11 with BNC female connectors installed in series



ESP RF AA1A11 with 7/16 DIN female connectors installed in series



NOTE: The high level of protection offered by these units comes from the addition of a high pass filter circuit which gives a very low letthrough voltage. It should be noted that due to this high pass filter circuit no DC power can pass along the transmission line. This is referred to as "DC blocked". Protectors with other connectors are available. For RF applications where DC power is present on the coaxial cable, use the alternative RF protectors. The ESP CCTV/B and ESP CCTV/T are suitable for use on coaxial (or twisted pair) CCTV lines. For coaxial CATV lines, use the ESP CATV/F.

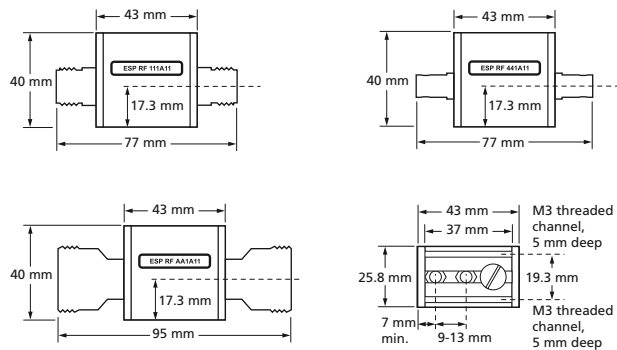
ESP RF Series - Technical specification

Electrical specification	ESP RF 111A11	ESP RF AA1A11	ESP RF 441A11
Order code	7TCA085450R0007	7TCA085450R0016	7TCA085450R0014
Maximum working voltage U_c (RMS)	86 V		
Maximum transmitted power (RMS)	150 W		
Characteristic impedance	50 Ω		
Capacitance (@ 1 MHz)	< 500 pF		
Bandwidth	50-2700 MHz		
Voltage standing wave ratio	≤ 1.2		
Insertion loss over bandwidth: – 50-500 MHz	≤ 0.4 dB		
– 500-1,600 MHz	≤ 0.2 dB		
– 1.6-2.7 GHz	≤ 0.4 dB		
Maximum power	150 W		
Transient specification	ESP RF 111A11	ESP RF AA1A11	ESP RF 441A11
Let-through voltage (all conductors)⁽¹⁾ Up			
C2 test 4 kV 1.2/50 μ s, 2 kA 8/20 μ s to BS EN/EN/IEC 61643-21	24 V		
C1 test 1 kV 1.2/50 μ s, 0.5 kA 8/20 μ s to BS EN/EN/IEC 61643-21	15 V		
B2 test 4 kV 10/700 μ s to BS EN/EN/IEC 61643-21	15 V		
5 kV, 10/700 μ s ⁽²⁾	20 V		
Maximum surge current⁽³⁾			
D1 test 10/350 μ s to BS EN/EN/IEC 61643-21	2.5 kA		
8/20 μ s to ITU-T K.45:2003, IEEE C62.41.2:2002	20 kA		
Mechanical specification	ESP RF 111A11	ESP RF AA1A11	ESP RF 441A11
Temperature range	–40 to +80 °C		
Connection type	N female	$\frac{7}{16}$ DIN female	BNC female
Conductor size (stranded)	Via mounting fixtures		
Case Material	Aluminium body, nickel plated. Brass connectors, white bronze plated		
Weight: – Unit	150 g	220 g	120 g
– Packaged	170 g	240 g	160 g
Dimensions	See diagram below		

⁽¹⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$). Response time < 10 ns. This let-through voltage represents a deviation from the applied signal voltage, present at the time of the test

⁽²⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)

⁽³⁾ The installation and connectors external to the protector may limit the capability of the protector

**ESP RF BK1 (Order code: 7TCA085450R0017)**

Straight mounting bracket, 53 x 26.3 x 3 mm

2 x M4 clearance mounting holes, 16.3 mm apart

ESP RF BK2 (Order code: 7TCA085450R0018)

90° mounting bracket, 33 x 26.3 x 3 mm, 20 x 26.3 x 3 mm

2 x M4 clearance mounting holes, 16.3 mm apart, 14 mm from fold line

ESP RF BK3 (Order code: 7TCA085450R0020)

90° mounting bracket, 50 x 24 x 1.5 mm, 60 x 24 x 1.5 mm

2 x M5 clearance mounting holes, 40 mm apart

ESP RF BK4 (Order code: 7TCA085450R0046)

90° quad mounting bracket, 50 x 24 x 1.5 mm, 210 x 24 x 1.5 mm

5 x M5 clearance mounting holes, various spacings

Mounting brackets supplied with screws for fixing to protector

Protector accessories

CME Series



Enables groups of protectors to be simultaneously mounted and earthed via their earth stud. Suitable for installing protectors with one or two earth studs on their top face. Available with 4, 8, 16 and 32 mounting holes.

Features & benefits

- Enables quick and easy installation of protectors for added convenience
- Speedy installation of groups of protectors saves time and money
- Individual protectors can be changed without needing to remove others
- Sturdy construction
- Supplied with a choice of flat and round ended fixing screws to suit your application

Application

Use CME kits to simultaneously mount and earth groups of single and double earth stud protectors. Each single earth stud protector requires one CME mounting position and each double earth stud protector requires two CME mounting positions, this includes:

- High conductivity copper with electro-tin plating and nylon insulating pillars, for low impedance to earth
- Single earth stud protectors which are:
- ESP 06D – ESP 06E – ESP 06H – ESP TN
 - ESP 15D – ESP 15E – ESP 15H – ESP RTD
 - ESP 30D – ESP 30E – ESP 30H – ESP CCTV/B
 - ESP 50D – ESP 50E – ESP 50H – ESP CCTV/T
 - ESP 110D – ESP 110E – ESP 110H – ESP RS485

Double earth stud protectors which are:

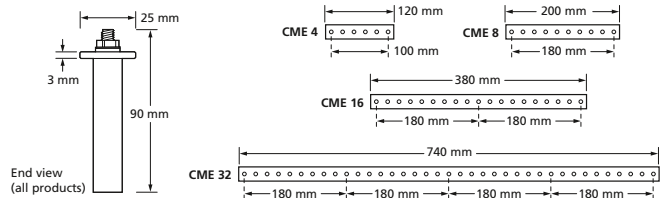
- ESP 240-5A – ESP 277-5A – ESP 277-16A

Once you know how many CME mounting positions you require choose a CME kit to suit:

- CME 4 has 4 mounting positions
- CME 8 has 8 mounting positions
- CME 16 has 16 mounting positions
- CME 32 has 32 mounting positions

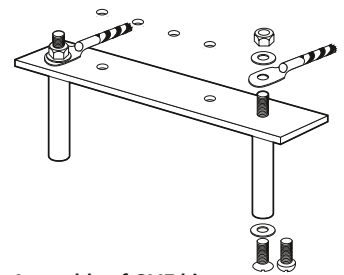
Installation

The earth bar is supported by a series of mounting pillars (which are fixed to the cubicle or box base). Protectors are attached to the CME's earth bar via their earth stud(s) and earthed with shared connections to earth. We suggest one earth connection per mounting pillar.



Accessories

Enclosures suitable for a CME 4 and its associated protectors: **(WBX 4/GS), CME 8** and protectors **(WBX 8/GS)** or one or two **CME 16** and protectors **(WBX 16/2/G)**



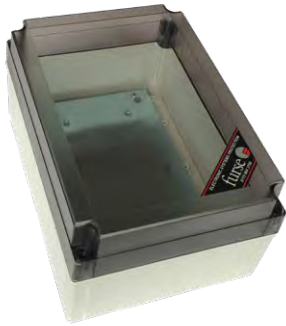
Assembly of CME kit
Earth connection (not supplied)

CME Series - Technical specification

	CME 4	CME 8	CME 16	CME 32
Order code	7TCA085400R0001	7TCA085400R0002	7TCA085400R0002	7TCA085400R0002
Hole size	6.5 mm with 20 mm spacings			
Weight	0.1 kg	0.15 kg	0.3 kg	0.6 kg
Dimensions	See diagram above			

Protector accessories

WBX Series



A range of moisture and dirt resistant enclosures for the convenient installation of any ESP protector. For signaling applications they can be used with their associated CME with grey base and either a see-through or grey (type /G or /GS) lid.

Features & benefits

- Tough polycarbonate enclosures (except ABS WBX 2/G)
- Weatherproof with IP resistance to dirt and water of IP56 or more
- Clear lid enables easy visual inspection of the protector's visual status indication (WBX 3, WBX 4, WBX D4, WBX 8, WBX D8, WBX M2, WBX M4)
- Grey lid for applications not needing regular protector inspection (WBX 2/G, WBX 3/G, WBX 4/GS, WBX 8/GS and WBX 16/2/G)
- For external CCTV and other installations requiring added security the WBX 4/GS and WBX 8/GS are supplied with an opaque lid and special secure head screws (plus tool)
- Supplied complete with metal base (mounting) plate with pre-prepared mounting positions and fixing hardware for easy installation (except WBX 2/G which has a plain metal base)

Application

Use WBX enclosures when your ESP protector(s) can't be installed within the existing equipment panel or enclosure and for added protection in damp and dirty environments.

Installation

The protector(s), or CME kit, are mounted on the metal base plate, which in turn mounts in the enclosure.

WBX Series - Technical specification

Enclosure type	For use with following protectors	Enclosure type	For use with following protectors
WBX D4	1 ESP 240 or 415/XXX/TNS or TNC protector, or single phase D1 series protector	WBX M4	1 ESP M4 series protector, such as ESP415M4
WBX D8	1 ESP 415/XXX/TT protector, or three phase D1 series protector	WBX 4 or the secure WBX 4/GS	1 CME 4 and associated protectors
WBX 3	1 single phase M1 series protector, such as ESP240M1	WBX 8 or the secure WBX 8/GS	1 CME 8 and associated protectors
WBX 4	1 three phase M1 series protector, such as ESP415M1	WBX 16/2/G	1 or 2 CME 16 and associated protectors
WBX M2	1 ESP M2 series protector, such as ESP415M2	WBX 2/G	1 or 2 single earth stud protectors
		WBX 3/G	Up to 3 single earth stud protectors
		WBX 3/G	1 double earth stud protector
		WBX SLQ or WBX SLQ/G	Up to 6 x ESP**Q, or up to 15 x ESP SL**

	WBX 2/G	WBX 3 WBX 3/G	WBX 4 WBX 4/GS	WBX D4	WBX 8 WBX 8/GS	WBX D8	WBX 16/2/G	WBX M2	WBX M4	WBX SLQ WBX SLQ/G
Order code	7TCA085410R0022	7TCA085410R0023 7TCA085410R0024	7TCA085410R0027 7TCA085410R0028	7TCA085410R0032	7TCA085410R0030 7TCA085410R0031	7TCA085410R0033	7TCA085410R0020	7TCA085410R0034	7TCA085410R0035	7TCA085410R0037 7TCA085410R0036
Weight: – Unit	0.45 kg	0.5 kg	0.9 kg	0.4 kg	1.3 kg	0.55 kg	6.4 kg	1.9 kg	2.2 kg	0.7 kg
– Packaged	0.5 kg	0.55 kg	0.95 kg	0.45 kg	1.35kg	0.6 kg	7.6 kg	2.3 kg	3.0 kg	1.0 kg
Dimensions:										
Length: – Internal	150 mm	222 mm	246 mm	–	225 mm	–	460 mm	254 mm	254 mm	230 mm
– External	160 mm	230 mm	255 mm	174 mm	235 mm	220 mm	474 mm	280 mm	280 mm	250 mm
Width: – Internal	110 mm	72 mm	171 mm	–	225 mm	–	380 mm	254 mm	254 mm	105 mm
– External	120 mm	80 mm	180 mm	104 mm	235 mm	205 mm	396 mm	280 mm	280 mm	125 mm
Depth: – Internal	71 mm	79 mm	119 mm	–	100 mm	–	120 mm	115 mm	165 mm	110 mm
– External	90 mm	85 mm	125 mm	112 mm	117 mm	140 mm	128 mm	130 mm	180 mm	125 mm
Fixing centres (mm)	148 x 90	210 x 60	240 x 165	110 centrally	215 x 215	90 x 94	380 x 310	254 x 254	254 x 254	235 x 110
IP rating	IP66	IP67	IP66	IP65	IP66	IP65	IP56	IP67	IP67	IP67
Temperature range	-40 to +80 °C	-40 to +80 °C	-15 to +75 °C	-25 to +60 °C	-15 to +75 °C	-25 to +60 °C	-25 to +60 °C	-40 to +80 °C	-40 to +80 °C	-40 to +80 °C
Flammability	UL 746C 5V	UL 746C 5V	UL 94 V2	UL 94 V0	UL 94 V2	UL 94 V0	UL 94 V0	UL 746C 5V	UL 746C 5V	UL 746C 5V

IEC-UL Data SPDs

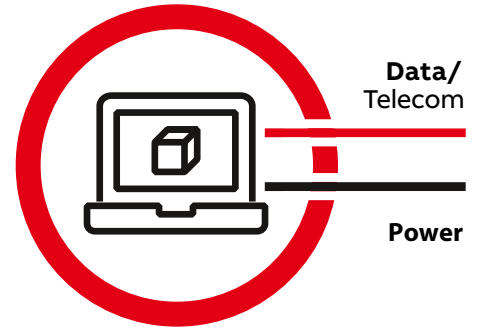
- 262–263** New ABB OVR UL data SPD range overview
- 264–287** Data and signal protection devices
- 288–299** Telecoms and computer line protection devices
- 300–307** Specific systems protection devices
- 308–309** Protector accessories

New ABB OVR UL data SPD range overview

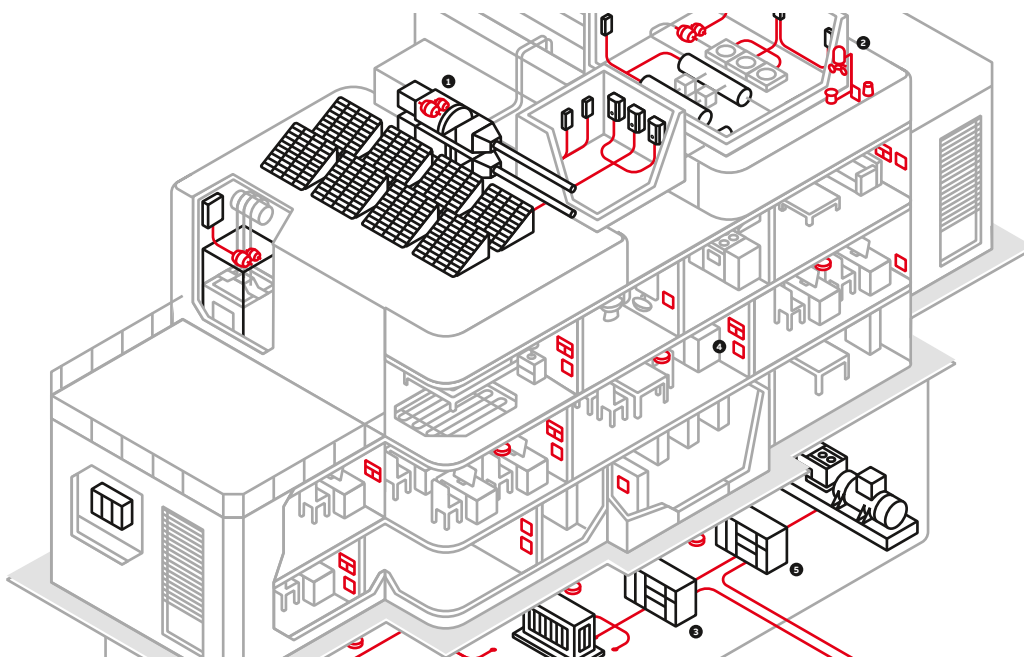
Protecting critical electronic systems

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.



