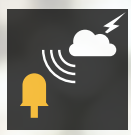
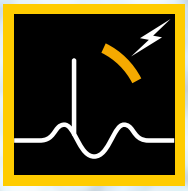
TRANSIENT

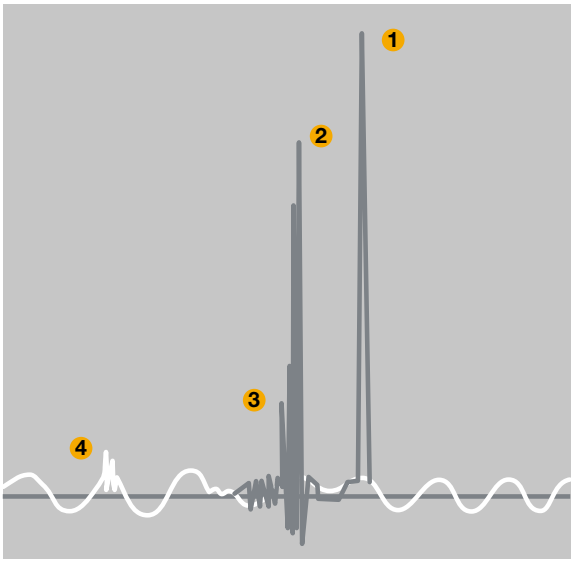


5

OVERVOLTAGE



> OVERVOLTAGES AND THEIR DAMAGES



Types of overvoltages:

1. Overvoltages due to atmospheric discharges
2. Switching overvoltages
3. Occasional increases in voltage
4. Harmonics

Overvoltages are an increase of voltage on the electrical network, measured between two conductors, which can cause damage to the electric installation and equipment. There are two different types: transient and permanent.

Permanent, temporary or power frequency overvoltages are characterized by their relatively long duration (several cycles). These overvoltages are explained from page 368 onwards.

Transient overvoltages are increases in voltage of very short duration between two conductors or between a conductor and the ground. They may be due to atmospheric electrical discharges (lightning), switching or electrical faults (contact with earth or short circuit).

HOW DO OVERVOLTAGES ENTER THE EQUIPMENT?

Power supply, telephone, TV or data lines often cover long distances, far from any protected areas, and are connected to very sensitive equipment. This condition makes the lines especially receptive to overvoltages, which will then be transmitted by conduction to the connected equipment.

Care must be taken with overhead lines that connect sensitive equipment even in protected environments, as it is likely that dangerous voltages may be induced. It is also important to take into account that lightning and power switching generate high magnitude electromagnetic fields, thus inducing currents in the conductors placed inside this field. Even cloud to cloud lightning strikes can cause damage to electrical installations.

In general, it is convenient to install surge protection on any line entering or leaving a building that is connected to or could be connected to sensitive equipment.

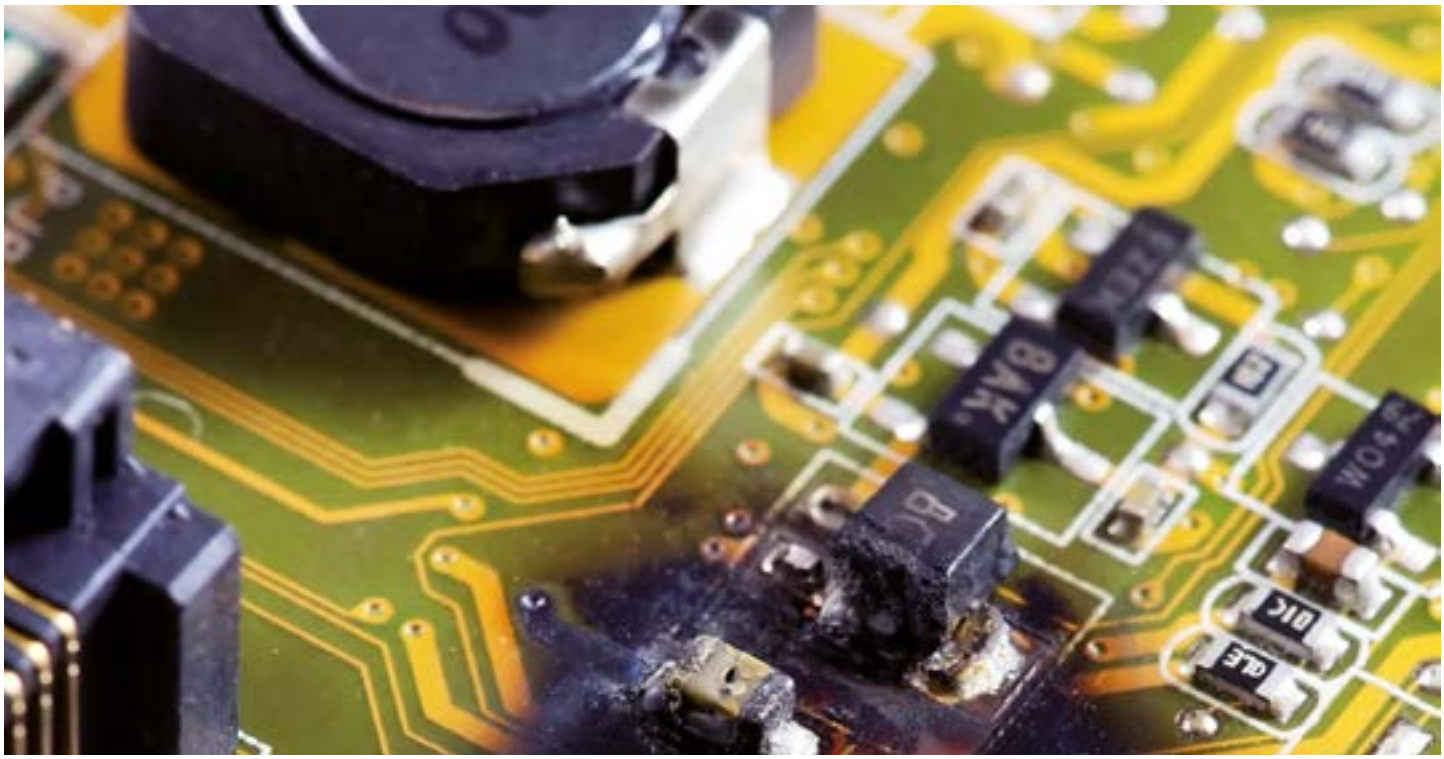
Finally, lightning effects can enter through the earthing network, changing the voltage reference of all the equipment connected to it or to the power supply line itself. The most susceptible equipment in this case are those that have the voltages of its elements referenced to two different grounds.

In this case, it is recommended to link all the earth connections, including those of the lightning protection system, in order to avoid overvoltages and larger flowing currents.

In addition, when there are several buildings in the same complex, the risk will usually increase due to the higher number of interconnections.

OVERVOLTAGES AND THEIR DAMAGES

> CONSEQUENCES OF OVERVOLTAGES



The most typical transient overvoltages are due to switching operations of machinery. However, the most destructive ones are due to atmospheric discharges.

Surge effects range from simple brief work interruptions to the total destruction of an installation or equipment.

> DISRUPTION

Interruption of system operation, data loss and corruption, computer failures, etc.

> DAMAGE

Severe transient overvoltages can damage components, circuit boards and can even burn or destroy the equipment, as well as causing an outbreak of fire.

> DETERIORATION

Exposure to transient overvoltages will, without the user realising, deteriorate electronic components and circuits, reducing the effective life of the equipment and increasing the possibility of failures.

All of these effects involve financial losses due to replacing damaged components, as well as the indirect cost of interruption to production.

Moreover, these effects can carry risks for people which must be avoided according to occupational health and safety laws:

Minimum health and safety requirements for workers using installations and equipment. R.D. 1215/97. Annex II, point 12.

“Any installation or machinery used for work which can be reached by lightning must be protected against its effects by adequate measures and devices".

OVERVOLTAGES AND THEIR DAMAGES

ELECTRONIC COMPONENTS: FROM VALVES TO NANOTECHNOLOGY

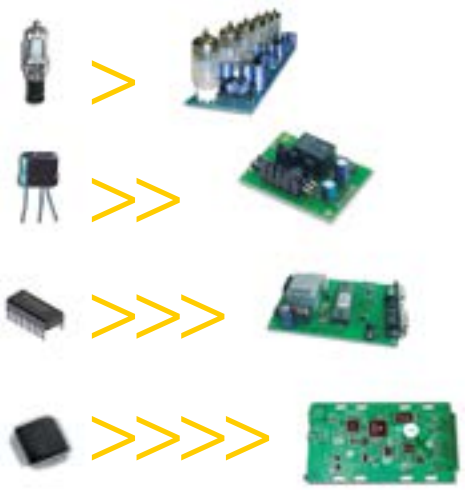
Although transient overvoltages have existed since the creation of electrical networks, nowadays the need for protection is much greater. This is due to advanced technology making electrical components smaller and smaller and more sensitive to electromagnetic disturbances.

ELECTRIC VALVES
Large and resistant. The majority can generally withstand overvoltages without suffering irreparable damages.

FIRST TRANSISTORS
More sensitive but with good insulation.

INTEGRATED CIRCUITS
They are made up of a large quantity of transistors and work with every low currents and voltages.

SMD COMPONENTS
Their small size, proximity of components and lines which join them, makes them very susceptible to overvoltages.



Damage caused by overvoltages

The effect of conducted or induced currents due to atmospheric discharges either from distant strikes, lightning between clouds or the switching operations of heavy machinery (which cause overvoltages similar to those produced by lightning strikes), can cause devastating damage to electronic equipment and electrical installations.

Atmospheric discharges produce voltage peaks on the signal, which are very intense but very short. The current associated with a direct lightning strike can reach over 100 kA, thus even its secondary effects include currents that may still cause great damage to the lines and equipment they reach.

Most electrical systems are equipped with security measures to avoid short-circuits and electrical shocks to people. Almost every electrical board contains protectors, such as circuit breakers and residual current devices. However, they cannot prevent the consequences of transient overvoltages, since their reaction is much slower than the voltage peak that appears.

UPS (Uninterrupted Power Supply) is a special case. These elements ensure the power supply of the equipment connected to it, even when there is a cut in the electricity supply. Most of this equipment also has a voltage filter that enables a stable power supply within ± 15% variation of nominal voltage. However, they can suffer serious damage when subjected to transient overvoltages, as they are sophisticated elements with microprocessor technology and are, therefore, very sensitive to overvoltages.

Surge Protection Devices complement the previously mentioned protection. They remain inactive with small deformations in the signal or network overloads. However, they respond instantly to transient voltage peaks and are able to drive lightning current (main or secondary) to earth, safeguarding the connected equipment.

> CAUSES OF OVERVOLTAGES

Depending on their nature, there are two categories of overvoltages:

Surges due to lightning strikes

Thunderstorms are very common and dangerous. It is estimated that, every second on our planet, there are 2,000 storms and 100 lightning strikes taking place simultaneously. In total, this represents 4,000 storms and 9 million atmospheric discharges every day.

When lightning strikes, it causes a current impulse that can reach tens of thousands of amperes. This discharge produces an overvoltage in the electrical lines and can cause fire, damage to equipment and even death.

Switching overvoltages

These overvoltages are generated in electrical lines mainly due to the following two reasons:

1. Electrical switching of large machinery.

Electrical motors are very inductive loads and their connection and disconnection can cause overvoltages. There are also other processes capable of producing them, for example turning a welding arch on/off and connecting and disconnecting power electronic devices.

2. Manoeuvres and/or faults in power supply network.

In the event of a short circuit at any point in the network, the circuit breakers will respond by opening the circuit and making subsequent autoreclosing attempts if it is a transient fault. Such faults can generate overvoltages that are typical in the connection of inductive loads.

OVERVOLTAGES AND THEIR DAMAGES

> MECHANISMS OF PROPAGATION

The prevailing mechanism of switching overvoltages is conduction, as it starts in the very same power supply networks. All kinds of different propagation methods can be observed in atmospheric discharges.

Therefore, we can differentiate between the following mechanisms:

Conducted overvoltages

Lightning can strike overhead lines directly. Surges then propagate and reach the user, finally diverting to the ground through the equipment, causing failures.

A common mistake is to think that discharges hitting power distribution lines (Medium Voltage) do not reach the Low Voltage ones because of the galvanic insulation provided by the transformer. However, this is not true due to the fact that the aforementioned insulation is effective for nominal frequencies in the network, while for the wave forms associated with lightning, the transformer produces little attenuation.

Induced overvoltages

The electromagnetic field produced by electrical discharges induces transient currents in nearby equipment, which can then enter facilities and damage the equipment.

Overvoltages due to capacitive coupling

There is always a capacitive coupling, also known as stray capacity, between every pair of conductors. Overvoltages due to capacitive coupling become more important as the voltage waveform velocity increases.

Overvoltage due to voltage raises at the grounding

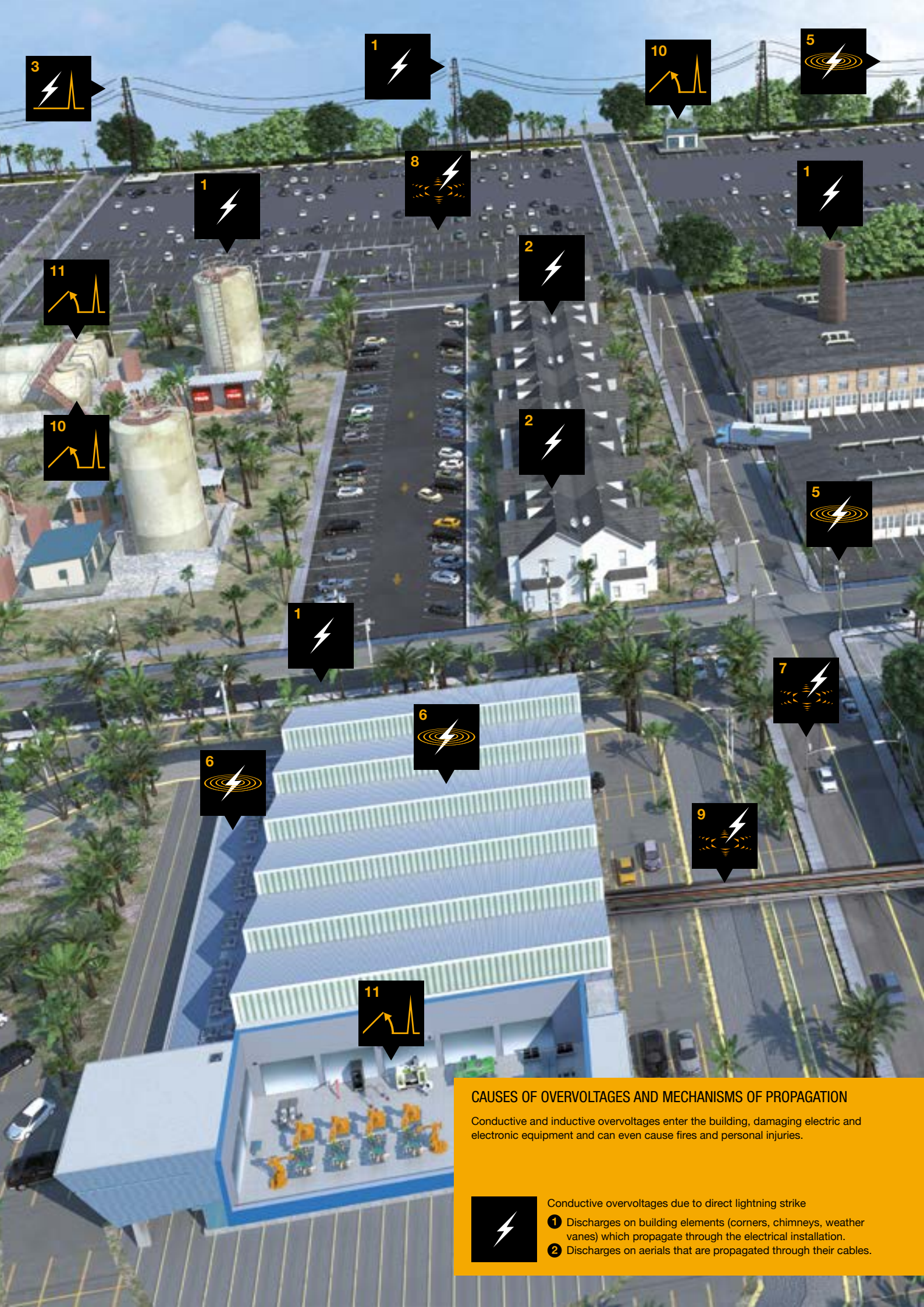
This mechanism is a special case of conducted overvoltages (described before) but due to its high incidence, it deserves a special mention.

When lightning disperses in the earth, the discharge current can consequently raise the ground voltage around the point of impact by several thousands of volts.

Any object on the affected ground will acquire the associated voltage during that time, which can produce a dangerous voltage difference with regard to other points of the installation. Special care is to be taken with buried metal objects, such as piping and earth terminals.

	Overvoltage	Intensity
Conducted overvoltages	Up to several tens of kV	Long distance impact: up to 1 kA Close impacts: up to some kA Direct impacts: up to tens of kA
Induced overvoltages	Up to some kV between conductors which are not ground Up to several tens of kV between ground and conductor	Up to a few kA Up to several tens of kA
Overvoltages due to capacitive coupling	Up to some kV between conductors which are not ground Up to a few kV between ground and conductor	Up to a few kA

The table represents each transmission mechanism, the corresponding overvoltage order of magnitude, as well as its associated currents.



CAUSES OF OVERVOLTAGES AND MECHANISMS OF PROPAGATION

Conductive and inductive overvoltages enter the building, damaging electric and electronic equipment and can even cause fires and personal injuries.

Conductive overvoltages due to direct lightning strike

1. Discharges on building elements (corners, chimneys, weather vanes) which propagate through the electrical installation.
2. Discharges on aerials that are propagated through their cables.

Conductive overvoltages due to indirect lightning discharge

- 3 Discharges on overhead power lines.
- 4 Discharges on overhead telephone lines.

Overvoltages due to voltage raises in the grounding

- 7 Direct discharges on objects near buildings (trees, metal railings, lamp posts).
- 8 Direct discharges to ground.
- 9 Discharges near underground power supply and data lines that connect to equipment between different buildings.

Induced overvoltages

- 5 Inductions in overhead power supply lines and telephone lines.
- 6 Inductions in power supply and computer lines inside buildings.

Switching overvoltages

- 10 Manoeuvres in power supply.
- 11 Switching in heavy machinery.

> COMPLETE DESIGN GUIDE FOR OVERVOLTAGE PROTECTION SYSTEM

The aim of an overvoltage protection system is to ensure continuity of service and minimise any probability of incidents due to transient overvoltages to an acceptable level.

The main feature of overvoltage protectors is their rapid response time.

Transient overvoltages could easily reach several kilovolts in a few microseconds. During this increase time and while the protector has not reacted, the rising voltage will reach the connected equipment. Generally, the response time of the protectors varies between 20 and 100 nanoseconds.

Overvoltage protection devices can be installed in series or in parallel, however they must always remain inactive under normal conditions. As soon as there is an overvoltage, the protector will start working, driving the lightning current to ground. There should not be any momentary interruptions, meaning that the end user should not notice that the protector is activated. Moreover, sustained interruptions are not permitted. When the overvoltage has been absorbed, the protector should return to its inactive state without affecting the normal operation of the signal.

In those cases where the components of the protector have suffered a bigger overvoltage than they can withstand, the fault mode should be open circuit thus preventing a signal short-circuit. Most of protectors are provided with a visual or remote control warning system which activates when the protector is no longer in service and should be replaced.

No protector nowadays is able to both absorb high currents and let harmless residual voltage pass through. Therefore, a number of devices are required in order to achieve a good balance between current and voltage, minimising any further damage to the equipment. From the user's point of view, this is the most important thing: the residual voltage should not represent a threat.

Protection against overvoltages are aimed to maintain service continuity and reduce, for the people security and machinery, the probabilities of accidents caused by transient overvoltages.

> COMPLETE DESIGN GUIDE FOR OVERVOLTAGE PROTECTION SYSTEM

> APPLICABLE REGULATIONS

The standards of series 61643 of the International Electrotechnical Committee (IEC) define the requirements and implementation of overvoltage protectors. These standards have already been adopted as European standards (EN), and translated as Spanish standards (UNE). There are other applicable regulations, among which are the lightning protection standards. Regulations for the installation of electrical boards should always be fulfilled.

The tests carried out on the protectors are mainly based on standard IEC 61643, although APLICACIONES TECNOLOGICAS products also comply with the requirements of UL 1449.

UL 1449 is a safety standard, not an operation standard. Therefore, it does not test the specific current or voltage values on the protector, but rather its safety. On the other hand, IEC 61643 certifies both security and working conditions.

> TESTS CARRIED OUT. IEC 61643 series

According to this regulation, overvoltage protection devices can be classified into three types depending on what they are used for: if they should be able to withstand direct lightning strikes, their secondary effects or attenuated overvoltages.

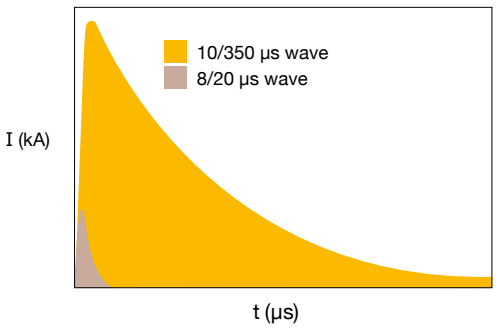
According to the class established, the manufacturer provides a piece of information that characterises the device and determines the type of test to be carried out. Although there is no set value of current defined in the standards for the protector to withstand, any value stated on the label and on its technical datasheet must pass a series of laboratory tests defined in the standard.

APLICACIONES TECNOLOGICAS, S.A. has tested its overvoltage protection devices in official and independent laboratories, passing all tests with the values described in their technical sheets and labels.

> CLASSIFICATION ACCORDING TO IMPULSE TEST

Information to be provided by the manufacturer for each type of protection

	I_{imp} (with 10/350 µs wave)	I_n (with 8/20 µs wave)	I_{max} (with 8/20 µs wave)	Ignition voltage with 1.2/50 µs wave	U_{OC} Open circuit voltage with combined wave 1.2/50 µs; 8/20 µs
Type 1	x	x		x	
Type 2		x	x	x	
Type 3					x



Impulse current waves applied to overvoltage protectors in order to check their characteristics. The area of each curve in this graph shows the specific energy applied.

> STANDARD IMPULSE CURRENT TESTS

There are two different current tests that simulate the effects of a lightning strike:

a Direct lightning strike test, modelled on wave form 10/350 µs in order to determine I_{imp}.

b Test on secondary lightning effects and switching elements, with 8/20 µs wave in order to determine I_{max}. Due to the different make up of the wave form tested, I_{imp} tests have a much higher energy than I_{max} and I_n tests.

During the tests, the protectors are submitted to repeated current and voltage impulses and the residual voltage is measured. The established level of protection (U_p) cannot be exceeded in any test. Residual voltage does not always increase with the current value: there may be some particularly critical current values. Therefore, it is very important to apply stepped current impulses, above and below the nominal current, in order to be aware of the voltage the protector can let pass. Thermal and mechanical tests are also performed.

> COMPLETE DESIGN GUIDE FOR OVERVOLTAGE PROTECTION SYSTEM

> OTHER APPLICABLE STANDARDS

There are other regulations to take into account when designing and installing overvoltage protection devices. Furthermore, these protectors are part of the internal protection described in the following lightning protection standards:

> **Standard UNE 21186 and NF C 17-102**, deals with "protection of structures and of open areas against lightning using early streamer emission air terminals".

> **Standard IEC 62305**, deals with "Lightning protection" using conventional systems (meshed conductors and air terminals).

> **Other standards**
Typically, in every country there are codes that may be related to overvoltage protection, such as National Electric Code and National Construction Code.

It is highly advisable to check carefully if there are surge protection requirements within national obligatory standards.

In National Electric Codes typical cases from REBT GUIDE-BT-23 are:

- Total or partial low voltage supply lines when the installation includes air lines.
- Risk of failure affecting human life. Ie.: Security services, emergency centres, medical equipment and hospitals.
- Risk of failure affecting animal life. Ie.: Fish farms
- Risk of failure affecting public services. Ie.: Telecommunication systems, informatics centres.
- Risk of failure affecting industrial or agricultural processes and operations which cannot be interrupted. Ie.: Industries with ovens or general industrial processes which are continuous.
- Risk of failure affecting the structures and equipments from the local public establishments which have security services or non autonomous emergency illuminating systems.
- Installations on buildings with external protection systems against lightning such as: Lightning conductors, Franklin rods, Faraday cages, installed on the same building in an area lower than 50 metres.

> **ENDESA VADEMECUM Guide for electrical Low Voltage installations.** In the section on Centralized Counter indicates that you must install surge protectors type 1.

- In the main switchboard, permanent and transient overvoltage protection must be installed.

> **IBERDROLA Distribution Technical Manual MT 2.80.12 for electrical installations.** In the section on Centralized Counter indicates that, when specified by the ITC-BT-23 and GUIDE-BT-23 of REBT, install surge protectors type 1.

> COMPLETE DESIGN GUIDE FOR OVERVOLTAGE PROTECTION SYSTEM

> SURGE PROTECTIVE DEVICE (SPD) SELECTION

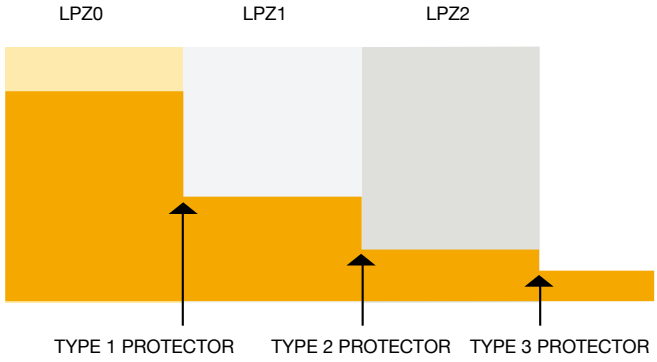
To protect any equipment correctly, it is necessary to know in detail all its characteristics. The most important parameters to take into account are:

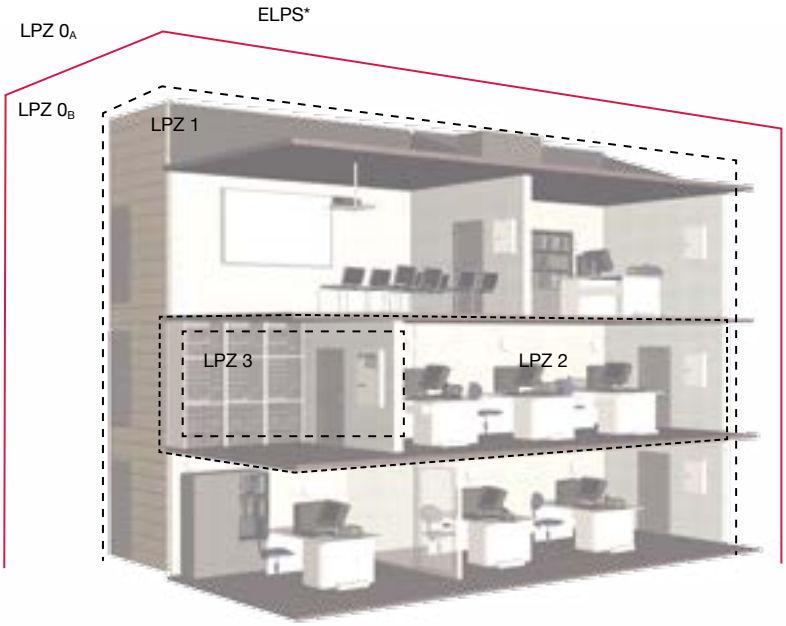
- **a** ZONES OF PROTECTION
- **b** MAXIMUM RESIDUAL VOLTAGE ALLOWED
- **c** ADDITIONAL PARAMETERS OF THE LINE

a ZONES OF PROTECTION

Lightning protection standards, as IEC 62305, define Lightning Protection Zones (LPZ) depending on the electromagnetic characteristics of each area around and inside the structure to be protected. For each of these zones, the damage that surges can cause is different, and therefore equipment should be protected according to this risk.

Surge protective devices are installed in the transitions between zones. A good coordination between them is very important: they should act in coordinated stages and be able to withstand lightning currents letting residual voltages that are harmless to the equipment.





Example of the division by zones in an office building:
* External Lighning Protection System

ZONE	CHARACTERISTICS	SURGES
LPZ 0_A	External zone, exposed to direct lightning strikes.	Full lightning current and electromagnetic field.
LPZ 0_B	External zone but within the LPS protection area and, therefore, protected against direct strikes	Can enter part of the lightning current and all the electromagnetic field
LPZ 1	Internal zone, where surges are limited by current spreading, up-stream SPDs and sometimes by screening.	Low currents and attenuated electric fields.
LPZ 2…n	Internal zones with more limited surges thanks to current spreading, screening and up-stream SPDs	Minimum currents and very attenuated electric fields.

> COMPLETE DESIGN GUIDE FOR OVERVOLTAGE PROTECTION SYSTEM

Three different types of protectors are described in the regulations according to the area where they are located:

TYPE 1 PROTECTORS

Type 1 protectors should be tested with 10/350 µs lightning impulse wave, simulating the effects of direct lightning discharges.

They are to be installed where lightning currents and electromagnetic effects are unattenuated.

TYPE 2 PROTECTORS

Type 2 protectors should be tested with 8/20 µs current impulse wave, simulating lightning secondary effects.

They have to be installed where lightning currents and electromagnetic effects are already attenuated.

TYPE 3 PROTECTORS

Type 3 protectors should be tested with a combination impulse wave but with low values, simulating very attenuated overvoltages. Normally they are installed near the equipment and have low residual voltages.

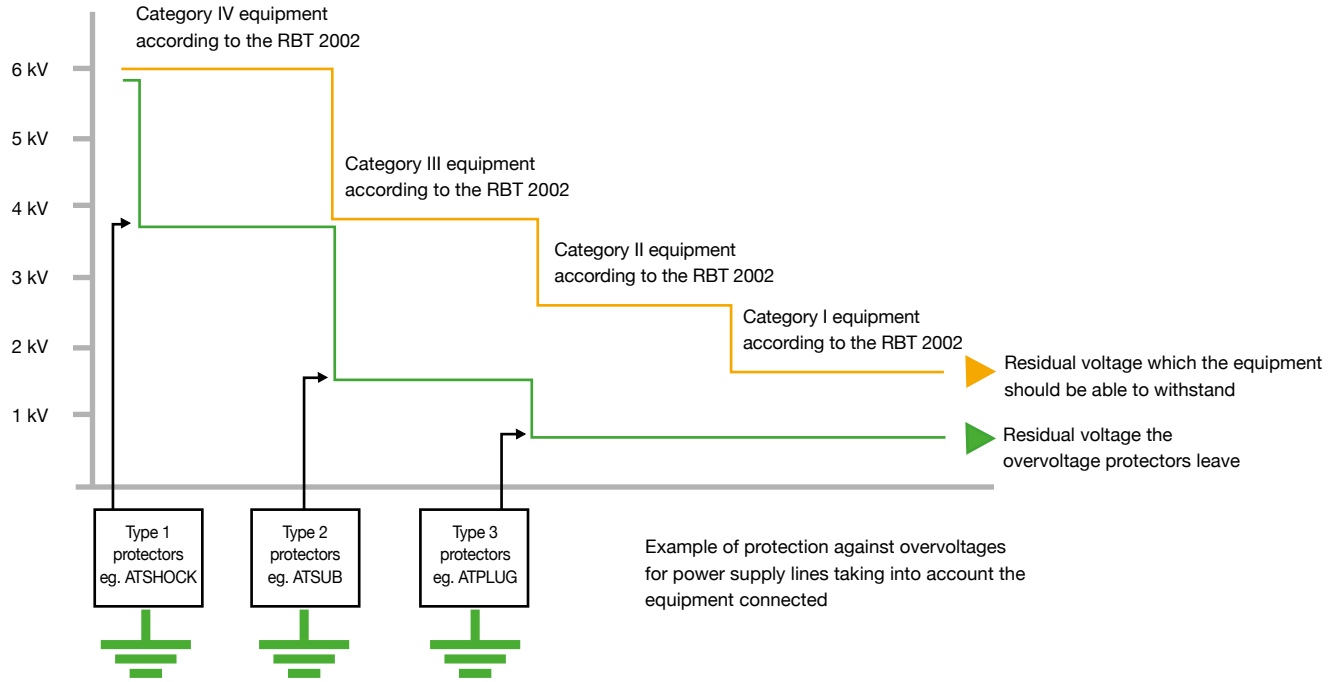
One way of reducing the electromagnetic fields and the danger they bring with them is to shield the structures, rooms and/or equipment. For buildings, the equipotential bonding of metal objects manages to reduce disturbances and is highly recommendable. If this interconnection is carried out during construction of the building, it is more effective and less costly.

In any case, all the lines entering or leaving a zone should be protected with the proper devices in order to prevent overvoltages.

b MAXIMUM RESIDUAL VOLTAGE ALLOWED

A low residual voltage is always a positive characteristic of protectors, given that the equipment will suffer less damage when surges reach high levels, even if they are capable of supporting them.

However, there is more robust equipment or including internal protection that does not require especially low residual voltage, whilst other equipment can be very sensitive and hence require very low residual voltage. Protectors, in this last case, must be installed very near the equipment. In order to select a suitable protector, the characteristics of each equipment connected should be taken into account.



Example of protection against overvoltages for power supply lines taking into account the equipment connected

> COMPLETE DESIGN GUIDE FOR OVERVOLTAGE PROTECTION SYSTEM

c ADDITIONAL PARAMETERS OF THE LINE

To finalise the protection details, it is convenient and in some cases, essential, to know the characteristics of the line to be protected. For example:

> Maximum operating voltage, to avoid the protector activates at an acceptable voltage level to the user.

> Type of voltage: alternating, continuous, impulses, etc.

> Working current of the line, absolutely essential if an element is inserted in series.

> Supply system TN, TT, IT (in power supply lines) to protect the suitable lines.

> Characteristics of the connections.

It is essential that the protector does not affect the working conditions of the line or produce significant losses of signal.

SPD selection

1 Check the line characteristics in order to find out the direct and/or alternating maximum operating voltage between each of the conductors. Select protectors such that:

U_c > maximum operating voltage of the line

2 Select the protector type and its maximum current according to the effects it should withstand:

Current that can reach the protector	Type of protector
Direct lightning current:	Type 1
Lightning secondary effects:	Type 2
Attenuated overvoltages:	Type 3

3 Select the protector residual voltage according to the equipment to be protected. For example, for power supply lines it is recommended:

Equipment to be protected	Residual Voltage (1.2/50 µs)
Very robust equipment (large motors, air conditioning, etc.):	< 4 kV
Non-sensitive or internally protected equipment:	< 1.5 kV
Very sensitive or unprotected equipment against electromagnetic disturbances	< 1 kV

> SPD COORDINATION

Once the protection requirements have been observed, it is likely that one commercial device will not meet the required characteristics for discharge current and residual voltage. For this reason, the installation and coordination of several devices is required.

In general, the higher the current withstanding capacity of a protector is, the higher the residual voltage and therefore also its level of protection:

$$\text{if } I_{max} \uparrow \longrightarrow U_p \uparrow$$

Therefore, proper overvoltage protection requires staggered and coordinated protectors with several protection stages acting sequentially so that they are able to, on the one hand, withstand all the lightning current and, on the other, leave a residual voltage which is harmless for the existing equipment or that which will later be installed.

If protectors are connected to the same electrical point, without any impedance between them, then the fastest one will withstand the whole overvoltage, whereas the most robust protector has no time to activate. If the overvoltage is very large, it could destroy or damage the protector. Even if the surge does not harm the protector, there is no sense in installing a robust protector with a huge current withstanding capability, if it never acts.

For two protectors to be correctly coordinated, the length of the cable between them should be at least 10 metres. If this is not possible (for example, if both are in the same electrical board), a decoupling inductor should be installed between them.

Aplicaciones Tecnológicas, S.A. supplies complete cabinets where all stages are already installed and coordinated by a decoupling inductor. Suitable for those installations where separation by cable is not possible.

> COMPLETE DESIGN GUIDE FOR OVERVOLTAGE PROTECTION SYSTEM

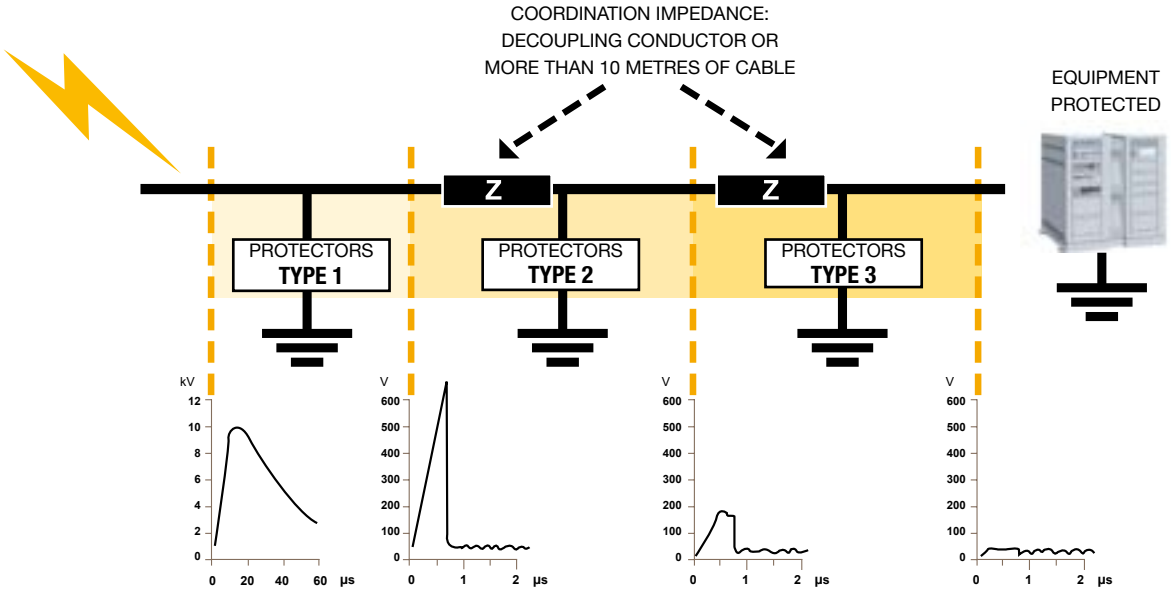
> PROTECTION STAGES

Usually, the **first protection** (coarse protection) should be a spark gap or gas discharge tube (GDT).

These elements typically remain completely open, without any flowing current, when the signal is normal. Each one has its typical breakdown voltage (although it varies slightly with the wave form). When this voltage is exceeded, then the component is short-circuited, driving all the current to ground. When the high level voltage disappears, these components return to inactive status, or in other words, to being an open circuit.

The element forming the **second protection,** finer than the first one, is usually a varistor. Varistors are electronic components with variable resistances. Their impedance is very high when voltage is normal and it begins to decrease in a non-linear way as voltage increases. In general, they are faster than spark gaps but the disadvantage is that, while voltage is normal, their impedance may be very high but still produce small current leakages.

The **third protection barrier** is normally formed by transient voltage suppressor diodes, very fast elements, capable of leaving very low residual voltages but unable to withstand currents greater than a few amperes.



Reduction of transient overvoltages by means of stepped protection.

Many protectors are formed by the combination of these elements or by several of them coordinated in a single device. Decoupling elements are normally resistances or inductors with very low impedances given that, as they are in series with the line, current continuously flows through them. If impedances were high, they would cause unnecessary losses and consumptions.

Normally the problem with electrical consumption is worse in power supply lines, where the flowing current is in amperes. For data lines, the current flowing is in milliamperes, hence consumption is not of concern. However, the operating voltages of electronic components are usually very low, thus preventing a voltage decrease in the decoupling impedance causing problems with data transmission.

For power supply lines, different combinations of ATSHOCK, ATSUB and ATCOVER have been tested, using ATLINK devices as decoupling inductors, verifying their coordination and proper operation even with lightning impulse waves (100 kA, 10/350 µs).

Aplicaciones Tecnológicas, S.A. Overvoltage Protection Devices have not only been tested individually but also in coordination with other protectors of different levels.

ATBARRIER, combined protectors

With regards to protectors for telephone, data lines, etc., our overvoltage protectors internally coordinate several protection stages.

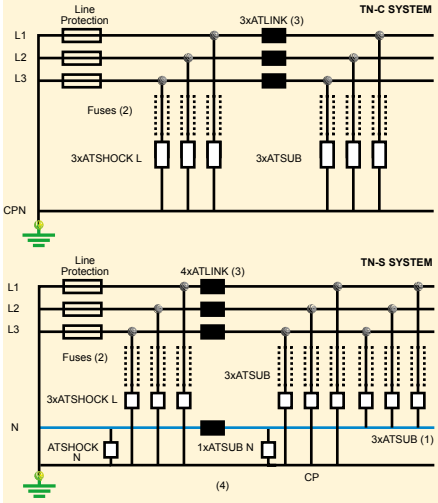
> COMPLETE DESIGN GUIDE FOR OVERVOLTAGE PROTECTION SYSTEM

> PROTECTOR SELECTION ACCORDING TO POWER SUPPLY SYSTEMS

Power supply networks are built following different wiring systems, defined in low voltage codes. It is necessary to know this information about the line to be protected in order to determine the overvoltage protection installation.

Electrical supply systems are characterized by their connections, on the one hand, with the distribution or supply grounding network and, on the other, the receiver installation ground.

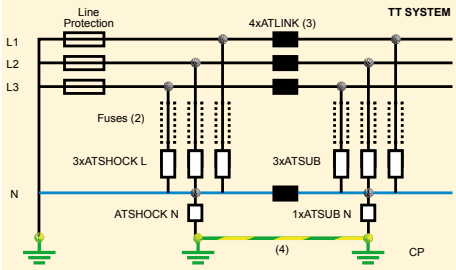
Systems are named using a letter code indicating the situation of the supply with respect to the earthing (T indicates direct connection, I means isolation, N connection to neutral). The main supply systems are the following:



> TN SYSTEM

TN systems have one point of the supply, generally the neutral, directly connected to earth. The exposed conductive part of the receiver installation is connected to that point by protective conductors. There are several TN distribution systems depending on the relative arrangement of the neutral conductor and the protective earth (PE) conductor.

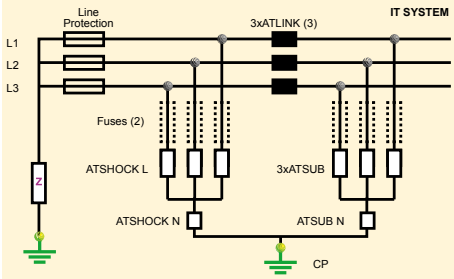
When the protective earth (PE) and the neutral are combined in the same conductor along the whole system (TN-C systems) then overvoltage protection is complete merely by installing protectors between each phase and the corresponding neutral/earth conductor. However, if neutral and earth are two different conductors (TN-S systems), then protectors should be installed between the phase or neutral and earth.



> TT SYSTEM

TT Systems have one point of the supply, generally the neutral, directly connected to earth. The exposed conductive part of the receiver installation is connected to a separate earth system.

In order to protect these systems against transient overvoltages, it is necessary to at least place protectors between each phase and neutral, and between neutral and earth.



> IT SYSTEM

IT Systems have no direct connection between a certain point of the supply and the earth, nonetheless the exposed conductive part of the receiver installations is directly connected to earth.

In this type of system, it is not recommended to distribute the neutral. However, overvoltage protection needs a common point where the protector earth terminals must be connected, and this common point will be connected to earth by means of a neutral protector (ATSHOCK-N, ATSUB-N).

> NOTES

(1) Three ATSUB devices installed between phases and neutral at TN-S systems are recommended, although the lines are also protected without them.

(2) The fuses specified in the characteristics of each protector should be used provided that there is no equal or lower current protection in the upstream power supply.

(3) ATLINK devices are not necessary if there are at least 10 metres of cable between the protectors.

(4) For effective protection, it is useful that all the structure's earthing systems are bonded together.

> OTHER COMBINATIONS

> All ATSUB devices, including ATSUB N, can be replaced by one single ATCOVER400T.

> ATSHOCK can be replaced by ATSHIELD or ATSUB, although then the withstood current will be lower.

> If only the first stage protection is installed, then the residual voltage would be too high, possibly damaging the equipment.

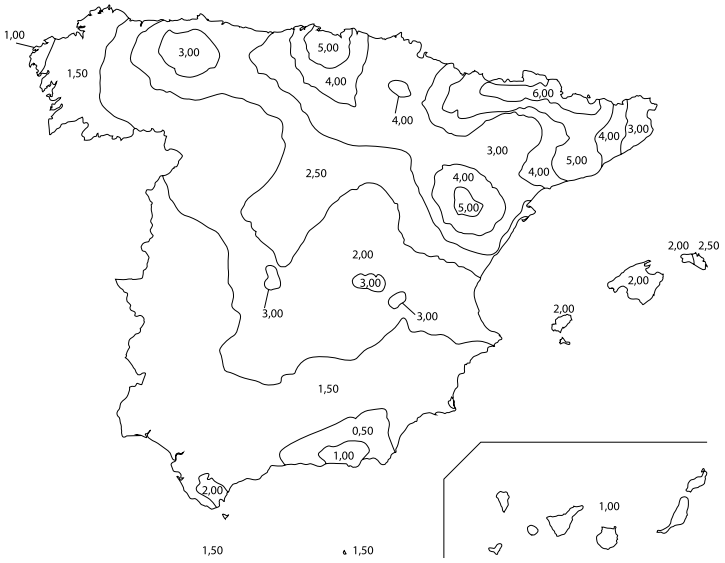
> Only tight protection (ATSUB or ATCOVER) can be installed if lightning currents reaching the installation are not expected to be higher than what the protector can withstand, and as long as indoor overvoltages are not expected.

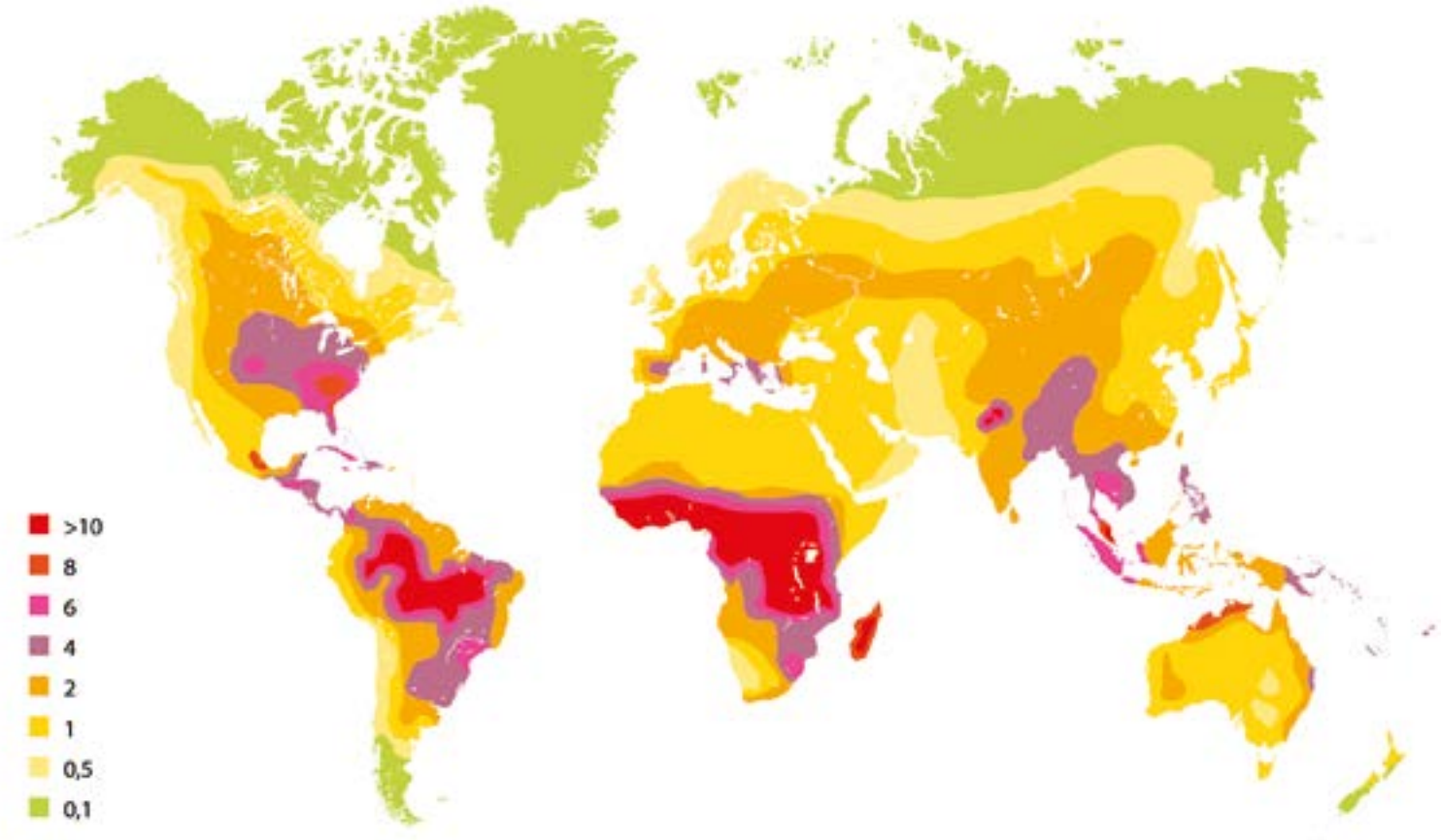
> Further protection stages may be installed, where the surge will arrive more attenuated. They should be able to reduce transient overvoltages to very low levels (for example, ATCOVER series).

> SIMPLIFIED SELECTION GUIDE FOR SURGE PROTECTORS BY MEANS OF RISK ASSESSMENT

In order to design an accurate overvoltage protection system, you will first need to know the overvoltage risk in the protected area (L) and, later, the probability of a surge reaching the connected equipment (E).

The calculation of these two-risk indices (L and E) is based on the guidelines in ITC-BT-23 from the REBT and in the standard UNE 21186.





Ng: lightning strike density, expressed in lightning flashes per km².

World isokeraunic map (Ng)

> SIMPLIFIED SELECTION GUIDE FOR SURGE PROTECTORS BY MEANS OF RISK ASSESSMENT

> RISK ASSESSMENT IN THE AREA TO BE PROTECTED (L)

L

Risk in the area to be protected (L):

L = NG+BT+MT+U

NG

Parameter related to Ng (average annual value of the number of lightning strikes per km²)

NG = 1	NG = 2	NG = 3
Ng≤1	1<Ng<4	Ng≥4

BT

Index proportional in length in metres to the low voltage aerial line, which provides the power supply to the installation

BT = 0	BT = 0.25	BT = 0.5	BT = 0.75	BT = 1
Underground	1 to 150 m	150 a 300 m	300 a 500 m	> 500 m

MT

Parameter showing the location of the medium voltage line

MT = 0	MT = 1
Underground medium voltage line	Medium voltage aerial line

U

Parameter showing the location of the medium voltage line

U = 0	U = 0.5	U = 0.75	U = 1
Input line close to trees or structures of a similar height or higher	Input line surrounded by lower structures	Isolated input line	Isolated input line on a hill or mound

> RISK ASSESSMENT OF CONNECTED EQUIPMENT (E)

E

Risk of connected equipment (E):

E = S + V + C

S

Sensitivity of the equipment according to the ITC-BT-23 from the RBT

S = 1	S = 2	S = 3	S = 4
Category IV. Equipment connected to the origin of the installation	Category III. Robust industrial equipment. I.e.: motors, pumps, compressors	Category II. Less robust industrial equipment. I.e.: electrical appliances, lighting, CNC machines	Category I. Electronically sensitive equipment i.e. computers, PLCs, frequency converters

V

Cost of the equipment

V = 1	V = 2	V = 3
Low cost (<€1,500)	Medium cost (€1,500 to 15,000)	Expensive (>€15,000)

C

Continuity of service

C = 1	C = 2	C = 3
Service continuity not required	Service continuity required	Unacceptable economic consequences due to interruption of service

> SUGGESTED SELECTION

With these two indices and the table, you can make a quick choice in order to determine the protectors required for the power supply side protection of the equipment. Please note that for complete protection, telephone and data lines should also be protected.

	L = 1 or 2	L = 3	L = 4	L = 5 or 6
E = 8, 9 or 10	ATCOVER (page 285)	ATSUB65 + ATCOVER* (page 224) (page 285)	ATSHIELD + ATCOVER* (page 216) (page 285)	ATSHOCK + ATCOVER* (page 208) (page 285)
E = 6 or 7	ATCOVER (page 285)	ATSUB65 (page 224)	ATSHIELD + ATSUB40* (page 216) (page 224)	ATSHOCK +ATSUB40* (page 208) (page 224)
E < 5	ATCOVER (page 285)	ATSUB65 (page 224)	ATSHIELD (page 216)	ATSHOCK (page 208)

* Protector for distribution boards

> QUICK SELECTION GUIDE FOR PROTECTION DEVICES BY REFERENCE (POWER SUPPLY LINES)

Is there any external lightning protection?

Yes

Overhead power supply lines?

Yes

	Central meter board – Main board		Consumer distribution board – Secondary board	
	Single-phase	Three-phase	Single-phase	Three-phase
Domestic	 **ATSUB 140** AT-8214/AT-8218	 **ATSUB 140** 3xAT-8214/AT-8218	 **ATSUB-2P 40** AT-8235	 **ATSUB 40-D** AT-8017
Industrial	 **ATSHOCK** AT-8350/AT-8399	 **ATSHOCK** 3xAT-8350/AT-8399	 **ATCOVER** AT-8112	 **ATCOVER** AT-8133

No

Overhead power supply lines?

