



US Catalog | March 2017

Surge protective devices (SPDs) UL range

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What is a transient surge?

A transient surge is a sudden (shorter than a millisecond) rise in the flow of power. Voltage can peak at 12x the nominal system voltage. Transient surges result from a number of sources, the most common of which are internal, such as load switching and even normal equipment operations. In fact, approximately 80% of transients are generated internally. External transients are the result of lightning and load switching by utilities and upstream facilities.

Internal load switching

Switching on/off any elements that create a sudden variation of load will also cause a sudden change in current flow and generate transient surges.

Lightning strikes

A lightning strike (direct or indirect) can have a destructive or disturbing effect on installations located up to several miles from the actual point of the strike. During a storm, underground cables can transmit energy from a lightning strike to equipment installed inside buildings.

A lightning protection device (such as a lightning rod or Faraday cage) installed on a building to protect against the risk of a direct strike can increase the risk of damage to electrical equipment connected to the main power supply near or inside the building.

The lightning protection device diverts the high strike current to ground, considerably raising the potential of the ground close to the building on which it is installed. This causes overvoltages on the electrical equipment directly via the ground terminals and induced via the underground supply cables.

Switching effects on power distribution

The switching of transformers, motors or inductances in general, variation of load, disconnection of circuit breakers or cut outs lead to overvoltages that penetrate a building. The closer the building is to a generating station, substation or upstream switching point, the higher the overvoltages may be.

Facilities and operations left unprotected are highly susceptible to the damaging effects of transients. such as:

- Catastrophic equipment failure
- Immediate operation shutdown
- Long term disruption of business
- Expensive equipment repair and replacement
- Data losses, system resets and network down time

In order to ensure protection from transient surges, installation of surge protective devices (SPD) is a must. ABB has a long history of engineering and manufacturing quality surge protective devices. This brochure will provide information needed to select the proper products to begin protecting any facility or operation.

ABB's family of surge protective devices include the following:

- OVR NE12 enclosed SPD for service entrance locations
- OVR DIN rail AC SPD for equipment protection
- OVR PV DIN rail DC SPD for photovoltaic installations
- OVR DIN rail data line SPD for sensitive communications networks

Overvoltages due to direct lightning strikes

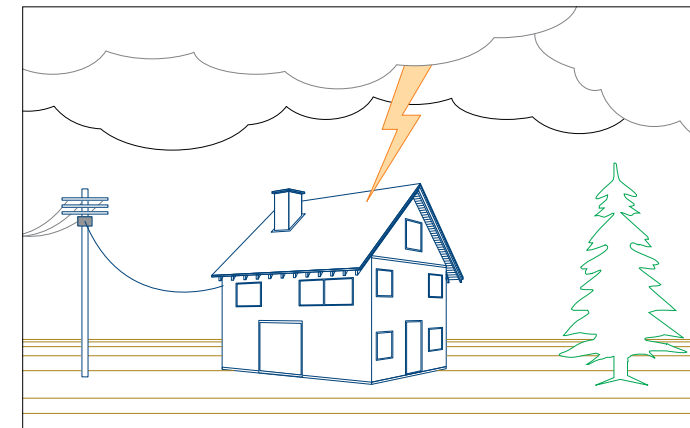
These can take two forms:

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

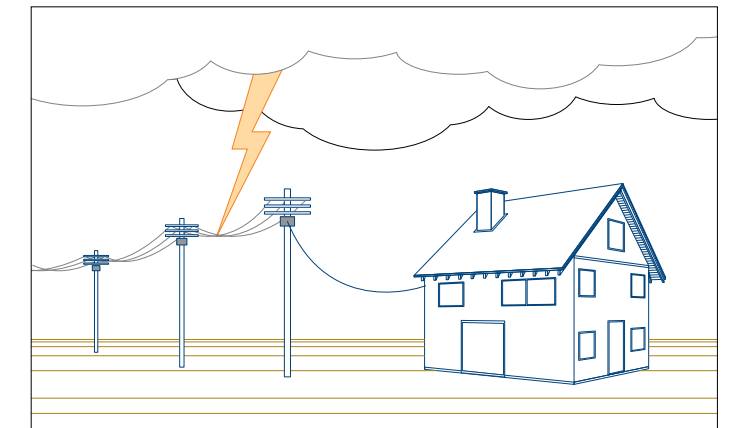
Overvoltages due to the indirect effects of lightning strikes

Overvoltages are also produced when lightning strikes in the vicinity of a building, due to the increase in potential of the ground at the point of impact. The electromagnetic fields created by the lightning current generate inductive and capacitive coupling, leading to other overvoltages. Within a radius up to several kilometers, the electromagnetic field caused by lightning in clouds can also create sudden increases in voltage.

Although less spectacular than in the previous case, irreparable damage is also caused to sensitive equipment such as fax machines, computer power supplies and safety and communication systems.



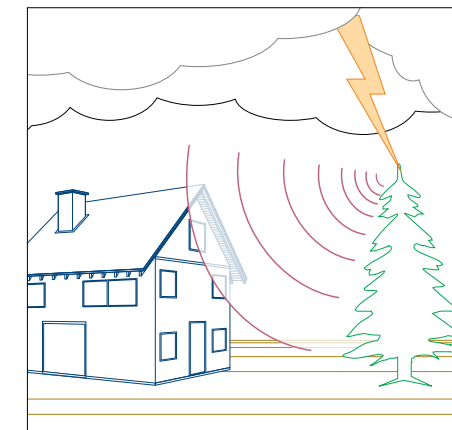
Direct lightning strike on a lightning conductor or the roof of a building



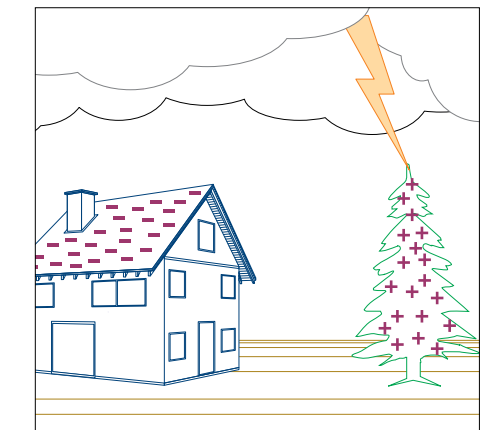
Direct lightning strike on an overhead line



Increase in ground potential



Magnetic field



Electrostatic field

The Underwriters Laboratories (UL) standard for surge protective devices (SPDs) has been the primary safety standard for surge protection since the first edition was published in 1985, and updated to the second edition in 1996.

The objective of UL 1449 has always been to increase safety in terms of surge protection.

Change in the standard's name: From TVSS to SPDs

Prior to UL 1449 3rd Edition taking effect, the devices this standard covers were known as Transient Voltage Surge Suppressors (TVSS), operating on power circuits not exceeding 600 V. With the inception of the 3rd Edition, these devices are now known as Surge Protective Devices (SPDs), and may operate on power circuits not exceeding 1500 V DC.

This new designation moves the UL standard closer to the international designation and to IEC standards. The new edition is now renamed UL Standard for Safety for Surge Protective Devices, UL 1449.

The different type designations of surge protective devices

The new UL 1449 3rd Edition 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.

Type 1 – "Permanently connected SPDs intended for installation between the secondary of the service transformer and the line side of the service equipment overcurrent device."

Type 2 – "Permanently connected SPDs intended for installation on the load side of the service equipment overcurrent device."

Type 3 – "Point of utilization SPDs, installed at a minimum conductor length of 10 meters (30 feet) from the electrical service panel."

Type 4 - Component assemblies – "Component assembly consisting of one or more Type 5 components together with a disconnect (integral or external) or a means of complying with the limited current tests."

Type 1, 2, 3 - Component assemblies – "Consists of a Type 4 component assembly with internal or external short circuit protection."

Type 5 – "Discrete component surge suppressors, such as MOVs that may be mounted on a PWB, connected by its leads or provided within an enclosure with mounting means and wiring terminations."



These new categories are major changes applied to UL 1449 3rd Edition. SPDs installation location is now taken into account. The closer an SPD is installed to the equipment, the better the protection is. This is a push in the direction of providing stepped protection including external and internal surge protection.

The measured voltage protection level

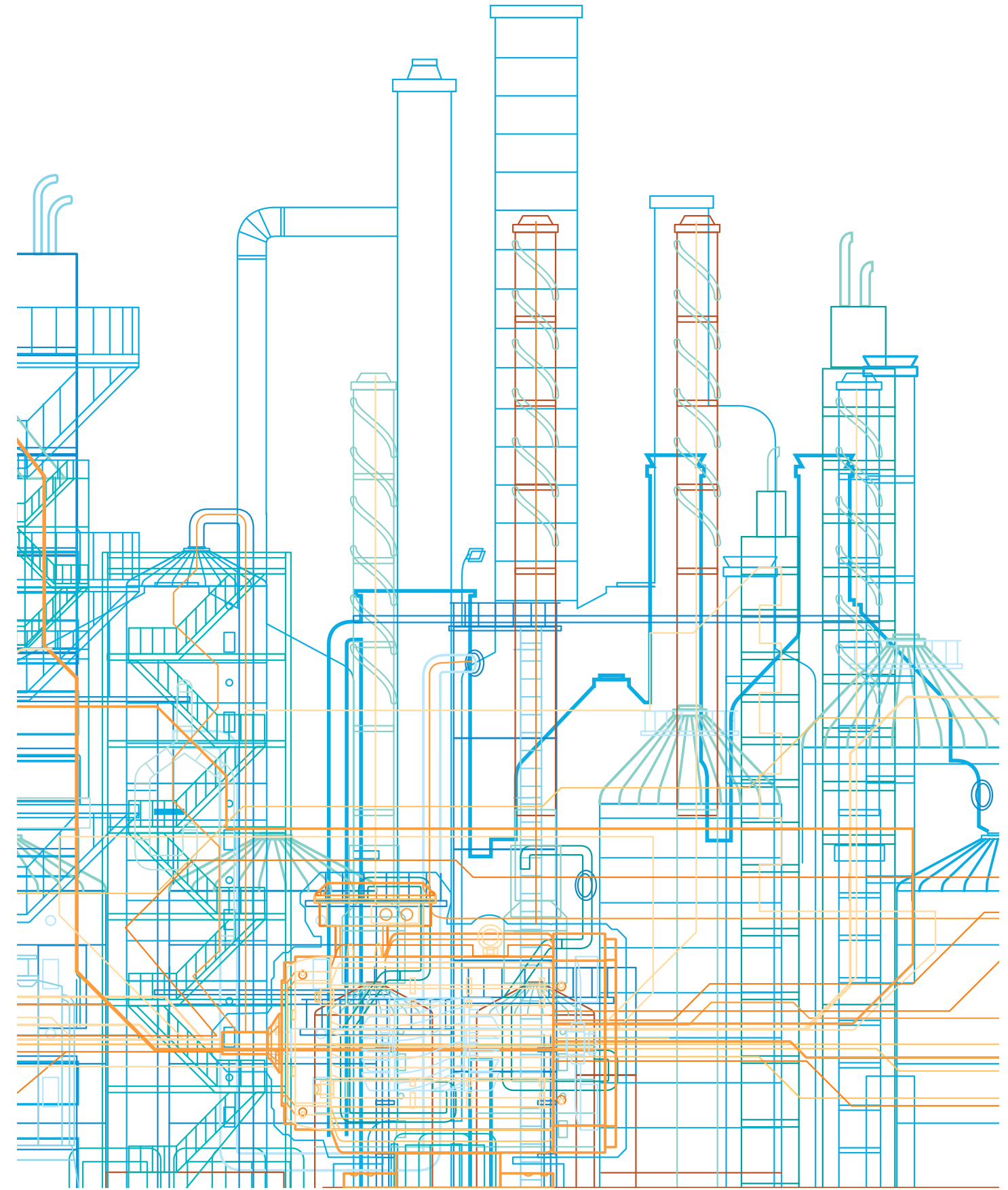
One of the last changes found in the new UL 1449 3rd Edition is the modification in the measured voltage protection level. The Measured Limiting Voltage (MLV) is the maximum magnitude of voltage measured at the application of a specific impulse wave shape.

When applying a certain surge current on the SPD, the measured voltage at the device terminals is the so called "let-through voltage."

In UL 1449 2nd Edition, the let-through voltage was referred to as Suppressed Voltage Rating (SVR) and was calculated with a 0.5 kA surge wave form at 6 kV. The new designation is Voltage Protection Rating (VPR) and is calculated with a 3 kA surge wave form at 6 kV.

All products in this chapter have been certified according to the UL 1449 3rd Edition.

The MLV will allow comparison of different types of SPDs with regards to the let-through voltage. However, it is important to note that the surge current used to measure the let-through voltage is six times higher in the 3rd Edition than in the 2nd Edition. This means that, comparing the obsolete SVR designation with the new VPR ratings will not be valid. VPR ratings will be higher than SVR ratings.



Terminology of SPD electrical characteristics

SPD terminology

8/20 wave

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

Type 2 surge protective device (SPD)

Permanently connected SPDs intended for installation on the load side of the service equipment overcurrent device including SPDs located at a branch panel. It has successfully passed testing to the standard with the 8/20 wave (class II test).

Metal oxide varistor (MOV)

A varistor is an electronic component with a "diode like" nonlinear current-voltage characteristic, used to protect circuits against excessive transient voltages. Most commonly composed of metal oxides.

Maximum continuous operating voltage (MCOV, U_c)

The maximum designated root mean square (rms) value of power frequency voltage that may be applied continuously between the terminals of the SPD.

Nominal discharge current (I_n)

Peak current value of an 8/20 waveform which the SPD is rated for based on the test program.

Maximum discharge current (I_{max})

Peak current value of an 8/20 waveform which can be safely discharged by the SPD, with an amplitude complying with the class II operating test sequence. $I_{max} > I_n$

Short circuit current rating (SCCR)

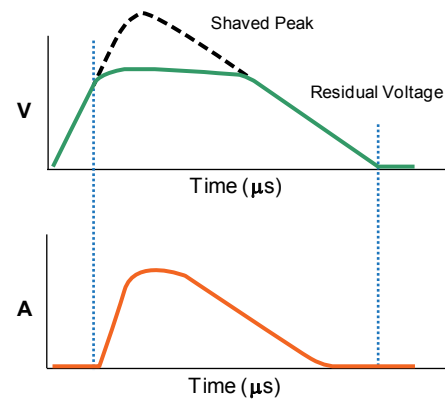
Maximum symmetrical fault current, at rated voltage, that the SPD can withstand without sustaining damage that exceeds acceptable criteria or creates a hazardous operating condition.

Voltage protection rating (VPR)

The value of the VPR is determined as the nearest highest value, taken from table 63.1 of ANSI/UL 1449 3rd edition, to the measured limiting voltage determined during the transient voltage surge suppression test using the combination wave generator at a setting of 6 kV, 3 kA.

Voltage protection level (U_p or U_{res})

The voltage let through by the SPD while diverting surge current to ground must not exceed the voltage withstand value of the equipment connected downstream.



* Graph depicts an 8/20 μs wave

Notes:

Test wave 8/20 μs according to IEEE # C62.62-200/UL 1449

The first number corresponds to the time from 10 % to 90 % of its peak value (8 μs).

The second number corresponds to the time taken for the wave to descend to 50 % of its peak value (20 μs).

Common mode and / or differential mode protection

Common mode

Common mode overvoltages appear between the live conductors and ground, e.g. phase/ground or neutral/ground. A live conductor not only refers to the phase conductors but also to the neutral conductor.

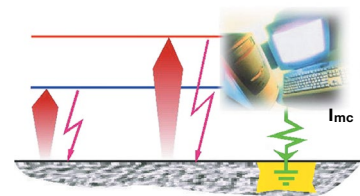
This overvoltage mode destroys equipment connected to ground (class I equipment) and also equipment not connected to ground (class II equipment) which is located near a grounded mass and which does not have sufficient electrical isolation (a few kilovolts).