- | | | | |
|--|---|--|---|
| <p>1. Data & measurement systems</p> <ul style="list-style-type: none"> • 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) | <p>2. Transceiver/CCTV systems</p> <ul style="list-style-type: none"> • RF (OVR RF series) • CCTV (OVR CCTV series with OVR 240-16A) • TV (OVR TV series) | <p>3. Data & measurement systems</p> <ul style="list-style-type: none"> • 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) | <p>4. Telecom systems</p> <ul style="list-style-type: none"> • PBX (OVR KT series) • RJ11 (OVR TN series) • RJ45 (OVR ISDN series) • 2 wire (OVR TN, OVR SLTN) • 8 wire (OVR TNQ) <p>5. Main power supply</p> <ul style="list-style-type: none"> • See OVR power SPD series |
|--|---|--|---|

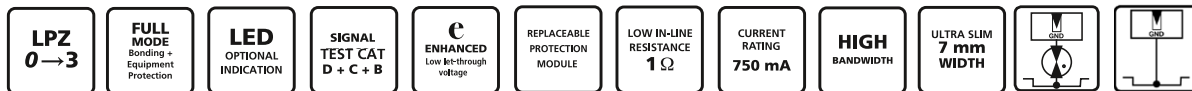
Product selector - Data line protection



Fieldbus/ PROFIBUS Systems							
HART Systems RS485	OVR RS485 Flat/DIN Mount 7TCA085400R0310	OVR SL RS485 Slim DIN Mount 7TCA085400R0310	OVR RS485Q Multiple Lines (DIN Mount) 7TCA085400R0312				
Ethernet		Cat-5 (100 Mbps) OVR Cat-5e 7TCA085400R0289	OVR Cat-5e/PoE 7TCA085400R0290	Cat-6 (1000 Mbps) OVR Cat-6 7TCA085400R0291	OVR Cat-6/PoE 7TCA085400R0292		
Video Surveillance CCTV		5V CCTV with BNC connector, power, and telemetry line		OVR CCTVB Video signal 7TCA085400R0296		OVR RS485 Telemetry signal 7TCA085400R0310	
				OVR 240-16A Power line 7TCA085460R0361		OVR CME4 Earth Bar 7TCA085400R0414	
						OVR WBX4/GS Enclosure 7TCA085410R0049	
						CCTV Protection is also available for different voltages and twisted pair connections.	
4 - 20 mA current loops		Screw terminals 30 V		OVR SL30L/4-20 Product code: 7TCA085400R0371			
Coaxial antennas: GSM, UMTS, Radar, Radio, TV, GPS		RF power = 650 W Female coaxial connector:		OVR RF 441421 BNC 7TCA085450R0066		OVR RF AA1421 7/16 DIN 7TCA085450R0063	
						OVR RF 111421 N 7TCA085450R0065	
Telephone ISDN DSL G.FAST		2 wire Telecom Screw terminals:		OVR TN Flat Mount 7TCA085400R0345		OVR SL TN Slim Mount 7TCA085400R0323	
		RJ11, RJ45				OVR SL TNL Slim Mount with LED 7TCA085400R0418	
		PBX Telecom					OVR TNQ Multiple Lines 7TCA085400R0344
		RJ11 telephone units			OVR TN/RJ11-6/6 6P6C Connector 7TCA085400R0359		OVR ISDN/RJ45-4/8 8P4C Connector 7TCA085400R0359
		LSA-PLUS connection			OVR KT1 Single module 7TCA085400R0305		OVR K10T1 10 modules 7TCA085400R0307
							OVR KE10 Earth Bar 7TCA085400R0304
TV: Satellite, Cable		OVR CATV/F Cable 7TCA085400R0293		OVR SMATV/F Satellite 7TCA085400R0336		OVR TV/EURO Antenna 7TCA085400R0334	
2 wire systems (30 V)		OVR 30E Flat Mount 7TCA085400R0353		OVR SL30 Slim Mount 7TCA085400R0363		OVR 30Q Multiple Lines 7TCA085400R0341	
						Protection for different voltages are available	
Hazardous Areas ATEX/IEC Approved		OVR SL15X 15 Volt 7TCA085400R0386		OVR SL30X 30 Volt 7TCA085400R0387			
						LED and Isolated base options are available	
Resistance Temperature Detectors (RTD) 3 wire systems		OVR RTD Flat/DIN Mount 7TCA085400R0313		OVR SL RTD Slim (DIN Mount) 7TCA085400R0315		OVR RTDQ Multiple Lines (DIN Mount) 7TCA085400R0314	
3 wire systems (30 V)		ESP SL30/3W Slim Mount 7TCA085400R0331					
						Protection for different voltages are available	
						IMPORTANT: Equipment is ONLY protected against transient overvoltages if all incoming / outgoing mains and data lines have protection fitted.	

Data and signal protection

OVR SL Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable for twisted pair signaling applications which require either a lower in-line resistance, an increased current and/or higher bandwidth. Also suitable for DC power applications less than 0.75 Amps. Available for working voltages of up to 6, 15, 30, 50, 110 and 180 Volts. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Ultra slim 7 mm width ideal for compact protection of large numbers of lines (e.g. process control installations)
- Optional LED status indication versions available for low current DC power applications - add L suffix to type - e.g. OVR SL30L
- Two stage removable protection module with simple quick release mechanism allowing partial removal for easy line commissioning and maintenance as well as full removal for protection replacement
- Strong, flame retardant, polymer housing
- High (750 mA) maximum running current
- High bandwidth enables higher frequency (high traffic or bit rate) data communications
- Screen terminal enables easy connection of cable screen to earth
- Suitable for earthed or isolated screen systems - add /I suffix to type for versions that require isolated screens - e.g. OVR SL30/I
- Built-in innovative DIN-Rail foot with locking feature for simple positioning and clip-on mounting to top hat DIN-Rails
- 4 mm² terminals allow for larger cross section wiring, stranded wires terminated with ferrules or fitting two wires into a single terminal
- Convenient earthing through DIN foot and/or earth terminal
- Very low (1 Ω) in-line resistance allows resistance critical applications (e.g. alarm loops) to be protected

Application

Use these protectors where installation space is at a premium and large numbers of lines require protection (e.g. process control, high speed digital communication equipment or systems with long signal lines).

Accessories

Replacement modules:

OVR SLXX/M

Standard module replacement where XX is voltage rating (06, 15, 30, 50 or 110)

OVR SLXXL/M

LED module replacement where XX is voltage rating, as above

OVR SL/B

Base replacement (common for standard and LED modules)

OVR SL/I/B

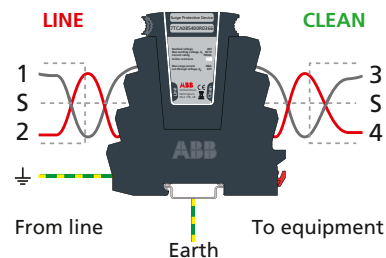
Base replacement with isolated screen from earth

Weatherproof enclosure:

OVR WBX SLQ

Installation

Connect in series with the data communication or signal line either near where it enters or leaves the building or close to the equipment being protected (e.g. within its control panel). Either way, it must be very close to the system's earth star point. Install protectors either within an existing cabinet/cubicle or in a separate enclosure.

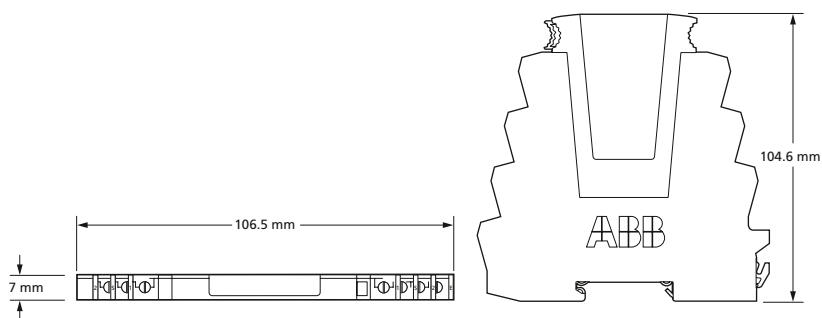


NOTE: The OVR SL 'Slim Line' Series is also available for protection of 3-wire, RS 485 and RTD applications (OVR SL/3W, OVR SL RS485 & OVR SL RTD). The OVR SL X Series has approvals for use in hazardous areas. For telecommunication applications use OVR SLTN Series.

OVR SL Series - Technical specification

Electrical specification	OVR SL06	OVR SL15	OVR SL30	OVR SL50	OVR SL110	OVR SL 180
Order code	7TCA085400R0360	7TCA085400R0361	7TCA085400R0363	7TCA085400R0364	7TCA085400R0362	7TCA085400R0424
Nominal voltage ⁽¹⁾	6 V	15 V	30 V	50 V	110 V	180 V
Maximum working voltage U_c (RMS/DC) ⁽²⁾	5 V / 7.79 V	11 V / 16.7 V	25 V / 36.7 V	40 V / 56.7 V	93 V / 132 V	130 V/190 V
Current rating (signal)	750 mA					250 mA
In-line resistance (per line $\pm 10\%$)	1.0 Ω				3.3 Ω	6.8 Ω
Bandwidth (-3 dB 50 Ω system)	45 MHz					
Transient specification	OVR SL06	OVR SL15	OVR SL30	OVR SL50	OVR SL110	OVR SL 180
Let-through voltage (all conductors)⁽³⁾ U_p						
C2 test 4 kV 1.2/50 μs , 2 kA 8/20 μs to BS EN/EN/IEC 61643-21	36.0 V	38.4 V	63.0 V	90.3 V	185 V	215 V
C1 test 1 kV, 1.2/50 μs , 0.5 kA 8/20 μs to BS EN/EN/IEC 61643-21	26.2 V	29.4 V	51.3 V	77.2 V	175 V	205 V
B2 test 4 kV 10/700 μs to BS EN/EN/IEC 61643-21	16.0 V	26.8 V	45.4 V	68.3 V	165 V	203 V
5 kV, 10/700 μs ⁽⁴⁾	17.0 V	27.5 V	46.3 V	69.1 V	170 V	200 V
Maximum surge current						
D1 test 10/350 μs to BS EN/EN/IEC 61643-21:	- Per signal wire 1.25 kA - Per pair 2.5 kA					
8/20 μs to ITU-T K.45:2003, IEEE C62.41.2:2002:	- Per signal wire 5 kA - Per pair 10 kA					
Mechanical specification	OVR SL06	OVR SL15	OVR SL30	OVR SL50	OVR SL110	OVR SL 180
Temperature range	-40 to +80 °C					
Connection type	Screw terminal - maximum torque 0.8 Nm					
Conductor size (stranded)	4 mm ²					
Earth connection	Via DIN-Rail or 4 mm ² earth terminal - maximum torque 0.8 Nm					
Case material	FR Polymer UL-94 V-0					
Weight	0.08 kg					
Dimensions	See diagram below					

- ⁽¹⁾ Nominal voltage (RMS/DC or AC peak) measured at < 10 μA (OVR SL15, OVR SL30, OVR SL50, OVR SL110, OVR SL180 and LED variants) and < 200 μA (OVR SL06 and OVR SL06L)
- ⁽²⁾ Maximum working voltage (RMS/DC or AC peak) measured at < 1 mA leakage
- ⁽³⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), line to line & line to earth, both polarities. Response time < 10 ns
- ⁽⁴⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)



Order codes

Type code	Order code	Type code	Order code	Type code	Order code
OVR SL06	7TCA085400R0360	OVR SL15	7TCA085400R0361	OVR SL30	7TCA085400R0363
OVR SL06/I	7TCA085400R0365	OVR SL15/I	7TCA085400R0382	OVR SL30/I	7TCA085400R0383
OVR SL06L	7TCA085400R0366	OVR SL15L	7TCA085400R0367	OVR SL30L	7TCA085400R0368
OVR SL06L/I	7TCA085400R0390	OVR SL15L/I	7TCA085400R0391	OVR SL30L/I	7TCA085400R0393
OVR SL06/M	7TCA085400R0375	OVR SL15/M	7TCA085400R0376	OVR SL30/M	7TCA085400R0377
OVR SL06L/M	7TCA085400R0399	OVR SL15L/M	7TCA085400R0411	OVR SL30L/M	7TCA085400R0400
OVR SL50	7TCA085400R0364	OVR SL110	7TCA085400R0362	OVR SL/B	7TCA085400R0320
OVR SL50/I	7TCA085400R0384	OVR SL110/I	7TCA085400R0385	OVR SL/I/B	7TCA085400R0321
OVR SL50L	7TCA085400R0369	OVR SL110L	7TCA085400R0370	OVR WBX SLQ	7TCA085400R0326
OVR SL50L/I	7TCA085400R0394	OVR SL110L/I	7TCA085400R0395	OVR WBX SLQ/G	7TCA085400R0327
OVR SL50/M	7TCA085400R0378	OVR SL110/M	7TCA085400R0379		
OVR SL50L/M	7TCA085400R0401	OVR SL110L/M	7TCA085400R0402		
OVR SL180L	7TCA085400R0425	OVR SL180/I	7TCA085400R0426		
OVR SL180	7TCA085400R0424	OVR SL180L/M	7TCA085400R0430		
OVR SL180L/I	7TCA085400R0423	OVR SL180/M	7TCA085400R0429		

Data and signal protection

OVR SLX Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable for twisted pair signaling applications within hazardous environments (ATEX/IECEx approved). Available for working voltages of up to 15 and 30 Volts. For use at boundaries up to LPZ 0 to protect against flashover through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Approved for use in hazardous environments for the protection of Intrinsically Safe circuits (Classification: II 2(1)G, Ex ia (ia Ga) IIC T4 Gb)
- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Ultra slim 7 mm width ideal for compact protection of large numbers of lines (e.g. process control installations)
- Optional LED status indication versions available for low current DC power applications
- Negligible self-capacitance and self-inductance offering minimal interference when protecting Intrinsically Safe circuits
- Very low (1Ω) in-line resistance allows resistance critical applications (e.g. alarm loops) to be protected
- High (750 mA) maximum running current
- High bandwidth enables higher frequency (high traffic or bit rate) data communications
- Screen terminal enables easy connection of cable screen to earth
- Suitable for earthed or isolated screen systems - add /I suffix to type for versions that require isolated screens
- Built-in innovative DIN-Rail foot with locking feature for simple positioning and clip-on mounting to top hat DIN-Rails
- 4 mm² terminals allow for larger cross section wiring, stranded wires terminated with ferrules or fitting two wires into a single terminal
- Approval references for OVR SL X Series: IECEx SIR 10.0030X, Sira 10ATEX2063X
- Evaluated for SIL to IEC 61508

Application

Use these protectors in hazardous environments where installation space is at a premium and large numbers of lines require protection (e.g. process control, 4-20 mA loops, fire and gas detectors and shut-down systems). Suitable for high speed digital communication equipment or systems with long signal lines. See Application Note OVR AN013.