Yes

	Central meter board – Main board		Consumer distribution board – Secondary board	
	Single-phase	Three-phase	Single-phase	Three-phase
Domestic	 **ATSUB 100** AT-8256/AT-8259	 **ATSUB 100** 3xAT-8256/AT-8399	 **ATSUB D** AT-8216	 **ATSUB D** AT-8217
Industrial	 **ATSHOCK 30** AT-8310/AT-8398	 **ATSHOCK 30** 3xAT-8310/AT-8398	 **ATSUB-2P 15** AT-8232	 **ATSUB-4P 15** AT-8282

No

Overhead power supply lines?

Yes

	Central meter board – Main board		Consumer distribution board – Secondary board	
	Single-phase	Three-phase	Single-phase	Three-phase
Domestic			 **ATSUB-2P 40** AT-8235	 **ATSUB 40-D** AT-8017
Industrial	 **ATSUB-2P 65** AT-8238	 **ATSUB-4P 65** AT-8287	 **ATCOVER** AT-8112	 **ATCOVER** AT-8133

No

	Central meter board – Main board		Consumer distribution board – Secondary board	
	Single-phase	Three-phase	Single-phase	Three-phase
Domestic			 **ATSUB-D 3/4** AT-8219  **ATSUB-D M 1DIN** AT-8200	 **ATSUB-D** AT-8217
Industrial	 **ATSUB-2P 40** AT-8235	 **ATSUB-4P 40** AT-8285	 **ATSUB-2P 15** AT-8232	 **ATSUB-4P 15** AT-8282

> QUICK SELECTION GUIDE FOR PROTECTION DEVICES BY REFERENCE (TELEPHONE AND DATA LINES)

Telephone lines

Screw

ATFONO
AT-9101

RJ11

ATFONO RJ11
AT-9104

RJ45

ATFONO RJ45
AT-9108

KRONE

ATFONO KRONE
AT-9109

Data lines

Screw

ATLINE
AT-9205 - AT-9280

DB9

ATDB9
AT-2300

Computer lines

CAT 5E

ATLAN
AT-2107
AT-2207

ATLAN-C 8
AT-2221

ATLAN 24/16/8
AT-2206
AT-2209
AT-2208

CAT 6

ATLAN CAT6
AT-2213

ATLAN 12/8/4 CAT6
AT-2211
AT-2212
AT-2217

CAT 5E POE

ATLAN POE
AT-2204

ATLAN 24/16/8 POE
AT-2223
AT-2224
AT-2225

CAT 6 POE

ATLAN CAT6 POE
AT-2210

ATLAN 12/8/4 CAT6 POE
AT-2226
AT-2227
AT-2228

Coaxial lines

Coaxial

ATFREQ
AT-2102 - AT-2126

> PRACTICAL EXAMPLES OF OVERVOLTAGE PROTECTION

> INDUSTRIAL INSTALLATIONS

Power supply		
TYPE 1 (direct lightning effects)	1	ATSHOCK (page 208 - 215)

Power supply line
Telephone line
Data line
Computer line
Coaxial line

Are there more than 10 m of separation cable?

YES	NO
	Coordination inductor
	ATLINK (page 291 - 292)
2 TYPE 2 (attenuated lightning effects) ATSHIELD (page 216 - 223) | ATSUB (page 224 - 284) | ATCOVER (page 285 - 290)	
3 Type 3 (attenuated electromagnetic effects) ATSOCKET (page 331 - 332) | ATPLUG (page 333 - 336)	

Data and telecommunication		
TYPE 2 and 3 (coordinated)	4	ATFONO (page 340 - 347)
	5	ATLINE (page 348 - 350)
	6	ATFREQ (page 364 - 367)
	7	ATLAN (page 352 - 361)

> PRACTICAL EXAMPLES OF OVERVOLTAGE PROTECTION

> DOMESTIC INSTALLATIONS

Power supply		
TYPE 1 and 2 (direct or attenuated lightning effects)	1	ATSHIELD (page 216 - 223) ATSUB (page 224 - 284) ATCOVER (page 285 - 290)
TYPE 3 (attenuated electromagnetic effects)	2	ATSOCKET (page 331 - 332) ATPLUG (page 333 - 336)

Power supply line
Telephone line
Coaxial line

Data and telecommunication		
TYPE 2 and 3 (coordinated)	3	ATFONO (page 340 - 347)
	4	ATFREQ (page 364 - 367)

> PRACTICAL EXAMPLES OF OVERVOLTAGE PROTECTION

> HOUSING BLOCKS

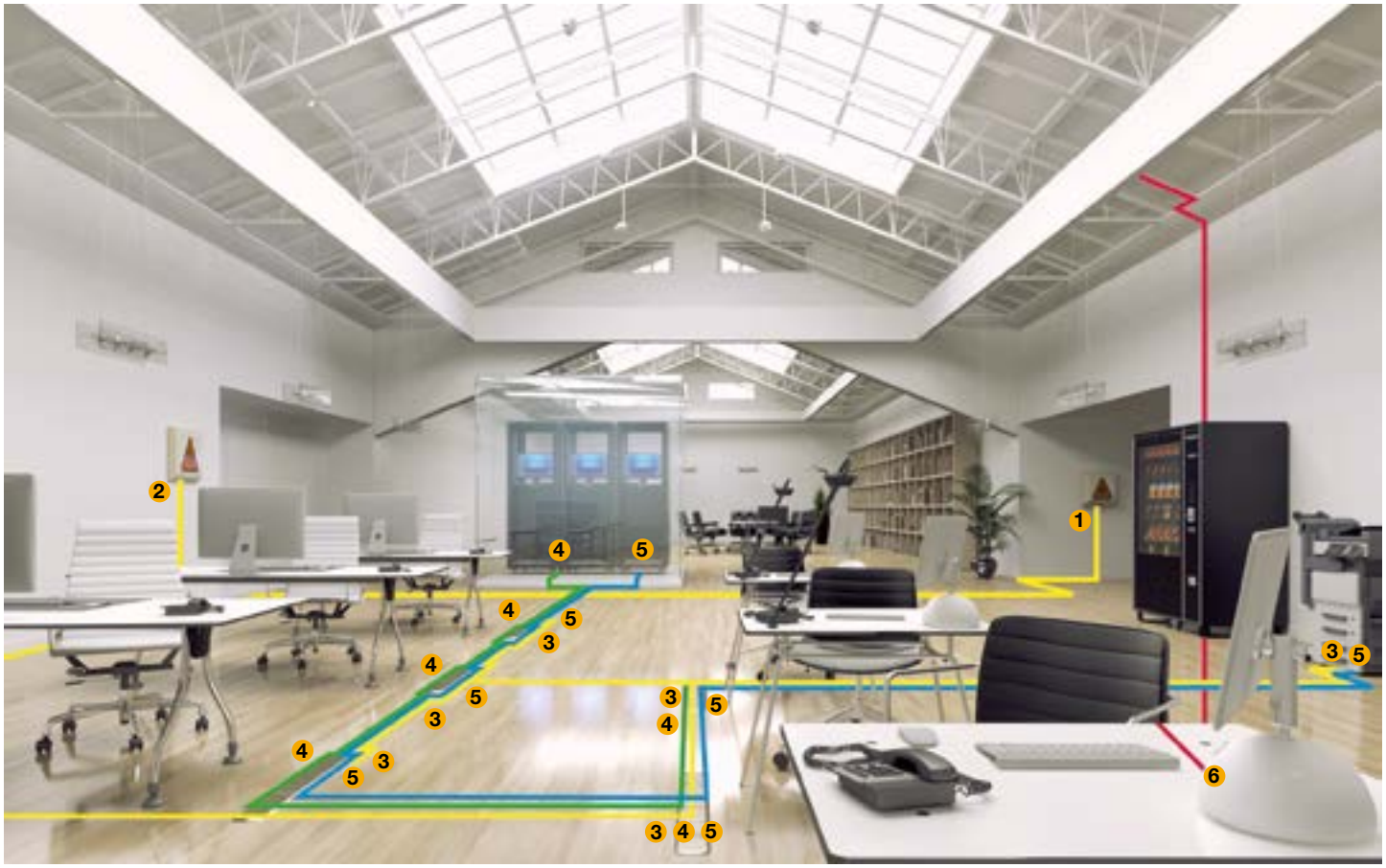
Power supply line
Telephone line
Coaxial line

Power supply			
Meter room TYPE 1 (direct effects of lightning)	1	ATCOMPACT CDA	(page 293 - 296)
Common areas (lift) + housing TYPE 2 (attenuated lightning effects)	2	ATCONTROL /R T ATCONTROL /R M	(page 382 - 387)
Housing Type 3 (attenuated electromagnetic effects)	3	ATSOCKET ATPLUG	(page 331 - 332) (page 333 - 336)

Data and telecommunication			
TYPE 2 and 3 (coordinated)	4	ATFONO KRONE	(page 346 - 347)
	5	ATFONO RJ11	(page 342 - 343)
	6	ATFREQ F	(page 364 - 365)
	7	ATFREQ TV	(page 364 - 365)

> PRACTICAL EXAMPLES OF OVERVOLTAGE PROTECTION

> OFFICES



Power supply line
Telephone line
Computer line
Coaxial line

Power supply		
TYPE 1 (direct lightning effects)	1	ATSHIELD (page 216-223)

Are there more than 10 m of separation cable?

YES	NO
	Coordination inductor
	ATLINK (page 291 -292)
2	TYPE 2 (attenuated lightning effects) ATSUB (page 224 - 284) | ATCOVER (page 285 - 290)
3	Type 3 (attenuated electromagnetic effects) ATSOCKET (page 331 - 332) | ATPLUG (page 333 - 336)

Data and telecommunication		
TYPE 2 and 3 (coordinated)	4	ATFONO (page 340 - 347)
	5	ATLAN (page 352 - 361)
	6	ATFREQ (page 364 - 367)

> PRACTICAL EXAMPLES OF OVERVOLTAGE PROTECTION

> PHOTOVOLTAIC INSTALLATIONS

Power supply line
Continuous supply line

Continuous supply		
TYPE 2 (attenuated lightning effects)	1	ATPV (page 319 - 322)

Power supply		
TYPE 1+2 (direct or attenuated lightning effects)	2	ATSHIELD (page 216 - 223) ATSUB (page 224 - 284)

> PRACTICAL EXAMPLES OF OVERVOLTAGE PROTECTION

WIND TURBINES

Power supply line
Data line
Computer line

Power supply		
TYPE 1 (direct lightning effects)	1	ATSHOCK (page 208 - 215)

Are there more than 10 m of separation cable?

YES	NO
	Coordination inductor
	ATLINK (page 291 - 292)
2 TYPE 2 (attenuated lightning effects) ATSUB-400 (page 224 - 284)	

Data and telecommunication		
TYPE 2 and 3 (coordinated)	3	ATLINE (page 348 - 350)
	4	ATLAN (page 352 - 361) ATFREQ (page 364 - 367)

> PRACTICAL EXAMPLES OF OVERVOLTAGE PROTECTION

> TELECOMMUNICATION TOWERS

Power supply		
TYPE 1+2 (direct or attenuated lightning effects)	1	ATSHIELD (page 216 - 223)

Continuous supply		
TYPE 2+3 (coordinated)	2	ATVOLT (page 323 - 327)

Coaxial		
TYPE 2 and 3 (coordinated)	3	ATFREQ (page 364 - 367)

Power supply line
Continuous supply line
Coaxial line

> PRACTICAL EXAMPLES OF OVERVOLTAGE PROTECTION

> TRAFFIC LIGHTS AND STREET LIGHTING

Power supply line

Power supply		
Protection against TYPE 2 transient overvoltages and permanent resettable overvoltages	1	**Traffic lights** KIT ATCONTROL/R M (page 385 - 386)
	2	**Street lighting board** KIT ATCONTROL/R T (page 387)
Protection against TYPE 3 transient overvoltages	3	**Lights** ATSOCKET (page 331 - 332)

> PRACTICAL EXAMPLES OF OVERVOLTAGE PROTECTION

> WATER TREATMENT PLANTS

Power supply		
1	**Transformer substation** TYPE 1 (direct lightning effects)	ATSHOCK (page 208 - 215)

Are there more than 10 m of separation cable?

YES	NO
	Coordination inductor ATLINK (page 291 - 292)

2	**Central building** TYPE 2 (attenuated lightning effects) ATSUB65 (page 228 - 276)	
3	**Motor control centre** TYPE 2 AND PERMANENT (attenuated lightning effects) ATCONTROL/R (page 382 - 387)	
4	**Control panel** Type 3 (attenuated electromagnetic effects) ATCOVER (page 285 - 290)	

Power supply line
Telephone line
Data line
Coaxial line

Telephony and data		
TYPE 2 and 3 (coordinated)	5	**Sensors (pH, flow meter, oxygen, among others)** ATLINE (page 348 - 350)
	6	**Transmission and telemetry antennas** ATFREQ (page 364 - 367)
	7	**Telephone line** ATFONO (page 340 - 347)

> PRACTICAL EXAMPLES OF OVERVOLTAGE PROTECTION

> BANKS AND SECURITY SYSTEMS

Power supply line
Telephone line
Data line
Computer line
Coaxial line

Power supply		
TYPE 1 + 2 (direct or attenuated lightning effects)	1	ATSHIELD (page 216 - 223) ATSUB (page 224 - 284) ATCOVER (page 285 - 290)
TYPE 3 (attenuated electromagnetic effects)	2	ATSOCKET (page 331 - 332) ATPLUG (page 333 - 336)

Data and telecommunication		
TYPE 2 and 3 (coordinated)	3	ATFONO (page 340 - 347)
	4	ATLAN (POE) (page 352 - 361) ATLINE (page 348 - 350)
	5	ATLAN (page 352 - 361)
	6	ATFREQ (page 364 - 367)

> PRACTICAL EXAMPLES OF OVERVOLTAGE PROTECTION

AIRPORTS

Power supply line
Continuous supply line
Computer line
Coaxial line

Power supply		
Main switch board	1	ATSHIELD (page 216 - 223)
Secondary boards connected to an external element	2	ATSUB65 (page 228 - 276)
Secondary boards to electronic equipment	3	ATCOVER (page 285 - 290)

Computer or data lines		
Computer equipment	5	ATLAN (page 352 - 361)

Continuous supply		
Beacons	4	ATVOLT (page 323 - 327)

Coaxial lines		
Antennas	6	ATFREQ (page 364 - 367)

> PRACTICAL EXAMPLES OF OVERVOLTAGE PROTECTION

> IRRIGATION SYSTEMS

Power supply line
Continuous supply line
Data line
Coaxial line

Power supply		
Main switch board	1	ATSHOCK (page 208 - 215)
Secondary boards connected to an external element	2	3 x ATSUB65 (page 257 - 276)
Secondary boards to pumps in wells	3	ATCONTROL/R (page 382 - 387)

Computer or data lines		
Exterior communications and sensors	5	ATLINE (page 348 - 350)
Telemetry meter data	6	ATLINE (page 348 - 350)

Continuous supply		
PLC supply and irrigation programmers	4	ATVOLT (page 323 - 327)

Coaxial lines		
RF aerials	7	ATFREQ (page 364 - 367)

> TECHNICAL GLOSSARY

> Overvoltage protector alarm

A device that gives a visual indication in the event of protector failure. Some protection devices are fitted with floating changeover contact for remote signalling. The alarm warns of protector disconnection in case of failure to avoid a sustained fault in the system.

> Follow up current extinguishing capability

When spark gaps or gas discharge tubes ignite, there is a dielectric breakdown, an ignition arc and the resulting short circuit between the two protected conductors. When working voltage conditions return, the referred short circuit and the arc must disappear. The follow up current extinguishing capability refers to the current that the protector is capable of extinguishing by itself in order to return to normal isolation conditions.

> Impulse current (I_{imp}) for type 1

Maximum peak value with 10/350 µs wave which has been applied to the protector, and which it safely diverts to ground.

> Maximum discharge current (I_{max}) for type 2

Maximum peak value with 8/20 µs wave which has been applied to the protector, and which it safely diverts to ground.

> Maximum working current (I_L)

RMS value of the alternating current or value of the continuous current in a line under normal working conditions so that the protector operates correctly.

> Nominal discharge current I_n (8/20)

Peak value of a 8/20 µs current wave that the protector can repeatedly withstand.

> Follow current (I_f)

Current supplied by the electrical power system and flowing through the protector after a discharge current impulse. It is expressed in kA_{eff}.

> Specific energy W/R for type 1 tests

The energy dissipated by the impulse I_{imp} per unit of resistance. This is equal to the power integral in the equivalent resistance during discharge. It is expressed in kJ/Ω or $kA^2 \cdot s$.

$$W/R = \int i^2 \cdot dt$$

> Thermal stability

An overvoltage protector is thermally stable if after the operating duty test, where it is connected to maximum continuous operating voltage and at specified ambient temperature conditions, the temperature begins to decrease with time (it is monitored for 30 minutes, the active power dissipation must show constant decline for the last 15 minutes).

> 1.2/50 voltage impulse

A voltage impulse with a virtual front time (from 10% to 90% of the peak value) of 1.2 µs and a time-to-half value of 50 µs.

> Methods of protection

An overvoltage protector can be connected Phase to Ground (common), Phase to Neutral (differential), or a combination of both. These connection types are called methods of protection.

> Level of protection (U_p)

Parameter that characterises the performance of the protector in limiting the voltage across its terminals and which is chosen from a chart of values. This value, in volts, should not be exceeded by any of the residual voltage values measured during the tests, including current impulses and 1.2/50 ms voltage tests.

> 10/350 µs current impulse

Current impulse, 10 µs of front time and 350 µs half-time value. Thus the direct effects of the lightning strike are simulated.

> 8/20 µs current impulse

Current impulse, 8 µs of front time and 20 µs half-time value. Thus the secondary effects of the lightning strike are simulated.

> TECHNICAL GLOSSARY

> **Insertion loss**

At a given frequency, the insertion loss of a connected protector is defined as the ratio of voltages appearing across the mains immediately beyond the point of insertion before and after the insertion of the SPD. This ratio is expressed in decibels (dB).

> **Backup overcurrent protection**

An overcurrent device (fuse or circuit breaker), which is a part of the electrical installation, located up-stream from the protector and located so as to prevent it from overheating and being destroyed in the event that the protector is not able to interrupt the sustained short-circuit current.

> **Surge Protection Device (SPD)**

A device intended to limit transient overvoltages and divert dangerous currents. It contains at least one nonlinear component.

There are one-port SPDs which are connected in parallel or two-port SPDs which are connected in series.

> **Combined SPD**

An SPD that includes both voltage switching components and voltage limiting components. It may display voltage switching behaviour, voltage limiting behaviour or a combination of both depending on the characteristics of the applied voltage.

> **Voltage switching type protector**

An SPD that has high impedance when no surge is present, but where the impedance can suddenly drop to a low value in response to a voltage surge in the line it is protecting. Typical examples are spark gaps, gas tubes, thyristors and triacs.

> **Voltage limiting type SPD**

An SPD that has high impedance when there is no overvoltage present, but which continuously decreases the bigger the surge current and voltage are; typical examples of components used as nonlinear devices are varistors and suppressor diodes.

> **Working temperature (ϑ)**

Temperature range where the SPD can be used

> **Sparkover voltage of a voltage switching SPD**

Maximum voltage value before disruptive discharge between the electrodes in the gap of an SPD

(empty space between terminals).

> **Voltage with combination wave ($U_{o.c.}$) for type 3**

The combined wave is produced in a generator which applies a voltage impulse of 1.2/50 µs in an open circuit and a voltage impulse of 8/20 µs in a short-circuit. The parameters of voltage, current and wave shape produced are determined by the generator and the protector impedance.

> **Maximum operating voltage (U_c)**

Maximum voltage that can be continuously applied to the protector.

> **Nominal voltage (U_n)**

The value of the alternating or direct current voltage of the line under normal conditions so that the SPD works correctly.

> **Response time (t_r):**

Parameter that characterizes the speed of protector activation. It may vary according to the gradient of the applied waveshape, although in general the response time for the varistor is considered to be 25 ns, while for the spark gap it is 100 ns.

> PROTECTION OF POWER SUPPLY LINES

Power supply lines enter the structure from outside and distribute the current to all the electrical and electronic equipment, ranging from robust motors to more sensitive devices. Main power supplies often suffer small oscillations, harmonics, sudden increases or even more severe damage such as short circuits or earth faults. Devices for preventing these kind of problems and safeguarding equipment are available on the market (circuit breakers, residual current circuit breakers, fuses etc.), however the response time of these devices is too slow and they do not react properly against transient overvoltages.

Surge protection devices for power supply lines complement the above mentioned devices, since they only protect against transient overvoltages caused by lightning discharges and power switching.

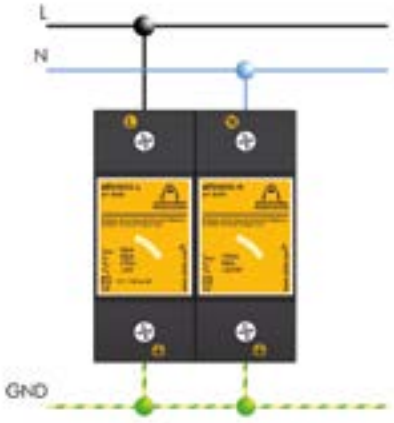
In general, they are to be installed in parallel with the line in order to avoid unnecessary losses and consumption, although some elements such as decoupling inductors must be installed in series. When a protector has an element in series with the line then its maximum continuous working current must be clearly specified, indicating the maximum current that can flow through it continuously.

Within electrical power supply protection, Aplicaciones Tecnológicas, S.A. offers different ranges of protectors according to the intensity of the expected discharge current in the area to be protected and the sensitivity of the protected equipment. When different protection stages are used, it is essential that SPDs are well coordinated when a surge occurs.

> ATSHOCK series

Type 1 protectors. Can withstand maximum direct lightning currents of up to 100 kA, 10/350 µs wave, leaving a residual voltage of a few kilovolts. They consist of gas discharge tubes, which do not produce external blowing or flashes. They are installed in points likely to directly receive large lightning discharges.

They should always be used in combination with ATSUB and/or ATCOVER series protectors as, in many cases, their residual voltage alone is still harmful to the connected equipment. They are single-pole protectors (they protect only one phase or the neutral depending on the earth) and can be installed in all types of supply systems. There are different versions available depending on the electrical supply.

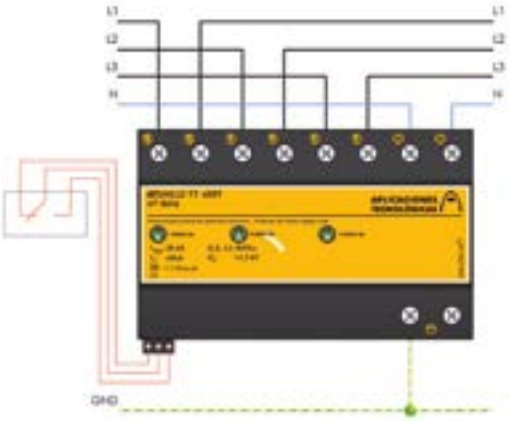


> PROTECTION OF POWER SUPPLY LINES

> ATSHIELD series

It combines very robust elements with limiter components in order to reach a better absorption capacity of direct lightning current along with a low residual voltage. Type 1 + 2 protectors. Protectors which combine both the quick response time of the zinc-oxide varistors and the shunt capacity of gas discharge tubes. They are designed and tested as a type 1 protector, meaning that they can withstand tens of kiloamperes of direct atmospheric discharge current (10/350 µs wave) leaving a non-harmful amount of residual voltage for the connected equipment, equivalent to type 2 protectors. They have a bright warning light to detect any possible overvoltages.

They can be installed in lines with or without neutral, and they are available in three-phase or single-phase versions, for different network voltages.

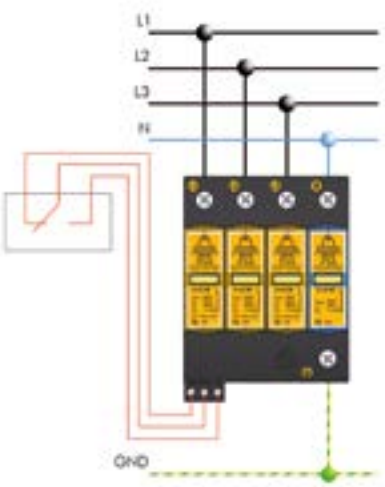


> ATSUB series

Withstands currents of tens of kiloamperes and reduces the overvoltage levels so that they cannot harm the equipment. Type 1 and 2 protectors. They are made up of zinc oxide varistors and gas discharge tubes and have a visual alarm for when the protector is out of service. Available in any pole configuration so that it can be installed in all distribution schemes. ATSUB protectors can withstand tens of kiloamperes for an 8/20 µs wave (wave simulating secondary effects of lightning) and reduce overvoltages to harmless levels for the protected equipment.

These characteristics, together with their small size and low cost, make them the most suitable protectors for installing in secondary boards and close to the equipment. They can be combined with other ATSUB, ATSHOCK (which would receive the main lightning current) and ATCOVER protectors, which leave a lower residual voltage. In any case, there must be 10 metres of cable or ATLINK devices for proper coordination between protection stages.

There are also versions with removable modules (ATSUB-P) for easy substitution in the event of repeated overvoltages and versions with remote warning (ATSUB-R, ATSUB-PR).



> PROTECTION OF POWER SUPPLY LINES

> ATCOVER series

Robust and very complete, it protects all the stages in a quick and effective way, both in common and differential mode, leaving a low residual voltage. Type 2 + 3 protectors.

ATCOVER series protectors combine protection in common mode (to earth) and differential mode (between lines) in one single device. They can withstand currents up to 30 kA with a 8/20 µs wave, leaving very low residual voltages, completely harmless to the connected equipment. They have an internal combination of varistors and gas discharge tubes that prevent current leakage while the line is working under normal conditions.

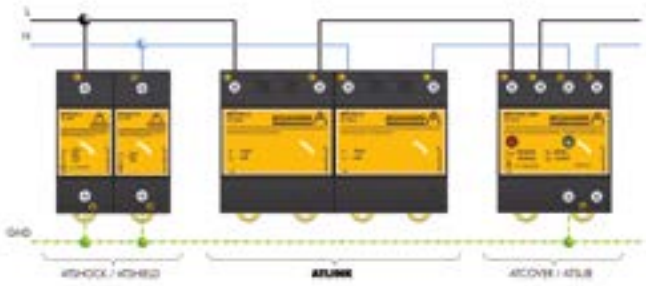
They are provided with a visual alarm and floating changeover contact output for remote control to enable operation monitoring. They can be installed in lines with or without neutral, and they are available in three-phase or single-phase versions, for different network voltages. They can be installed in combination with other ATSHOCK and ATSUB series protectors, always linked by at least 10 metres of cable or ATLINK decoupling inductor.

> ATLINK series

For the coordination of protection stages

ATLINK decoupling inductors are installed in series with the line and therefore you should always check that the current flowing through it is not higher than the rated current of the installed ATLINK.

It enables the protection of different types of devices to be coordinated.



> PROTECTION OF POWER SUPPLY LINES

> ATCOMPACT series

Multi-pole protection cabinet consisting of single-pole elements.

These series consist of cabinets with different combinations of the aforementioned protectors, already wired and ready for installation. It is practical for installations where there is not enough space available in distribution boards.

> ATBARRIER series

Coordination protection cabinet.

These series consist of cabinets with different combinations of the aforementioned protectors, already wired and ready for installation. It is practical for installations where there is not enough space available in distribution boards.

> PROTECTION OF POWER SUPPLY LINES

> ATSHOCK series

> ATSHOCK

Maximum single-pole protection for power supply lines

> **AT-8350 ATSHOCK L**: phase-ground protection. U_c = 275 V
> **AT-8351 ATSHOCK L-130**: phase-ground protection. U_c = 150 V
> **AT-8352 ATSHOCK L-400**: phase-ground protection. U_c = 460 V
> **AT-8399 ATSHOCK N**: neutral-ground protection

The highest protection against transient overvoltages for power supply lines at the point they **enter the building**. ATSHOCK series provide protection even against **direct lightning strikes**. Tested and certified with lightning impulse current 10/350 µs wave, **50 kA**.

Coarse protection according to scaled protection recommended in Low Voltage Regulation (REBT).

Type 1 protector according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. For equipment of **categories III and IV** according to REBT.

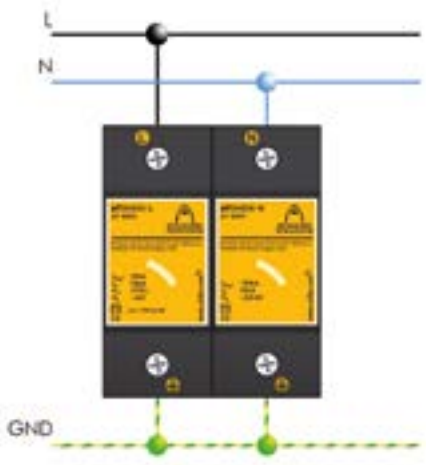
- Gas discharge tube inside.
- Suitable for TT, TN-C and TN-S systems.
- Can be coordinated with other SPDs such as ATSUB and ATCOVER.
- Quick response.
- Single-pole protection. Withstands direct lightning strike current (10/350 wave) up to 50 kA (ATSHOCK N up to 100 kA)
- Fork connection with fork terminal included for 16 mm² cable.
- High energy diverting capacity.
- Limits following current supply.

ATSHOCK series protectors have been tested in **official, independent laboratories** obtaining their characteristics according to applicable standards (shown in the table).

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

ATSHOCK surge protection devices are to be installed **in parallel** with the low voltage supply line, connected to a phase and ground (ATSHOCK L) or to neutral and ground (ATSHOCK N). One ATSHOCK L is needed for each phase.
Installation should be carried out **without power running through the line**.
ATSHOCK can be installed in combination with ATSUB or ATCOVER protectors. In either case, both must be separated by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor, in order to achieve **correct coordination between them**.
Installation is recommended in distribution boards where the line enters the building and where direct lightning currents could penetrate.



> PROTECTION OF POWER SUPPLY LINES

> ATSHOCK series

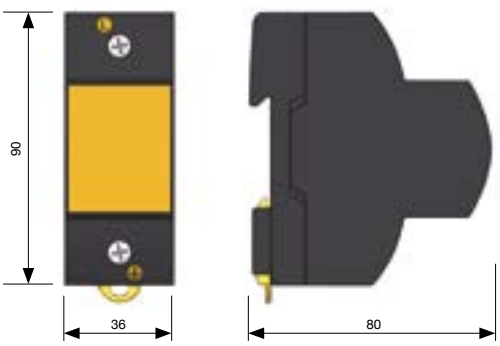
> TECHNICAL DATASHEET

Reference		ATSHOCK L **AT-8350**	ATSHOCK L-120 **AT-8351**	ATSHOCK L-400 **AT-8352**	ATSHOCK N **AT-8399**
Protection categories according to the REBT:		III and IV			
Type of tests according to EN 61643-11:		Type 1			
Nominal voltage:	U_n	230 V_{AC}	120 V_{AC}	400 V_{AC}	-
Maximum continuous operating voltage:	U_c	275 V_{AC}	150 V_{AC}	460 V_{AC}	-
Nominal frequency:		50 - 60 Hz			
Impulse current (10/350 µs wave):	I_{imp}	50 kA			100 kA
Specific energy:	W/R	625 kJ/Ω			2.5 MJ/Ω
Nominal discharge current (8/20 µs wave):	I_n	50 kA			
Protection level for I_n (8/20 µs):	U_p	2.5 kV			1.5 kV
Follow current extinguishing capability:	I_f	50 kA_{eff}			100 A_{eff}
Response time:	t_r	< 100 ns			-
Backup fuse(1):		160 A gL/gG			
Maximum short-circuit current:		50 kA (for maximum fuse)			
Working temperature:	ϑ	-40 °C to +70 °C			
Protector location:		Indoor			
Type of connection:		Parallel (one port)			
Dimensions:		36 x 90 x 80 mm (2 mod. DIN 43880)			
Fixing:		DIN Rail			
Enclosure material:		Polyamide			
Enclosure protection:		IP20			
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)			
Connections L/N/G:		Section 16 mm^2			

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATSHOCK series

> ATSHOCK30

Single-pole protection for power supply lines

> **AT-8310 ATSHOCK L30**: phase-ground protection. U_c = 275 V
> **AT-8311 ATSHOCK L30-130**: phase-ground protection. U_c = 150 V
> **AT-8312 ATSHOCK L30-400**: phase-ground protection. U_c = 460 V
> **AT-8398 ATSHOCK N60**: neutral-ground protection

High protection against transient overvoltages for power supply lines at the point they **enter the building**. ATSHOCK series provide protection even against **direct lightning strikes**. Tested and certified with lightning impulse current 10/350 µs wave, **30 kA**.

Coarse protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT).

Type 1 protector according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. For equipment of **categories III and IV** according to REBT.

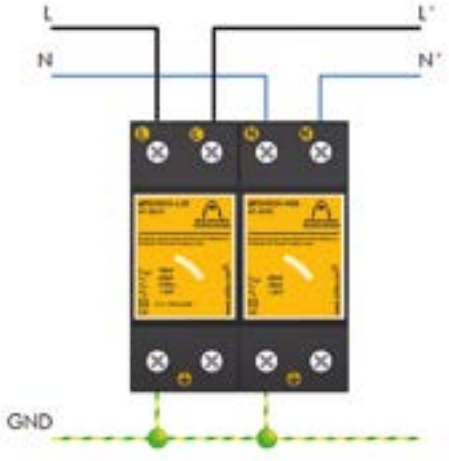
- Gas discharge tube inside.
- Double connection in order to facilitate wiring (limited to 63 A).
- Possibility of connection to M5 fork terminal
- Can be coordinated with other SPDs such as ATSUB and ATCOVER.
- Suitable for TT, TN-C and TN-S systems.
- Quick response.
- Single-pole protection. Withstands direct lightning strike current (10/350 wave) up to 30 kA (ATSHOCK-P N60 up to 60kA).
- High energy diverting capacity.
- Limits following current supply.

ATSHOCK series protectors have been tested in **official, independent laboratories** obtaining their characteristics according to applicable standards (shown in the table).

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

ATSHOCK 30 surge protection devices are to be installed **in parallel** with the low voltage supply line, connected to phase and ground (ATSHOCK L30) or to neutral and ground (ATSHOCK N60). ATSHOCK L30 is required for each phase.
Installation should be carried out **without power running through the line**.
ATSHOCK can be installed in combination with ATSUB or ATCOVER protectors. In either case, both must be separated by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor, in order to achieve **correct coordination between them**.
Installation is recommended in distribution boards where the line enters the building and where direct lightning currents could penetrate.



> PROTECTION OF POWER SUPPLY LINES

> ATSHOCK series

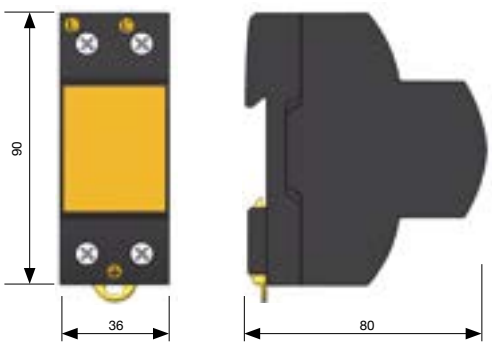
> TECHNICAL DATASHEET

Reference		ATSHOCK L30 **AT-8310**	ATSHOCK L30-130 **AT-8311**	ATSHOCK L30-400 **AT-8312**	ATSHOCK N60 **AT-8398**
Protection categories according to the REBT:		III and IV			
Type of tests according to EN 61643-11:		Type 1			
Nominal voltage:	U_n	230 V_{AC}	120 V_{AC}	400 V_{AC}	-
Maximum continuous operating voltage:	U_c	275 V_{AC}	150 V_{AC}	460 V_{AC}	-
Nominal frequency:		50 - 60 Hz			
Impulse current (10/350 µs wave):	I_{imp}	30 kA			60 kA
Specific energy:	W/R	224 kJ/Ω			900 kJ/Ω
Nominal discharge current (8/20 µs wave):	I_n	40 kA			
Protection level for I_n (8/20 µs):	U_p	2 kV			900 V
Follow current extinguishing capability:	I_f	50 kA_{eff}			100 A_{eff}
Response time:	t_r	< 100 ns			-
Backup fuse[1]:		160 A gL/gG			
Maximum short-circuit current:		50 kA (for maximum fuse)			
Working temperature:	ϑ	-40 ºC to +70 ºC			
Protector location:		Indoor			
Type of connection:		Parallel (one port)			
Dimensions:		36 x 90 x 80 mm (2 mod. DIN 43880)			
Fixing:		DIN Rail			
Enclosure material:		Polyamide			
Enclosure protection:		IP20			
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)			
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2			

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATSHOCK series

> ATSHOCK25

Single-pole and pluggable protection for power supply lines

> **AT-8325 ATSHOCK L25**: phase-ground protection. U_c = 275 V
> **AT-8326 ATSHOCK L25-130**: phase-ground protection. U_c = 150 V
> **AT-8327 ATSHOCK L25-400**: phase-ground protection. U_c = 460 V

High protection against transient overvoltages for power supply lines at the point they **enter the building**. ATSHOCK series provide protection even against **direct lightning strikes**. Tested and certified with lightning impulse current 10/350 µs wave, **25 kA**.

Type 1 and 2 protectors according to EN 61643-11 and GUIA-BT-23 from REBT. Suitable for equipment of **categories I, II, III and IV** according to ITC-BT-23 from REBT.

- Gas discharge tube inside.
- Double connection in order to facilitate wiring (limited to 63 A).
- Possibility of connection to M5 fork terminal.
- Suitable for TT, TN-C and TN-S systems.
- Can be coordinated with other ATSUB and ATCOVER series protectors.
- Quick response.
- Single-pole protection. Withstands direct lightning strike current (10/350 wave) up to 25 kA.
- Limits following current supply.
- Thermodynamic control device and visual alarm.
- Test button for checking protector status. Green light indicates correct operation. If not, replace.
- This indicator does not generate any fault current during normal operation.
- Complies with IBERDROLA requirements for type 1 overvoltage protection on the Meter Board.

ATSHOCK series protectors have been tested in **official, independent laboratories** obtaining their characteristics according to applicable standards (shown in the table).

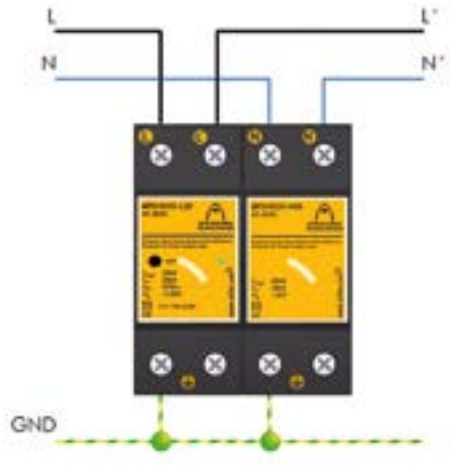
Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

ATSHOCK L25 surge protection devices are to be installed **in parallel** with the low voltage supply line, connected to phase and neutral. ATSHOCK N is recommended between neutral and earth.

Installation should be carried out **without power running through the line**. ATSHOCK can be installed in combination with ATSUB or ATCOVER protectors. In either case, both must be separated by at least 10 metres of cable or, if this is not possible, by a decoupling inductor ATLINK, in order to achieve **correct coordination** between them.

Installation is recommended in distribution boards where the line enters the building and where direct lightning currents could penetrate.



> PROTECTION OF POWER SUPPLY LINES

> ATSHOCK series

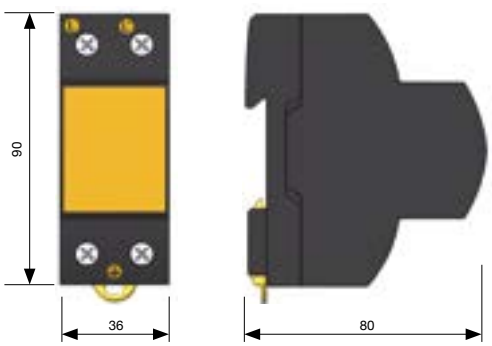
> TECHNICAL DATASHEET

Reference		ATSHOCK L25 **AT-8325**	ATSHOCK L25-130 **AT-8326**	ATSHOCK L25-400 **AT-8327**
Protection categories according to the REBT:		I, II, III and IV		
Type of tests according to EN 61643-11:		Type 1 and 2		
Nominal voltage:	U_n	230 V_{AC}	120 V_{AC}	400 V_{AC}
Maximum continuous operating voltage:	U_c	275 V_{AC}	150 V_{AC}	460 V_{AC}
Nominal frequency:		50 - 60 Hz		
Impulse current (10/350 µs wave):	I_{imp}	25 kA		
Specific energy:	W/R	156 kJ/Ω		
Nominal discharge current (8/20 µs wave):	I_n	25 kA		
Protection level for I_n (8/20 µs):	U_p	1.5 kV		
Follow current extinguishing capability:	I_f	50 kA_{eff}		
Response time:	t_r	< 100 ns		
Backup fuse[1]:		160 A gL/gG		
Maximum short-circuit current:		50 kA (for maximum fuse)		
Working temperature:	ϑ	-40 ºC to +70 ºC		
Protector location:		Indoor		
Type of connection:		Parallel (one port)		
Dimensions:		36 x 90 x 80 mm (2 mod. DIN 43880)		
Fixing:		DIN Rail		
Enclosure material:		Polyamide		
Enclosure protection:		IP20		
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)		
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2		

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATSHOCK series

> ATSHOCK-P 30

Single-pole and removable plug protection for power supply lines

> **AT-8330 ATSHOCK-P L30**: phase-ground protection. Uc = 275 V
> **AT-8331 ATSHOCK-P L30-130**: phase-ground protection. Uc = 145 V
> **AT-8332 ATSHOCK-P L30-400**: phase-ground protection. Uc = 440 V
> **AT-8397 ATSHOCK-P N60**: neutral-ground protection

High protection against transient overvoltages for power supply lines at the point they **enter the building**. ATSHOCK series provide protection even against**direct lightning strikes**. Tested and certified with lightning impulse current, **30 kA, 10/350 µs** wave in removable modules.

Coarse protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT).

Type 1 protector according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. For equipment of **categories III and IV** according to REBT.

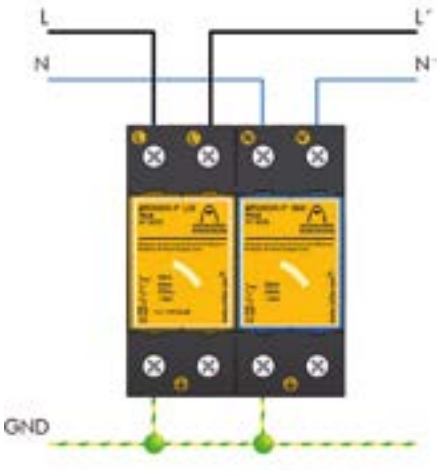
- Gas discharge tube inside.
- Double connection in order to facilitate wiring (limited to 63 A).
- Possibility of connection to M5 fork terminal.
- Suitable for TT, TN-C and TN-S systems.
- Can be coordinated with other ATSUB and ATCOVER series protectors.
- Quick response.
- Single-pole protection. Withstands direct lightning strike current (10/350 wave) up to 30 kA (ATSHOCK-P N60 up to 60 kA).
- High energy diverting capacity.
- Limits following current supply.

ATSHOCK series protectors have been tested in **official, independent laboratories** obtaining their characteristics according to applicable standards (shown in the table).

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

ATSHOCK-P 30 surge protection devices are to be installed **in parallel** with the low voltage supply line, connected to phase and ground (ATSHOCK L30) or to neutral and ground (ATSHOCK N60). ATSHOCK L30 is required for each phase.
Installation should be carried out **without power running through the line**.
ATSHOCK can be installed in combination with ATSUB or ATCOVER protectors. In either case, both must be separated by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor, in order to achieve **correct coordination between them**.
Installation is recommended in distribution boards where the line enters the building and where direct lightning currents could penetrate.



> PROTECTION OF POWER SUPPLY LINES

> ATSHOCK series

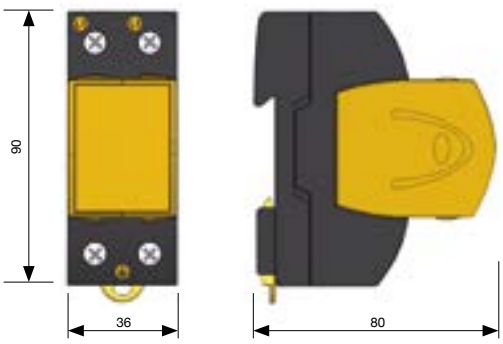
> TECHNICAL DATASHEET

Reference		ATSHOCK-P L30 **AT-8330**	ATSHOCK-P L30-130 **AT-8331**	ATSHOCK-P L30-400 **AT-8332**	ATSHOCK-P N60 **AT-8397**
Protection categories according to the REBT:		III and IV			
Type of tests according to EN 61643-11:		Type 1			
Nominal voltage:	U_n	230 V_{AC}	120 V_{AC}	400 V_{AC}	-
Maximum continuous operating voltage:	U_c	275 V_{AC}	150 V_{AC}	460 V_{AC}	-
Nominal frequency:		50 - 60 Hz			
Impulse current (10/350 µs wave):	I_{imp}	30 kA			60 kA
Specific energy:	W/R	224 kJ/Ω			900 kJ/Ω
Nominal discharge current (8/20 µs wave):	I_n	40 kA			
Protection level for I_n (8/20 µs):	U_p	2 kV			900 V
Follow current extinguishing capability:	I_f	50 kA_{eff}			100 A_{eff}
Response time:	t_r	< 100 ns			
Backup fuse(1):		160 A gL/gG			-
Maximum short-circuit current:		50 kA (for maximum fuse)			
Working temperature:	ϑ	-40 ºC to +70 ºC			
Protector location:		Indoor			
Type of connection:		Parallel (one port)			
Dimensions:		36 x 90 x 80 mm (2 mod. DIN 43880)			
Fixing:		DIN Rail			
Enclosure material:		Polyamide			
Enclosure protection:		IP20			
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)			
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2			

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> ACCESSORIES

> AT-8333 ATSHOCK-P L30 Mod.: I_{imp} 30 kA. U_n 230 V
> AT-8334 ATSHOCK-P L30-130 Mod.: I_{imp} 30 kA. U_n 130 V
> AT-8335 ATSHOCK-P L30-400 Mod.: I_{imp} 30 kA. U_n 400 V
> AT-8336 ATSHOCK-P N60 Mod.: I_{imp} 60 kA.

> PROTECTION OF POWER SUPPLY LINES

> ATSHIELD series

> ATSHIELD TT

Combined technology against direct lightning strikes

> **AT-8616 ATSHIELD TT 400T**: protection of both phase and neutral to ground for 400 V_{AC} three-phase lines

> **AT-8617 ATSHIELD TT 230T**: protection of both phase and neutral to ground for 230 V_{AC} three-phase lines

Effective and compact protection against transient overvoltages for TT and TNS power supply systems, using an internal combination of gas discharge tubes and varistors.

This element is internally connected in such a way that no element in series with the line is needed for correct coordination of the protection. This protector combines the best qualities of the latest overvoltage protection technologies: the passing residual voltage of the varistors along with the gas discharge tube capacity to absorb lightning current. Tested and certified as a **type 1 and 2** protector according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV** equipment according to the REBT.

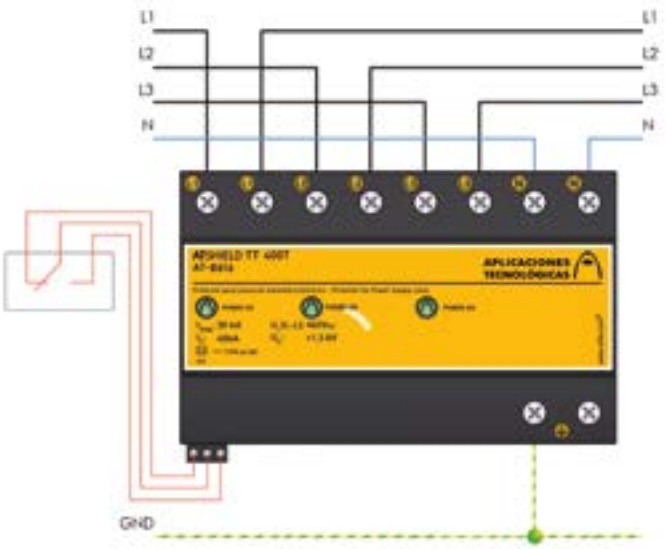
- Can be coordinated with other ATSUB and ATCOVER series protectors.
- Double connection in order to facilitate wiring (limited to 63 A).
- Short response time.
- Does not produce deflagration.
- Multi-pole protection.
- Their activation causes no interruption in power supply.
- Compact protection.
- Thermodynamic control device and visual alarm for each phase.

ATSHIELD series protectors have been tested in **official and independent laboratories,** obtaining their characteristics according to relevant standards (shown in the table).

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

ATSHIELD TT surge protection devices must be installed **in parallel** with the low voltage three-phase power supply line provided with a neutral.
Installation should be carried out **without power running through the line**.
They can be installed as single protection or in combination with other protectors that leave less residual voltage, in which case they need to be separated by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor, in order to achieve **correct coordination between them**.
Installation is recommended in distribution boards where the line enters the building or where large overvoltages can occur.
They are particularly recommended for places where direct lightning strikes can occur and when lines are connected to very sensitive equipment that cannot withstand large overvoltages.



> PROTECTION OF POWER SUPPLY LINES

> ATSHIELD series

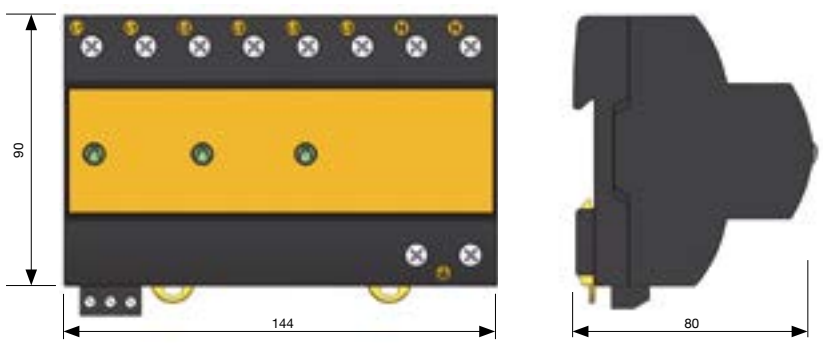
> TECHNICAL DATASHEET

Reference:		ATSHIELD TT 400T **AT-8616**	ATSHIELD TT 230T **AT-8617**
Protection categories according to the REBT:		I, II, III, IV	
Type of tests according to EN 61643-11:		Type 1 + 2	
Nominal voltage:	U_n	400 V_{AC} (L-L) 230 V_{AC} (L-N, L-GND)	230 V_{AC} (L-L) 130 V_{AC} (L-N, L-GND)
Maximum continuous operating voltage:	U_c	460 V_{AC} (L-L) 275 V_{AC} (L-N, L-GND)	275 V_{AC} (L-L) 150 V_{AC} (L-N, L-GND)
Nominal frequency:		50 - 60 Hz	
Impulse current per pole (10/350 µs wave):	I_{imp}	30 kA	
Specific energy:	W/R	224 kJ/Ω	
Nominal discharge current per pole (8/20 µs wave):	I_n	40 kA	
Maximum discharge current per pole (8/20 µs wave):	I_{max}	65 kA	
Protection level:	U_p	< 1500 V	
Follow current extinguishing capability:	I_f	50 kA_{eff}	
Response time:	t_r	< 100 ns	
Backup fuse(1):		125 A gL/gG	
Maximum short-circuit current:		25 kA (for maximum fuse)	
Working temperature:	ϑ	-40 ºC to +70 ºC	
Protector location:		Indoor	
Type of connection:		Parallel (one port)	
No. of poles:		4	
Dimensions:		144 x 90 x 80 mm (8 mod. DIN 43880)	
Fixing:		DIN Rail	
Enclosure material:		Polyamide	
Enclosure protection:		IP20	
Insulation resistance:		> 10^{14} Ω	
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)	
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2	

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATSHIELD series

> ATSHIELD T

Combined technology against direct lightning strikes

> **AT-8603 ATSHIELD 400T**: protection of both phase and neutral for 400V_{AC} three-phase lines

> **AT-8604 ATSHIELD 230T**: protection of both phase and neutral for 230 V_{AC} three-phase lines

Effective and compact protection against transient overvoltages for TT and TNS power supply systems, using an internal combination of gas discharge tubes and varistors.

This element is internally connected in such a way that no element in series with the line is needed for correct coordination of the protection.

This protector combines the best qualities of the latest overvoltage protection technologies: the passing residual voltage of the varistors along with the gas discharge tube capacity to absorb lightning current.

Tested and certified as a **type 1 and 2** protector according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV equipment** according to the REBT.

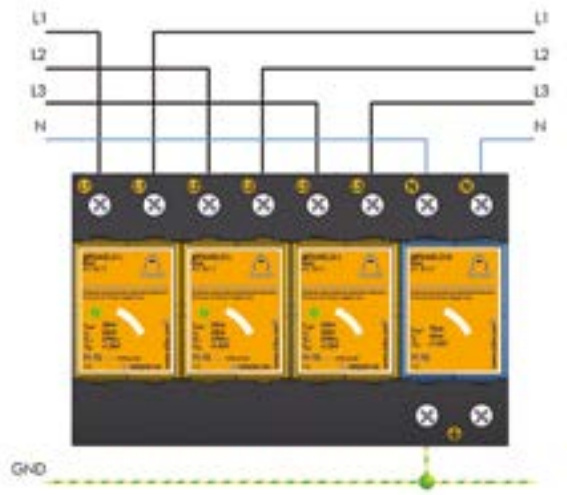
- Can be coordinated with other ATSUB and ATCOVER series protectors.
- Double connection in order to facilitate wiring (limited to 63 A).
- Short response time.
- Does not produce deflagration.
- Multi-pole protection.
- Their activation causes no interruption in power supply.
- Compact protection.
- Thermodynamic control device and visual alarm for each phase.
- Removable modules for easy replacement.

