ALLTEC®

SOLUTION PROVIDERS FOR AN ENERGIZED WORLD™

Grounding and Bonding Solutions • Surge Suppression • Lightning Protection

Surge Suppression Catalog

ALLTEC®

SOLUTION PROVIDERS FOR AN ENERGIZED WORLD™

Surge Suppression Catalog

Grounding / Earthing & Bonding Solutions | Surge Protection | Lightning Protection

Introduction

About ALLTEC

ALLTEC is a global leader in the design, manufacture and development of products and services for grounding & bonding solutions, surge protection, and lightning protection.

"As 'Solution Providers for an Energized World™,' we offer a comprehensive facility protection approach to solving the world's most difficult grounding, power quality, and lightning problems."
-Christopher Bean, President/CEO

Grounding / Earthing & Bonding Solutions

As equipment becomes more sophisticated and electrically susceptible, the need for an exceptionally low-resistance/low-impedance grounding system becomes more crucial. When implemented effectively, harmful electrical currents are safely redirected to earth and away from important equipment and facilities.

Surge Protection

While lightning is the most notorious surge generator, approximately 80% of all transient surge activity originates from internally generated sources. Properly installed surge protection devices on all circuit conductors maximizes total site protection.

Lightning Protection

Lightning is an awesome and unpredictable act of nature that causes more deaths and property damage than any other weather related event. A properly installed lightning protection system is over 98% effective in preventing catastrophic lightning damage.

Consulting, Engineering & Design, Project Management and Inspection/ Preventative Maintenance Services

ALLTEC's greatest strength is our complete Systems Engineering and Products Solutions Program. Our experienced and accredited Engineering and Project Management teams apply the three-tiered ALLTEC Protection Pyramid™ approach while working with leading international client companies to develop the best solutions for each and every situation. While ALLTEC offers a full multi-phase solution for clients in need of all of our services, we can also provide a selection of individualized services which best fit a client's unique protection needs.

Assessing the Problems, Providing Answers, Project Oversight & Continued Protection

- Consulting (Phase I) - TerraEval℠ Advanced Solution Assessment
- Engineering & Design (Phase II) - Customized Solution Development
- Project Management (Phase III) – Strong and Cost Effective Project Management Support
- Inspection/Preventative Maintenance (Phase IV) – System Performance and Condition Evaluation

You can learn more about our services and capabilities at www.alltecglobal.com/services

The ALLTEC Protection Pyramid™

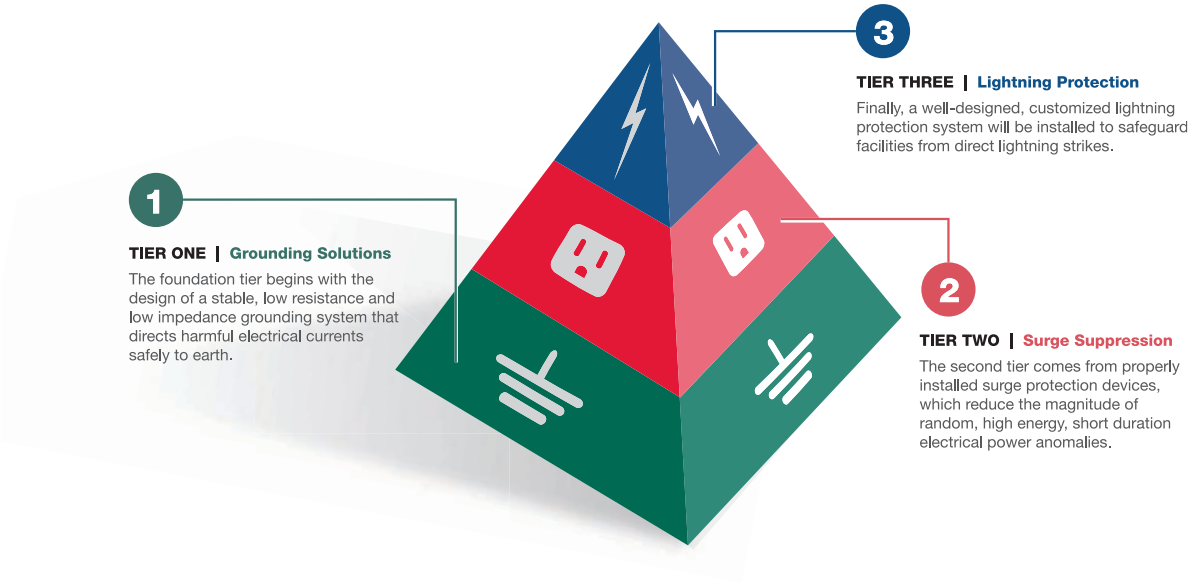
The ALLTEC Protection Pyramid™ provides a three-tier comprehensive facility approach for grounding/ earthing & bonding, surge suppression, and lightning protection solutions. The Pyramid comes as close as humanly possible to protect both man and machine from lightning and non-lightning induced transient voltage damage.

Why the Pyramid?

Each level of the ALLTEC Protection Pyramid™ represents a method utilized to protect facilities from damages caused by harmful electrical events. Rather than treating these tiers as independent, ALLTEC regards each layer as an interlocking component. When all three tiers are designed, installed, and maintained as a total system, comprehensive facility protection can be achieved.

Safeguard valuable assets, defend critical electronics, and protect businesses using the ALLTEC Protection Pyramid™. The ALLTEC Protection Pyramid™ uses ALLTEC's proven products and services for grounding, surge suppression, and lightning protection to provide full infrastructure protection.

You can learn more at www.alltecglobal.com/pyramid



ALLTEC is an ISO 9001 registered company. We are committed to our customers' satisfaction and follow strict quality guidelines to ensure that we meet or exceed our customer's needs. When dealing with the risks associated with lightning and power quality issues, it is imperative that every effort is taken to use the highest quality products and adhere to the highest standards for protection services.

ALLTEC Products & Solutions

Grounding / Earthing & Bonding Solutions

TerraDyne®
Electrolytic Grounding System

TerraFill®
Low-Resistivity Grounding Backfill

TerraWeld®
Exothermic Welding System

TerraBar
Bus Bars

GroundGuardian®
Active Floating Roof Tank Monitoring System

Surge Protection Solutions

DynaShield®
Medium Voltage Protection

DynaShield®
Main and Sub Panel Protection

DynaShield®
Hardwired Protection

DynaShield®
DIN Rail Protection

DynaShield®
Data Signal Protection

Custom SPDs can be developed for your specific needs.

Lightning Protection System Solutions

TerraStat®
Charge Dissipation Terminals

TerraStreamer®
Early Streamer Emission Terminals

LSC-7D
Lightning Strike Counter

Traditional Lightning Protection Equipment

Standards & Code Specification Compliance

ALLTEC is accredited and certified by numerous standards authorities. As an expert in the latest approved standards and code specifications for grounding and lightning protection systems, ALLTEC is an active sought-after member for standards committees.

You can learn more about ALLTEC Products at www.alltecglobal.com/products

General Information

Ability to Serve

ALLTEC has the capability to design, manufacture, and install any lightning protection or grounding system you may require. Our complete engineering facilities are prepared to assist you with any special or unusual requirements.