Accessories

Replacement modules:

OVR SL15X/M,
OVR SL30X/M

Standard module replacement for 15 and 30 V protectors respectively

OVR SL15XL/M,
OVR SL30XL/M

LED module replacement for 15 and 30 V protectors respectively

OVR SLX/B Base

replacement (common for standard and LED modules)

OVR SLX/I/B Base

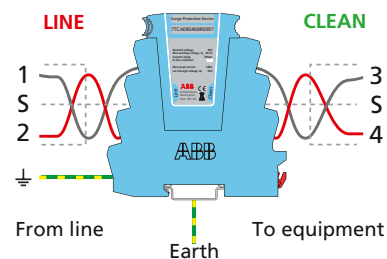
replacement with isolated screen from earth

Weatherproof enclosure:

OVR WBX SLQ

Installation

Connect in series with the data communication or signal line either near where it enters or leaves the building or close to the equipment being protected (e.g. within its control panel). Either way, it must be very close to the system's earth star point. Install protectors either within an existing cabinet/cubicle or in a separate enclosure.



NOTE: Use the standard OVR SL 'Slim Line' Series for non-hazardous areas. The OVR SL Series is also available for protection of 3-wire, RS 485, RTD & telecommunication applications (OVR SL/3W, OVR SL RS485, OVR SL RTD & OVR SL TN).

OVR SL X Series - Technical specification

Electrical specification	OVR SL15X	OVR SL30X
Order code	7TCA085400R0386	7TCA085400R0387
Nominal voltage ⁽¹⁾	15 V	30 V
Maximum working voltage U_c (RMS/DC) ⁽²⁾	11 V / 16.7 V	25 V / 36.7 V
Current rating (signal)	750 mA	
In-line resistance (per line $\pm 10\%$)	1.0 Ω	
Bandwidth (-3 dB 50 Ω system)	45 MHz	
Intrinsically safe specification	OVR SL15X	OVR SL30X
Maximum voltage U_i	30 V	
Maximum power P_i : - Per $-40^\circ\text{C} < T_a < 40^\circ\text{C}$ - Per $-40^\circ\text{C} < T_a < 60^\circ\text{C}$ - Per $-40^\circ\text{C} < T_a < 80^\circ\text{C}$	1.3 W 1.2 W 1.0 W	
Capacitance C_i	0 μF	
Inductance L_i	0 μH	
Certificate number	IECEX SIR 10.0030X, Sira 10ATEX2063X	
Classification	Ex II 2 (1) G, Ex ia (ia Ga) IIC T4 Gb	
Transient specification	OVR SL15X	OVR SL30X
Let-through voltage (all conductors)⁽³⁾ Up		
C2 test 4 kV 1.2/50 μs , 2 kA 8/20 μs to BS EN/EN/IEC 61643-21	38.4 V	63.0 V
C1 test 1 kV, 1.2/50 μs , 0.5 kA 8/20 μs to BS EN/EN/IEC 61643-21	29.4 V	51.3 V
B2 test 4 kV 10/700 μs to BS EN/EN/IEC 61643-21	26.8 V	45.4 V
5 kV, 10/700 μs ⁽⁴⁾	27.5 V	46.3 V
Maximum surge current		
D1 test 10/350 μs to BS EN/EN/IEC 61643-21: - Per signal wire - Per pair	1.25 kA 2.5 kA	
8/20 μs to ITU-T K.45:2003, IEEE C62.41.2:2002: - Per signal wire - Per pair	5 kA 10 kA	
Mechanical specification	OVR SL15X	OVR SL30X
Temperature range	-40 to +80 $^\circ\text{C}$	
Connection type	Screw terminal - maximum torque 0.8 Nm	
Conductor size (stranded)	4 mm ²	
Earth connection	Via DIN-Rail or 4 mm ² earth terminal - maximum torque 0.8 Nm	
Case material	FR Polymer UL-94 V-0	
Weight: - Unit	0.08 kg	
SIL (Safety Integrity Level) to IEC 61508	SIL 3 ⁽⁵⁾	
Dimensions	See diagram below	

⁽¹⁾ Nominal voltage (RMS/DC or AC peak) measured at $< 10 \mu\text{A}$

⁽²⁾ Maximum working voltage (RMS/DC or AC peak) measured at $< 1 \text{ mA}$ leakage

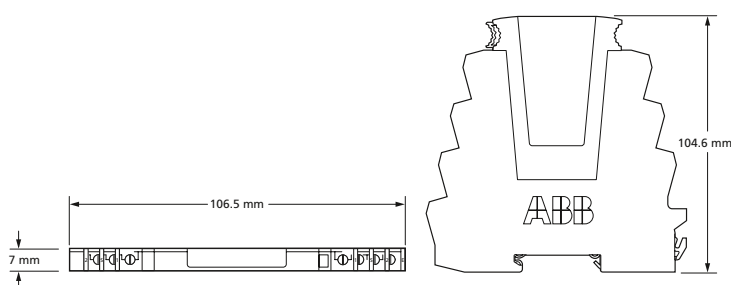
⁽³⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), line to line & line to earth, both polarities. Response time $< 10 \text{ ns}$

⁽⁴⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)

⁽⁵⁾ Assessed as a Type A device, with HFT=1 (assumes line short-circuits and short-circuits to GND are detectable or do not have an effect).

SFF = 73%, to be used to determine the overall Safe Failure Fraction.

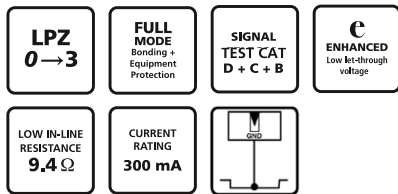
For HFT=0 (worst-case analysis), SIL 2 applies.

**Order codes**

Type code	Order code	Type code	Order code
OVR SL15X	7TCA085400R0386	OVR SL30X	7TCA085400R0387
OVR SL15X/I	7TCA085400R0388	OVR SL30X/I	7TCA085400R0392
OVR SL15XL	7TCA085400R0396	OVR SL30XL	7TCA085400R0397
OVR SL15XL/I	7TCA085400R0389	OVR SL30XL/I	7TCA085400R0398
OVR SL15X/M	7TCA085400R0380	OVR SL30X/M	7TCA085400R0381
OVR SL15XL/M	7TCA085400R0404	OVR SL30XL/M	7TCA085400R0403
OVR SLX/B	7TCA085400R0325	OVR WBX SLQ	7TCA085400R0326
OVR SLX/I/B	7TCA085400R0374	OVR WBX SLQ/G	7TCA085400R0327

Data and signal protection

OVR D Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable for most twisted pair signaling applications. Available for working voltages of up to 6, 15, 30, 50 and 110 Volts. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Low in-line resistance minimizes unnecessary reductions in signal strength
- Strong, flame retardant, ABS housing
- Supplied ready for flat mounting on base or side
- Built-in DIN-Rail foot for simple clip-on mounting to top hat DIN-Rails
- Colour coded terminals give a quick and easy installation check - grey for the dirty (line) end and green for the clean end
- Screen terminal enables easy connection of cable screen to earth
- Substantial earth stud to enable effective earthing
- Integral earthing plate for enhanced connection to earth via a OVR CME kit

Application

Use on twisted pair lines, e.g. those found in process control equipment, modems and computer communications interfaces.

Installation

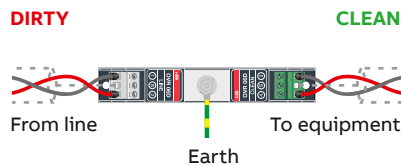
Connect in series with the data communication or signal line either near where it enters or leaves the building or close to the equipment being protected (e.g. within its control panel). Either way, it must be very close to the system's earth star point. Install protectors either within an existing cabinet/cubicle or in a separate enclosure.

Accessories

Combined Mounting/Earthing kits:
OVR CME 4 Mount & earth up to 4 protectors
OVR CME 8 Mount & earth up to 8 protectors
OVR CME 16 Mount & earth up to 16 protectors
OVR CME 32 Mount & earth up to 32 protectors

Weatherproof enclosures:
OVR WBX 4, OVR WBX 4/GS
 For use with a OVR CME 4 and up to 4 protectors
OVR WBX 8, OVR WBX 8/GS
 For use with a OVR CME 8 and up to 8 protectors
OVR WBX 16/2/G
 For use with one or two OVR CME 16 and up to 32 protectors

Install in series (in-line)



Slim Line (OVR SL) and ATEX (OVR SLX) versions are also available. If your system requires a protector with a very low resistance or higher current, see the OVR E & H Series. Also use the OVR E Series for systems needing a higher bandwidth. Protectors for 3-wire (OVR SL/3W) and RTD (OVR RTD, OVR SL RTD) are available, as are the space saving protectors (OVR Q, OVR SL Series). The OVR KT and TN Series are additional protectors specifically for telephone lines.

OVR D Series - Technical specification

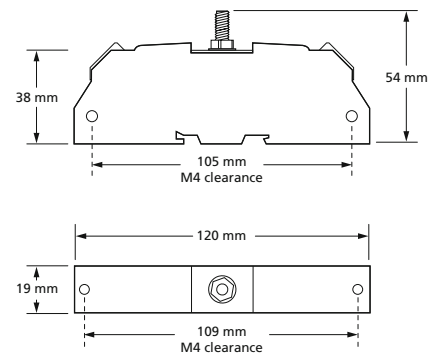
Electrical specification	OVR 06D	OVR 15D	OVR 30D	OVR 50D	OVR 110D
Order code	7TCA085400R0288	7TCA085400R0349	7TCA085400R0351	7TCA085400R0352	7TCA085400R0347
Nominal voltage ⁽¹⁾	6 V	15 V	30 V	50 V	110 V
Maximum working voltage U_c (RMS/DC) ⁽²⁾	5 V / 7.79 V	13 V / 19 V	26 V / 37.1 V	41 V / 58 V	93 V / 132 V
Current rating (signal)	300 mA				
In-line resistance (per line $\pm 10\%$)	9.4 Ω	9.4 Ω	9.4 Ω	9.4 Ω	9.4 Ω
Bandwidth (-3 dB 50 Ω system)	800 kHz	2.5 MHz	4 MHz	6 MHz	9 MHz
Transient specification	OVR 06D	OVR 15D	OVR 30D	OVR 50D	OVR 110D
Let-through voltage (all conductors)⁽³⁾ Up					
C2 test 4 kV 1.2/50 μ s, 2 kA 8/20 μ s to BS EN/EN/IEC 61643-21	12.0 V	25.0 V	44.0 V	78.0 V	155 V
C1 test 1 kV, 1.2/50 μ s, 0.5 kA 8/20 μ s to BS EN/EN/IEC 61643-21	11.5 V	24.5 V	43.5 V	76.0 V	150 V
B2 test 4 kV 10/700 μ s to BS EN/EN/IEC 61643-21	10.0 V	23.0 V	42.5 V	73.0 V	145 V
5 kV, 10/700 μ s ⁽⁴⁾	10.5 V	23.8 V	43.4 V	74.9 V	150 V
Maximum surge current					
D1 test 10/350 μ s to BS EN/EN/IEC 61643-21:	- Per signal wire - Per pair	2.5 kA 5 kA			
8/20 μ s to ITU-T K.45:2003, IEEE C62.41.2:2002:	- Per signal wire - Per pair	10 kA 20 kA			
Mechanical specification	OVR 06D	OVR 15D	OVR 30D	OVR 50D	OVR 110D
Temperature range	-40 to +80 °C				
Connection type	Screw terminal - maximum torque 0.5 Nm				
Conductor size (stranded)	2.5 mm ²				
Earth connection	M6 stud				
Case material	FR Polymer UL-94 V-0				
Weight	0.08 kg				
Dimensions	See diagram below				

⁽¹⁾ Nominal voltage (RMS/DC or AC peak) measured at $< 5 \mu$ A (OVR 15D, OVR 30D, OVR 50D, OVR 110D) and $< 200 \mu$ A (OVR 06D)

⁽²⁾ Maximum working voltage (RMS/DC or AC peak) measured at < 1 mA leakage (OVR 15D, OVR 30D, OVR 50D, OVR 110D), < 10 mA (OVR 06D)

⁽³⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), line to line & line to earth, both polarities. Response time < 10 ns

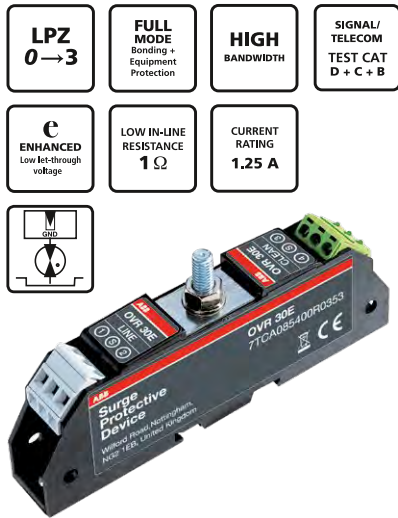
⁽⁴⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)

**Order codes**

Type code	Order code	Type code	Order code	Type code	Order code
OVR CME4	7TCA085400R0414	OVR WBX4	7TCA085410R0048	OVR WBX4/GS	7TCA085410R0049
OVR CME8	7TCA085400R0415	OVR WBX8	7TCA085410R0050	OVR WBX8/GS	7TCA085410R0051
OVR CME16	7TCA085410R0415	OVR CME32	7TCA085410R0046	OVR WBX16/2/G	7TCA085410R0047

Data and signal protection

OVR E Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable for twisted pair signaling applications which require either a lower in-line resistance, an increased current or a higher bandwidth than the OVR D Series. Also suitable for DC power applications less than 1.25 Amps. Available for working voltages of up to 6, 15, 30, 50 and 110 Volts. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Very low (1 Ω) in-line resistance allows resistance critical applications (e.g. alarm loops) to be protected
- High (1.25 A) maximum running current
- High bandwidth enables higher frequency (high traffic or bit rate) data communications
- Screen terminal enables easy connection of cable screen to earth
- Strong, flame retardant, ABS housing
- Built-in DIN-Rail foot for simple clip-on mounting to top hat DIN-Rails
- Colour coded terminals give a quick and easy installation check - grey for the dirty (line) end and green for clean
- Substantial earth stud to enable effective earthing
- Supplied ready for flat mounting on base or side
- Integral earthing plate for enhanced connection to earth via OVR CME kit)

Application

Use these units to protect resistance sensitive, higher frequency or running current systems, e.g. high speed digital communications equipment or systems with long signal lines.

Installation

Connect in series with the data communication or signal line either near where it enters or leaves the building or close to the equipment being protected (e.g. within its control panel). Either way, it must be very close to the system's earth star point. Install protectors either within an existing cabinet/cubicle or in a separate enclosure.

Accessories

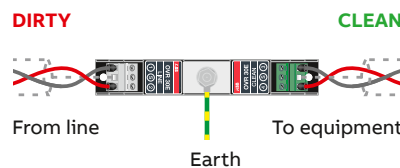
Combined Mounting/Earthing kits:

- OVR CME 4** Mount & earth up to 4 protectors
- OVR CME 8** Mount & earth up to 8 protectors
- OVR CME 16** Mount & earth up to 16 protectors
- OVR CME 32** Mount & earth up to 32 protectors

Weatherproof enclosures:

- OVR WBX 4, OVR WBX 4/GS** For use with a OVR CME 4 and up to 4 protectors
- OVR WBX 8, OVR WBX 8/GS** For use with a OVR CME 8 and up to 8 protectors
- OVR WBX 16/2/G** For use with one or two OVR CME 16 and up to 32 protectors

Install in series (in-line)



NOTE: Slim Line (OVR SL) and ATEX (OVR SLX) are available. For many twisted pair data and signal applications, the lower cost OVR D Series may be suitable. For applications requiring higher current (1.25 A to 4 A) or ultra-low in-line resistance, the OVR H Series protectors may be more suitable.