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

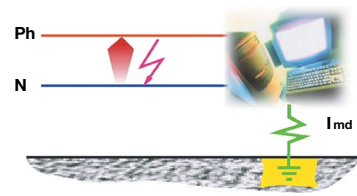
Differential mode

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

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



Note: Common mode overvoltages affect all grounding systems.



UL wiring diagrams

Single phase

120/240/277 V



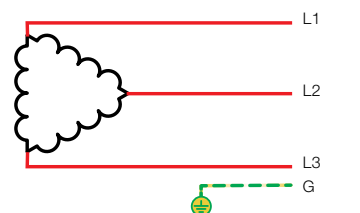
Split phase

240/120 V, 480/240 V



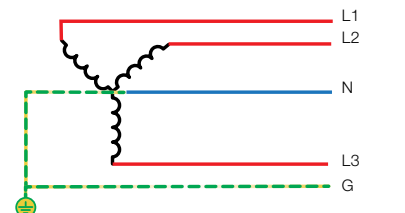
Delta

240/480/600 V



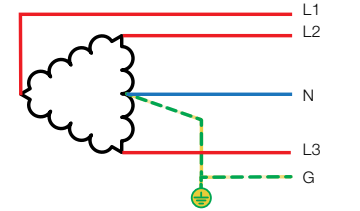
Grounded Wye

208 Y/120 V, 480 Y/277 V, 600 Y/347 V



High-Leg Delta

240/1200 V HLD



Selection tables

OVR Type 2 surge protective devices

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Grounded Wye networks	2/21

OVR for applications

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List of OVR T2 UL products according to their certification

Type acc. To UL 1449 Ed3

Range	Type	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	●	

Type acc. To UL 1449 Ed3

Range	Type	Order code	Type 4 CA	Type 1 CA
PV U	OVR PV 40-600 P U	2CTB802340R0800		●
	OVR PV 40-600 P TS U	2CTB802340R0900		●
	OVR PV 40-800 P U	2CTB802340R2000		●
	OVR PV 40-800 P TS U	2CTB802340R2100		●
	OVR PV 40-1000 P U	2CTB802340R3200		●
	OVR PV 40-1000 P TS U	2CTB802340R3300		●
	OVR PV 15-600 P U	2CTB802340R5600		●
	OVR PV 15-600 P TS U	2CTB802340R5700		●
	OVR PV 15-800 P U	2CTB802340R6800		●
	OVR PV 15-800 P TS U	2CTB802340R6900		●
	OVR PV 15-1000 P U	2CTB802340R8000		●
	OVR PV 15-1000 P TS U	2CTB802340R8100		●
	OVR PV 40-600 C U	2CTB802349R0400		●
	OVR PV 40-800 C U	2CTB802349R1000		●
	OVR PV 40-1000 C U	2CTB802349R1600		●
	OVR PV 15-600 C U	2CTB802349R2900		●
	OVR PV 15-800 C U	2CTB802349R3500		●
	OVR PV 15-1000 C U	2CTB802349R4100		●

OVR surge protective devices – UL version

Selection tables

Choosing the correct model

1) Determine the service voltage

Consult qualified personnel if the facility or operation service voltage is unknown.

2) Select the SPD maximum continuous operating voltage (MCOV, Uc)

The MCOV should correspond to the service voltage. Example: If the service voltage is 480 V Delta, an SPD with 550 V or 660 V MCOV will be required.

Surge protection devices must also provide a level of protection compatible with the withstand voltage of the equipment.

This withstand voltage depends on the type of equipment and its sensitivity. The incoming surge protector may not provide adequate protection by itself, as certain electrical phenomena may greatly increase its residual voltage if cable lengths exceed 10 m. A second SPD may be necessary.

3) Select the SPD surge capacity (Imax)

Surge capacity is the amount of energy the SPD can withstand from a single surge event. The higher the surge capacity, the longer the device will protect the system. A second surge protector may be required if the surge capacity of the first is not capable of diverting all surge current to ground. See coordination below.

4) Remote monitoring (optional)

Integrated auxiliary contact for remote monitoring available on models with "TS" designation.

Refer to the "selection tables" on next page for assistance selecting SPDs.

Complete facility protection

Installing surge protection at the main distribution panel is only the beginning of protecting the entire operation. As most transient surges are created internally, it is necessary to install surge protection at sub-distribution panels (equipment protection) to be fully protected. Stepping down the I_{max} level from the service entrance panel toward equipment to be protected is recommended.

For example, if a 40 kA I_{max} SPD is installed in the main distribution panel, then 15 kA I_{max} SPDs should be installed in sub-distribution panels for equipment protection.

Coordination

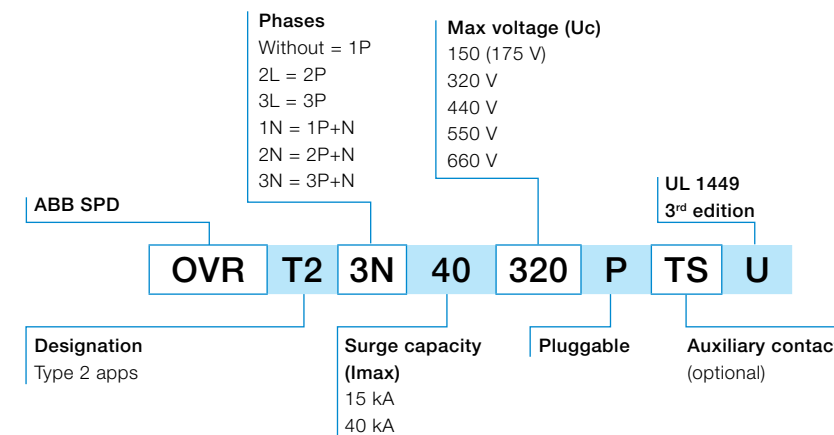
It may be necessary to add a second surge protector, wired to the incoming unit, to achieve the required voltage protection and/or surge capacity. For Type 2 or 4 SPDs, installing this second unit a minimum of 1 m from the first unit will allow the two to work together, achieving the required protection.

Wiring rules

The impedance of the cables increases the voltage across the connected equipment. Therefore, the length of the cable between the surge protector and the equipment should be minimized.

The surge protective device should be installed as close to the equipment to be protected as possible. If this is not possible (the equipment is over 30 m from the panel), then a second surge protector must be installed.

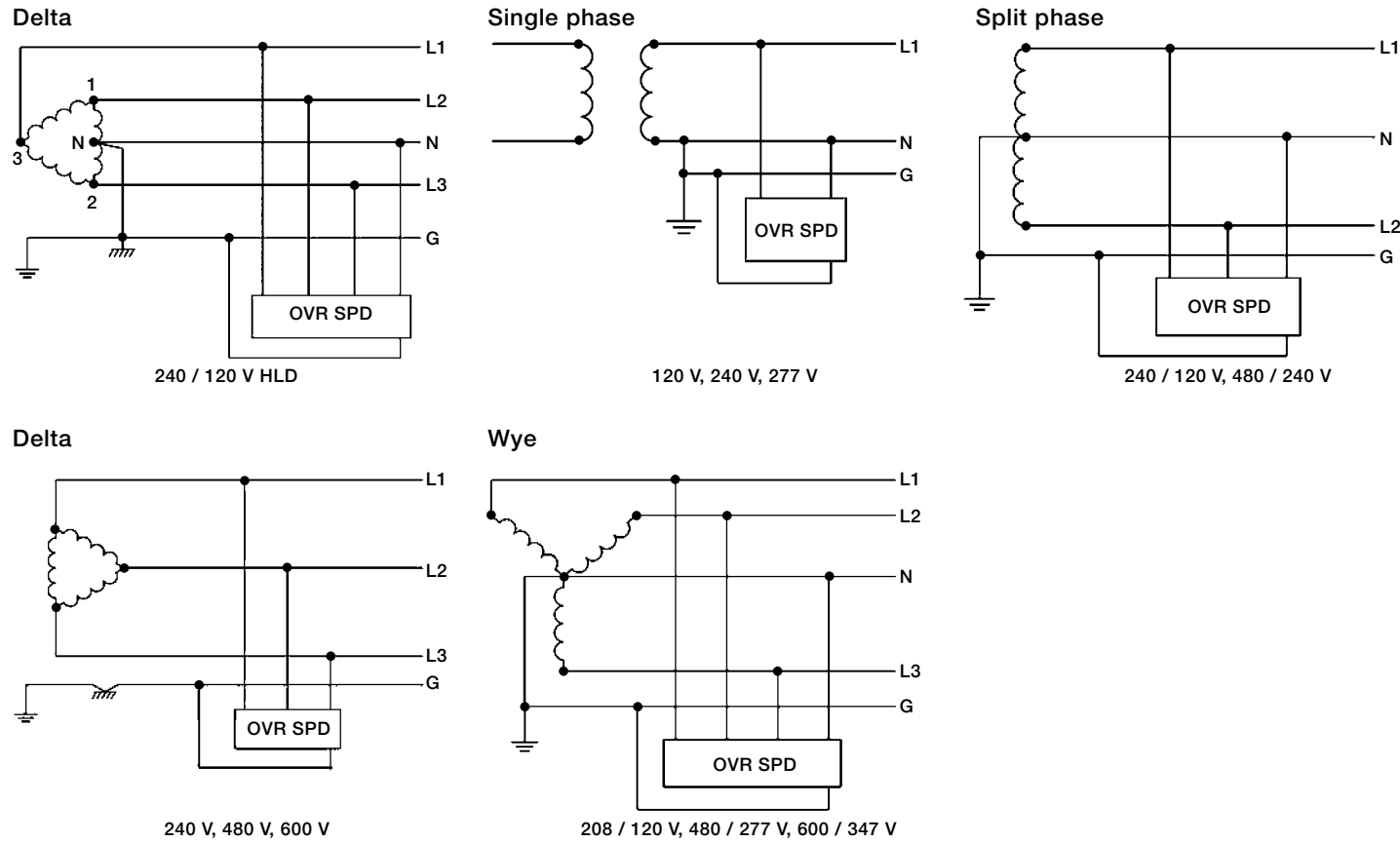
OVR DIN rail SPD - catalog number explanation



OVR surge protective devices – UL version

Selection tables

General wiring diagrams - DIN rail devices



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

Protected 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	Catalog number
Type 2 - Pluggable - Single pole networks								
1	–	15	5	–	0.6	120	150	OVR T2 15-150 P U
1	–	15	5	–	1	277 ±15%	320	OVR T2 15-320 P U
1	–	40	20	–	0.6	120	150	OVR T2 40-150 P U
1	–	40	20	–	0.6	120	150	OVR T2 40-150 P TS U
1	–	40	20	–	1	277 ±15%	320	OVR T2 40-320 P U
1	–	40	20	–	1	277 ±15%	320	OVR T2 40-320 P TS U
1	–	40	10	–	1.3	347 ±15%	440	OVR T2 40-440 P TS U
1	–	40	10	–	1.7	480 ±15%	550	OVR T2 40-550 P TS U
1	–	40	10	–	1.9	600 ±15%	660	OVR T2 40-660 P TS U
Neutral								
1	–	70	20	0.1	1.2	230	275	OVR T2 70 N P U
Cartridges								
1	–	–	–	–	–	120 ±15%	175	OVR T2 15-150 C U
1	–	–	–	–	–	277 ±15%	320	OVR T2 15-320 C U
1	–	–	–	–	–	120 ±15%	175	OVR T2 40-150 C U
1	–	–	–	–	–	277 ±15%	320	OVR T2 40-320 C U
1	–	–	–	–	–	347 ±15%	440	OVR T2 40-440 C U
1	–	–	–	–	–	480 ±15%	550	OVR T2 40-550 C U
1	–	–	–	–	–	600 ±15%	660	OVR T2 40-660 C U
1	–	–	–	–	–	230	275	OVR T2 70 N C U

OVR surge protective devices – UL version

Selection tables

Protected 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	Catalog number
Type 2 - Pluggable - delta networks								
3	–	15	5	–	1	277 ±15%	320	OVR T2 3L 15-320 P U
3	–	40	20	–	1	277 ±15%	320	OVR T2 3L 40-320 P TS U
3	–	40	10	–	1.7	480 ±15%	550	OVR T2 3L 40-550 P TS U
Cartridges								
1	–	–	–	–	–	277 ±15%	320	OVR T2 15-320 C U
1	–	–	–	–	–	277 ±15%	320	OVR T2 40-320 C U
1	–	–	–	–	–	480 ±15%	550	OVR T2 40-550 C U
Type 2 - Pluggable - Single phase networks								
2	–	15	5	–	1.2	120	150	OVR T2 1N 15-150 P U
2	–	15	5	–	1.2	277	320	OVR T2 1N 15-320 P U
2	–	40	20	–	1.2	120	150	OVR T2 1N 40-150 P U
2	–	40	20	–	1.2	120	150	OVR T2 1N 40-150 P U (x10)
2	–	40	20	–	1.2	120	150	OVR T2 1N 40-150 P TS U
2	–	40	20	–	1.2	277	320	OVR T2 1N 40-320 P TS U
2	–	40	10	–	1.2	347	440	OVR T2 1N 40-440 P TS U
2	–	40	10	–	1.2	480	550	OVR T2 1N 40-550 P TS U
2	–	40	10	–	1.2	600	660	OVR T2 1N 40-660 P TS U
Cartridges								
1	–	–	–	–	–	120 ±15%	175	OVR T2 15-150 C U
1	–	–	–	–	–	277 ±15%	320	OVR T2 15-320 C U
1	–	–	–	–	–	120 ±15%	175	OVR T2 40-150 C U
1	–	–	–	–	–	277 ±15%	320	OVR T2 40-320 C U
1	–	–	–	–	–	347 ±15%	440	OVR T2 40-440 C U
1	–	–	–	–	–	480 ±15%	550	OVR T2 40-550 C U
1	–	–	–	–	–	600 ±15%	660	OVR T2 40-660 C U
Type 2 - Pluggable - Split phase networks								
2	–	15	5	–	0.6	120 ±15%	175	OVR T2 2L 15-150 P U
2	–	15	5	–	1	277 ±15%	320	OVR T2 2L 15-320 P U
3	–	15	5	–	0.7	120 ±15%	175	OVR T2 2N 15-150 P U
3	–	15	5	–	1.1	277 ±15%	320	OVR T2 2N 15-320 P U
2	–	40	20	–	0.6	120 ±15%	175	OVR T2 2L 40-150 P TS U
2	–	40	20	–	1	277 ±15%	320	OVR T2 2L 40-320 P TS U
3	–	40	20	–	0.7	120 ±15%	175	OVR T2 2N 40-150 P TS U
3	–	40	20	–	1.1	277 ±15%	320	OVR T2 2N 40-320 P TS U
3	–	40	10	–	1.4	347 ±15%	440	OVR T2 2N 40-440 P TS U
3	–	40	10	–	1.8	480 ±15%	550	OVR T2 2N 40-550 P TS U
3	–	40	10	–	2	600 ±15%	660	OVR T2 2N 40-660 P TS U
Cartridges								
1	–	–	–	–	–	120 ±15%	175	OVR T2 15-150 C U
1	–	–	–	–	–	277 ±15%	320	OVR T2 15-320 C U
1	–	–	–	–	–	120 ±15%	175	OVR T2 40-150 C U
1	–	–	–	–	–	277 ±15%	320	OVR T2 40-320 C U
1	–	–	–	–	–	347 ±15%	440	OVR T2 40-440 C U
1	–	–	–	–	–	480 ±15%	550	OVR T2 40-550 C U
Type 2 - Pluggable - Grounded Wye networks								
3	–	15	5	–	0.6	120 ±15%	175	OVR T2 3L 15-150 P U
4	–	15	5	–	0.6	120 ±15%	175	OVR T2 3N 15-150 P U
4	–	15	5	–	1.2	277 ±15%	320	OVR T2 3N 15-320 P U
3	–	40	20	–	0.6	120 ±15%	175	OVR T2 3L 40-150 P TS U
3	–	40	10	–	1.3	347 ±15%	440	OVR T2 3L 40-440 P TS U
4	–	40	20	–	1.2	120 ±15%	175	OVR T2 3N 40-150 P TS U
4	–	40	20	–	1.2	277 ±15%	320	OVR T2 3N 40-320 P TS U
4	–	40	10	–	1.2	347 ±15%	440	OVR T2 3N 40-440 P TS U
4	–	40	10	–	1.2	480 ±15%	550	OVR T2 3N 40-550 P TS U
4	–	40	10	–	1.2	600 ±15%	660	OVR T2 3N 40-660 P TS U
Cartridges								
1	–	–	–	–	–	120 ±15%	175	OVR T2 15-150 C U
1	–	–	–	–	–	120 ±15%	175	OVR T2 40-150 C U
1	–	–	–	–	–	347 ±15%	440	OVR T2 40-440 C U
1	–	–	–	–	–	277 ±15%	320	OVR T2 15-320 C U
1	–	–	–	–	–	277 ±15%	320	OVR T2 40-320 C U
1	–	–	–	–	–	480 ±15%	550	OVR T2 40-550 C U
1	–	–	–	–	–	600 ±15%	660	OVR T2 40-660 C U