ATSHIELD series protectors have been tested in **official and independent laboratories,** obtaining their characteristics according to relevant standards (shown in the table).

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

ATSHIELD T surge protection devices must be installed **in parallel** with the low voltage three-phase power supply line provided with a neutral.
Installation should be carried out **without power running through the line**.
They can be installed as single protection or in combination with other protectors that leave less residual voltage, in which case they need to be separated by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor, in order to achieve **correct coordination between them**.
Installation is recommended in distribution boards where the line enters the building or where large overvoltages can occur.
They are particularly recommended for places where direct lightning strikes can occur and when lines are connected to very sensitive equipment that cannot withstand large overvoltages.



> PROTECTION OF POWER SUPPLY LINES

> ATSHIELD series

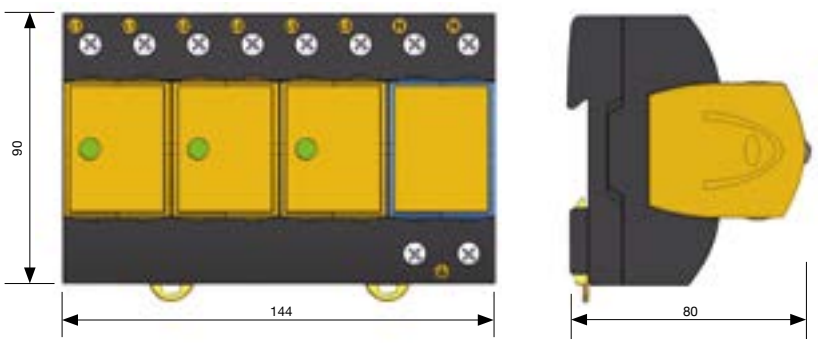
> TECHNICAL DATASHEET

Reference:		ATSHIELD 400T **AT-8603**	ATSHIELD 230T **AT-8604**
Protection categories according to the REBT:		I, II, III, IV	
Type of tests according to EN 61643-11:		Type 1 + 2	
Nominal voltage:	U_n	400 V_{AC} (L-L) 230 V_{AC} (L-N, L-GND)	230 V_{AC} (L-L) 130 V_{AC} (L-N, L-GND)
Maximum continuous operating voltage:	U_c	460 V_{AC} (L-L) 275 V_{AC} (L-N, L-GND)	275 V_{AC} (L-L) 150 V_{AC} (L-N, L-GND)
Nominal frequency:		50 - 60 Hz	
Impulse current per pole (10/350 µs wave):	I_{imp}	25 kA	
Specific energy:	W/R	156 kJ/Ω	
Nominal discharge current per pole (8/20 µs wave):	I_n	40 kA	
Maximum discharge current per pole (8/20 µs wave):	I_{max}	65 kA	
Protection level:	U_p	< 1500 V	
Follow current extinguishing capability:	I_f	50 kA_{eff}	
Response time:	t_r	< 100 ns	
Backup fuse(1):		125 A gL/gG	
Maximum short-circuit current:		25 kA (for maximum fuse)	
Working temperature:	ϑ	-40 ºC to +70 ºC	
Protector location:		Indoor	
Type of connection:		Parallel (one port)	
No. of poles:		4	
Dimensions:		144 x 90 x 80 mm (8 mod. DIN 43880)	
Fixing:		DIN Rail	
Enclosure material:		Polyamide	
Enclosure protection:		IP20	
Insulation resistance:		> 10^{14} Ω	
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)	
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2	

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> ACCESSORIES

> AT-8611 ATSHIELD L Mod: I_{imp} 25 kA. U_n 230 V
> AT-8612 ATSHIELD L-130 Mod: I_{imp} 25 kA. U_n 130 V
> AT-8613 ATSHIELD N Mod: I_{imp} 75 kA

> PROTECTION OF POWER SUPPLY LINES

> ATSHIELD series

> ATSHIELD S

Combined technology against direct lightning strikes

> **AT-8618 ATSHIELD S 230M**: protection of both phase and neutral to ground for 230 V_{AC} single-phase lines

> **AT-8619 ATSHIELD S 130M**: protection of both phase and neutral to ground for 130 V_{AC} single-phase lines

Effective and compact protection against transient overvoltages for power supply systems, using an internal combination of gas discharge tubes and varistors.

This element is internally connected in such a way that no element in series with the line is needed for correct coordination of the protection. This protector combines the best qualities of the latest overvoltage protection technologies: the passing residual voltage of the varistors along with the gas discharge tube capacity to absorb lightning current. Tested and certified as a **type 1 and 2** protector according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV equipment** according to the REBT.

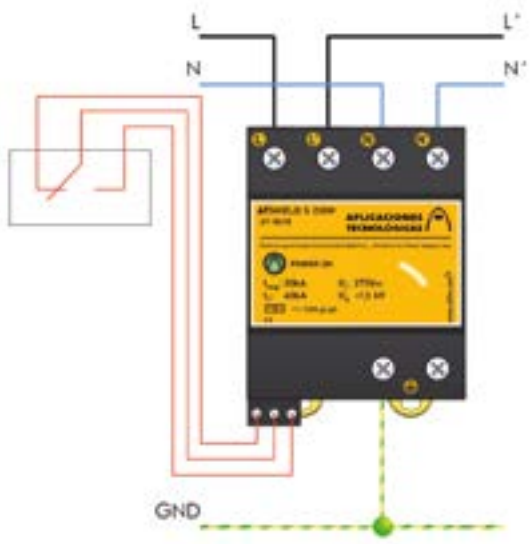
- Can be coordinated with other ATSUB and ATCOVER series protectors.
- Double connection in order to facilitate wiring (limited to 63 A).
- Short response time.
- Do not produce deflagration.
- Bipolar protection.
- Their activation causes no interruption in power supply.
- Compact protection.
- Thermodynamic control device and visual alarm for phase.

ATSHIELD series protectors have been tested in **official and independent laboratories,** obtaining their characteristics according to relevant standards (shown in the table).

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

ATSHIELD surge protection devices must be installed **in parallel** with the low voltage single-phase power supply line.
Installation should be carried out **without power running through the line**.
They can be installed as single protection or in combination with other protectors that leave less residual voltage, in which case they need to be separated by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor, in order to achieve **correct coordination between them**.
Installation is recommended in distribution boards where the line enters the building or where large overvoltages can occur.
They are particularly recommended for places where direct lightning strikes can occur and when lines are connected to very sensitive equipment that cannot withstand large overvoltages.



> PROTECTION OF POWER SUPPLY LINES

> ATSHIELD series

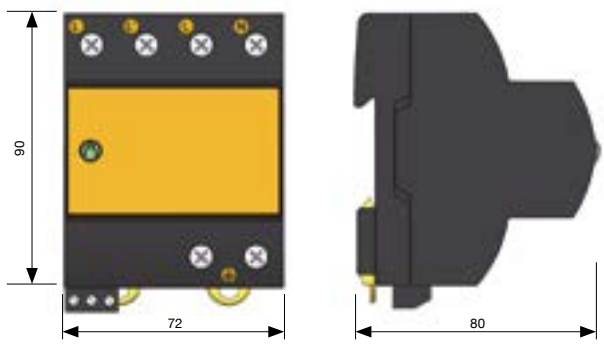
> TECHNICAL DATASHEET

Reference:		ATSHIELD S 230M **AT-8618**	ATSHIELD S 130M **AT-8619**
Protection categories according to the REBT:		I, II, III, IV	
Type of tests according to EN 61643-11:		Type 1 + 2	
Nominal voltage:	U_n	230 V_{AC}	130 V_{AC}
Maximum continuous operating voltage:	U_c	275 V_{AC}	150 V_{AC}
Nominal frequency:		50 - 60 Hz	
Impulse current per pole (10/350 µs wave):	I_{imp}	30 kA	
Specific energy:	W/R	224 kJ/Ω	
Nominal discharge current per pole (8/20 µs wave):	I_n	40 kA	
Maximum discharge current per pole (8/20 µs wave):	I_{max}	65 kA	
Protection level:	U_p	< 1500 V	
Follow current extinguishing capability:	I_f	50 kA_{eff}	
Response time:	t_r	< 100 ns	
Backup fuse(1):		125 A gL/gG	
Maximum short-circuit current:		25 kA (for maximum fuse)	
Working temperature:	ϑ	-40 ºC to + 70 ºC	
Protector location:		Indoor	
Type of connection:		Parallel (one port)	
No. of poles:		2	
Dimensions:		72 x 90 x 80 mm (4 mod. DIN 43880)	
Fixing:		DIN Rail	
Enclosure material:		Polyamide	
Enclosure protection:		IP20	
Insulation resistance:		> 10^{14} Ω	
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)	
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2	

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATSHIELD series

> ATSHIELD M

Combined technology against direct lightning strikes

> **AT-8607 ATSHIELD 230M**: protection of both phase and neutral to ground for 230 V_{AC} single-phase lines.

> **AT-8608 ATSHIELD 130M**: protection of both phase and neutral to ground for 130V_{AC} single-phase lines.

Effective and compact protection against transient overvoltages for power supply systems, using an internal combination of gas discharge tubes and varistors.

This element is internally connected in such a way that no element in series with the line is needed for correct coordination of the protection. This protector combines the best qualities of the latest overvoltage protection technologies: the passing residual voltage of the varistors along with the gas discharge tube capacity to absorb lightning current. Tested and certified as a **type 1 and 2** protector according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV equipment** according to the REBT.

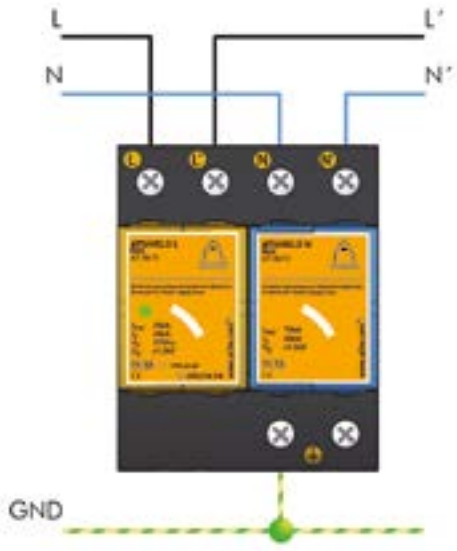
- Can be coordinated with other ATSUB and ATCOVER series protectors.
- Double connection in order to facilitate wiring (limited to 63 A).
- Short response time.
- Do not produce deflagration.
- Bipolar protection.
- Their activation causes no interruption in power supply.
- Compact protection.
- Thermodynamic control device and visual alarm for phase.
- Removable modules for easy replacement.

ATSHIELD series protectors have been tested in **official and independent laboratories,** obtaining their characteristics according to relevant standards (shown in the table).

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

ATSHIELD M surge protection devices must be installed **in parallel** with the low voltage single-phase power supply line.
Installation should be carried out **without power running through the line**.
They can be installed as single protection or in combination with other protectors that leave less residual voltage, in which case they need to be separated by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor, in order to achieve **correct coordination between them**.
Installation is recommended in distribution boards where the line enters the building or where large overvoltages can occur.
They are particularly recommended for places where direct lightning strikes can occur and when lines are connected to very sensitive equipment that cannot withstand large overvoltages.



> PROTECTION OF POWER SUPPLY LINES

> ATSHIELD series

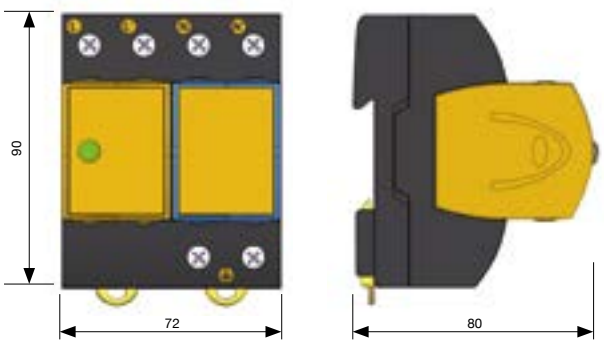
> TECHNICAL DATASHEET

Reference:		ATSHIELD 230M **AT-8607**	ATSHIELD 130M **AT-8608**
Protection categories according to the REBT:		I, II, III, IV	
Type of tests according to EN 61643-11:		Type 1 + 2	
Nominal voltage:	U_n	230 V_{AC}	130 V_{AC}
Maximum continuous operating voltage:	U_c	275 V_{AC}	150 V_{AC}
Nominal frequency:		50 - 60 Hz	
Impulse current per pole (10/350 µs wave):	I_{imp}	25 kA	
Specific energy:	W/R	156 kJ/Ω	
Nominal discharge current per pole (8/20 µs wave):	I_n	40 kA	
Maximum discharge current per pole (8/20 µs wave):	I_{max}	65 kA	
Protection level:	U_p	< 1500 V	
Follow current extinguishing capability:	I_f	50 kA_{eff}	
Response time:	t_r	< 100 ns	
Backup fuse(1):		125 A gL/gG	
Maximum short-circuit current:		25 kA (for maximum fuse)	
Working temperature:	ϑ	-40 ºC to +70 ºC	
Protector location:		Indoor	
Type of connection:		Parallel (one port)	
No. of poles:		2	
Dimensions:		72 x 90 x 80 mm (4 mod. DIN 43880)	
Fixing:		DIN Rail	
Enclosure material:		Polyamide	
Enclosure protection:		IP20	
Insulation resistance:		> 10^{14} Ω	
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)	
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2	

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> ACCESSORIES

> AT-8611 ATSHIELD L Mod: I_{imp} 25 kA. U_n 230 V
> AT-8612 ATSHIELD L-130 Mod: I_{imp} 25 kA. U_n 130 V
> AT-8613 ATSHIELD N Mod: I_{imp} 75 kA

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> ATSUB140

Single-pole and pluggable protection for power supply lines

- **AT-8214 ATSUB 140-230**: line protection. Maximum current 140 kA a U_n=230 V_{AC}
- **AT-8215 ATSUB 140-130**: line protection. Maximum current 140 kA a U_n=130 V_{AC}
- **AT-8213 ATSUB 140-400**: line protection. Maximum current 140 kA a U_n=400 V_{AC}
- **AT-8218 ATSUB 140-N**: neutral protection. Maximum current 140 KA

> NOMENCLATURE

ATSUB 140 – 230

Max. discharge voltage in kA | Line - ground nominal voltage

Effective protection against transient overvoltages, using metal oxide varistors, for power supply lines with or without a neutral. Medium protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT ITC23).

Tested and certified as a **type 1 and 2** protector according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV equipment** according to the REBT.

- Containing zinc oxide varistors, able to withstand very high currents.
- Short response time.
- Do not produce deflagration.
- Single-pole protection.
- Their activation causes no interruption in power supply.
- Thermodynamic control device and visual alarm.

ATSUB series protectors have been tested in **official, independent laboratories,** obtaining their characteristics according to relevant standards (listed in the table).

It is possible to select a protector for the alternating voltage suitable for each particular case. The 230 V and 130 V versions of nominal voltage are included in the technical datasheet.

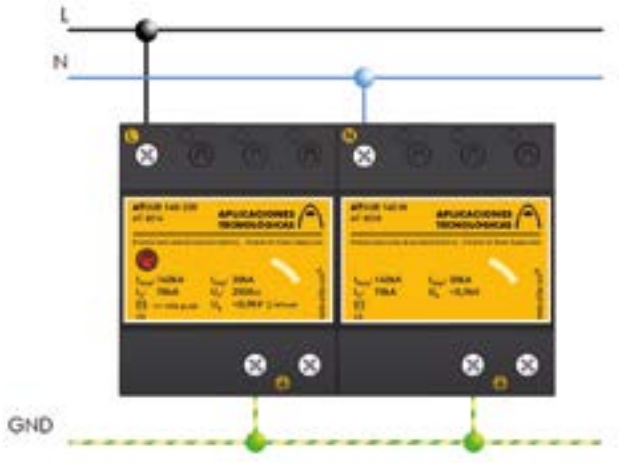
Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

They are installed **in parallel** with the low voltage line, with connections to the phases that are to be protected (or to neutral) and to ground.

Installation should be carried out **without power running through the line**.

They are recommended for installations where large overvoltages can occur after the main switchboard and when these lines are not connected to very sensitive equipment.



> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

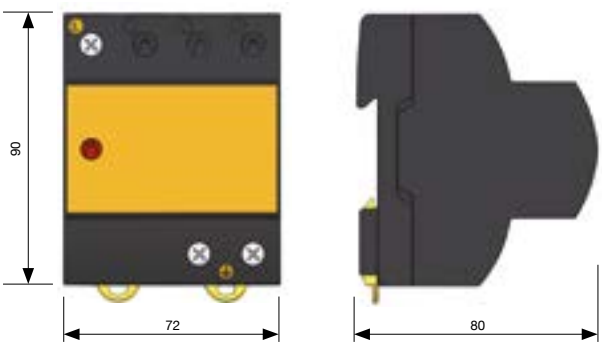
> TECHNICAL DATASHEET

Reference:		ATSUB 140-230 **AT-8214**	ATSUB 140-400 **AT-8213**	ATSUB 140-130 **AT-8215**	ATSUB 140-N **AT-8218**
Protection categories according to the REBT:		I, II, III, IV			
Type of tests according to EN 61643-11:		Type 1 + 2			
Nominal voltage:	U_n	230 V_{AC}	400 V_{AC}	130 V_{AC}	-
Maximum continuous operating voltage:	U_c	275 V_{AC}	460 V_{AC}	150 V_{AC}	-
Nominal frequency:		50 - 60 Hz			
Impulse current (10/350 µs wave):	I_{imp}	30 kA			
Nominal discharge current (8/20 µs wave):	I_n	40 kA			
Maximum discharge current per pole (8/20 µs wave):	I_{max}	140 kA			
Protection level 1.2/50 µs wave:	U_p	900 V	1500 V	500 V	900 V
Response time:	t_r	< 25 ns			
Backup fuse(1):		125 A gL/gG			
Maximum short-circuit current:		25 kA (for maximum fuse)			
Working temperature:	ϑ	-40 °C to +70 °C			
Protector location:		Indoor			
Type of connection:		Parallel (one port)			
Dimensions:		72 x 90 x 80 mm (4 mod. DIN 43880)			
Fixing:		DIN Rail			
Enclosure material:		Polyamide			
Enclosure protection:		IP20			
Insulation resistance:		> 10^{14} Ω			
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)			
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2			

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> ATSUB100

Single-pole and pluggable protection for power supply lines

- **AT-8256 ATSUB 100**: line protection.
  Maximum current 100 kA a U_n=230 V_{AC}
- **AT-8257 ATSUB 100-120**: line protection
  Maximum current 100 kA a U_n=120 V_{AC}
- **AT-8258 ATSUB 100-400**: line protection.
  Maximum current 100 kA a U_n=400 V_{AC}
- **AT-8259 ATSUB 100-N**: neutral protection.
  Maximum current 100 kA

> NOMENCLATURE

ATSUB 100 – 120

Max. discharge voltage in kA

Line - ground nominal voltage

Effective protection against transient overvoltages, using metal oxide varistors, for power supply lines with or without a neutral. Medium protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT ITC23).

Tested and certified as a **type 1 and 2** protector according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV equipment** according to the REBT.

- Containing zinc oxide varistors, able to withstand very high currents.
- Double connection in order to facilitate wiring (limited to 63 A).
- Short response time.
- Do not produce deflagration.
- Single-pole protection.
- Their activation causes no interruption in power supply.
- Thermodynamic control device and visual alarm.

ATSUB series protectors have been tested in **official, independent laboratories,** obtaining their characteristics according to relevant standards (listed in the table).
It is possible to select a protector for the alternating voltage suitable for each particular case.

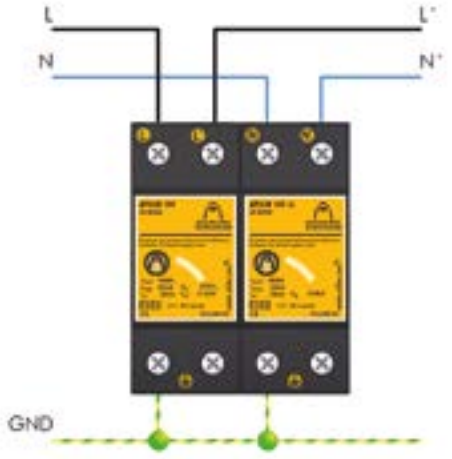
Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

They are installed **in parallel** with the low voltage line, with connections to the phases that are to be protected (or neutral) and ground.

Installation should be carried out **without power running through the line**.

They are recommended for installations where large overvoltages can occur after the main switchboard and when these lines are not connected to very sensitive equipment.



> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

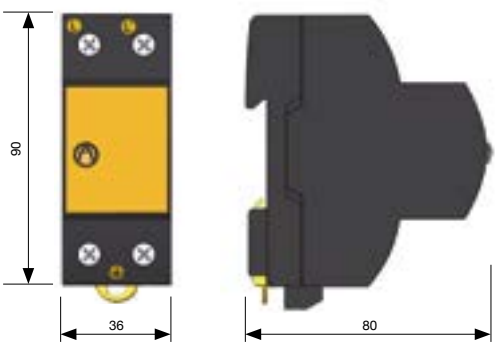
> TECHNICAL DATASHEET

Reference:		ATSUB 100 **AT-8256**	ATSUB 100-120 **AT-8257**	ATSUB 100-400 **AT-8258**	ATSUB 100-N **AT-8259**
Protection categories according to the REBT:		I, II, III, IV			
Type of tests according to EN 61643-11:		Type 1 + 2			
Nominal voltage:	U_n	230 V_{AC}	120 V_{AC}	400 V_{AC}	-
Maximum continuous operating voltage:	U_c	275 V_{AC}	150 V_{AC}	460 V_{AC}	-
Nominal frequency:		50 - 60 Hz			
Impulse current (10/350 µs wave):	I_{imp}	25 kA			
Nominal discharge current (8/20 µs wave):	I_n	30 kA			
Maximum discharge current per pole (8/20 µs wave):	I_{max}	100 kA			
Protection level 1.2/50 µs wave:	U_p	1.3 kV	0.9 kV	1.5 kV	1.3 kV
Response time:	t_r	< 25 ns			
Backup fuse(1):		125 A gL/gG			
Maximum short-circuit current:		25 kA (for maximum fuse)			
Working temperature:	ϑ	-40 °C to +70 °C			
Protector location:		Indoor			
Type of connection:		Parallel (one port)			
Dimensions:		36 x 90 x 80 mm (2 mod. DIN 43880)			
Fixing:		DIN Rail			
Enclosure material:		Polyamide			
Enclosure protection:		IP20			
Insulation resistance:		> 10^{14} Ω			
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)			
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2			

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> ATSUB-4P-NR TT

Compact protection for TT three-phase power supply lines

> **AT-8034 ATSUB-4P-NR 15 TT**: peak current 15 kA. U_n 230 V
> **AT-8030 ATSUB-4P-NR 40 TT**: peak current 40 kA. U_n 230 V
> **AT-8036 ATSUB-4P-NR 65 TT**: peak current 65 kA. U_n 230 V

Effective protection against transient overvoltages for electrical supply lines with type TT neutral, using metal oxide varistors and gas discharge tubes. Medium protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT ITC23).

It includes removable modules for replacement in the event of a breakdown or fault, without needing to disconnect the wiring. Tested and certified as type 1, 2 and 3 protectors according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV** equipment according to ITC-BT-23.

- Can be coordinated with other protectors such as ATSHOCK, ATSHIELD and ATCOVER series.
- Made up of zinc oxide varistors and gas discharge tubes able to withstand very high currents.
- Short response time.
- Do not produce deflagration.
- Compact protection with removable modules for quick replacement in case of breakage.
- Their activation causes no interruption in power supply.
- Thermodynamic control device, mechanical warning and remote alarm. When the warning light is yellow, the cartridge is in good condition. If not, replace.

ATSUB series protectors have been tested in **official, independent laboratories,** obtaining their characteristics according to relevant standards (listed in the table).

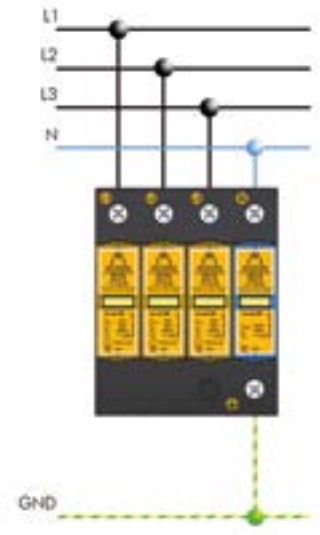
Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

They are installed **in parallel** with the low voltage line, with connections to the phases to be protected, neutral and ground. Installation should be carried out **without power running through the line**.

When ATSUB protectors are installed as medium protection, they must be separated from the coarse and/or tight protectors by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor, in order to achieve **correct coordination between them**.

Installation is recommended in places where large overvoltages can occur and where lines are connected to very sensitive equipment that cannot withstand large overvoltages.



> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

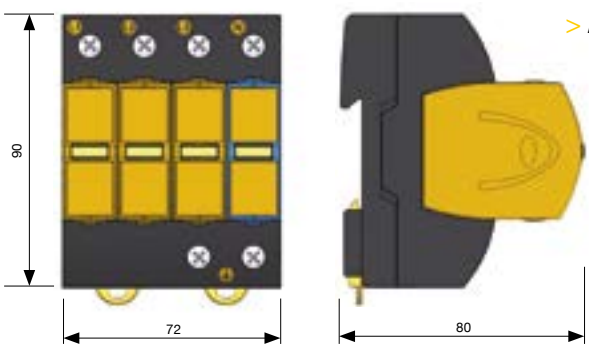
> TECHNICAL DATASHEET

Reference:		ATSUB-4P-NR 15 TT **AT-8034**	ATSUB-4P-NR 40 TT **AT-8030**	ATSUB-4P-NR 65 TT **AT-8036**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2
Nominal voltage:	U_n	400 V_{AC} (L-L) / 230 V_{AC} (L-N, L-GND)		
Maximum continuous operating voltage:	U_c	460 V_{AC} (L-L) / 275 V_{AC} (L-N, L-GND)		
Nominal frequency:		50 - 60 Hz		
Nominal discharge current per pole (8/20 µs wave):	I_n	5 kA	20 kA	30 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA
Protection level at I_n(8/20 µs wave):	$U_p(I_n)$	1200 V	1400 V	1600 V
Level protection for 1.2/50 µs wave:	U_p	700 V	700 V	900 V
Level protection for 5 kA; 8/20 µs wave:		900 V	1000 V	1100 V
Impulse current per pole (10/350 µs):	I_{imp}	-		15 kA
Combined wave voltage:	$U_{o.c.}$	6 kV	-	
Response time:	t_r	< 25 ns		
Backup fuse(1):		125 A gL/gG		
Maximum short-circuit current:		25 kA (for maximum fuse)		
Working temperature:	ϑ	-40 °C to +70 °C		
Protector location:		Indoor		
Type of connection:		Parallel (one port)		
No. of poles:		4		
Dimensions:		72 x 90 x 80 mm (4 mod. DIN 43880)		
Fixing:		DIN Rail		
Enclosure material:		Polyamide		
Enclosure protection:		IP20		
Insulation resistance:		> 10^{14} Ω		
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)		
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2		

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> ACCESSORIES

> AT-8248 ATSUB Mod. 40: I_{max} 40 kA
> AT-8228 ATSUB Mod. 15: I_{max} 15 kA
> AT-8268 ATSUB Mod. 65: I_{max} 65 kA
> AT-8205 ATSUB Mod. N: neutral-ground

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> ATSUB-4P TT

Compact protection for TT three-phase power supply lines

> **AT-8282 ATSUB-4P 15 TT**: peak current 15 kA. U_n 230 V
> **AT-8285 ATSUB-4P 40 TT**: peak current 40 kA. U_n 230 V
> **AT-8287 ATSUB-4P 65 TT**: peak current 65 kA. U_n 230 V
> **AT-8283 ATSUB-4P 15-120 TT**: peak current 15 kA. U_n 120 V
> **AT-8286 ATSUB-4P 40-120 TT**: peak current 40 kA. U_n 120 V
> **AT-8289 ATSUB-4P 65-120 TT**: peak current 65 kA. U_n 120 V
> **AT-8070 ATSUB-4P 15-300 TT**: peak current 15 kA. U_n 300 V
> **AT-8071 ATSUB-4P 40-300 TT**: peak current 40 kA. U_n 300 V
> **AT-8072 ATSUB-4P 65-300 TT**: peak current 65 kA. U_n 300 V
> **AT-8281 ATSUB-4P 15-400 TT**: peak current 15 kA. U_n 400 V
> **AT-8284 ATSUB-4P 40-400 TT**: peak current 40 kA. U_n 400 V

Effective protection against transient overvoltages for electrical supply lines with type TT neutral, using metal oxide varistors and gas discharge tubes. Medium protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT ITC23).

> NOMENCLATURE

ATSUB 4P - 40 – 400 TT

- 40: Max. discharge voltage in kA
- 400: Line - ground nominal voltage

It includes removable modules for replacement in the event of a breakdown or fault, without needing to disconnect the wiring.
Tested and certified as type 1, 2 and 3 protectors according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV** equipment according to ITC-BT-23.

- Can be coordinated with other protectors such as ATSHOCK, ATSHIELD and ATCOVER series.
- Containing zinc oxide varistors, which are able to withstand very high currents.
- Short response time.
- Does not produce deflagration.
- Compact protection with removable modules enabling quick replacement in the event of breakage.
- Does not, at any moment, cause any interruption to the supply lines.
- Thermodynamic control device, mechanical warning and remote alarm. When the warning light is yellow, the cartridge is in good condition. If not, replace.

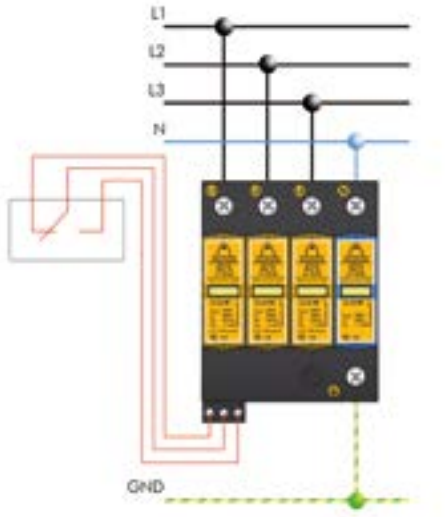
ATSUB series protectors have been tested in **official, independent laboratories,** obtaining their characteristics according to relevant standards (listed in the table). It is possible to select a protector for the alternating voltage suitable for each particular case.
For example, the technical datasheets of the optimal protectors for American voltages are also included (voltage line 230 V and Voltage line – neutral 120 V), voltages greater than 230 V (voltage line 520 V and voltage line – neutral 300 V), and wind generator voltages (voltage line 690 V and voltage line - ground 400 V).

> INSTALLATION

They are installed **in parallel** with the low voltage line, with connections to the phases to be protected, neutral and ground. Installation should be carried out **without power running through the line**.

When ATSUB protectors are installed as medium protection, they must be separated from the coarse and/or tight protectors by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor, in order to achieve **correct coordination between them**.

They are recommended for installations where large overvoltages can occur after the main switchboard but which do not supply sensitive equipment.



Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω. If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> PROTECTION OF POWER SUPPLY LINES

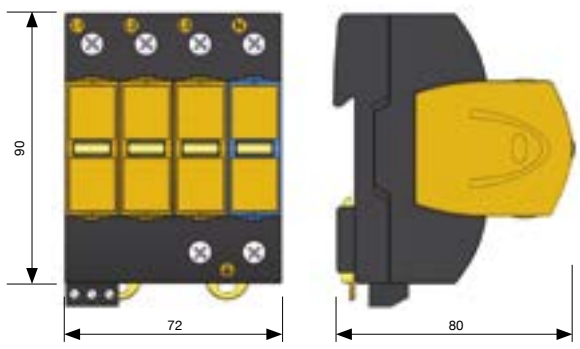
> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-4P 15 TT **AT-8282**	ATSUB-4P 40 TT **AT-8285**	ATSUB-4P 65 TT **AT-8287**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2
Nominal voltage:	U_n	400 V_{AC} (L-L) / 230 V_{AC} (L-N, L-GND)		
Maximum continuous operating voltage:	U_c	460 V_{AC} (L-L) / 275 V_{AC} (L-N, L-GND)		
Nominal frequency:		50 - 60 Hz		
Nominal discharge current per pole (8/20 µs wave):	I_n	5 kA	20 kA	30 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA
Protection level at I_n(8/20 µs wave):	$U_p(I_n)$	1200 V	1400 V	1600 V
Level protection for 1.2/50 µs wave:	U_p	700 V	700 V	900 V
Level protection for 5 kA; 8/20 µs wave:		900 V	1000 V	1100 V
Impulse current per pole (10/350 µs):	I_{imp}	-		15 kA
Combined wave voltage:	$U_{o.c.}$	6 kV	-	
Response time:	t_r	< 25 ns		
Backup fuse(1):		125 A gL/gG		
Maximum short-circuit current:		25 kA (for maximum fuse)		
Working temperature:	ϑ	-40 °C to +70 °C		
Protector location:		Indoor		
Type of connection:		Parallel (one port)		
No. of poles:		4		
Dimensions:		72 x 90 x 80 mm (4 mod. DIN 43880)		
Fixing:		DIN Rail		
Enclosure material:		Polyamide		
Enclosure protection:		IP20		
Insulation resistance:		> 10^{14} Ω		
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)		
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2		
Voltage-free contact for the remote control				
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2		
Contact output:		Switch		
Operating voltage:		250 V_{AC} (Maximum operating voltage of the alarm power supply)		
Maximum current:		2 A (Maximum current of the alarm power supply)		
Certificated tests according to: UNE-EN 61643-11 Complies with requirements of: UL 1449 Relevant standards: UNE 21186, NF C 17-102, IEC 62305				

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> ACCESSORIES

> AT-8248 ATSUB Mod. 40: I_{max} 40 kA
> AT-8228 ATSUB Mod. 15: I_{max} 15 kA
> AT-8268 ATSUB Mod. 65: I_{max} 65 kA
> AT-8205 ATSUB Mod. N: neutral-ground

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-4P 15-120 TT **AT-8283**	ATSUB-4P 40-120 TT **AT-8286**	ATSUB-4P 65-120 TT **AT-8289**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2
Nominal voltage:	U_n	230 V_{AC} (L-L) / 120 V_{AC} (L-N, L-GND)		
Maximum continuous operating voltage:	U_c	275 V_{AC} (L-L) / 150 V_{AC} (L-N, L-GND)		
Nominal frequency:		50 - 60 Hz		
Nominal discharge current per pole (8/20 µs wave):	I_n	5 kA	20 kA	30 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA
Protection level for I_n (8/20 µs wave):	$U_p(I_n)$	1200 V	1400 V	1600 V
Protection level for 1.2/50 µs wave:	U_p	700 V	700 V	900 V
Protection level for 5 kA; 8/20 µs wave:		900 V	1000 V	1100 V
Impulse current per pole (10/350 µs):	I_{imp}	-		15 kA
Combined wave voltage:	$U_{o.c.}$	6 k V	-	
Response time:	t_r	< 25 ns		
Backup fuse(1):		125 A gL/gG		
Maximum short-circuit current:		25 kA (for maximum fuse)		
Working temperature:	ϑ	-40 °C to +70 °C		
Protector location:		Indoor		
Type of connection:		Parallel (one port)		
No. of poles:		4		
Dimensions:		72 x 90 x 80 mm (4 mod. DIN 43880)		
Fixing:		DIN Rail		
Enclosure material:		Polyamide		
Enclosure protection:		IP20		
Insulation resistance:		> 10^{14} Ω		
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)		
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2		
Voltage-free contact for the remote control				
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2		
Contact output:		Switch		
Operating voltage:		250 V_{AC} (Maximum operating voltage of the alarm power supply)		
Maximum current:		2 A (Maximum current of the alarm power supply)		
Certificated tests according to: UNE-EN 61643-11 Complies with requirements of: UL 1449 Relevant standards: UNE 21186, NF C 17-102, IEC 62305				

(1) Required in cases where there is higher nominal current installed upstream from the protector

> ACCESSORIES

> AT-8296 ATSUB Mod. 40-120: I_{max} 40 kA / U_n120 V
> AT-8297 ATSUB Mod. 15-120: I_{max} 15 kA / U_n120 VA
> AT-8298 ATSUB Mod. 65-120: I_{max} 65 kA / U_n120 V
> AT-8205 ATSUB Mod. N: neutral-ground

For other voltages, get in touch with Aplicaciones Tecnologicas, S.A. Technical Department.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-4P 15-300 TT **AT-8070**	ATSUB-4P 40-300 TT **AT-8071**	ATSUB-4P 65-300 TT **AT-8072**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2
Nominal voltage:	U_n	520 V_{AC} (L-L) / 300 V_{AC} (L-N, L-GND)		
Maximum continuous operating voltage:	U_c	555 V_{AC} (L-L) / 320 V_{AC} (L-N, L-GND)		
Nominal frequency:		50 - 60 Hz		
Nominal discharge current per pole (8/20 µs wave):	I_n	5 kA	20 kA	30 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA
Protection level for I_n (8/20 µs wave):	$U_p(I_n)$	1400 V	1500 V	1800 V
Protection level for 1.2/50 µs wave:	U_p	900 V	900 V	1100 V
Protection level for 5 kA; 8/20 µs wave:		1100 V	1200 V	1300 V
Impulse current per pole (10/350 µs):	I_{imp}	-		15 kA
Combined wave voltage:	$U_{o.c.}$	6 kV	-	
Response time:	t_r	< 25 ns		
Backup fuse(1):		125 A gL/gG		
Maximum short-circuit current:		25 kA (for maximum fuse)		
Working temperature:	ϑ	-40 ºC to +70 ºC		
Protector location:		Indoor		
Type of connection:		Parallel (one port)		
No. of poles:		4		
Dimensions:		72 x 90 x 80 mm (4 mod. DIN 43880)		
Fixing:		DIN Rail		
Enclosure material:		Polyamide		
Enclosure protection:		IP20		
Insulation resistance:		> 10^{14} Ω		
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)		
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2		
Voltage-free contact for the remote control				
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2		
Contact output:		Switch		
Operating voltage:		250 V_{AC} (Maximum operating voltage of the alarm power supply)		
Maximum current:		2 A (Maximum current of the alarm power supply)		
Certificated tests according to: UNE-EN 61643-11 Complies with requirements of: UL 1449 Relevant standards: UNE 21186, NF C 17-102, IEC 62305				

(1) Required in cases where there is higher nominal current installed upstream from the protector

> ACCESSORIES

> AT-8043 ATSUB Mod. 40-300: I_{max} 40 kA / U_n 300 V
> AT-8044 ATSUB Mod. 15-300: I_{max} 15 kA / U_n 300 V
> AT-8045 ATSUB Mod. 65-300: I_{max} 65 kA / U_n 300 V
> AT-8205 ATSUB Mod. N: neutral-ground

For other voltages, get in touch with Aplicaciones Tecnologicas, S.A. Technical Department.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-4P 15-400 TT **AT-8281**	ATSUB-4P 40-400 TT **AT-8284**
Protection categories according to the REBT:		I, II, III, IV	
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2
Nominal voltage:	U_n	690 V_{AC} (L-L) / 400 V_{AC} (L-N, L-GND)	
Maximum continuous operating voltage:	U_c	800 V_{AC} (L-L) / 460 V_{AC} (L-N, L-GND)	
Nominal frequency:		50 - 60 Hz	
Nominal discharge current per pole (8/20 µs wave):	I_n	5 kA	20 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA	40 kA
Protection level for I_n (8/20 µs wave):	$U_p(I_n)$	2100 V	2300 V
Protection level for 1.2/50 µs wave:	U_p	1800 V	1800 V
Protection level for 5 kA; 8/20 µs wave:		1900 V	2000 V
Combined wave voltage:	$U_{o.c.}$	6 kV	-
Response time:	t_r	< 25 ns	
Backup fuse(1):		125 A gL/gG	
Maximum short-circuit current:		25 kA (for maximum fuse)	
Working temperature:	ϑ	-40 °C to +70 °C	
Protector location:		Indoor	
Type of connection:		Parallel (one port)	
No. of poles:		4	
Dimensions:		72 x 90 x 80 mm (4 mod. DIN 43880)	
Fixing:		DIN Rail	
Enclosure material:		Polyamide	
Enclosure protection:		IP20	
Insulation resistance:		> 10^{14} Ω	
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)	
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2	
Voltage-free contact for the remote control			
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2	
Contact output:		Switch	
Operating voltage:		250 V_{AC} (Maximum operating voltage of the alarm power supply)	
Maximum current:		2 A (Maximum current of the alarm power supply)	
Certificated tests according to: UNE-EN 61643-11 Complies with requirements of: UL 1449 Relevant standards: UNE 21186, NF C 17-102, IEC 62305			

(1) Required in cases where there is higher nominal current installed upstream from the protector

> ACCESSORIES

> AT-8249 ATSUB Mod. 40-400: I_{max} 40 kA / U_n 400 V
> AT-8229 ATSUB Mod. 15-400: I_{max} 15 kA / U_n 400 V
> AT-8205 ATSUB Mod. N: neutral-ground

For other voltages, get in touch with Aplicaciones Tecnologicas, S.A. Technical Department.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> ATSUB-4P TNS

Compact protection for TNS three-phase power supply lines

> **AT-8000 ATSUB-4P 15 TNS**: peak current 15 kA. U_n 230 V
> **AT-8001 ATSUB-4P 40 TNS**: peak current 40 kA. U_n 230 V
> **AT-8002 ATSUB-4P 65 TNS**: peak current 65 kA. U_n 230 V
> **AT-8003 ATSUB-4P 15-120 TNS** peak current 15 kA. U_n 120 V
> **AT-8004 ATSUB-4P 40-120 TNS** peak current 40 kA. U_n 120 V
> **AT-8005 ATSUB-4P 65-120 TNS** peak current 65 kA. U_n 120 V
> **AT-8050 ATSUB-4P 15-300 TNS** peak current 15 kA. U_n 300 V
> **AT-8051 ATSUB-4P 40-300 TNS** peak current 40 kA. U_n 300 V
> **AT-8052 ATSUB-4P 65-300 TNS** peak current 65 kA. U_n 300 V
> **AT-8006 ATSUB-4P 15-400 TNS** peak current 15 kA. U_n 400 V
> **AT-8007 ATSUB-4P 40-400 TNS** peak current 40 kA. U_n 400 V

Effective protection against transient overvoltages for electrical supply lines with neutral type TNS using metal oxide varistors. Medium protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT ITC23).

> NOMENCLATURE

ATSUB 4P - 40 – 400 TNS

- 40: Max. discharge voltage in kA
- 400: Line-ground nominal voltage

It includes removable modules for replacement in the event of a breakdown or fault, without needing to disconnect the wiring.
Tested and certified as type 1, 2 and 3 protectors according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV equipment** according to the REBT.

> Can be coordinated with other ATSHOCK, ATSHIELD and ATCOVER series protectors.
> Made up of zinc oxide varistors and gas discharge tubes able to withstand very high currents.
> Short response time.
> Do not produce deflagration.
> Compact protection with removable modules enabling quick replacement in the event of breakage.
> Does not, at any time, cause interruption to the power supply lines.
> Thermodynamic control device, mechanical warning and remote alarm. When the warning light is yellow, the cartridge is in good condition. If not, replace.

ATSUB series protectors have been tested in **official and independent laboratories,** obtaining their characteristics according to relevant standards (shown in the table).
It is possible to select a protector for the alternating voltage suitable for each particular case. For example, the technical datasheets of the optimal protectors for American voltages are also included (line voltage 230 V and line – neutral voltage 120 V), voltages greater than 230 V (line voltage 520 V and line – neutral voltage 300 V), and wind generator voltages (line voltage 690 V and line - ground voltage 400 V).

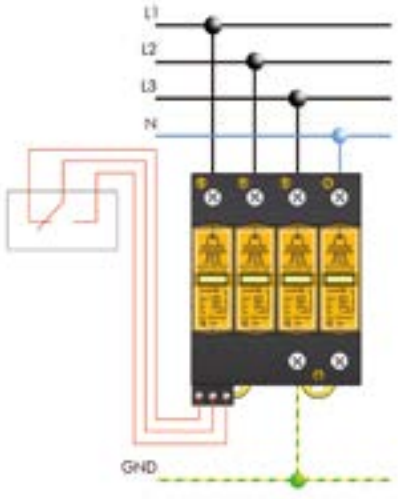
Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω. If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

They are installed **in parallel** with the low voltage line, with connections to the phases that are to be protected and to ground. Installation should be carried out **without power running through the line**.

When ATSUB protectors are installed as medium protection, they must be separated from the coarse and/or tight protectors by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor, in order to achieve **correct coordination between them**.

They are recommended for installations where large overvoltages can occur after the main switchboard but which do not supply sensitive equipment.



> PROTECTION OF POWER SUPPLY LINES

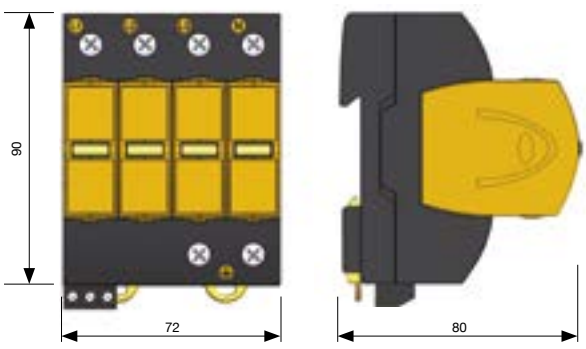
> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-4P 15 TNS **AT-8000**	ATSUB-4P 40 TNS **AT-8001**	ATSUB-4P 65 TNS **AT-8002**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2
Nominal voltage:	U_n	400 V_{AC} (L-L) / 230 V_{AC} (L-GND)		
Maximum continuous operating voltage:	U_c	460 V_{AC} (L-L) / 275 V_{AC} (L-GND)		
Nominal frequency:		50 - 60 Hz		
Nominal discharge current per pole (8/20 µs wave):	I_n	5 kA	20 kA	30 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA
Protection level at I_n (8/20 µs wave):	$U_p(I_n)$	1200 V	1400 V	1600 V
Protection level per wave 1.2/50 µs:	U_p	700 V	700 V	900 V
Protection level for 5 kA; 8/20 µs wave:		900 V	1000 V	1100 V
Impulse current per pole (10/350 µs):	I_{imp}	-		15 kA
Combined wave voltage:	$U_{o.c.}$	6 kV	-	
Response time:	t_r	< 25 ns		
Backup fuses(1):		125 A gL/gG		
Maximum short-circuit current:		25 kA (for maximum fuse)		
Working temperature:	ϑ	-40 °C to +70 °C		
Protector location:		Indoor		
Type of connection:		Parallel (one port)		
No. of poles:		4		
Dimensions:		72 x 90 x 80 mm (4 mod. DIN 43880)		
Fixing:		DIN Rail		
Enclosure material:		Polyamide		
Enclosure protection:		IP20		
Insulation resistance:		> 10^{14} Ω		
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)		
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2		
Voltage-free contact for the remote control				
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2		
Contact output:		Switch		
Operating voltage:		250 V_{AC} (Maximum operating voltage of the alarm power supply)		
Maximum current:		2 A (Maximum current of the alarm power supply)		
Certificated tests according to: UNE-EN 61643-11 Complies with requirements of: UL 1449 Relevant standards: UNE 21186, NF C 17-102, IEC 62305				

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> ACCESSORIES

> AT-8248 ATSUB Mod. 40: I_{max} 40 kA
> AT-8228 ATSUB Mod. 15: I_{max} 15 kA
> AT-8268 ATSUB Mod. 65: I_{max} 65 kA

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-4P 15-120 TNS **AT-8003**	ATSUB-4P 40-120 TNS **AT-8004**	ATSUB-4P 65-120 TNS **AT-8005**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2
Nominal voltage:	U_n	230 V_{AC} (L-L) / 120 V_{AC} (L-GND)		
Maximum continuous operating voltage:	U_c	275 V_{AC} (L-L) / 150 V_{AC} (L-GND)		
Nominal frequency:		50 - 60 Hz		
Nominal discharge current (8/20 µs wave):	I_n	5 kA	20 kA	30 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	1200 V	1400 V	1600 V
Protection level for 1.2/50 µs wave:	U_p	700 V	700 V	900 V
Protection level 5 kA; 8/20 µs wave:		900 V	1000 V	1100 V
Impulse current per pole (10/350 µs):	I_{imp}	-		15 kA
Combined wave voltage:	$U_{o.c.}$	6 kV	-	
Response time:	t_r	< 25 ns		
Backup fuse(1):		125 A gL/gG		
Maximum short-circuit current:		25 kA (for maximum fuse)		
Working temperature:	ϑ	-40 °C to +70 °C		
Protector location:		Indoor		
Type of connection:		Parallel (one port)		
No. of poles:		4		
Dimensions:		72 x 90 x 80 mm (4 mod. DIN 43880)		
Fixing:		DIN Rail		
Enclosure material:		Polyamide		
Enclosure protection:		IP20		
Insulation resistance:		> 10^{14} Ω		
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)		
Connections L/N/GND:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2		
Voltage-free contact for the remote control				
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2		
Contact output:		Switch		
Operating voltage:		250 V_{AC} (Maximum working voltage of the alarm power supply)		
Maximum current:		2 A (Maximum current of the alarm power supply)		
Certificated tests according to: UNE-EN 61643-11 Complies with requirements of: UL 1449 Relevant standards: UNE 21186, NF C 17-102, IEC 62305				

(1) Required in cases where there is higher nominal current installed upstream from the protector

> ACCESSORIES

> AT-8296 ATSUB Mod. 40-120: I_{max} 40 kA / U_n 120 V
> AT-8297 ATSUB Mod. 15-120: I_{max} 15 kA / U_n 120 V
> AT-8298 ATSUB Mod. 65-120: I_{max} 65 kA / U_n 120 V

For other voltages, get in touch with Aplicaciones Tecnologicas, S.A. Technical Department.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-4P 15 -300 TNS **AT-8050**	ATSUB-4P 40-300 TNS **AT-8051**	ATSUB-4P 65-300 TNS **AT-8052**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2
Nominal voltage:	U_n	520 V_{AC} (L-L) / 300 V_{AC} (L-GND)		
Maximum continuous operating voltage:	U_c	555 V_{AC} (L-L) / 320 V_{AC} (L-GND)		
Nominal frequency:		50 - 60 Hz		
Nominal discharge current (8/20 µs wave):	I_n	5 kA	20 kA	30 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	1400 V	1500 V	1800 V
Protection level for 1.2/50 µs wave:	U_p	900 V	900 V	1100 V
Protection level 5 kA; 8/20 µs wave:		1100 V	1200 V	1300 V
Impulse current per pole (10/350 µs):	I_{imp}	-		15 kA
Combined wave voltage:	$U_{o.c.}$	6 kV	-	
Response time:	t_r	< 25 ns		
Backup fuse(1):		125 A gL/gG		
Maximum short-circuit current:		25 kA (for maximum fuse)		
Working temperature:	ϑ	-40 °C to +70 °C		
Protector location:		Indoor		
Type of connection:		Parallel (one port)		
No. of poles:		4		
Dimensions:		72 x 90 x 80 mm (4 mod. DIN 43880)		
Fixing:		DIN Rail		
Enclosure material:		Polyamide		
Enclosure protection:		IP20		
Insulation resistance:		> 10^{14} Ω		
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)		
Connections L/N/GND:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2		
Voltage-free contact for the remote control				
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2		
Contact output:		Switch		
Operating voltage:		250 V_{AC} (Maximum working voltage of the alarm power supply)		
Maximum current:		2 A (Maximum current of the alarm power supply)		

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> ACCESSORIES

> AT-8043 ATSUB Mod. 40-300: I_{max} 40 kA / U_n 300 V
> AT-8044 ATSUB Mod. 15-300: I_{max} 15 kA / U_n 300 V
> AT-8045 ATSUB Mod. 65-300: I_{max} 65 kA / U_n 300 V

For other voltages, get in touch with Aplicaciones Tecnologicas, S.A. Technical Department.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-4P 15-400 TNS **AT-8006**	ATSUB-4P 40-400 TNS **AT-8007**
Protection categories according to the REBT:		I, II, III, IV	
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2
Nominal voltage:	U_n	690 V_{AC} (L-L) / 400 V_{AC} (L-GND)	
Maximum continuous operating voltage:	U_c	800 V_{AC} (L-L) / 460 V_{AC} (L-GND)	
Nominal frequency:		50 - 60 Hz	
Nominal discharge current (8/20 µs wave):	I_n	5 kA	20 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA	40 kA
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	2100 V	2300 V
Protection level for 1.2/50 µs wave:	U_p	1800 V	1800 V
Protection level 5 kA; 8/20 µs wave:		1900 V	2000 V
Combined wave voltage:	$U_{o.c.}$	6 kV	-
Response time:	t_r	< 25 ns	
Backup fuses(1):		125 A gL/gG	
Maximum short-circuit current:		25 kA (for maximum fuse)	
Working temperature:	ϑ	-40 °C to +70 °C	
Protector location:		Indoor	
Type of connection:		Parallel (one port)	
No. of poles:		4	
Dimensions:		72 x 90 x 80 mm (4 mod. DIN 43880)	
Fixing:		DIN Rail	
Enclosure material:		Polyamide	
Enclosure protection:		IP20	
Insulation resistance:		> 10^{14} Ω	
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)	
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2	
Voltage-free contact for the remote control			
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2	
Contact output:		Switch	
Operating voltage:		250 V_{AC} (Maximum working voltage of the alarm power supply)	
Maximum current:		2 A (Maximum current of the alarm power supply)	
Certificated tests according to: UNE-EN 61643-11 Complies with requirements of: UL 1449 Relevant standards: UNE 21186, NF C 17-102, IEC 62305			

(1) Required in cases where there is higher nominal current installed upstream from the protector

> ACCESSORIES

> AT-8249 ATSUB Mod. 40-400: I_{max} 40 kA / U_n 400 V
> AT-8229 ATSUB Mod. 15-400: I_{max} 15 kA / U_n 400 V

For other voltages, get in touch with Aplicaciones Tecnologicas, S.A. Technical Department.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> ATSUB-3P-NR

Compact protection for two-phase power supply lines with neutral for american voltages

> **AT-8037 ATSUB-3P-NR 15-120:** peak current 15 kA. U_n 120 V
> **AT-8038 ATSUB-3P-NR 40-120:** peak current 40 kA. U_n 120 V
> **AT-8039 ATSUB-3P-NR 65-120:** peak current 65 kA. U_n 120 V

Effective protection against transient overvoltages for electrical two-phase power supply lines with neutral, using metal oxide varistors and gas discharge tubes. Medium protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT ITC23).