OVR E Series - Technical specification

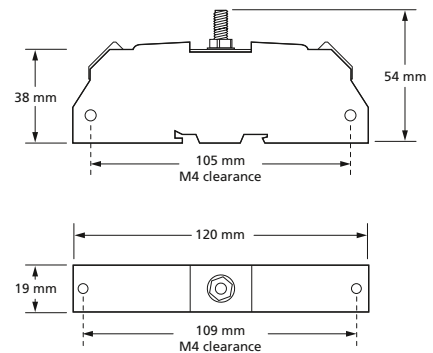
Electrical specification	OVR 06E	OVR 15E	OVR 30E	OVR 50E	OVR 110E
Order code	7TCA085400R0346	7TCA085400R0350	7TCA085400R0353	7TCA085400R0354	7TCA085400R0348
Nominal voltage ⁽¹⁾	6 V	15 V	30 V	50 V	110 V
Maximum working voltage U_c (RMS/DC) ⁽²⁾	5 V / 7.79 V	11 V / 16.7 V	25 V / 36.7 V	40 V / 56.7 V	93 V / 132 V
Current rating (signal)	1.25 A				
In-line resistance (per line $\pm 10\%$)	1.0 Ω				
Bandwidth (-3 dB 50 Ω system)	45 MHz				
Transient specification	OVR 06E	OVR 15E	OVR 30E	OVR 50E	OVR 110E
Let-through voltage (all conductors)⁽³⁾ Up					
C2 test 4 kV 1.2/50 μ s, 2 kA 8/20 μ s to BS EN/EN/IEC 61643-21	36.0 V	39.0 V	60.0 V	86.0 V	180 V
C1 test 1 kV, 1.2/50 μ s, 0.5 kA 8/20 μ s to BS EN/EN/IEC 61643-21	26.2 V	28.0 V	49.0 V	73.5 V	170 V
B2 test 4 kV 10/700 μ s to BS EN/EN/IEC 61643-21	16.0 V	25.5 V	43.5 V	65.0 V	160 V
5 kV, 10/700 μ s ⁽⁴⁾	17.0 V	26.2 V	44.3 V	65.8 V	165 V
Maximum surge current					
D1 test 10/350 μ s to BS EN/EN/IEC 61643-21:	- Per signal wire - Per pair	2.5 kA 5 kA			
8/20 μ s to ITU-T K.45:2003, IEEE C62.41.2:2002:	- Per signal wire - Per pair	10 kA 20 kA			
Mechanical specification	OVR 06E	OVR 15E	OVR 30E	OVR 50E	OVR 110E
Temperature range	-40 to +80 °C				
Connection type	Screw terminal - maximum torque 0.5 Nm				
Conductor size (stranded)	2.5 mm ²				
Earth connection	M6 stud				
Case material	FR Polymer UL-94 V-0				
Weight	0.08 kg				
Dimensions	See diagram below				

⁽¹⁾ Nominal voltage (RMS/DC or AC peak) measured at < 10 μ A (OVR 15E, OVR 30E, OVR 50E, OVR 110E) and < 200 μ A (OVR 06E)

⁽²⁾ Maximum working voltage (RMS/DC or AC peak) measured at < 5 mA leakage (OVR 15E, OVR 30E, OVR 50E, OVR 110E) and < 10 mA (OVR 06E)

⁽³⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), line to line & line to earth, both polarities. Response time < 10 ns

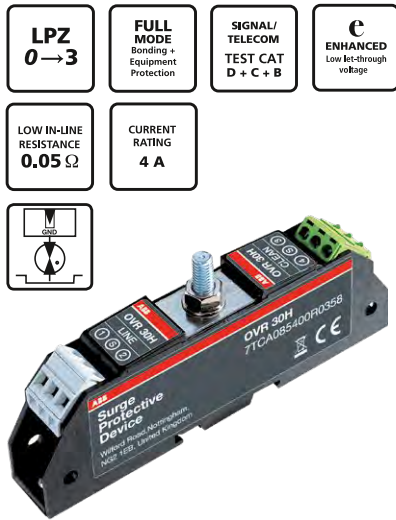
⁽⁴⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)

**Order codes**

Type code	Order code	Type code	Order code	Type code	Order code
OVR CME4	7TCA085400R0414	OVR WBX4	7TCA085410R0048	OVR WBX4/GS	7TCA085410R0049
OVR CME8	7TCA085400R0415	OVR WBX8	7TCA085410R0050	OVR WBX8/GS	7TCA085410R0051
OVR CME16	7TCA085410R0415	OVR CME32	7TCA085410R0046	OVR WBX16/2/G	7TCA085410R0047

Data and signal protection

OVR H Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable for twisted pair signaling applications which require either a lower in-line resistance or an increased current than the OVR D or E Series. Also suitable for DC power applications less than 4 Amps. Available for working voltages of up to 6, 15, 30, 50 and 110 Volts. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Ultra-low (< 0.05 Ω) in-line resistance allows resistance critical applications (e.g. alarm loops) to be protected
- Very high (4 A) maximum running current
- Strong, flame retardant ABS housing
- Supplied ready for flat mounting on base or side
- Built-in DIN-Rail foot for simple clip-on mounting to top hat DIN-Rails
- Colour coded terminals give a quick and easy installation check - grey for the dirty (line) end and green for clean
- Screen terminal enables easy connection of cable screen to earth
- Substantial earth stud to enable effective earthing
- Integral earth plate enables enhanced connection to earth via OVR CME kit

Application

Use these applications to protect resistance sensitive or higher running current systems, e.g. systems with long signal lines, or DC power applications.

Installation

Connect in series with the data communication or signal line either near where it enters or leaves the building or close to the equipment being protected (e.g. within its control panel). Either way, it must be very close to the system's earth star point. Install protectors either within an existing cabinet/cubicle or in a separate enclosure.

Accessories

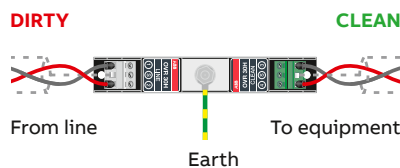
Combined Mounting/Earthing kits:

- OVR CME 4** Mount & earth up to 4 protectors
- OVR CME 8** Mount & earth up to 8 protectors
- OVR CME 16** Mount & earth up to 16 protectors
- OVR CME 32** Mount & earth up to 32 protectors

Weatherproof enclosures:

- OVR WBX 4, OVR WBX 4/GS**
For use with a OVR CME 4 and up to 4 protectors
- OVR WBX 8, OVR WBX 8/GS**
For use with a OVR CME 8 and up to 8 protectors
- OVR WBX 16/2/G**
For use with one or two OVR CME 16 and up to 32 protectors

Install in series (in-line)



NOTE: For some data and signal applications with lower current, higher in-line resistance or higher bandwidth requirements, the OVR D or E Series protectors

OVR H Series - Technical specification

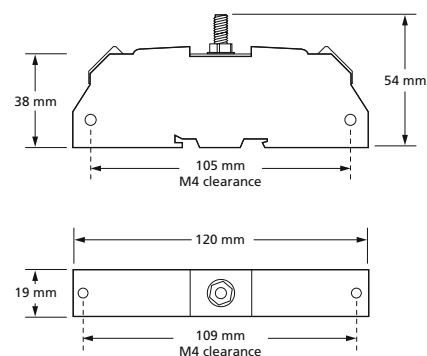
Electrical specification	OVR 06H	OVR 15H	OVR 30H	OVR 50H	OVR 110H
Order code	7TCA085400R0355	7TCA085400R0357	7TCA085400R0358	7TCA085400R0359	7TCA085400R0356
Nominal voltage ⁽¹⁾	6 V	15 V	30 V	50 V	110 V
Maximum working voltage U_c (RMS/DC) ⁽²⁾	5 V / 7.79 V	11 V / 16.7 V	25 V / 36.7 V	40 V / 56.7 V	93 V / 132 V
Current rating (signal)	4 A				
In-line resistance (per line $\pm 10\%$)	0.05 Ω				
Bandwidth (-3 dB 50 Ω system)	160 KHz	140 KHz	130 KHz	120 KHz	120 KHz
Transient specification	OVR 06H	OVR 15H	OVR 30H	OVR 50H	OVR 110H
Let-through voltage (all conductors)⁽³⁾ Up					
C2 test 4 kV 1.2/50 μ s, 2 kA 8/20 μ s to BS EN/EN/IEC 61643-21	12.0 V	27.5 V	46.0 V	67.0 V	150 V
C1 test 1 kV, 1.2/50 μ s, 0.5 kA 8/20 μ s to BS EN/EN/IEC 61643-21	11.0 V	26.5 V	45.0 V	66.5 V	145 V
B2 test 4 kV 10/700 μ s to BS EN/EN/IEC 61643-21	10.5 V	25.5 V	43.5 V	65.0 V	140 V
5 kV, 10/700 μ s ⁽⁴⁾	10.8 V	26.2 V	44.3 V	65.8 V	145 V
Maximum surge current					
D1 test 10/350 μ s to BS EN/EN/IEC 61643-21:	- Per signal wire - Per pair	2.5 kA 5 kA			
8/20 μ s to ITU-T K.45:2003, IEEE C62.41.2:2002:	- Per signal wire - Per pair	10 kA 20 kA			
Mechanical specification	OVR 06E	OVR 15E	OVR 30E	OVR 50E	OVR 110E
Temperature range	-40 to +80 °C				
Connection type	Screw terminal - maximum torque 0.5 Nm				
Conductor size (stranded)	2.5 mm ²				
Earth connection	M6 stud - maximum torque 0.5 Nm				
Case material	FR Polymer UL-94 V-0				
Weight	0.08 kg				
Dimensions	See diagram below				

⁽¹⁾ Nominal voltage (RMS/DC or AC peak) measured at < 10 μ A (OVR 15H, OVR 30H, OVR 50H, OVR 110H) and < 200 μ A (OVR 06H)

⁽²⁾ Maximum working voltage (RMS/DC or AC peak) measured at < 5 mA leakage (OVR 15H, OVR 30H, OVR 50H, OVR 110H) and < 10 mA (OVR 06H)

⁽³⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), line to line & line to earth, both polarities. Response time < 10 ns

⁽⁴⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)

**Order codes**

Type code	Order code	Type code	Order code	Type code	Order code
OVR CME4	7TCA085400R0414	OVR WBX4	7TCA085410R0048	OVR WBX4/GS	7TCA085410R0049
OVR CME8	7TCA085400R0415	OVR WBX8	7TCA085410R0050	OVR WBX8/GS	7TCA085410R0051
OVR CME16	7TCA085410R0415	OVR CME32	7TCA085410R0046	OVR WBX16/2/G	7TCA085410R0047

Data and signal protection

OVR SL 3-Wire Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable for 3-wire signaling applications which require either a lower in-line resistance, an increased current and/or higher bandwidth. Also suitable for DC power applications less than 0.5 Amps. Available for working voltages of up to 6, 15, 30, 50 and 110 Volts. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Ultra slim 7 mm width ideal for compact protection of large numbers of lines (e.g. process control installations)
- Two stage removable protection module with simple quick release mechanism allowing partial removal for easy line commissioning and maintenance as well as full removal for protection replacement
- Very low (1 Ω) in-line resistance allows resistance critical applications (e.g. alarm loops) to be protected
- High (500 mA) maximum running current
- High bandwidth enables higher frequency (high traffic or bit rate) data communications
- Strong, flame retardant polymer housing
- Built-in innovative DIN-Rail foot with locking feature for simple positioning and clip-on mounting to top hat DIN-Rails
- 4 mm² terminals allow for larger cross section wiring, stranded wires terminated with ferrules or fitting two wires into a single terminal
- Convenient earthing through DIN foot and/or earth terminal

Application

Use these protectors for 3-wire systems where installation space is at a premium and large numbers of lines require protection (e.g. process control, high speed digital communication equipment or systems with long signal lines).

Accessories

Replacement modules:

OVR SLXX/3W/M

Standard module replacement where XX is voltage rating (06, 15, 30, 50 or 110)

OVR SL/3W/B

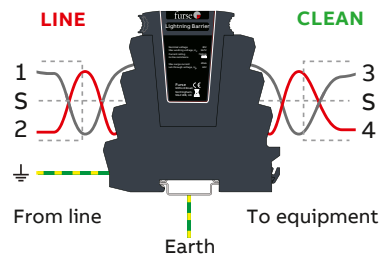
Base replacement

Weatherproof enclosure:

OVR WBX SLQ

Installation

Connect in series with the data communication or signal line either near where it enters or leaves the building or close to the equipment being protected (e.g. within its control panel). Either way, it must be very close to the system's earth star point. Install protectors either within an existing cabinet/cubicle or in a separate enclosure.



NOTE: The OVR SL 'Slim Line' Series is also available for protection of 2-wire systems up to 110 V, RS 485, RTD and telecommunication applications (OVR SL Series, OVR SL RS485, OVR SL RTD and OVR SL TN). The OVR SL X Series has approvals for use in hazardous areas.

OVR SL 3-Wire Series - Technical specification

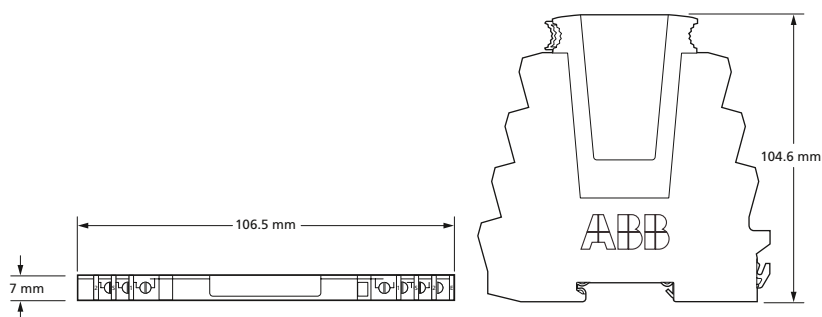
Electrical specification	OVR SL06/3W	OVR SL15/3W	OVR SL30/3W	OVR SL50/3W	OVR SL110/3W
Order code	7TCA085400R0328	7TCA085400R0330	7TCA085400R0331	7TCA085400R0332	7TCA085400R0329
Nominal voltage ⁽¹⁾	6 V	15 V	30 V	50 V	110 V
Maximum working voltage U_c (RMS/DC) ⁽²⁾	5 V / 7.79 V	11 V / 16.7 V	25 V / 36.7 V	40 V / 56.7 V	93 V / 132 V
Current rating (signal)	500 mA				
In-line resistance (per line $\pm 10\%$)	1.0 Ω				3.3 Ω
Bandwidth (-3 dB 50 Ω system)	45 MHz				
Transient specification	OVR SL06/3W	OVR SL15/3W	OVR SL30/3W	OVR SL50/3W	OVR SL110/3W
Let-through voltage (all conductors)⁽³⁾ Up					
C2 test 4 kV 1.2/50 μ s, 2 kA 8/20 μ s to BS EN/EN/IEC 61643-21	36.0 V	38.4 V	63.0 V	90.3 V	185 V
C1 test 1 kV, 1.2/50 μ s, 0.5 kA 8/20 μ s to BS EN/EN/IEC 61643-21	26.2 V	29.4 V	51.3 V	77.2 V	175 V
B2 test 4 kV 10/700 μ s to BS EN/EN/IEC 61643-21	16.0 V	26.8 V	45.4 V	68.3 V	165 V
5 kV, 10/700 μ s ⁽⁴⁾	17.0 V	27.5 V	46.3 V	69.1 V	170 V
Maximum surge current					
D1 test 10/350 μ s to BS EN/EN/IEC 61643-21:	- Per signal wire	1.25 kA			
	- Per pair	2.5 kA			
8/20 μ s to ITU-T K.45:2003, IEEE C62.41.2:2002:	- Per signal wire	5 kA			
	- Per pair	10 kA			
Mechanical specification	OVR SL06/3W	OVR SL15/3W	OVR SL30/3W	OVR SL50/3W	OVR SL110/3W
Temperature range	-40 to +80 °C				
Connection type	Screw terminal - maximum torque 0.8 Nm				
Conductor size (stranded)	4 mm ²				
Earth connection	Via DIN-Rail or 4 mm ² earth terminal - maximum torque 0.8 Nm				
Case material	FR Polymer UL-94 V-0				
Weight: - Unit	0.08 kg				
Dimensions	See diagram below				