Claims & Shortages

Please be aware that ALLTEC assumes no liability for any damage to goods in shipment. All materials must be inspected upon receipt BEFORE signing for acceptance of shipment. Once you have signed the bill of lading accepting shipment, you are acknowledging that you have received the shipment in full and with no damage. Any damages or shortages need to be noted on the bill of lading before signing and immediately file a claim with the delivering transportation company. It is our policy that any claims for shortages or errors must be made within 24 hours after receipt of goods. Any error on our part will be taken care of promptly and at no cost to you, the customer. Any shortages found and reported more than 24 hours after shipment acceptance will not be replaced free of charge.

International Customers

Our exporting policy is available upon request. This policy may vary slightly, depending upon the receiving country and its Customs procedures. ALLTEC offers all of our engineering and design services worldwide.

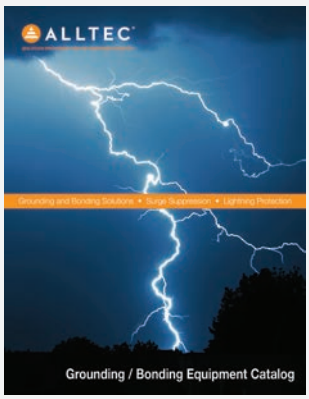
Documentation & Wire Transfer Fees

ALLTEC charges standard customary fees for obtaining and processing documents for overseas shipments. Any wire transfer or bank fees are the responsibility of the customer and will be included in the price quotation supplied before the shipment leaves our warehouse.

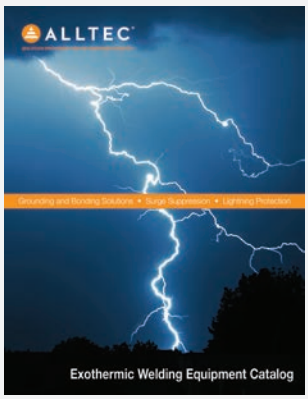
ALLTEC Product Catalogs

ALLTEC offers four catalogs.

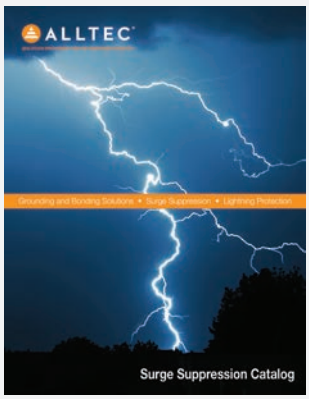
Grounding / Bonding Equipment Catalog



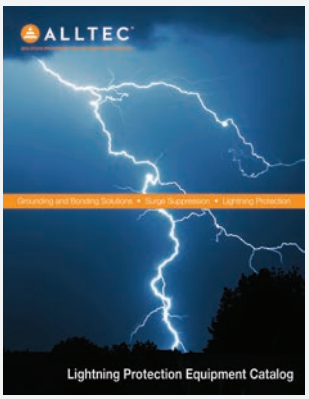
Exothermic Welding Equipment Catalog



Surge Suppression Catalog



Lightning Protection Equipment Catalog



Terms and Conditions

"Goods & Services"

1. Definitions

The term "Seller" means ALLTEC, the term"Buyer" means the company, person or other entity who is the purchaser of the Goods, the term "Goods" means any goods or materials ordered and sold pursuant to the terms and conditions set forth herein.

2. Price

Unless otherwise stated, price of the Goods shall be the price in effect at the date and time of shipment. Seller reserves the right to adjust price based on volume purchases; any discounts allowed for volume purchases will be in the Seller's sole discretion. Price does not include any sales, use, excise or similar taxes which shall be added to the price of the Goods and shall be the responsibility of Buyer. Unless otherwise stated, minimum order is $125.00 (excluding freight) on any single order. Each shipment will be separately invoiced.

3. Payments Terms

Terms of payment are net thirty (30) days. Service charge on late payments shall be applicable at the rate of one and one-half percent (1.5%) per month or an annual percentage rate of eighteen (18%) per annum. In addition, Buyer shall be obligated for Seller's reasonable collection agency or attorneys' fees that may be incurred by Seller to collect any sums due Seller hereunder or service charge. Seller reserves the right to apply any payments received from Buyer to any outstanding invoice of Seller at Seller's sole discretion.

4. Freight

The purchase price of the Goods shall be EXWORKS, Canton, NC or other named shipping point. In situations of "prepay and add", ALLTEC is unable to provide a copy of the actual freight bill due to agreements with our carriers regarding rate disclosure confidentiality.

5. Delivery

(a) Seller's place and point of delivery shall be deemed to be delivery to a carrier at Seller's plant in Canton, NC, USA or such other designated shipping point designated by Seller. If Buyer fails to furnish complete shipping directions to Seller within a reasonable time of placing the order, Seller, at Seller's discretion, may make necessary shipping arrangements with a carrier selected by Seller, the cost of which shall be paid by Buyer.

(b) If and to the extent a delivery date is stated, it is the estimated delivery date only. All accepted orders, whether or not delivery dates are specified thereon, shall be subject to delays or failures in manufacture or delivery due to causes beyond the control of Seller or carrier. Buyer's obligations shall continue notwithstanding any delay in delivery, provided if performance by Seller is prevented in whole or in part for a period of three (3) consecutive months, then in such event Seller or Buyer (provided Buyer is not responsible for the delay) may cancel any order that has not been shipped as of such date.

(c) If for any reason, the Buyer is unable to accept the delivery of Goods according to the mutually established schedule; the Seller, at its option and after three (3) days written notice to the Buyer, may place the Goods in storage. In such event, the Buyer shall pay any and all storage or other related costs. If the Buyer fails to accept any delivery or part thereof, the Seller, at its option, may treat such failure as a breach of this Agreement and exercise any and all remedies available to it pursuant to the terms and conditions set forth herein or available to it as a matter of law.

6. Credit

The Seller's obligations are at all times subject to the Seller's approval of the Buyer's credit standing. Upon request, the Buyer shall furnish the Seller such credit information as may be customary and reasonably requested by the Seller. At its discretion, the Seller reserves the right to require payment in advance, C.O.D., and/or otherwise modify credit terms. If at any time the Buyer is past due with respects to amounts due, the Seller at its option (without liability or prejudice to any other remedies), may decline to ship or stop any Goods in transit until such time the Seller (1) receives payment in full of all amounts owing to it by the Buyer or (2) otherwise receives assurances satisfactory to the Seller of such payment.

7. Risk of Loss

Risk of loss or damage to the Goods shall be solely that of Buyer upon delivery to a carrier for shipment; any loss or damage subsequent to such delivery shall not be the responsibility of Seller, provided further any such loss shall not release Buyer from Buyer's obligation to pay for the Goods. Any claim for damage or loss in transit must be asserted by Buyer against the carrier.

8. Warranty

Seller warrants that the Goods will conform to the description stated herein subject to tolerances and variations consistent with current trade practices, testing and inspections methods. Seller makes no other warranties hereunder, expressed or implied. Seller specifically disclaims any implied warranties of merchantability or fitness for a particular purpose. Some products have special warranties and periods of duration.