Surge protective devices ready for two-phase power supply lines with neutral seldom used in America. Moreover, they are tropicalised for these voltages.

It includes removable modules for replacement in the event of a breakdown or fault, without needing to disconnect the wiring. Tested and certified as type 1, 2 and 3 protectors according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for Categories I, II, III and IV equipment according to ITC-BT-23.

- Can be coordinated with other ATSHOCK, ATSHIELD and ATCOVER series protectors.
- Made up of zinc oxide varistors and gas discharge tubes able to withstand very high currents.
- Short response time.
- Do not produce deflagration.
- Compact protection with removable modules for quick replacement in case of breakage.
- Their activation causes no interruption in power supply.
- Thermodynamic control device, mechanical warning and remote alarm. When the warning light is yellow, the cartridge is in good condition. If not, replace.

ATSUB series protectors have been tested in **official, independent laboratories,** obtaining their characteristics according to relevant standards (listed in the table).

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

They are installed **in parallel** with the low voltage line, with connections to the phases to be protected, neutral and ground. Installation should be carried out **without power running through the line**.

When ATSUB protectors are installed as medium protection, they must be separated from the coarse and/or tight protectors by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor, in order to achieve **correct coordination between them**.

Installation is recommended in places where large overvoltages can occur and where lines are connected to very sensitive equipment that cannot withstand large overvoltages.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

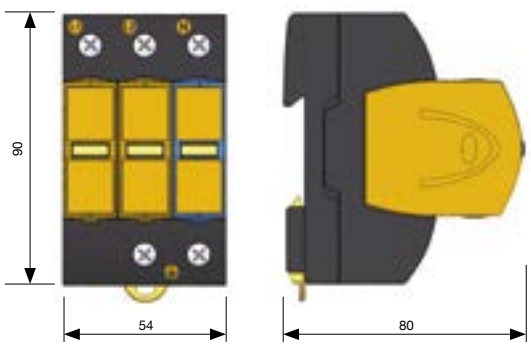
> TECHNICAL DATASHEET

Reference:		ATSUB-3P-NR 15-120 **AT-8037**	ATSUB-3P-NR 40-120 **AT-8038**	ATSUB-3P-NR 65-120 **AT-8039**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2
Nominal voltage:	U_n	230 V_{AC} (L-L) / 120 V_{AC} (L-N, L-GND)		
Maximum continuous operating voltage:	U_c	275 V_{AC} (L-L) / 150 V_{AC} (L-N, L-GND)		
Nominal frequency:		50 - 60 Hz		
Nominal discharge current per pole (8/20 µs wave):	I_n	5 kA	20 kA	30 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA
Protection level at I_n (8/20 µs wave):	$U_p(I_n)$	1200 V	1400 V	1600 V
Level protection for 1.2/50 µs wave:	U_p	700 V	700 V	900 V
Level protection for 5 kA; 8/20 µs wave:		900 V	1000 V	1100 V
Impulse current per pole (10/350 µs):	I_{imp}	-		15 kA
Combined wave voltage:	$U_{o.c.}$	6 kV	-	
Response time:	t_r	< 25 ns		
Backup fuse(1):		125 A gL/gG		
Maximum short-circuit current:		25 kA (for maximum fuse)		
Working temperature:	ϑ	-40 ºC to + 70 ºC		
Protector location:		Indoor		
Type of connection:		Parallel (one port)		
No. of poles:		3		
Dimensions:		54 x 90 x 80 mm (3 mod. DIN 43880)		
Fixing:		DIN Rail		
Enclosure material:		Polyamide		
Enclosure protection:		IP20		
Insulation resistance:		> 10^{14} Ω		
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)		
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2		

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> ACCESSORIES

> AT-8296 ATSUB Mod. 40-120: I_{max} 40 kA / U_n 120 V
> AT-8297 ATSUB Mod. 15-120: I_{max} 15 kA / U_n 120 V
> AT-8298 ATSUB Mod. 65-120: I_{max} 65 kA / U_n 120 V
> AT-8205 ATSUB Mod. N: neutral-ground

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> ATSUB-3P TNC

Compact protector for TNC three-phase power supply lines

> **AT-8070 ATSUB-3P-NR 15 TNC:** peak current 15 kA. U_n 230 V
> **AT-8071 ATSUB-3P-NR 40 TNC:** peak current 40 kA. U_n 230 V
> **AT-8072 ATSUB-3P-NR 65 TNC:** peak current 65 kA. U_n 230 V
> **AT-8073 ATSUB-3P-NR 15-120 TNC:** peak current 15 kA. U_n 120 V
> **AT-8074 ATSUB-3P-NR 40-120 TNC:** peak current 40 kA. U_n 120 V
> **AT-8075 ATSUB-3P-NR 65-120 TNC:** peak current 65 kA. U_n 120 V

Effective protection against transient overvoltages for **TNC type** electrical supply lines, using metal oxide varistors. **Medium** protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT ITC23).

> NOMENCLATURE

ATSUB-3P-NR 40 – 120 TNC

- 40: Max. discharge voltage in kA
- 120: Line-ground nominal voltage

It includes removable modules for replacement in the event of a breakdown or fault, without needing to disconnect the wiring.
Tested and certified as a **type 1, 2 and 3** protector according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV** equipment according to ITC-BT-23.

- Can be coordinated with other ATSHOCK, ATSHIELD and ATCOVER series protectors.
- Made up of zinc oxide varistors and gas discharge tubes able to withstand very high currents.
- Short response time.
- Do not produce deflagration.
- Compact protection with removable modules for quick replacement in the event of breakage.
- They do not cause any interruption to the power supply.
- Thermodynamic mechanical warning and remote alarm. When the warning light is yellow, the cartridge is in good condition. If not, replace.

ATSUB series protectors have been tested in **official, independent laboratories,** obtaining their characteristics according to relevant standards (listed in the table).
It is possible to select a protector for the alternating voltage suitable for each particular case.

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

They are installed **in parallel** with the low voltage line, with connections to the phases to be protected, neutral and ground. Installation should be carried out **without power running through the line**.

When ATSUB protectors are installed as medium protection, they must be separated from the coarse and/or tight protectors by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor, in order to achieve **correct coordination between them**.

They are recommended for installations where large overvoltages can occur after the main switchboard but which do not supply sensitive equipment.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

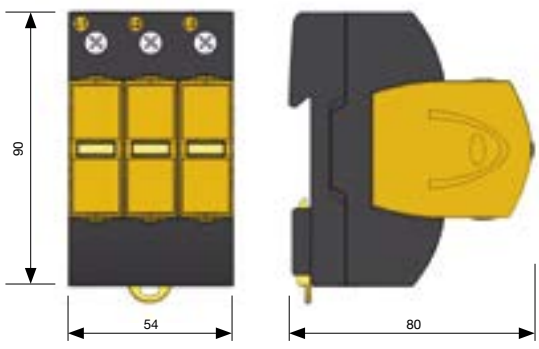
> TECHNICAL DATASHEET

Reference:		ATSUB-3P 15 TNC **AT-8070**	ATSUB-3P 40 TNC **AT-8071**	ATSUB-3P 65 TNC **AT-8072**
Protection categories according to the REBT:		I, II, III, IV		I, II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2
Nominal voltage:	U_n	230 V_{AC}		
Maximum continuous operating voltage:	U_c	275 V_{AC}		
Nominal frequency:		50 - 60 Hz		
Nominal discharge current (8/20 µs wave):	I_n	5 kA	20 kA	30 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	1200 V	1400 V	1600 V
Protection level for 1.2/50 µs wave:	U_p	700 V	700 V	900 V
Protection level 5 kA; 8/20 µs wave:		900 V	1000 V	1100 V
Impulse current per pole (10/350 µs):	I_{imp}	-		15 kA
Combined wave voltage:	$U_{o.c.}$	6 kV	-	
Response time:	t_r	< 25 ns		
Backup fuse(1):		125 A gL/gG		
Maximum short-circuit current:		25 kA (for maximum fuse)		
Working temperature:	ϑ	-40 ºC to + 70 ºC		
Protector location:		Indoor		
Type of connection:		Parallel (one port)		
No. of poles:		3		
Dimensions:		54 x 90 x 80 mm (3 mod. DIN 43880)		
Fixing:		DIN Rail		
Enclosure material:		Polyamide		
Enclosure protection:		IP20		
Insulation resistance:		> 10^{14} Ω		
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)		
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2		

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> ACCESSORIES

> AT-8248 ATSUB Mod. 40: I_{max} 40 kA
> AT-8228 ATSUB Mod. 15: I_{max} 15 kA
> AT-8268 ATSUB Mod. 65: I_{max} 65 kA

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-3P-NR 15-120 TNC **AT-8073**	ATSUB-3P-NR 40-120 TNC **AT-8074**	ATSUB-3P-NR 65-120 TNC **AT-8075**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2
Nominal voltage:	U_n	120 V_{AC}		
Maximum continuous operating voltage:	U_c	150 V_{AC}		
Nominal frequency:		50 - 60 Hz		
Nominal discharge current (8/20 µs wave):	I_n	5 kA	20 kA	30 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	1200 V	1400 V	1600 V
Protection level for 1.2/50 µs wave:	U_p	700 V	700 V	900 V
Protection level 5 kA; 8/20 µs wave:		900 V	1000 V	1100 V
Impulse current per pole (10/350 µs):	I_{imp}	-		15 kA
Combined wave voltage:	$U_{o.c.}$	6 kV	-	
Response time:	t_r	< 25 ns		
Backup fuse(1):		125 A gL/gG		
Maximum short-circuit current:		25 kA (for maximum fuse)		
Working temperature:	ϑ	-40 ºC to +70 ºC		
Protector location:		Indoor		
Type of connection:		Parallel (one port)		
No. of poles:		3		
Dimensions:		54 x 90 x 80 mm (3 mod. DIN 43880)		
Fixing:		DIN Rail		
Enclosure material:		Polyamide		
Enclosure protection:		IP20		
Insulation resistance:		> 10^{14} Ω		
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)		
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2		

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> ACCESSORIES

> AT-8296 ATSUB Mod. 40-120: I_{max} 40 kA / U_n120 V
> AT-8297 ATSUB Mod. 15-120: I_{max} 15 kA / U_n120 V
> AT-8298 ATSUB Mod. 65-120: I_{max} 65 kA / U_n 120 V

For other voltages, get in touch with Aplicaciones Tecnologicas, S.A. Technical Department.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> ATSUB-2P-NR TT

Compact protection for TT single-phase power supply lines

> **AT-8035 ATSUB-2P-NR 15 TT**: peak current 15 kA. U_n 230 V
> **AT-8020 ATSUB-2P-NR 40 TT**: peak current 40 kA. U_n 230 V
> **AT-8026 ATSUB-2P-NR 65 TT**: peak current 65 kA. U_n 230 V

Effective protection against transient overvoltages for electrical supply lines with type TT neutral, using metal oxide varistors and gas discharge tubes. Medium protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT ITC23).

> NOMENCLATURE

ATSUB 2P - 40 – 400 TT

- 40: Max. discharge voltage in kA
- 400: Nominal voltage Line-ground

It includes removable modules for replacement in the event of a breakdown or fault, without needing to disconnect the wiring. Tested and certified as type 1, 2 and 3 protectors according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV** equipment according to ITC-BT-23.

- Can be coordinated with other protectors such as ATSHOCK, ATSHIELD and ATCOVER series.
- Made up of zinc oxide varistors and gas discharge tubes able to withstand very high currents.
- Short response time.
- Does not produce deflagration.
- Compact protection with removable modules enabling quick replacement in the event of breakage.
- Does not, at any moment, cause any interruption to the supply lines.
- Thermodynamic control device, mechanical warning and remote alarm. When the warning light is yellow, the cartridge is in good condition. If not, replace.

ATSUB series protectors have been tested in **official, independent laboratories,** obtaining their characteristics according to relevant standards (listed in the table).
It is possible to select a protector for the alternating voltage suitable for each particular case. For example, the technical datasheets of the optimal protectors for american voltages are also included (voltage line 230 V and voltage line – neutral 120 V), voltages greater than 230 V (voltage line 520 V and voltage line – neutral 300 V), and wind generator voltages (voltage line 690 V and voltage line - ground 400 V).

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω. If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

They are installed **in parallel** with the low voltage line, with connections to the phases to be protected, neutral and ground. Installation should be carried out **without power running through the line**.

When ATSUB protectors are installed as medium protection, they must be separated from the coarse and/or tight protectors by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor, in order to achieve **correct coordination between them**.

They are recommended for installations where large overvoltages can occur after the main switchboard but which do not supply sensitive equipment.

> PROTECTION OF POWER SUPPLY LINES

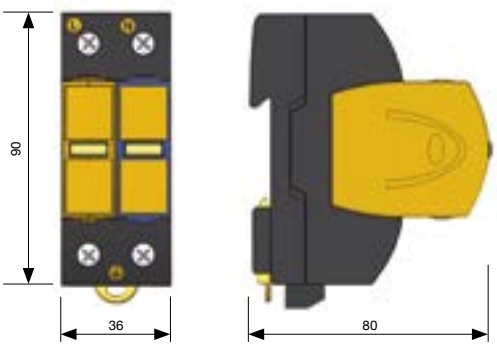
> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-2P-NR 15 TT **AT-8035**	ATSUB-22P-NR 40 TT **AT-8020**	ATSUB-2P-NR 65 TT **AT-8026**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2
Nominal voltage:	U_n	230 V_{AC}		
Maximum continuous operating voltage:	U_c	275 V_{AC}		
Nominal frequency:		50 - 60 Hz		
Nominal discharge current per pole (8/20 µs wave):	I_n	5 kA	20 kA	30 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA
Protection level at I_n(8/20 µs wave):	$U_p(I_n)$	1200 V	1400 V	1600 V
Protection level for 1.2/50 µs wave:	U_p	700 V	700 V	900 V
Protection level for 5 kA; 8/20 µs wave:		900 V	1000 V	1100 V
Impulse current per pole (10/350 µs):	I_{imp}	-		15 kA
Combined wave voltage:	$U_{o.c.}$	6 kV	-	
Response time:	t_r	< 25 ns		
Backup fuse(1):		125 A gL/gG		
Maximum short-circuit current:		25 kA (for maximum fuse)		
Working temperature:	ϑ	-40 ºC to +70 ºC		
Protector location:		Indoor		
Type of connection:		Parallel (one port)		
No. of poles:		2		
Dimensions:		36 x 90 x 80 mm (2 mod. DIN 43880)		
Fixing:		DIN Rail		
Enclosure material:		Polyamide		
Enclosure protection:		IP20		
Insulation resistance:		> 10^{14} Ω		
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)		
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2		
Certificated tests according to: UNE-EN 61643-11 Complies with requirements of: UL 1449 Relevant standards: UNE 21186, NF C 17-102, IEC 62305				

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> ACCESSORIES

> AT-8248 ATSUB Mod. 40: I_{max} 40 kA
> AT-8228 ATSUB Mod. 15: I_{max} 15 kA
> AT-8268 ATSUB Mod. 65: I_{max} 65 kA
> AT-8205 ATSUB Mod. N: neutral-ground

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> ATSUB-2P TT

Compact protection for TT single-phase power supply lines

- > **AT-8232 ATSUB-2P 15 TT**: peak current 15 kA. U_n 230 V
- > **AT-8235 ATSUB-2P 40 TT**: peak current 40 kA. U_n 230 V
- > **AT-8238 ATSUB-2P 65 TT**: peak current 65 kA. U_n 230 V
- > **AT-8234 ATSUB-2P 15-120 TT**: peak current 15 kA. U_n 120 V
- > **AT-8237 ATSUB-2P 40-120 TT**: peak current 40 kA. U_n 120 V
- > **AT-8280 ATSUB-2P 65-120 TT**: peak current 65 kA. U_n 120 V
- > **AT-8047 ATSUB-2P 15-300 TT**: peak current 15 kA. U_n 300 V
- > **AT-8048 ATSUB-2P 40-300 TT**: peak current 40 kA. U_n 300 V
- > **AT-8049 ATSUB-2P 65-300 TT**: peak current 65 kA. U_n 300 V
- > **AT-8233 ATSUB-2P 15-400 TT**: peak current 15 kA. U_n 400 V
- > **AT-8236 ATSUB-2P 40-400 TT**: peak current 40 kA. U_n 400 V

Effective protection against transient overvoltages for electrical supply lines with type TT neutral, using metal oxide varistors and gas discharge tubes. Medium protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT ITC23).

> NOMENCLATURE

ATSUB 2P - 40 – 400 TT

- 40: Max. discharge voltage in kA
- 400: Line - ground nominal voltage

It includes removable modules for replacement in the event of a breakdown or fault, without needing to disconnect the wiring. Tested and certified as Type 1, 2 and 3 protectors according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **Categories I, II, III and IV** equipment according to ITC-BT-23.

- > Can be coordinated with other protectors such as ATSHOCK, ATSHIELD and ATCOVER series.
- > Made up of zinc oxide varistors and gas discharge tubes able to withstand very high currents.
- > Short response time.
- > Does not produce deflagration.
- > Compact protection with removable modules enabling quick replacement in the event of breakage.
- > Does not, at any moment, cause any interruption to the supply lines.
- > Thermodynamic control device, mechanical warning and remote alarm. When the warning light is yellow, the cartridge is in good condition. If not, replace.

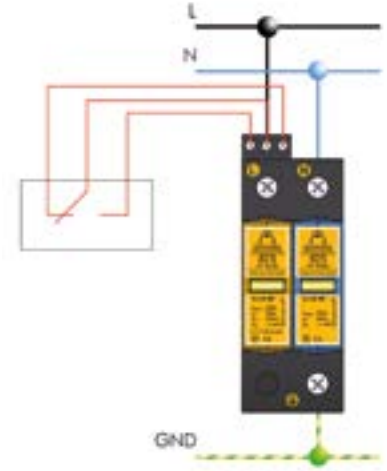
ATSUB series protectors have been tested in **official, independent laboratories,** obtaining their characteristics according to relevant standards (listed in the table).
It is possible to select a protector for the alternating voltage suitable for each particular case. For example, the technical datasheets of the optimal protectors for american voltages are also included (voltage line 230 V and voltage line – neutral 120 V), voltages greater than 230 V (voltage line 520 V and voltage line – neutral 300 V), and wind generator voltages (line voltages 690 V and line- ground voltages 400 V).

> INSTALLATION

They are installed **in parallel** or with the low voltage line, with connections to the phases to be protected, neutral and ground. Installation should be carried out **without power running through the line**.

When ATSUB protectors are installed as medium protection, they must be separated from the coarse and/or tight protectors by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor, in order to achieve **correct coordination between them**.

They are recommended for installations where large overvoltages can occur after the main switchboard but which do not supply sensitive equipment.



Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω. If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> PROTECTION OF POWER SUPPLY LINES

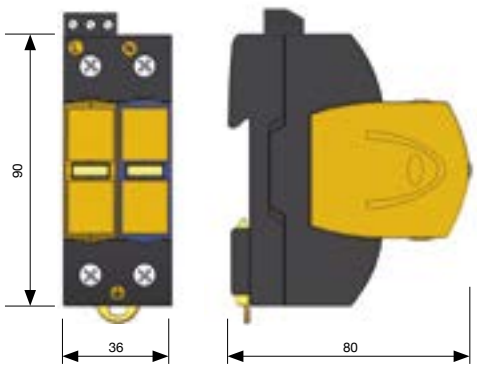
> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-2P 15 TT **AT-8232**	ATSUB-2P 40 TT **AT-8235**	ATSUB-2P 65 TT **AT-8238**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2
Nominal voltage:	U_n	230 V_{AC}		
Maximum continuous operating voltage:	U_c	275 V_{AC}		
Nominal frequency:		50 - 60 Hz		
Nominal discharge current per pole (8/20 µs wave):	I_n	5 kA	20 kA	30 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA
Protection level at I_n(8/20 µs wave):	$U_p(I_n)$	1200 V	1400 V	1600 V
Protection level for 1.2/50 µs wave:	U_p	700 V	700 V	900 V
Protection level for 5 kA; 8/20 µs wave:		900 V	1000 V	1100 V
Impulse current per pole (10/350 µs):	I_{imp}	-		15 kA
Combined wave voltage:	$U_{o.c.}$	6 kV	-	
Response time:	t_r	< 25 ns		
Backup fuse(1):		125 A gL/gG		
Maximum short-circuit current:		25 kA (for maximum fuse)		
Working temperature:	ϑ	-40 ºC to + 70 ºC		
Protector location:		Indoor		
Type of connection:		Parallel (one port)		
No. of poles:		2		
Dimensions:		36 x 90 x 80 mm (2 mod. DIN 43880)		
Fixing:		DIN Rail		
Enclosure material:		Polyamide		
Enclosure protection:		IP20		
Insulation resistance:		> 10^{14} Ω		
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)		
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2		
Voltage-free contact for the remote control				
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2		
Contact output:		Switch		
Operating voltage:		250 V_{AC} (Maximum operating voltage of the alarm power supply)		
Maximum current:		2 A (Maximum current of the alarm power supply)		
Certificated tests according to: UNE-EN 61643-11 Complies with requirements of: UL 1449 Relevant standards: UNE 21186, NF C 17-102, IEC 62305				

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> ACCESSORIES

> AT-8248 ATSUB Mod. 40: I_{max} 40 kA
> AT-8228 ATSUB Mod. 15: I_{max} 15 kA
> AT-8268 ATSUB Mod. 65: I_{max} 65 kA
> AT-8205 ATSUB Mod. N: neutral-ground

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-2P 15-120 TT **AT-8234**	ATSUB-2P 40-120 TT **AT-8237**	ATSUB-2P 65-120 TT **AT-8280**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2
Nominal voltage:	U_n	120 V_{AC}		
Maximum continuous operating voltage:	U_c	150 V_{AC}		
Nominal frequency:		50 - 60 Hz		
Nominal frequency:	I_n	5 kA	20 kA	30 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA
Protection level for I_n (8/20 µs wave):	$U_p(I_n)$	1200 V	1400 V	1600 V
Protection level for 1.2/50 µs wave:	U_p	700 V	700 V	900 V
Protection level for 5 kA; 8/20 µs wave:		900 V	1000 V	1100 V
Impulse current per pole (10/350 µs):	I_{imp}	-		15 kA
Combined wave voltage:	$U_{o.c.}$	6 kV	-	
Response time:	t_r	< 25 ns		
Backup fuse(1):		125 A gL/gG		
Maximum short-circuit current:		25 kA (for maximum fuse)		
Working temperature:	ϑ	-40 ºC to +70 ºC		
Protector location:		Indoor		
Type of connection:		Parallel (one port)		
No. of poles:		2		
Dimensions:		36 x 90 x 80 mm (2 mod. DIN 43880)		
Fixing:		DIN Rail		
Enclosure material:		Polyamide		
Enclosure protection:		IP20		
Insulation resistance:		> 10^{14} Ω		
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)		
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2		
Voltage-free contact for the remote control				
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2		
Contact output:		Switch		
Operating voltage:		250 V_{AC} (Maximum operating voltage of the alarm power supply)		
Maximum current:		2 A (Maximum current of the alarm power supply)		
Certificated tests according to: UNE-EN 61643-11 Complies with requirements of: UL 1449 Relevant standards: UNE 21186, NF C 17-102, IEC 62305				

(1) Required in cases where there is higher nominal current installed upstream from the protector

> ACCESSORIES

> AT-8296 ATSUB Mod. 40-120: I_{max} 40 kA / U_n 120 V
> AT-8297 ATSUB Mod. 15-120: I_{max} 15 kA / U_n 120 V
> AT-8298 ATSUB Mod. 65-120: I_{max} 65 kA / U_n 120 V
> AT-8205 ATSUB Mod. N: neutral-ground

For other voltages, get in touch with Aplicaciones Tecnologicas, S.A. Technical Department.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-2P 15-300 TT **AT-8047**	ATSUB-2P 40-300 TT **AT-8048**	ATSUB-2P 65-300 TT **AT-8049**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2
Nominal voltage:	U_n	300 V_{AC}		
Maximum continuous operating voltage:	U_c	320 V_{AC}		
Nominal frequency:		50 - 60 Hz		
Nominal discharge current per pole (8/20 µs wave):	I_n	5 kA	20 kA	30 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA
Protection level at I_n(8/20 µs wave):	$U_p(I_n)$	1400 V	1500 V	1800 V
Protection level for 1.2/50 µs wave:	U_p	900 V	900 V	1100 V
Protection level for 5 kA; 8/20 µs wave:		1100 V	1200 V	1300 V
Impulse current per pole (10/350 µs):	I_{imp}	-		15 kA
Combined wave voltage:	$U_{o.c.}$	6 kV	-	
Response time:	t_r	< 25 ns		
Backup fuse(1):		125 A gL/gG		
Maximum short-circuit current:		25 kA (for maximum fuse)		
Working temperature:	ϑ	-40 ºC to +70 ºC		
Protector location:		Indoor		
Type of connection:		Parallel (one port)		
No. of poles:		2		
Dimensions:		36 x 90 x 80 mm (2 mod. DIN 43880)		
Fixing:		DIN Rail		
Enclosure material:		Polyamide		
Enclosure protection:		IP20		
Insulation resistance:		> 10^{14} Ω		
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)		
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2		
Voltage-free contact for the remote control				
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2		
Contact output:		Switch		
Operating voltage:		250 V_{AC} (Maximum operating voltage of the alarm power supply)		
Maximum current:		2 A (Maximum current of the alarm power supply)		
Certificated tests according to: UNE-EN 61643-11 Complies with requirements of: UL 1449 Relevant standards: UNE 21186, NF C 17-102, IEC 62305				

(1) Required in cases where there is higher nominal current installed upstream from the protector

> ACCESSORIES

> AT-8043 ATSUB Mod. 40-300: Imax 40 kA / U_n 300 V
> AT-8044 ATSUB Mod. 15-300: Imax 15 kA / U_n 300 V
> AT-8045 ATSUB Mod. 65-300: Imax 65 kA / U_n 300 V
> AT-8205 ATSUB Mod. N: neutral-ground

For other voltages, get in touch with Aplicaciones Tecnologicas, S.A. Technical Department.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-2P 15-400 TT **AT-8233**	ATSUB-2P 40-400 TT **AT-8236**
Protection categories according to the REBT:		I, II, III, IV	
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2
Nominal voltage:	U_n	400 V_{AC}	
Maximum continuous operating voltage:	U_c	460 V_{AC}	
Nominal frequency:		50 - 60 Hz	
Nominal discharge current per pole (8/20 µs wave):	I_n	5 kA	20 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA	40 kA
Protection level for 8/20 µs wave:	$U_p(I_n)$	2100 V	2300 V
Protection level 1.2/50 µs wave:	U_p	1800 V	1800 V
Protection level for 5 kA; 8/20 µs wave:		1900 V	2000 V
Combined wave voltage:	$U_{o.c.}$	6 kV	-
Response time:	t_r	< 25 ns	
Backup fuse(1):		125 A gL/gG	
Maximum short-circuit current:		25 kA (for maximum fuse)	
Working temperature:	ϑ	-40 °C to +70 °C	
Protector location:		Indoor	
Type of connection:		Parallel (one port)	
No. of poles:		2	
Dimensions:		36 x 90 x 80 mm (2 mod. DIN 43880)	
Fixing:		DIN Rail	
Enclosure material:		Polyamide	
Enclosure protection:		IP20	
Insulation resistance:		> 10^{14} Ω	
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)	
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2	
Voltage-free contact for the remote control			
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2	
Contact output:		Switch	
Operating voltage:		250 V_{AC} (Maximum working voltage of the alarm supply)	
Maximum current:		2 A (Maximum current of the alarm power supply)	

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> ACCESSORIES

> AT-8249 ATSUB Mod. 40-400: I_{max} 40 kA / U_n 400 V
> AT-8229 ATSUB Mod. 15-400: I_{max} 15 kA / U_n 400 V
> AT-8205 ATSUB Mod. N: neutral-ground

For other voltages, get in touch with Aplicaciones Tecnologicas, S.A. Technical Department.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> ATSUB-2P TN

Compact protection for TN single-phase power supply lines

> **AT-8010 ATSUB-2P 15 TN**: peak current 15 kA. U_n 230 V
> **AT-8009 ATSUB-2P 40 TN**: peak current 40 kA. U_n 230 V
> **AT-8011 ATSUB-2P 65 TN**: peak current 65 kA. U_n 230 V
> **AT-8012 ATSUB-2P 15-120 TN**: peak current 15 kA. U_n 120 V
> **AT-8013 ATSUB-2P 40-120 TN**: peak current 40 kA. U_n 120 V
> **AT-8014 ATSUB-2P 65-120 TN**: peak current 65 kA. U_n 120 V
> **AT-8053 ATSUB-4P 15-300 TN**: peak current 15 kA. U_n 300 V
> **AT-8054 ATSUB-4P 40-300 TN**: peak current 40 kA. U_n 300 V
> **AT-8055 ATSUB-4P 65-300 TN**: peak current 65 kA. U_n 300 V
> **AT-8015 ATSUB-2P 15-400 TN**: peak current 15 kA. U_n 400 V
> **AT-8016 ATSUB-2P 40-400 TN**: peak current 40 kA. U_n 400 V

Effective protection against transient overvoltages for TN type electrical supply lines. Medium protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT ITC23).

> NOMENCLATURE

ATSUB 2P - 40 – 400 TN

- 40: Max. discharge voltage in kA
- 400: Line-ground nominal voltage

It includes removable modules for replacement in the event of a breakdown or fault, without needing to disconnect the wiring. Tested and certified as type 1, 2 and 3 protectors according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV equipment** according to the REBT.

> Can be coordinated with other protectors such as ATSHOCK, ATSHIELD and ATCOVER series.
> Made up of zinc oxide varistors and gas discharge tubes able to withstand very high currents.
> Short response time.
> Do not produce deflagration.
> Compact protection with removable modules for quick replacement in case of breakage.
> Their activation causes no interruption in power supply.
> Thermodynamic mechanical warning and remote alarm. When the warning light is yellow, the cartridge is in good condition. If not, replace.

ATSUB series protectors have been tested in **official and independent laboratories,** obtaining their characteristics according to relevant standards (shown in the table). It is possible to select a protector for the alternating voltage suitable for each particular case. For example, the technical datasheets of the optimal protectors for american voltages are also included (line voltage 230 V and line – neutral voltage 120 V), voltages greater than 230 V (line voltage 520 V and line – neutral voltage 300 V), and wind generator voltages (line voltage 690 V and line - ground voltage 400 V).

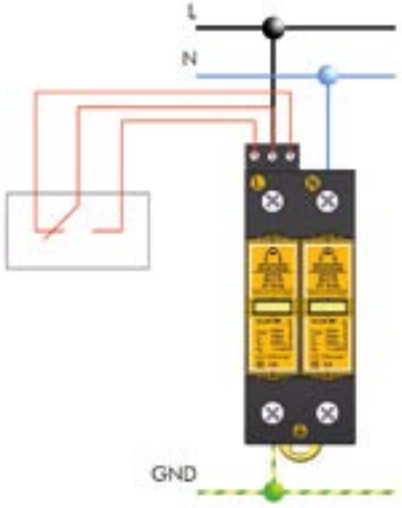
Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω. If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

They are installed **in parallel** with the low voltage line, with connections to the phases to be protected, neutral and ground. Installation should be carried out **without power running through the line**.

When ATSUB protectors are installed as medium protection, they must be separated from the coarse and/or tight protectors by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor, in order to achieve **correct coordination between them**.

They are recommended for installations where large overvoltages can occur after the main switchboard but which do not supply sensitive equipment.



> PROTECTION OF POWER SUPPLY LINES

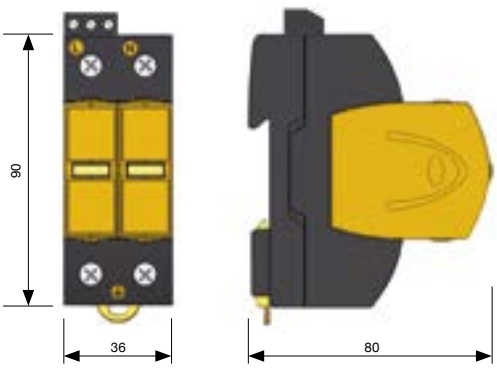
> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-2P 15 TN **AT-8010**	ATSUB-2P 40 TN **AT-8009**	ATSUB-2P 65 TN **AT-8011**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2
Nominal voltage:	U_n	230 V_{AC}		
Maximum continuous operating voltage:	U_c	275 V_{AC}		
Nominal frequency:		50 - 60 Hz		
Nominal discharge current per pole (8/20 µs wave):	I_n	5 kA	20 kA	30 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA
Protection level at I_n (8/20 µs wave):	$U_p(I_n)$	1200 V	1400 V	1600 V
Protection level per wave 1.2/50 µs:	U_p	700 V	700 V	900 V
Protection level for 5 kA; 8/20 µs wave:		900 V	1000 V	1100 V
Impulse current per pole (10/350 µs):	I_{imp}	-		15 kA
Combined wave voltage:	$U_{o.c.}$	6 kV	-	
Response time:	t_r	< 25 ns		
Backup fuses(1):		125 A gL/gG		
Maximum short-circuit current:		25 kA (for maximum fuse)		
Working temperature:	ϑ	-40 °C to +70 °C		
Protector location:		Indoor		
Type of connection:		Parallel (one port)		
No. of poles:		4		
Dimensions:		36 x 90 x 80 mm (2 mod. DIN 43880)		
Fixing:		DIN Rail		
Enclosure material:		Polyamide		
Enclosure protection:		IP20		
Insulation resistance:		> 10^{14} Ω		
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)		
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2		
Voltage-free contact for the remote control				
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2		
Contact output:		Switch		
Operating voltage:		250 V_{AC} (Maximum operating voltage of the alarm power supply)		
Maximum current:		2 A (Maximum current of the alarm power supply)		
Certificated tests according to: UNE-EN 61643-11 Complies with requirements of: UL 1449 Relevant standards: UNE 21186, NF C 17-102, IEC 62305				

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> ACCESSORIES

> AT-8248 ATSUB Mod. 40: I_{max} 40 kA
> AT-8228 ATSUB Mod. 15: I_{max} 15 kA
> AT-8268 ATSUB Mod. 65: I_{max} 65 kA

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-2P 15-120 TN **AT-8012**	ATSUB-2P 40-120 TN **AT-8013**	ATSUB-2P 65-120 TN **AT-8014**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2
Nominal voltage:	U_n	120 V_{AC}		
Maximum continuous operating voltage:	U_c	150 V_{AC}		
Nominal frequency:		50 - 60 Hz		
Nominal discharge current (8/20 µs wave):	I_n	5 kA	20 kA	30 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	1200 V	1400 V	1600 V
Protection level for 1.2/50 µs wave:	U_p	700 V	700 V	900 V
Protection level 5 kA; 8/20 µs wave:		900 V	1000 V	1100 V
Impulse current per pole (10/350 µs):	I_{imp}	-		15 kA
Combined wave voltage:	$U_{o.c.}$	6 kV	-	
Response time:	t_r	< 25 ns		
Backup fuses(1):		125 A gL/gG		
Maximum short-circuit current:		25 kA (for maximum fuse)		
Working temperature:	ϑ	-40 ºC to +70 ºC		
Protector location:		Indoor		
Type of connection:		Parallel (one port)		
No. of poles:		4		
Dimensions:		36 x 90 x 80 mm (2 mod. DIN 43880)		
Fixing:		DIN Rail		
Enclosure material:		Polyamide		
Enclosure protection:		IP20		
Insulation resistance:		> 10^{14} Ω		
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)		
Connections L/N/GND:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2		
Voltage-free contact for the remote control				
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2		
Contact output:		Switch		
Operating voltage:		250 V_{AC} (Maximum working voltage of the alarm power supply)		
Maximum current:		2 A (Maximum current of the alarm power supply)		

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> ACCESSORIES

> AT-8296 ATSUB Mod. 40-120: I_{max} 40 kA / U_n 120 V
> AT-8297 ATSUB Mod. 15-120: I_{max} 15 kA / U_n 120 V
> AT-8298 ATSUB Mod. 65-120: I_{max} 65 kA / U_n 120 V

For other voltages, get in touch with Aplicaciones Tecnologicas, S.A. Technical Department.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-2P 15-300 TN **AT-8053**	ATSUB-2P 40-300 TN **AT-8054**	ATSUB-2P 65-300 TN **AT-8055**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2
Nominal voltage:	U_n	300 V_{AC}		
Maximum continuous operating voltage:	U_c	320 V_{AC}		
Nominal frequency:		50 - 60 Hz		
Nominal discharge current (8/20 µs wave):	I_n	5 kA	20 kA	30 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	1400 V	1500 V	1800 V
Protection level for 1.2/50 µs wave:	U_p	900 V	900 V	1100 V
Protection level 5 kA; 8/20 µs wave:		1100 V	12000 V	1300 V
Impulse current per pole (10/350 µs):	I_{imp}	-		15 kA
Combined wave voltage:	$U_{o.c.}$	6 kV	-	
Response time:	t_r	< 25 ns		
Backup fuses(1):		125 A gL/gG		
Maximum short-circuit current:		25 kA (for maximum fuse)		
Working temperature:	ϑ	-40 °C to +70 °C		
Protector location:		Indoor		
Type of connection:		Parallel (one port)		
No. of poles:		2		
Dimensions:		36 x 90 x 80 mm (2 mod. DIN 43880)		
Fixing:		DIN Rail		
Enclosure material:		Polyamide		
Enclosure protection:		IP20		
Insulation resistance:		> 10^{14} Ω		
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)		
Connections L/N/GND:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2		
Voltage-free contact for the remote control				
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2		
Contact output:		Switch		
Operating voltage:		250 V_{AC} (Maximum working voltage of the alarm power supply)		
Maximum current:		2 A (Maximum current of the alarm power supply)		
Certificated tests according to: UNE-EN 61643-11 Complies with requirements of: UL 1449 Relevant standards: UNE 21186, NF C 17-102, IEC 62305				

(1) Required in cases where there is higher nominal current installed upstream from the protector

> ACCESSORIES

> AT-8043 ATSUB Mod. 40-300: Imax 40 kA / U_n 300 V
> AT-8044 ATSUB Mod. 15-300: Imax 15 kA / U_n 300 V
> AT-8045 ATSUB Mod. 65-300: Imax 65 kA / U_n 300 V

For other voltages, get in touch with Aplicaciones Tecnologicas, S.A. Technical Department.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-2P 15-400 TN **AT-8015**	ATSUB-2P 40-400 TN **AT-8016**
Protection categories according to the REBT:		I, II, III, IV	
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2
Nominal voltage:	U_n	400 V_{AC}	
Maximum continuous operating voltage:	U_c	460 V_{AC}	
Nominal frequency:		50 - 60 Hz	
Nominal discharge current (8/20 µs wave):	I_n	5 kA	20 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA	40 kA
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	2100 V	2300 V
Protection level for 1.2/50 µs wave:	U_p	1800 V	1800 V
Protection level 5 kA; 8/20 µs wave:		1900 V	2000 V
Combined wave voltage:	$U_{o.c.}$	6 kV	-
Response time:	t_r	< 25 ns	
Backup fuses(1):		125 A gL/gG	
Maximum short-circuit current:		25 kA (for maximum fuse)	
Working temperature:	ϑ	-40 °C to +70 °C	
Protector location:		Indoor	
Type of connection:		Parallel (one port)	
No. of poles:		4	
Dimensions:		36 x 90 x 80 mm (2 mod. DIN 43880)	
Fixing:		DIN Rail	
Enclosure material:		Polyamide	
Enclosure protection:		IP20	
Insulation resistance:		> 10^{14} Ω	
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)	
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2	
Voltage-free contact for the remote control			
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2	
Contact output:		Switch	
Operating voltage:		250 V_{AC} (Maximum working voltage of the alarm power supply)	
Maximum current:		2 A (Maximum current of the alarm power supply)	
Certificated tests according to: UNE-EN 61643-11 Complies with requirements of: UL 1449 Relevant standards: UNE 21186, NF C 17-102, IEC 62305			

(1) Required in cases where there is higher nominal current installed upstream from the protector

> ACCESSORIES

> AT-8249 ATSUB Mod. 40-400: I_{max} 40 kA / U_n 400 V
> AT-8229 ATSUB Mod. 15-400: I_{max} 15 kA / U_n 400 V

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> ATSUB-P

Single-pole and pluggable protection for power supply lines

> **AT-8222 ATSUB-P 15**: peak current of 15 kA. U_n 230 V
> **AT-8242 ATSUB-P 40**: peak current of 40 kA. U_n 230 V
> **AT-8262 ATSUB-P 65**: peak current of 65 kA. U_n 230 V
> **AT-8202 ATSUB-P N**: for neutral-ground protection
> **AT-8290 ATSUB-P 15-120**: peak current 15 kA. U_n 120 V
> **AT-8291 ATSUB-P 40-120**: peak current 40 kA. U_n 120 V
> **AT-8292 ATSUB-P 65-120**: peak current 65 kA. U_n 120 V
> **AT-8056 ATSUB-P 15-300**: peak current 15 kA. U_n 300 V
> **AT-8057 ATSUB-P 40-300**: peak current 40 kA. U_n 300 V
> **AT-8058 ATSUB-P 65-300**: peak current 65 kA. U_n 300 V
> **AT-8226 ATSUB-P 15-400**: peak current 15 kA. U_n 400 V
> **AT-8246 ATSUB-P 40-400**: peak current 40 kA. U_n 400 V

Effective protection against transient overvoltages for electrical supply lines with or without neutral, using metal oxide varistors and gas discharge tubes. Protects three-phase TT, TNS, TNC and IT type lines. Medium protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT ITC23).

> NOMENCLATURE

ATSUB-P **40** – **400**

- **40**: Max. discharge voltage in kA
- **400**: Line - ground nominal voltage

It includes removable modules for replacement in the event of a breakdown or fault, without needing to disconnect the wiring. Tested and certified as a **type 1, 2 and 3** protector according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV equipment** according to the REBT.

> Can be coordinated with other protectors such as ATSHOCK, ATSHIELD and ATCOVER series.
> Made up of zinc oxide varistors and gas discharge tubes able to withstand very high currents.
> Short response time.
> Do not produce deflagration.
> Single-pole protection with removable module.
> They do not cause any interruption to the power supply.
> Small size modular protection.
> Thermodynamic control device, mechanical warning and remote alarm. When the warning light is yellow, the cartridge is in good condition. If not, replace.

ATSUB series protectors have been tested in **official, independent laboratories,** obtaining their characteristics according to relevant standards (listed in the table). It is possible to select a protector for the alternating voltage suitable for each particular case. For example, the technical datasheets of the optimal protectors for american voltages are also included (line voltage 230 V and line – neutral voltage 120 V), voltages greater than 230 V (line voltage 520 V and line – neutral Current 300 V), and wind generator voltages (line voltage 690 V and line - ground voltage 400 V).

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω. If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

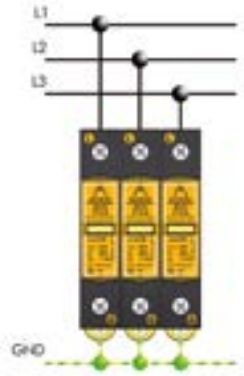
> INSTALLATION

They are installed **in parallel** with the low voltage line, with connections to the phases that are to be protected and to ground. As an example, 3 ATSUB-P connections in a TNC type three-phase power supply line are shown.

Installation should be carried out **without power running through the line**.

When ATSUB protectors are installed as medium protection, they must be separated from the coarse and/or tight protectors by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor, in order to achieve **correct coordination between them**.

They are recommended for installations where large overvoltages can occur after the main switchboard but which do not supply sensitive equipment.



> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

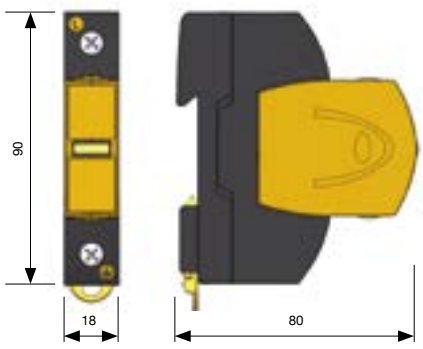
> TECHNICAL DATASHEET

Reference:		ATSUB-P 15 **AT-8222**	ATSUB-P 40 **AT-8242**	ATSUB-P 65 **AT-8262**	ATSUB-P N **AT-8202**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV	I, II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2	Type 2
Nominal voltage:	U_n	230 V_{AC}			-
Maximum continuous operating voltage:	U_c	275 V_{AC}			-
Nominal frequency:		50 - 60 Hz			
Nominal discharge current (8/20 µs wave):	I_n	5 kA	20 kA	30 kA	20 kA
Maximum current (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA	40 kA
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	1200 V	1400 V	1600 V	1400 V
Protection level for 1.2/50 µs wave:	U_p	700 V	700 V	900 V	700 V
Protection level 5 kA; 8/20 µs wave:		900 V	1000 V	1100 V	1000 V
Impulse current (10/350 µs wave):	I_{imp}	-		15 kA	-
Combined wave voltage:	$U_{o.c.}$	6 kV	-		
Response time:	t_r	< 25 ns			
Backup fuses(1):		125 A gL/gG			
Maximum short-circuit current:		25 kA (for maximum fuse)			
Working temperature:	ϑ	-40 °C to +70 °C			
Protector location:		Indoor			
Type of connection:		Parallel (one port)			
Dimensions:		18 x 90 x 80 mm (1 mod. DIN 43880)			
Fixing:		DIN Rail			
Enclosure material:		Polyamide			
Enclosure protection:		IP20			
Insulation resistance:		> 10^{14} Ω			
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)			
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2			

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> ACCESSORIES

> AT-8248 ATSUB Mod. 40: I_{max} 40 kA
> AT-8228 ATSUB Mod. 15: I_{max} 15 kA
> AT-8268 ATSUB Mod. 65: I_{max} 65 kA
> AT-8205 ATSUB Mod. N: neutral-ground

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-P 15-120 **AT-8290**	ATSUB-P 40-120 **AT-8291**	ATSUB-P 65-120 **AT-8292**	ATSUB-P N **AT-8202**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV	I, II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2	Type 2
Nominal voltage:	U_n	120 V_{AC}			-
Maximum continuous operating voltage:	U_c	150 V_{AC}			-
Nominal frequency:		50 - 60 Hz			
Nominal discharge current (8/20 µs wave):	I_n	5 kA	20 kA	30 kA	20 kA
Maximum current (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA	40 kA
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	1200 V	1400 V	1600 V	1400 V
Protection level for 1.2/50 µs wave:	U_p	700 V	700 V	900 V	700 V
Protection level 5 kA; 8/20 µs wave:		900 V	1000 V	1100 V	1000 V
Impulse current (10/350 µs wave):	I_{imp}	-		15 kA	-
Combined wave voltage:	$U_{o.c.}$	6 kV	-		
Response time:	t_r	< 25 ns			
Backup fuses(1):		125 A gL/gG			
Maximum short-circuit current:		25 kA (for maximum fuse)			
Working temperature:	ϑ	-40 °C to +70 °C			
Protector location:		Indoor			
Type of connection:		Parallel (one port)			
Dimensions:		18 x 90 x 80 mm (1 mod. DIN 43880)			
Fixing:		DIN Rail			
Enclosure material:		Polyamide			
Enclosure protection:		IP20			
Insulation resistance:		> 10^{14} Ω			
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)			
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2			

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> ACCESSORIES

> AT-8296 ATSUB Mod. 40-120: I_{max} 40 kA / U_n 120 V
> AT-8297 ATSUB Mod. 15-120: I_{max} 15 kA / U_n 120 V
> AT-8298 ATSUB Mod. 65-120: I_{max} 65 kA / U_n 120 V
> AT-8205 ATSUB Mod. N: neutral-ground

For other voltages, get in touch with Aplicaciones Tecnologicas, S.A. Technical Department.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-P 15-300 **AT-8056**	ATSUB-P 40-300 **AT-8057**	ATSUB-P 65-300 **AT-8058**	ATSUB-P N **AT-8202**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV	I, II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2	Type 2
Nominal voltage:	U_n	300 V_{AC}			-
Maximum continuous operating voltage:	U_c	320 V_{AC}			-
Nominal frequency:		50 - 60 Hz			
Nominal discharge current (8/20 µs wave):	I_n	5 kA	20 kA	30 kA	20 kA
Maximum current (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA	40 kA
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	1400 V	1500 V	1800 V	1400 V
Protection level for 1.2/50 µs wave:	U_p	900 V	900 V	1100 V	700 V
Protection level 5 kA; 8/20 µs wave:		1100 V	1200 V	1300 V	1000 V
Impulse current (10/350 µs wave):	I_{imp}	-		15 kA	-
Combined wave voltage:	$U_{o.c.}$	6 kV	-		
Response time:	t_r	< 25 ns			
Backup fuses(1):		125 A gL/gG			
Maximum short-circuit current:		25 kA (for maximum fuse)			
Working temperature:	ϑ	-40 °C to + 70 °C			
Protector location:		Indoor			
Type of connection:		Parallel (one port)			
Dimensions:		18 x 90 x 80 mm (1 mod. DIN 43880)			
Fixing:		DIN Rail			
Enclosure material:		Polyamide			
Enclosure protection:		IP20			
Insulation resistance:		> 10^{14} Ω			
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)			
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2			

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> ACCESSORIES

> AT-8043 ATSUB Mod. 40-300: Imax 40 kA / U_n 300 V
> AT-8044 ATSUB Mod. 15-300: Imax 15 kA / U_n 300 V
> AT-8045 ATSUB Mod. 65-300: Imax 65 kA / U_n 300 V
> AT-8205 ATSUB Mod. N: neutral-ground

For other voltages, get in touch with Aplicaciones Tecnologicas, S.A. Technical Department.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-P 15-400 **AT-8226**	ATSUB-P 40-400 **AT-8246**	ATSUB-P N **AT-8202**
Protection categories according to the REBT:		I, II, III, IV		I, II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 2
Nominal voltage:	U_n	400 V_{AC}		-
Maximum continuous operating voltage:	U_c	460 V_{AC}		-
Nominal frequency:		50 - 60 Hz		
Nominal discharge current (8/20 µs wave):	I_n	5 kA	20 kA	20 kA
Maximum current (8/20 µs wave):	I_{max}	15 kA	40 kA	40 kA
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	2100 V	2300 V	2100 V
Protection level for 1.2/50 µs wave:	U_p	1800 V	1800 V	1800 V
Protection level 5 kA; 8/20 µs wave:		1900 V	2000 V	1900 V
Combined wave voltage:	$U_{o.c.}$	6 kV	-	
Response time:	t_r	< 25 ns		
Backup fuse(1):		125 A gL/gG		
Maximum short-circuit current:		25 kA (for maximum fuse)		
Working temperature:	ϑ	-40 °C to + 70 °C		
Protector location:		Indoor		
Type of connection:		Parallel (one port)		
Dimensions:		18 x 90 x 80 mm (1 mod. DIN 43880)		
Fixing:		DIN Rail		
Enclosure material:		Polyamide		
Enclosure protection:		IP20		
Insulation resistance:		> 10^{14} Ω		
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)		
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2		

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> ACCESSORIES

> AT-8249 ATSUB Mod. 40-400: I_{max} 40 kA / U_n 400 V
> AT-8229 ATSUB Mod. 15-400: I_{max} 15 kA / U_n 400 V

For other voltages, get in touch with Aplicaciones Tecnologicas, S.A. Technical Department.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> ATSUB-PR

Single-pole and pluggable protection for power supply lines

> **AT-8223 ATSUB-PR 15**: peak current 15 kA. U_n 230 V
> **AT-8243 ATSUB-PR 40**: peak current 40 kA. U_n 230 V
> **AT-8263 ATSUB-PR 65**: peak current 65 kA. U_n 230 V
> **AT-8203 ATSUB-PR N**: for neutral-ground protection
> **AT-8293 ATSUB-PR 15-120**: peak current 15 kA. U_n 120 V
> **AT-8294 ATSUB-PR 40-120**: peak current 40 kA. U_n 120 V
> **AT-8295 ATSUB-PR 65-120**: peak current 65 kA. U_n 120 V
> **AT-8059 ATSUB-PR 15-300**: peak current 15 kA. U_n 300 V
> **AT-8060 ATSUB-PR 40-300**: peak current 40 kA. U_n 300 V
> **AT-8061 ATSUB-PR 65-300**: peak current 65 kA. U_n 300 V
> **AT-8227 ATSUB-PR 15-400**: peak current 15 kA. U_n 400 V
> **AT-8247 ATSUB-PR 40-400**: peak current 40 kA. U_n 400 V

Effective protection against transient overvoltages for electrical supply lines with or without neutral, using metal oxide varistors and gas discharge tubes. Protects three-phase TT, TNS, TNC and IT type lines. Medium protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT ITC23).

> NOMENCLATURE

ATSUB-PR 65 – 400

- 65: Max. discharge voltage in kA
- 400: Line - ground nominal voltage

It includes removable modules for replacement in the event of a breakdown or fault, without needing to disconnect the wiring. Tested and certified as a **type 1, 2 and 3** protector according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV** equipment according to ITC-BT-23.