⁽¹⁾ Nominal voltage (RMS/DC or AC peak) measured at <10 μ A (OVR SL15/3W, OVR SL30/3W, OVR SL50/3W, OVR SL110/3W) and < 200 μ A (OVR SL06/3W)

⁽²⁾ Maximum working voltage (RMS/DC or AC peak) measured at < 1 mA leakage

⁽³⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), line to line & line to earth, both polarities. Response time < 10 ns

⁽⁴⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)

**Order codes**

Type code	Order code	Type code	Order code
OVR SL06/3W	7TCA085400R0328	OVR SL50/3W	7TCA085400R0332
OVR SL06/3W/M	7TCA085400R0405	OVR SL50/3W/M	7TCA085400R0409
OVR SL15/3W	7TCA085400R0330	OVR WBX SLQ/G	7TCA085400R0327
OVR SL15/3W/M	7TCA085400R0406	OVR SL110/3W	7TCA085400R0329
OVR WBX SLQ	7TCA085400R0326	OVR SL110/3W/M	7TCA085400R0408
OVR SL30/3W	7TCA085400R0331	OVR SL/B	7TCA085400R0320
OVR SL30/3W/M	7TCA085400R0407	OVR SL/I/B	7TCA085400R0321

Data and signal protection

OVR SL LED 4-20 mA Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable for twisted pair 4-20 mA loop systems with innovative LED protector status indication. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment (e.g. transmitters, monitors, controllers).

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Innovative LED indication of protection status provides easy visual checking and quick maintenance
- Ultra slim 7 mm width ideal for compact protection of large numbers of lines (e.g. process control installations)
- Two stage removable protection module with simple quick release mechanism allowing partial removal for easy line commissioning and maintenance as well as full removal for protection replacement
- Strong, flame retardant, polymer housing
- Very low ($1\ \Omega$) in-line resistance for minimal system interference
- High (75 mA) maximum running current - can also be used on 10-50 mA systems (e.g. process control)
- Screen terminal enables easy connection of cable screen to earth
- Built-in innovative DIN-Rail foot with locking feature for simple positioning and clip-on mounting to top hat DIN-Rails
- $4\ \text{mm}^2$ terminals allow for larger cross section wiring, stranded wires terminated with ferrules or fitting two wires into a single terminal
- Convenient earthing through DIN foot and/or earth terminal
- Suitable for earthed or isolated screen versions - add /I suffix to type for version that requires isolated screen - e.g. OVR SL30L/4-20/I

Application

Use these protectors on 4-20 mA loop systems - ideal where installation space is at a premium and large numbers of lines require protection, or for systems with long signal lines.

Accessories

OVR SL30L/4-20/M

Module replacement

OVR SL/B

Base replacement

OVR SL/I/B

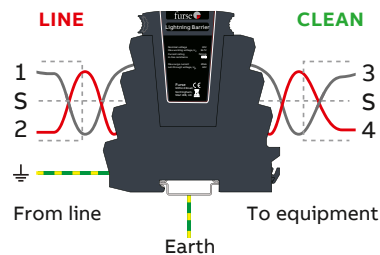
Isolated base replacement

Weatherproof enclosure:

OVR WBX SLQ

Installation

Connect in series with the 4-20 mA current loop either near where it enters or leaves the building or close to the equipment being protected (e.g. within its control panel). Either way, it must be very close to the system's earth star point. Install protectors either within an existing cabinet/cubicle or in a separate enclosure.



TECHNICAL NOTE: 4-20 mA current loops can serve multiple devices over a long distance. The devices and wiring produce a voltage drop (also known as "loop drops") but these do not reduce the 4-20 mA current as long as the power supply voltage is greater than the sum of

the voltage drops around the loop at the maximum signaling current of 20 mA.

For design considerations, each OVR SL30L/4-20 device installed within the loop introduces a 1.7 V loop drop.



NOTE: The OVR SL 'Slim Line' Series is also available for protection of systems up to 110 V as well as 3-wire, RS 485, RTD & telecommunication applications (OVR SL/3W, OVR SL RS485, OVR SL RTD & OVR SL TN). The OVR SL X Series has approvals for use in hazardous areas.

OVR SL LED 4-20 mA Series - Technical specification

Electrical specification		OVR SL30L/4-20
Order code	7TCA085400R0371	
Nominal voltage ⁽¹⁾	30 V	
Maximum working voltage U_c (RMS/DC) ⁽²⁾	25 V / 36.7 V	
Current rating (signal) ⁽³⁾	75 mA	
In-line resistance (per line $\pm 10\%$)	1.0 Ω	
Series voltage drop ⁽⁴⁾	1.7 V	
Bandwidth (-3 dB 50 Ω systems)	45 MHz	
Transient specification		OVR SL30L/4-20
Let-through voltage (all conductors)⁽⁵⁾ Up		
C2 test 4 kV 1.2/50 μ s, 2 kA 8/20 μ s to BS EN/EN/IEC 61643-21	63.0 V	
C1 test 1 kV, 1.2/50 μ s, 0.5 kA 8/20 μ s to BS EN/EN/IEC 61643-21	51.3 V	
B2 test 4 kV 10/700 μ s to BS EN/EN/IEC 61643-21	45.4 V	
5 kV, 10/700 μ s ⁽⁶⁾	46.3 V	
Maximum surge current		
D1 test 10/350 μ s to BS EN/EN/IEC 61643-21:	- Per signal wire	1.25 kA
	- Per pair	2.5 kA
8/20 μ s to ITU-T K.45:2003, IEEE C62.41.2:2002:	- Per signal wire	5 kA
	- Per pair	10 kA
Mechanical specification		OVR SL30L/4-20
Temperature range	-40 to +80 °C	
Connection type	Screw terminal - maximum torque 0.8 Nm	
Conductor size (stranded)	4 mm ²	
Earth connection	Via DIN-Rail or 4 mm ² earth terminal - maximum torque 0.8 Nm	
Case material	FR Polymer UL-94 V-0	
Weight: – Unit	0.08 kg	
Dimensions	See diagram below	

⁽¹⁾ Nominal voltage (RMS/DC or AC peak) measured at < 10 μ A

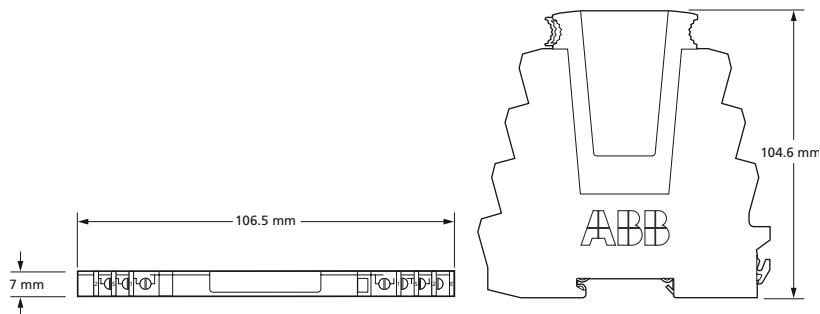
⁽²⁾ Maximum working voltage (RMS/DC or AC peak) measured at < 1 mA leakage

⁽³⁾ The minimum current for LED indicator operation is 2 mA

⁽⁴⁾ At 20 mA

⁽⁵⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), line to line & line to earth, both polarities. Response time < 10 ns

⁽⁶⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)

**Order codes**

Type code	Order code	Type code	Order code
OVR SL30L/4-20	7TCA085400R0371	OVR SL/B	7TCA085400R0320
OVR SL30L/4-20/I	7TCA085400R0372	OVR SL/I/B	7TCA085400R0321
OVR SL30L/4-20/M	7TCA085400R0373	OVR WBX SLQ	7TCA085400R0326

Data and signal protection

OVR Q Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable for 4 twisted pair lines. Available for working voltages of up to 6, 15, 30, 50, 110 and 180 Volts. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Almost twice as space efficient as smallest competitor
- Standard DIN module (18 mm) depth
- Removable (plug-in) terminals allow pre-wiring of cable looms, for easier installation
- Suitable for earthed or isolated screen systems
- Built-in DIN-Rail foot for clip-on mounting to top hat or G DIN-Rails
- Optional flat mounting on side
- 2.5 mm² terminals allow for larger cross section wiring, stranded wires terminated with ferrules or fitting two wires into a single terminal
- Very low resistance to minimizes unwanted signal strength reductions
- Strong, flame retardant, ABS housing
- Colour coded terminals (grey for line, green for clean) give a quick and easy installation check
- Screen terminal enables easy connection of cable screen, maintaining continuity through the SPD between the input and output connectors.
- Simple, yet substantial, connection to earth via DIN-Rail

Application

Use these protectors where installation space is at a premium and large numbers of lines require protection.

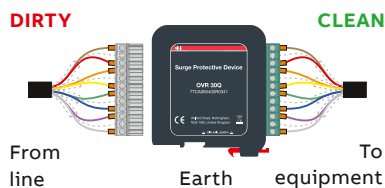
Accessories

Weatherproof enclosure: **OVR WBX SLQ**

Installation

Connect in series with the signal or data line either near where it enters or leaves the building or close to the equipment being protected. Install in a cabinet/cubicle close to the system's earth star point.

OVR 06Q, OVR 15Q, OVR 30Q, OVR 50Q, OVR 110Q and OVR 180Q installed in series (in-line)



NOTE: The OVR Q Series is also available for protection of RS 485 and RTD applications (OVR RS485Q, OVR RTDQ). Protectors for individual data and signal lines are available (OVR D Series and Slim Line OVR SL Series). Alternatively, for individual protectors with higher current or bandwidth use the OVR E and OVR H Series. For telecommunication applications use OVR TNQ Series.

OVR Q Series - Technical specification

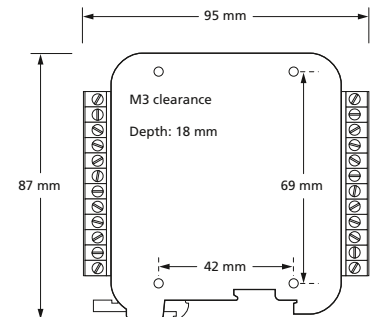
Electrical specification	OVR 06Q	OVR 15Q	OVR 30Q	OVR 50Q	OVR 110Q	OVR 180Q
Order code	7TCA085400R0333	7TCA085400R0340	7TCA085400R0341	7TCA085400R0342	7TCA085400R0343	7TCA085400R0463
Nominal voltage ⁽¹⁾	6 V	15 V	30 V	50 V	110 V	180 V
Maximum working voltage U_c (RMS/DC) ⁽²⁾	5 V / 7.79 V	13 V / 18.8 V	26 V / 37.8 V	41 V / 57.8 V	93 V / 132 V	130 V/190 V
Current rating (signal)	750 mA		500 mA		250 mA	
In-line resistance (per line $\pm 10\%$)	1.0 Ω		3.3 Ω		6.8 Ω	
Bandwidth (-3 dB 50 Ω system)	45 MHz					
Transient specification	OVR 06Q	OVR 15Q	OVR 30Q	OVR 50Q	OVR 110Q	OVR 180Q
Let-through voltage (all conductors)⁽³⁾ Up						
C2 test 4 kV 1.2/50 μ s, 2 kA 8/20 μ s to BS EN/EN/IEC 61643-21	15.0 V	28.0 V	53.0 V	84.0 V	188 V	215 V
C1 test 1 kV, 1.2/50 μ s, 0.5 kA 8/20 μ s to BS EN/EN/IEC 61643-21	12.5 V	26.5 V	48.0 V	76.0 V	175 V	205 V
B2 test 4 kV 10/700 μ s to BS EN/EN/IEC 61643-21	10.0 V	23.0 V	43.5 V	64.5 V	145 V	203 V
5 kV, 10/700 μ s ⁽⁴⁾	10.8 V	26.2 V	44.3 V	65.8 V	150 V	200 V
Maximum surge current						
D1 test 10/350 μ s to BS EN/EN/IEC 61643-21:	- Per signal wire	2.5 kA				
	- Per pair	5 kA				
8/20 μ s to ITU-T K.45:2003, IEEE C62.41.2:2002:	- Per signal wire	10 kA				
	- Per pair	20 kA				
Mechanical specification	OVR 06Q	OVR 15Q	OVR 30Q	OVR 50Q	OVR 110Q	OVR 180Q
Temperature range	-40 to +80 °C					
Connection type	Pluggable 12 way screw terminal - maximum torque 0.6 Nm					
Conductor size (stranded)	2.5 mm ²					
Earth connection	Via DIN-Rail or M5 threaded hole in base of unit					
Case material	FR Polymer UL-94 V-0					
Weight: - Unit	0.1 kg					
- Packaged (each)	0.12 kg					
Dimensions	See diagram below					

⁽¹⁾ Nominal voltage (RMS/DC or AC peak) measured at < 5 μ A (OVR 15Q, OVR 30Q, OVR 50Q, OVR 110Q, OVR 180Q) and < 200 μ A (OVR 06Q)

⁽²⁾ Maximum working voltage (RMS/DC or AC peak) measured at < 5 mA leakage (OVR 15Q, OVR 30Q, OVR 50Q, OVR 110Q, OVR 180Q) and < 10 mA (OVR 06Q)

⁽³⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), line to line & line to earth, both polarities. Response time < 10 ns

⁽⁴⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)



Telecoms and computer line protection

OVR KT & KE Series

- LPZ 0 → 3**
- FULL MODE**
Bonding + Equipment Protection
- SIGNAL/TELECOM**
TEST CAT D + C + B
- ENHANCED**
Low let-through voltage
- HIGH BANDWIDTH**
- LOW IN-LINE RESISTANCE**
4,4 Ω
- 



Combined Category D, C, B tested protector (to BS EN 61643) suitable for use on ten line LSA-PLUS disconnection modules to PBX telephone exchanges, ISDN and other telecoms equipment with LSA-PLUS disconnection modules. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Low cost protection for large numbers of data and signal lines
- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Colour of housing distinguishes electrically different protectors - avoids confusion when installed together on the same distribution frame
- Quick and easy plug-in installation, with 'bump' location feedback
- Under power line cross conditions /PTC versions offer safe disconnection during fault duration. Unit auto-resets once fault corrected
- At larger installations OVR K10T1 and OVR K10T1/PTC provide all in one protection for all ten lines on LSA-PLUS disconnection modules
- Use the OVR KE10 to provide trouble free earthing for up to ten OVR KT1 and OVR KT1/PTC (per disconnection module)
- OVR K10T1 and OVR K10T1/PTC have an integral earth connection, and an external M4 earth bush for use with non-metallic LSA-Plus frames
- OVR KT1/PTC and OVR K10T1/PTC have resettable overcurrent protection and are rated for power cross faults
- OVR KT1, OVR KT1/PTC, OVR K10T1 and OVR K10T1/PTC are suitable for telecoms applications in accordance with Telcordia and ANSI Standards

Application

- For PSTN (e.g POTS, dial-up, lease line, T1/E1, *DSL and Broadband) and U interface ISDN lines, use OVR KT1 (or OVR KT1/PTC) and OVR K10T1 (or OVR K10T1/PTC)
- Protect single lines with OVR KT1 or OVR KT1/PTC
- Protect all ten lines on a disconnection module with OVR K10T1 or OVR K10T1/PTC

Installation

Install protectors on all lines that enter or leave each building (including extensions to other buildings). Identify the lines requiring protection and plug-in the protector (ensuring the correct orientation) for a series connection. Plug OVR K10T1 or OVR K10T1/PTC directly into each disconnection module requiring protection.