9. Claims

(a) Buyer shall inspect the Goods immediately upon receipt. Any claim that the Goods have been damaged or otherwise do not conform must be made to Seller in writing within ten (10) days of receipt of such Goods by Buyer. All claims for defective, damaged, or non-conforming Goods must be submitted in writing to ALLTEC, LLC at 64 Catalyst Drive, Canton, NC 28716, USA accompanied with a copy of the signed bill-of-lading noting the damage/shortages, and any other information (photos, etc) supporting Buyer's claim. In the absence of such notice, the Goods shall be deemed to be accepted by Buyer.

(b) With respect to any valid claims properly submitted hereunder, Buyer's exclusive remedy and Seller's sole liability shall be limited to Seller repairing or replacing Goods that do not conform to specifications, or at Seller's sole option refunding the purchase price of the Goods. In no event shall Seller have any liability to damages in connection with the sale of the Goods in an amount exceeding the purchase price of the Goods sold. Seller shall have no liability for any consequential, special, or indirect damages.

(c) Claims for quantity deviations or unit pricing errors are deemed waived unless submitted in writing within thirty (30) days of notice of invoice.

10. Quotations

Quotations, based on plans and specifications, are Seller's interpretation of the requirements and include only the material described and listed on the quotation unless otherwise stated. Quotations will be in writing and unless otherwise specified will remain in effect for a period of thirty (30) days from issue date. Formal written purchase orders for work covered by any quotation submitted must be received within forty-five (45) days from the date of quotation. Prices and inventory classifications are subject to changes without notice, and are those in effect at the time of shipment.

11. Errors

ALLTEC reserves the right to correct, at any time, any errors and omissions relating to any component or item upon which a purchase order may be based, including, but not limited to, clerical or stenographic errors or omissions as may relate to quotations, price, catalog and other materials supplied by ALLTEC, or other terms and conditions as reasonably determined by Seller.

12. Returns

Goods may be returned for credit upon written request and upon Seller's written approval and issuance to Buyer of a customer return materials authorization form with RMA number. Any returned items are subject to reasonable restocking charges which unless otherwise agreed to by Seller, shall be deemed to be twenty-five percent (25%) of the price of the Goods returned. Any returned items must be in saleable condition, in the original standard packages, and conform to current catalog descriptions. All returned material is to be shipped to seller freight prepaid. Unless otherwise stated, these terms and conditions govern the purchase and sale of the Goods. All terms and conditions, including price, are subject to change without notice as to any Goods not shipped as of the effective date of such change.

13. Cancellation

Orders received and accepted by Seller may not be cancelled or changed subsequent to delivery, prior to that date such orders may be received and accepted by Seller with the written permission of Seller. Any cancellation or change shall be subject to applicable charges for labor, material, and other costs actually incurred by Seller.

14. Seller's Remedies

If Buyer cancels or abrogates this Agreement in whole or in part prior to shipment for any reason, without Seller's consent, Buyer shall pay Seller for all costs and expenses incurred by Seller, including the cost of all work executed or performed; any special engineering costs and commitments made by Seller prior to the time of cancellation; and all other incidental and storage costs incurred prior to resale.

15. Binding Nature

These terms and conditions shall be binding upon the parties hereto, their successors and assignees.

16. Authority

Any person, employee or agent otherwise acting on behalf of Buyer hereunder shall be deemed to have full authority to act on behalf of Buyer which Seller may rely on exclusively without further inquiry.

17. Governing Law

This Agreement shall be construed in accordance with and governed by laws of the state of North Carolina, USA.

Section 1

Surge Protection Devices

DynaShield®

Surge Protection Devices

Introduction

To ensure 99.999% of service availability and to prolong the service life of mission critical equipment, it is absolutely necessary for facilities to be equipped to effectively dissipate damaging levels of transient surge energy. A complete LIGHTNING PROTECTION SYSTEM includes strike termination devices, surge protection devices, grounding electrodes and the required interconnecting conductors, connectors and fittings. UL 96A recommends that UL Listed surge protection devices should be installed on each electric service entrance in accordance with NEC Article 285, ANSI/NFPA 70. Properly installed ALLTEC DynaShield® Surge Protection Devices (SPDs) reduce the magnitude of random, high energy, short-duration electrical power anomalies and keep your site operating reliably.

ALLTEC's Protection Pyramid™ depends on DynaShield® products to support ALLTEC's comprehensive facility protection methodology. The second tier of protection in the ALLTEC Protection Pyramid™ comes from properly installed surge protection devices which diminish the significance of random, high energy, short duration electrical power transients. These occurrences are typically caused by atmospheric phenomena (such as lightning strikes), utility switching, inductive loads, and internally generated over voltages. The ultimate goal of our approach is to keep sites and systems operating safely and reliably. ALLTEC DynaShield® SPDs are available for installation at Medium Voltage, Main Service Entrance, Distribution Panels, and critical equipment locations. Multiple enclosure options, mounting styles, and connection methods are available. Addtionally, we offer SPDs to protect DC power and Data Signal lines. We also have experience designing & developing custom SPDs for unique customer applications. Our products are designed to IEEE and IEC standards, and carry industry recognized certifications including UL, ETL, CE and KEMA.