> Can be coordinated with other protectors such as ATSHOCK, ATSHIELD and ATCOVER series.
> Made up of zinc oxide varistors and gas discharge tubes able to withstand very high currents.
> Short response time.
> Does not produce deflagration.
> Single-pole protection with removable module.
> They do not cause any interruption to the power supply.
> Small size modular protection.
> Thermodynamic control device with mechanical warning and remote alarm. When the warning light is yellow, the cartridge is in good condition. If not, replace.

ATSUB series protectors have been tested in **official, independent laboratories,** obtaining their characteristics according to relevant standards (listed in the table). It is possible to select a protector for the alternating voltage suitable for each particular case. For example, the technical datasheets of the optimal protectors for american voltages are also included (line voltage of 230 V and line – neutral voltage of 120 V), voltages greater than 230 V (line voltage 520 V and line – neutral voltage 300 V), and wind generator voltages (line voltage 690 V and line – ground voltage 400 V).

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω. If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

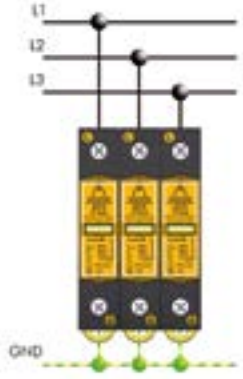
> INSTALLATION

They are installed **in parallel** with the low voltage line, with connections to the phases that are to be protected and to ground. As an example, 3 ATSUB-PR connections in a TNC type three-phase power supply line are shown.

Installation should be carried out **without power running through the line**.

When ATSUB protectors are installed as medium protection, they must be separated from the coarse and/or tight protectors by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor, in order to achieve **correct coordination between them**.

They are recommended for installations where large overvoltages can occur after the main switchboard but which do not supply sensitive equipment.



> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

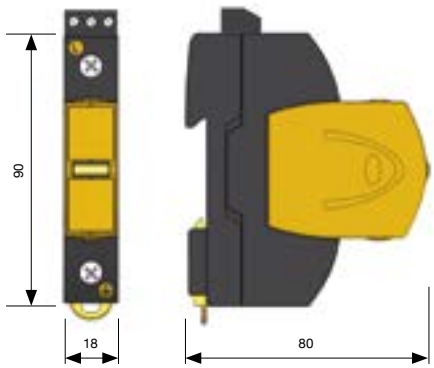
> TECHNICAL DATASHEET

Reference:		ATSUB-PR 15 **AT-8223**	ATSUB-PR 40 **AT-8243**	ATSUB-PR 65 **AT-8263**	ATSUB-PR N **AT-8203**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV	I, II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2	Type 2
Nominal voltage:	U_n	230 V_{AC}			-
Maximum continuous operating voltage:	U_c	275 V_{AC}			-
Nominal frequency:		50 - 60 Hz			
Nominal discharge current (8/20 µs wave):	I_n	5 kA	20 kA	30 kA	20 kA
Maximum current (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA	40 kA
Protection level for 8/20 µs wave to I_n:	$U_p(I_n)$	1200 V	1400 V	1600 V	1400 V
Protection level per wave 1.2/50 µs:	U_p	700 V	700 V	900 V	700 V
Protection level for 5 kA; 8/20 µs wave:		900 V	1000 V	1100 V	1000 V
Impulse current (10/350 µs):	I_{imp}	-		15 kA	-
Combined wave voltage:	$U_{o.c.}$	6 kV	-		
Response time:	t_r	< 25 ns			
Backup fuses[1]:		125 A gL/gG			
Maximum short-circuit current:		25 kA (for maximum fuse)			
Working temperature:	ϑ	-40 ºC to +70 ºC			
Protector location:		Indoor			
Type of connection:		Parallel (one port)			
Dimensions:		18 x 90 x 80 mm (1 mod. DIN 43880)			
Fixing:		DIN Rail			
Enclosure material:		Polyamide			
Enclosure protection:		IP20			
Insulation resistance:		> 10^{14} Ω			
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)			
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2			
Voltage-free contact for the remote control					
Connection:		Max. single-stranded/multi-stranded section: 1.5mm^2			
Contact output:		Switch			
Operating voltage:		250 V_{AC} (Maximum working voltage of the alarm supply)			
Maximum current:		2 A (Maximum current of the alarm power supply)			

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> ACCESSORIES

> AT-8248 ATSUB Mod. 40: I_{max} 40 kA
> AT-8228 ATSUB Mod. 15: I_{max} 15 kA
> AT-8268 ATSUB Mod. 65: I_{max} 65 kA
> AT-8205 ATSUB Mod. N: neutral-ground

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-PR 15-120 **AT-8293**	ATSUB-PR 40-120 **AT-8294**	ATSUB-PR 65-120 **AT-8295**	ATSUB-PR N **AT-8203**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV	I, II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2	Type 2
Nominal voltage:	U_n	120 V_{AC}			-
Maximum continuous operating voltage:	U_c	150 V_{AC}			-
Nominal frequency:		50 - 60 Hz			
Nominal discharge current (8/20 µs wave):	I_n	5 kA	20 kA	30 kA	20 kA
Maximum current (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA	40 kA
Protection level for 8/20 µs wave to I_n:	$U_p(I_n)$	1200 V	1400 V	1600 V	1400 V
Protection level per wave 1.2/50 µs:	U_p	700 V	700 V	900 V	700 V
Protection level for 5 kA; 8/20 µs wave:		900 V	1000 V	1100 V	1000 V
Impulse current (10/350 µs):	I_{imp}	-		15 kA	-
Combined wave voltage:	$U_{o.c.}$	6 kV	-		
Response time:	t_r	< 25 ns			
Backup fuses(1):		125 A gL/gG			
Maximum short-circuit current:		25 kA (for maximum fuse)			
Working temperature:	ϑ	-40 ºC to +70 ºC			
Protector location:		Indoor			
Type of connection:		Parallel (one port)			
Dimensions:		18 x 90 x 80 mm (1 mod. DIN 43880)			
Fixing:		DIN Rail			
Enclosure material:		Polyamide			
Enclosure protection:		IP20			
Insulation resistance:		> 10^{14} Ω			
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)			
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2			
Voltage-free contact for the remote control					
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2			
Contact output:		Switch			
Operating voltage:		250 V_{AC} (Maximum operating voltage of the alarm power supply)			
Maximum current:		2 A (Maximum current of the alarm power supply)			
Certificated tests according to: UNE-EN 61643-11 Complies with requirements of: UL 1449 Relevant standards: UNE 21186, NF C 17-102, IEC 62305					

(1) Required in cases where there is higher nominal current installed upstream from the protector

> ACCESSORIES

> AT-8296 ATSUB Mod. 40-120: I_{max} 40 kA / U_n 120 V
> AT-8297 ATSUB Mod. 15-120: I_{max} 15 kA / U_n 120 V
> AT-8298 ATSUB Mod. 65-120: I_{max} 65 kA / U_n 120 V
> AT-8205 ATSUB Mod. N: neutral-ground

For other voltages, get in touch with Aplicaciones Tecnologicas, S.A. Technical Department.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-PR 15-300 **AT-8059**	ATSUB-PR 40-300 **AT-8060**	ATSUB-PR 65-300 **AT-8061**	ATSUB-PR N **AT-8203**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV	I, II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2	Type 2
Nominal voltage:	U_n	300 V_{AC}			-
Maximum continuous operating voltage:	U_c	320 V_{AC}			-
Nominal frequency:		50 - 60 Hz			
Nominal discharge current (8/20 µs wave):	I_n	5 kA	20 kA	30 kA	20 kA
Maximum current (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA	40 kA
Protection level for 8/20 µs wave to I_n:	$U_p(I_n)$	1400 V	1500 V	1800 V	1400 V
Protection level per wave 1.2/50 µs:	U_p	900 V	900 V	1100 V	700 V
Protection level for 5 kA; 8/20 µs wave:		1100 V	1200 V	1300 V	1000 V
Impulse current (10/350 µs):	I_{imp}	-		15 kA	-
Combined wave voltage:	$U_{o.c.}$	6 kV	-		
Response time:	t_r	< 25 ns			
Backup fuses[1]:		125 A gL/gG			
Maximum short-circuit current:		25 kA (for maximum fuse)			
Working temperature:	ϑ	-40 ºC to +70 ºC			
Protector location:		Indoor			
Type of connection:		Parallel (one port)			
Dimensions:		18 x 90 x 80 mm (1 mod. DIN 43880)			
Fixing:		DIN Rail			
Enclosure material:		Polyamide			
Enclosure protection:		IP20			
Insulation resistance:		> 10^{14} Ω			
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)			
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2			
Voltage-free contact for the remote control					
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2			
Contact output:		Switch			
Operating voltage:		250 V_{AC} (Maximum operating voltage of the alarm power supply)			
Maximum current:		2 A (Maximum current of the alarm power supply)			
Certificated tests according to: UNE-EN 61643-11 Complies with requirements of: UL 1449 Relevant standards: UNE 21186, NF C 17-102, IEC 62305					

(1) Required in cases where there is higher nominal current installed upstream from the protector

> ACCESSORIES

> AT-8248 ATSUB Mod. 40: I_{max} 40 kA
> AT-8228 ATSUB Mod. 15: I_{max} 15 kA
> AT-8268 ATSUB Mod. 65: I_{max} 65 kA
> AT-8205 ATSUB Mod. N: neutral-ground

For other voltages, get in touch with Aplicaciones Tecnologicas, S.A. Technical Department.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-PR 15-400 **AT-8227**	ATSUB-PR 40-400 **AT-8247**	ATSUB-PR N **AT-8203**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 2
Nominal voltage:	U_n	400 V_{AC}		
Maximum continuous operating voltage:	U_c	460 V_{AC}		
Nominal frequency:		50 - 60 Hz		
Nominal discharge current (8/20 µs wave):	I_n	5 kA	20 kA	20 kA
Maximum current (8/20 µs wave):	I_{max}	15 kA	40 kA	40 kA
Protection level for 8/20 µs wave to I_n:	$U_p(I_n)$	2100 V	2300 V	2100 V
Protection level per wave 1.2/50 µs:	U_p	1800 V	1800 V	1800 V
Protection level for 5 kA; 8/20 µs wave:		1900 V	2000 V	1900 V
Combined wave voltage:	$U_{o.c.}$	6 kV	-	
Response time:	t_r	< 25 ns		
Backup fuses(1):		125 A gL/gG		
Maximum short-circuit current:		25 kA (for maximum fuse)		
Working temperature:	ϑ	-40 °C to + 70 °C		
Protector location:		Indoor		
Type of connection:		Parallel (one port)		
Dimensions:		18 x 90 x 80 mm (1 mod. DIN 43880)		
Fixing:		DIN Rail		
Enclosure material:		Polyamide		
Enclosure protection:		IP20		
Insulation resistance:		> 10^{14} Ω		
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)		
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2		
Voltage-free contact for the remote control				
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2		
Contact output:		Switch		
Operating voltage:		250 V_{AC} (Maximum operating voltage of the alarm power supply)		
Maximum current:		2 A (Maximum current of the alarm power supply)		

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> ACCESSORIES

> AT-8249 ATSUB Mod. 40-400: I_{max} 40 kA / U_n 400 V
> AT-8229 ATSUB Mod. 15-400: I_{max} 15 kA / U_n 400 V
> AT-8205 ATSUB Mod. N: neutral-ground

For other voltages, get in touch with Aplicaciones Tecnologicas, S.A. Technical Department.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> ATSUB

Single-pole protection for power supply lines

> **AT-8220 ATSUB 15**: peak current 15 kA. U_n 230 V
> **AT-8240 ATSUB 40**: peak current 40 kA. U_n 230 V
> **AT-8260 ATSUB 65**: peak current 65 kA. U_n 230 V
> **AT-8201 ATSUB N**: for neutral-ground protection
> **AT-8230 ATSUB 15-120**: peak current 15 kA. U_n 120 V
> **AT-8250 ATSUB 40-120**: peak current 40 kA. U_n 120 V
> **AT-8270 ATSUB 65-120**: peak current 65 kA. U_n 120 V
> **AT-8062 ATSUB 15-300**: peak current 15 kA. U_n 300 V
> **AT-8063 ATSUB 40-300**: peak current 40 kA. U_n 300 V
> **AT-8064 ATSUB 65-300**: peak current 65 kA. U_n 300 V
> **AT-8224 ATSUB 15-400**: peak current 15 kA. U_n 400 V
> **AT-8244 ATSUB 40-400**: peak current 40 kA. U_n 400 V
> **AT-8264 ATSUB 65-400**: peak current 65 kA. U_n 400 V

Effective protection against transient overvoltages for electrical supply lines with or without neutral, using metal oxide varistors and gas discharge tubes. Protects three-phase TT, TNS, TNC and IT type lines. Medium protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT ITC23).

> NOMENCLATURE

ATSUB 65 – 400

- 65: Max. discharge voltage in kA
- 400: Line - ground nominal voltage

Tested and certified as a **type 1, 2 and 3** protector according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV equipment** according to the REBT.

> Can be coordinated with other protectors such as ATSHOCK, ATSHIELD and ATCOVER series.
> Made up of zinc oxide varistors and gas discharge tubes able to withstand very high currents.
> It is possible to join the modules using rivets in order to obtain blocks of 2, 3 or 4 elements.
> Short response time.
> Does not produce deflagration.
> Single-pole protection.
> They do not cause any interruption to the power supply.
> Small size modular protection.
> Thermodynamic control device and mechanical warning. When the warning light is yellow, the protector is in good condition. If not, replace.

ATSUB series protectors have been tested in **official, independent laboratories,** obtaining their characteristics according to relevant standards (listed in the table). It is possible to select a protector for the alternating voltage suitable for each particular case. For example, the technical datasheets of the optimal protectors for american voltages are also included (line voltage of 230 V and line – neutral voltage of 120 V), voltages greater than 230 V (line voltage 520 V and line – neutral voltage 300 V), and wind generator voltages (line voltage 690 V and line – ground voltage 400 V).

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω. If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

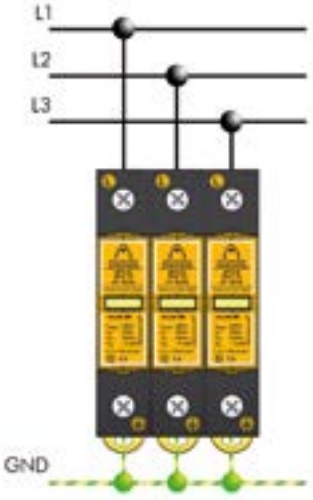
> INSTALLATION

They are installed **in parallel** with the low voltage line, with connections to the phases that are to be protected and to ground. As an example, 3 ATSUB connections in a TNC type three-phase power supply line are shown.

Installation should be carried out **without power running through the line**.

When ATSUB protectors are installed as medium protection, they must be separated from the coarse and/or tight protectors by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor, in order to achieve **correct coordination between them**.

They are recommended for installations where large overvoltages can occur after the main switchboard but which do not supply sensitive equipment.



> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

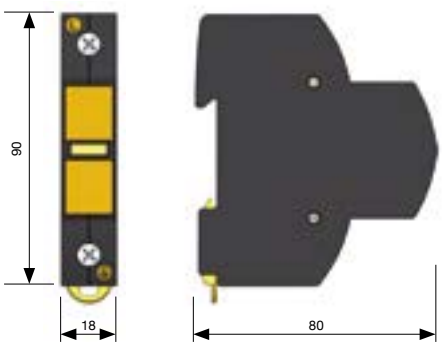
> TECHNICAL DATASHEET

Reference:		ATSUB 15 **AT-8220**	ATSUB 40 **AT-8240**	ATSUB 65 **AT-8260**	ATSUB N **AT-8201**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV	I, II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2	Type 2
Nominal voltage:	U_n	230 V_{AC}			-
Maximum continuous operating voltage:	U_c	275 V_{AC}			-
Nominal frequency:		50 - 60 Hz			
Nominal discharge current (8/20 µs wave):	I_n	5 kA	20 kA	30 kA	20 kA
Maximum current (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA	40 kA
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	1200 V	1400 V	1600 V	1400 V
Protection level for 1.2/50 µs wave:	U_p	700 V	700 V	900 V	700 V
Protection level 5 kA; 8/20 µs wave:		900 V	1000 V	1100 V	1000 V
Impulse current (10/350 µs wave):	I_{imp}	-		15 kA	-
Combined wave voltage:	$U_{o.c.}$	6 kV	-		
Response time:	t_r	< 25 ns			
Backup fuses(1):		125 A gL/gG			
Maximum short-circuit current:		25 kA (for maximum fuse)			
Working temperature:	ϑ	-40 °C to +70 °C			
Protector location:		Indoor			
Type of connection:		Parallel (one port)			
Dimensions:		18 x 90 x 80 mm (1 mod. DIN 43880)			
Fixing:		DIN Rail			
Enclosure material:		Polyamide			
Enclosure protection:		IP20			
Insulation resistance:		> 10^{14} Ω			
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)			
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2			

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB 15-120 **AT-8230**	ATSUB 40-120 **AT-8250**	ATSUB 65-120 **AT-8270**	ATSUB N **AT-8201**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV	I, II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2	Type 2
Nominal voltage:	U_n	120 V_{AC}			-
Maximum continuous operating voltage:	U_c	150 V_{AC}			-
Nominal frequency:		50 - 60 Hz			
Nominal discharge current (8/20 µs wave):	I_n	5 kA	20 kA	30 kA	20 kA
Maximum current (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA	40 kA
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	1200 V	1400 V	1600 V	1400 V
Protection level for 1.2/50 µs wave:	U_p	700 V	700 V	900 V	700 V
Protection level 5 kA; 8/20 µs wave:		900 V	1000 V	1100 V	1000 V
Impulse current (10/350 µs wave):	I_{imp}	-		15 kA	-
Combined wave voltage:	$U_{o.c.}$	6 kV	-		
Response time:	t_r	< 25 ns			
Backup fuses(1):		125 A gL/gG			
Maximum short-circuit current:		25 kA (for maximum fuse)			
Working temperature:	ϑ	-40 °C to +70 °C			
Protector location:		Indoor			
Type of connection:		Parallel (one port)			
Dimensions:		18 x 90 x 80 mm (1 mod. DIN 43880)			
Fixing:		DIN Rail			
Enclosure material:		Polyamide			
Enclosure protection:		IP20			
Insulation resistance:		> 10^{14} Ω			
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)			
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2			

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

For other voltages, get in touch with Aplicaciones Tecnologicas, S.A. Technical Department.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB 15-300 **AT-8062**	ATSUB 40-300 **AT-8063**	ATSUB 65-300 **AT-8064**	ATSUB N **AT-8201**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV	I, II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2	Type 2
Nominal voltage:	U_n	300 V_{AC}			-
Maximum continuous operating voltage:	U_c	320 V_{AC}			-
Nominal frequency:		50 - 60 Hz			
Nominal discharge current (8/20 µs wave):	I_n	5 kA	20 kA	30 kA	20 kA
Maximum current (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA	40 kA
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	1400 V	1500 V	1800 V	2100 V
Protection level for 1.2/50 µs wave:	U_p	900 V	900 V	1100 V	1800 V
Protection level 5 kA; 8/20 µs wave:		1100 V	1200 V	1300 V	1900 V
Impulse current (10/350 µs wave):	I_{imp}	-		15 kA	-
Combined wave voltage:	$U_{o.c.}$	6 kV	-		
Response time:	t_r	< 25 ns			
Backup fuses(1):		125 A gL/gG			
Maximum short-circuit current:		25 kA (for maximum fuse)			
Working temperature:	ϑ	-40 °C to +70 °C			
Protector location:		Indoor			
Type of connection:		Parallel (one port)			
Dimensions:		18 x 90 x 80 mm (1 mod. DIN 43880)			
Fixing:		DIN Rail			
Enclosure material:		Polyamide			
Enclosure protection:		IP20			
Insulation resistance:		> 10^{14} Ω			
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)			
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2			

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

For other voltages, get in touch with Aplicaciones Tecnologicas, S.A. Technical Department.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB 15-400 **AT-8224**	ATSUB 40-400 **AT-8244**	ATSUB 65-400 **AT-8264**	ATSUB N **AT-8201**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV	I, II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2	Type 2
Nominal voltage:	U_n	400 V_{AC}			-
Maximum continuous operating voltage:	U_c	460 V_{AC}			-
Nominal frequency:		50 - 60 Hz			
Nominal discharge current (8/20 µs wave):	I_n	5 kA	20 kA	30 kA	20 kA
Maximum current (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA	40 kA
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	2100 V	2300 V	2500 V	2100 V
Protection level for 1.2/50 µs wave:	U_p	1800 V	1800 V	1900 V	1800 V
Protection level 5 kA; 8/20 µs wave:		1900 V	2000 V	2100 V	1900 V
Impulse current (10/350 µs wave):	I_{imp}	-		15 kA	-
Combined wave voltage:	$U_{o.c.}$	6 kV	-		
Response time:	t_r	< 25 ns			
Backup fuses(1):		125 A gL/gG			
Maximum short-circuit current:		25 kA (for maximum fuse)			
Working temperature:	ϑ	-40 °C to +70 °C			
Protector location:		Indoor			
Type of connection:		Parallel (one port)			
Dimensions:		18 x 90 x 80 mm (1 mod. DIN 43880)			
Fixing:		DIN Rail			
Enclosure material:		Polyamide			
Enclosure protection:		IP20			
Insulation resistance:		> 10^{14} Ω			
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)			
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2			

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

For other voltages, get in touch with Aplicaciones Tecnologicas, S.A. Technical Department.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> ATSUB-R

Single-pole protection for power supply lines

> **AT-8221 ATSUB-R 15**: peak current 15 kA. U_n 230 V
> **AT-8241 ATSUB-R 40**: peak current 40 kA. U_n 230 V
> **AT-8261 ATSUB-R 65**: peak current 65 kA. U_n 230 V
> **AT-8204 ATSUB-R N**: for neutral-ground protection
> **AT-8299 ATSUB-R 15-120**: peak current 15 kA. U_n 120 V
> **AT-8208 ATSUB-R 40-120**: peak current 40 kA. U_n 120 V
> **AT-8209 ATSUB-R 65-120**: peak current 65 kA. U_n 120 V
> **AT-8065 ATSUB-R 15-300**: peak current 15 kA. U_n 300 V
> **AT-8066 ATSUB-R 40-300**: peak current 40 kA. U_n 300 V
> **AT-8067 ATSUB-R 65-300**: peak current 65 kA. U_n 300 V
> **AT-8225 ATSUB-R 15-400**: peak current 15 kA. U_n 400 V
> **AT-8245 ATSUB-R 40-400**: peak current 40 kA. U_n 400 V
> **AT-8265 ATSUB-R 65-400**: peak current 65 kA. U_n 400 V

Effective protection against transient overvoltages for electrical supply lines with or without neutral, using metal oxide varistors and gas discharge tubes. Protects three-phase TT, TNS, TNC and IT type lines. Medium protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT ITC23).

> NOMENCLATURE

ATSUB-R 65 – 400

- 65: Max. discharge voltage in kA
- 400: Line - ground nominal voltage

Tested and certified as a type **1, 2 and 3** protector according to the standard UNE-EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV equipment** according to the REBT.

- Can be coordinated with other protectors such as ATSHOCK, ATSHIELD and ATCOVER series.
- Made up of zinc oxide varistors and gas discharge tubes able to withstand very high currents.
- It is possible to join the modules using rivets in order to obtain blocks of 2, 3 or 4 elements.
- Short response time.
- Does not produce deflagration.
- Single-pole protection.
- They do not cause any interruption to the power supply.
- Small size modular protection.
- Thermodynamic control device with mechanical warning and remote alarm. When the warning light is yellow, the protector is in good condition. If not, replace.

ATSUB series protectors have been tested in **official, independent laboratories,** obtaining their characteristics according to relevant standards (listed in the table). It is possible to select a protector for the alternating voltage suitable for each particular case. For example, the technical datasheets of the optimal protectors for american voltages are also included (line voltage 230 V and line – neutral voltage 120 V), voltages greater than 230 V (line voltage 520 V and line – neutral voltage 300 V), and wind generators (line voltage 690 V and line – ground voltage 400 V).

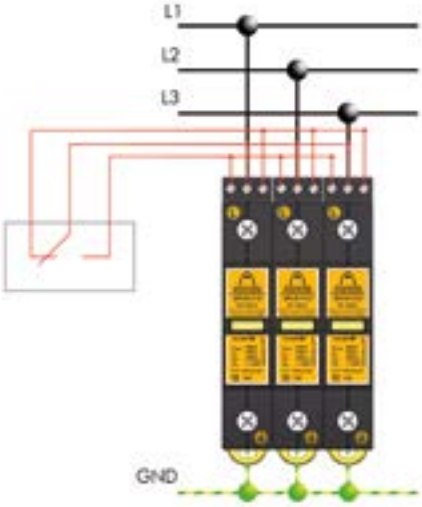
Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω. If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

They are installed **in parallel** with the low voltage line, with connections to the phases that are to be protected and to ground. As an example, 3 ATSUB-R connections in a TNC type three-phase power supply line are shown.

Installation should be carried out **without power running through the line**. When ATSUB protectors are installed as medium protection, they must be separated from the coarse and/or tight protectors by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor, in order to achieve **correct coordination between them**.

They are recommended for installations where large overvoltages can occur after the main switchboard and when these lines are not connected to very sensitive equipment.



> PROTECTION OF POWER SUPPLY LINES

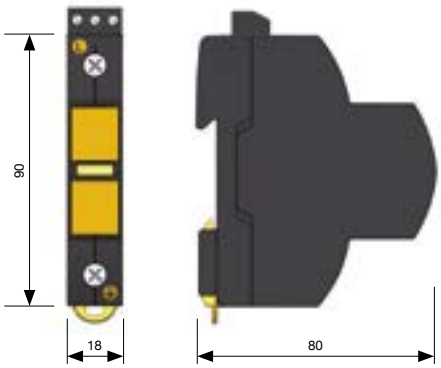
> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-R 15 **AT-8221**	ATSUB-R 40 **AT-8241**	ATSUB-R 65 **AT-8261**	ATSUB-R N **AT-8204**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV	I, II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2	Type 2
Nominal voltage:	U_n	230 V_{AC}			-
Maximum continuous operating voltage:	U_c	275 V_{AC}			-
Nominal frequency:		50 - 60 Hz			
Nominal discharge current (8/20 µs wave):	I_n	5 kA	20 kA	30 kA	20 kA
Maximum current (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA	40 kA
Protection level for 8/20 µs wave to I_n:	$U_p(I_n)$	1200 V	1400 V	1600 V	1400 V
Protection level per wave 1.2/50 µs:	U_p	700 V	700 V	900 V	700 V
Protection level for 5 kA; 8/20 µs wave:		900 V	1000 V	1100 V	1000 V
Impulse current (10/350 µs):	I_{imp}	-		15 kA	-
Combined wave voltage:	$U_{o.c.}$	6 kV	-		
Response time:	t_r	< 25 ns			
Backup fuses(1):		125 A gL/gG			
Maximum short-circuit current:		25 kA (for maximum fuse)			
Working temperature:	ϑ	-40 °C to +70 °C			
Protector location:		Indoor			
Type of connection:		Parallel (one port)			
Dimensions:		18 x 90 x 80 mm (1 mod. DIN 43880)			
Fixing:		DIN Rail			
Enclosure material:		Polyamide			
Enclosure protection:		IP20			
Insulation resistance:		> 10^{14} Ω			
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)			
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2			
Voltage-free contact for the remote control					
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2			
Contact output:		Switch			
Operating voltage:		250 V 250 V (maximum operating voltage of the alarm power supply)			
Maximum current:		2 A (Maximum current of the alarm power supply)			
Certificated tests according to: UNE-EN 61643-11 Complies with requirements of: UL 1449 Relevant standards: UNE 21186, NF C 17-102, IEC 62305					

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-R 15-120 **AT-8299**	ATSUB-R 40-120 **AT-8208**	ATSUB-R 65-120 **AT-8209**	ATSUB-R N **AT-8204**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV	I, II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2	Type 2
Nominal voltage:	U_n	120 V_{AC}			-
Maximum continuous operating voltage:	U_c	150 V_{AC}			-
Nominal frequency:		50 - 60 Hz			
Nominal discharge current (8/20 µs wave):	I_n	5 kA	20 kA	30 kA	20 kA
Maximum current (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA	40 kA
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	1200 V	1400 V	1600 V	1400 V
Protection level for 1.2/50 µs wave:	U_p	700 V	700 V	900 V	700 V
Protection level 5 kA; 8/20 µs wave:		900 V	1000 V	1100 V	1000 V
Impulse current (10/350 µs wave):	I_{imp}	-		15 kA	-
Combined wave voltage:	$U_{o.c.}$	6 kV	-		
Response time:	t_r	< 25 ns			
Backup fuses(1):		125 A gL/gG			
Maximum short-circuit current:		25 kA (for maximum fuse)			
Working temperature:	ϑ	-40 °C to + 70 °C			
Protector location:		Indoor			
Type of connection:		Parallel (one port)			
Dimensions:		18 x 90 x 80 mm (1 mod. DIN 43880)			
Fixing:		DIN Rail			
Enclosure material:		Polyamide			
Enclosure protection:		IP20			
Insulation resistance:		> 10^{14} Ω			
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)			
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2			
Voltage-free contact for the remote control					
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2			
Contact output:		Switch			
Operating voltage:		250 V_{AC} (Maximum working voltage of the alarm supply)			
Maximum current:		2 A (Maximum current of the alarm power supply)			

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

For other voltages, get in touch with Aplicaciones Tecnologicas, S.A. Technical Department.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-R 15-300 **AT-8065**	ATSUB-R 40-300 **AT-8066**	ATSUB-R 65-300 **AT-8067**	ATSUB-R N **AT-8204**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV	I, II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2	Type 2
Nominal voltage:	U_n	300 V_{AC}			-
Maximum continuous operating voltage:	U_c	320 V_{AC}			-
Nominal frequency:		50 - 60 Hz			
Nominal discharge current (8/20 µs wave):	I_n	5 kA	20 kA	30 kA	20 kA
Maximum current (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA	40 kA
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	1400 V	1500 V	1800 V	1400 V
Protection level for 1.2/50 µs wave:	U_p	900 V	900 V	1100 V	700 V
Protection level 5 kA; 8/20 µs wave:		1100 V	1200 V	1300 V	1000 V
Impulse current (10/350 µs wave):	I_{imp}	-		15 kA	-
Combined wave voltage:	$U_{o.c.}$	6 kV	-		
Response time:	t_r	< 25 ns			
Backup fuses(1):		125 A gL/gG			
Maximum short-circuit current:		25 kA (for maximum fuse)			
Working temperature:	ϑ	-40 °C to + 70 °C			
Protector location:		Indoor			
Type of connection:		Parallel (one port)			
Dimensions:		18 x 90 x 80 mm (1 mod. DIN 43880)			
Fixing:		DIN Rail			
Enclosure material:		Polyamide			
Enclosure protection:		IP20			
Insulation resistance:		> 10^{14} Ω			
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)			
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2			
Voltage-free contact for the remote control					
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2			
Contact output:		Switch			
Operating voltage:		250 V_{AC} (Maximum working voltage of the alarm supply)			
Maximum current:		2 A (Maximum current of the alarm power supply)			

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

For other voltages, get in touch with Aplicaciones Tecnologicas, S.A. Technical Department.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-R 15-400 **AT-8225**	ATSUB-R 40-400 **AT-8245**	ATSUB-R 65-400 **AT-8265**	ATSUB-R N **AT-8204**
Protection categories according to the REBT:		I, II, III, IV		II, III, IV	I, II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3	Type 2	Type 1 + 2	Type 2
Nominal voltage:	U_n	400 V_{AC}			-
Maximum continuous operating voltage:	U_c	460 V_{AC}			-
Nominal frequency:		50 - 60 Hz			
Nominal discharge current (8/20 µs wave):	I_n	5 kA	20 kA	30 kA	20 kA
Maximum current (8/20 µs wave):	I_{max}	15 kA	40 kA	65 kA	40 kA
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	2100 V	2300 V	2500 V	2100 V
Protection level for 1.2/50 µs wave:	U_p	1800 V	1800 V	1900 V	1800 V
Protection level 5 kA; 8/20 µs wave:		1900 V	2000 V	2100 V	1900 V
Impulse current (10/350 µs wave):	I_{imp}	-		15 kA	-
Combined wave voltage:	$U_{o.c.}$	6 kV	-		
Response time:	t_r	< 25 ns			
Backup fuses(1):		125 A gL/gG			
Maximum short-circuit current:		25 kA (for maximum fuse)			
Working temperature:	ϑ	-40 °C to +70 °C			
Protector location:		Indoor			
Type of connection:		Parallel (one port)			
Dimensions:		18 x 90 x 80 mm (1 mod. DIN 43880)			
Fixing:		DIN Rail			
Enclosure material:		Polyamide			
Enclosure protection:		IP20			
Insulation resistance:		> 10^{14} Ω			
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)			
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2			
Voltage-free contact for the remote control					
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2			
Contact output:		Switch			
Operating voltage:		250 V_{AC} (Maximum working voltage of the alarm power supply)			
Maximum current:		2 A (Maximum current of the alarm power supply)			

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

For other voltages, get in touch with Aplicaciones Tecnologicas, S.A. Technical Department.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> ATSUB-D T

Three-phase compact protector

> **AT-8217 ATSUB-D T**: peak current 15 kA. U_n 230 V
> **AT-8017 ATSUB40-D T**: peak current 40 kA. U_n 230 V

Effective protection against transient overvoltages for three-line electrical supply lines with TT type neutral, using metal oxide varistors and gas discharge tubes. Medium protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT ITC23). Especially made to be installed in houses according to ITC-25 from REBT.

Tested and certified as a t**ype 2 and 3** protector according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV equipment** according to the REBT.

- Can be coordinated with other protectors such as ATSHOCK, ATSHIELD and ATCOVER series.
- Made up of zinc oxide varistors and gas discharge tubes able to withstand very high currents.
- Short response time.
- Do not produce deflagration.
- Compact protection.
- Their activation causes no interruption in power supply.
- Thermodynamic control device, mechanical warning and remote alarm. When the warning light is yellow, the protector is in good condition. If not, replace.

ATSUB series protectors have been tested in **official, independent laboratories,** obtaining their characteristics according to relevant standards (listed in the table).

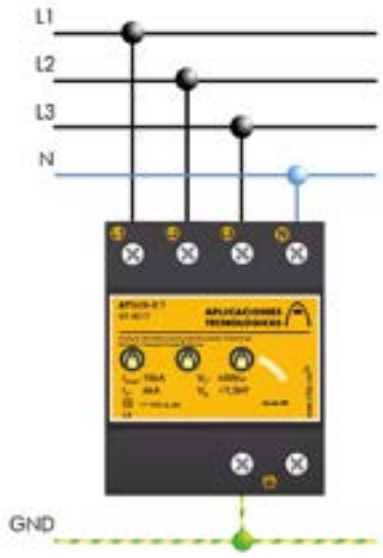
Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

They are installed **in parallel** with the low voltage line, with connections to the phase that is to be protected and to neutral and/or ground.

Installation should be carried out **without power running through the line**.

They are recommended for installations where large overvoltages can occur after the main switchboard and when these lines are not connected to very sensitive equipment.



> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

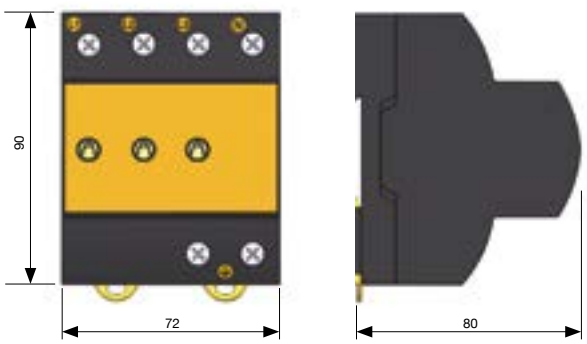
> TECHNICAL DATASHEET

Reference:		ATSUB-D T **AT-8217**	ATSUB40-D **AT-8017**
Protection categories according to the REBT:		I, II, III, IV	
Type of tests according to EN 61643-11:		Type 2	
Nominal voltage:	U_n	400 V_{AC} (L-L) / 230 V_{AC} (L-N, L-GND)	
Maximum continuous operating voltage:	U_c	460 V_{AC} (L-N, L-GND)	
Nominal frequency:		50 - 60 Hz	
Nominal discharge current (8/20 µs wave):	I_n	5 kA	15 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA	40 kA
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	1500 V	1800 V
Response time:	t_r	< 25 ns	
Backup fuses(1):		80 A gL/gG	
Maximum short-circuit current:		25 kA (for maximum fuse)	
Working temperature:	ϑ	-40 ºC to +70 ºC	
Protector location:		Indoor	
Type of connection:		Parallel (one port)	
No. of poles:		4	
Dimensions:		72 x 90 x 80 mm (2 mod. DIN 43880)	
Fixing:		DIN Rail	
Enclosure material:		Polyamide	
Enclosure protection:		IP20	
Insulation resistance:		> 10^{14} Ω	
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)	
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2	

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> ATSUB-D M

Compact single-phase protection for domestic use

> **AT-8216 ATSUB-D M**: peak current 15 kA. U_n 230V

Effective protection against transient overvoltages for single-line electrical supply lines with TT type neutral, using metal oxide varistors and gas discharge tubes. Medium protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT ITC23). Especially made to be installed in houses according to ITC-25 from REBT.

Tested and certified as a **type 2 and 3** protector according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV equipment** according to the REBT.

- Can be coordinated with protectors from the ATSHOCK, ATSHIELD and ATCOVER series.
- Made up of zinc oxide varistors and gas discharge tubes able to withstand very high currents.
- Short response time.
- Do not produce deflagration.
- Compact protection.
- Their activation causes no interruption in power supply.
- Thermodynamic control device, mechanical warning and remote alarm. When the warning light is yellow, the protector is in good condition. If not, replace.

ATSUB series protectors have been tested in **official, independent laboratories,** obtaining their characteristics according to relevant standards (listed in the table).

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

They are installed **in parallel** with the low voltage line, with connections to the phases that are to be protected, as well as to neutral and/or ground. Installation should be carried out **without power running through the line**.

When ATSUB protectors are installed as medium protection, they must be separated from the coarse and/or tight protectors by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor, in order to achieve **correct coordination between them**.

They are especially recommended for the main switchboard of houses according to article 16.3 from the REBT.

> PROTECTION OF POWER SUPPLY LINES

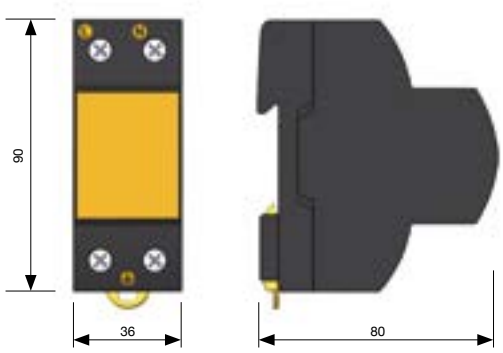
> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-D M **AT-8216**
Protection categories according to the REBT:		I, II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3
Nominal voltage:	U_n	230 V_{AC}
Maximum continuous operating voltage:	U_c	400 V_{AC}
Nominal frequency:		50 - 60 Hz
Nominal discharge current per pole (8/20 µs wave)	I_n	5 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA
Protection level at I_n (8/20 µs wave):	$U_P(I_n)$	1500 V
Protection level for 1.2/50 µs wave:	U_p	1100 V
Residual voltage with 6 kV/3 kA combination wave:	$U_{o.c.}$	1500 V
Response time:	t_r	< 25 ns
Backup fuses(1):		80 A gL/gG
Maximum short-circuit current:		25 kA (for maximum fuse)
Working temperature:	ϑ	-40 ºC to +70 ºC
Protector location:		Indoor
Type of connection:		Parallel (one port)
No. of poles:		4
Dimensions:		36 x 90 x 80 mm (2 mod. DIN 43880)
Fixing:		DIN Rail
Enclosure material:		Polyamide
Enclosure protection:		IP20
Insulation resistance:		> 10^{14} Ω
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2
Certificated tests according to: UNE-EN 61643-11 Complies with requirements of: UL 1449 Relevant standards: UNE 21186, NF C 17-102, IEC 62305		

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> ATSUB-D M 3/4DIN

Compact single-phase protector

> **AT-8219 ATSUB-D M 3/4 DIN**: peak current 15 kA U_n 230 V
> **AT-8021 ATSUB-D M 3/4 DIN-120**: peak current 15 kA U_n 120 V

Effective protection against transient overvoltages for single-line electrical supply lines with TT type neutral, using metal oxide varistors and gas discharge tubes. Medium protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT ITC23). Especially made to be installed in houses according to ITC-25 from REBT.

Tested and certified as a **type 2 and 3** protector according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV equipment** according to the REBT.

- Can be coordinated with other protectors such as ATSHOCK, ATSHIELD and ATCOVER series.
- Made up of zinc oxide varistors and gas discharge tubes able to withstand very high currents.
- Removable module that can be replaced in the event of a breakdown or fault without needing to disconnect the wiring.
- Thermodynamic control device and visual alarm. If the cartridge is damaged, a red warning light will show.
- Short response time.
- Compact protection.

ATSUB series protectors have been tested in **official, independent laboratories,** obtaining their characteristics according to relevant standards (listed in the table).

> INSTALLATION

They are installed **in parallel** to the low voltage line, with connections to the phase, neutral and ground. Installation should be carried out **without power running through the line**.

When ATSUB protectors are installed as medium protection, they must be separated from the coarse and/or tight protectors by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor, in order to achieve **correct coordination between them**.

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

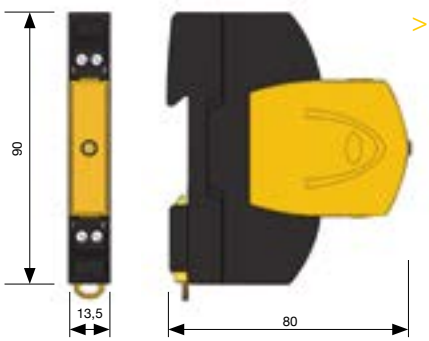
> TECHNICAL DATASHEET

Reference:		ATSUB-D M 3/4 DIN **AT-8219**	ATSUB-D M 3/4 DIN-120 **AT-8021**
Protection categories according to the REBT:		I, II, III, IV	
Type of tests according to EN 61643-11:		Type 2 + 3	
Nominal voltage:	U_n	230 V_{AC}	120 V_{AC}
Maximum continuous operating voltage:	U_c	400 V_{AC}	275 V_{AC}
Nominal frequency:		50 - 60 Hz	
Nominal discharge current per pole (8/20 µs wave):	I_n	5 kA	
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA	
Protection level at I_n(8/20 µs wave):	$U_p(I_n)$	1500 V	1000 V
Response time:	t_r	< 25 ns	
Backup fuse(1):		50 A gL/gG	
Maximum short-circuit current:		25 kA (for maximum fuse)	
Working temperature:	ϑ	-40 ºC to +70 ºC	
Protector location:		Indoor	
Type of connection:		Parallel (one port)	
No. of poles:		2	
Dimensions:		13.5 x 90 x 80 mm (3/4 mod. DIN 43880)	
Fixing:		DIN Rail	
Enclosure material:		Polyamide	
Enclosure protection:		IP20	
Insulation resistance:		> 10^{14} Ω	
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)	
Connections:		4 mm^2 maximum section	

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> ACCESSORIES

> AT-8210 ATSUB-D M 3/4DIN Mod.: peak current 15 kA U_n 230 V
> AT-8027 ATSUB-D M 3/4DIN-120 Mod.: peak current 15 kA U_n 120 V

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> ATSUB-D M 1DIN

Compact single-phase protection for domestic use

> **AT-8200 ATSUB-D M 1DIN**: peak current 15 kA U_n 230 V

Effective protection against transient overvoltages for single-line electrical supply lines with TT type neutral, using metal oxide varistors and gas discharge tubes. Medium protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT ITC23). Especially made to be installed in houses according to ITC-25 from REBT.

Tested and certified as a **type 2 and 3** protector according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV equipment** according to the REBT.

- Can be coordinated with other protectors such as ATSHOCK, ATSHIELD and ATCOVER series.
- Made up of zinc oxide varistors and gas discharge tubes able to withstand very high currents.
- Thermodynamic control device with mechanical warning. The warning light will be red if the protector is not in good condition.
- Short response time.
- Compact protection.

ATSUB series protectors have been tested in **official, independent laboratories,** obtaining their characteristics according to relevant standards (listed in the table).

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

They are installed **in parallel** to the low voltage line, with connections to the phase, neutral and ground. Installation should be carried out **without power running through the line**.

When ATSUB protectors are installed as medium protection, they must be separated from the coarse and/or tight protectors by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor, in order to achieve **correct coordination between them**.

They are especially recommended for the main switchboard of houses according to article 16.3 from the REBT.

> PROTECTION OF POWER SUPPLY LINES

> ATSUB series

> TECHNICAL DATASHEET

Reference:		ATSUB-D M 1DIN **AT-8200**
Protection categories according to the REBT:		I, II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3
Nominal voltage:	U_n	230 V_{AC}
Maximum continuous operating voltage:	U_c	320 V_{AC}
Nominal frequency:		50 - 60 Hz
Nominal discharge current per pole (8/20 µs wave)	I_n	5 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA
Protection level at I_n (8/20 µs wave):	$U_P(I_n)$	1500 V
Response time:	t_r	< 25 ns
Backup fuses(1):		50 A gL/gG
Maximum short-circuit current:		25 kA (for maximum fuse)
Working temperature:	ϑ	-40 ºC to +70 ºC
Protector location:		Indoor
Type of connection:		Parallel (one port)
No. of poles:		2
Dimensions:		18 x 90 x 80 mm (1 mod. DIN 43880)
Fixing:		DIN Rail
Enclosure material:		Polyamide
Enclosure protection:		IP20
Insulation resistance:		> 10^{14} Ω
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)
Connections:		6 mm^2 maximum section
Certificated tests according to: UNE-EN 61643-11 Complies with requirements of: UL 1449 Relevant standards: UNE 21186, NF C 17-102, IEC 62305		

(1) Required in cases where there is higher nominal current installed upstream from the protector

> PROTECTION OF POWER SUPPLY LINES

> ATCOVER series

> ATCOVER T

Compact protector for TT and TNS three-phase power supply lines in common and differential mode

> **AT-8133 ATCOVER 400T**: three-phase 400 V_{AC} line.
> **AT-8132 ATCOVER 230T**: three-phase 230 V_{AC} line.

Effective protection against transient overvoltages for TT and TNS electrical supply lines in only one device. Internal coordination of **medium and tight** protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT ITC23).

Tested and certified as a **type 2 and 3** protector according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV equipment** according to the REBT.

- Discharge takes place in an internal encapsulated element with no external flash.
- Double connection in order to facilitate wiring (limited to 63 A).
- It remains inactive in normal conditions, without affecting the normal working of the line or producing leakages.
- Can be coordinated with other ATSHOCK, ATSHIELD and ATSUB series protectors.
- Both common and differential protection for the three lines and neutral.
- No interruptions in power supply, thus no data loss or any other inconveniences for the user.
- Low residual voltage.
- Double 'no protection' warning by means of a light indicating faults and a green light indicating good operation.
- With remote control alarm.
- Robust connectors, suitable for all types of connection.

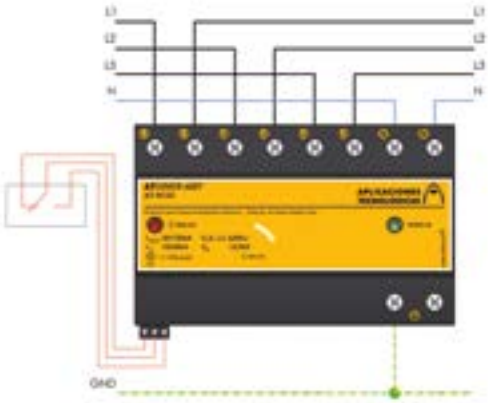
ATCOVER protectors have been tested in **official, independent laboratories,** obtaining their characteristics according to relevant standards (related in the table).

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

ATCOVER surge protection devices are to be installed **in parallel** with the low voltage supply line, connected to the phases, neutral and ground. Installation should be carried out **without power running through the line**.
When connecting the protector, the green light must light up indicating proper operation. If the fault warning lights up or the green pilot turns off, replace the protector.
ATCOVERs can be installed as single protection or in combination with other protectors that withstand higher discharge currents. In this case, both must be separated by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor in order to achieve **correct coordination between them**.
They are recommended for installation in:

- Secondary boards supplying systems sensitive to overvoltages (electronic or computer systems).
- Power supply of important equipment such as UPSs, PLCs, etc.



> PROTECTION OF POWER SUPPLY LINES

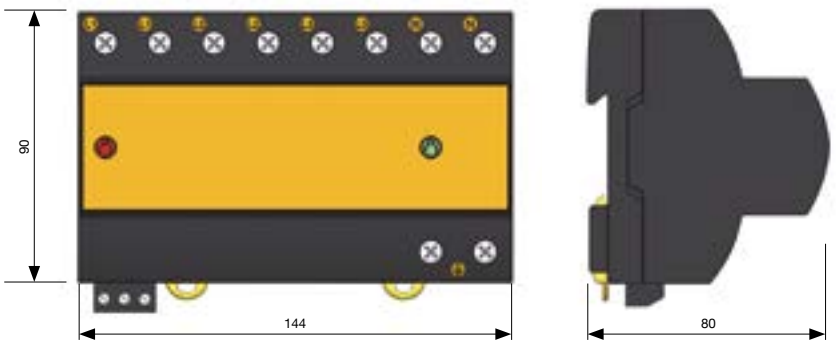
> ATCOVER series

> TECHNICAL DATASHEET

Reference:		ATCOVER 400T **AT-8133**	ATCOVER 230T **AT-8132**
Protection categories according to the REBT:		I, II, III, IV	
Type of tests according to EN 61643-11:		Type 2 + 3	
Nominal voltage:	U_n	400 V_{AC} (L-L) 220 V_{AC} (L-N, L-GND)	230 V_{AC} (L-L) 130 V_{AC} (L-N, L-GND)
Maximum continuous operating voltage:	U_c	460 V_{AC} (L-L) 275 V_{AC} (L-N, L-GND)	275 V_{AC} (L-L) 145 V_{AC} (L-N, L-GND)
Nominal frequency:		50 - 60 Hz	
Nominal discharge current per pole (8/20 µs wave):	I_n	10 kA	
Maximum discharge current per pole (8/20 µs wave):	I_{max}	30 kA	
Protection level (1.2/50 µs wave):	U_p	700 V	500 V
Protection level at I_n (8/20 µs wave):	$U_p(I_n)$	900 V	700 V
Combined wave voltage:	$U_{o.c.}$	6 kV	
Residual voltage with 6 kV/3 kA combination wave:		700 V	450 V
Response time:	t_r	< 25 ns	
Backup fuses(1):		125 A gL/gG	
Maximum short-circuit current:		25 kA (for maximum fuse)	
Working temperature:	ϑ	-40 °C to +70 °C	
Protector location:		Indoor	
Type of connection:		Parallel (one port)	
No. of poles:		4	
Dimensions:		144 x 90 x 80 mm (8 mod. DIN 43880)	
Fixing:		DIN Rail	
Enclosure material:		Polyamide	
Enclosure protection:		IP20	
Insulation resistance:		> 10^{14} Ω	
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)	
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2	
Voltage-free contact for the remote control			
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2	
Contact output:		Switch	
Operating voltage:		250 V_{AC} (Maximum working voltage of the alarm supply)	
Maximum current:		2 A (Maximum current of the alarm power supply)	
Certificated tests according to: UNE-EN 61643-11 Complies with requirements of: UL 1449 Relevant standards: UNE 21186, NF C 17-102, IEC 62305			

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATCOVER series

> ATCOVER TNC

Compact protector for TNC and IT three-phase power supply lines in common and differential mode

> **AT-8153 ATCOVER TNC 400T**: three-phase 400 V_{AC} lines
> **AT-8152 ATCOVER TNC 230T**: three-phase 230 V_{AC} lines

Effective protection against transient overvoltages for TT and IT electrical supply lines in only one device. Internal coordination of **medium and tight** protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT ITC23).

Tested and certified as a **type 2 and 3** protector according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV equipment** according to the REBT.

- Discharge takes place in an internal encapsulated element with no external flash.
- Double connection in order to facilitate wiring (limited to 63 A).
- It remains inactive in normal conditions, without affecting the normal working of the line or producing leakages.
- Can be coordinated with other ATSHOCK, ATSHIELD and ATSUB series protectors.
- Both common and differential protection for the three lines and neutral.
- No interruptions in power supply, thus no data loss or any other inconveniences for the user.
- Low residual voltage.
- Double 'no protection' warning by means of a light indicating faults and a green light indicating good operation.
- With remote control alarm.
- Robust connectors, suitable for all types of connection.

ATCOVER protectors have been tested in **official, independent laboratories,** obtaining their characteristics according to relevant standards (related in the table).

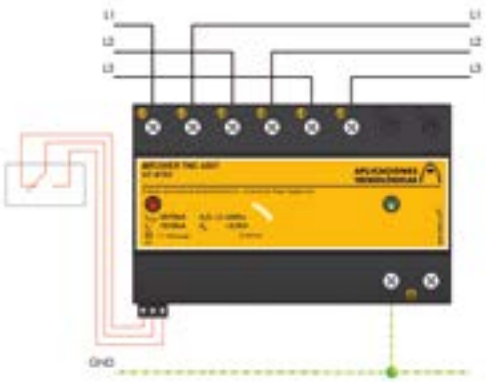
Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

ATCOVER surge protection devices are to be installed **in parallel** with the low voltage supply line, connected to the phases and ground. Installation should be carried out **without power running through the line**.
When connecting the protector, the green light must light up indicating proper operation. If the fault warning lights up or the green pilot turns off, replace the protector.
ATCOVERs can be installed as single protection or in combination with other protectors that withstand higher discharge currents. In this case, both must be separated by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor in order to achieve **correct coordination between them**.
They are recommended for installation in:

- Secondary boards supplying systems sensitive to overvoltages (electronic or computer systems).