OVR KT1 and OVR KT1/PTC must be installed via the OVR KE10 earth bar. Clip an OVR KE10 on to the disconnection module and plug an OVR KT1 or OVR KT1/PTC in to each line on the module that needs protecting. In the unlikely situation that the protector is damaged, it will sacrifice itself and fail short circuit, taking the line out of commission, indicating it needs replacing and preventing subsequent transients from damaging equipment.

For further information on global telephony applications, see separate Application Note OVR AN005 (contact us for a copy).



NOTE: For individual telephone lines and lines at unmanned sites the high performance OVR TN or plug-in OVR TN/JP or OVR TN/RJ11 Series should be used. For plug-in S/T interface ISDN protection, use the ISDN Series protectors.

OVR KT & KE Series - Technical specification

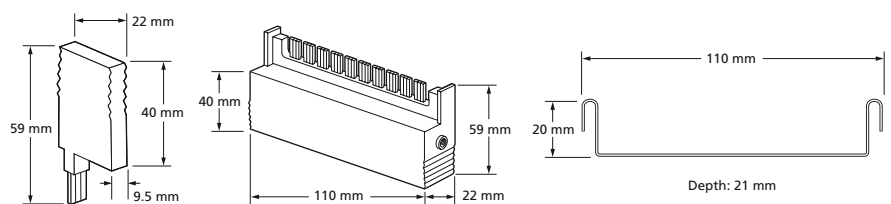
Electrical specification		OVR KT1	OVR KT1/PTC	OVR K10T1	OVR K10T1/PTC
Order code		7TCA085400R0305	7TCA085400R0306	7TCA085400R0307	7TCA085400R0410
Maximum working voltage $U_c^{(1)}$	- line to line - line to earth	296 V 296 V			
Current rating (signal)		300 mA	145 mA	300 mA	145 mA
In-line resistance (per line $\pm 10\%$)		4.4 Ω			
Bandwidth (-3 dB 50 Ω system)		20 MHz			
Transient specification		OVR KT1	OVR KT1/PTC	OVR K10T1	OVR K10T1/PTC
Let-through voltage (all conductors)⁽²⁾ Up					
C2 test 4 kV 1.2/50 μ s,	- line to line	395 V			
2 kA 8/20 μ s to BS EN/EN/IEC 61643-21	- line to earth	395 V			
C1 test 1 kV, 1.2/50 μ s,	- line to line	390 V			
0.5 kA 8/20 μ s to BS EN/EN/IEC 61643-21	- line to earth	390 V			
B2 test 4 kV 10/700 μ s to	- line to line	298 V			
BS EN/EN/IEC 61643-21	- line to earth	298 V			
5 kV, 10/700 μ s ⁽³⁾	- line to line	300 V			
	- line to earth	300 V			
Maximum surge current⁽⁴⁾					
D1 test 10/350 μ s to	- line to line	1 kA			
BS EN/EN/IEC 61643-21:	- line to earth	2 kA			
8/20 μ s to ITU-T K.45:2003,	- line to line	5 kA			
IEEE C62.41.2:2002:	- line to earth	10 kA			
Power Faults specification		OVR KT1	OVR KT1/PTC	OVR K10T1	OVR K10T1/PTC
Power/Line Cross and Power Induction - tests to: ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, UL 60950/IEC 950					
Power/line cross		-	110/230 Vac	-	110/230 Vac
Power induction		-	600 V, 1 A	-	600 V, 1 A
Mechanical specification		OVR KT1, OVR KT1/PTC		OVR K10T1, OVR K10T1/PTC	
Temperature range		-40 to +80°C		-	
Connection type		To LSA-PLUS disconnection modules (BT type 237A)		-	
Earth connection		Via OVR KE10 earth bar		Via integral earth clip/external M4 bush	
Material		FR Polymer UL-94 V-0		Stainless Steel	
Weight: - Unit		0.01 kg		0.01 kg	
Dimensions		See diagram below			

⁽¹⁾ Maximum working voltage (DC or AC peak) at 10 μ A for OVR KT1, OVR KT1/PTC, OVR K10T1, OVR K10T1/PTC

⁽²⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), line to line & line to earth, both polarities. Response time < 10 ns

⁽³⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)

⁽⁴⁾ The installation and connections external to the protector may limit the capability of the protector



Telecoms and computer line protection

OVR TN/RJ11 & ISDN/RJ45 Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable to protect telephony equipment plugged into a Modem (RJ11) or ISDN (RJ45) socket. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Substantial earth connection to enable effective

Application

- For PSTN (e.g. POTS, dial-up, lease line, T1/E1, *DSL and Broadband) use TN/RJ11
- OVR TN/RJ11... are suitable for use on telephone lines with a maximum (or ringing) voltage of up to 296 Volts
- For telephone lines with RJ11 connections protect the middle 2 (of 6) conductors with OVR TN/RJ11-2/6, the middle 4 (of 6) with OVR TN/RJ11-4/6 or all 6 with OVR TN/RJ11-6/6
- For S/T interface ISDN lines, use OVR ISDN/RJ45-4/8 and OVR ISDN/RJ45-8/8

Installation

Connect in series with the telephone or ISDN line. These units are usually installed close to the equipment being protected and within a short distance of a good electrical earth.

Plug-in series connection for OVR TN/RJ11-2/6, 4/6 & 6/6



earthing

- Supplied in a sturdy ABS housing ready for flat mounting, or vertically via TS35 'Top Hat' DIN-Rail
- OVR TN/RJ11-2/6, OVR TN/RJ11-4/6 and OVR TN/RJ11-6/6 are suitable for telecommunication applications in accordance with Telcordia and ANSI Standards (see Application Note OVR AN005)

- For S/T interface ISDN lines with RJ45 connections protect the middle 4 (of 8) conductors (paired 3&6, 4&5) with OVR ISDN/RJ45-4/8, or all 8 (outside pairs 1&2, 7&8) with OVR ISDN/RJ45-8/8

For further information on RJ45 ISDN applications, see separate Application Note OVR AN002 and for global telephony applications, see separate Application Note OVR AN005 (contact us for a copy).

Accessories

OVR CAT5e/UTP-1 (7TCA085400R0321)

1 metre cable with RJ45 connections

Plug-in series connection for OVR ISDN/RJ45-4/8 & 8/8



NOTE: For non-ISDN wire-in applications the high performance OVR TN, OVR SLTN or OVR TNQ can be used. Protect PBX telephone exchanges and other equipment with LSA-PLUS connections using OVR KT series.

OVR TN/RJ11 & ISDN/RJ45 Series - Technical specification

Electrical specification	OVR TN/ RJ11-2/6	OVR TN/ RJ11-4/6	OVR TN/ RJ11-6/6	OVR ISDN/ RJ45-4/8	OVR ISDN/ RJ45-8/8
Order code	7TCA085400R0337	7TCA085400R0338	7TCA085400R0339	7TCA085460R0359	7TCA085460R0360
Nominal voltage	296 V	296 V	296 V	5 V	5 V/58 V ⁽²⁾
Maximum working voltage Uc(1)	296 V	296 V	296 V	58 V	58 V
Current rating (signal)	300 mA				
In-line resistance (per line ±10%)	4.4 Ω				
Bandwidth (-3 dB 50 Ω system)	20 MHz	20 MHz	20 MHz	19 MHz	19 MHz
Transient specification	OVR TN/ RJ11-2/6	OVR TN/ RJ11-4/6	OVR TN/ RJ11-6/6	OVR ISDN/ RJ45-4/8	OVR ISDN/ RJ45-8/8
Let-through voltage (all conductors)⁽³⁾ Up					
C2 test 4 kV 1.2/50 μs, 2 kA 8/20 μs to BS EN/EN/IEC 61643-21	- line to line 395 V	- line to line 395 V	- line to line 395 V	28 V	28 V/88 V ⁽⁵⁾
	- line to earth 395 V	- line to earth 395 V	- line to earth 395 V	88 V	88 V
C1 test 1 kV, 1.2/50 μs, 0.5 kA 8/20 μs to BS EN/EN/IEC 61643-21	- line to line 390 V	- line to line 390 V	- line to line 390 V	23 V	23 V/63 V ⁽⁵⁾
	- line to earth 390 V	- line to earth 390 V	- line to earth 390 V	63 V	63 V
B2 test 4 kV 10/700 μs to BS EN/EN/IEC 61643-21	- line to line 298 V	- line to line 298 V	- line to line 298 V	26 V	26 V/65 V ⁽⁵⁾
	- line to earth 298 V	- line to earth 298 V	- line to earth 298 V	65 V	65 V
5 kV, 10/700 μs4	- line to line 300 V	- line to line 300 V	- line to line 300 V	27 V	27 V/80 V ⁽⁵⁾
	- line to earth 300 V	- line to earth 300 V	- line to earth 300 V	80 V	80 V
Maximum surge current(6)					
D1 test 10/350 μs to BS EN/EN/IEC 61643-21	1 kA				
8/20 μs to ITU-T K.45:2003, IEEE C62.41.2:2002:	10 kA				
Mechanical specification	OVR TN/ RJ11-2/6	OVR TN/ RJ11-4/6	OVR TN/ RJ11-6/6	OVR ISDN/ RJ45-4/8	OVR ISDN/ RJ45-8/8
Temperature range	-40 to +80 °C				
Connection type	RJ11 plug and socket	RJ11 plug and socket	RJ11 plug and socket	RJ45 plug and socket	RJ45 plug and socket
Earth connection	M4/DIN-Rail				
Case Material	FR Polymer UL-94 V-0				
Weight: - Unit	0.15 kg				
- Packaged	0.2 kg				
Dimensions	See diagram below				

⁽¹⁾ Maximum working voltage (DC or AC peak) measured at < 10 μA leakage for OVR TN/RJ11 products and < 5 μA for OVR ISDN/RJ45 products

⁽²⁾ Maximum working voltage is 5 V for pairs 3/6 & 4/5, and 58 V for pairs 1/2 & 7/8

⁽³⁾ The maximum transient voltage let-through of the protector throughout the test (±10%), line to line & line to earth, both polarities. Response time < 10 ns

⁽⁴⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)

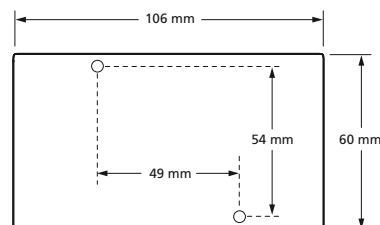
⁽⁵⁾ The first let-through voltage value is for pairs 3/4 & 5/6, and the second value is for pairs 1/2 & 7/8

⁽⁶⁾ The installation and connectors external to the protector may limit the capability of the protector

OVR ISDN/RJ45-4/8, 8/8 cable length: 0.5 m



OVR TN/RJ11-2/6, 4/6, 6/6 cable length: 1 m



Depth: 24 mm
Fixing centres 49 x 54 mm, M3 clearance

Telecom and computer line protection

OVR Cat-5 & Cat-6 Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable to protect twisted pair Ethernet networks, including Power over Ethernet (PoE), with RJ45 connections. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Suitable for systems signaling on up to eight wires of either shielded or unshielded twisted pair cable
- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Unlike some competing devices, the ethernet SPDs provide effective protection without impairing the system's normal operation
- Low capacitance circuitry prevents the start-up signal degradation associated with other types of network protector
- Low in-line resistance minimizes unnecessary reductions in signal strength to maximize signaling distance
- Sturdy ABS housing with convenient holes for flat mounting, or vertically via TS35 'Top Hat' DIN-Rail
- Substantial earth connection to enable effective earthing
- Will protect all PoE powering modes A and B.

Application

Use these protectors on network cables that travel between buildings to prevent damage to equipment, e.g. computers, servers, repeaters and hubs. Suitable for computer networks up to Cat-6A cabling.

- To protect up to 100baseT networks with Cat-5/Cat-5e cabling use OVR Cat-5e
- To protect up to 1000baseT/ 10GbaseT networks with Cat-6/Cat-6A cabling use OVR Cat-6

- To protect up to 100baseT Power over Ethernet (PoE) networks with Cat-5/Cat-5e use OVR Cat-5e/PoE
- To protect up to 1000baseT/ 10GbaseT Power over Ethernet (PoE) networks with Cat-6/Cat-6A cabling use OVR Cat-6/PoE

For further application information, see separate Application Note OVR AN004 (contact us for a copy).

Installation

Connect in series with the network cable, either:

- Near to where it enters or leaves the building, or
- As it enters the network hub, or
- Close to the equipment being protected

This should be close to the system's earth star point (to enable a good connection to earth).

Accessories

OVR CAT5e/UTP-1
1 metre cable with unshielded RJ45 connections

OVR CAT6/STP-2
2 metre screened cable with shielded RJ45 connections

Plug-in series connection



TECHNICAL NOTE: The interfaces used in Ethernet networks incorporate an isolation transformer which gives these systems an inbuilt immunity to transients between line and earth of 1,500 Volts or more.



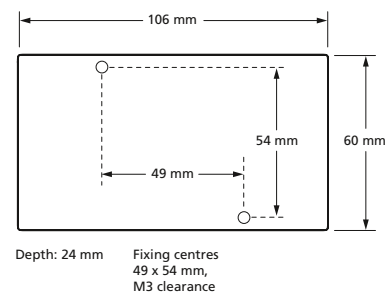
NOTE: To protect datacomms systems based on twisted pairs, use the OVR D, E or H Series. Local protection for networked equipment is also available.