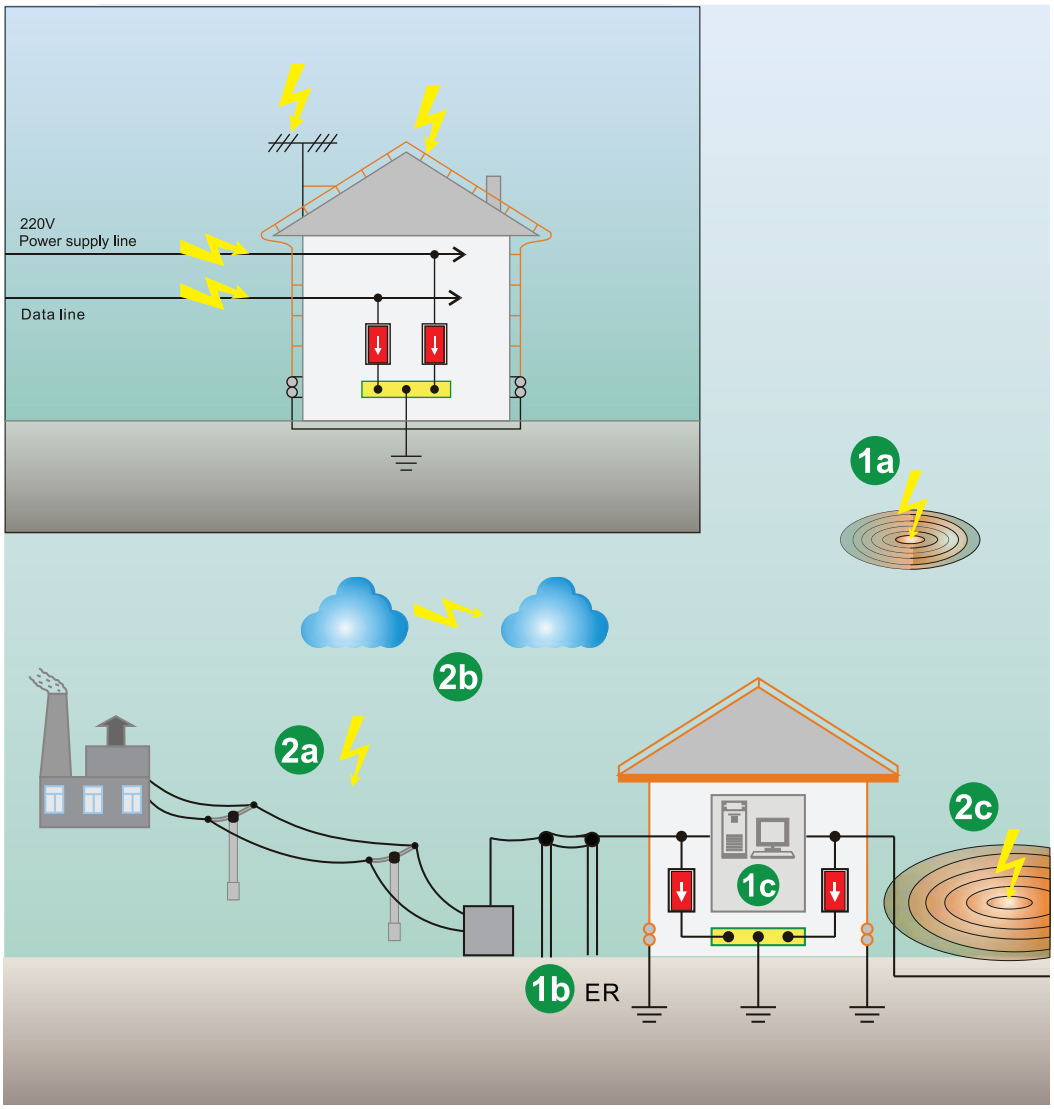
The ALLTEC Surge Protection Device Application Map provides a clear understanding of where surge protection should be installed to ensure safeguarding your entire equipment and facility.

Some of the many applications where ALLTEC SPDs are located include: cellular, radio and television broadcasting sites, data centers, power substations, communication centers, hospitals, research labs, industrial plants, petrochemical processing and gas pipelines.

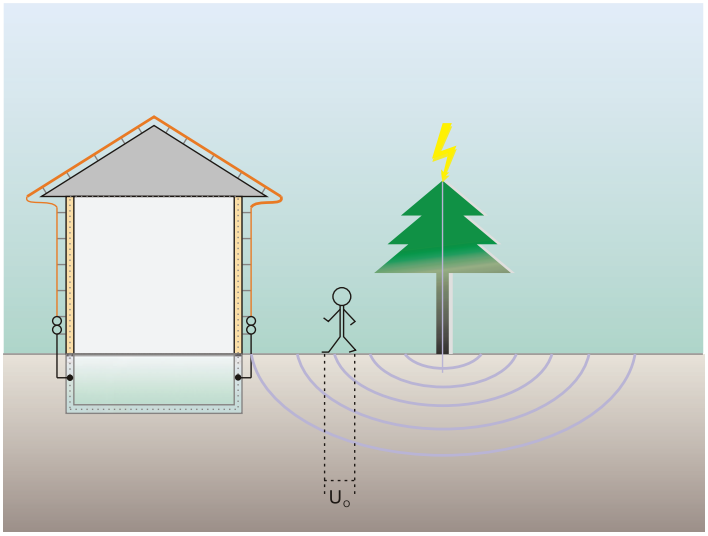
Introduction

The Lightning Threat

A direct lightning strike is an obvious hazard to human safety. The same lightning strike has the potential to damage electronic equipment (1c), as referenced in the illustration below. Although direct strikes to a facility are somewhat rare events, lightning strikes that occur in the general proximity of a facility (1b, 2a) produce sufficient energy levels to severely damage sensitive electronic devices. Distant lightning activity (1a) and discharges between overhead clouds (2b) can generate significant surge currents on AC power conductors and data lines that can disrupt equipment operation. Over time, these repeated surge events stress electronic components enough to cause them to prematurely fail. A motor with an expected life of 20 years can fail in five years if subjected to repeated transient surges.



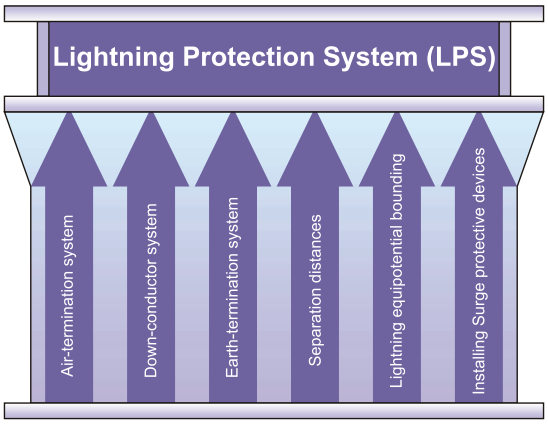
Lightning induced surge currents create high amplitude voltages across Earth ground resistances (2c) that give rise to life threatening “Step Voltage” are dangers to human beings. Step Voltage perils occur during close proximity lightning strikes. In these rare situations, trees and other tall structures conduct the lightning induced surge current; resulting in the generation of large voltage imbalances throughout the surface area around the trees, as shown here. A deadly high voltage differential can develop in the short distance between the feet of a person as they simply walk through an affected area during such an event. In wet and conductive conditions, the voltage difference can cause a large current to flow through a human body, sufficient to cause death. This situation also jeopardizes sensitive electronic equipment via their ground references. By employing properly designed surge and lightning protection devices in and around vulnerable facilities, these dangers can be mitigated.



Lightning Protection Systems

Lightning protection systems are comprised of both internal and external protection equipment.
Examples of external protection devices include: Air termination devices (lightning rods, belts, and grids), Down Conductors, and Earth Grounding Systems.

Internal protectors include shielding products, SPDs, and bonding equipment.



Lightning Protection Zones (LPZ)

A properly designed lightning protection system should be undertaken in a segmented approach, as defined by IEC 61312-1. Separate sections of the indoor and outdoor protected areas are equipped with different protection devices to implement a cascaded protection scheme based on the intensity of the transient energy the SPDs will be subjected. Those areas are divided into specified “lightning protection zones” (LPZ) that are designed to withstand different levels of lightning induced energy. Each zone will employ different types of surge protection equipment. Lightning protection zones are classified as follows:

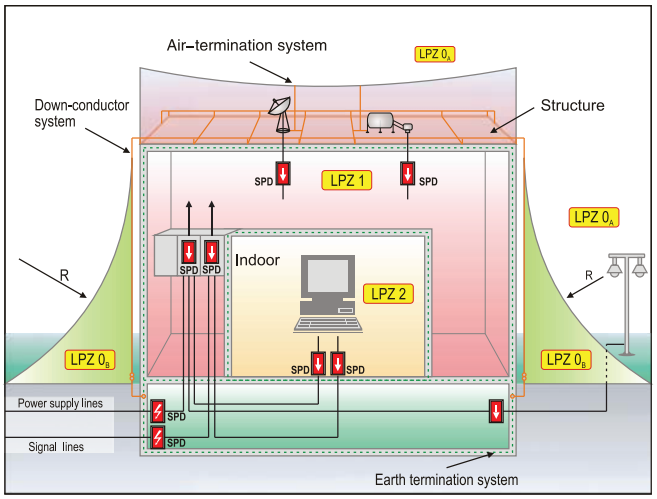
- LPZ 0_A
refers to the zone where a direct lightning hit is possible and where objects must be capable of carrying the full lightning current. It is in this zone where the unattenuated electromagnetic field is highest and most dangerous. The laboratory generated surge waveforms required to simulate lightning induced surge currents in this zone are the highly intense IEC 61643 defined 10/350 µs current impulses.