- Power supply of important equipment such as UPSs, PLCs, etc.



> PROTECTION OF POWER SUPPLY LINES

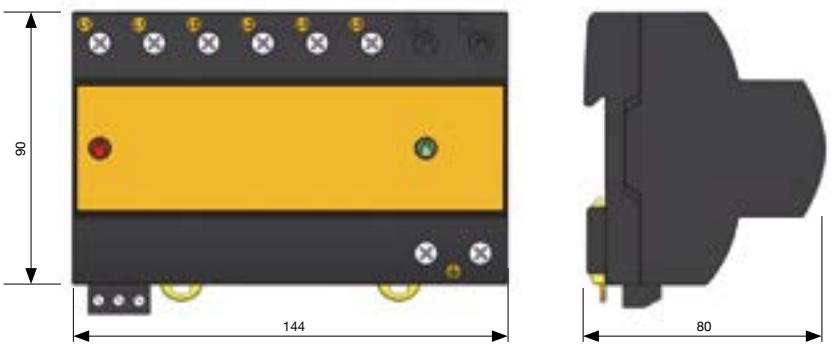
> ATCOVER series

> TECHNICAL DATASHEET

Reference:		ATCOVER 400T **AT-8153**	ATCOVER 230T **AT-8152**
Protection categories according to the REBT:		I, II, III, IV	
Type of tests according to EN 61643-11:		Type 2 + 3	
Nominal voltage:	U_n	400 V_{AC} (L-L) 220 V_{AC} (L-N, L-GND)	230 V_{AC} (L-L) 130 V_{AC} (L-N, L-GND)
Maximum continuous operating voltage:	U_c	440 V_{AC} (L-L) 275 V_{AC} (L-GND)	275 V_{AC} (L-L) 150 V_{AC} (L-GND)
Nominal frequency:		50 - 60 Hz	
Nominal discharge current per pole (8/20 µs wave):	I_n	10 kA	
Maximum discharge current per pole (8/20 µs wave):	I_{max}	30 kA	
Protection level (1.2/50 µs wave):	U_p	700 V	500 V
Protection level at I_n (8/20 µs wave):	$U_p(I_n)$	900 V	700 V
Combined wave voltage:	$U_{o.c.}$	6 kV	
Residual voltage with 6 kV/3 kA combination wave:		700 V	450 V
Response time:	t_r	< 25 ns	
Backup fuses(1):		125 A gL/gG	
Maximum short-circuit current:		25 kA (for maximum fuse)	
Working temperature:	ϑ	-40 °C to +70 °C	
Protector location:		Indoor	
Type of connection:		Parallel (one port)	
No. of poles:		3	
Dimensions:		144 x 90 x 80 mm (8 mod. DIN 43880)	
Fixing:		DIN Rail	
Enclosure material:		Polyamide	
Enclosure protection:		IP20	
Insulation resistance:		> $10^{14}\Omega$	
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)	
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2	
Voltage-free contact for the remote control			
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2	
Contact output:		Switch	
Operating voltage:		250 V_{AC} (Maximum working voltage of the alarm supply)	
Maximum current:		2 A (Maximum current of the alarm power supply)	
Certificated tests according to: UNE-EN 61643-11 Complies with requirements of: UL 1449 Relevant standards: UNE 21186, NF C 17-102, IEC 62305			

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATCOVER series

> ATCOVER M

Compact protector for single-phase power supply lines in common and differential mode

> **AT-8112 ATCOVER 230M**: single-phase 230 V_{AC} lines
> **AT-8111 ATCOVER 130M**: single-phase 130 V_{AC} lines

Effective protection against transient overvoltages for single-phase electrical supply lines in only one device. Internal coordination of **medium and tight** protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT ITC23).

Tested and certified as a **type 2 and 3** protector according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV equipment** according to the REBT.

- Discharge takes place in an internal encapsulated element with no external flash.
- Double connection in order to facilitate wiring (limited to 63 A).
- It remains inactive in normal conditions, without affecting the normal working of the line or producing leakages.
- Can be coordinated with other ATSHOCK, ATSHIELD and ATSUB series protectors.
- Both common and differential protection for the phase and neutral lines
- No interruptions in power supply, thus no data loss or any other inconveniences for the user.
- Low residual voltage.
- Double 'no protection' warning by means of a light indicating faults and a green light indicating good operation.
- With remote control alarm.
- Robust connectors, suitable for all types of connection.

ATCOVER protectors have been tested in **official, independent laboratories,** obtaining their characteristics according to relevant standards (related in the table).

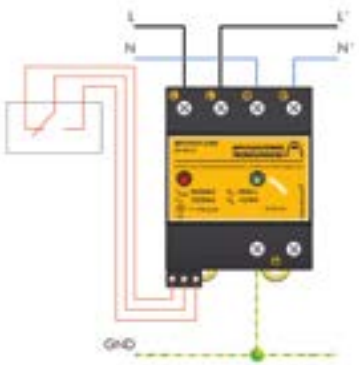
Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

ATCOVER surge protection devices are to be installed **in parallel** with the low voltage supply line, connected to the phases and ground. Installation should be carried out **without power running through the line**.
When connecting the protector, the green light must light up indicating proper operation. If the fault warning lights up or the green pilot turns off, replace the protector.
ATCOVERs can be installed as single protection or in combination with other protectors that withstand higher discharge currents. In this case, both must be separated by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor in order to achieve **correct coordination between them**.
They are recommended for installation in:

- Secondary boards supplying systems sensitive to overvoltages (electronic or computer systems).

- Power supply of important equipment such as UPSs, PLCs, etc.



> PROTECTION OF POWER SUPPLY LINES

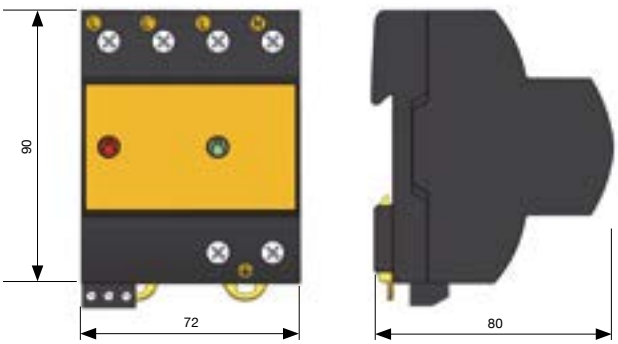
> ATCOVER series

> TECHNICAL DATASHEET

Reference:		ATCOVER 230M **AT-8112**	ATCOVER 130M **AT-8111**
Protection categories according to the REBT:		I, II, III, IV	
Type of tests according to EN 61643-11:		Type 2 + 3	
Nominal voltage:	U_n	230 V_{AC}	130 V_{AC}
Maximum continuous operating voltage:	U_c	275 V_{AC}	150 V_{AC}
Nominal frequency:		50 - 60 Hz	
Nominal discharge current per pole (8/20 µs wave):	I_n	10 kA	
Maximum discharge current per pole (8/20 µs wave):	I_{max}	30 kA	
Protection level (1.2/50 µs wave):	U_p	700 V	500 V
Protection level at I_n (8/20 µs wave):	$U_p(I_n)$	900 V	700 V
Combined wave voltage:	$U_{o.c.}$	6 kV	
Residual voltage with 6 kV/3 kA combination wave:		700 V	450 V
Response time:	t_r	< 25 ns	
Backup fuse(1):		125 A gL/gG	
Maximum short-circuit current:		25 kA (for maximum fuse)	
Working temperature:	ϑ	-40 °C to +70 °C	
Protector location:		Indoor	
Type of connection:		Parallel (one port)	
No. of poles:		2	
Dimensions:		72 x 90 x 80 mm (4 mod. DIN43880	
Fixing:		DIN Rail	
Enclosure material:		Polyamide	
Enclosure protection:		IP20	
Insulation resistance:		> 10^{14} Ω	
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)	
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2	
Voltage-free contact for the remote control			
Connection:		Max. single-stranded/multi-stranded section: 1.5 mm^2	
Contact output:		Switch	
Operating voltage:		250 V_{AC} (Maximum operating voltage of the alarm power supply)	
Maximum current:		2 A (Maximum current of the alarm power supply)	
Certificated tests according to: UNE-EN 61643-11 Complies with requirements of: UL 1449 Relevant standards: UNE 21186, NF C 17-102, IEC 62305			

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATLINK series

> ATLINK

Decoupling inductor for protector power supply coordination

> **AT-8435 ATLINK 35**: for lines with $I_L \leq 35$ A
> **AT-8463 ATLINK 63**: for lines with $I_L \leq 63$ A

Proper protection against transient overvoltages requires **good coordination between** protectors. ATLINK series inductors produce decoupling between protectors when they are connected **in parallel** on the same line so that each one acts at the right moment, achieving the double objective of withstanding the lightning current and reducing the overvoltage to an acceptable level for the connected equipment.

One ATLINK device is needed for each phase and another for the neutral. When selecting them, **the operating current of the line must be taken into account,** since this current will flow continuously through the device.

Its coordination capability has been tested and certified using **lightning wave** 10/350 µs according to EN 61643-11.

> Enables installation of protectors for different stages in the same place, since the inductor substitutes the necessary length of cable for protector coordination.

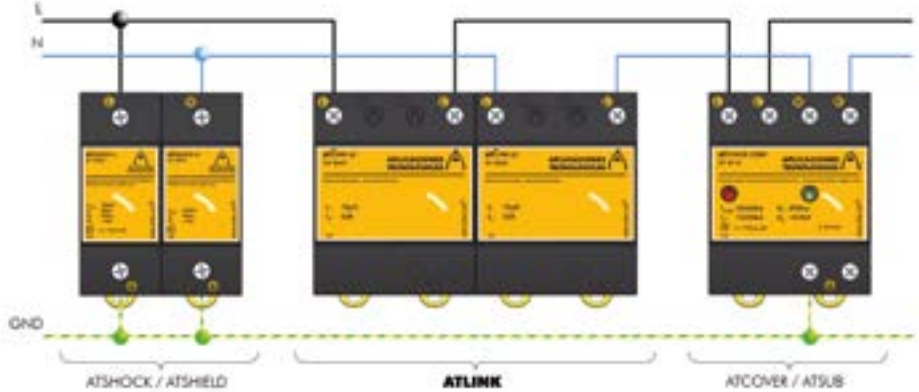
> Robust connectors, suitable for all types of connection.

ATLINK devices have been tested in **official, independent laboratories,** verifying that the protectors are correctly coordinated.

> INSTALLATION

ATLINK inductors are to be installed **in series** with the power supply line, that is, cutting the supply line and connecting the cable ends to the ATLINK input and output connectors. One ATLINK device is needed for each phase and another for the neutral. There should be no ground connection.

It coordinates the ATSHOCK and/or ATSHIELD protectors with ATSUB and/or ATCOVER protectors when they cannot be separated by a cable at least 10 metres in length.



> PROTECTION OF POWER SUPPLY LINES

> ATLINK series

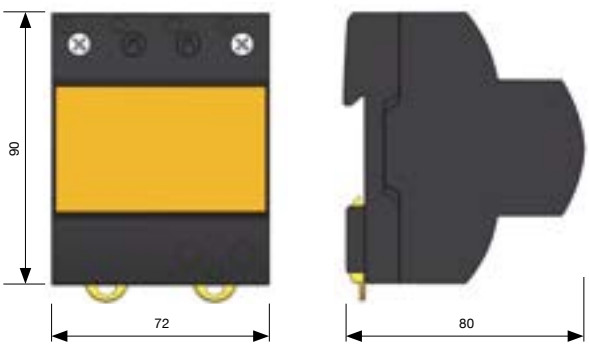
> TECHNICAL DATASHEET

Reference:		ATLINK 35 **AT-8435**	ATLINK 63 **AT-8463**
Protection categories according to the REBT:		I, II, III, IV	
Maximum operating current:	I_L	35 A	63 A
Nominal voltage:	U_n	230 V_{AC}	
Maximum continuous operating voltage:	U_c	275 V_{AC}	
Nominal frequency:		50 - 60 Hz	
Nominal discharge current (8/20 µs):	I_{max}	100 kA	
Impulse coordinated current (10/350 µs):	I_{imp}	100 kA	
Inductance:	L	15 µH	
Resistance:		3 mΩ	
Protector location:		Indoor	
Type of connection:		Series (two ports)	
Working temperature:	ϑ	-40 °C to +70 °C	
Dimensions:		72 x 90 x 80 mm (4 mod. DIN 43880)	
Fixing:		DIN Rail	
Enclosure material:		Polyamide	
Enclosure protection:		IP20	
Insulation resistance:		> 10^{14} Ω	
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)	
Connections:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2	

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATCOMPACT series

> ATCOMPACT CDA

Multi-pole power supply protection cabinet including protective fuses

> NOMENCLATURE

ATCOMPACT CDA-T1 15 kA

- T1: Three-phase type 1 protection
- T2: Three-phase type 2 protection
- M1: Single-phase type 1 protection
- M2: Single-phase type 2 protection

Peak current per pole

Reference	Model	Description
AT-8190	ATCOMPACT CDA T1 15 kA	Three-phase protection with 3 x ATSUB65 + ATSUB N in double isolation box
AT-8191	ATCOMPACT CDA T1 25 kA	Three-phase protection with 3 x ATSUB100 + ATSHOCK N in double isolation box
AT-8192	ATCOMPACT CDA T1 30 kA	Three-phase protection with 3 x ATSHOCK30 + ATSHOCK N in double isolation box

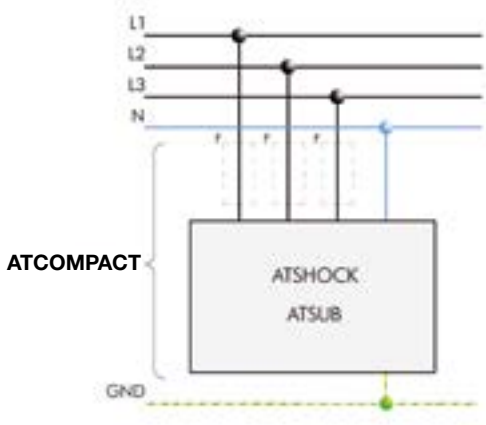
ATCOMPACT protection cabinets are made of several protectors from the same series with the aim of protecting all of the phases, including the protective fuses, against short-circuits.

ATCOMPACT surge protection devices are to be installed **in parallel** with the supply line, without affecting operation under normal conditions in any way at all. Combinations can be made for protection either in common (in relation to ground) or differential mode (between phase/s and neutral).
Compact box, easy to install and with the same advantages as Aplicaciones Tecnológicas protectors: robust, quick, reliable and tested according to applicable standards (EN 61643-11) in **official and independent laboratories.**

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

ATCOMPACT boxes are to be installed **in parallel** with the low voltage supply line, connected to the phases, neutral and ground.
Installation should be carried out without power in the line.
When ATCOMPACT protectors are installed as medium protection, they must be separated from coarse and/or tight protectors by at least 10 metres of cable or, if this is not possible, by ATLINK decoupling inductors in order to achieve **correct coordination between them.**



> PROTECTION OF POWER SUPPLY LINES

> ATCOMPACT series

> ATCOMPACT CDA T1 15 kA

Compact protection for three-phase power supply in double insulation cabinet.

> TECHNICAL DATASHEET

Reference:		**AT-8190**
Protection categories according to the REBT:		II, III, IV
Type of tests according to EN 61643-11:		Type 1, 2
Nominal voltage:	U_n	400 V_{AC} (L-L) 230 V_{AC} (L-GND)
Maximum continuous operating voltage:	U_c	440 V_{AC} (L-L) 275 V_{AC} (L-GND)
Nominal frequency:		50 – 60 Hz
Nominal discharge current (8/20 µs wave):	I_n	30 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	65 kA
Impulse current per pole (10/350 µs wave):	I_{imp}	15 kA
Protection level for 1.2/50 µs wave:	U_p	900 V
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	1600 V
Response time:	t_r	< 25 ns
Fuse included:		80A gG
Maximum fuse short-circuit current:		100 kA
Working temperature:	ϑ	-40 ºC to +80 ºC
Protector location:		Outdoor
Type of connection:		Parallel (one port)
No. of poles:		4
Dimensions:		380 x 285 x 190 mm
Fixing:		Wall or vertical support
Box material:		Self-extinguishing, insulating
IP Code:		IP65 according to IEC 60.529
Insulation:		Double (class II)
Fire resistance:		650 ºC according to IEC 60695-2-1
Impact protection:		IK09 according to EN 50.102
Connections L/N/G:		25 mm^2 maximum section

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> PROTECTION OF POWER SUPPLY LINES

> ATCOMPACT series

> ATCOMPACT CDA T1 25 kA

Compact protection for three-phase power supply in double insulation cabinet.

> TECHNICAL DATASHEET

Reference:		**AT-8191**
Protection categories according to the REBT:		II, III, IV
Type of tests according to EN 61643-11:		Type 1, 2
Nominal voltage:	U_n	400 V_{AC} (L-L) 230 V_{AC} (L-GND)
Maximum continuous operating voltage:	U_c	440 V_{AC} (L-L) 275 V_{AC} (L-GND)
Nominal frequency:		50 – 60 Hz
Nominal discharge current (8/20 µs wave):	I_n	30 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	100 kA
Impulse current per pole (10/350 µs wave):	I_{imp}	25 kA
Protection level for 1.2/50 µs wave:	U_p	1500 V
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	2400 V
Response time:	t_r	< 25 ns
Fuse included:		80A gG
Maximum fuse short-circuit current:		100 kA
Working temperature:	ϑ	-40 °C to +80 °C
Protector location:		Outdoor
Type of connection:		Parallel (one port)
No. of poles:		4
Dimensions:		380 x 285 x 190 mm
Fixing:		Wall or vertical support
Box material:		Self-extinguishing, insulating
IP Code:		IP65 according to IEC 60.529
Insulation:		Double (class II)
Fire resistance:		650 °C according to IEC 60695-2-1
Impact protection:		IK09 according to EN 50.102
Connections L/N/G:		25 mm^2 maximum section

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> PROTECTION OF POWER SUPPLY LINES

> ATCOMPACT series

> ATCOMPACT CDA T1 30 kA

Compact protection for three-phase power supply in double insulation cabinet.

> TECHNICAL DATASHEET

Reference:		**AT-8192**
Protection categories according to the REBT:		II, III, IV
Type of tests according to EN 61643-11:		Type 1
Nominal voltage:	U_n	400 V_{AC} (L-L) 230 V_{AC} (L-GND)
Maximum continuous operating voltage:	U_c	440 V_{AC} (L-L) 275 V_{AC} (L-GND)
Nominal frequency:		50 – 60 Hz
Nominal discharge current (8/20 µs wave):	I_n	40 kA
Impulse current per pole (10/350 µs wave):	I_{imp}	30 kA
Protection level for 1.2/50 µs wave:	U_p	2500 V
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	3000 V
Response time:	t_r	< 25 ns
Fuse included:		80A gG
Maximum fuse short-circuit current:		100 kA
Working temperature:	ϑ	-40 ºC to +80 ºC
Protector location:		Outdoor
Type of connection:		Parallel (one port)
No. of poles:		4
Dimensions:		380 x 285 x 190 mm
Fixing:		Wall or vertical support
Box material:		Self-extinguishing, insulating
IP Code:		IP65 according to IEC 60.529
Insulation:		Double (class II)
Fire resistance:		650 ºC according to IEC 60695-2-1
Impact protection:		IK09 according to EN 50.102
Connections L/N/G:		25 mm^2 maximum section

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> PROTECTION OF POWER SUPPLY LINES

> ATCOMPACT series

> ATCOMPACT

Multi-pole power supply protection cabinet including protective fuses

> NOMENCLATURE

ATCOMPACT T2 15 kA

- T2: Three-phase type 2 protection
- 15 kA: Peak current per pole

T1: Three-phase type 1 protection
M1: Single-phase type 1 protection
M2: Single-phase type 2 protection

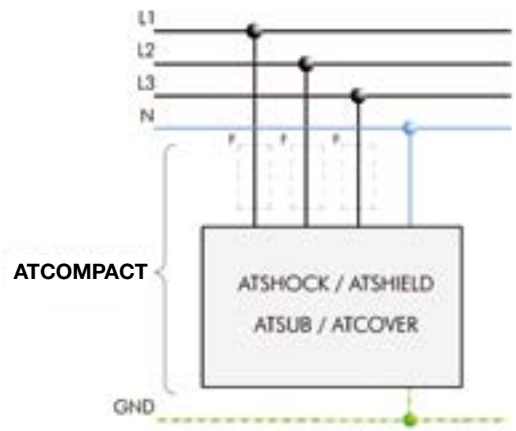
ATCOMPACT protection cabinets are made of several protectors from the same series with the aim of protecting all of the phases, including the protective fuses, against short-circuits.

Reference	Model	Description
AT-8131	ATCOMPACT M2 30 kA	Protection for single-phase lines with ATCOVER 230M
AT-8130	ATCOMPACT T2 30 kA	Protection for three-phase lines with ATCOVER 400T
AT-8117	ATCOMPACT M2 15 kA	Protection for single-phase lines with ATSUB-2P 15
AT-8122	ATCOMPACT T2 15 kA	Protection for three-phase lines with ATSUB-4P 15
AT-8139	ATCOMPACT M2 40 kA	Protection for single-phase lines with ATSUB-2P 40
AT-8140	ATCOMPACT T2 40 kA	Protection for three-phase lines with ATSUB-4P 40
AT-8119	ATCOMPACT M2 65 kA	Protection for single-phase lines with ATSUB-2P 65
AT-8120	ATCOMPACT T2 65 kA	Protection for three-phase lines with ATSUB-4P 65
AT-8161	ATCOMPACT M1 30 kA	Protection for single-phase lines with ATSHIELD 230M
AT-8160	ATCOMPACT T1 30 kA	Protection for three-phase lines with ATSHIELD 400T
AT-8149	ATCOMPACT M1 50 kA	Protection for single-phase lines with ATSHOCK
AT-8150	ATCOMPACT T1 50 kA	Protection for three-phase lines with ATSHOCK

> INSTALLATION

ATCOMPACT boxes are to be installed **in parallel** with the low voltage supply line, connected to the phases, neutral and ground.
Installation should be carried out without power in the line.
When ATCOMPACT protectors are installed as medium protection, they must be separated from coarse and/or tight protectors by at least 10 metres of cable or, if this is not possible, by ATLINK decoupling inductors in order to achieve **correct coordination between them.**

ATCOMPACT surge protection devices are to be installed **in parallel** with the supply line, without altering its operation under normal conditions. Combinations can be made for protection either in common (in relation to ground) or differential mode (between phase/s and neutral).
Compact box, easy to install and with the same advantages as Aplicaciones Tecnológicas protectors: robust, quick, reliable and tested according current standards (EN 61643-11) **in official independent laboratories.**



Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω. If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> PROTECTION OF POWER SUPPLY LINES

> ATCOMPACT series

> ATCOMPACT M2 30 kA

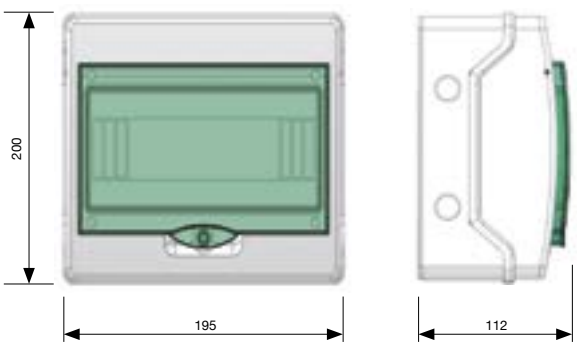
Compact protection for power supply single-phase lines

> TECHNICAL DATASHEET

Reference:		**AT-8131**
Protection categories according to the REBT:		I, II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3
Nominal voltage:	U_n	230 V_{AC}
Maximum continuous operating voltage:	U_c	275 V_{AC}
Nominal frequency:		50 – 60 Hz
Nominal discharge current (8/20 µs wave):	I_n	10 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	30 kA
Protection level for 1.2/50 µs wave:	U_p	700 V
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	900 V
Combined wave voltage:	$U_{o.c.}$	6 kV
Residual voltage with 6 kV/3 kA combination wave:		700 V
Response time:	t_r	< 25 ns
Fuse included:		50A gG
Maximum fuse short-circuit current:		100 kA
Working temperature:	ϑ	-40 ºC to +70 ºC
Protector location:		Outdoor
Type of connection:		Parallel (one port)
No. of poles:		2
Dimensions:		200 x 195 x 112 mm
Fixing:		Wall or vertical support
Box material:		Self-extinguishing, insulating
IP Code:		IP65 according to IEC 60.529
Insulation:		Double (class II)
Fire resistance:		650 ºC according to IEC 60695-2-1
Impact protection:		IK09 according to EN 50.102
Connections L/N/G:		25 mm² maximum section

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATCOMPACT series

> ATCOMPACT T2 30 kA

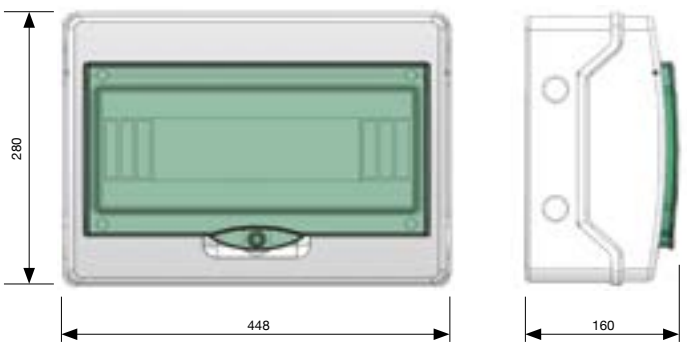
Compact protection for power supply three-phase lines

> TECHNICAL DATASHEET

Reference:		**AT-8130**
Protection categories according to the REBT:		I, II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3
Nominal voltage:	U_n	400 V_{AC} (L-L) 230 V_{AC} (L-GND)
Maximum continuous operating voltage:	U_c	460 V_{AC} (L-L) 275 V_{AC} (L-GND)
Nominal frequency:		50 – 60 Hz
Nominal discharge current (8/20 µs wave):	I_n	10 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	30 kA
Protection level for 1.2/50 µs wave:	U_p	700 V
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	900 V
Combined wave voltage:	$U_{o.c.}$	6 kV
Residual voltage with 6 kV/3 kA combination wave:		700 V
Response time:	t_r	< 25 ns
Fuse included:		50A gG
Maximum fuse short-circuit current:		100 kA
Working temperature:	ϑ	-40 ºC to +70 ºC
Protector location:		Outdoor
Type of connection:		Parallel (one port)
No. of poles:		4
Dimensions:		280 x 448 x 160 mm
Fixing:		Wall or vertical support
Box material:		Self-extinguishing, insulating
IP Code:		IP65 according to IEC 60.529
Insulation:		Double (class II)
Fire resistance:		650 ºC according to IEC 60695-2-1
Impact protection:		IK09 according to EN 50.102
Connections L/N/G:		25 mm² maximum section

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATCOMPACT series

> ATCOMPACT M2 15 kA

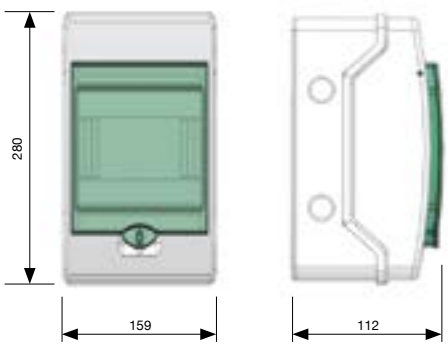
Compact protection for power supply single-phase lines

> TECHNICAL DATASHEET

Reference:		**AT-8117**
Protection categories according to the REBT:		I, II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3
Nominal voltage:	U_n	230 V_{AC}
Maximum continuous operating voltage:	U_c	275 V_{AC}
Nominal frequency:		50 – 60 Hz
Nominal discharge current (8/20 µs wave):	I_n	5 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA
Protection level for 1.2/50 µs wave:	U_p	700 V
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	1200 V
Combined wave voltage:	$U_{o.c.}$	6 kV
Response time:	tr	< 25 ns
Fuse included:		50A gG
Maximum fuse short-circuit current:		100 kA
Working temperature:	ϑ	-40 ºC to +70 ºC
Protector location:		Outdoor
Type of connection:		Parallel (one port)
No. of poles:		2
Dimensions:		280 x 159 x 112 mm
Fixing:		Wall or vertical support
Box material:		Self-extinguishing, insulating
IP Code:		IP65 according to IEC 60.529
Insulation:		Double (class II)
Fire resistance:		650 ºC according to IEC 60695-2-1
Impact protection:		IK09 according to EN 50.102
Connections L/N/G:		25 mm^2 maximum section

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATCOMPACT series

> ATCOMPACT T2 15 kA

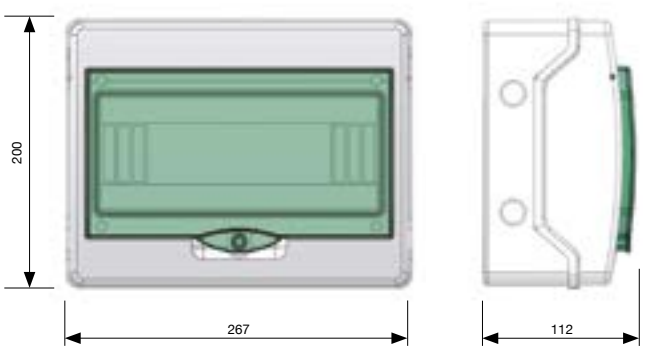
Compact protection for power supply three-phase lines

> TECHNICAL DATASHEET

Reference:		**AT-8122**
Protection categories according to the REBT:		I, II, III, IV
Type of tests according to EN 61643-11:		Type 2 + 3
Nominal voltage:	U_n	400 V_{AC} (L-L) 230 V_{AC} (L-GND)
Maximum continuous operating voltage:	U_c	460 V_{AC} (L-L) 275 V_{AC} (L-GND)
Nominal frequency:		50 – 60 Hz
Nominal discharge current (8/20 µs wave):	I_n	5 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	15 kA
Protection level for 1.2/50 µs wave:	U_p	700 V
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	1200 V
Combined wave voltage:	$U_{o.c.}$	6 kV
Response time:	t_r	< 25 ns
Fuse included:		50A gG
Maximum fuse short-circuit current:		100 kA
Working temperature:	ϑ	-40 ºC to +70 ºC
Protector location:		Outdoor
Type of connection:		Parallel (one port)
No. of poles:		4
Dimensions:		200 x 267 x 112 mm
Fixing:		Wall or vertical support
Box material:		Self-extinguishing, insulating
IP Code:		IP65 according to IEC 60.529
Insulation:		Double (class II)
Fire resistance:		650 ºC according to IEC 60695-2-1
Impact protection:		IK09 according to EN 50.102
Connections L/N/G:		25 mm^2 maximum section

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATCOMPACT series

> ATCOMPACT M2 40 kA

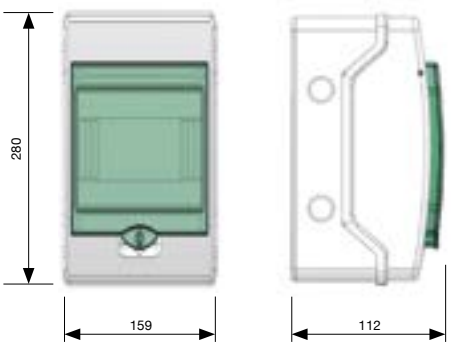
Compact protection for power supply single-phase lines

> TECHNICAL DATASHEET

Reference:		**AT-8139**
Protection categories according to the REBT:		I, II, III, IV
Type of tests according to EN 61643-11:		Type 2
Nominal voltage:	U_n	230 V_{AC}
Maximum continuous operating voltage:	U_c	275 V_{AC}
Nominal frequency:		50 – 60 Hz
Nominal discharge current (8/20 µs wave):	I_n	20 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	40 kA
Protection level for 1.2/50 µs wave:	U_p	700 V
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	1400 V
Response time:	t_r	< 25 ns
Fuse included:		50A gG
Maximum fuse short-circuit current:		100 kA
Working temperature:	ϑ	-40 °C to +70 °C
Protector location:		Outdoor
Type of connection:		Parallel (one port)
No. of poles:		2
Dimensions:		280 x 159 x112 mm
Fixing:		Wall or vertical support
Box material:		Self-extinguishing, insulating
IP Code:		IP65 according to IEC 60.529
Insulation:		Double (class II)
Fire resistance:		650 °C according to IEC 60695-2-1
Impact protection:		IK09 according to EN 50.102
Connections L/N/G:		25 mm^2 maximum section

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATCOMPACT series

> ATCOMPACT T2 40 kA

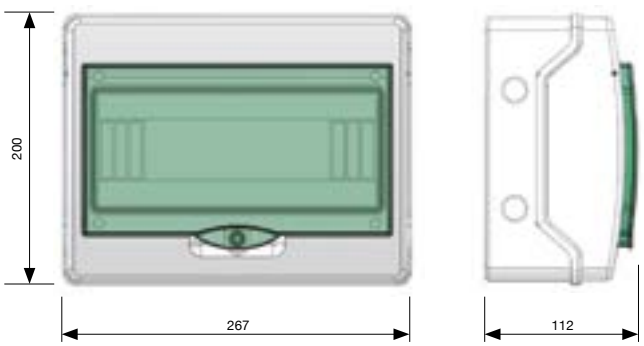
Compact protection for power supply three-phase lines

> TECHNICAL DATASHEET

Reference:		**AT-8140**
Protection categories according to the REBT:		I, II, III, IV
Type of tests according to EN 61643-11:		Type 2
Nominal voltage:	U_n	400 V_{AC} (L-L) 230 V_{AC} (L-GND)
Maximum continuous operating voltage:	U_c	460 V_{AC} (L-L) 275 V_{AC} (L-GND)
Nominal frequency:		50 – 60 Hz
Nominal discharge current (8/20 µs wave):	I_n	20 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	40 kA
Protection level for 1.2/50 µs wave:	U_p	700 V
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	1400 V
Response time:	t_r	< 25 ns
Fuse included:		50A gG
Maximum fuse short-circuit current:		100 kA
Working temperature:	ϑ	-40 °C to +70 °C
Protector location:		Outdoor
Type of connection:		Parallel (one port)
No. of poles:		4
Dimensions:		200 x 267 x 112 mm
Fixing:		Wall or vertical support
Box material:		Self-extinguishing, insulating
IP Code:		IP65 according to IEC 60.529
Insulation:		Double (class II)
Fire resistance:		650 °C according to IEC 60695-2-1
Impact protection:		IK09 according to EN 50.102
Connections L/N/G:		25 mm^2 maximum section

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATCOMPACT series

> ATCOMPACT M2 65 kA

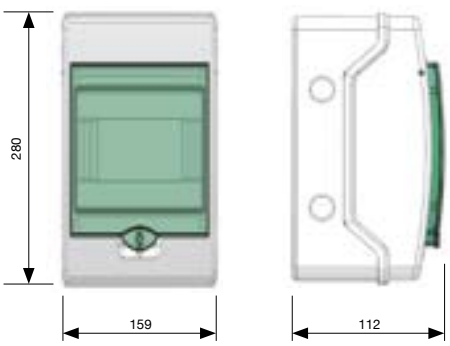
Compact protection for power supply single-phase lines

> TECHNICAL DATASHEET

Reference:		**AT-8119**
Protection categories according to the REBT:		II, III, IV
Type of tests according to EN 61643-11:		Type 1 + 2
Nominal voltage:	U_n	230 V_{AC}
Maximum continuous operating voltage:	U_c	275 V_{AC}
Nominal frequency:		50 – 60Hz
Nominal discharge current (8/20 µs wave):	I_n	30 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	65 kA
Impulse current per pole (10/350 µs wave):	$_{limp}$	15 kA
Protection level for 1.2/50 µs wave:	U_p	900 V
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	1600 V
Response time:	t_r	< 25 ns
Fuse included:		50A gG
Maximum fuse short-circuit current:		100 kA
Working temperature:	ϑ	-40 °C to +70 °C
Protector location:		Outdoor
Type of connection:		Parallel (one port)
No. of poles:		2
Dimensions:		280 x 159 x 112 mm
Fixing:		Wall or vertical support
Box material:		Self-extinguishing, insulating
IP Code:		IP65 according to IEC 60.529
Insulation:		Double (class II)
Fire resistance:		650 °C according to IEC 60695-2-1
Impact protection:		IK09 according to EN 50.102
Connections L/N/G:		25 mm^2 maximum section

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATCOMPACT series

> ATCOMPACT T2 65 kA

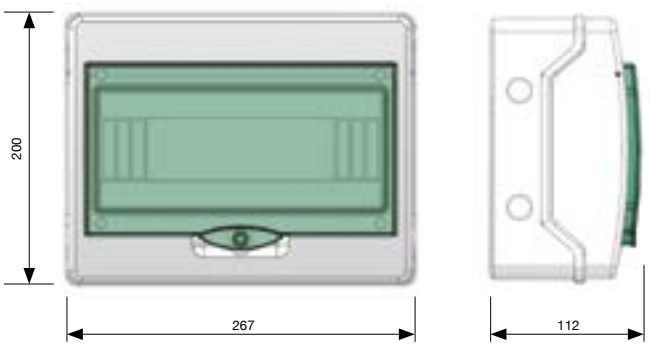
Compact protection for power supply single-phase lines

> TECHNICAL DATASHEET

Reference:		**AT-8120**
Protection categories according to the REBT:		II, III, IV
Type of tests according to EN 61643-11:		Type 1 + 2
Nominal voltage:	U_n	400 V_{AC} (L-L) 230 V_{AC} (L-GND)
Maximum continuous operating voltage:	U_c	460 V_{AC} (L-L) 275 V_{AC} (L-GND)
Nominal frequency:		50 – 60 Hz
Nominal discharge current (8/20 µs wave):	I_n	30 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	65 kA
Impulse current per pole (10/350 µs wave):	$_{limp}$	15 kA
Protection level for 1.2/50 µs wave:	U_p	900 V
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	1600 V
Response time:	t_r	< 25 ns
Fuse included:		50A gG
Maximum fuse short-circuit current:		100 kA
Working temperature:	ϑ	-40 ºC to +70 ºC
Protector location:		Outdoor
Type of connection:		Parallel (one port)
No. of poles:		4
Dimensions:		200 x 267 x 112 mm
Fixing:		Wall or vertical support
Box material:		Self-extinguishing, insulating
IP Code:		IP65 according to IEC 60.529
Insulation:		Double (class II)
Fire resistance:		650 ºC according to IEC 60695-2-1
Impact protection:		IK09 according to EN 50.102
Connections L/N/G:		25 mm^2 maximum section

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATCOMPACT series

> ATCOMPACT M1 30 kA

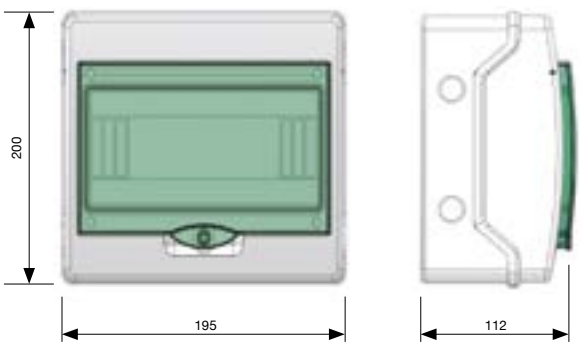
Compact protection for power supply single-phase lines

> TECHNICAL DATASHEET

Reference:		**AT-8161**
Protection categories according to the REBT:		I, II, III, IV
Type of tests according to EN 61643-11:		Type 1 + 2
Nominal voltage:	U_n	230 V_{AC}
Maximum continuous operating voltage:	U_c	275 V_{AC}
Nominal frequency:		50 – 60 Hz
Nominal discharge current (8/20 µs wave):	I_n	40 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	65 kA
Impulse current per pole (10/350 µs wave):	I_{imp}	30 kA
Protection level:	U_p	1500 V
Response time:	t_r	< 100 ns
Fuse included:		80A gG
Maximum fuse short-circuit current:		100 kA
Working temperature:	ϑ	-40 ºC to +70 ºC
Protector location:		Outdoor
Type of connection:		Parallel (one port)
No. of poles:		2
Dimensions:		200 x 195 x 112 mm
Fixing:		Wall or vertical support
Box material:		Self-extinguishing, insulating
IP Code:		IP65 according to IEC 60.529
Insulation:		Double (class II)
Fire resistance:		650 ºC according to IEC 60695-2-1
Impact protection:		IK09 according to EN 50.102
Connections L/N/G:		25 mm^2 maximum section

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATCOMPACT series

> ATCOMPACT T1 30 kA

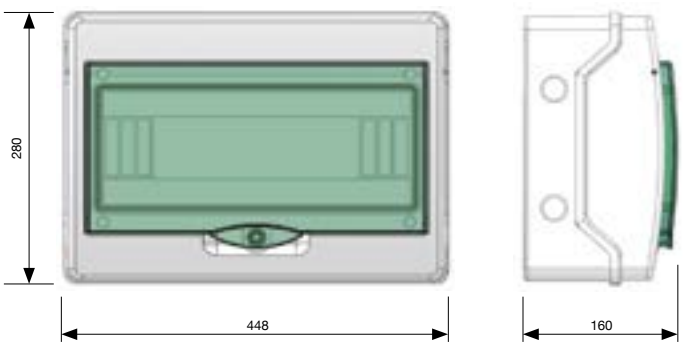
Compact protection for power supply three-phase lines

> TECHNICAL DATASHEET

Reference:		**AT-8160**
Protection categories according to the REBT:		I, II, III, IV
Type of tests according to EN 61643-11:		Type 1 + 2
Nominal voltage:	U_n	400 V_{AC} (L-L) 230 V_{AC} (L-GND)
Maximum continuous operating voltage:	U_c	460 V_{AC} (L-L) 275 V_{AC} (L-GND)
Nominal frequency:		50 – 60 Hz
Nominal discharge current (8/20 µs wave):	I_n	40 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	65 kA
Impulse current per pole (10/350 µs wave):	I_{imp}	30 kA
Protection level:	U_p	1500 V
Response time:	t_r	< 100 ns
Fuse included:		80A gG
Maximum fuse short-circuit current:		100 kA
Working temperature:	ϑ	-40 °C to +70 °C
Protector location:		Outdoor
Type of connection:		Parallel (one port)
No. of poles:		4
Dimensions:		280 x 448 x 160 mm
Fixing:		Wall or vertical support
Box material:		Self-extinguishing, insulating
IP Code:		IP65 according to IEC 60.529
Insulation:		Double (class II)
Fire resistance:		650 °C according to IEC 60695-2-1
Impact protection:		IK09 according to EN 50.102
Connections L/N/G:		25 mm^2 maximum section

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATCOMPACT series

> ATCOMPACT M1 50 kA

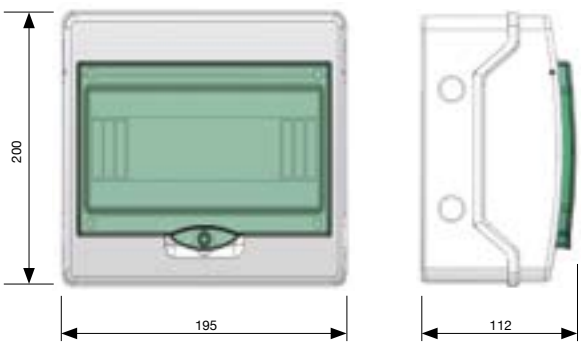
Compact protection for power supply single-phase lines

> TECHNICAL DATASHEET

Reference:		**AT-8149**
Protection categories according to the REBT:		III, IV
Type of tests according to EN 61643-11:		Type 1
Nominal voltage:	U_n	230 V_{AC}
Maximum continuous operating voltage:	U_c	275 V_{AC}
Nominal frequency:		50 – 60 Hz
Nominal discharge current (8/20 µs wave):	I_n	50 kA
Impulse current per pole (10/350 µs wave):	I_{max}	50 kA
Protection level:	U_p	4000 V
Response time:	t_r	< 100 ns
Fuse included:		80A gG
Maximum fuse short-circuit current:		100 kA
Working temperature:	ϑ	-40 ºC to +70 ºC
Protector location:		Outdoor
Type of connection:		Parallel (one port)
No. of poles:		2
Dimensions:		200 x 195 x 112 mm
Fixing:		Wall or vertical support
Box material:		Self-extinguishing, insulating
IP Code:		IP65 according to IEC 60.529
Insulation:		Double (class II)
Fire resistance:		650 ºC according to IEC 60695-2-1
Impact protection:		IK09 according to EN 50.102
Connections L/N/G:		25 mm^2 maximum section

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATCOMPACT series

> ATCOMPACT T1 50 kA

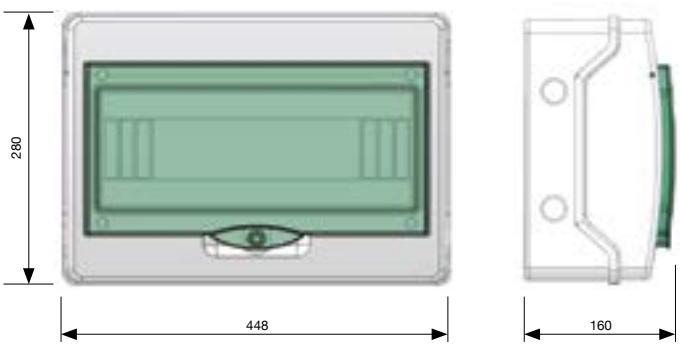
Compact protection for power supply three-phase lines

> TECHNICAL DATASHEET

Reference:		**AT-8150**
Protection categories according to the REBT:		III, IV
Type of tests according to EN 61643-11:		Type 1
Nominal voltage:	U_n	400 V_{AC} (L-L) 230 V_{AC} (L-GND)
Maximum continuous operating voltage:	U_c	460 V_{AC} (L-L) 275 V_{AC} (L-GND)
Nominal frequency:		50 – 60 Hz
Nominal discharge current (8/20 µs wave):	I_n	50 kA
Impulse current per pole (10/350 µs wave):	I_{max}	50 kA
Protection level:	U_p	4000 V
Response time:	t_r	< 100 ns
Fuse included:		80A gG
Maximum fuse short-circuit current:		100 kA
Working temperature:	ϑ	-40 °C to +70 °C
Protector location:		Outdoor
Type of connection:		Parallel (one port)
No. of poles:		4
Dimensions:		280 x 448 x 160 mm
Fixing:		Wall or vertical support
Box material:		Self-extinguishing, insulating
IP Code:		IP65 according to IEC 60.529
Insulation:		Double (class II)
Fire resistance:		650 °C according to IEC 60695-2-1
Impact protection:		IK09 according to EN 50.102
Connections L/N/G:		25 mm^2 maximum section

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATBARRIER series

> ATBARRIER

Coordinated protection cabinets for power supply lines

Reference	Model	Description
AT-8114	ATBARRIER MFF	Coordinated protection for single-phase lines with ATSHOCK + ATCOVER
AT-8125	ATBARRIER MF	Coordinated protection for single-phase lines with ATSHOCK + ATSUB15
AT-8118	ATBARRIER MM	Coordinated protection for single-phase lines with ATSHOCK + ATSUB40
AT-8134	ATBARRIER TFF	Coordinated protection for three-phase lines with ATSHOCK + ATCOVER
AT-8141	ATBARRIER TF	Coordinated protection for three-phase lines with ATSHOCK + ATSUB15
AT-8121	ATBARRIER TM	Coordinated protection for three-phase lines with ATSHOCK + ATSUB40

-N: For lines with no neutral

> NOMENCLATURE

ATBARRIER **T** **F**

T: if three-phase
M: if single-phase

M: for medium protection (with ATSUB40)
F: for tight protection (with ATSUB15)
FF: for very tight protection (with ATCOVER)

For all of the protectors to work, they must be separated by at least 10 metres of cable or a decoupling inductor which also withstands the line operating current. The complete ATBARRIER systems have been designed in this way.
ATBARRIER series protection cabinets contain all the different protectors required for coordinated protection of all of the phases. ATBARRIER boxes are to be installed in series with the line. In normal conditions, they remain inactive without affecting line operation at all. Compact box, easy to install and with the same advantages as Aplicaciones Tecnológicas protectors: robust, quick, reliable and tested according to applicable standards (EN 61643-11) in **official and independent laboratories.**

Correct overvoltage protection is only achieved if all of the protection stages are well coordinated. Otherwise, the most robust protection will not work, possibly even causing the destruction of the most sensitive protectors and even the equipment that they should protect.

> INSTALLATION

ATBARRIER boxes are to be installed **in series** with the low voltage line, connected to phase/s, neutral and ground. **Fuses or circuit breakers must be present upstream.** They will be disconnected during installation for operator safety.
Installation is recommended where **direct lightning currents** could penetrate and very sensitive equipment is connected, without enough space to separate the different protection stages.

The operating current of the line must be lower than 63 amps.