OVR Cat-5 & Cat-6 Series - Technical specification

Electrical Specification		OVR Cat-5e	OVR Cat-5e/PoE	OVR Cat-6	OVR Cat-6/PoE
Order code		7TCA085400R0289	7TCA085400R0290	7TCA085400R0291	7TCA085400R0292
Maximum working voltage $U_c^{(1)}$	- data ⁽²⁾	5 V			
	- power ⁽³⁾	-	58 V	-	58 V
Current rating		300 mA	600 mA ⁽⁴⁾	300 mA	600 mA ⁽⁴⁾
In-line resistance (per line ±25%)	- data ⁽²⁾	1.5 Ω			
	- power	-	1.5 Ω	-	-
Maximum data rate		100 Mbps	100 Mbps	1000 Mbps	1000 Mbps
Networking standards:		10/100baseT	10/100baseT	10/100/1000/10GbaseT	10/100/1000/10GbaseT
		TIA Cat-5e	TIA Cat-5/PoE	TIA Cat-6	TIA Cat-6
		IEEE 802.3i	IEEE 802.3i	IEEE 802.3i	IEEE 802.3i
		IEEE 802.3u	IEEE 802.3u	IEEE 802.3u	IEEE 802.3u
		-	IEEE 802.3af	IEEE 802.3ab	IEEE 802.3ab
		-	IEEE 802.3at	IEEE 802.3an	IEEE 802.3an
		-	-	-	IEEE 802.3af
		-	-	-	IEEE 802.3at
Transient specification		OVR Cat-5e	OVR Cat-5e/PoE	OVR Cat-6	OVR Cat-6/PoE
Let-through voltage (all conductors)⁽⁵⁾ Up					
C2 test 4 kV 1.2/50 μs,	- line to line	120 V	120 V/116 V ⁽⁶⁾	120 V	120 V/116 V ⁽⁶⁾
	- line to earth ⁽⁶⁾	700 V			
2 kA 8/20 μs to BS EN/EN/IEC 61643-21	- line to line	74 V	74 V/95 V ⁽⁶⁾	74 V	74 V/95 V ⁽⁶⁾
	- line to earth ⁽⁶⁾	600 V			
B2 test 4 kV 10/700 μs to BS EN/EN/IEC 61643-21	- line to line	21 V	21 V/87 V ⁽⁶⁾	21 V	21 V/87 V ⁽⁶⁾
	- line to earth ⁽⁶⁾	550 V			
5 kV, 10/700 μs ⁽⁷⁾	- line to line	25 V	25 V/90 V ⁽⁶⁾	25 V	25 V/90 V ⁽⁶⁾
	- line to earth ⁽⁶⁾	600 V			
Maximum surge current⁽⁹⁾					
D1 test 10/350 μs to BS EN/EN/IEC 61643-21		1 kA			
8/20 μs to ITU-T K.45:2003, IEEE C62.41.2:2002		10 kA			
Mechanical specification		OVR Cat-5e, OVR Cat-5e/PoE		OVR Cat-6, OVR Cat-6/PoE	
Temperature range		-40 to +80°C			
Connection type		RJ45 sockets			
Cable (supplied)		0.25 m Cat-5e UTP patch lead		0.5 m Cat-6 STP patch lead	
Earth connection		M4/DIN-Rail			
Case Material		FR Polymer UL-94 V-0			
Weight: - Unit		0.15 kg			
- Packaged		0.2 kg			
Dimensions		See diagram below			

⁽¹⁾ Maximum working voltage (DC or AC peak) measured at 1 mA leakage
⁽²⁾ Data pairs 1/2 and 3/6 are protected as standard. Pairs 4/5 and 7/8 are also protected on Cat-6 barriers
⁽³⁾ PoE protectors transmit power Mode A and Mode B power
⁽⁴⁾ Based on 30W of transmitted PSE power, to IEEE 802.3at.
⁽⁵⁾ The maximum transient voltage let-through of the protector throughout the test (±10%), line to line & line to earth. Response time <10 ns (on all protected pairs)

⁽⁶⁾ The interfaces used in network systems incorporate an isolation transformer that inherently provides an inbuilt immunity to transients between line and earth of 1,500 Volts or more
⁽⁷⁾ Test to IEC 61000-4-5:2014, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 6:2011, ANSI TIA/EIA/IS-968-A:2005 (formerly FCC Part 68).
⁽⁸⁾ The first number is for the data pair, with the second number for the power pair
⁽⁹⁾ The installation and connectors may limit the capability of the protector



Order codes

Type code	Order code	Type code	Order code
OVR Cat-5e	7TCA085400R0289	OVR Cat-6	7TCA085400R0291
OVR Cat-5e/PoE	7TCA085400R0290	OVR Cat-6/PoE	7TCA085400R0292
OVR Cat-5e/UTP-1	7TCA085400R0294	OVR Cat-6/STP-2	7TCA085400R0295

Specific systems protection

OVR TV Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable to protect Cable, Terrestrial and Satellite TV systems. For use on lines running within buildings at boundaries up to LPZ 0 to through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Low attenuation and high return loss over a wide range of frequencies ensures the protectors do not impair system performance
- Substantial earth termination
- Supplied ready for flat mounting
- Strong metal housing
- 8K (3224 MHz) ready to ISDB-S3 satellite digital broadcast standard

Application

- Use to protect analogue and digital Cable, Terrestrial and Satellite TV installations. OVR CATV/F, OVR MATV/F, OVR SMATV/F and OVR TV/F are suitable for systems using F connectors. OVR TV/EURO is suitable for systems using EURO-TV connectors.
- For protecting terrestrial antenna feeds use OVR TV/F or OVR TV/EURO
- For protecting satellite feeds use OVR SMATV/F
- For protecting distributed combined TV feeds use OVR MATV/F
- For protecting cable TV feeds use OVR CATV/F

For further information on TV applications, see separate Application Note OVR AN006 (contact us for a copy).

Installation

Connect in series with the coaxial cable either near where it enters or leaves each building or close to equipment being protected.

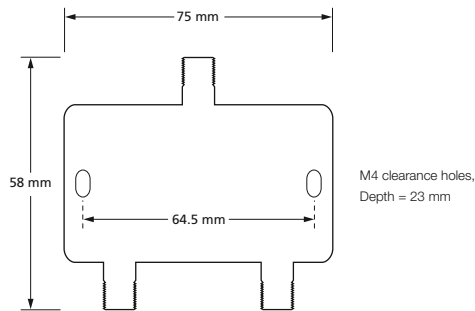


NOTE: Protectors for coaxial (or twisted pair) CCTV Lines are available. For coaxial RF lines, use the OVR RF Series. Transients can also be conducted into TV systems via the mains power supplies - use suitable OVR mains protection.

OVR TV Series - Technical specification

Electrical specification	OVR CATV/F	OVR MATV/F	OVR SMATV/F	OVR TV/F	OVR TV/EURO
Order code	7TCA085400R0293	7TCA085400R0308	7TCA085400R0336	7TCA085400R0335	7TCA085400R0334
Maximum working voltage ⁽¹⁾	140 V	18.9 V	18.9 V	6.4 V	6.4 V
Maximum operating current	4 A	800 mA	800 mA	300 mA	300 mA
Characteristic impedance	75 Ω				
Bandwidth	5-860 MHz	5-3224 MHz	860-3224 MHz	5-860 MHz	5-860 MHz
Insertion loss:					
– 5-860 MHz	< 0.5 dB	< 0.3 dB	–	< 0.3 dB	< 0.3 dB
– 860-2150 MHz	–	< 1.5 dB	< 1.5 dB	–	–
– 2150-3224 MHz	–	< 2.2 dB	< 2.2 dB	–	–
Return loss (VSWR):					
– 5-860 MHz	> 20 dB (< 1.2:1)	> 32 dB (< 1.05:1)	–	> 32 dB (< 1.05:1)	> 32 dB (< 1.05:1)
– 860-2150 MHz	–	> 20 dB (< 1.2:1)	> 20 dB (< 1.2:1)	–	–
– 2150-3224 MHz	–	> 20 dB (< 1.2:1)	> 20 dB (< 1.2:1)	–	–
Transient specification	OVR CATV/F	OVR MATV/F	OVR SMATV/F	OVR TV/F	OVR TV/EURO
Let-through voltage (all conductors)⁽²⁾ Up					
C2 test 4 kV 1.2/50 μs, 2 kA 8/20 μs to BS EN/EN/IEC 61643-21	270 V	70 V	70 V	65 V	65 V
C1 test 1 kV 1.2/50 μs, 0.5 kA 8/20 μs to BS EN/EN/IEC 61643-21	265 V	60 V	60 V	50 V	50 V
B2 test 4 kV 10/700 μs to BS EN/EN/IEC 61643-21	245 V	45 V	45 V	30 V	30 V
5 kV, 10/700 μs ⁽³⁾	250 V	50 V	50 V	35 V	35 V
Maximum surge current					
8/20 μs to ITU-T K.45:2003, IEEE C62.41.2:2002	3 kA				
D1 test 10/350 μs to BS EN/EN/IEC 61643-21	500 A	750 A	750 A	750 A	750 A
Mechanical specification	OVR CATV/F	OVR MATV/F	OVR SMATV/F	OVR TV/F	OVR TV/EURO
Temperature range	-40 to +80 °C				
Connection type	F female				
Earth connection	~ 9.5 mm (3/8") diameter earth stud				
Case Material	Diecast				
Weight: – Unit	0.14 kg				
– Packaged	0.15 kg				
Dimensions	See diagram below				

- ⁽¹⁾ Maximum working voltage (DC or AC peak) measured at < 5 μA (OVR CATV/F) and < 50 mA (OVR MATV/F, OVR SMATV/F, OVR TV/EURO, OVR TV/F)
- ⁽²⁾ The maximum transient voltage let-through of the protector throughout the test (±10%) line to earth. Response time < 10 ns
- ⁽³⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)



Specific systems protection

OVR CCTV Series

- LPZ 0→3**
- FULL MODE**
Bonding + Equipment Protection
- HIGH BANDWIDTH**
- SIGNAL/TELECOM TEST CAT D + C + B**
- LOW IN-LINE RESISTANCE 1 Ω**
- e ENHANCED**
Low let-through voltage
- CURRENT RATING 300 mA**
-
-



Combined Category D, C, B tested protector (to BS EN 61643) suitable for coaxial CCTV cables with BNC connectors (OVR CCTV/B) or twisted pair CCTV lines (OVR CCTV/T) on systems with either an earthed or an isolated screen. Not suitable for use on broadcast, satellite or cable TV systems. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- 100 MHz bandwidth prevents the degradation of high frequency signals
- Low in-line resistance to minimize unnecessary reductions in signal strength and maximizes signaling distance
- Very low reflection coefficient/VSWR ensure that the protector doesn't disrupt system operations
- Suitable for either earthed or isolated screen systems
- Sturdy, conductive ABS housing for 2 way shielding - preventing emissions & providing signals with immunity from external interference
- Convenient holes for flat mounting on base or side
- Built-in DIN-Rail foot for easy installation on a top hat DIN-Rail
- OVR CCTV/T has colour coded terminals for a quick and easy installation check - grey for the dirty (line) end and green for the clean end
- Substantial earth stud to enable effective earthing
- Integral earthing plate for enhanced connection to earth via OVR CME kit

Application

Use these protectors on the video cable to outdoor CCTV cameras and central control and monitoring equipment.

Installation

Connect in series with the CCTV cable in a convenient place close to the equipment being protected. For outdoor CCTV cameras, protectors should be mounted in the junction box, or in a separate enclosure, close to the camera. Protect central control and monitoring equipment inside the building by installing protectors on all incoming or outgoing lines, either:

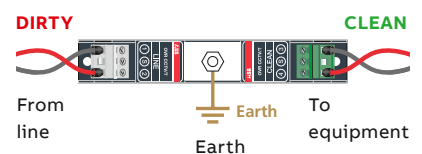
- a) near where they enter or leave the building, or
- b) close to the equipment being protected (or actually within its control panel).

Accessories

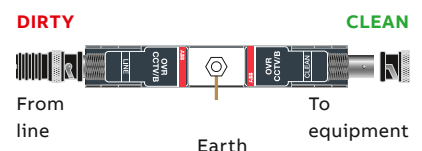
When CCTV protectors are installed in groups, or alongside protectors for signal and mains power lines, these can be mounted and earthed simultaneously on a OVR CME kit. An OVR CME 4 will accommodate the video, telemetry and power protectors to a camera. If protectors cannot be incorporated within an existing panel or enclosure, OVR WBX enclosures are available for up to 4, 8, 16 or 32 protectors and their associated OVR CME kit. The OVR WBX 4/GS is a secure IP66 enclosure suitable for a OVR CME 4 and associated protectors.



Series connection for OVR CCTV/T



Series connection for OVR CCTV/B

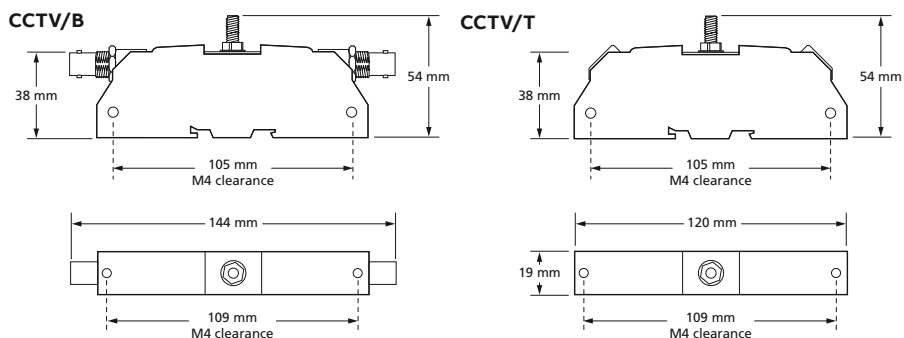


NOTE: Camera telemetry or control lines should be protected with a suitable Lightning Barrier from the OVR D or E Series. Protectors for the power supply to individual cameras (e.g. OVR 240-16A) and the mains supply to the control room are available. For coaxial RF (OVR RF Series) cable protectors and CATV systems (OVR CATV/F) are also available.

OVR CCTV Series - Technical specification

Electrical specification	OVR CCTV/B	OVR CCTV/B-15V	OVR CCTV/B-30V	OVR CCTV/B-50V	OVR CCTV/T	OVR CCTV/T-15V	OVR CCTV/T-30V	OVR CCTV/T-50V
Order code	7TCA085400R0296	7TCA085400R0297	7TCA085400R0299	7TCA085400R0300	7TCA085400R0301	7TCA085400R0302	7TCA085400R0298	7TCA085400R0303
Nominal voltage ⁽¹⁾ (peak-peak)	1 V				2 V			
Maximum working voltage $U_c^{(2)}$ (peak)	7.79 V	16.7 V	36.7 V	56.7 V	7.79 V	16.7 V	36.7 V	56.7 V
Current rating (signal)	300 mA							
In-line resistance ($\pm 10\%$)	1 Ω inserted in coax inner				1 Ω per line			
Bandwidth (-3 dB 75 Ω system) ⁽³⁾	> 100 MHz							
Voltage standing wave ratio	< 1.2:1							
Transient specification	OVR CCTV/B	OVR CCTV/B-15V	OVR CCTV/B-30V	OVR CCTV/B-50V	OVR CCTV/T	OVR CCTV/T-15V	OVR CCTV/T-30V	OVR CCTV/T-50V
Let-through voltage (all conductors)⁽⁴⁾ Up								
C2 test 4 kV 1.2/50 μ s, 2 kA 8/20 μ s to BS EN/EN/IEC 61643-21	39.5 V	55.0 V	78.0 V	105.0 V	39.5 V	55.0 V	78.0 V	105.0 V
C1 test 1 kV 1.2/50 μ s, 0.5 kA 8/20 μ s to BS EN/EN/IEC 61643-21	26.0 V	42.0 V	66.5 V	93.5 V	26.0 V	42.0 V	66.5 V	93.5 V
B2 test 4 kV 10/700 μ s to BS EN/EN/IEC 61643-21	16.0 V	27.2 V	47.5 V	73.6 V	16.0 V	27.2 V	47.5 V	73.6 V
5 kV, 10/700 μ s ⁽⁵⁾	17.0 V	28.2 V	49.5 V	76.2 V	17.0 V	28.2 V	49.5 V	76.2 V
Maximum surge current⁽⁶⁾								
D1 test 10/350 μ s to BS EN/EN/IEC 61643-21:	2.5 kA (per signal wire) -				2.5 kA (per signal wire) 5 kA (per pair)			
8/20 μ s to ITU (formerly CCITT):	10 kA (per signal wire) -				10 kA (per signal wire) 20 kA (per pair)			
Mechanical specification	OVR CCTV/B variants				OVR CCTV/T variants			
Temperature range	-40 to +80°C							
Connection type	Coaxial BNC female				Screw terminal			
Conductor size (stranded)	Not applicable				2.5 mm ²			
Earth connection	M6 stud							
Case Material	ABS UL94 V-0				ABS UL94 V-0			
Weight: – Unit	0.08 kg							
Dimensions	See diagram below							

⁽¹⁾ Nominal voltage (DC or AC peak) measured at <10 μ A leakage
⁽²⁾ Maximum working voltage (DC or AC peak) measured at 5 mA leakage
⁽³⁾ Capacitance < 30 pF
⁽⁴⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), line to line & line to earth. Screen to earth let-through voltage will be up to 600 V (with 5 kV 10/700 test), when protector is configured for use with non-earthed or isolated screen systems. Response time < 10 ns
⁽⁵⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)
⁽⁶⁾ The installation and connectors external to the protector may limit the capability of the protector



Order codes

Type code	Order code	Type code	Order code
OVR CME4	7TCA085400R0414	OVR WBX4	7TCA085410R0048
OVR CME8	7TCA085400R0415	OVR WBX4/GS	7TCA085410R0049
OVR CME16	7TCA085410R0045	OVR WBX8	7TCA085410R0050
OVR CME32	7TCA085410R0046	OVR WBX8/GS	7TCA085410R0051
		OVR WBX16/2/G	7TCA085410R0047

Specific systems protection

OVR RF Series



Combined Category D, C, B tested protector (to BS EN 61643) suitable for RF systems using coaxial cables at frequencies between DC and 2.7 GHz and where DC power is present. Suitable for RF systems with power up to 1.9 kW. For use at boundaries up to LPZ 0 to protect against flashover (typically the service entrance location) through to LPZ 3 to protect sensitive electronic equipment.