OVR surge protective devices – UL version

Selection tables

2

Protected lines	Impulse current Iimp 10/350 kA	Max. discharge current Imax 8/20 kA	Nominal discharge current In kA	Short circuit withstand Iscsr/Iscpv kA	Voltage protection rating VPR kV	Nominal voltage Un V	Max. cont. operating voltage Uc V DC	Catalog number
Type 2 - pluggable - photovoltaic applications								
2	—	15	5	1	3	600	670	OVR PV 15-600 P U
2	—	15	5	1	3	600	670	OVR PV 15-600 P TS U
2	—	40	10	1	3	600	670	OVR PV 40-600 P U
2	—	40	10	1	3	600	670	OVR PV 40-600 P TS U
2	—	15	5	1	4	800	1000	OVR PV 15-800 P U
2	—	15	5	1	4	800	1000	OVR PV 15-800 P TS U
2	—	40	10	1	4	800	1000	OVR PV 40-800 P U
2	—	40	10	1	4	800	1000	OVR PV 40-800 P TS U
2	—	15	5	1	4	1000	1250	OVR PV 15-1000 P U
2	—	15	5	1	4	1000	1250	OVR PV 15-1000 P TS U
2	—	40	10	1	4	1000	1250	OVR PV 40-1000 P U
2	—	40	10	1	4	1000	1250	OVR PV 40-1000 P TS U
2	2	40	15	1	4.5	1500	1500	OVR PV 40-1500H P U
2	2	40	15	1	4.5	1500	1500	OVR PV 40-1500H P TS U
Cartridges								
—	—	—	—	—	—	600	670	OVR PV 15-600 C U
—	—	—	—	—	—	600	670	OVR PV 40-600 C U
—	—	—	—	—	—	800	1000	OVR PV 15-800 C U
—	—	—	—	—	—	800	1000	OVR PV 40-800 C U
—	—	—	—	—	—	1000	1250	OVR PV 15-1000 C U
—	—	—	—	—	—	1000	1250	OVR PV 40-1000 C U
—	—	—	—	—	—	1500	1500	OVR PV 40-1500H C U
Dataline protection - pluggable								
1	—	10	5	—	300	200	220	OVR TC 200FR US
1	—	10	5	—	15	6	7	OVR TC 06V US
1	—	10	5	—	20	12	14	OVR TC 12V US
1	—	10	5	—	35	24	27	OVR TC 24V US
1	—	10	5	—	70	48	53	OVR TC 48V US

OVR type 2 surge protective devices - single pole

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 information

Protected lines	Max discharge current Imax 8/20 kA	Nominal discharge current In kA	Voltage protection rating VPR kV	Nominal voltage Un V	Max. cont. operating voltage MCOV V	Bbn 3660308 EAN	Catalog number
Pluggable							
1	15	5	0.6	120	150	518514	OVR T2 15-150 P U
1	15	5	1	277 ±15%	320	518521	OVR T2 15-320 P U
1	40	20	0.6	120	150	518958	OVR T2 40-150 P U
1	40	20	0.6	120	150	518958	OVR T2 40-150 P TS U
1	40	20	1	277 ±15%	320	518965	OVR T2 40-320 P U
1	40	20	1	277 ±15%	320	518545	OVR T2 40-320 P TS U
1	40	10	1.3	347 ±15%	440	518552	OVR T2 40-440 P TS U
1	40	10	1.7	480 ±15%	550	518569	OVR T2 40-550 P TS U
1	40	10	1.9	600 ±15%	660	518576	OVR T2 40-660 P TS U
Neutral - Pluggable							
1	70	20	1.2	230	275	518583	OVR T2 70 N P U



OVR T2 40-150 P U

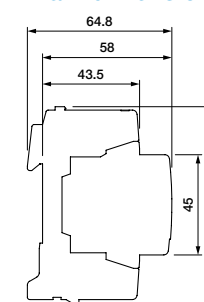


OVR T2 40-440 P TS U

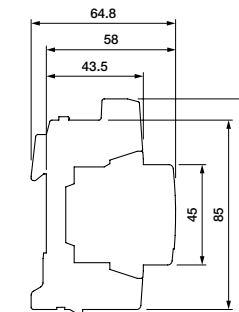


OVR T2 70 N P U

Main dimensions mm



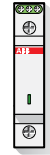
- OVR T2 15-150 P U
- OVR T2 15-320 P U
- OVR T2 40-150 P U
- OVR T2 40-150 P TS U
- OVR T2 40-320 P U
- OVR T2 40-320 P TS U
- OVR T2 40-440 P TS U
- OVR T2 40-550 P TS U
- OVR T2 40-660 P TS U
- OVR T2 70 N P U



- 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

Catalog number	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

OVR type 2 surge protective devices - single pole



General technical specifications

Type	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 40-440 P TS U	OVR T2 40-550 P TS U	OVR T2 40-660 P TS U	OVR T2 70 N P U
with auxiliary contact (TS)	-	-	OVR T2 40-150 P TS U	OVR T2 40-320 P TS U	-	-	-	-
Technology	Varistor	Varistor	Varistor	Varistor	Varistor	Varistor	Varistor	Spark gap
Electrical features								
Standard	UL 1449	UL 1449	UL 1449	UL 1449	UL 1449	UL 1449	UL 1449	UL 1449
Type / test class (UL 1449)	1	1	1	1	1	1	1	4
Protected lines	1	1	1	1	1	1	1	1
System network	-	-	-	-	-	-	-	-
Type of current / frequency	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz	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%	±15%	±15%	+15%
Nominal system voltage Un	120 V	277 V	120 V	277 V	347 V	480 V	600 V	230 V
Maximum continuous operating voltage MCOV	150 V	320 V	150 V	320 V	440 V	550 V	660 V	275 V
Maximal discharge current (8/20) Imax	15 kA	15 kA	40 kA	40 kA	40 kA	40 kA	40 kA	70 kA
Nominal discharge current (8/20) In	5 kA	5 kA	20 kA	20 kA	10 kA	10 kA	10 kA	20 kA
Voltage protection rating (L-N / N-G / L-G) VPR	0.6 kV	1 kV	0.6 kV	1 kV	1.3 kV	1.7 kV	1.9 kV	1.2 kV
Response time	< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns
Short circuit withstand SCCR	200 kA	200 kA	200 kA	200 kA	200 kA	200 kA	200 kA	200 kA
Back up protection fuse (gG - gL)	≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A
maximum rating circuit breaker (B or C Curve)	≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A
Pluggable cartridges	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Integrated QuickSafe® technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
State indicator	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Safety reserve	-	-	-	-	-	-	-	-
Auxiliary contact (TS)	No	No	Yes (TS option)	Yes (TS option)	Yes	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	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	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	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	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	-	-	1 NO - 1 NC	1 NO - 1 NC	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	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	250 V AC - 1 A	250 V AC - 1 A	-
Connection cross section	-	-	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	-
Miscellaneous characteristics								
Stocking temperature	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C
Operating temperature	-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C
Degree of protection	NEMA 1	NEMA 1	NEMA 1	NEMA 1	NEMA 1	NEMA 1	NEMA 1	NEMA 1
Fire resistance according to UL 94	V0	V0	V0	V0	V0	V0	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	88 x 17.8 x 64.8 mm	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	3.46 x 0.7 x 2.55 in	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	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	-
inches h x w x d	-	-	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	3.78 x 0.7 x 2.55 in	-
Replacement cartridges								
Phase product ID Type	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 40-440 C U	OVR T2 40-550 C U	OVR T2 40-660 C U	-
Order code	2CTB802348R2500	2CTB802348R2700	2CTB802348R3500	2CTB802348R3700	2CTB802348R3900	2CTB802348R4100	2CTB802348R4300	-
Neutral product ID Type	-	-	-	-	-	-	-	OVR T2 70 N C U
Order code	-	-	-	-	-	-	-	2CTB802348R6500

OVR type 2 surge protective devices Delta networks

OVR type 2 surge protective devices Delta networks

2



OVR T2 3L 15-320 P U



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.

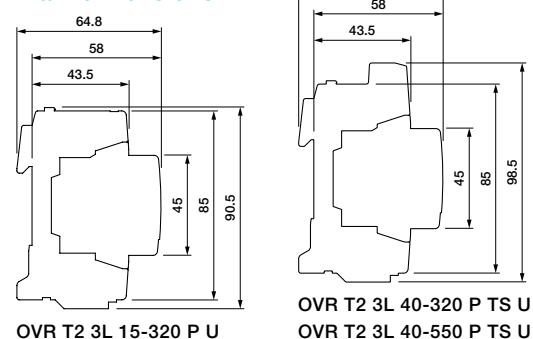
Ordering information

Protected lines	Max discharge current I _{max} 8/20 kA	Nominal discharge current I _n kA	Voltage protection rating VPR kV	Nominal voltage U _n V	Max. cont. operating voltage MCOV, U _c V	Bbn 3660308 EAN	Catalog number
3	15	5	1	277 ±15%	320	518644	OVR T2 3L 15-320 P U
3	40	20	1	277 ±15%	320	518668	OVR T2 3L 40-320 P TS U
3	40	10	1.7	480 ±15%	550	518682	OVR T2 3L 40-550 P TS U

Pluggable

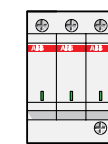
Protected lines	Max discharge current I _{max} 8/20 kA	Nominal discharge current I _n kA	Voltage protection rating VPR kV	Nominal voltage U _n V	Max. cont. operating voltage MCOV, U _c V	Bbn 3660308 EAN	Catalog number
3	15	5	1	277 ±15%	320	518644	OVR T2 3L 15-320 P U
3	40	20	1	277 ±15%	320	518668	OVR T2 3L 40-320 P TS U
3	40	10	1.7	480 ±15%	550	518682	OVR T2 3L 40-550 P TS U

Main dimensions mm



Catalog number	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

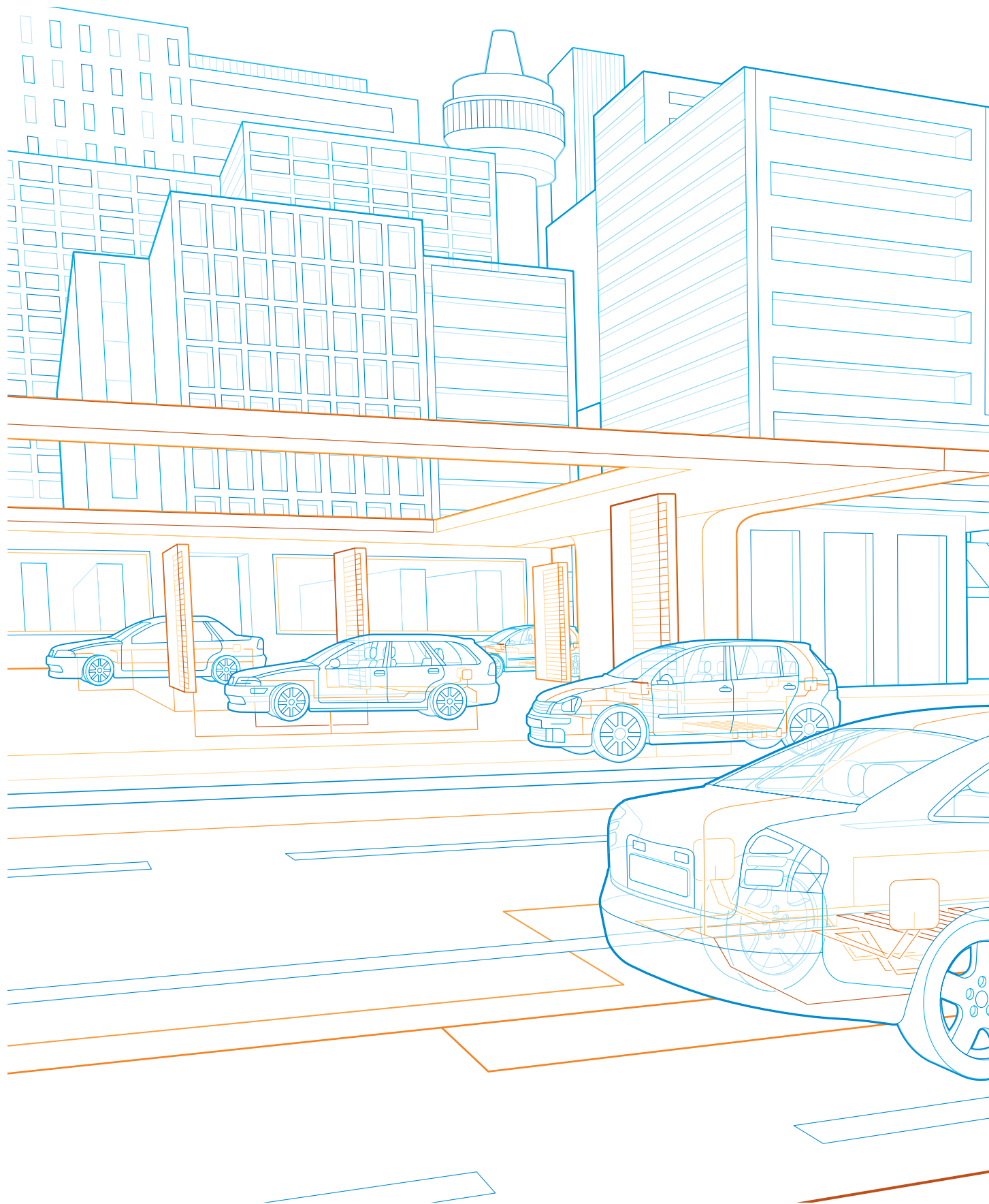
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General technical specifications

Type	OVR T2 3L 15-320 P U	OVR T2 3L 40-320 P TS U	OVR T2 3L 40-550 P TS U
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 U _n	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 fuse (gG - gL)	≤ 100 A	≤ 100 A	≤ 100 A
maximum rating 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
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 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 -	-	-
Order code	-	-	-

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 μ s wave form.

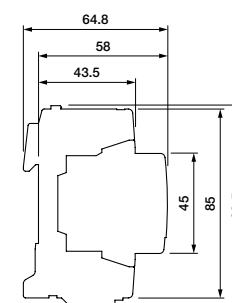
Ordering information

Protected lines	Max discharge current I_{max} 8/20	Nominal discharge current I_n	Voltage protection rating VPR	Nominal voltage U_n	Max. cont. operating voltage MCOV, U_c	Bbn 3660308	Catalog number
	kA	kA	kV	V	V	EAN	
Pluggable							
2	15	5	1.2	120	150	519238	OVR T2 1N 15-150 P U
2	15	5	1.2	277	320	519245	OVR T2 1N 15-320 P U
2	40	20	1.2	120	150	520869	OVR T2 1N 40-150 P U
2	40	20	1.2	120	150	520876	OVR T2 1N 40-150 P U (x10)
2	40	20	1.2	120	150	819252	OVR T2 1N 40-150 P TS U
2	40	20	1.2	277	320	519269	OVR T2 1N 40-320 P TS U
2	40	10	1.2	347	440	519276	OVR T2 1N 40-440 P TS U
2	40	10	1.2	480	550	519283	OVR T2 1N 40-550 P TS U
2	40	10	1.2	600	660	519290	OVR T2 1N 40-660 P TS U

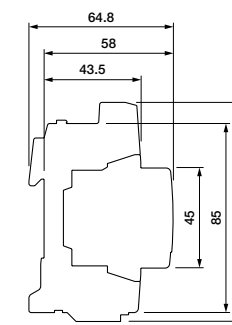
(x10) packaging of 10 pieces.