- LPZ 0_B
is the zone where a direct hit is not possible, but where the full unattenuated electromagnetic field is present. 10/350 µs current impulses are used here too, to simulate the severity of the lightning induced surge current. This zone designation is determined by the effectiveness of external lightning protection systems consisting of air termination, down conductors, and earth termination systems.

- LPZ 1
is defined zones where a direct hit is not possible and where the lightning induced current will be at much lower levels throughout all conductive components than that of LPZ 0_A and LPZ 0_B defined zones. In this zone, the electromagnetic field is attenuated according to the screening measures applied. Signal, RF and power supply lines leading into this zone can be protected by lightning and surge protection components. These protection devices can employ a variety of different operating principles.

- LPZ 2
A designated Lightning Protection Zone 2 (LPZ 2) refers to a region that is contained deeply within a facility. The LPZ 2 areas within a facility are those that would never be exposed to direct lightning strikes; and which are further shielded from outside environmental anomalies by upstream surge protective devices (SPD), internal compartments and/or partitions; along with outside structural walls and/or barriers.

External lightning protection equipment and surge protection devices must be employed at key points throughout a facility to ensure maximum levels of lightning protection for man and machine.



An example of a LPZ 2 region would be the area within an equipment enclosure that is located inside a room in the middle of a facility.

IEC 62305-1 defines a LPZ 2 region as a zone where surge current is further limited by current sharing and by additional surge protective devices (SPDs) at the boundary; and where additional spatial shielding may be used to further attenuate the lightning induced electromagnetic field.

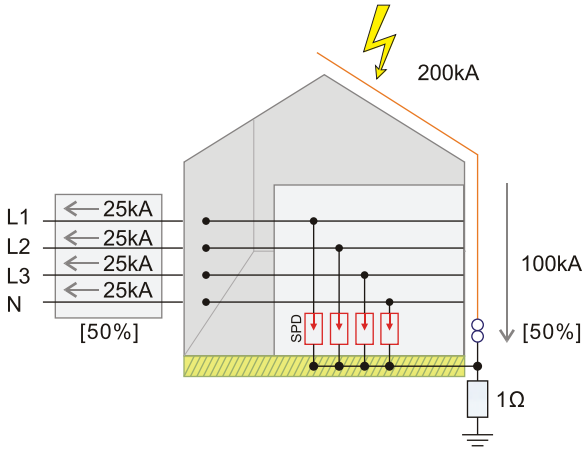
If a further reduction of the current of the electric field is necessary, additional subsequent zones must be established (LPZ2, etc.). Additional lightning protection components applied here form a “fine protection system” complementing the standard protection level ensured by zone LPZ1.

For optimum protection, all AC and DC power supply and data signal lines should enter the protected area at one single point. This philosophy applies regardless of whether it is a brick and mortar building, a ruggedized enclosure mounted on a pole or equipment cluster mounted on a concrete pedestal. At this point they must be connected to the bonding bar by surge protection devices. At every interface between one LPZ and the next, potential equalization practices must be established in the same manner.

This classifies lightning protectors as being components of the bonding system. They provide a basic “interference event” triggered bonding stratagem for signal-carrying lines.
Special lightning protection principles for RF applications allow continuous bonding of lines. The grounding must always be in accordance with IEC 61024-1. The grounding of the installed lightning protectors, their connections to the bonding bar of the structure or equipment have to be prepared very carefully to achieve the lowest possible impedance path to ground.

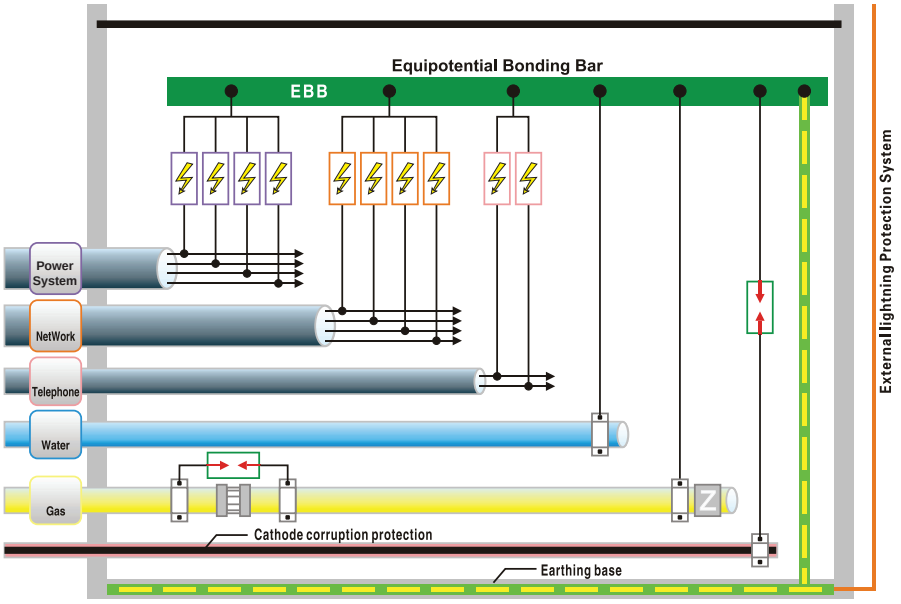
Lightning Discharge Current

According to IEC 62305-1, lightning induced current values can approach levels up to 200,000 Amps at the point it strikes. From there, however, the current circulates via multiple paths to Ground. For example, if lightning strikes an air termination device attached to a building, it can be speculated that approximately half of the current will find the earth ground via its down conductors. The remaining 100kA of the surge current can be expected to flow into the facility via power and data cables. In cases where AC power is supplied to the facility via three-phase WYE configured distribution transformers, or with via TN-C-S power distribution systems, there will be four AC power conductors for the surge current to use as pathways to propagate into the facility. If all things are equal, then 25% (25kA) of the available surge current will flow into the facility on each of the four AC power conductors. So, a surge protection device that is rated in its capability to withstand a 25kA 10/350µs surge current pulse on each incoming power line should be sufficient to protect the distribution's equipment loads.