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> PROTECTION OF POWER SUPPLY LINES

> ATBARRIER series

> ATBARRIER MFF

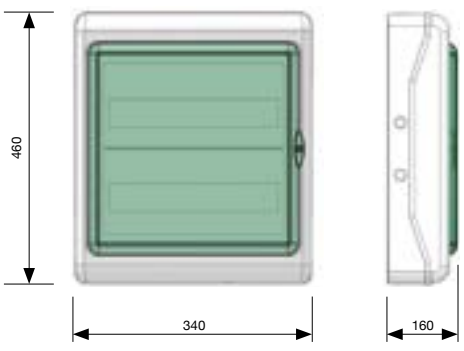
Coordinated protection for power supply single-phase lines

> TECHNICAL DATASHEET

Reference:		**AT-8114**
Protection categories according to the REBT:		I, II, III and IV
Type of tests according to EN 61643-11:		Type 1 + 2 + 3
Nominal voltage:	U_n	230 V_{AC}
Maximum continuous operating voltage:	U_c	275 V_{AC}
Nominal frequency:		50 – 60 Hz
Maximum operating current:	I_L	63 A
Nominal discharge current (8/20 µs wave):	I_n	50 kA
Impulse current per pole (10/350 µs wave):	I_{imp}	50 kA
Protection level:	U_p	900 V
Combined wave voltage:	$U_{o.c.}$	6 kV
Residual voltage with 6 kV/3 kA combination wave:		700 V
Response time:	t_r	< 25 ns
Working temperature:	ϑ	-40 °C to +70 °C
Protector location:		Outdoor
Type of connection:		Series (two ports)
No. of poles:		2
Dimensions:		460 x 340 x 160 mm
Fixing:		Wall or vertical support
Box material:		Self-extinguishing, insulating
IP Code:		IP65 according to IEC 60.529
Insulation:		Double (class II)
Fire resistance:		650 °C according to IEC 60695-2-1
Impact protection:		IK09 according to EN 50.102
Connections L/N/G:		25 mm^2 maximum section

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATBARRIER series

> ATBARRIER MF

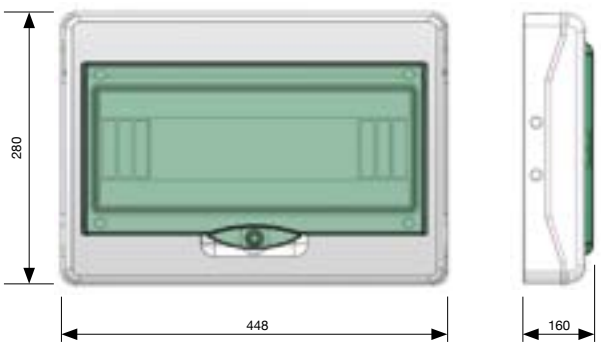
Coordinated protection for power supply single-phase lines

> TECHNICAL DATASHEET

Reference:		**AT-8125**
Protection categories according to the REBT:		I, II, III and IV
Type of tests according to EN 61643-11:		Type 1 + 2 + 3
Nominal voltage:	U_n	230 V_{AC}
Maximum continuous operating voltage:	U_c	275 V_{AC}
Nominal frequency:		50 – 60 Hz
Maximum operating current:	I_L	63 A
Nominal discharge current (8/20 µs wave):	I_n	50 kA
Impulse current per pole (10/350 µs wave):	I_{imp}	50 kA
Protection level:	U_p	1200 V
Combined wave voltage:	$U_{o.c.}$	6 kV
Response time:	t_r	< 25 ns
Working temperature:	ϑ	-40 ºC to +70 ºC
Protector location:		Outdoor
Type of connection:		Series (two ports)
No. of poles:		2
Dimensions:		280 x 448 x 160 mm
Fixing:		Wall or vertical support
Box material:		Self-extinguishing, insulating
IP Code:		IP65 according to IEC 60.529
Insulation:		Double (class II)
Fire resistance:		650 ºC according to IEC 60695-2-1
Impact protection:		IK09 according to EN 50.102
Connections L/N/G:		25 mm^2 maximum section

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATBARRIER series

> ATBARRIER MM

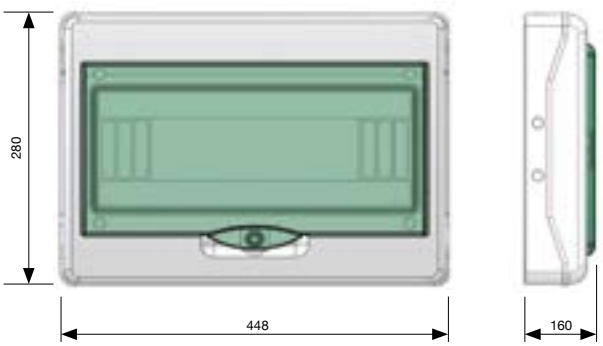
Coordinated protection for power supply single-phase lines

> TECHNICAL DATASHEET

Reference:		**AT-8118**
Protection categories according to the REBT:		I, II, III and IV
Type of tests according to EN 61643-11:		Type 1 + 2
Nominal voltage:	U_n	230 V_{AC}
Maximum continuous operating voltage:	U_c	275 V_{AC}
Nominal frequency:		50 – 60 Hz
Maximum operating current:	I_L	63 A
Nominal discharge current (8/20 µs wave):	I_n	50 kA
Impulse current per pole (10/350 µs wave):	I_{imp}	50 kA
Protection level:	U_p	1400 V
Response time:	t_r	< 25 ns
Working temperature:	ϑ	-40 °C to +70 °C
Protector location:		Outdoor
Type of connection:		Series (two ports)
No. of poles:		2
Dimensions:		280 x 448 x 160 mm
Fixing:		Wall or vertical support
Box material:		Self-extinguishing, insulating
IP Code:		IP65 according to IEC 60.529
Insulation:		Double (class II)
Fire resistance:		650 ºC according to IEC 60695-2-1
Impact protection:		IK09 according to EN 50.102
Connections L/N/G:		25 mm^2 maximum section

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATBARRIER series

> ATBARRIER TFF

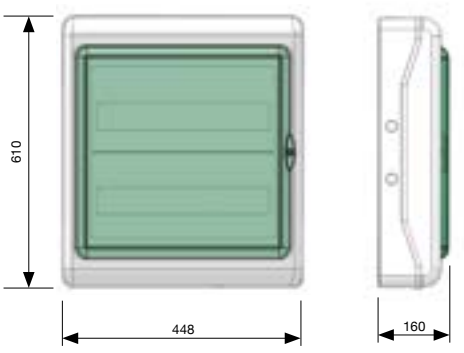
Coordinated protection for power supply three-phase lines

> TECHNICAL DATASHEET

Reference:		**AT-8134**
Protection categories according to the REBT:		I, II, III and IV
Type of tests according to EN 61643-11:		Type 1 + 2 + 3
Nominal voltage:	U_n	400 V_{AC} (L-L) 230 V_{AC} (L-GND)
Maximum continuous operating voltage:	U_c	460 V_{AC} (L-L) 275 V_{AC} (L-GND)
Nominal frequency:		50 – 60 Hz
Maximum operating current:	I_L	63 A
Nominal discharge current (8/20 µs wave):	I_n	50 kA
Impulse current per pole (10/350 µs wave):	I_{imp}	50 kA
Protection level:	U_p	900 V
Combined wave voltage:	$U_{o.c.}$	6 kV
Residual voltage with 6 kV/3 kA combination wave:		700 V
Response time:	t_r	< 25 ns
Working temperature:	ϑ	-40 ºC to +70 ºC
Protector location:		Outdoor
Type of connection:		Series (two ports)
No. of poles:		4
Dimensions:		610 x 448 x 160 mm
Fixing:		Wall or vertical support
Box material:		Self-extinguishing, insulating
IP Code:		IP65 according to IEC 60.529
Insulation:		Double (class II)
Fire resistance:		650 ºC according to IEC 60695-2-1
Impact protection:		IK09 according to EN 50.102
Connections L/N/G:		25 mm^2 maximum section

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATBARRIER series

> ATBARRIER TF

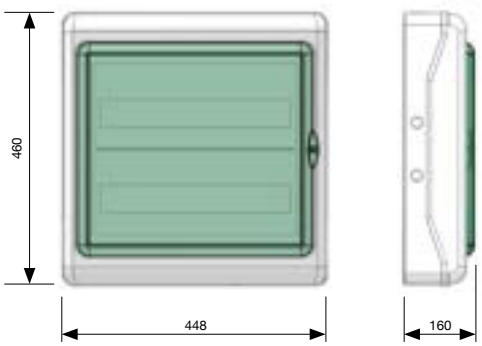
Coordinated protection for power supply single-phase lines

> TECHNICAL DATASHEET

Reference:		**AT-8141**
Protection categories according to the REBT:		I, II, III and IV
Type of tests according to EN 61643-11:		Type 1 + 2 + 3
Nominal voltage:	U_n	400 V_{AC} (L-L) 230 V_{AC} (L-GND)
Maximum continuous operating voltage:	U_c	460 V_{AC} (L-L) 275 V_{AC} (L-GND)
Nominal frequency:		50 – 60 Hz
Maximum operating current:	I_L	63 A
Nominal discharge current (8/20 µs wave):	I_n	50 kA
Impulse current per pole (10/350 µs wave):	I_{imp}	50 kA
Protection level:	U_p	1200 V
Combined wave voltage:	$U_{o.c.}$	6 kV
Response time:	t_r	< 25 ns
Working temperature:	ϑ	-40 ºC to +70 ºC
Protector location:		Outdoor
Type of connection:		Series (two ports)
No. of poles:		4
Dimensions:		460 x 448 x 160 mm
Fixing:		Wall or vertical support
Box material:		Self-extinguishing, insulating
IP Code:		IP65 according to IEC 60.529
Insulation:		Double (class II)
Fire resistance:		650 ºC according to IEC 60695-2-1
Impact protection:		IK09 according to EN 50.102
Connections L/N/G:		25 mm^2 maximum section

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> PROTECTION OF POWER SUPPLY LINES

> ATBARRIER series

> ATBARRIER TM

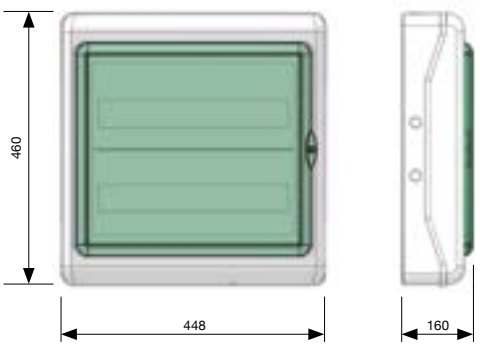
Coordinated protection for power supply three-phase lines

> TECHNICAL DATASHEET

Reference:		**AT-8121**
Protection categories according to the REBT:		I, II, III and IV
Type of tests according to EN 61643-11:		Type 1 + 2
Nominal voltage:	U_n	400 V_{AC} (L-L) 230 V_{AC} (L-GND)
Maximum continuous operating voltage:	U_c	460 V_{AC} (L-L) 275 V_{AC} (L-GND)
Nominal frequency:		50 – 60 Hz
Maximum operating current:	I_L	63 A
Nominal discharge current (8/20 µs wave):	I_n	50 kA
Impulse current per pole (10/350 µs wave):	I_{imp}	50 kA
Protection level:	U_p	1400 V
Response time:	t_r	< 25 ns
Working temperature:	ϑ	-40 ºC to +70 ºC
Protector location:		Outdoor
Type of connection:		Series (two ports)
No. of poles:		4
Dimensions:		460 x 448 x 160 mm
Fixing:		Wall or vertical support
Box material:		Self-extinguishing, insulating
IP Code:		IP65 according to IEC 60.529
Insulation:		Double (class II)
Fire resistance:		650 ºC according to IEC 60695-2-1
Impact protection:		IK09 according to EN 50.102
Connections L/N/G:		25 mm^2 maximum section

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> PROTECTION OF SPECIAL EQUIPMENT POWER SUPPLY

The different power supply protector series focus on AC power supply systems for different voltages. However, there is a lot of equipment which is supplied by special generators, such as batteries or solar cells with different types of voltages (continuous, pulses etc.) and a wide range of different characteristics regarding current, frequency, number of wires etc.

Very often this equipment is located in areas which are difficult to access, in usual storm areas and carrying out very important functions such as telecommunications, forest vigilance, environmental control etc. The protection of this type of equipment not only prevents destruction but also it being moved for repair, as well as interruption of the services they carry out.

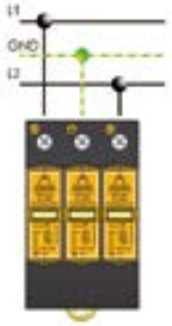
> ATPV series

Protection for photovoltaic installations.

ATPV series protectors are designed for maximum protection of photovoltaic cells and all of their integrated elements, such as the inverter.

They are made up of zinc oxide varistors adjusted to the specific voltage of each electrical installation to be protected.

ATPV surge protection devices are to be installed **in parallel** with the supply line, without altering its operation under normal conditions.



> ATVOLT series

Coordinated protection for DC supply lines

ATVOLT series protectors have several uses in this kind of equipment thanks to the flexibility of their design and connectors. These protection devices protect two pairs of wires with different protection stages which are internally coordinated. ATVOLT series contains a wide range of voltages. They are mainly used for DC supply lines of tens of volts.

They are installed in series with the line and they are able to continuously withstand currents ranging up to several amperes without significant line losses or consumption.

They withstand the secondary effects of lightning and power switching surges. They react to voltage impulses in a few nanoseconds, thus achieving a very low residual voltage, protecting even highly sensitive equipment.

> PROTECTION OF SPECIAL EQUIPMENT POWER SUPPLY

> ATVOLT P series

Protection for DC supply lines.

ATVOLT P series protectors protect the same equipment as the ATVOLT series but since these are installed **in parallel**, they do not have any limitation for current consumption. Each one protects a pair of wires, leaving a low residual voltage. They are mainly used for DC supply lines of tens of volts.

They withstand the secondary effects of lightning and power switching surges. They react to voltage impulses in a few nanoseconds, thus achieving a very low residual voltage, protecting even highly sensitive equipment.

> ATCOMBO series

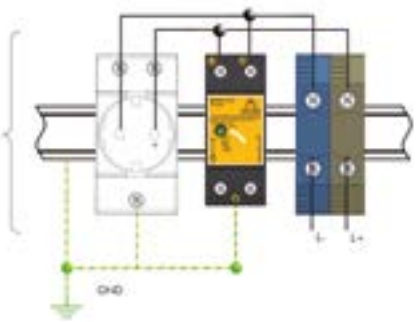
Protection cabinets with Schuko connection.

ATCOMBO series protectors gather a power supply protector such as ATVOLT or ATCOVER, along with a Schuko socket in a single, small cabinet in order to facilitate connections.

They are especially recommended for telecommunication stations or similar installations, where the use of moving equipment is very common and there are adverse weather conditions.

The protectors and accessories are supplied in a closed, robust box, easy to open for connecting equipment and with all of the internal connections already done.

ATCOMBO



> PROTECTION OF SPECIAL EQUIPMENT POWER SUPPLY

> ATPV series

> ATPV

Protection for photovoltaic installations

> **AT-8901 ATPV**: for overvoltages induced by photovoltaic installations

Effective protection of the photovoltaic installations and every element that could be integrated in the installation, such as the voltage inverter.

Tested and certified as a **type 2** protector according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT.

- Made up of zinc oxide varistors adjusted to the specific voltage of the electrical installation to be protected. They are able to **protect inverters with an open input voltage of 1000 V_{DC}**.
- Short response time.
- Do not produce deflagration.
- Protection with removable modules.
- They do not cause any interruption to the power supply.
- Thermodynamic control device, mechanical warning and remote alarm. When the warning light is yellow, the cartridge is in good condition. If not, replace.

They are installed **in parallel** with the line, without affecting its operation in normal conditions.

The **ATPV series** includes removable modules that can be replaced in the event of a breakdown or fault without needing to disconnect the wiring.

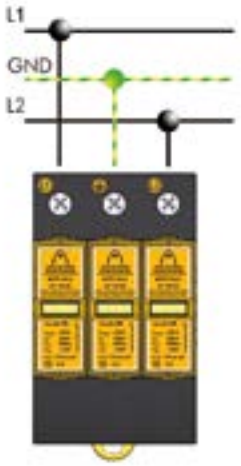
ATPV series protectors have been tested in **official and independent laboratories,** obtaining their characteristics according to relevant standards (shown in the table).

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

Installations based on **photovoltaic panels** are more prone to suffering the effects of overvoltages due to being installed outdoors.

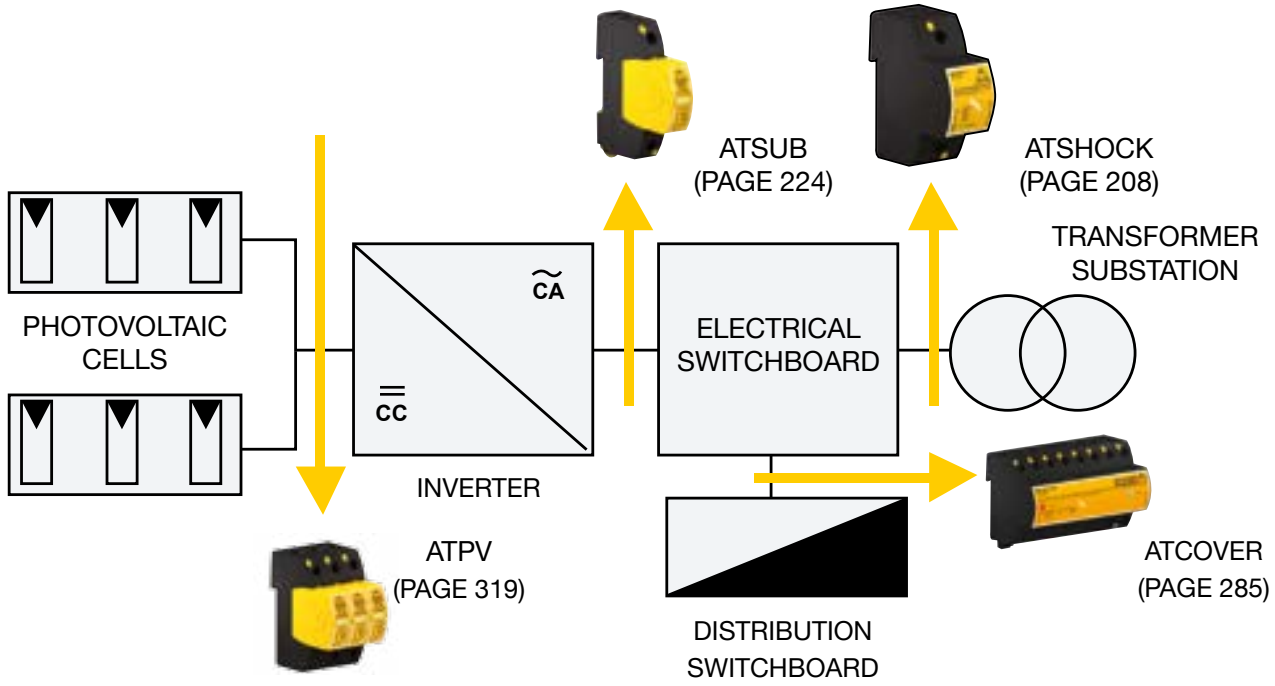
> INSTALLATION

They must be installed i**n parallel** with the Direct Current (DC) line, connected to positive and negative line/s and the ground.
A fuses or circuit breaker must be present upstream. They will be disconnected during installation for safety purposes. Installation should be carried out **without power running through the line**.



> PROTECTION OF SPECIAL EQUIPMENT POWER SUPPLY

> ATPV series



The electrical installation should be protected as follows:

- An ATPV protector should be installed on the continuous part of the inverter.
- A medium protection based in the ATSUB series must be placed in order to protect the main switchboards from the installation process.
- If generated power is used for local needs, an ATCOVER series protector must be placed in the distribution board in order to prevent high residual voltages.
- If generated power is to export to the electrical network through a transformer substation, ATSHOCK should be used in order to prevent transient overvoltages in the line.

> PROTECTION OF SPECIAL EQUIPMENT POWER SUPPLY

> ATPV series

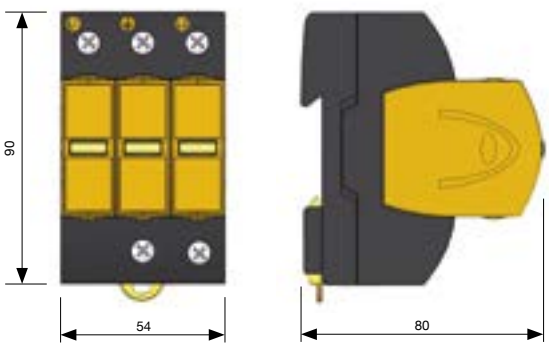
> ATPV

> TECHNICAL DATASHEET

Reference:		**AT-8901**
Type of tests according to EN 61643-11:		Type 2
Maximum continuous operating voltage:	U_c	1000 V_{DC}
Nominal discharge current (8/20 µs wave):	I_n	20 kA
Maximum discharge current per pole (8/20 µs wave):	I_{max}	40 kA
Protection level, 8/20 µs wave at I_n:	$U_p(I_n)$	4 kV
Protection level 5 kA; 8/20 µs wave:		3.5 kV
Response time:	t_r	< 25 ns
Backup fuse(1):		125 A gL/gG
Maximum short-circuit current:		25 kA (for maximum fuse)
Working temperature:	ϑ	-40 ºC to +70 ºC
Protector location:		Indoor
Type of connection:		Parallel (one port)
Number of poles:		3
Dimensions:		54 x 90 x 80 mm (3 mod. DIN 43880)
Fixing:		DIN Rail
Enclosure material:		Polyamide
Enclosure protection:		IP20
Insulation resistance:		> 10^{14} Ω
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)
Connections L/N/G:		Min/Max multi-stranded section: 4 / 35 mm² Min/Max single-stranded section: 1 / 35 mm²
Certificated tests according to: UNE-EN 61643-11 Complies with requirements of: UL 1449 Relevant standards: UNE 21186, NF C 17-102, IEC 62305		

(1) Required in cases where there is higher nominal current installed upstream from the protector

> DIMENSIONS (mm)



> ACCESSORIES

> AT-8906 ATPV Mod.: Imax 40 kA / U_c 500 V_{DC}

> PROTECTION OF SPECIAL EQUIPMENT POWER SUPPLY

> ATPV series

> ATPV3

> TECHNICAL DATASHEET

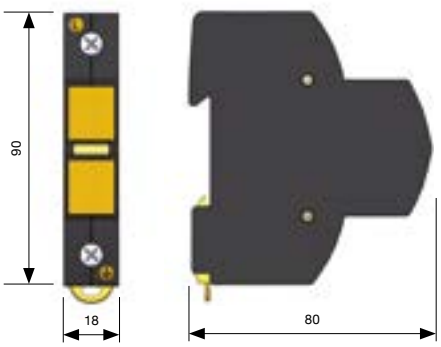
Reference:		**AT-8905**
Maximum continuous operating voltage:	U_c	950 V_{DC}
Nominal discharge current (8/20 µs wave):	I_n	20 kA
Maximum current (8/20 µs wave):	I_{max}	40 kA
Protection level:	U_p	2600 V
Response time:	t_r	< 25 ns
Backup fuse(1):		125 A gL/gG
Maximum short-circuit current:		25 kA (for maximum fuse)
Working temperature:	ϑ	-40 °C to +70 °C
Protector location:		Indoor
Type of connection:		Parallel (one port)
Dimensions:		18 x 90 x 80 mm (1 mod. DIN 43880)
Fixing:		DIN Rail
Enclosure material:		Polyamide
Enclosure protection:		IP20
Insulation resistance:		> 10^{14} Ω
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)
L/N/T connections:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2

Tests certified according to standards: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

(1) Required in cases where there is higher nominal current installed upstream from the protector

> INSTALLATION

> DIMENSIONS (mm)



> PROTECTION OF SPECIAL EQUIPMENT POWER SUPPLY

> ATVOLT series

> ATVOLT

Coordinated direct current power supply for overvoltage protection devices

> **AT-8505**: ATVOLT 5: 5 V_{DC} lines
> **AT-8512**: ATVOLT 12: 12 V_{DC} lines
> **AT-8515**: ATVOLT 15: 15 V_{DC} lines
> **AT-8524**: ATVOLT 24: 24 V_{DC} lines
> **AT-8530**: ATVOLT 30: 30 V_{DC} lines
> **AT-8548**: ATVOLT 48: 48 V_{DC} lines
> **AT-8560**: ATVOLT 60: 60 V_{DC} lines
> **AT-8580**: ATVOLT 80: 80 V_{DC} lines
> **AT-8510**: ATVOLT 110: 110 V_{DC} lines

> AT-3501: RF SPD TESTER: Radiofrequency SPD tester

Tested and certified as a **type 3** protector according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV equipment** according to the REBT.

- Protection in common and differential mode is advisable for this type of line.
- Includes removable module that can be replaced in the event of a breakdown or fault without needing to disconnect the wiring. The power supply is not interrupted when replacing the module.
- It has a radiofrequency receptor in order to carry out maintenance using only an emitter kit. When the RF SPD Tester is applied and the protector is working, the LED flickers green. If the cartridge is damaged, the LED does not light up.
- Wide variety of protectors for different working voltages.
- It remains inactive in normal conditions, without affecting normal operation of the line and or producing leakages.
- Discharge takes place in an internal encapsulated element, with no external flash.
- Low residual voltage for all operating voltages.
- Very fast response time.
- Mechanical connection of conductors using screws, in order to absorb a higher amount of overvoltage.

ATVOLT protectors have been tested and certified in **official and independent laboratories,** obtaining their characteristics according to relevant standards (related in the table).

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

Effective protection for **DC supply lines** in modules containing **medium and tight coordinated protection** for one pair of wires.

> INSTALLATION

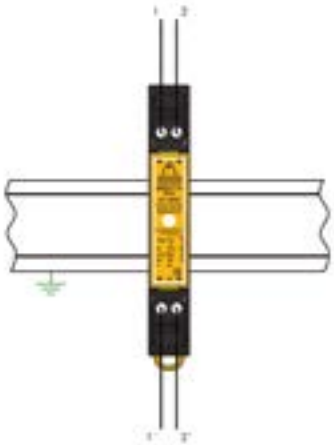
ATVOLT surge protection devices are to be installed **in series** with the DC supply line, cutting the cables and connecting the positive and negative terminals to the corresponding connectors. It is very important to pay close attention to these connections, since a wrong connection could cause short-circuits in the power supply.

It is also essential to correctly connect the input and output terminals. Otherwise the protector components will not work properly.

It is essential to connect the DIN rail to the earth termination system, where the current associated with the overvoltage will have to be channelled.

ATVOLT protectors should preferably be installed **as close to the equipment as possible.**

The power should be disconnected during protector installation.



> PROTECTION OF SPECIAL EQUIPMENT POWER SUPPLY

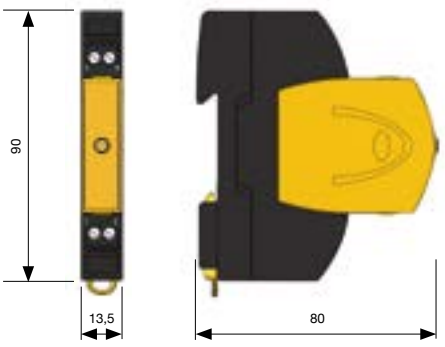
> ATVOLT series

> TECHNICAL DATASHEET

Reference:		ATVOLT 5 **AT-8505**	ATVOLT 12 **AT-8512**	ATVOLT 15 **AT-8515**	ATVOLT 24 **AT-8524**	ATVOLT 30 **AT-8530**
Protection categories according to the REBT:		I, II, III, IV				
Type of tests according to EN 61643-11:		Type 3				
Nominal voltage:	U_n	5 V_{DC}	12 V_{DC}	15 V_{DC}	24 V_{DC}	30 V_{DC}
Maximum continuous operating voltage:	U_c	7 V_{DC}	15 V_{DC}	18 V_{DC}	31 V_{DC}	37 V_{DC}
Maximum operating current:	I_L	3 A				
Nominal discharge current per pole (8/20 µs):	I_n	5 kA				
Combined wave voltage:	$U_{o.c.}$	10 kV				
Protection level at I_n: 8/20 µs wave	$U_p(I_n)$	100 V			120 V	150 V
Response time:	t_r	< 10 ns				
Working temperature:	ϑ	-40 ºC to +70 ºC				
Protector location:		Indoor				
Type of connection:		Series (two ports)				
No. of poles:		2				
Dimensions:		13.5 x 90 x 80 mm (0.75 mod. DIN 43880)				
Fixing:		DIN Rail				
Enclosure material:		Polyamide				
Enclosure protection:		IP20				
Insulation resistance:		> 10^{14} Ω				
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)				
Connections:		4 mm^2 maximum section				

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> ACCESSORIES

> AT-8506: ATVOLT 5 Mod.: 5 V_{DC} lines
> AT-8513: ATVOLT 12 Mod.: 12 V_{DC} lines
> AT-8516: ATVOLT 15 Mod.: 15 V_{DC} lines
> AT-8525: ATVOLT 24 Mod.: 24 V_{DC} lines
> AT-8531: ATVOLT 30 Mod.: 30 V_{DC} lines

> PROTECTION OF SPECIAL EQUIPMENT POWER SUPPLY

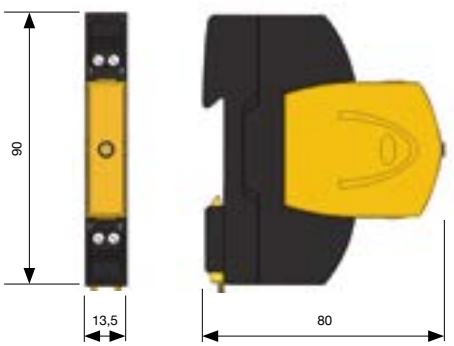
> ATVOLT series

> TECHNICAL DATASHEET

Reference:		ATVOLT 48 **AT-8548**	ATVOLT 60 **AT-8560**	ATVOLT 80 **AT-8580**	ATVOLT 110 **AT-8510**
Protection categories according to the REBT:		I, II, III, IV			
Type of tests according to EN 61643-11:		Type 3			
Nominal voltage:	U_n	48 V_{DC}	60 V_{DC}	80 V_{DC}	110 V_{DC}
Maximum continuous operating voltage:	U_c	65 V_{DC}	72 V_{DC}	96 V_{DC}	132 V_{DC}
Maximum operating current:	I_L	3 A			
Nominal discharge current per pole (8/20 µs):	I_n	5 kA			
Combined wave voltage:	$U_{o.c.}$	10 kV			
Protection level for I_n (8/20 µs wave):	$U_p(I_n)$	240 V	300 V	400 V	
Response time:	t_r	< 10 ns			
Working temperature:	ϑ	-40 °C to +70 °C			
Protector location:		Indoor			
Type of connection:		Series (two ports)			
No. of poles:		2			
Dimensions:		13.5 x 90 x 80 mm (0.75 mod. DIN 43880)			
Fixing:		DIN Rail			
Enclosure material:		Polyamide			
Enclosure protection:		IP20			
Insulation resistance:		> 10^{14} Ω			
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)			
Connections:		4 mm^2 maximum section			

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> ACCESSORIES

> AT-8550: ATVOLT 48 Mod.: 48 V_{DC} lines
> AT-8561: ATVOLT 60 Mod.: 60 V_{DC} lines
> AT-8581: ATVOLT 80 Mod.: 80 V_{DC} lines
> AT-8511: ATVOLT 110 Mod.: 110 V_{DC} lines

> PROTECTION OF SPECIAL EQUIPMENT POWER SUPPLY

> ATVOLT P series

> ATVOLT P

DC power supply protector

> **AT-8590: ATVOLT P5**: 5 V_{DC} lines
> **AT-8514: ATVOLT P12**: 12 V_{DC} lines
> **AT-8526: ATVOLT P24**: 24 V_{DC} lines
> **AT-8549: ATVOLT P48**: 48 V_{DC} lines

Tested and certified as a **type 2** protector according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV equipment** according to the REBT.

- Wide variety of protectors for different operating voltages.
- It remains inactive in normal conditions, without affecting normal line operation.
- Discharge takes place in an internal encapsulated element with no external flash.
- Mechanical connection of conductors using screws, in order to absorb a higher amount of overvoltage.
- Possibility of connection to M5 fork terminal
- Quick response.

ATVOLT P protectors have been tested and certified in **official and independent laboratories,** obtaining their characteristics according to relevant standards (related in the table).

Effective protection for **DC supply lines** in modules containing **medium protection** for one pair of wires.

> INSTALLATION

ATVOLT P surge protection devices are to be installed **in parallel** connected to positive and negative lines and to the ground. It can be installed as the only protection or in combination with other protectors that withstand higher discharge currents. In this case, it is necessary for both to be separated by at least 10 metres of cable or, if this is not possible, by an ATLINK decoupling inductor in order to achieve **correct coordintation between them.**

The lower terminal must be connected to the earth termination system, where the associated overvoltage current will be channelled.

ATVOLT protectors should preferably be installed **as close to the equipment as possible.**

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> PROTECTION OF SPECIAL EQUIPMENT POWER SUPPLY

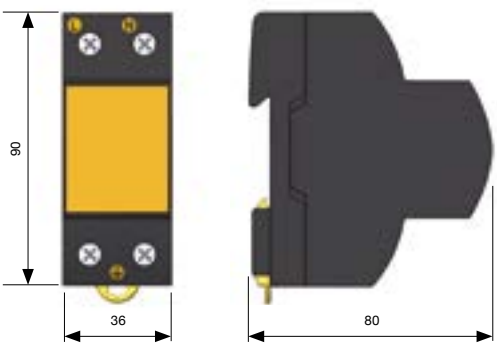
> ATVOLT P series

> TECHNICAL DATASHEET

Reference:		ATVOLT P5 **AT-8590**	ATVOLT P12 **AT-8514**	ATVOLT P24 **AT-8526**	ATVOLT P48 **AT-8549**
Protection categories according to the REBT:		I, II, III, IV			
Type of tests according to EN 61643-11:		Type 2+3			
Nominal voltage:	U_n	5 V_{DC}	12 V_{DC}	24 V_{DC}	48 V_{DC}
Maximum continuous operating voltage:	U_c	7 V_{DC}	15 V_{DC}	31 V_{DC}	65 V_{DC}
Nominal discharge current per pole (8/20 µs):	I_n	5 kA			
Maximum discharge current per pole (8/20 µs wave):	I_{max}	10 kA			
Combined wave voltage:	$U_{o.c}$	6 kV			
Protection level for I_n (8/20 µs wave):	$U_p(I_n)$	500 V	570 V	630 V	730 V
Response time:	t_r	< 25 ns			
Working temperature:	ϑ	-40 ºC to +70 ºC			
Protector location:		Indoor			
Type of connection:		Parallel (one port)			
No. of poles:		2			
Dimensions:		36 x 90 x 80 mm (2 mod. DIN 43880)			
Fixing:		DIN Rail			
Enclosure material:		Polyamide			
Enclosure protection:		IP20			
Insulation resistance:		> 10^{14} Ω			
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)			
Connections:		Min/Max multi-stranded section: 4 / 35 mm^2 Min/Max single-stranded section: 1 / 35 mm^2			

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> PROTECTION OF SPECIAL EQUIPMENT POWER SUPPLY

> ATCOMBO series

> ATCOMBO

Protection of power supply lines with Schuko base

> **AT-8113 ATCOMBO 230**: 230 V_{AC} lines
> **AT-8115 ATCOMBO 130**: 130 V_{AC} lines
> **AT-9320 ATCOMBO 12**: 12 V_{DC} lines
> **AT-9325 ATCOMBO 24**: 24 V_{DC} lines
> **AT-9326 ATCOMBO 48**: 48 V_{DC} lines

- Contains the protectors with lower residual voltage (ATCOVER, ATVOLT).
- Compact box, fully wired and easy to install.
- Discharge takes place in an internal encapsulated element with no external flash.
- It remains inactive in normal conditions, without affecting normal operation of the line and or producing leakages.
- Can be coordinated with other SPDs such as ATSHOCK, ATSHIELD and ATSUB series.
- Both common and differential protection.
- No interruptions in power supply, thus preventing data loss and other inconveniences for the user.
- Wide variety of protectors for different working voltages.
- Mechanical connection of conductors using screws, in order to absorb a higher amount of overvoltage.

The protectors in the ATCOMBO series have been tested in **official and independent laboratories,** obtaining their characteristics according to relevant standards.

ATCOMBO series are power supply protection boxes with specific Schuko sockets to facilitate equipment connection.

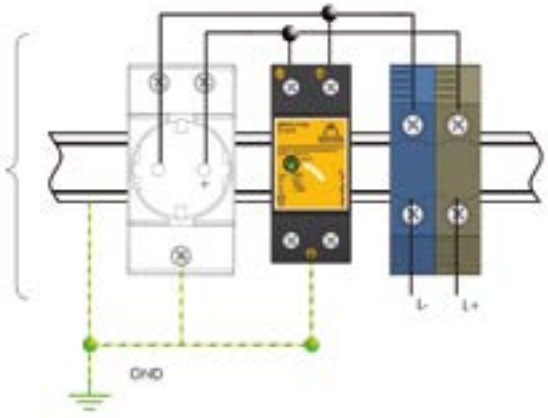
> INSTALLATION

ATCOMBO boxes are to be installed in **in parallel** with the low voltage line, connected to line/s, neutral and ground. **Fuses or circuit breakers must be present upstream.** They will be disconnected during installation for operator safety.

Installation is recommended where **direct lightning currents** could penetrate and very sensitive equipment is connected, without enough space between the coarse and tight protection.

Special care should be taken when there is an **ATCOMBO box containing ATVOLT protectors,** since the polarity could be altered.

ATCOMBO



Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> PROTECTION OF SPECIAL EQUIPMENT POWER SUPPLY

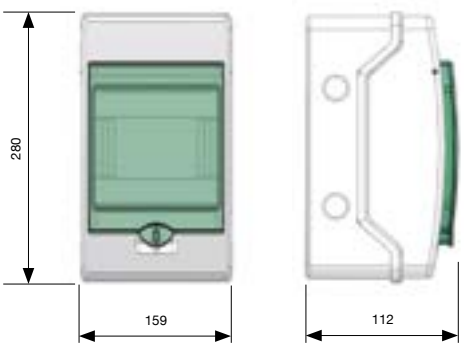
> ATCOMBO series

> TECHNICAL DATASHEET

Reference:		ATCOMBO 230 **AT-8113**	ATCOMBO 130 **AT-8115**	ATCOMBO 12 **AT-9320**	ATCOMBO 24 **AT-9325**	ATCOMBO 48 **AT-9326**
Protection categories according to the REBT:		I, II, III, IV				
Type of tests according to EN 61643-11:		1 + 2 + 3		2 + 3		
Nominal voltage:	U_n	230 V_{AC} (50 Hz)	130 V_{AC} (50 Hz)	12 V_{DC}	24 V_{DC}	48 V_{DC}
Maximum continuous operating voltage:	U_c	275 V_{AC} (50 Hz)	145 V_{AC} (50 Hz)	15 V_{DC}	31 V_{DC}	65 V_{DC}
Nominal discharge current per pole (8/20 µs wave):	I_n	10 kA		5 kA		
Maximum discharge current per pole (8/20 µs wave):	I_{max}	30 kA		10 kA		
Impulse current per pole (10/350 µs wave):	I_{imp}	6 kA		-		
Protection level for I_n (8/20 µs wave):	$U_p(I_n)$	900 V	700 V	570 V	630 V	730 V
Combined wave voltage:	$U_{o.c.}$	6 kV				
Response time:	t_r	< 25 ns				
Working temperature:	ϑ	-40 °C to +70 °C				
Dimensions:		200 x 267 x 112 mm		280 x 159 x 112 mm		
Protector location:		Outdoor				
Type of connection:		Parallel (one port)				
No. of poles:		2				
Fixing:		Wall or vertical support				
Box material:		Self-extinguishing, insulating				
IP Code:		IP65 according to IEC 60.529				
Insulation:		Double (class II)				
Fire resistance:		650 °C according to IEC 60695-2-1				
Impact protection:		IK09 according to EN 50.102				
Connections:		25 mm² maximum section		4 mm² maximum section		

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> POWER SUPPLY PROTECTION FOR AREAS WITH LOW OVERVOLTAGES

This protection is especially designed for working in coordination with the power supply protection already seen in previous sections. Usually, we talk about tight protection, whereas in other sections we referred to coarse or medium protection.

This aims to protect equipment that is more sensitive to overvoltages (computer systems, measurement or electronic equipment etc.) and designed for the end user.

It is also the most flexible since it allows protection for both installations (distribution board) and workstations or a particular piece of equipment.

Aplicaciones Tecnológicas protectors display coordinated protection of the complete electrical installation from the mains to the end user equipment, leaving protection levels around its maximum working voltage.

> ATSOCKET series

Protectors for indoor power supply installation.

> ATPLUG series

Protectors for already installed power supply sockets

> POWER SUPPLY PROTECTION FOR AREAS WITH LOW OVERVOLTAGES

> ATSOCKET series

> ATSOCKET

Indoor protector for power supply lines

> **AT-9501 ATSOCKET**: Single-phase protection. I_n= 3 kA
> **AT-9505 ATSOCKET 5 kA**: Single-phase protection. I_n= 5 kA

Its small size allows its fitting close to the voltage sockets that will be used by customers.

It contains effective protection against transient overvoltages for single-phase power supply lines. **Tight** protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT ITC23).

Type 2 and 3 protectors according to EN 61643-11 and GUIA-BT-23 from REBT. Suitable for **categories I, II, III and IV equipment** according to the REBT.

- Can be coordinated with other protectors such as those from the ATSHOCK, ATSHIELD, ATSUB and ATCOVER series.
- Short response time.
- Do not produce deflagration.
- They do not cause any interruption to the power supply.
- Small size modular protection.
- Thermodynamic control device and sounding alarm (only AT-9501).

ATSOCKET series protectors have been tested in **official and independent laboratories** obtaining their characteristics according to applicable standards (shown in the table).

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

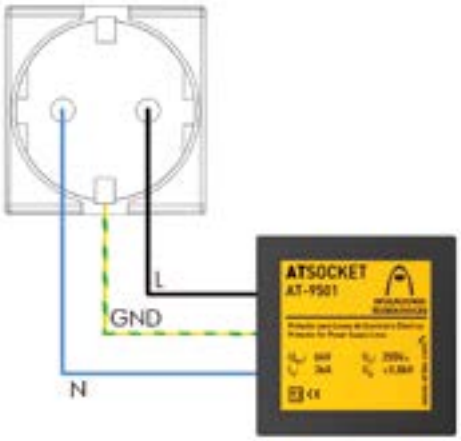
This protector is designed for its connection inside the cable channels that feed the sockets. **Especially designed for outdoor and street lighting**.

> INSTALLATION

To be installed **in parallel** with the low voltage power supply line, with connections to phase to be protected, neutral and ground.

Installation should be carried out **without power running through the line**.

Its use is recommended in systems where equipment sensitive to overvoltages is installed (computers, printers, servers etc.) and always coordinated with type 1 or 2 protectors.



> POWER SUPPLY PROTECTION FOR AREAS WITH LOW OVERVOLTAGES

> ATSOCKET series

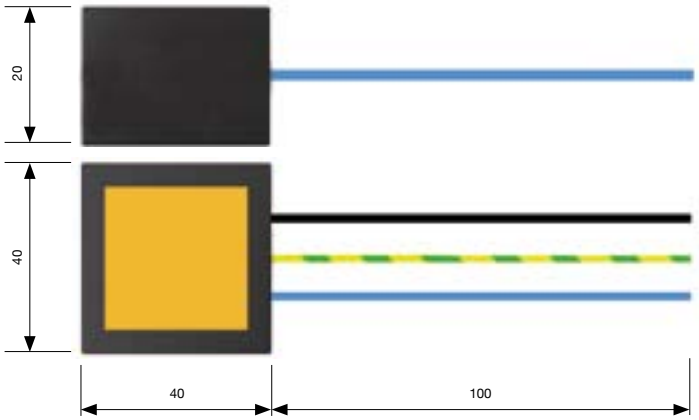
> ATSOCKET

> TECHNICAL DATASHEET

Reference:		ATSOCKET **AT-9501**	ATSOCKET 5 kA **AT-9505**
Protection categories according to the REBT:		I, II, III and IV	
Type of tests according to EN 61643-11:		Type 3	Type 2+3
Nominal voltage:	U_n	230 V_{AC}	
Maximum continuous operating voltage:	U_c	275 V_{AC}	400 V_{AC}
Nominal frequency:		50 – 60 Hz	
Nominal discharge current (8/20 µs wave):	I_n	3 kA	5 kA
Maximum discharge current (8/20 µs wave):	I_{max}	-	15 kA
Combined wave voltage:	$U_{o.c.}$	6 kV	10 kV
Protection level for I_n (8/20 µs wave):	$U_p(I_n)$	800 V	1400 V
Response time:	t_r	< 10 ns	
Working temperature:	ϑ	-40 ºC to +70 ºC	
Dimensions:		40 x 40 x 20 mm	
Protector location:		Indoor	
Type of connection:		Parallel (one port)	phase in series / neutral in parallel
No. of poles:		2	
Enclosure material:		ABS	
Enclosure protection:		IP20	
Insulation resistance:		> 10^{14} Ω	
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)	
Connections L/N/G:		Section 1.5 mm^2 Length 100 mm	

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> POWER SUPPLY PROTECTION FOR AREAS WITH LOW OVERVOLTAGES

> ATPLUG series

> ATPLUG

Electrical plug-in protector

> **AT-9601 ATPLUG**: Single-phase line protection for Schuko type plug.

It contains effective protection against transient overvoltages for single-phase power supply lines. **Tight** protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT ITC23).

Its installation is simple and intuitive, complementing the load to be protected regardless of where it is placed.

Type 3 protector according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV equipment** according to the REBT.

- Can be coordinated with other ATSHOCK, ATSHIELD, ATSUB and ATCOVER series protectors.
- Short response time.
- Do not produce deflagration.
- No interruptions in power supply at any time.
- Thermodynamic control device and visual alarm. When the protector it OK, the green light is illuminated. When there is a failure, the light turns off.

ATPLUG series protectors have been tested in **official and independent laboratories,** obtaining their characteristics according to relevant standards (shown in the table).

This SPD is plugged directly in the same socket as the load to be protected.

> INSTALLATION

To be installed **in parallel** with the loads plugged to the charges that want to be protected.

Its use is recommended in systems where equipment sensitive to overvoltages is installed (computers, printers, servers etc.) and always coordinated with type 1 or 2 protectors.

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> POWER SUPPLY PROTECTION FOR AREAS WITH LOW OVERVOLTAGES

> ATPLUG series

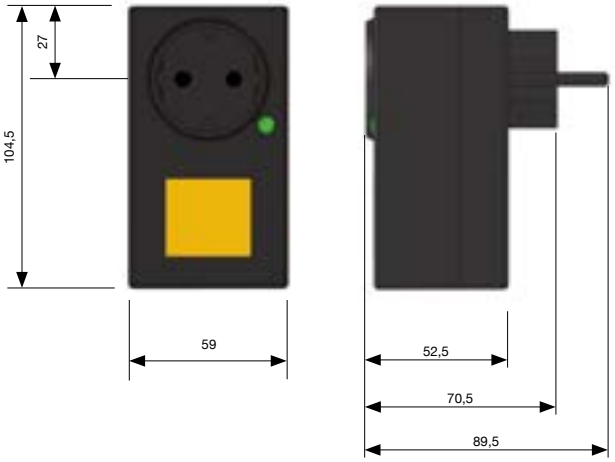
> ATPLUG

> TECHNICAL DATASHEET

Reference:		ATPLUG **AT-9601**
Protection categories according to the REBT:		I, II, III and IV
Type of tests according to EN 61643-11:		Type 3
Nominal voltage:	U_n	230 V_{AC}
Maximum continuous operating voltage:	U_c	275 V_{AC}
Nominal frequency:		50 - 60Hz
Nominal discharge current (8/20 µs wave):	I_n	3 kA
Combined wave voltage:	$U_{o.c.}$	6 kV
Protection level for I_n (8/20 µs wave):	$U_p(I_n)$	800 V
Response time:	t_r	< 10 ns
Working temperature:	ϑ	-40 °C to +70 °C
Dimensions:		105 x 90 x 59 mm
Protector location:		Outdoor
Type of connection:		Parallel (one port)
No. of poles:		2
Enclosure material:		ABS
Enclosure protection:		IP20
Insulation resistance:		> 10^{14} Ω
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> POWER SUPPLY PROTECTION FOR AREAS WITH LOW OVERVOLTAGES

> ATPLUG series

> ATPLUG 130V

Electrical plug-in protector

> **AT-9602 ATPLUG 130V**: Single-phase line protection for type B NEMA 5 plug.

It contains effective protection against transient overvoltages for single-phase power supply lines. **Tight** protection according to the cascade protection recommended in the Spanish Low Voltage Regulations (REBT ITC23).

Its installation is simple and intuitive, complementing the load to be protected regardless of where it is placed.

Type 3 protector according to the standard EN 61643-11 and GUÍA-BT-23 from the REBT. Suitable for **categories I, II, III and IV equipment** according to the REBT.

- Can be coordinated with other ATSHOCK, ATSHIELD, ATSUB and ATCOVER series protectors.
- Short response time.
- Do not produce deflagration.
- No interruptions in power supply at any time.
- Thermodynamic control device and visual alarm. When the protector it OK, the green light is illuminated. When there is a failure, the light turns off.

ATPLUG series protectors have been tested in **official and independent laboratories,** obtaining their characteristics according to relevant standards (shown in the table).

This SPD is plugged directly in the same socket as the load to be protected.

> INSTALLATION

To be installed **in parallel** with the loads plugged to the charges that want to be protected.

Its use is recommended in systems where equipment sensitive to overvoltages is installed (computers, printers, servers etc.) and always coordinated with type 1 or 2 protectors.

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> POWER SUPPLY PROTECTION FOR AREAS WITH LOW OVERVOLTAGES

> ATPLUG series

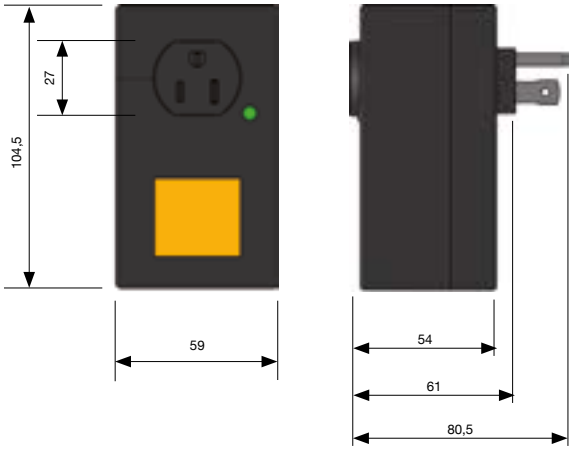
> ATPLUG 130V

> TECHNICAL DATASHEET

Reference:		ATPLUG **AT-9602**
Protection categories according to the REBT:		I, II, III and IV
Type of tests according to EN 61643-11:		Type 3
Nominal voltage:	U_n	130 V_{AC}
Maximum continuous operating voltage:	U_c	170 V_{AC}
Nominal frequency:		50 - 60 Hz
Nominal discharge current (8/20 µs wave):	I_n	3 kA
Combined wave voltage:	$U_{o.c.}$	6 kV
Protection level for I_n (8/20 µs wave):	$U_p(I_n)$	800 V
Response time:	t_r	< 10 ns
Working temperature:	ϑ	-40 °C to +70 °C
Dimensions:		105 x 80 x 59 mm
Protector location:		Outdoor
Type of connection:		Parallel (one port)
No. of poles:		2
Enclosure material:		ABS
Enclosure protection:		IP20
Insulation resistance:		> 10^{14} Ω
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)

Certificated tests according to: UNE-EN 61643-11
Complies with requirements of: UL 1449
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

Surges often enter structures via telephone and data lines, thus affecting the equipment. Just like power supply lines, they can cover large distances and connect very sensitive electronic equipment. Besides, telephone and data lines usually drive very low currents and reach the most fragile components. In any electronic machine it is easy to see that the electrical power supply area is made up of more robust elements, while data communication lines directly connect to integrated circuits, other electronic components through the printed board thin tracks. Surges can cause severe damage in these tracks and components, deteriorating or destroying them and also affecting the data they store.

Telephone lines connect not only phone terminals but also more important and sensitive equipment, such as faxes and modems, inside and outside computers.

Furthermore, one of the consequences of the global use of the internet is that many machines (PLCs, electrical household appliances etc.) activate through the data line (home automation). This gives rise to the appearance of a new trend which consists of designing all kinds of devices for controlling electronic equipment from remote distances. This process often means the multiplication of cross-connections and wiring between devices that are placed in separate buildings or with different earthing systems. The risk of overvoltages damaging the equipment then increases considerably, causing great financial loss not only due to the equipment damage but also the delay or cancellation of the processes and the services they should provide. Protecting communication lines against overvoltages can prevent all these problems.

Data and telephone lines require a previous study of the systems to be protected. Telecommunications is a field in constant evolution, where high precision is required and many different procedures exist. Each transmission protocol has its own working voltage, type of connection, pin-out, etc. All of this data should be known before designing an overvoltage protection strategy which, firstly, does not affect the user and, secondly, is effective against transient overvoltages.

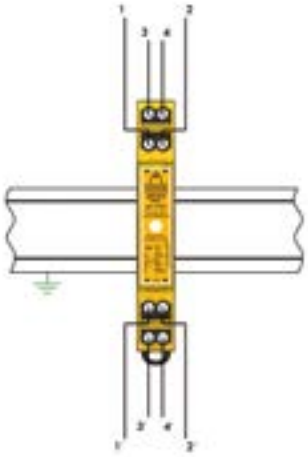
Aplicaciones Tecnológicas, S.A. supplies specific protectors for the most common working conditions. Besides, being manufacturers, we can develop new devices for new types of telecommunication that appear on the market. Our protectors usually have screw-in terminals which are able to withstand greater overvoltages than standard connectors (RJ11, RJ45 and DB9).

Telephone lines connect not only phone terminals but also more important and sensitive equipment, such as faxes and modems, inside and outside computers.

> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

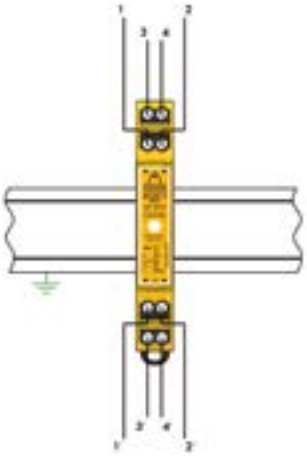
> ATFONO series

Protection of telephone lines (analogue, ADSL, RDSI).



> ATLINE series

Data line protection with a wide range of working voltages.



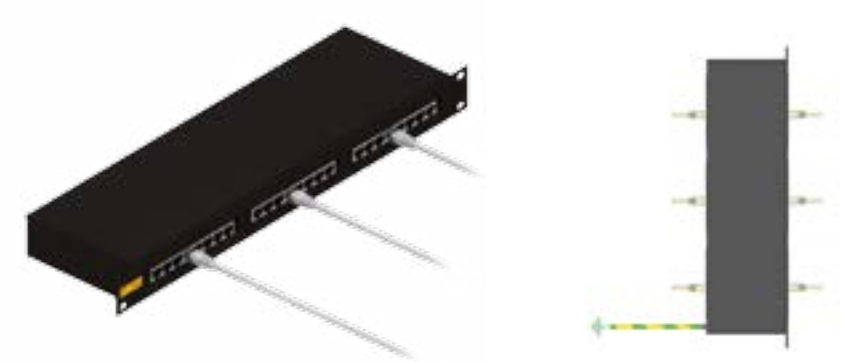
> ATLAN series

Protectors for RJ45 computer lines and internal network (switches, hubs).

> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

> ATLAN 24/16/8 series

Computer network overvoltage protection for rack.



> ATLAN 12/8/4 CAT6 series

Computer network overvoltage protection for rack with category 6 wiring.

> ATDB9 series

Protection of data lines and communication buses with type DB9 connector.

> ATFREQ series

Coaxial cable protectors (TV, CCTV and high frequency signals).

> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

> ATFONO series

> ATFONO

Modular protector against overvoltages for telephone lines for DIN rail

> **AT-9101 ATFONO**: for two pairs of telephone lines.

> AT-3501: RF SPD TESTER: Radiofrequency SPD tester

Effective protection for **analogical and ADSL telephone lines** in modules containing **coordinated protection for 2 pairs of wires.**

- Both common and differential protection recommended for this type of line.
- Connects up to 2 pairs of lines that are very small in size (0.75 DIN modules).
- Protection for telephone lines and also for the digital and analogical equipment connected to these lines (fax, modem, etc).
- Includes removable module that can be replaced in the event of a breakdown or fault without needing to disconnect the wiring. The power supply is not interrupted when replacing the module.
- It has a radiofrequency receptor in order to carry out maintenance using only an emitter kit. When the RF SPD tester is applied and the protector is working, the LED flickers green. If the cartridge is damaged, the LED does not light up.
- Earthing system is introduced through a metal sheet opposite to the fixing on the DIN rail.
- In normal conditions, it remains inactive without affecting line operation or producing any leakages.
- Discharge takes place in an internal encapsulated element with no external flash.
- Very fast response time.
- Conductors are connected using screws, which enable them to absorb a greater amount of the overvoltage.

The ATFONO protector has been tested in **official and independent laboratories**, obtaining their characteristics according to relevant standards (shown in the table).

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

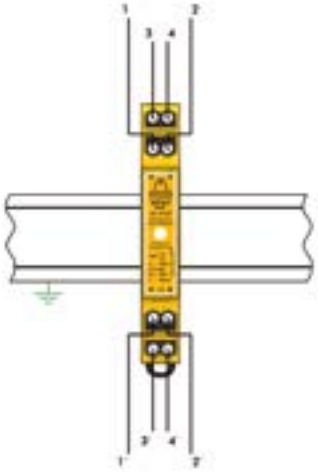
> INSTALLATION

ATFONO protectors are to be installed **in series** with the telephone line, at the point where the line **enters the building**, always respecting the telephone company indications.

When the 2 pieces of equipment to be protected are placed in **different buildings and interlinked,** the protection device should be placed both where the line goes into and out of the buildings.

The **recommended procedure** for installation is the following:

1. Cut the telephone cable.
2. Insert the telephone ends into the connectors. Carefully check that the input and output connections are correctly placed.
3. Connect the DIN rail to the earth terminal, since the overvoltage will be diverted to this element.



> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

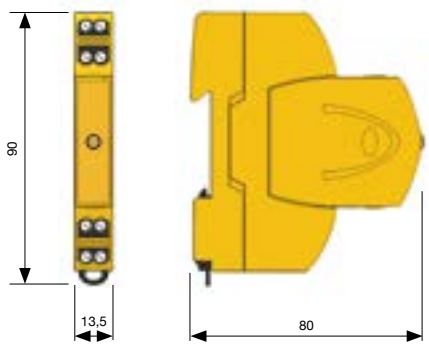
> ATFONO series

> TECHNICAL DATASHEET

Reference:		ATFONO **AT-9101**
Nominal voltage:	U_n	130 V_{DC}
Maximum continuous operating voltage:	U_c	220 $V_{AC, DC}$
Nominal discharge current per line C2 4 kV (1.2/50 µs / 2 kA (8/20 µs):	$I_n(C_2)$	2 kA
Total nominal discharge current C2 4 kV (1.2/50 µs / 2 kA (8/20 µs):		8 kA
Protection level:	U_p	270 V
Maximum operating current:	I_L	360 mA
Series resistance:	R_s	15 Ω
Response time:	t_r	< 10 ns
Working temperature:	ϑ	-40 °C to +70 °C
Protector location:		Indoor
Type of connection:		Series (two ports)
No. of poles:		4
Dimensions:		13.5 x 90 x 80 mm (0.75 mod. DIN 43880)
Fixing:		DIN Rail
Enclosure material:		Polyamide
Enclosure protection:		IP20
Insulation resistance:		> 10^{14} Ω
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)
Connections:		4 mm^2 maximum section

Certificated tests according to: UNE-EN 61643-21
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> ACCESSORIES

> AT-9107: ATFONO Mod.: Telephone lines up to 220 V_{AC}

> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

> ATFONO series

> ATFONO RJ11

Protector for telephone lines with RJ11 connection

> **AT-9104 ATFONO RJ11**: for telephone lines with RJ11 connection type.

ATFONO RJ11 is a protector with **RJ11 input and output** connectors, able to withstand nominal discharge currents of 2 kA for each line.

- Both common and differential protection recommended for this type of line.
- Protection for telephone lines and also for the digital and analogical equipment connected to these lines (fax, modem, etc).
- In normal conditions, it remains inactive without affecting line operation or producing any leakages.
- Discharge takes place in an internal encapsulated element with no external flash.
- Very fast response time.
- Includes 20 cm cable with RJ11 connector.

The ATFONO RJ11 protector has been tested in **official and independent laboratories,** obtaining their characteristics according to relevant standards (shown in the table).

Effective protection for **telephone lines with RJ11** connectors in modules with **tight protection.**

> INSTALLATION

It is recommended that installation is carried out **as close as possible to the equipment**. A telephone cable with a RJ11 connector has 4 wires. The ATFONO RJ11 protects these two pairs of wires **in series**.

For full protection, it must be coordinated with an ATFONO protector at the main line input.

When the 2 devices to be protected are placed in **different buildings and intercommunicated,** protectors should be placed on both sides of the line.

The **recommended procedure** for installation is the following:

1. Insert the protector between the cable with RJ11 connector and the equipment to be protected.
2. Bond the protector to earth through the provided 'faston' type connector.

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

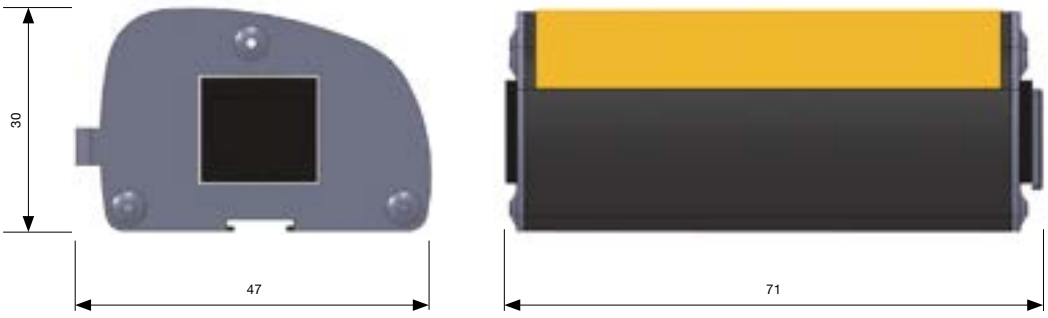
> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

> ATFONO series

> TECHNICAL DATASHEET

Reference:		ATFONO RJ11 **AT-9104**
Nominal voltage:	U_n	130 V_{DC}
Maximum continuous operating voltage:	Uc	220 $V_{AC, DC}$
Nominal discharge current per line C2 4 kV (1.2/50 µs / 2 kA (8/20 µs):	I_n(C2)	2 kA
Protection level:	U_p	270 V
Maximum operating current:	I_L	300 mA
Series resistance:	R_s	15 Ω
Response time:	t_r	< 10 ns
Working temperature:	ϑ	-40 ºC to +70 ºC
Protector location:		Indoor
Type of connection:		Series (two ports)
No. of pairs protected:		2 pairs
Dimensions:		68 x 47 x 30 mm
Enclosure material:		Aluminium
Enclosure protection:		IP20
Input / output connector:		RJ11 / RJ11
Earthing system:		6 mm faston
Certificated tests according to: UNE-EN 61643-21 Relevant standards: UNE 21186, NF C 17-102, IEC 62305		

> DIMENSIONS (mm)



> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

> ATFONO series

> ATFONO RJ45

Protector for telephone lines with RJ45 connection

> **AT-9108 ATFONO RJ45**: for telephone lines with RJ45 type connection.

Effective protection for telephone lines with RJ45 connectors in modules with **tight protection**.

The ATFONO RJ45 is a protector with **RJ45 input and output connectors,** able to withstand nominal discharge currents of 2 kA for each line.

- Both common and differential protection recommended for this type of line.
- Protection for telephone lines and also for the digital and analogical equipment connected to these lines (fax, modem, etc).
- In normal conditions, it remains inactive without affecting line operation or producing any leakages.
- Discharge takes place in an internal encapsulated element with no external flash.
- Very fast response time.
- Includes 50 cm cable with RJ45 connector.

The ATFONO RJ45 protector has been tested in **official and independent laboratories,** obtaining their characteristics according to relevant standards (shown in the table).

Effective protection for **telephone lines with RJ45** connectors in modules with **tight protection.**

> INSTALLATION

It is recommended that installation is carried out **as close as possible to the equipment**. A telephone cable with a RJ45 connector has 4 wires. The ATFONO RJ45 protects these two pairs of wires in series.

For full protection, it must be coordinated with an ATFONO protector at the main line input.

When the 2 devices to be protected are placed in **different buildings and intercommunicated,** protectors should be placed on both sides of the line.

The **recommended procedure** for installation is the following:

1. Insert the protector between the cable with RJ45 connector and the equipment to be protected.
2. Bond the protector to the ground using the 'faston' type connector provided.

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

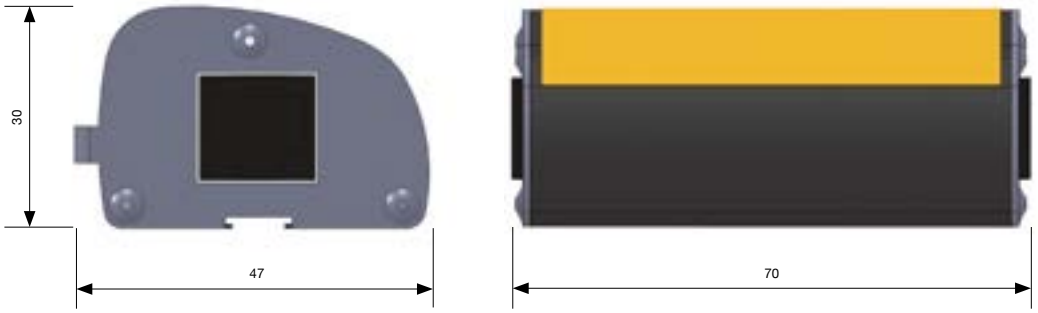
> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

> ATFONO series

> TECHNICAL DATASHEET

Reference:		ATFONO RJ45 **AT-9108**
Nominal voltage:	U_n	130 V_{DC}
Maximum continuous operating voltage:	U_c	220 $V_{AC, DC}$
Nominal discharge current per line C2 4 kV (1.2/50 µs / 2 kA (8/20 µs):	I_n(C2)	2 kA
Protection level:	U_p	270 V
Maximum operating current:	I_L	300 mA
Series resistance:	R_s	15 Ω
Response time:	t_r	< 10 ns
Working temperature:	ϑ	-40 °C to +70 °C
Protector location:		Indoor
Type of connection:		Series (two ports)
No. of pairs protected:		2 pairs
Dimensions:		68 x 47 x 30 mm
Enclosure material:		Aluminium
Enclosure protection:		IP20
Input / output connector:		RJ45 / RJ45 shielded
Earthing system:		6 mm faston
Certificated tests according to: UNE-EN 61643-21 Relevant standards: UNE 21186, NF C 17-102, IEC 62305		

> DIMENSIONS (mm)



> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

> ATFONO series

> ATFONO KRONE / R&M

Protector for telephone lines for KRONE or Reichle & De-Massari connections with earthing terminal

> **AT-9105 ATFONO R&M1**: coordinated protection for telephone lines connected to Reichle & De-Massari connections.

> **AT-9106 ATFONO R&M2**: tight protection for telephone lines with Reichle & De-Massari connections.

> **AT-9109 ATFONO KRONE**: coordinated protection for telephone lines connected to Reichle & De-Massari connections.

This is a modular and removable plug-in protector, able to withstand nominal discharge nominal currents of 5 kA for each line.

- Protection for telephone lines and also for the digital and analogical equipment connected to these lines (fax, modem, etc).
- Compact, removable and small in size.
- In normal conditions, it remains inactive without affecting line operation or producing any leakages.
- Discharge takes place in an internal encapsulated element with no external flash.
- Very fast response time.
- It has a testing system in the front part to check the protector's status.
- The earthing system is introduced through a slot connected to the earthing terminal tab of the Reichle & De-Massari or Krone connection.

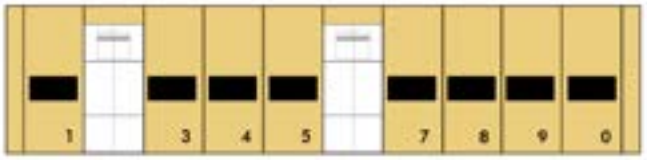
This protector has been tested in **official and independent laboratories**, obtaining their characteristics according to relevant standards (shown in the table).

Effective protection for **telephone lines with KRONE or Reichle & De-Massari connections** in modules with **medium and tight coordinated protection** for 1 pair of wires.

> INSTALLATION

ATFONO R&M/KRONE is to be installed **in series** with the telephone line, on the input connection line, always respecting the indications from the telephone company.

When the 2 devices to be protected are placed in **different buildings and interlinked,** protectors should be placed on both sides of the line.



Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

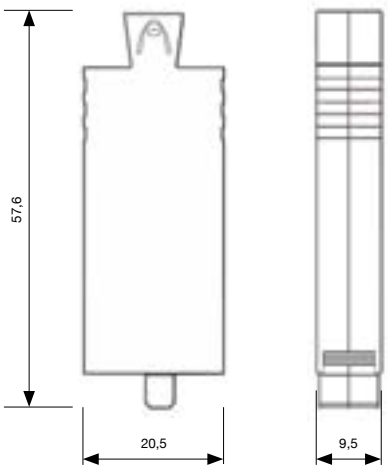
> ATFONO series

> TECHNICAL DATASHEET

Reference:		ATFONO R&M1 **AT-9105**	ATFONO R&M2 **AT-9106**	ATFONO KRONE **AT-9109**
Nominal voltage:	U_n	110 V_{DC}		
Maximum continuous operating voltage:	U_c	180 V_{DC}		
Nominal discharge current (8/20 µs wave):	I_n(C2)	5 kA	100 A	5 kA
Protection level for I_n (8/20 µs wave):	U_p	390 V		300 V
Maximum operating current:	I_L	100 mA		
Response time:	t_r	< 10 ns		
Working temperature:	ϑ	-40 °C to +70 °C		
Protector location:		Indoor		
Type of connection:		Series (two ports)		
No. of pairs protected:		1 pair		
Dimensions:		58 x 21 x 10 mm		
Enclosure material:		Polyamide		
Enclosure protection:		IP20		
Insulation resistance:		> 10^{14} Ω		
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)		

Certificated tests according to: UNE-EN 61643-21
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

> ATLINE series

> ATLINE

Modular overvoltage protector for data lines for DIN rail

- > **AT-9205 ATLINE 5**: 5 V_{DC} lines
- > **AT-9212 ATLINE 12**: 12 V_{DC} lines
- > **AT-9215 ATLINE 15**: 15 V_{DC} lines
- > **AT-9224 ATLINE 24**: 24 V_{DC} lines
- > **AT-9230 ATLINE 30**: 30 V_{DC} lines
- > **AT-9248 ATLINE 48**: 48 V_{DC} lines
- > **AT-9260 ATLINE 60**: 60 V_{DC} lines
- > **AT-9280 ATLINE 80**: 80 V_{DC} lines
- > **AT-9210 ATLINE 110**: 110 V_{DC} lines

Effective protection for **data lines**, in modules with **medium and tight coordinated** protection for two pair of lines.

- > Protection for data lines and the digital or analogical equipment connected to them (computers, PLCs, load cells etc.).
- > Wide variety of protectors for different working voltages.
- > Both common and differential protection recommended for this type of line.
- > Connects up to two pairs of lines that are very small in size (0.75 DIN modules).
- > Includes removable module that can be replaced in the event of a breakdown or fault without needing to disconnect the wiring. The power supply is not interrupted when replacing the module.
- > It has a radiofrequency receptor in order to carry out maintenance using only an emitter kit. When the RF SPD Tester is applied and the protector is working, the LED flickers green. If the cartridge is damaged, the LED does not light up.
- > Earthing system is introduced through a metal sheet opposite to the fixing on the DIN rail.
- > In normal conditions, it remains inactive without affecting line operation or producing any leakages.
- > Discharge takes place in internal encapsulated elements with no external flash.
- > Low residual voltage for all operating voltages.
- > Very fast response time.
- > Mechanical connection of conductors using screws, in order to absorb a higher amount of overvoltage.

ATLINE protectors have been tested in **official and independent laboratories,** obtaining their characteristics according to relevant standards (shown in the table).

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

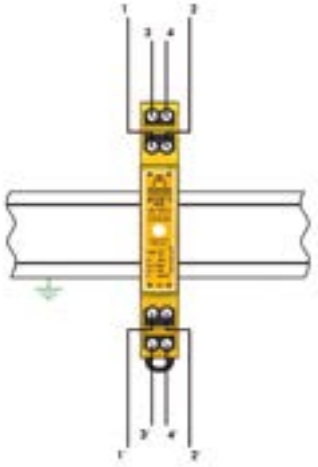
> INSTALLATION

It is recommended that installation is carried out **as close as possible to the equipment**. One communication cable or data line may contain several wires. Each ATLINE can protect up to four of these wires **in series**. It is very important to know **the working voltage, current and function of each wire precisely** in order to select the proper protector.

When the 2 devices to be protected are placed in **different buildings and interlinked,** protectors should be placed on both sides of the line.

The recommended installation procedure is the following:

1. Cut the data cable.
2. Insert the cable ends into the connectors. Carefully check that the input and output connections are correctly placed.
3. Connect the DIN rail to the earth terminal, since the overvoltage will be diverted to this element.



> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

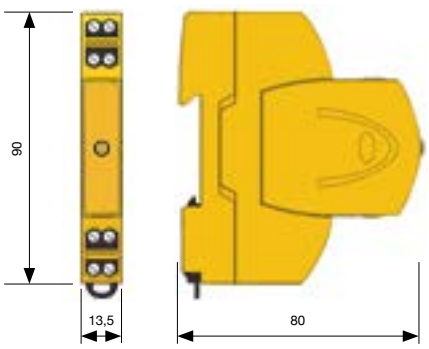
> ATLINE series

> TECHNICAL DATASHEET

Reference:		ATLINE5 **AT-9205**	ATLINE12 **AT-9212**	ATLINE15 **AT-9215**	ATLINE24 **AT-9224**	ATLINE30 **AT-9230**
Nominal voltage:	U_n	5 V_{DC}	12 V_{DC}	15 V_{DC}	24 V_{DC}	30 V_{DC}
Maximum continuous operating voltage:	U_c	7 $V_{AC, DC}$	15 $V_{AC, DC}$	18 $V_{AC, DC}$	31 $V_{AC, DC}$	37 $V_{AC, DC}$
Nominal discharge current per line C2 4 kV (1.2/50 µs) / 2 kA (8/20 µs):	I_n(C2)	2 kA				
Total nominal discharge current C2 4 kV (1.2/50 µs) / 2 kA (8/20 µs):		8 kA				
Protection level (1.2/50 µs):	U_p	66 V			70 V	
Nominal current:	I_n	360 mA				
Series resistance:	R_s	15 Ω				
Response time:	t_r	< 10 ns				
Protector location:		Indoor				
Type of connection:		Series (two ports)				
No. of poles:		4				
Working temperature:	ϑ	-40 ºC to +70 ºC				
Dimensions:		13.5 x 90 x 80 mm (0.75 mod. DIN 43880)				
Fixing:		DIN Rail				
Enclosure material:		Polyamide				
Enclosure protection:		IP20				
Insulation resistance:		> 10^{14} Ω				
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)				
Connections:		4 mm^2 maximum section				

Certificated tests according to: UNE-EN 61643-21
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

DIMENSIONS (mm)



> ACCESSORIES

> AT-9206 ATLINE 5 Mod.: 5V_{DC} lines
> AT-9213 ATLINE 12 Mod.: 12V_{DC} lines
> AT-9216 ATLINE 15 Mod.:15V_{DC} lines
> AT-9225 ATLINE 24 Mod.:24V_{DC} lines
> AT-9231 ATLINE 30 Mod.:30V_{DC} lines

> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

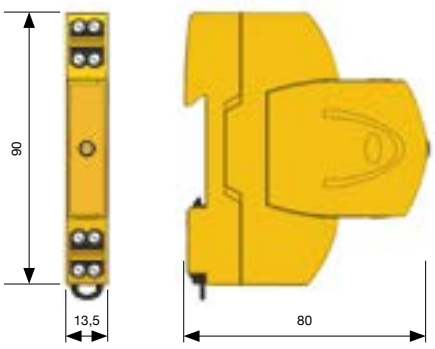
> ATLINE series

> TECHNICAL DATASHEET

Reference:		ATLINE48 **AT-9248**	ATLINE60 **AT-9260**	ATLINE80 **AT-9280**	ATLINE110 **AT-9210**
Nominal voltage:	U_n	48 V_{DC}	60 V_{DC}	80 V_{DC}	110 V_{DC}
Maximum continuous operating voltage:	U_c	65 $V_{AC, DC}$	72 $V_{AC, DC}$	96 $V_{AC, DC}$	132 $V_{AC, DC}$
Nominal discharge current per line C2 4 kV (1.2/50 µs) / 2 kA (8/20 µs):	I_n(C2)	2 kA			
Total nominal discharge current C2 4 kV (1.2/50 µs) / 2 kA (8/20 µs):		8 kA			
Protection level (1.2/50 µs):	U_p	100 V	120 V	140 V	160 V
Nominal current:	I_n	360 mA			
Series resistance:	R_s	15 Ω			
Response time:	t_r	< 10 ns			
Protector location:		Indoor			
Type of connection:		Series (two ports)			
No. of poles:		4			
Working temperature:	ϑ	-40 °C to +70 °C			
Dimensions:		13.5 x 90 x 80 mm (0.75 mod. DIN 43880)			
Fixing:		DIN Rail			
Enclosure material:		Polyamide			
Enclosure protection:		IP20			
Insulation resistance:		> 10^{14} Ω			
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)			
Connections:		Maximum section 4 mm^2			

Certificated tests according to: UNE-EN 61643-21
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> ACCESSORIES

> AT-9249 ATLINE 48 Mod.:48 V_{DC} lines
> AT-9261 ATLINE 60 Mod.:60 V_{DC} lines
> AT-9281 ATLINE 80 Mod.:80 V_{DC} lines
> AT-9211 ATLINE 110 Mod.:110 V_{DC} lines

> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

> RF SPD TESTER

Radiofrequency test device for transient overvoltage protectors for data & communication and DC power supply lines

> **AT-3501 RF SPD TESTER**

RF SPD TESTER is a radiofrequency portable device which checks the status of the removable modules for transient overvoltage protectors in the ATFONO (data lines), ATLINE (telephone lines) and ATVOLT (DC power supply lines) series.

How it works:

Pressing the test button, the RF SPD TESTER sends out a signal to the surge protector circuit. If the protector's LED flickers at the same time as the checking LED, then the module is working properly. When the LED does not light up, the cartridge is damaged and must be replaced as soon as possible to prevent imminent failure in the protection system.

Compatible with:

- > ATLINE series
- > ATFONO series
- > ATVOLT series

Fast and simple checks for effective overvoltage protection system maintenance.

Benefits

Easy and fast test: it is only necessary to bring the RF SPD TESTER to the removable module and press the test button.

No electrical contacts required.

The modules in the protector do not need to be removed or disconnected.

If the indications of this datasheet are not fulfilled during the use or installation of the SPDs, the protection assured by this device could be endangered.

> TECHNICAL DATASHEET

Reference:	RF SPD TESTER **AT-3501**
Dimensions:	150 x 90 x 30 mm
Weight:	200 g
Operating voltage:	9 V_{DC}
Battery type:	PP3
Low battery warning:	Yes
Working temperature:	-10 ºC to +..60 ºC

> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

> ATLAN series

> ATLAN

Individual protector for computer networks

> **AT-2107 ATLAN 100 BASE-T**: individual network SPD with speed of 100 Mbit/s.

> **AT-2204 ATLAN 1000 BASE-T POE**: individual network SPD with speed of 1 Gbit/s Power Over Ethernet type.

> **AT-2207 ATLAN 1000 BASE-T**: individual network SPD with speed of 1 Gbit/s.

ATLAN is a protector with **RJ45 input and output**, able to withstand current up to 2 kA per line.

It is available in different voltages and data transmission speeds.

It is designed to individually protect every individual piece of equipment connected to the computer network.

The **1000 BASE-T** version is designed for equipment which transmits a **large amount of data** (workstations, graphic stations, servers etc.)

Includes 50 cm cable with RJ45 connector.

ATLAN have been tested in **official and independent laboratories,** obtaining their characteristics according to relevant standards (shown in the table).

ATLAN protectors are especially designed to **prevent failures in data transfer between equipment within the same network**. They protect the electronic circuit inputs of the network cards against damage due to transient currents.

> INSTALLATION

Protection should be installed **as close as possible to the equipment.** A UTP cable with a RJ45 connector has 8 wires. ATLAN protects 4 pairs (8 wires) **in series.**

If there are two pieces of equipment located in **separate buildings but linked together**, the protection must be installed on both sides of the line.

The **recommended procedure** for installation is the following:

1. Insert the protector between the cable with RJ45 connector and the equipment to be protected.
2. Bond the protector to the ground using the 'faston' type connector provided.

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

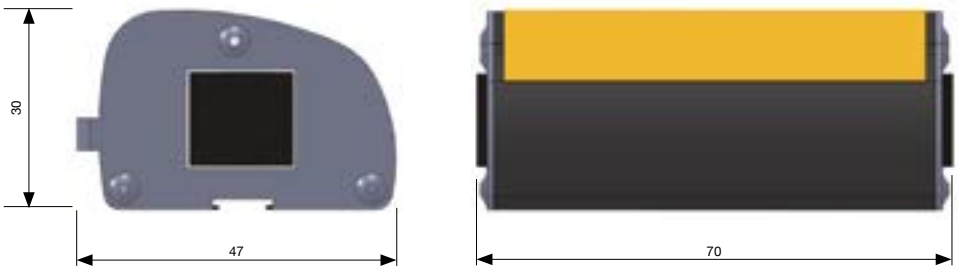
> ATLAN series

> TECHNICAL DATASHEET

Reference:		ATLAN 100 BASE-T **AT-2107**	ATLAN 1000 BASE-T POE **AT-2204**	ATLAN 1000 BASE-T **AT-2207**
Maximum transfer speed:		100 Mbit/s	1000 Mbit	1000 Mbit
Nominal voltage:	U_n	5 V_{DC}	48 V_{DC}	5 V_{DC}
Maximum continuous operating voltage:	U_c	6 V_{DC}	60 V_{DC}	6 V_{DC}
Nominal discharge current per line C2 4 kV (1.2/50 µs) / 2 kA (8/20 µs):	I_n(C2)	2 kA		
Protection level:	U_p	100 V	200 V	100 V
Maximum operating current:	I_L	300 mA		
Series resistance:	R_s	15 Ω		
Response time:	t_r	< 10 ns		
Working temperature:	ϑ	-40 °C to +70 °C		
Protector location:		Indoor		
Type of connection:		Series (two ports)		
No. of pairs protected:		4 pairs		
Dimensions:		68 x 47 x 30 mm		
Enclosure material:		Aluminium		
Enclosure protection:		IP20		
Input / output connector:		RJ45 / RJ45 shielded		
Earthing system:		6 mm faston		

Certificated tests according to: UNE-EN 61643-21
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

> ATLAN series

> ATLAN 1000 BASE-T CAT6

Individual protector for computer networks with category 6 cables.

> **AT-2213 ATLAN 1000 BASE-T CAT6**: individual network SPD with category 6 cables.

> **AT-2210 ATLAN 1000 BASE-T CAT6 POE**: individual POE (Power Over Ethernet) network SPD with category 6 cables.

ATLAN 1000 BASE-T CAT6 is a protector with **RJ45 crimped input cable and RJ45 output connector,** able to withstand current up to 2 kA for each line with a transfer speed of 250 MHz.

It is especially designed to individually protect every piece of equipment connected to a 1000 BASE-T computer network with category 6 wiring which **transmits a large amount of data**(workstations, graphic stations, servers etc.)

Includes 50 cm category 6 cable already crimped.

ATLAN CAT6 have been tested in **official and independent laboratories,** obtaining their characteristics according to relevant standards (shown in the table).

ATLAN protectors are especially designed to **prevent failures in data transfer between equipment within the same network**. They protect the electronic circuit inputs of the network cards against damage due to transient currents.

> INSTALLATION

Protection should be installed **as close as possible to the equipment**. A cable with RJ45 connector has 8 wires. ATLAN protects 4 pairs (8 wires) **in series** .

If there are two pieces of equipment located in **separate buildings but linked together**, the protection must be installed on both sides of the line.

The **recommended procedure** for installation is the following:

1. Insert the protector between the cable with RJ45 connector and the equipment to be protected.
2. Bond the protector to the ground using the 'faston' type connector provided.

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

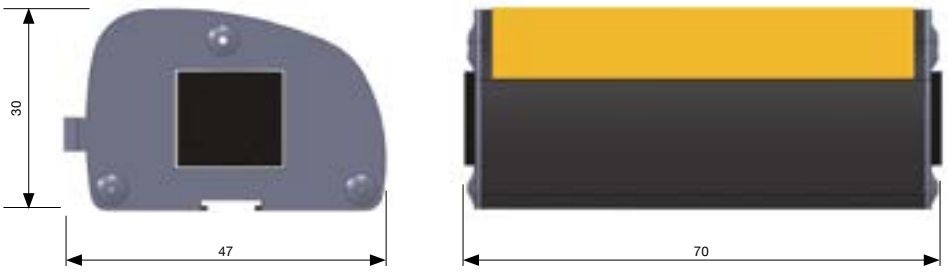
> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

> ATLAN series

> TECHNICAL DATASHEET

Reference:		ATLAN 1000 BASE-T CAT6 **AT-2213**	ATLAN 1000 BASE-T CAT6 POE **AT-2210**
Maximum transfer speed:		1000 Mbit	
Nominal voltage:	U_n	5 V_{DC}	48 V_{DC}
Maximum continuous operating voltage:	U_c	25 V_{DC}	60 V_{DC}
Nominal discharge current per line C2 4 kV (1.2/50 µs / 2 kA (8/20 µs):	I_n(C2)	2 kA	
Protection level:	U_p	150 V	250 V
Maximum operating current:	I_L	300 mA	
Series resistance:	R_s	11 Ω	
Response time:	t_r	< 10 ns	
Working temperature:	ϑ	-40 ºC to +70 ºC	
Protector location:		Indoor	
Type of connection:		Series (two ports)	
No. of pairs protected:		4 pairs	
Dimensions:		68 x 47 x 30 mm	
Enclosure material:		Aluminium	
Enclosure protection:		IP20	
Input / output connector:		Crimped cable / RJ45	
Earthing system:		6 mm faston	
Certificated tests according to: UNE-EN 61643-21 Relevant standards: UNE 21186, NF C 17-102, IEC 62305			

> DIMENSIONS (mm)



> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

> ATLAN series

> ATLAN-C8

Protector against overvoltages for 8 computer lines in one box

> **AT-2221 ATLAN-C 8**: protector ready for 8 local network lines.

ATLAN-C 8 is a protector for **eight line protection,** four pairs protected per line. This is done with a printed circuit board with **RJ45 input/output connectors**, able to withstand current up to 2 kA for every line and with a transfer speed of Gbits/s.

It is especially designed to protect equipment which requires a high internet connection speed, such as the PCs from a cyber place.

Includes eight 50 cm cables with RJ45 connector.

ATLAN-C 8 have been tested in **official and independent laboratories,** obtaining their characteristics according to relevant standards (shown in the table).

ATLAN protectors are especially designed to **prevent failures in data transfer between equipment within the same network**. They protect the electronic circuit inputs of the network cards against damage due to transient currents.

> INSTALLATION

Protection should be installed **as close as possible to the equipment**.

If there are two pieces of equipment located in **separate buildings but linked together**, the protection must be installed on both sides of the line.

The **recommended procedure** for installation is the following:

1. Insert the protector between the cable with RJ45 connector and the equipment to be protected.
2. Bond the cabinet ground to the ground marked on the chassis.

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

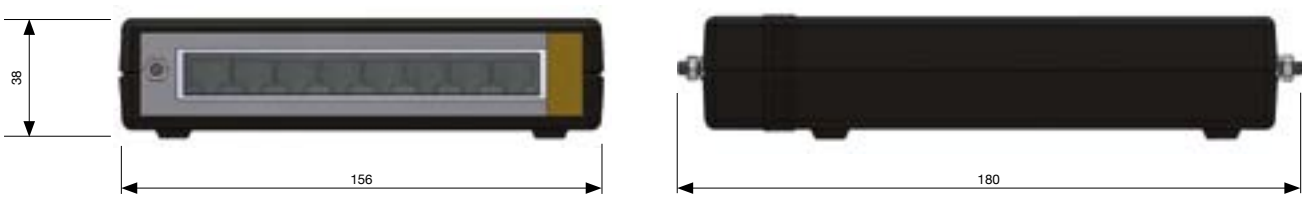
> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

> ATLAN series

> TECHNICAL DATASHEET

Reference:		ATLAN-C 8 **AT-2221**
Maximum transfer speed:		1000 Mbit
Nominal voltage:	U_n	5 V_{DC}
Maximum continuous operating voltage:	U_c	6 V_{DC}
Nominal discharge current per line C2 4 kV (1.2/50 µs) / 2 kA (8/20 µs):	I_n(C2)	2 kA
Protection level:	U_p	100 V
Maximum operating current:	I_L	300 mA
Series resistance:	R_s	15 Ω
Response time:	t_r	< 10 ns
Working temperature:	ϑ	-40 ºC to +70 ºC
Protector location:		Indoor
Type of connection:		Series (two ports)
No. of pairs protected:		8 x 4 pairs
Dimensions:		180 x 156 x 38 mm
Enclosure material:		Polyamide
Enclosure protection:		IP20
Insulation resistance:		> 10^{14} Ω
Self-extinguishing enclosure:		V-0 Type according to UNE-EN 60707 (UL94)
Input / output connector:		RJ45 / RJ45
Earthing system:		M5 screw
Certificated tests according to: UNE-EN 61643-21 Relevant standards: UNE 21186, NF C 17-102, IEC 62305		

> DIMENSIONS (mm)



> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

> ATLAN 24/16/8 series

> ATLAN 24/16/8

Protector for computer network rack

> **AT-2206 ATLAN 8**: protector in rack for 8 network lines.

> **AT-2209 ATLAN 16**: protector in rack for 16 network lines.

> **AT-2208 ATLAN 24**: protector in rack for 24 network lines.

> **AT-2224 ATLAN 8 POE:** protector in rack for 8 POE (Power over Ethernet) network lines.

> **AT-2225 ATLAN 16 POE:** protector in rack for 16 POE (Power over Ethernet) network lines.

> **AT-2223 ATLAN 24 POE:** protector in rack for 24 POE (Power over Ethernet) network lines.

ATLAN protectors are especially designed to prevent failures in data transfer between equipment within the same network. They protect the electronic circuit inputs of the network cards against damage due to transient currents.

ATLAN 24/16/8 is an SPD for **24, 16 and 8 lines** protection with four pairs protected per line. This is done using a printed circuit board with RJ45 input/output connectors, able to withstand current up to 2 kA for each line and with a transfer speed of Gbits/s.

It is especially designed to be inserted into a rack and protect computer network distribution cabinets. Due to its high transfer speed, it is suitable for networks **transferring a large amount of data** (servers, workstations, graphic stations etc)

Includes 50 cm output cables with RJ45 connector.

ATLAN 24/16/8 have been tested in **official and independent laboratories,** obtaining their characteristics according to relevant standards (shown in the table).

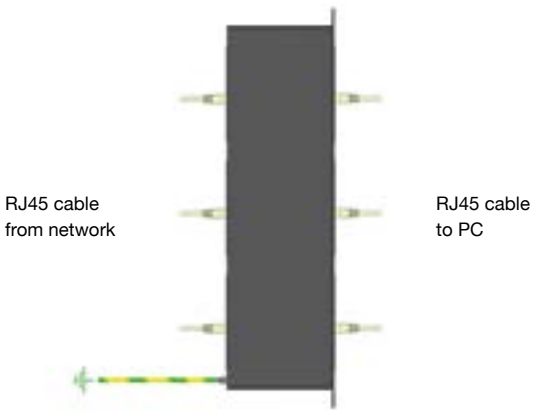
> INSTALLATION

Protection should be installed **as close as possible to the equipment**. In this particular case, we're talking about switches and hubs.

If there are two pieces of equipment located in **separate buildings but linked together**, the protection must be installed on both sides of the line.

The **recommended procedure** for installation is the following:

1. Screw the protectors onto the 19" rack for computer network distribution.
2. Run the network distribution lines from the hub or switch to the protector.
3. Bond the rack ground to the ground marked in the box chassis.



Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

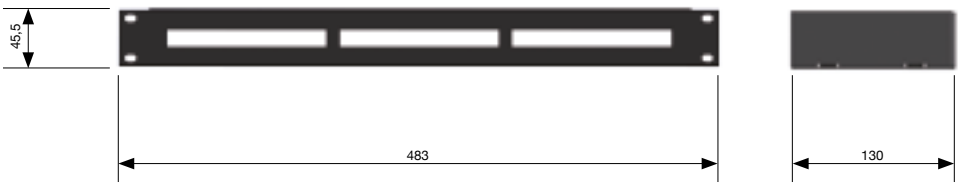
> ATLAN 24/16/8 series

> TECHNICAL DATASHEET

Reference:		ATLAN 8 **AT-2206**	ATLAN 16 **AT-2209**	ATLAN 24 **AT-2208**	ATLAN 8 POE **AT-2224**	ATLAN 16 POE **AT-2225**	ATLAN 24 POE **AT-2223**
Maximum transfer speed:		1000 Mbit					
Nominal voltage:	U_n	5 V_{DC}			48 V_{DC}		
Maximum continuous operating voltage:	U_c	6 V_{DC}			60 V_{DC}		
Nominal discharge current for line C2 4 kV (1.2/50 µs / 2 kA (8/20 µs:	I_n(C2)	2 kA					
Protection level:	U_p	100 V			200 V		
Maximum operating current:	I_L	300 mA					
Series resistance:	R_s	15 Ω					
Response time:	t_r	< 10 ns					
Working temperature:	ϑ	-40 °C to +70 °C					
Protector location:		Indoor					
Type of connection:		Series (two ports)					
No. of pairs protected:		8 x 4 pairs	16 x 4 pairs	24 x 4 pairs	8 x 4 pairs	16 x 4 pairs	24 x 4 pairs
Dimensions:		483 x 150 x 44 mm					
Enclosure material:		Steel					
Enclosure protection:		IP20					
Input / output connector:		RJ45 / RJ45 shielded					
Earthing system:		M5 screw					

Certificated tests according to: UNE-EN 61643-21
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> ACCESSORIES

> **ATLAN 8 PCB – AT-2215**
Printed Circuit Board for ATLAN 8/16/24. Protects 8 lines.

> **ATLAN 8 PCB POE – AT-2231**
Printed Circuit Board for ATLAN 8/16/24 POE. Protects 8 lines.

> **ATLAN 8/24 – AT-2201**
Metal panel where up to 3 ATLAN 8 PCB modules can be fitted. To be mounted on 19" computer racks.

> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

> ATLAN 12/8/4 CAT6 series

> ATLAN 12/8/4 CAT6

Protector for computer network rack with category 6 wiring

- **AT-2217 ATLAN 4 CAT6**: protector in rack for 4 network category 6 lines.
- **AT-2212 ATLAN 8 CAT6**: protector in rack for 8 network category 6 lines.
- **AT-2211 ATLAN 12 CAT6**: protector in rack for 12 network category 6 lines.
- **AT-2226 ATLAN 4 CAT6 POE:** protector in rack for 4 POE (Power Over Ethernet) network category 6 lines.
- **AT-2227 ATLAN 8 CAT6 POE:** protector in rack for 8 POE (Power Over Ethernet) network category 6 lines.
- **AT-2228 ATLAN 12 CAT6 POE:** protector in rack for 12 POE (Power Over Ethernet) network category 6 lines.

ATLAN protectors are especially designed to **prevent failures in data transfer between equipment within the same network**. They protect the electronic circuit inputs of the network cards against damage due to transient currents.

ATLAN 12/8/4 is an SPD for **12, 8 and 4 protected lines**, with four pairs protected per line. This is done with a printed circuit board with **crimped input cable and RJ45 output connector**, able to withstand current up to 2 kA for each line and with a transfer speed of 250 MHz.

It is especially designed to be inserted into a rack and protect computer network distribution cabinets. Due to its high transfer speed, it is suitable for networks **transferring a large amount of data** (servers, workstations, graphic stations etc.)

Includes 50 cm category 6 output cable already crimped.

The ATLAN 12/8/4 CAT6 protector has been tested and certified in **official and independent laboratories,** obtaining their characteristics according to relevant standards (shown in the table).

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

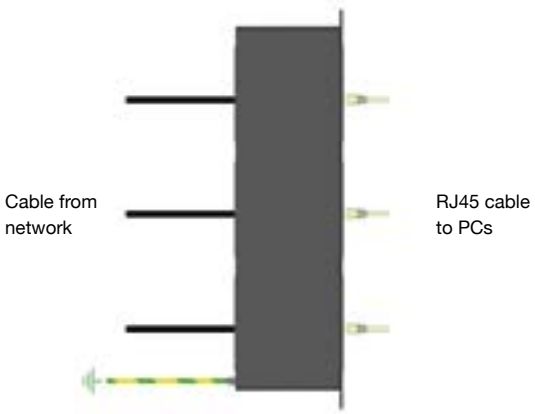
> INSTALLATION

Protection should be installed **as close as possible to the equipment**. In this particular case, we're talking about switches and hubs.

If there are two pieces of equipment located in **separate buildings but linked together**, the protection must be installed on both sides of the line.

The **recommended procedure** for installation is the following:

1. Screw the protectors onto the 19" rack for computer network distribution.
2. Run the network distribution lines from the hub or switch to the protector.
3. Bond the rack ground to the ground marked in the box chassis.



> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

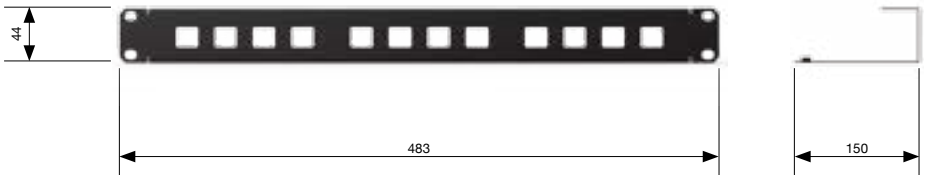
> ATLAN 12/8/4 CAT6 series

> TECHNICAL DATASHEET

Reference:		ATLAN 4 CAT6 **AT-2217**	ATLAN 8 CAT6 **AT-2212**	ATLAN 12 CAT6 **AT-2211**	ATLAN 4 CAT6 POE **AT-2226**	ATLAN 8 CAT6 POE **AT-2227**	ATLAN 12 CAT6 POE **AT-2228**
Maximum transfer speed:		1000 Mbit					
Nominal voltage:	U_n	5 V_{DC}			48 V_{DC}		
Maximum continuous operating voltage:	U_c	25 V_{DC}			60 V_{DC}		
Nominal discharge current for line C2 4 kV (1.2/50 µs / 2 kA (8/20 µs:	I_n(C2)	2 kA					
Protection level:	U_p	150 V			250 V		
Maximum operating current:	I_L	300 mA					
Series resistance:	R_s	15 Ω					
Response time:	t_r	< 10 ns					
Working temperature:	ϑ	-40 ºC to +70 ºC					
Protector location:		Indoor					
Type of connection:		Series (two ports)					
No. of pairs protected:		4 x 4 pairs	8 x 4 pairs	12 x 4 pairs	4 x 4 pairs	8 x 4 pairs	12 x 4 pairs
Dimensions:		483 x 150 x 44 mm					
Enclosure material:		Steel					
Enclosure protection:		IP20					
Input / output connector:		Crimped connector / RJ45					
Earthing system:		M5 screw					

Certificated tests according to: UNE-EN 61643-21
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> DIMENSIONS (mm)



> ACCESSORIES

> **AT-2222 ATLAN 4 PCB CAT6:** Printed Circuit Board for replacing ATLAN 4/12/16 series. Protects 4 CAT6 lines.

> **AT-2230 ATLAN 4 PCB CAT6 POE:** Printed Circuit Board for replacing ATLAN 4/12/16 POE series. Protects 4 CAT6 POE lines.

> **AT-2229 ATLAN 4/12:** Metal panel where up to 3 ATLAN 4 PCB CAT6 modules can be fitted. To be mounted on 19" computer racks.

> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

> ATDB9 series

> ATDB9

Individual overvoltage protector for type DB9 data lines

> **AT-2300 ATDB9**: individual protector with DB9 type connector for data lines.

ATDB9 protectors are especially designed to **prevent failures in data transfer between equipment with type DB9 or SUB-D9 connectors.**

They are specially design for type **RS-232, RS-485, TTL** communications and type **Profibus, CAN, I2C and SPI** buses.

ATDB9 is a screened protector with **SUB-D9 input and output connectors,** able to withstand current of 2 kA for each line.

ATDB9 have been tested in **official and independent laboratories,** obtaining their characteristics according to relevant standards (shown in the table).

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

It is recommended that installation is carried out **as close as possible to the equipment**. ATBD9 connector has 9 wires. The ATDB9 protects these 9 wires in series.

If there are two pieces of equipment located in **separate buildings but linked together**, the protection must be installed on both sides of the line.

The **recommended procedure** for installation is the following:

1. Insert the protector between the communication cable with DB9 connector and the equipment to be protected.
2. Bond the protector to the ground using the 'faston' type connector provided.

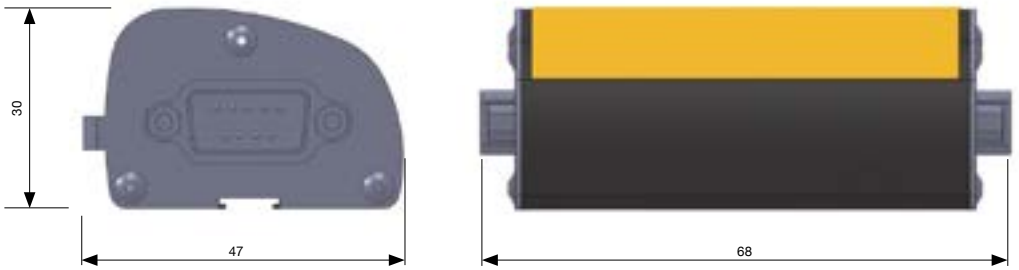
> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

> ATDB9 series

> TECHNICAL DATASHEET

Reference:		**AT-2300**
Nominal voltage:	Un	12 V_{DC}
Maximum continuous operating voltage:	U_c	15 V_{DC}
Nominal discharge current per line C2 4 kV (1.2/50 µs / 2 kA (8/20 µs):	I_n(C2)	2 kA
Protection level:	U_p	80 V
Maximum operating current:	I_L	300 mA
Series resistance:	R_s	15 Ω
Response time:	t_r	< 10 ns
Working temperature:	ϑ	-40 ºC to +70 ºC
Protector location:		Indoor
Type of connection:		Series (two ports)
No. of wires protected:		9 wires
Dimensions:		68 x 47 x 30 mm
Enclosure material:		Aluminium
Enclosure protection:		IP20
Input / output connector:		DB9 / DB9
Earthing system:		6 mm faston
Certificated tests according to: UNE-EN 61643-21 Relevant standards: UNE 21186, NF C 17-102, IEC 62305		

> DIMENSIONS (mm)



> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

> ATFREQ series

> ATFREQ

Overvoltage protection devices for coaxial cables

- **AT-2102 ATFREQ-50UHF**: UHF type 50 W protector.
- **AT-2103 ATFREQ-F**: F type 50 W protector.
- **AT-2104 ATFREQ-TV**: TV type 50 W protector.
- **AT-2105 ATFREQ-50BNC015**: BNC type 50 W protector 0.15 dB.
- **AT-2106 ATFREQ-50N**: N type 50 W protector.
- **AT-2108 ATFREQ-400BNC015**: BNC type 400 W protector 0.15 dB.
- **AT-2109 ATFREQ-400UHF**: UHF type 400 W protector.
- **AT-2110 ATFREQ-7/16**: 7/16 type 900 W protector.
- **AT-2111 ATFREQ-400N**: N type 400 W protector.
- **AT-2115 ATFREQ-50BNC:** BNC type 50 W protector.
- **AT-2117 ATFREQ-50SMA:** SMA type 50 W protector.
- **AT-2118 ATFREQ-400BNC**: BNC type 400 W protector.
- **AT-2119 ATFREQ-6G:** N type 6 GHz protector.
- **AT-2120 ATFREQ-75BNC:** BNC type 75 Ω protector.
- **AT-2121 ATFREQ-1200UHF:** UHF type 1200 W protector.
- **AT-2123 ATFREQ-50TNC:** TNC type 50 W protector.
- **AT-2126 ATFREQ-6GSMA:** SMA type 6 GHz protector.

Due to their location, **aerials** are one of the most exposed elements to lightning discharges. Even when an external lightning protection system exists, the discharge secondary effects can affect the television and radiofrequency signals.

ATFREQ surge protection devices **protect the signal cable**, channelling the induced and conducted surges to ground, thus preventing damage to the communication and TV equipment and the connected devices (DVD, video, decoders, home cinemas etc.)

Effective protection against transitory overvoltages by means of **gas discharge tubes** able to withstand up to **10 kA**.

- Optimum coupling with imperceptible losses.
- Small attenuation in the signal even for very high frequencies.
- Short response time.
- Do not produce deflagration.
- Small size.
- Specific connectors for each application.

ATFREQ protectors have been tested in **official and independent laboratories,** obtaining their characteristics according to relevant standards (shown in the table).

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> INSTALLATION

ATFREQ SPDs are designed to be placed in series with the aerial signal cable. It should be installed **as close as possible to the equipment** to be protected.

Each protector has two coaxial connectors and one earthing terminal. We supply SPDs with the most widely used coaxial connectors **(BNC, UHF, N, F, TV, 7/16)** and male/female adapters to be directly inserted into any connection.

It is important to point out that ATFREQ protects the signal coaxial cable coming from the aerial, not the power supply. Power supply should be protected using specific SPDs such as ATSUB, ATCOVER, ATSHOCK, ATSHIELD or ATVOLT.

Connection to earth is carried out using a M5 screw placed to one side of the SPD. The earth connection must be as direct as possible, using a proper terminal and cable.

> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

> ATFREQ series

> TECHNICAL DATASHEET

Reference	Name (ATFREQ-)	Connector	Frequency range	Attenuation	Impedance	Exchanged power	DC sparkover voltage	M-F Coupling
AT-2104	TV	TV	0 - 1 GHz	< 1.2 dB	75 Ω	50 W	90 V	Included
AT-2103	SAT	F (sat.)	0 - 2 GHz	< 0.5 dB	75 Ω	50 W	90 V	Included
AT-2105	50BNC015	BNC	0 - 1 GHz	< 0.15 dB	50 Ω	50 W	90 V	Included
AT-2115	50BNC	BNC	0 - 1 GHz	< 0.2 dB	50 Ω	50 W	90 V	Included
AT-2120	75BNC	BNC	0 - 1 GHz	< 0.2 dB	75 Ω	50 W	90 V	Included
AT-2108	400BNC015	BNC	0 - 1 GHz	< 0.15 dB	50 Ω	400 W	250 V	Included
AT-2118	400BNC	BNC	0 - 1 GHz	< 0.2 dB	50 Ω	400 W	250 V	Included
AT-2123	50TNC	TNC	0 - 2.6 GHz	< 0.2 dB	50 Ω	50 W	90 V	AT-2770
AT-2106	50N	N	0 - 3 GHz	< 0.15 dB	50 Ω	50 W	90 V	Included
AT-2111	400N	N	0 - 3 GHz	< 0.15 dB	50 Ω	400 W	250 V	Included
AT-2119	6G	N	0 - 5.8 GHz	< 0.2 dB	50 Ω	50 W	90 V	Included
AT-2117	50SMA	SMA	0 - 1 GHz	< 0.2 dB	50 Ω	50 W	90 V	Included
AT-2126	6GSMA	SMA	0 - 5.8 GHz	< 0.2 dB	50 Ω	50 W	90 V	Included
AT-2102	50	UHF	0 - 3 GHz	< 0.3 dB	50 Ω	50 W	90 V	AT-2750
AT-2109	400	UHF	0 - 3 GHz	< 0.3 dB	50 Ω	400 W	250 V	AT-2750
AT-2121	1200	UHF	0 - 3 GHz	< 0.3 dB	50 Ω	1200 W	250 V	AT-2750
AT-2110	900	7/16	0.9 - 2.6 GHz	< 0.3 dB	50 Ω	900 W	600 V	AT-2760

> COMMON CHARACTERISTICS

Maximum current:	I_{max}	10 kA (8/20 µs)
Working temperature:	ϑ	-55 °C to +85 °C
Response time:	t_r	< 100 ns
Enclosure material:		Stainless steel
Enclosure protection:		IP20

Tests certified according to standards: UNE-EN 61643-21
Relevant standards: UNE 21186, NF C 17-102, IEC 62305

> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

> ATFREQ series

> ATFREQ 12 BNC

Surge protection devices for coaxial cable rack

> **AT-2218 ATFREQ12 BNC**: protector in rack for 12 telecommunication lines

ATFREQ 12 BNC is a protector ready for **12 lines protection in a 19" rack.** Each device integrated into this rack, has two BNC type female coaxial connectors and a ground connection (includes adapter to allow connection from female to male).

ATFREQ SPDs are designed to be placed in series with the aerial signal cable. It should be installed **as close as possible to the equipment** to be protected.

It is designed to be inserted into a rack and protect data network cabinets. Due to its high transfer speed, it is suitable for networks **transferring a large amount of data** (aerials, wave amplifiers, wave distributors etc.).

Connection to earth is carried out using a M5 screw placed to one side of the SPD. The connection must be as direct as possible, using a suitable ring terminal and cable.

ATFREQ 12 BNC have been tested in **official and independent laboratories**, obtaining their characteristics according to relevant standards (shown in the table).

> INSTALLATION

Protection should be installed **as close as possible to the equipment.** In this particular case, we are talking about aerials, amplifiers and distributors.

If there are two pieces of equipment located in **separate buildings but linked together**, the protection must be installed on both sides of the line.

The **recommended procedure** for installation is the following:

1. Place the 19" rack inside the cabinet.
2. Lay cables from the aerial or element to be protected up to the back end of the machine.
3. The protected outlet must be at the front of the rack.
4. Bond the cabinet ground to the ground marked in the box.

Connection to earth is a must. Earthing in the whole installation must be bonded either directly or by a spark gap and resistance should be lower than 10 Ω.
If the indications on this datasheet are not fulfilled during use or installation of the protectors, the protection provided by this device could be compromised.

> PROTECTION FOR DATA AND TELECOMMUNICATION LINES

> ATFREQ series

> TECHNICAL DATASHEET

Reference:		ATFREQ 12 BNC **AT-2218**
Frequency range:		0 - 1 GHz
Attenuation:		< 0.15 dB
Maximum continuous operating voltage:	U_c	70 V_{DC}
Nominal discharge current for line C2 10 kV (1.2/50 µs / 5 kA (8/20 µs:	I_n(C2)	5 kA
Maximum discharge current (8/20 µs wave)	I_{max}	10 kA
DC Sparkover voltage:		90 V
Exchanged power:		50 W
Impedance:	Z	50 Ω
Response time:	t_r	< 100 ns
Working temperature:	ϑ	-40 ºC to +70 ºC
Protector location:		Indoor
Type of connection:		Series
No. of protections:		12
Dimensions:		482 x 67 x 44 mm
Enclosure material:		Steel
Enclosure protection:		IP20
Input / output connector:		BNC
Earthing system:		M5 screw
Certificated tests according to: UNE-EN 61643-21 Relevant standards: UNE 21186, NF C 17-102, IEC 62305		

> DIMENSIONS (mm)