Catalog number	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



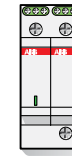
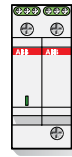
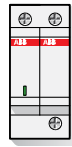
OVR T2 1N 15-150 P U
OVR T2 1N 15-320 P U
OVR T2 1N 40-150 P U



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

OVR type 2 surge protective devices

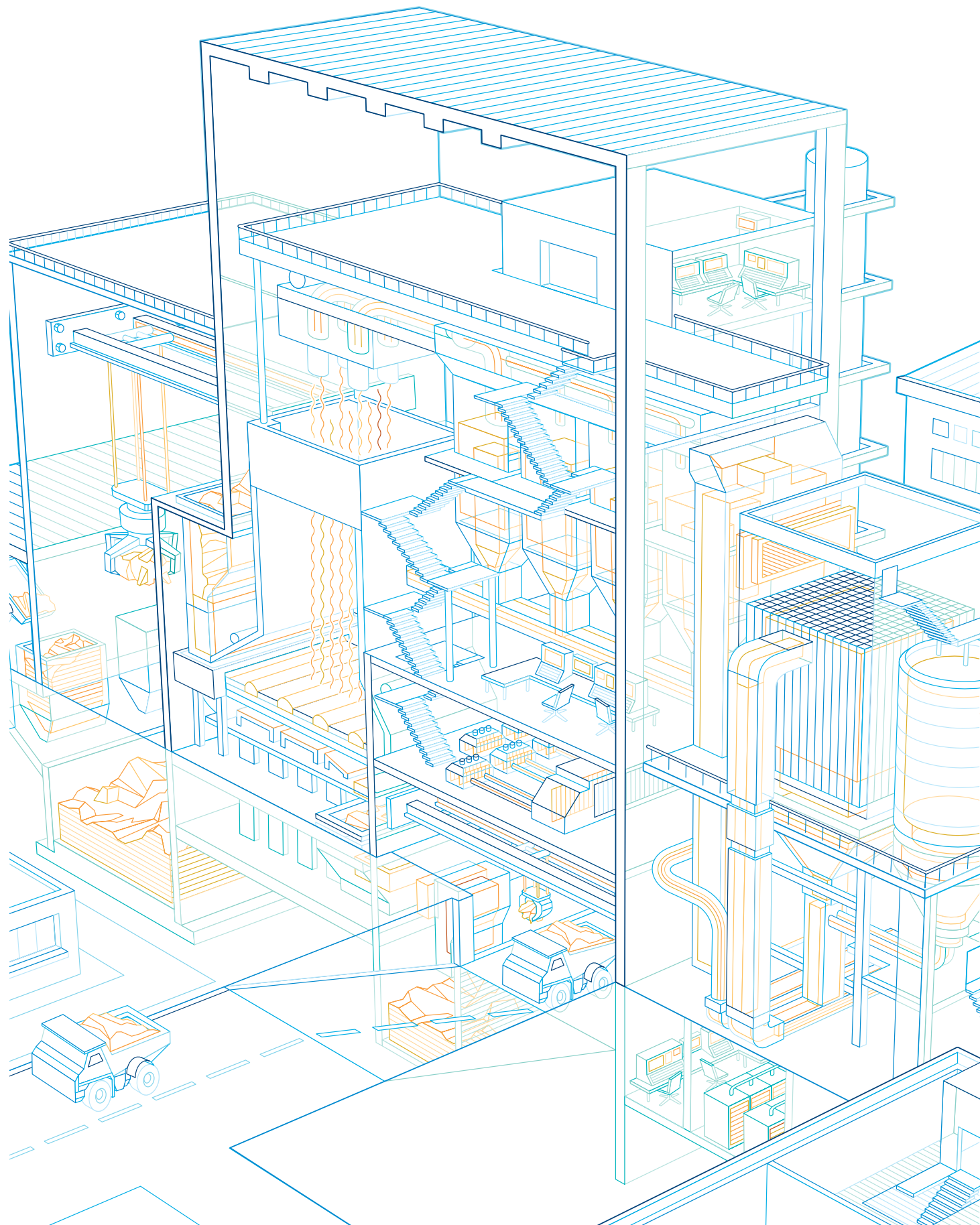
Single phase networks



General technical specifications

Type with auxiliary contact (TS)	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
Electrical features							
Standards	UL 1449	UL 1449	UL 1449	UL 1449	UL 1449	UL 1449	UL 1449
Type / test class (UL 1449)	4	4	4	4	4	4	4
Protected lines	2	2	2	2	2	2	2
Type of current / frequency	AC 47-63 Hz	AC 47-63 Hz	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%	±15%	±15%
Nominal system voltage Un	120 V	277 V	120 V	277 V	347 V	480 V	600 V
Maximum continuous operating voltage MCOV	150 V	320 V	150 V	320 V	440 V	550 V	660 V
Maximal discharge current (8/20) Imax	15 kA	15 kA	40 kA	40 kA	40 kA	40 kA	40 kA
Nominal discharge current (8/20) In	5 kA	5 kA	20 kA	20 kA	10 kA	10 kA	10 kA
Voltage protection rating (L-N / N-G / L-G) VPR	1.2 kV	1.2 kV	1.2 kV	1.2 kV	1.2 kV	1.2 kV	1.2 kV
Response time	< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns
Short circuit withstand SCCR	200 kA	200 kA	200 kA	200 kA	200 kA	200 kA	200 kA
Back up protection fuse (gG - gL) maximum rating	≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A
Back up protection circuit breaker (B or C curve)	≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A
Pluggable cartridges	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Integrated QuickSafe® technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State indicator	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Safety reserve	-	-	-	-	-	-	-
Auxiliary contact (TS)	No	No	Yes (TS option)	Yes	Yes	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	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
Wire range (L,N,PE) 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	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	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	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	2 NO – 2 NC	2 NO – 2 NC	2 NO – 2 NC
Min. load			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
Max. load			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
Connection cross section			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
Miscellaneous characteristics							
Stocking temperature	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C
Operating temperature	-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C
Degree of protection	NEMA 1	NEMA 1	NEMA 1	NEMA 1	NEMA 1	NEMA 1	NEMA 1
Fire resistance according to UL 94	V0	V0	V0	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 35.6 x 64.8 mm	-	-	-	-
Dimensions mm 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	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
Dimensions with auxiliary contact (TS) inches h x w x d	-	-	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	3.88 x 1.4 x 2.55 in
Replacement cartridges							
Phase product ID Type	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 40-440 C U	OVR T2 40-550 C U	OVR T2 40-660 C U
Phase product ID Order code	2CTB802348R2500	2CTB802348R2700	2CTB802348R3500	2CTB802348R3700	2CTB802348R3900	2CTB802348R4100	2CTB802348R4300
Neutral product ID Type	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	OVR T2 70 N C U
Neutral product ID Order code	2CTB802348R6500	2CTB802348R6500	2CTB802348R6500	2CTB802348R6500	2CTB802348R6500	2CTB802348R6500	2CTB802348R6500

OVR type 2 surge protective devices Split phase networks



OVR T2 2L 15-320 P U



OVR T2 2L 40-320 P TS U



OVR T2 2N 15-320 P U



OVR T2 2N 40-440 P TS U

Catalog number	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

Description

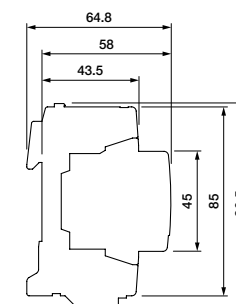
Split phase devices are composed by two MOV poles or two MOV poles plus a spark gap one, depending on the number of lines the customer wants to protect. The spark gap pole guarantees the lowest voltage protection rating and has to be connected to the neutral.

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 μs wave form.

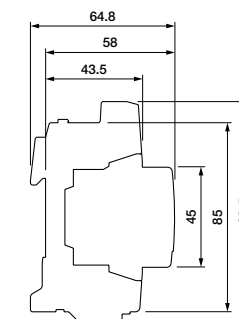
Ordering information

Protected lines	Max discharge current I _{max} 8/20 kA	Nominal discharge current I _n kA	Voltage protection rating VPR kV	Nominal voltage U _n V	Max. cont. operating voltage MCOV, U _c V	Bbn 3660308 EAN	Catalog number
Pluggable							
2	15	5	0.6	120 ±15%	175	518590	OVR T2 2L 15-150 P U
2	15	5	1	277 ±15%	320	518606	OVR T2 2L 15-320 P U
2	40	20	0.6	120 ±15%	175	518613	OVR T2 2L 40-150 P TS U
2	40	20	1	277 ±15%	320	518620	OVR T2 2L 40-320 P TS U
3	15	5	0.7	120 ±15%	175	519306	OVR T2 2N 15-150 P U
3	15	5	1.1	277 ±15%	320	519313	OVR T2 2N 15-320 P U
3	40	20	0.7	120 ±15%	175	519320	OVR T2 2N 40-150 P TS U
3	40	20	1.1	277 ±15%	320	519337	OVR T2 2N 40-320 P TS U
3	40	10	1.4	347 ±15%	440	519344	OVR T2 2N 40-440 P TS U
3	40	10	1.8	480 ±15%	550	519351	OVR T2 2N 40-550 P TS U
3	40	10	2	600 ±15%	660	519368	OVR T2 2N 40-660 P TS U

Main dimensions mm



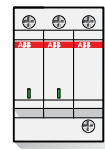
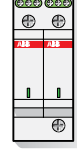
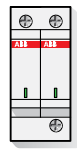
- OVR T2 2L 15-150 P U
- OVR T2 2L 15-320 P U
- OVR T2 2N 15-150 P U
- OVR T2 2N 15-320 P U