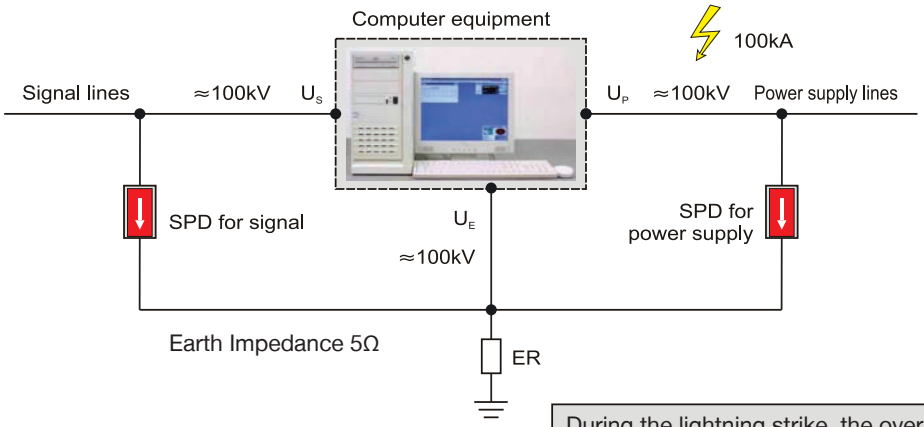
Lightning and Equipotential Bonding

Quality SPDs can only protect at the points where they are installed. All power conductors, data lines, and conduits within the boundary area between outdoor and indoor locations must be bonded to minimize the destructive potential differences that can develop during a lightning event.

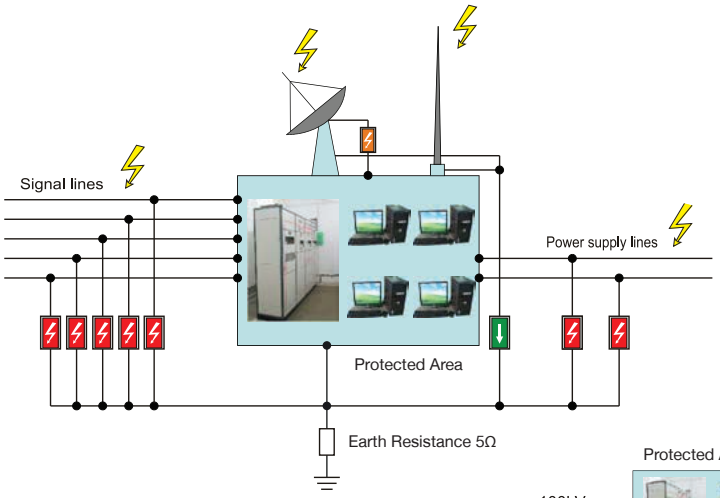


Surge Protection for Terminal Devices (Equipotential Principle)

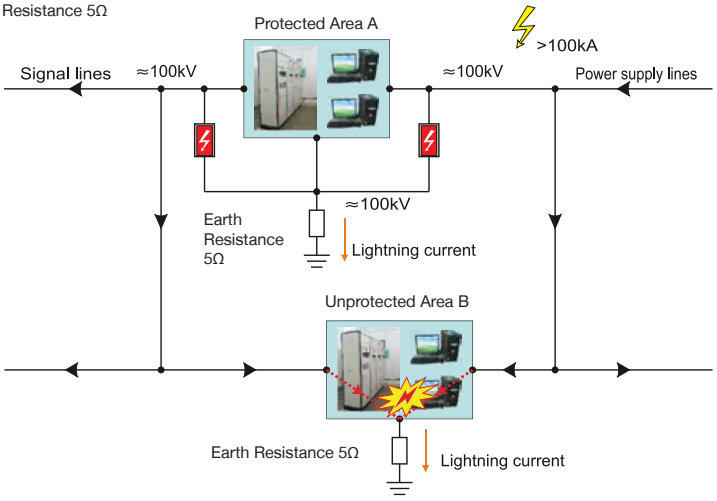
All conductors connected to sensitive electronic computer equipment should employ quality SPD products to equally dissipate lightning induced energy to all connecting points.
This illustration shows the equipotential effect resulting as SPDs work in tandem with each other to maintain a constant voltage balance throughout and between both data and power circuits to prevent arcing and flashovers between conductors as the surge current is safely shunted to ground.



During the lightning strike, the over voltage will reach equipotential within 100ns, then the overcurrent can be discharged through earth by ER, signal line & power supply line (i.e. $U_P \approx U_S \approx U_{E1}$ hence the equipment is safe!)



These two illustrations show the safely configured surge protection system (left) versus its improperly configured unsafe counterpart (right).



What is a Surge Protection Device

For all practical purposes a surge protection device (SPD) acts as an ultrafast switch that activates upon encountering a voltage at some defined amplitude. Upon activating, the SPD's suppression components transition from a high impendence (open) state to a low (closed) state. The purpose of the SPD is to divert intense levels of surge current away from electronic equipment load. Surge current is shunted safely to the ground while the SPD maintains a relatively constant voltage drop across its suppression components throughout the full duration of the surge event. In other words, they protect sensitive electronic devices from momentary bursts of energy that are generated during lightning activity, utility grid switching actions, power factor correction procedures, and other internal and external transient events.

Parts used in SPD:

Type	Response time (say≈)	Range of discharge current (say≈)	Waveform
Semiconductor	1ns	1kA	8/20µs
Variable resistor	25ns	20kA	8/20µs
Spark gap	100ns	100kA	10/350µs

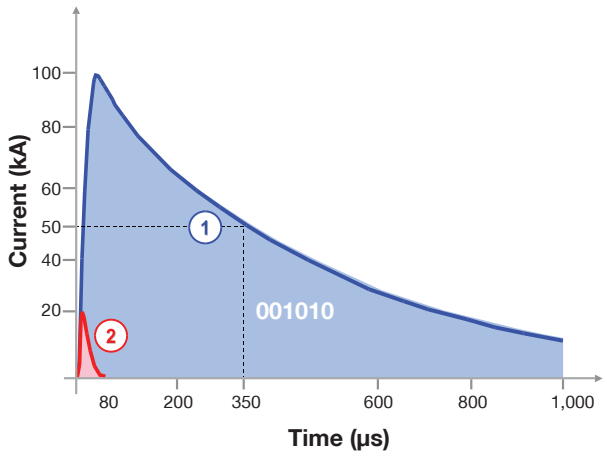
Depending on the intended application, SPD's can be designed using semiconductors, metal oxide varistor (MOVs), gas discharge tubes (GDTs), spark gaps or a combination of technologies. For example; a SPD used to protect a data signal line typically uses semiconductors to take advantage of the fast acting operational characteristic of these components. But for AC Main Service Entrance Panel applications requiring high energy handling capabilities, a SPD using MOV or spark gap technology would be a better choice. Semiconductors are fast acting, but cannot withstand much surge energy. Spark gaps can withstand enormous amounts of energy, but are slow to respond and activate to a "bolted short." Hybrid suppression circuits employing spark gap components in conjunction with MOVs are often used for SPD applications where fast-acting, high energy dissipating SPDs are required.