Features & benefits

- Very low let-through voltage (enhanced protection to IEC/BS EN 62305) between all lines - Full Mode protection
- Full Mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- Repeated protection in lightning intense environments
- Wide bandwidth means a single product is suitable for a range of applications
- Very low attenuation and near unity VSWR over a wide range of frequencies ensure the protectors do not impair system performance
- Available with N, 7/16 DIN and BNC connectors
- Easily mounted and earthed via fixtures on the base of the unit that accept M3 and M5 screws or via mounting brackets
- Additional mounting plates give increased flexibility
- Robust aluminium housing

Application

Use on coaxial cables to protect RF transmitter and receiver systems, including electronics located at the antenna or dish. Typical examples include cell sites, military communications, satellite earth stations, pager systems and emergency services communications systems.

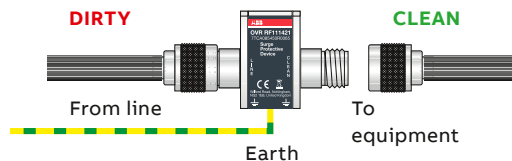
Installation

In a building, connect in series with the coaxial cable near where it enters or leaves the structure, or close to the equipment being protected. This should be as close as possible to the system's earth star point (to enable a good connection to earth). On a mast, connect in series with the coaxial cable near the antenna/dish being protected. Install in a radio communications room, an existing cabinet or a suitable enclosure.

Accessories

- OVR RF BK1 Straight mounting plates
- OVR RF BK2 90° angled mounting plates
- OVR RF BK3 Bulkhead through mounting plate (single)
- OVR RF BK4 Bulkhead through mounting plate (for 4 products)
- OVR RF GDT-4 Replacement gas discharge tube

OVR RF 111421 with N female connectors installed in series



NOTE: These protectors are based on a continuous transmission line with a GDT connected between this line and screen/earth, and are suited for applications where DC is required to pass to the equipment. OVR CCTV/B and OVR CCTV/T are suitable for use on coaxial (or twisted pair) CCTV lines. For coaxial CATV lines, use the OVR CATV/F.

OVR RF Series - Technical specification

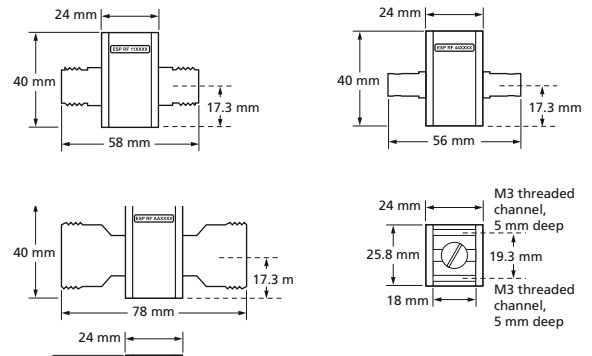
Electrical specification	OVR RF 111421, OVR RF AA1421, OVR RF 441421		
Gas Discharge Tube voltage	350 V		
Maximum working voltage U_c (RMS)	200 V		
Characteristic impedance	50 Ω		
Capacitance (@ 1 MHz)	< 5 pF		
Bandwidth	DC-2.7 GHz		
Voltage standing wave ratio	≤ 1.1		
Insertion loss over bandwidth	≤ 0.1 dB		
Maximum power ⁽¹⁾	650 W		
Transient specification	OVR RF 111421, OVR RF AA1421, OVR RF 441421		
Let-through voltage (all conductors) ⁽²⁾ Up			
C2 test 4 kV 1.2/50 μ s, 2 kA 8/20 μ s to BS EN/EN/IEC 61643-21	< 800 V		
C1 test 1 kV 1.2/50 μ s, 0.5 kA 8/20 μ s to BS EN/EN/IEC 61643-21	< 650 V		
B2 test 4 kV 10/700 μ s to BS EN/EN/IEC 61643-21	< 550 V		
5 kV, 10/700 μ s ⁽³⁾	< 580 V		
Maximum surge current ⁽⁴⁾			
D1 test 10/350 μ s to BS EN/EN/IEC 61643-21	2.5 kA		
8/20 μ s to ITU-T K.45:2003, IEEE C62.41.2:2002	20 kA		
Mechanical specification	OVR RF 111421	OVR RF AA1421	OVR RF 441421
Order code	7TCA085450R0065	7TCA085450R0063	7TCA085450R0066
Temperature range	-40 to +80 °C		
Connection type	N female	$\frac{7}{16}$ DIN female	BNC female
Conductor size (stranded)	Via mounting fixtures		
Case Material	Aluminium body, nickel plated. Brass connectors, white bronze plated		
Weight: – Unit	120 g	190 g	90 g
– Packaged	140 g	210 g	110 g
Dimensions	See diagram below		

⁽¹⁾ Power levels have been de-rated to allow for real life 'worst case' conditions, calculated with VSWR as 2:1. Higher power levels are possible, contact ABB for details.

⁽²⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$). Response time < 10 ns. This let-through voltage represents a deviation from the applied signal voltage, present at the time of the test

⁽³⁾ Test to IEC 61000-4-5:2006, ITU-T (formerly CCITT) K.20, K.21 and K.45, Telcordia GR-1089-CORE, Issue 2:2002, ANSI TIA/EIA/IS-968-A:2002 (formerly FCC Part 68)

⁽⁴⁾ The installation and connections external to the protector may limit the capability of the protector

**OVR RF BK1 (Order code: 7TCA085400R0416)**

Straight mounting bracket, 53 x 26.3 x 3 mm
2 x M4 clearance mounting holes, 16.3 mm apart

OVR RF BK2 (Order code: 7TCA085400R0064)

90° mounting bracket, 33 x 26.3 x 3 mm, 20 x 26.3 x 3 mm
2 x M4 clearance mounting holes, 16.3 mm apart, 14 mm from fold line

OVR RF BK3 (Order code: 7TCA085400R0412)

90° mounting bracket, 50 x 24 x 1.5 mm, 60 x 24 x 1.5 mm
2 x M5 clearance mounting holes, 40 mm apart

OVR RF BK4 (Order code: 7TCA085400R0413)

90° quad mounting bracket, 50 x 24 x 1.5 mm, 210 x 24 x 1.5 mm
5 x M5 clearance mounting holes, various spacings
Mounting brackets supplied with screws for fixing to protector

Protector accessories

OVR CME Series



Enables groups of protectors to be simultaneously mounted and earthed via their earth stud. Suitable for installing protectors with one or two earth studs on their top face. Available with 4, 8, 16 and 32 mounting holes.

Features & benefits

- Enables quick and easy installation of protectors for added convenience
- Speedy installation of groups of protectors saves time and money
- Individual protectors can be changed without needing to remove others
- Sturdy construction
- Supplied with a choice of flat and round ended fixing screws to suit your application

Application

Use OVR CME kits to simultaneously mount and earth groups of single and double earth stud protectors. Each single earth stud protector requires one OVR CME mounting position and each double earth stud protector requires two OVR CME mounting positions, this includes:

High conductivity copper with electro-tin plating and nylon insulating pillars, for low impedance to earth

Single earth stud protectors which are:

- OVR 06D
- OVR 06E
- OVR 06H
- OVR TN
- OVR 15D
- OVR 15E
- OVR 15H
- OVR RTD
- OVR 30D
- OVR 30E
- OVR 30HOVR CCTV/B
- OVR 50D
- OVR 50E
- OVR 50H
- OVR CCTV/T
- OVR 110D
- OVR 110E
- OVR 110H
- OVR RS485

Double earth stud protectors which are:

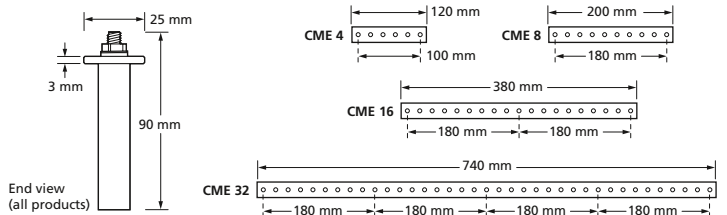
- OVR 240-16A

Once you know how many OVR CME mounting positions you require choose a OVR CME kit to suit:

- OVR CME 4 has 4 mounting positions
- OVR CME 8 has 8 mounting positions
- OVR CME 16 has 16 mounting positions
- OVR CME 32 has 32 mounting positions

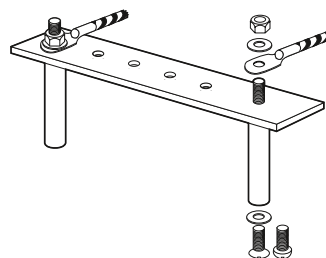
Installation

The earth bar is supported by a series of mounting pillars (which are fixed to the cubicle or box base). Protectors are attached to the OVR CME's earth bar via their earth stud(s) and earthed with shared connections to earth. We suggest one earth connection per mounting pillar.



Accessories

Enclosures suitable for a **OVR CME 4** and its associated protectors: (**OVR WBX 4/GS**), **OVR CME 8** and protectors (**OVR WBX 8/GS**) or one or two **OVR CME 16** and protectors (**OVR WBX 16/2/G**)



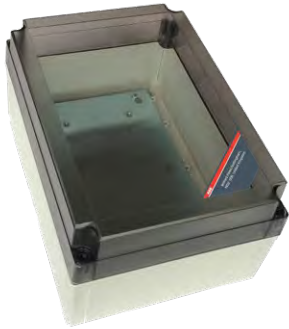
Assembly of OVR CME kit
Earth connection (not supplied)

OVR CME Series - Technical specification

	OVR CME 4	OVR CME 8	OVR CME 16	OVR CME 32
Order code	7TCA085400R0414	7TCA085400R0415	7TCA085410R0045	7TCA085410R0046
Hole size	6.5 mm with 20 mm spacings			
Weight	0.1 kg	0.15 kg	0.3 kg	0.6 kg
Dimensions	See diagram above			

Protector accessories

OVR WBX Series



A range of moisture and dirt resistant enclosures for the convenient installation of any OVR protector. For signaling applications they can be used with their associated OVR CME with grey base and either a see-through or grey (type /G or /GS) lid.

Features & benefits

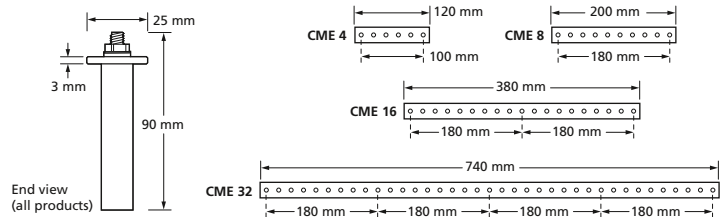
- Tough polycarbonate enclosures
- Weatherproof with IP resistance to dirt and water of IP56 or more
- Clear lid enables easy visual inspection of the protector's visual status indication (OVR WBX 4, OVR WBX 8)
- Grey lid for applications not needing regular protector inspection (OVR WBX 4/GS, OVR WBX 8/GS and OVR WBX 16/2/G)
- For external CCTV and other installations requiring added security the OVR WBX 4/GS and OVR WBX 8/GS are supplied with an opaque lid and special secure head screws (plus tool)
- Supplied complete with metal base (mounting) plate with pre-prepared mounting positions and fixing hardware for easy installation

Application

Use OVR WBX enclosures when your OVR protector(s) can't be installed within the existing equipment panel or enclosure and for added protection in damp and dirty environments.

Installation

The protector(s), or OVR CME kit, are mounted on the metal base plate, which in turn mounts in the enclosure.



OVR WBX Series - Technical specification

Enclosure type	For use with following protectors
OVR WBX 4 or the secure OVR WBX 4/GS	1 OVR CME 4 and associated protectors
OVR WBX 8 or the secure OVR WBX 8/GS	1 OVR CME 8 and associated protectors
OVR WBX 16/2/G	1 or 2 OVR CME 16 and associated protectors
OVR WBX SLQ or OVR WBX SLQ/G	Up to 6 x OVR**Q, or up to 15 x OVR SL**

	OVR WBX 4 OVR WBX 4/GS	OVR WBX 8 OVR WBX 8/GS	OVR WBX 16/2/G	OVR WBX SLQ OVR WBX SLQ/G
Order code	7TCA085410R0048 7TCA085410R0049	7TCA085410R0050 7TCA085410R0051	7TCA085410R0047	7TCA085400R0326 7TCA085400R0327
Weight: – Unit	0.9 kg	1.3 kg	6.4 kg	0.7 kg
– Packaged	0.95 kg	1.35kg	7.6 kg	1.0 kg
Dimensions:				
Length: – Internal	246 mm	225 mm	460 mm	230 mm
– External	255 mm	235 mm	474 mm	250 mm
Width: – Internal	171 mm	225 mm	380 mm	105 mm
– External	180 mm	235 mm	396 mm	125 mm
Depth: – Internal	119 mm	100 mm	120 mm	110 mm
– External	125 mm	117 mm	128 mm	125 mm
Fixing centres (mm)	240 x 165	215 x 215	380 x 310	235 x 110
IP rating	IP66	IP66	IP56	IP67
Temperature range	-15 to +75 °C	-15 to +75 °C	-25 to +60 °C	-40 to +80 °C
Flammability	UL 94 V2	UL 94 V2	UL 94 V0	UL 746C 5V



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Electrification Business,
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surge-protective-devices-ovr](https://new.abb.com/low-voltage/products/system-pro-m/surge-protective-devices-ovr)

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