- 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

OVR type 2 surge protective devices

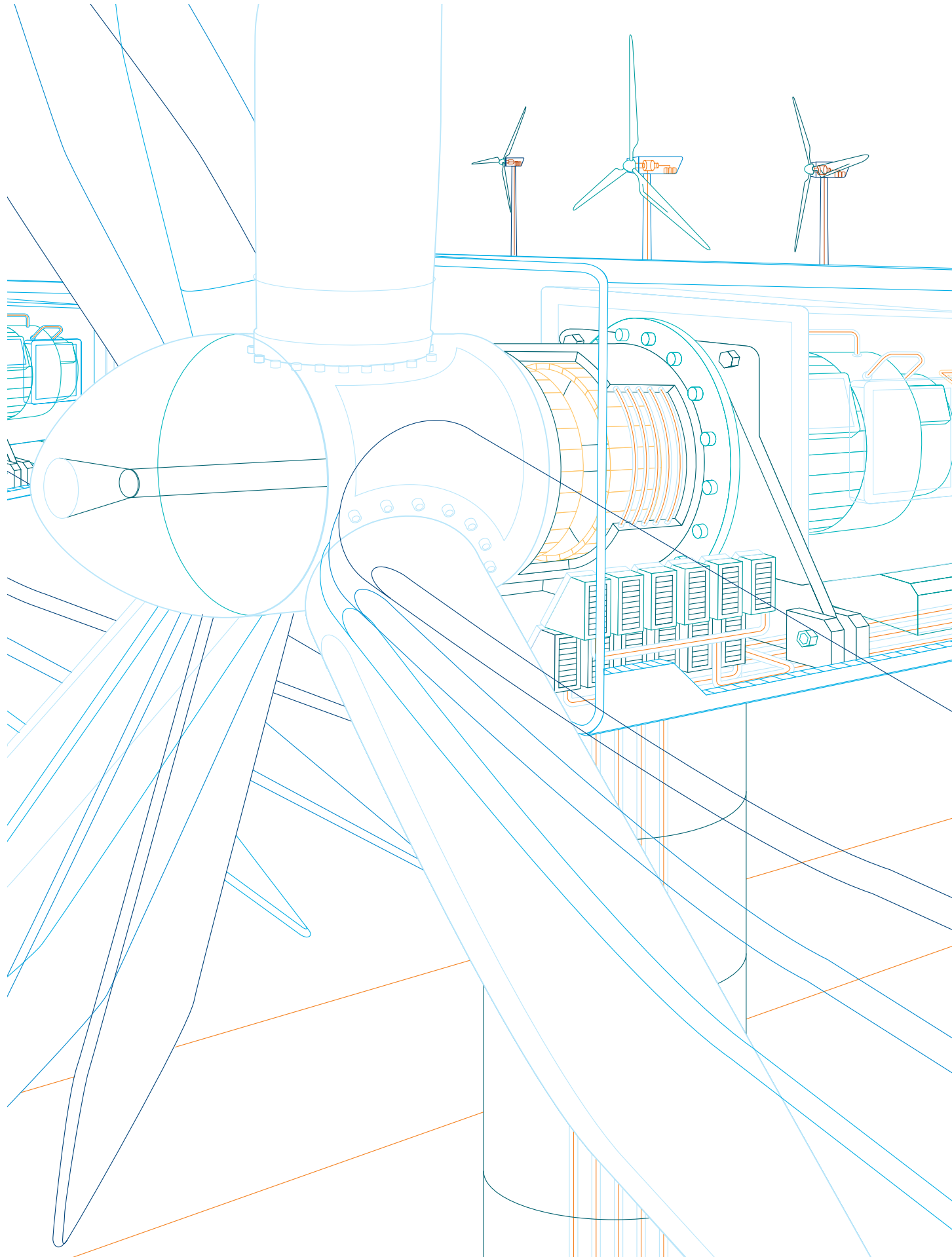
Split phase networks



General technical specifications

Type	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	-	-	-	-	-
with auxiliary contact (TS)	-	-	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	-
Electrical features												
Standards	UL 1449	UL 1449	UL 1449	UL 1449	UL 1449		UL 1449	UL 1449	UL 1449	UL 1449	UL 1449	UL 1449
Type / test class (UL 1449)	1	1	1	1	4		4	4	4	4	4	4
Protected lines	2	2	2	2	3		3	3	3	3	3	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		AC 47-63 Hz	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%		±15%	±15%	±15%	±15%	±15%	±15%
Nominal system voltage Un	120 V	277 V	120 V	277 V	120 V		277 V	120 V	277 V	347 V	480 V	600 V
Maximum continuous operating voltage MCOV	175 V	320 V	175 V	320 V	175 V		320 V	175 V	320 V	440 V	550 V	660 V
Maximal discharge current (8/20) I _{max}	15 kA	15 kA	40 kA	40 kA	15 kA		15 kA	40 kA	40 kA	40 kA	40 kA	40 kA
Nominal discharge current (8/20) I _n	5 kA	5 kA	20 kA	20 kA	5 kA		5 kA	20 kA	20 kA	10 kA	10 kA	10 kA
Voltage protection rating (L-N / N-G / L-G) VPR	0.6 kV	1 kV	0.6 kV	1 kV	0.7 kV		1.1 kV	0.7 kV	1.1 kV	1.4 kV	1.8 kV	2 kV
Response time	< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns		< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns
Short circuit withstand SCCR	200 kA	200 kA	200 kA	200 kA	200 kA		200 kA	200 kA	200 kA	200 kA	200 kA	200 kA
Back up protection fuse (gG - gL)	≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A		≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A
maximum rating circuit breaker (B or C curve)	≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A		≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A
Pluggable cartridges	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Integrated QuickSafe® technology	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
State indicator	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Safety reserve	-	-	-	-	-		-	-	-	-	-	-
Auxiliary contact (TS)	No	No	Yes	Yes	No		No	Yes	Yes	Yes	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	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...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		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
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		12.5 / 0.5	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		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
Auxiliary contact (TS)												
Contact information	-	-	2 NO - 2 NC	2 NO - 2 NC	-		-	3 NO - 3 NC	3 NO - 3 NC	3 NO - 3 NC	3 NO - 3 NC	3 NO - 3 NC
Min. load	-	-	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	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	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 / 16 mm ²	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	1.5 / 16 mm ²
Miscellaneous characteristics												
Stocking temperature	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C		-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C
Operating temperature	-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C		-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C
Degree of protection	NEMA 1	NEMA 1	NEMA 1	NEMA 1	NEMA 1		NEMA 1	NEMA 1	NEMA 1	NEMA 1	NEMA 1	NEMA 1
Fire resistance according to UL 94	V0	V0	V0	V0	V0		V0	V0	V0	V0	V0	V0
Dimensions mm	h x w x d 90.5 x 35.6 x 64.8 mm	h x w x d 90.5 x 35.6 x 64.8 mm	-	-	h x w x d 90.5 x 53.4 x 64.8 mm		h x w x d 90.5 x 53.4 x 64.8 mm	-	-	-	-	-
inches	h x w x d 3.56 x 1.4 x 2.55 in	h x w x d 3.56 x 1.4 x 2.55 in	-	-	h x w x d 3.56 x 2.1 x 2.55 in		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 -	h x w x d -	h x w x d 98.5 x 35.6 x 64.8 mm	h x w x d 98.5 x 35.6 x 64.8 mm	h x w x d -		h x w x d -	h x w x d 98.5 x 53.4 x 64.8 mm	h x w x d 98.5 x 53.4 x 64.8 mm	h x w x d 98.5 x 53.4 x 64.8 mm	h x w x d 98.5 x 53.4 x 64.8 mm	h x w x d 98.5 x 53.4 x 64.8 mm
inches	h x w x d -	h x w x d -	h x w x d 3.88 x 1.4 x 2.55 in	h x w x d 3.88 x 1.4 x 2.55 in	h x w x d -		h x w x d -	h x w x d 3.88 x 2.1 x 2.55 in	h x w x d 3.88 x 2.1 x 2.55 in	h x w x d 3.88 x 2.1 x 2.55 in	h x w x d 3.88 x 2.1 x 2.55 in	h x w x d 3.88 x 2.1 x 2.55 in
Replacement cartridges												
Phase product ID	Type OVR T2 15-150 C U	Type OVR T2 15-320 C U	Type OVR T2 40-150 C U	Type OVR T2 40-320 C U	Type OVR T2 15-150 C U		Type OVR T2 15-320 C U	Type OVR T2 40-150 C U	Type OVR T2 40-320 C U	Type OVR T2 40-440 C U	Type OVR T2 40-550 C U	Type OVR T2 40-660 C U
Order code	2CTB802348R2500	2CTB802348R2700	2CTB802348R3500	2CTB802348R3700	2CTB802348R2500		2CTB802348R2700	2CTB802348R3500	2CTB802348R3700	2CTB802348R3900	2CTB802348R4100	2CTB802348R4300
Neutral product ID	Type -	Type -	Type -	Type -	Type OVR T2 70 N C U		Type OVR T2 70 N C U	Type OVR T2 70 N C U	Type OVR T2 70 N C U	Type OVR T2 70 N C U	Type OVR T2 70 N C U	Type OVR T2 70 N C U
Order code	-	-	-	-	2CTB802348R6500		2CTB802348R6500	2CTB802348R6500	2CTB802348R6500	2CTB802348R6500	2CTB802348R6500	2CTB802348R6500

OVR type 2 surge protective devices Grounded Wye networks



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.

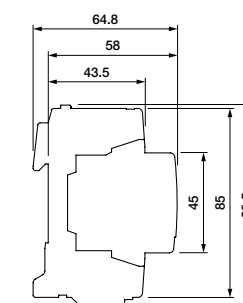
OVR T2 devices provide the best protection as they are designed to protect electric installations and sensitive equipment against indirect surges with ensuring a low protection level (VPR). They are characterized by their capacity to safely discharge current with 8/20 μ s wave form.

Ordering information

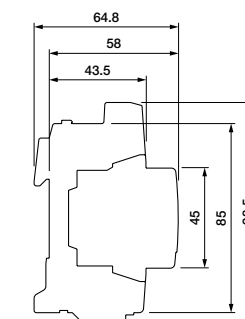
Protected lines	Max discharge current I _{max} 8/20 kA	Nominal discharge current I _n kA	Voltage protection rating VPR kV	Nominal voltage U _n V	Max. cont. operating voltage MCOV, U _c V	Bbn 3660308 EAN	Catalog number
Pluggable							
3	15	5	0.6	120 ±15%	175	518637	OVR T2 3L 15-150 P U
3	40	20	0.6	120 ±15%	175	518651	OVR T2 3L 40-150 P TS U
3	40	10	1.3	347 ±15%	440	518675	OVR T2 3L 40-440 P TS U
4	15	5	1.2	120 ±15%	175	518699	OVR T2 3N 15-150 P U
4	15	5	1.2	277 ±15%	320	518705	OVR T2 3N 15-320 P U
4	40	20	1.2	120 ±15%	175	518712	OVR T2 3N 40-150 P TS U
4	40	20	1.2	277 ±15%	320	518729	OVR T2 3N 40-320 P TS U
4	40	10	1.2	347 ±15%	440	518736	OVR T2 3N 40-440 P TS U
4	40	10	1.2	480 ±15%	550	518743	OVR T2 3N 40-550 P TS U
4	40	10	1.2	600 ±15%	660	518750	OVR T2 3N 40-660 P TS U

Catalog number	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



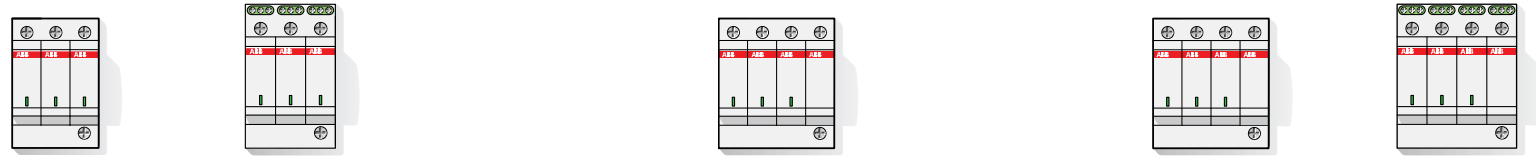
OVR T2 3L 15-150 P U
OVR T2 3N 15-150 P U
OVR T2 3N 15-320 P U



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

OVR type 2 surge protective devices

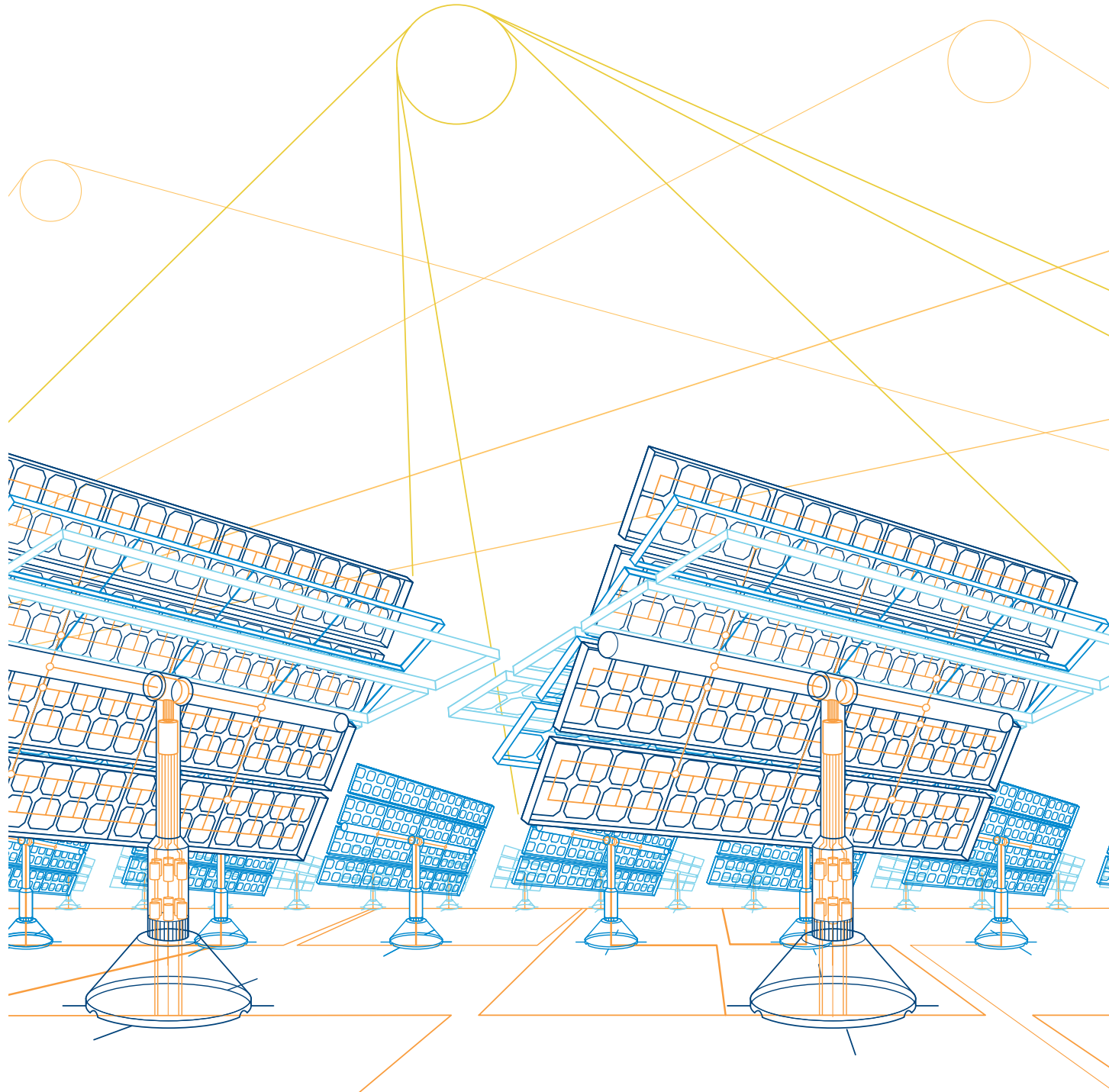
Grounded Wye networks



General technical specifications

Type	OVR T2 3L 15-150 P U	-	-	OVR T2 3N 15-150 P U	-	OVR T2 3N 15-320 P U	-	-	-	-	-
with auxiliary contact (TS)	-	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	-
Electrical features											
Standards	UL 1449	UL 1449	UL 1449	UL 1449		UL 1449	UL 1449	UL 1449	UL 1449	UL 1449	UL 1449
Type / test class (UL 1449)	1	1	1	4		4	4	4	4	4	4
Protected lines	3	3	3	4		4	4	4	4	4	4
Type of current / frequency	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz	AC 47-63 Hz		AC 47-63 Hz	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%	±15%	±15%	±15%	±15%	±15%
Nominal system voltage Un	120 V	120 V	347 V	120 V		277 V	120 V	347 V	480 V	600 V	660 V
Maximum continuous operating voltage MCOV	175 V	175 V	440 V	175 V		320 V	175 V	320 V	440 V	550 V	660 V
Maximal discharge current (8/20) Imax	15 kA	40 kA	40 kA	15 kA		15 kA	40 kA	40 kA	40 kA	40 kA	40 kA
Nominal discharge current (8/20) In	5 kA	10 kA	10 kA	5 kA		5 kA	20 kA	20 kA	10 kA	10 kA	10 kA
Voltage protection rating (L-N / N-G / L-G VPR)	0.6 kV	0.6 kV	1.3 kV	0.6 kV		1 kV	1.2 kV	1.2 kV	1.2 kV	1.2 kV	1.2 kV
Response time	< 25 ns	< 25 ns	< 25 ns	< 25 ns		< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns
Short circuit withstand SCCR	200 kA	200 kA	200 kA	200 kA		200 kA	200 kA	200 kA	200 kA	200 kA	200 kA
Back up protection fuse (gG - gL)	≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A		≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A	≤ 100 A
maximum rating circuit breaker (B or C curve)	≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A		≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A	≤ 125 A
Pluggable cartridges	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Integrated QuickSafe® technology	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
State indicator	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Safety reserve	-	-	-	-		-	-	-	-	-	-
Auxiliary contact (TS)	No	Yes	Yes	No		No	Yes	Yes	Yes	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	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...25 / 4...14 mm ²
Stripping length (L,N,PE) 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	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
Tightening torque (L,N,PE)	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	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		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
Auxiliary contact (TS)											
Contact information	-	4 NO - 4 NC	4 NO - 4 NC	-		-	4 NO - 4 NC	4 NO - 4 NC	4 NO - 4 NC	4 NO - 4 NC	4 NO - 4 NC
Min. load	-	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	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	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 / 16 mm ²	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	1.5 / 16 mm ²
Miscellaneous characteristics											
Stocking temperature	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C		-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C
Operating temperature	-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C		-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C	-40...+176 °C
Degree of protection	NEMA 1	NEMA 1	NEMA 1	NEMA 1		NEMA 1	NEMA 1	NEMA 1	NEMA 1	NEMA 1	NEMA 1
Fire resistance according to UL 94	V0	V0	V0	V0		V0	V0	V0	V0	V0	V0
Dimensions mm	90.5 x 53.4 x 64.8 mm	-	-	90.5 x 71.2 x 64.8 mm		90.5 x 71.2 x 64.8 mm	-	-	-	-	-
Dimensions inches	3.56 x 2.1 x 2.55 in	-	-	3.56 x 2.8 x 2.55 in		3.56 x 2.8 x 2.55 in	-	-	-	-	-
Dimensions with auxiliary contact (TS) mm	-	98.5 x 53.4 x 64.8 mm	98.5 x 53.4 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	98.5 x 71.2 x 64.8 mm
Dimensions with auxiliary contact (TS) inches	-	3.88 x 2.1 x 2.55 in	3.88 x 2.1 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	3.88 x 2.8 x 2.55 in
Replacement cartridges											
Phase product ID	OVR T2 15-150 C U	OVR T2 40-150 C U	OVR T2 40-440 C U	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 40-440 C U	OVR T2 40-550 C U	OVR T2 40-660 C U
Order code	2CTB802348R2500	2CTB802348R3500	2CTB802348R3900	2CTB802348R2500		2CTB802348R2700	2CTB802348R3500	2CTB802348R3700	2CTB802348R3900	2CTB802348R4100	2CTB802348R4300
Neutral product ID	-	-	-	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	OVR T2 70 N C U
Order code	-	-	-	2CTB802348R6500		2CTB802348R6500	2CTB802348R6500	2CTB802348R6500	2CTB802348R6500	2CTB802348R6500	2CTB802348R6500

OVR PV surge protection devices Photovoltaic applications



OVR PV 40-1000 P TS U

Description

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

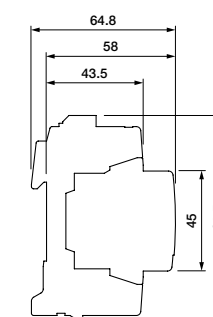
The OVR PV surge protective devices comply with UL 1449.