10/350µs Versus 8/20µs Surge Current Test Waveforms

There are two laboratory generated test waveforms that are used to simulate the amount of current associated with lightning activity. The 8 by 20 micro second (8 x 20µs) current impulse is intended to simulate the effects of an indirect lightning strike, whereas the 10 x 350µs current waveform is intended to simulate a direct strike. Both waveforms are used to test and report a SPD's surge current handling abilities. The first numeric designator for each waveform defines the time period, in microseconds, for the current level to reach 90% of its maximum value. The second numeric designator, indicates the time period the impulse current value decays to 50% of its peak amplitude. Due to its longer duration, the 10 x 350µs waveform is a far more stressful impulse as it contains 20 times more energy than its 8 x 20 µs counterpart.

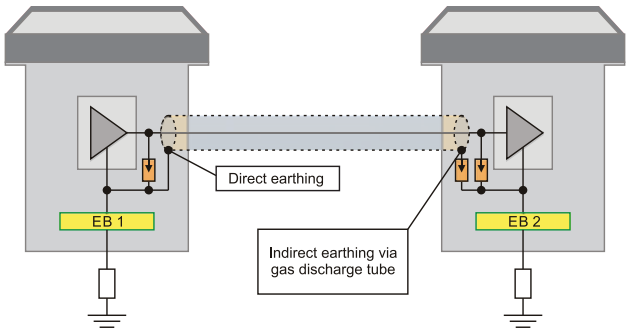
Comparison of Lightning Test Currents

	①	②
Waveform µs	10/350	8/20
i max. (kA)	100	20
Q (As)	50	0.4



Data and Signal Line Shield Grounding Considerations

Generally speaking, when a shielded cable is routed between two buildings or distribution systems that reference separate grounding systems, then the shield at only one end of the cable run should be grounded to preclude the possibility creating an undesirable ground loop between the two earth ground references. To adequately protect data and communications interfaces, one end of the cable shield should directly reference the earth ground, and the other end of the cable run should reference the earth ground via a gas discharge tube, as shown here.



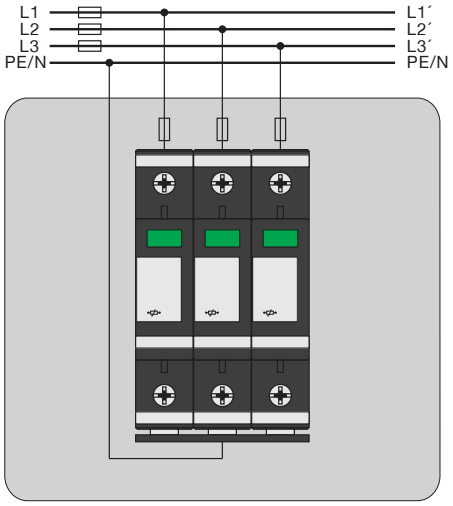
SPD Terms and Definitions

Nominal voltage UN	The nominal voltage of the system to be protected, for AC voltages it is indicated as RMS value.
MCOV	The maximum continuous supply voltage that can be applied to the SPD during its normal operation.
Nominal current IL	The highest value that the SPD can conduct continuously.
Nominal discharge current In	The maximum peak value 8/20µs surge current that can be conducted repeatedly by the SPD.
Max. discharge current Imax	The maximum peak value of 8/20µs that the SPD can safely discharge.
Lightning impulse current Iimp	A 10/350µs laboratory generated simulated test waveform intended to simulate the surge current associated with a direct lightning strike.
Voltage protection level Up	The level to which the SPD limits voltage as it is called upon to conduct a specified level of surge current.
Follow current extinguishing capability If	The maximum rms “follow current” (brought on by the surge current discharge) that the SPD can extinguish at UC.
Short-circuit withstand capability	The maximum short-circuit current the SPD can withstand.
Combined impulse Uoc	A laboratory generated (Open Circuit 1.2/50µs, Close Circuit 8/20µs) test impulse used to test SPDs to IEC 61643-1 Class III parameters.
Operating temperature range Tu (Nominal temperature range)	The temperature range where the SPD normally operates.
Response time tA	The time it takes a SPD to begin conducting surge current upon being subjected to its activating voltage level.
Bandwidth fG	The amount of data that can be passed along a communications channel during a given time period.
Data transmission speed VS	Data transfer rate indicating the number of bytes transmitted per second.
Return loss aR	The ratio of the power reflected back from the line to the power transmitted into the line.
Insertion loss aE	The ratio of the power received vs to the power transmitted in the line.

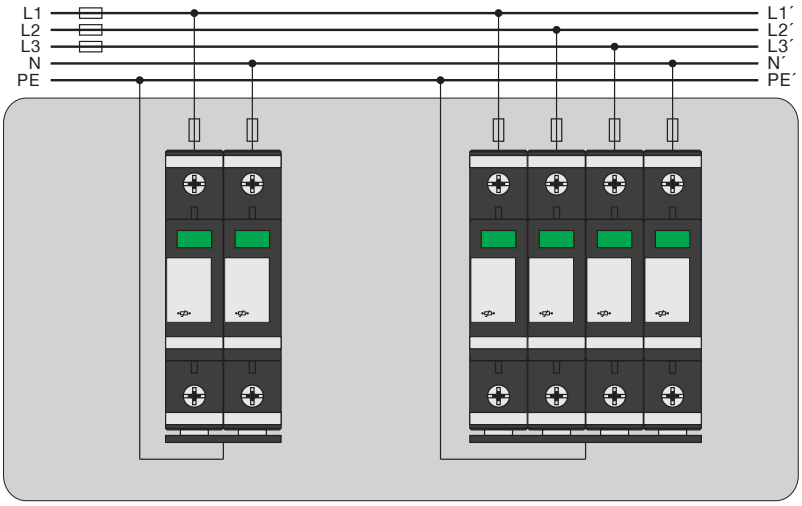
Earthing Systems

TN-System

Applied in Class II TNC system, for three phases.

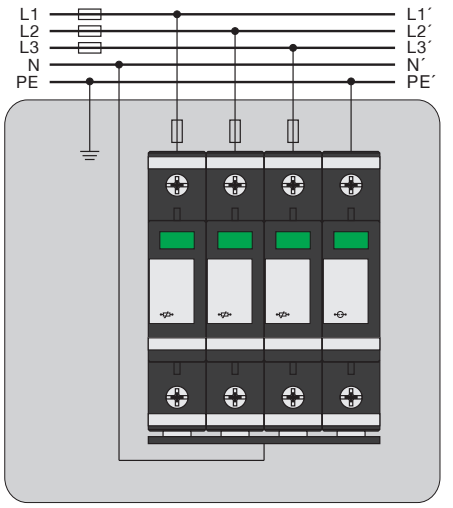


Applied in Class II TNS system, for single phase / three phases.