Ordering information

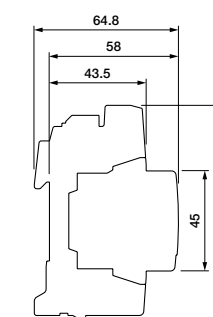
Protected lines	Max discharge current I_{max} 8/20	Nominal discharge current I_n	Voltage protection rating V_{PR}	Nominal voltage U_n	Max. cont. operating voltage $MCOV, U_c$	Bbn 3660308	Catalog number
	kA	kA	kV	V	V	EAN	
Pluggable							
2	15	5	3	600	670	521088	OVR PV 15-600 P U
2	15	5	3	600	670	521095	OVR PV 15-600 P TS U
2	40	10	3	600	670	521101	OVR PV 40-600 P U
2	40	10	3	600	670	521118	OVR PV 40-600 P TS U
2	15	5	4	800	1000	521125	OVR PV 15-800 P U
2	15	5	4	800	1000	521132	OVR PV 15-800 P TS U
2	40	10	4	800	1000	521149	OVR PV 40-800 P U
2	40	10	4	800	1000	521156	OVR PV 40-800 P TS U
2	15	5	4	1000	1250	521163	OVR PV 15-1000 P U
2	15	5	4	1000	1250	521170	OVR PV 15-1000 P TS U
2	40	10	4	1000	1250	521187	OVR PV 40-1000 P U
2	40	10	4	1000	1250	521194	OVR PV 40-1000 P TS U
2	40	15	4.5	1500	1500	524829	OVR PV 40-1500H P U
2	40	15	4.5	1500	1500	524812	OVR PV 40-1500H P TS U

Catalog number	Width mm
OVR PV 15-600 P U	53.4
OVR PV 15-600 P TS U	53.4
OVR PV 40-600 P U	53.4
OVR PV 40-600 P TS U	53.4
OVR PV 15-800 P U	53.4
OVR PV 15-800 P TS U	53.4
OVR PV 40-800 P U	53.4
OVR PV 40-800 P TS U	53.4
OVR PV 15-1000 P U	53.4
OVR PV 15-1000 P TS U	53.4
OVR PV 40-1000 P U	53.4
OVR PV 40-1000 P TS U	53.4
OVR PV 40-1500H P U	53.4
OVR PV 40-1500H P TS U	53.4

Main dimensions mm



OVR PV 15-600 P U
OVR PV 40-600 P U
OVR PV 15-800 P U
OVR PV 40-800 P U
OVR PV 15-1000 P U
OVR PV 40-1000 P U
OVR PV 40-1500H P U

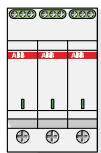


OVR PV 15-600 P TS U
OVR PV 40-600 P TS U
OVR PV 15-800 P TS U
OVR PV 40-800 P TS U
OVR PV 15-1000 P TS U
OVR PV 40-1000 P TS U
OVR PV 40-1500H P TS U

OVR PV surge protection devices

Photovoltaic applications

2



General technical specifications

Type	OVR PV 15-600 P U	OVR PV 40-600 P U	OVR PV 15-800 P U	OVR PV 40-800 P U	OVR PV 15-1000 P U	OVR PV 40-1000 P U	OVR PV 40-1500H P U
with auxiliary contacts (TS)	OVR PV 15-600 P TS U	OVR PV 40-600 P TS U	OVR PV 15-800 P TS U	OVR PV 40-800 P TS U	OVR PV 15-1000 P TS U	OVR PV 40-1000 P TS U	OVR PV 40-1500H P TS U
Technology	Varistor	Varistor	Varistor	Varistor	Varistor	Varistor	Varistor
Electrical features							
Standards	UL 1449	UL 1449	UL 1449	UL 1449	UL 1449	UL 1449	UL 1449
Type / test class (UL 1449)	1	1	1	1	1	1	1
Protected lines	2	2	2	2	2	2	2
Type of current / frequency	Photovoltaic systems - DC side	Photovoltaic systems - DC side	Photovoltaic systems - DC side	Photovoltaic systems - DC side	Photovoltaic systems - DC side	Photovoltaic systems - DC side	Photovoltaic systems - DC side
Voltage regulation of the system network	DC	DC	DC	DC	DC	DC	DC
Nominal system voltage Un	600 V	600 V	800 V	800 V	1000 V	1000 V	1500 V
Maximum continuous operating voltage MCOV	670 V	670 V	1000 V	1000 V	1250 V	1250 V	1500 V
Maximal discharge current (8/20) Imax	15 kA	40 kA	15 kA	40 kA	15 kA	40 kA	40 kA
Nominal discharge current (8/20) In	5 kA	10 kA	5 kA	10 kA	5 kA	10 kA	15 kA
Voltage protection rating (L-N / N-G / L-G) VPR	3 kV	3 kV	4 kV	4 kV	4 kV	4 kV	4.5 kV
Response time	< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns	< 25 ns
Residual current IPE	< 25 µA	< 25 µA	< 25 µA	< 25 µA	< 25 µA	< 25 µA	< 25 µA
Short circuit withstand SCCR	1 kA	1 kA	1 kA	1 kA	1 kA	1 kA	1 kA
Disconnecter							
fuse (gG - gL)	-	-	-	-	-	-	-
circuit breaker (B or C curve)	-	-	-	-	-	-	-
Pluggable cartridges	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Integrated QuickSafe® technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State indicator	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Safety reserve	No	No	No	No	No	No	No
Auxiliary contact (TS)	Yes (TS option)	Yes (TS option)	Yes (TS option)	Yes (TS option)	Yes (TS option)	Yes (TS option)	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	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	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	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	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	3 NO – 3 NC	3 NO – 3 NC	3 NO – 3 NC	3 NO – 3 NC	3 NO – 3 NC
Min. load	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	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	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...16 mm ²	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	1.5...16 mm ²
Miscellaneous characteristics							
Stocking and operating temperature	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C
Degree of protection	NEMA 1	NEMA 1	NEMA 1	NEMA 1	NEMA 1	NEMA 1	NEMA 1
Fire resistance according to UL 94	V0	V0	V0	V0	V0	V0	V0
Dimensions							
mm	h x w x d 91.5 x 53.4 x 64.8 mm	h x w x d 91.5 x 53.4 x 64.8 mm	h x w x d 91.5 x 53.4 x 64.8 mm	h x w x d 91.5 x 53.4 x 64.8 mm	h x w x d 91.5 x 53.4 x 64.8 mm	h x w x d 91.5 x 53.4 x 64.8 mm	h x w x d 91.5 x 53.4 x 64.8 mm
inches	h x w x d 3.6 x 2.1 x 2.55 in	h x w x d 3.6 x 2.1 x 2.55 in	h x w x d 3.6 x 2.1 x 2.55 in	h x w x d 3.6 x 2.1 x 2.55 in	h x w x d 3.6 x 2.1 x 2.55 in	h x w x d 3.6 x 2.1 x 2.55 in	h x w x d 3.6 x 2.1 x 2.55 in
Dimensions with auxiliary contact (TS)							
mm	h x w x d 96 x 53.4 x 64.8 mm	h x w x d 96 x 53.4 x 64.8 mm	h x w x d 96 x 53.4 x 64.8 mm	h x w x d 96 x 53.4 x 64.8 mm	h x w x d 96 x 53.4 x 64.8 mm	h x w x d 96 x 53.4 x 64.8 mm	h x w x d 96 x 53.4 x 64.8 mm
inches	h x w x d 3.78 x 2.1 x 2.55 in	h x w x d 3.78 x 2.1 x 2.55 in	h x w x d 3.78 x 2.1 x 2.55 in	h x w x d 3.78 x 2.1 x 2.55 in	h x w x d 3.78 x 2.1 x 2.55 in	h x w x d 3.78 x 2.1 x 2.55 in	h x w x d 3.78 x 2.1 x 2.55 in
Replacement cartridges							
Phase product ID	OVR PV 15-600 C U	OVR PV 40-600 C U	OVR PV 15-800 C U	OVR PV 40-800 C U	OVR PV 15-1000 C U	OVR PV 40-1000 C U	OVR PV 40-1500H C U
Order code	2CTB802349R2900	2CTB802349R0400	2CTB802349R3500	2CTB802349R1000	2CTB802349R4100	2CTB802349R1600	2CTB802349R1700

OVR TC surge protective devices Dateline protection

2



OVR TC 200FR US

Description

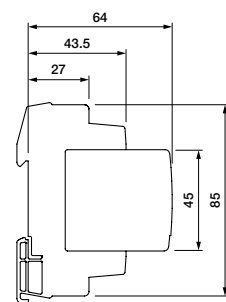
The OVR TC family offers a reliable surge protection to dateline networks for datacenters, water treatment installations or wind turbine installations.

With the RJ11 and RJ45 bases, they allow a flexible and easy installation.

Ordering information

Protected lines	Max discharge current I _{max} 8/20 kA	Nominal discharge current I _n kA	Voltage protection rating VPR V	Nominal voltage U _n V	Max. cont. operating voltage MCOV, U _c V	Bbn 3660308 EAN	Catalog number
Pluggable							
1	10	5	300	200	220	512291	OVR TC 200FR US
1	10	5	15	6	7	512246	OVR TC 06V US
1	10	5	20	12	14	512253	OVR TC 12V US
1	10	5	35	24	27	512260	OVR TC 24V US
1	10	5	70	48	53	512277	OVR TC 48V US
1	10	5	700	200	220	-	OVR TC 200 V US

Main dimensions mm



Catalog number	Width mm
OVR TC 200FR US	12
OVR TC 06V US	12
OVR TC 12V US	12
OVR TC 24V US	12
OVR TC 48V US	12

OVR TC 200FR US
OVR TC 06V US
OVR TC 12V US
OVR TC 24V US
OVR TC 48V US

OVR TC surge protection devices Dateline protection

2



General technical specifications

Type	OVR TC 200FR US	OVR TC 06V US	OVR TC 12V US	OVR TC 24V US	OVR TC 48V US
with auxiliary contact (TS)	-	-	-	-	-
Connection configuration	Serie	Serie	Serie	Serie	Serie
Electrical features					
Standards	UL 1449	UL 1449	UL 1449	UL 1449	UL 1449
Test class	II	II	II	II	II
Number of protected wires	1	1	1	1	1
Types of network	RTC analog / ADSL	MIC/T2 - RS422/485	RS232	LS - 4/20mA	RNIS - To
Type of current	DC	DC	DC	DC	DC
Nominal voltage U _n	200 V	6 V	12 V	24 V	48 V
Maximal continuous operating voltage M _{cov}	220 V	7 V	14 V	27 V	53 V
Maximal discharge current (8/20) I _{max}	10 kA	10 kA	10 kA	10 kA	10 kA
Nominal discharge current (8/20) I _n	5 kA	5 kA	5 kA	5 kA	5 kA
Voltage protection level at I _n / VPR	300 V	15 V	20 V	35 V	70 V
Short circuit withstand current	10 kA	10 kA	10 kA	10 kA	10 kA
Response time	<1 ns	<1 ns	<1 ns	<1 ns	<1 ns
Operating current I _c	140 mA	140 mA	140 mA	140 mA	140 mA
Series resistance	10 Ohm	10 Ohm	10 Ohm	10 Ohm	10 Ohm
Cut frequency	3 MHz	10 MHz	2 MHz	4 MHz	6 MHz
Pluggable unit	No	No	No	No	No
State Indicator	Yes	Yes	Yes	Yes	Yes
Safety reserve	No	No	No	No	No
Auxiliary contact (TS)	No	No	No	No	No
Installation					
Wire range (L,N, PE) solid wire	0.5...2.5 mm ²	0.5...2.5 mm ²	0.5...2.5 mm ²	0.5...2.5 mm ²	0.5...2.5 mm ²
stranded wire	-	-	-	-	-
Stripping length (L, N, PE)	6 mm ²	6 mm ²	6 mm ²	6 mm ²	6 mm ²
Tightening torque (L, N, PE)	0.2 Nm	0.2 Nm	0.2 Nm	0.2 Nm	0.2 Nm
Auxiliary contact (TS)					
Contact complement	-	-	-	-	-
Min. load	-	-	-	-	-
Max. load	-	-	-	-	-
Connection cross section	-	-	-	-	-
Miscellaneous characteristics					
Operating temperature	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C	-40...+80 °C
Degree of protection	IP20	IP20	IP20	IP20	IP20
Fire resistance according to UL 94	V0	V0	V0	V0	V0
Dimensions mm	h x w x d 85 x 12 x 64 mm	85 x 12 x 64 mm	85 x 12 x 64 mm	85 x 12 x 64 mm	85 x 12 x 64 mm
inches	h x w x d 3.35 x 0.47 x 2.52 in	3.35 x 0.47 x 2.52 in	3.35 x 0.47 x 2.52 in	3.35 x 0.47 x 2.52 in	3.35 x 0.47 x 2.52 in

Joslyn® surge protective devices

JSP	3/2
Surgitron® I	3/4
TransEnd®	3/5
Surgitron® III -21 series	3/6
Surgitron® III -49 series	3/7
Surgitron® III -22 series	3/8
LDP	3/9
1000 series	3/10

JSP

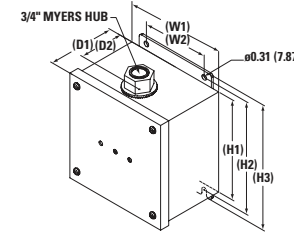
Heavy duty for service entrance applications

Description

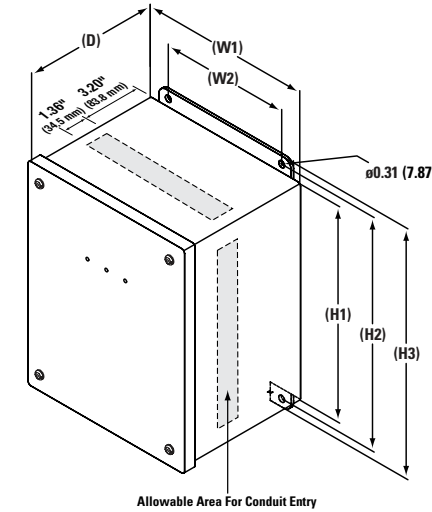
- Listed to UL 1449 4th Edition for a Type 1 and Type 2 SPD application.
- Fail-safe design with individually fused Metal Oxide Varistors (MOVs) eliminating single point failure, protecting against both overcurrent and overvoltage events.
- 200kAIC short circuit rating permits direct bus connection to 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.
- 10-year standard warranty with optional 15-year extended warranty.



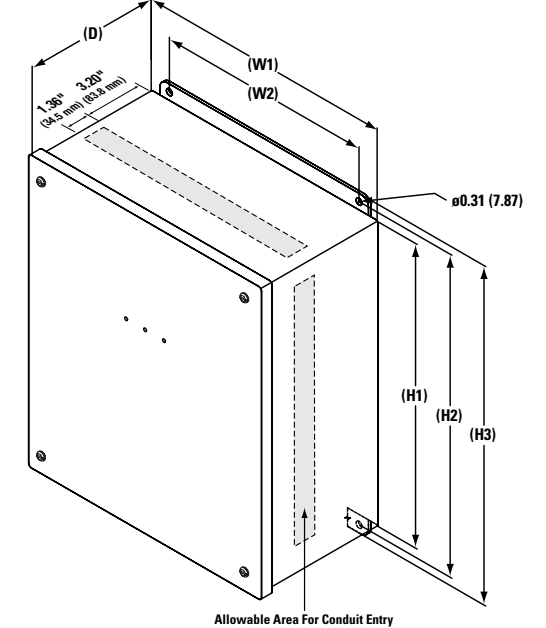
JSP 60-100



JSP 120-160



JSP 200-400



Ordering information

Catalog number	Voltage	Configuration
JSPxxx-1P120	120V	1-Phase, 2-Wire + Ground
JSPxxx-1P240	240V	1-Phase, 2-Wire + Ground
JSPxxx-1S240	120/240V	2-Phase, 3-Wire + Ground
JSPxxx-3Y208	120/208V	3-Phase Wye, 4-Wire + Ground
JSPxxx-3Y380	220/380V	3-Phase Wye, 4-Wire + Ground
JSPxxx-3Y415	240/415V	3-Phase Wye, 4-Wire + Ground
JSPxxx-3Y480	277/480V	3-Phase Wye, 4-Wire + Ground
JSPxxx-3H240	120/240V	3-Phase High-Leg, 4-Wire + Ground
JSPxxx-3D240	240V	3-Phase Delta, 3-Wire + Ground
JSPxxx-3D380*	380V	3-Phase Delta, 3-Wire + Ground
JSPxxx-3D480*	480V	3-Phase Delta, 3-Wire + Ground
JSPxxx-3Y600*	600V	3-Phase Wye, 4-Wire + Ground
JSPxxx-3D600*	600V	3-Phase Delta, 4-Wire + Ground

*Not available in all kA
Where xxx = 60, 80, 100, 120, 160, 200, 240, 300, 400kA per phase
Above are the most popular configurations.

Warranty	Available options
10-years (optional 15-years)	Advanced monitoring Surge counter Transient filter Stainless steel enclosure
Recessed option JSPR	(to be ordered as a separate item) Compact design to allow the SPD to be recessed into the wall. (available in 120, 160kA only in all voltage configurations. Optional surge counter not available.)
Flush-mount options JSP-FMP JSPR-FMP-120/160	(to be ordered as a separate item) Flush-mount plate kit (available in 60, 80, 100kA only) Flush-mount plate kit (available in 120, 160kA JSPR only)

Technical specifications

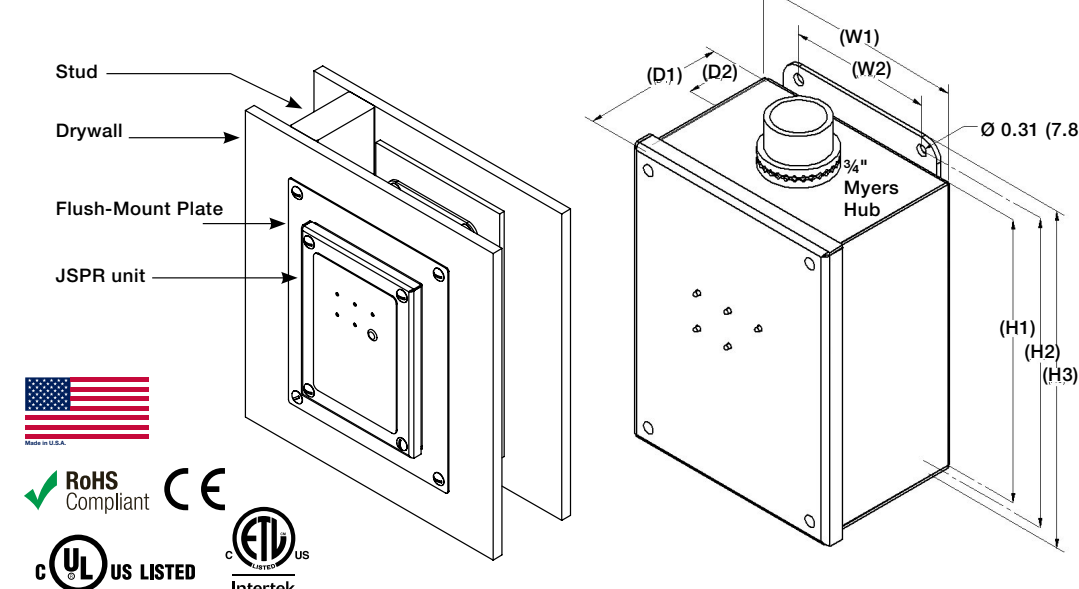
Electrical	Mechanical	Regulatory
Nominal Discharge Current Rating (I-n)	Weight	UL 1449 4th Edition Type
(l-n) 60, 80, 100kA – 10kA 120kA or higher – 20kA	60-100 10 lbs. (4.5 kg) 120-160 20 lbs. (9 kg) 200-400 40 lbs. (18.2 kg)	Type 1
Operating Frequency	Enclosure Type	UL 1283
47-63Hz	Powder-coated, impact-resistance steel, weather-proof NEMA 4	IEEE C62.41.1, .2, C62.45
Connection Method	Installation Location	Listed By
Parallel to electrical distribution system	Indoor/Outdoor	ETL 60-100kA models only UL 120-400kA models only CE 120-400kA models only
Response Time	Operating Environment	
Less than 1 nanosecond	-40° to +185°F (-40° to +70°C)	
Standard Monitoring	Altitude	
60-100kA and JSPR only – LED status indicator lights (one per phase)	Up to 13,000 ft. (4000 m)	
120kA or higher LED status indicator lights (one per phase)	Product Design	
Standard Dry (From C) Relay Contacts	Parallel design with individually fused MOVs	
Audible Alarm with Silence Button		

Technical specifications

Dim	JSP 60, 80, 100	JSP 120, 160	JSP 200, 240, 300, 400
H1	6.00 (152.4)	10.00 (254.0)	14.00 (355.6)
H2	6.75 (171.5)	10.75 (273.1)	14.75 (374.7)
H3	7.50 (190.5)	11.50 (292.1)	15.50 (393.7)
W1	6.00 (152.4)	8.00 (203.2)	12.00 (304.8)
W2	4.00 (101.6)	6.00 (152.4)	10.00 (254.0)
D	-	6.20 (157.5)	6.20 (157.5)
D1	4.16 (105.7)	-	-
D2	2.00 (50.8)	-	-

All measurements in inches (mm)

JSPR



Approximate dimensions

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

All measurements in inches (mm)



Surgitron® I

Heavy duty service entrance application modular design

Description

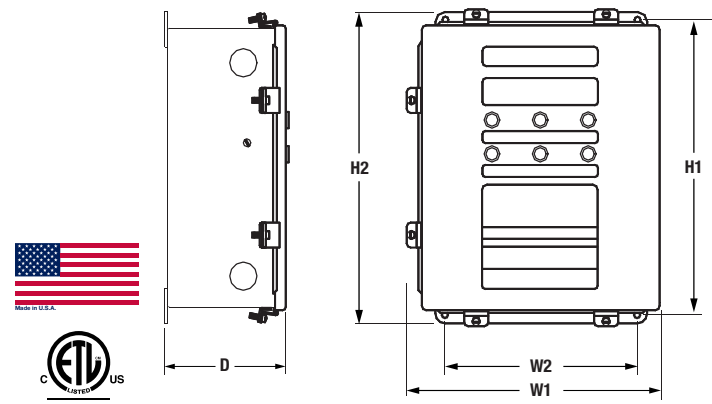
- Listed by ETL to UL 1449 4th Edition for a Type 1 SPD application.
- Matrix of individually fused Metal Oxide Varistors (MOVs) housed in replaceable modules.
- Cover lights indicate status of modules.

Ordering information

Catalog number	kA Per Phase	Voltage	Configuration
1260-45/85	120kA	120V	1-Phase, 2-Wire + Ground
1261-45/85	120kA	230V	1-Phase, 2-Wire + Ground
1265-45/85	120kA	120/240V	1-Phase, 3-Wire + Ground
1265-85-M*/MN*	240kA	120/240V	1-Phase, 3-Wire + Ground
1455-45/80/85	120kA	120/208V	3-Phase Wye, 4-Wire + Ground
1455-85-M*/MN*	240kA	120/208V	3-Phase Wye, 4-Wire + Ground
1457-45/80/85	120kA	230/400V	3-Phase Wye, 4-Wire + Ground
1456-45/80/85	120kA	277/480V	3-Phase Wye, 4-Wire + Ground
1456-85-M*/MN*	240kA	277/480V	3-Phase Wye, 4-Wire + Ground
1456-85-L	240kA	277/480V	3-Phase, 4-Wire + Ground
1450-85	120kA	220-240V	3-Phase, 3-Wire Ungrounded Delta
1266-85	120kA	240V	3-Phase Delta, 3-Wire + Corner Grounded
1452-80/85	120kA	120/240V	3-Phase High-Leg Delta, 4-Wire + Ground
1451-85	120kA	440/480V	3-Phase, 3-Wire Ungrounded

*M = L-N only
*MN = L-N, N-G only

Warranty 5-years	
Available options	
Surge counter	Add suffix -S
Stainless Steel NEMA 4X enclosure	Add suffix -4X
Dry Relay Contacts available on select models.	
Stand alone option	
Remote Monitor	1260-97 (available on select models)



Technical specifications

Electrical	
Nominal Discharge Current Rating (I-n)	20kA
Operating Frequency	50-60Hz
Connection Methods	Parallel to Load (shunt) Lugs #14-#2 Directly connect or through 60A (min) breaker
Response Time	Less than 1 nanosecond (one per phase)
Standard Monitoring	LED status indicator lights (one per phase)
Mechanical	
Weight	Model dependent
Enclosure Type	Model dependent
Installation Location	Indoor/Outdoor
Operating Environment	-40° to +185°F (-40° to +85°C)
Altitude	Up to 16,400 ft. (5000 m)
Product Design	Individually fused MOVs Overcurrent Fusing
Regulatory	
UL 1449 4th Edition Type	Type 1
UL 1283	No
IEEE C62.41.1, .2, C62.45	Yes
Listed By	ETL

Approximate dimensions

Dim	1265-45/85, 1265-85-M/MN, 1266-85	1450-85, 1451-85, 1452-80/85, 1455-45/80/85, 1455-85-M/MN, 1456-45/80/85, 1456-85-L, 1456-85-M/MN, 1457-45/80/85	1260-45/85, 1261-45/85
H1	12.75 (323.9)	14.75 (374.7)	10.75 (273.1)
H2	13.50 (342.9)	15.50 (393.7)	11.50 (292.1)
W1	10.90 (276.9)	12.90 (327.7)	08.90 (226.1)
W2	08.00 (203.2)	10.00 (254.0)	06.00 (152.4)
D	05.20 (132.1)	06.20 (157.5)	04.20 (106.7)

All measurements in inches (mm)

TransEnd®

Medium duty for distribution applications

Description

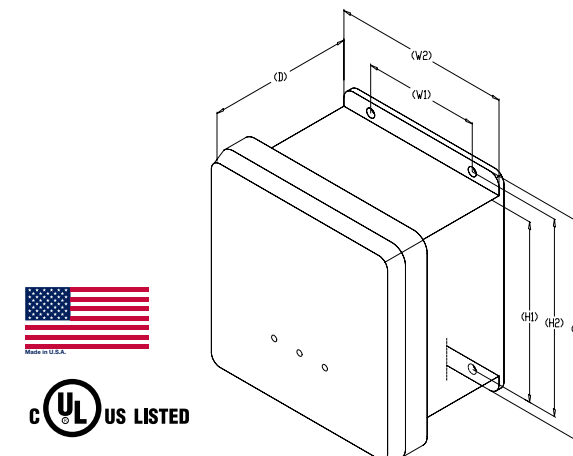
- Listed to UL 1449 4th Edition for a Type 2 SPD application.
- Protects facilities and equipment against the harmful effects of lightning strikes and internally generated electrical transients.
- Includes pre-wired pigtail conductors to streamline installation.
- Features internal copper bus conduction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

Ordering information

Catalog number	Voltage	Configuration
XNxx-120/240-2G	120/240V	1-Phase, 3-Wire + Ground
XNxx-120/208-3GY	120/208V	3-Phase Wye, 4-Wire + Ground
XNxx-220/380-3GY	220/380V	3-Phase Wye, 4-Wire + Ground
XNxx-120/240-3GHD	120/240V	3-Phase High-Leg Delta, 4-Wire + Ground
XNxx-277/480-3GY	277/480V	3-Phase Wye, 4-Wire + Ground
XNxxx-240-3DG	240V	3-Phase, 3-Wire + Ground
XNxxx-380-3DG	380V	3-Phase, 3-Wire + Ground
XNxxx-480-3DG	480V	3-Phase, 3-Wire + Ground

Where XX = 25, 50, 80, 100kA Per Mode

Warranty 5-years	
Available options	
Dry Form "C" Relay Contacts	Add suffix -FC
Stand alone option	(to be ordered as a separate item)
Option A XN Metallic Conduit Kit	1260-97 (available on select models) Metallic conduit installation kit has a 3/4" (.019 m) x 3" (.076 m) metallic nipple and all associated hardware required to complete the TransEnd installation
Option B XN Plastic Conduit Kit	Flexible plastic conduit installation kit, including 18" (.457 m) flexible conduit and all associated hardware required to complete the TransEnd installation



Technical specifications

Electrical	
Nominal Discharge Current Rating (I-n)	20kA
Operating Frequency	47-63Hz
Connection Methods	Parallel to Load (shunt) 24" #10 AWG wires Through 20A (max) breaker
Response Time	Less than 1 nanosecond (one per phase)
Standard Monitoring	LED status indicator lights
Mechanical	
Weight	12.7 lbs. (5.8 kg)
Enclosure Type	NEMA 4X fiberglass-reinforced polyester (FRP) surface-mount, non-removable cover
Installation Location	Indoor/Outdoor
Operating Environment	-40° to +140°F (-40° to +60°C)
Altitude	Up to 16,400 ft. (5000 m)
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

Approximate dimensions

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

All measurements in inches (mm)

Surgitron® III -21 series

Medium duty for residential or industrial applications

Description

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

Ordering information

Type 1			
Catalog number	kA Per Phase	Voltage	Configuration
1260-21	40kA	120V	1-Phase, 2-Wire + Ground
1265-21	40kA	120/240V	2-Phase, 3-Wire + Ground
1265-21-G	40kA	120/240V	2-Phase, 3-Wire + Ground
1455-21	40kA	120/208V	3-Phase, 4-Wire + Ground
1455-21-A	40kA	120/208V	3-Phase, 4-Wire + Ground
1455-21-D	40kA	230/240V	3-Phase Delta, 3-Wire + Ground

Type 2			
Catalog number	kA Per Phase	Voltage	Configuration
1261-21-xx	40kA	230V	1-Phase, 2-Wire + Ground
1261-21	40kA	277V	1-Phase, 2-Wire + Ground
1263-21	40kA	480V	1-Phase, 2-Wire
1452-21	40kA	120/240V	3-Phase High-Leg Delta, 4-Wire + Ground
1456-21	40kA	277/480V	3-Phase, 4-Wire + Ground
1456-21-D	40kA	480V	3-Phase, 3-Wire + Ground
1457-21	40kA	230/400V	3-Phase, 4-Wire + Ground

xx = -TNG, -TMS, -TT, -IT, -IT-L
Bracket comes standard with all models

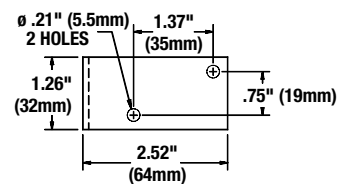
Warranty	3-years
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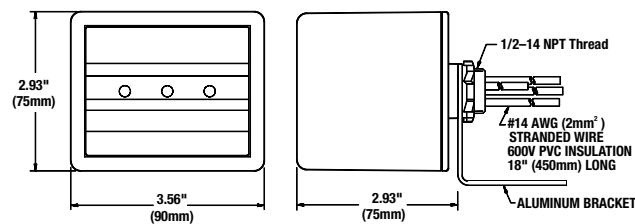
Technical specifications

Electrical	
Nominal Discharge Current Rating (I-n)	20kA
Operating Frequency	47-63Hz
Connection Methods	Parallel to Load (shunt) #14 AWG wires
Response Time	Less than 1 nanosecond (one per phase)
Standard Monitoring	LED status indicator lights
Mechanical	
Weight	2 lbs. (.9 kg)
Enclosure Type	NEMA 1, Non-metallic
Installation Location	Indoor
Operating Environment	-40° to +176°F (-40° to +80°C)
Altitude	Up to 16,400 ft. (5000 m)
Product Design	Individually fused MOVs
Regulatory	
UL 1449 4th Edition Type	Model dependent
UL 1283	No
IEEE C62.41.1, .2, C62.45	Yes
Listed By	UL

Bracket detail



Approximate dimensions



RoHS Compliant



Surgitron® III -49 series

Medium duty for residential or industrial applications

Description

- Listed to UL 1449 4th Edition for a Type 1 or Type 2 SPD application.
- Individual fusing for each Metal Oxide Varistors (MOVs).
- LED indicates proper function of individual MOVs.

Ordering information

Type 1			
Catalog number	kA Per Phase	Voltage	Configuration
1260-49	40kA	120V	1-Phase, 2-Wire + Ground
1260-49-C	40kA	120V	1-Phase, 2-Wire + Ground
1261-49-C	40kA	240V	1-Phase, 2-Wire + Ground
1265-49	40kA	120/240V	2-Phase, 3-Wire + Ground
1265-49-C	40kA	120/240V	2-Phase, 3-Wire + Ground
1450-49	40kA	240V	3-Phase Delta, 4-Wire + Ground
1455-49	40kA	120/208V	3-Phase Delta, 4-Wire + Ground

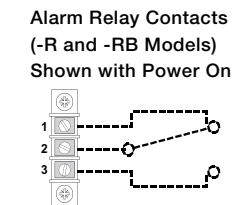
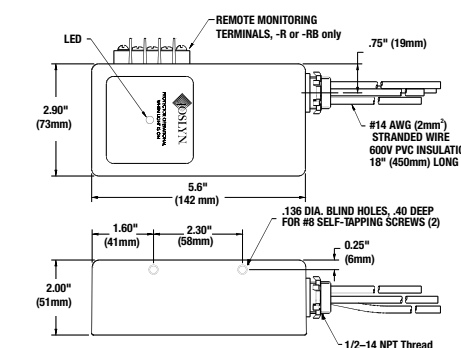
Type 2			
Catalog number	kA Per Phase	Voltage	Configuration
1261-49	40kA	240V	1-Phase, 2-Wire + Ground
1451-49	40kA	480V	3-Phase Delta, 3-Wire + Ground
1452-49	40kA	120/240V	3-Phase High-Leg Delta, 4-Wire + Ground
1456-49	40kA	277/480V	3-Phase, 4-Wire + Ground
1457-49	40kA	230-400V	3-Phase, 4-Wire + Ground

-CF Model (Contains UL 1283 listed filter)			
Catalog number	kA Per Phase	Voltage	Configuration
1265-49-CF*	80kA	120/240V	2-Phase, 3 Wire + Ground

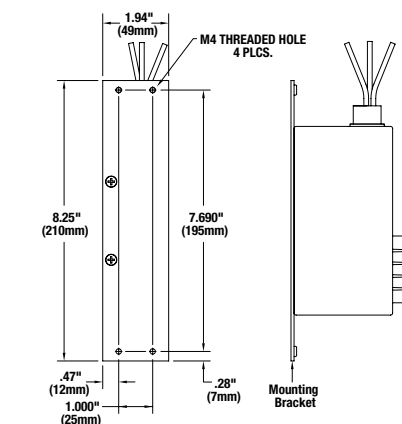
*Dry Relay Contacts not available.

Warranty	3-years
Options	(to be ordered as a separate item)
1 Set of Dry Relay Contacts (All Models)	Add suffix -R
1 Set of Dry Relay Contacts + Mounting Bracket	Add suffix -RB
xx-RB Option only Available on 1261 and 1457 models	

Approximate dimensions



-RB MODEL ONLY



1265-49-CF model Same Dimensions as -R With no Dry Relay Contacts



Technical specifications

Electrical	
Nominal Discharge Current Rating (I-n)	20kA
Operating Frequency	47-63Hz
Connection Methods	Parallel to Load (shunt) #14 AWG wires
Response Time	Less than 1 nanosecond (one per phase)
Standard Monitoring	LED status indicator lights
Mechanical	
Weight	2 lbs. (.9 kg)
Enclosure Type	NEMA 1, Non-metallic
Installation Location	Indoor
Operating Environment	-40° to +176°F (-40° to +80°C)
Altitude	Up to 16,400 ft. (5000 m)
Product Design	Individually fused MOVs
Regulatory	
UL 1449 4th Edition Type	Model dependent
UL 1283	No (Except for 1265-49-CF model)
IEEE C62.41.1, .2, C62.45	Yes
Listed By	UL

Surgitron® III -22 series

Medium duty for residential or industrial applications

Description

- Listed to UL 1449 4th Edition for Type 2 SPD application.
- Multiple Metal Oxide Varistors (MOVs) with individual and overcurrent protection.
- LED indicates proper function of individual MOVs.

Ordering information

Catalog number	kA Per Phase	Voltage	Configuration
1265-22-80-F1	80kA	120/240V	1-Phase, 3-Wire
1265-22-60-F1	60kA	120/240V	1-Phase, 3-Wire
1265-22-40-F1	40kA	120/240V	1-Phase, 3-Wire

Warranty

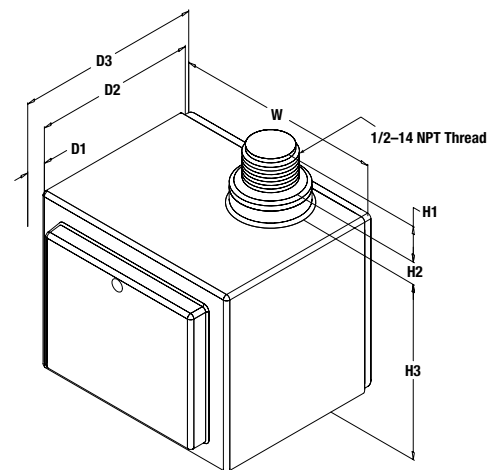
3-years

Stand alone option

Flush-Mount Plate Kit (to be ordered as a separate item)

22-FMP-KIT

Approximate dimensions



Schematic shown in horizontal position. (Photo shown in vertical position)

Approximate dimensions

Dim	TransEnd
H1	.75 (19.1)
H2	.25 (6.4)
H3	2.93 (74.4)
W	3.56 (90.4)
D1	.32 (8.1)
D2	2.78 (70.6)
D3	3.10 (78.7)

All measurements in inches (mm)



Technical specifications

Electrical	
Nominal Discharge Current Rating (I-n)	Model dependent
Operating Frequency	50-60Hz
Connection Methods	#14 AWG wires 30A Max Breaker
Response Time	Less than 1 nanosecond (one per phase)
Standard Monitoring	LED status indicator lights
Mechanical	
Weight	2 lbs. (.9 kg)
Enclosure Type	NEMA 1, Non-metallic
Installation Location	Indoor
Operating Environment	-40° to +185°F (-40° to +85°C)
Altitude	Up to 16,400 ft. (5000 m)
Product Design	Individually fused MOVs
Regulatory	
UL 1449 4th Edition Type	Type 2
UL 1283	No
IEEE C62.41.1, .2, C62.45	Yes
Listed By	UL

LDP

Light duty for AC applications

Description

- Listed by ETL to UL 1449 4th Edition for a Type 1 SPD application.
- Multiple Metal Oxide Varistors (MOVs), with individual current fusing and thermal disconnects for each MOV.
- LED indicates proper functioning of L-N MOVs.
- Intended for use on U.S., TN-C, TN-C-S and TNS grounded systems.

Ordering information

Catalog number scheme

kA Rating	Voltage	Modes Protected	
LDP XX - YYY - Z			
20	120	1 L1-N, N-G	(1 LED)
25	127	2 L1-N, L2-N	(2 LEDs)
30	230	3 L1-G, L2-G	(2 LEDs)
	277	4 L1-G, N-G	(1 LED)
		5 L1-N, L1-G	(2 LEDs)
		6 L1-N	(1 LED)
		7 L1-G	(1 LED)
		8 N-G	(0 LEDs)
		9 L1-L2	(1 LED)

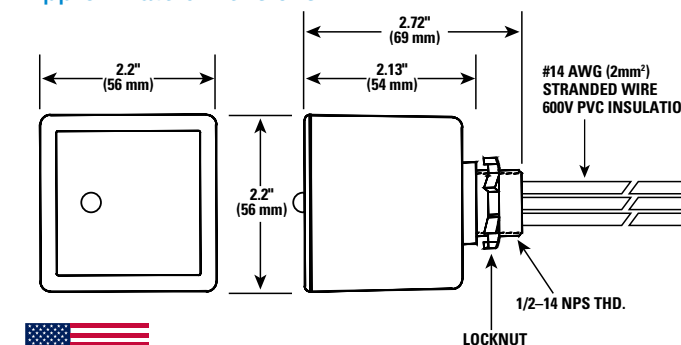
Example: LDP30-120-1

30kA device suitable for 120V systems, designed to protect L1-N and N-G mode

A dedicated breaker should be ≥20A at main panel or ≥10A at subpanel.

Warranty	
3-years	
Available options	
Mounting Bracket	Add suffix -B

Approximate dimensions



Technical specifications

Electrical	
Nominal Discharge Current Rating (I-n)	10kA
Operating Frequency	47-63Hz
Connection Methods	Parallel to Load (shunt) 18" #14 AWG wires Direct connect or Breaker
Response Time	Less than 1 nanosecond
Standard Monitoring	LED status indicator lights (one per phase)
Mechanical	
Weight	1 lb. (.5kg)
Enclosure Type	NEMA 1, Non-metallic
Installation Location	Indoor
Operating Environment	-40° to +176°F (-40° to +80°C)
Altitude	Up to 16,400 ft. (5000 m)
Product Design	Individually fused MOVs Overcurrent Fusing Thermal Fusing
Regulatory	
UL 1449 4th Edition Type	Type 1
UL 1283	No
IEEE C62.41.1, .2, C62.45	Yes
Listed By	ETL

1000 Series Light Duty for DC Applications

Description

- Full weather permanently connected.
- Individually fused Metal Oxide Varistors (MOVs).
- May be used on grounded (+ or -) or floating power systems, for DC or low voltage AC (up to 400Hz).
- LED indicates proper functioning of L-L and L-G MOVs.

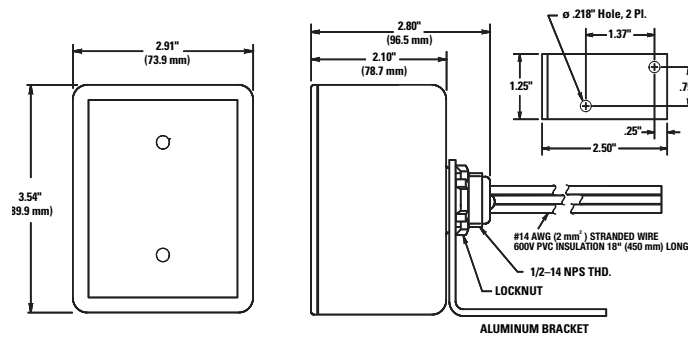
Ordering information

Catalog number	kA Per Phase	Voltage	Configuration
1020-30	25kA	30Vdc	25Vac
1020-60	50kA	60Vdc	45Vac
1020-90	50kA	90Vdc	65Vac
1020-150*	50kA	150Vdc	110Vac

*Catalog number 1020-150 is not intended for use on 110/120 Vac power system. Mounting bracket standard on all units

Warranty
3-years

Approximate dimensions



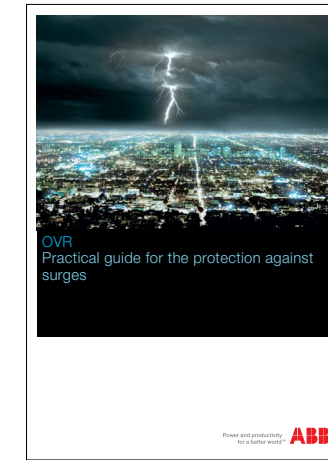
Schematic shown in vertical position. (Photo shown in horizontal position)



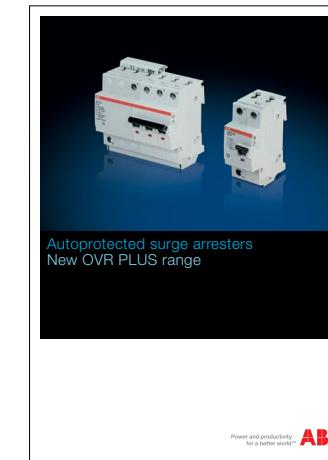
Technical specifications

Electrical	
Nominal Discharge Current Rating (I-n)	None
Operating Frequency	AC/DC 0-400 Hz
Connection Methods	Mounts through 1/2" knockout or by its bracket
Modes of Protection	Connects in parallel with load
Response Time	L-L, L-G
Standard Monitoring	Less than 1 nanosecond
	LED status indicator lights
Mechanical	
Weight	1.5 lbs. (.7kg)
Enclosure Type	NEMA 1
Installation Location	Indoor
Operating Environment	-40° to +176°F (-40° to +80°C)
Altitude	Up to 16,400 ft. (5000 m)
Product Design	Individually fused MOVs Overcurrent Fusing Thermal Fusing
Regulatory	
Requirements are discretionary and respective to the product application	

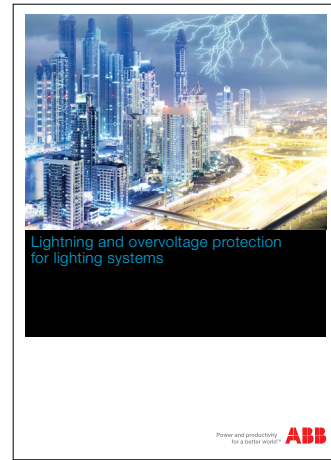
Marketing tools



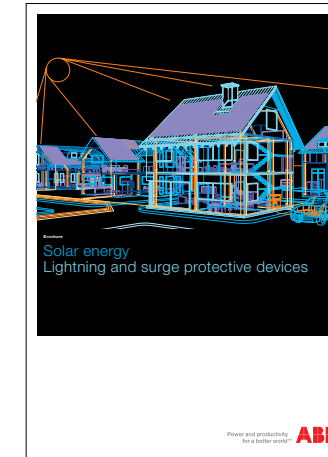
Brochure
OVR Practical guide for the protection against surges with QuickSafe® technology
1TXH000416C0201



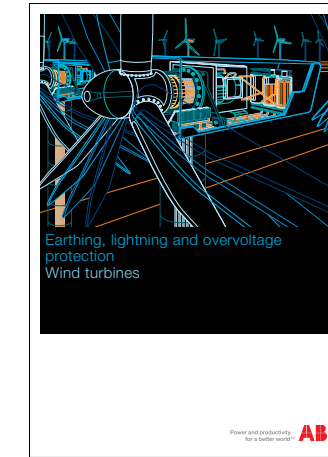
Brochure
Autoprotected surge arresters
New OVR PLUS range
1TXH000045B0203



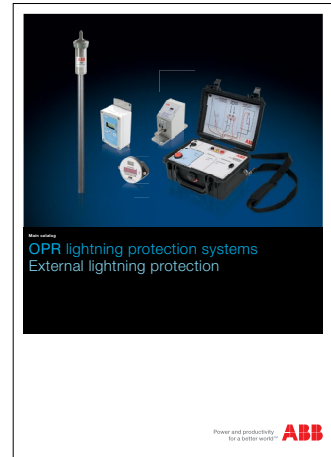
Brochure
Lightning and overvoltage protection for lighting systems
1TXH000312B0202



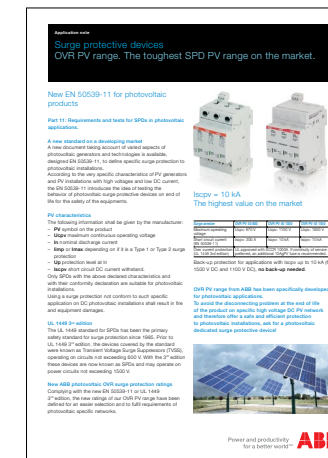
Brochure
Solar energy
Lightning and surge protective devices
1TXH000118B0202



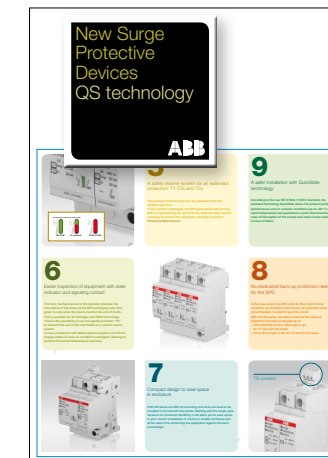
Brochure
Earthing, lightning and overvoltage protection
Wind turbines
1TXH000215B0201



Main catalog
OPR lightning protection systems
External lightning protection
1TXH000247C0202



Application note
Surge protective devices - OVR PV range.
The toughest SPD PV range on the market.
1TXH000313L0202



Leaflet
New Surge Protective Devices
QS technology
1TXH000351E0201



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ABB

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7:00 a.m. - 5:00 p.m., CST, Monday-Friday
lvps.support@us.abb.com



www.abb.com/windpower



www.furse.com



<http://www.abb.com/lowvoltage>



www.abb.com

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