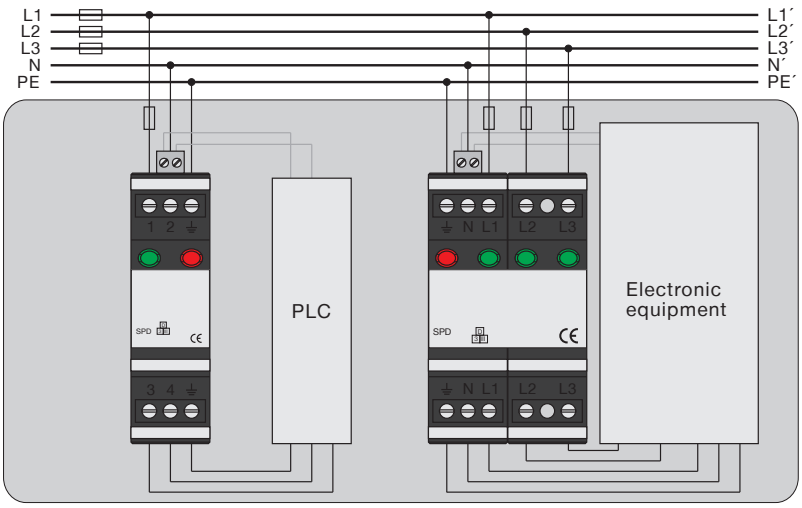


TT-System

Applied in Class II TT system, for three phases.



Applied in Class III system, for single phase / three phases.

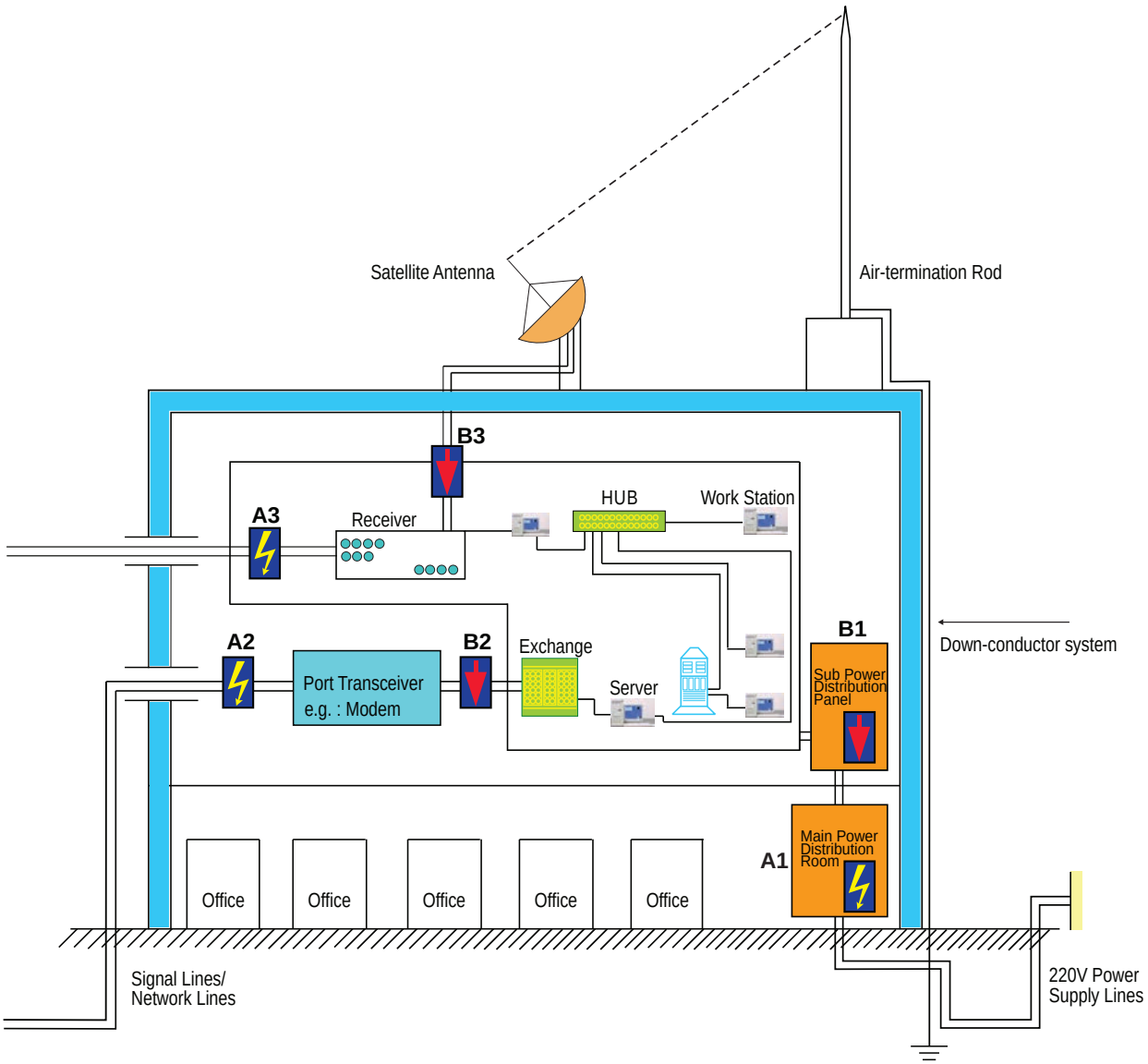


Important Note:

The device may only be connected and installed by an electrical skilled person conforming to national standards and safety regulations. Fuse must be installed at the upstream of the SPD or the lightning arrester for power supply system to make sure that protected system has double protection. The value of the fuse used in a SPD system should be confirmed to:

1. The value of the fuse should not be larger than the max. withstand capacity of the SPD's backup fuse value.
2. Under the status of the max. current in the power supply & close loop circuit available current, the fuse should be able to disconnect when overloaded or short-circuited.
3. Taken (1) & (2) into consideration, the fuse should be as large as possible to allow the maximum surge discharge of the SPD.

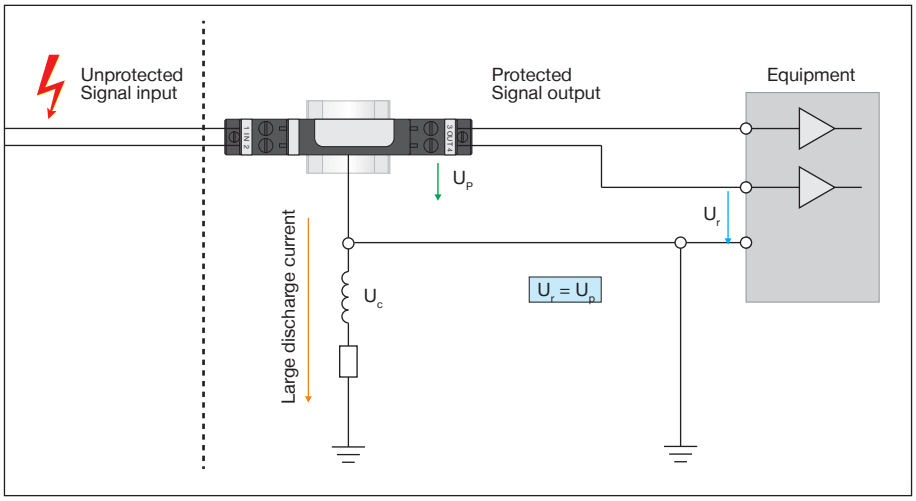
Lightning Protection of an Electronic System



Note: A1 -- SPD Clas I for power s pply s em
A2 -- SPD Clas I for information teb nology s em
(SPD Clas I for networ
A3 -- SPD for CATV lines
B1 -- SPD Clas II for power s pply s em
SPD Clas III for power s pply s em
B2 -- SPD Clas II for information teb nology s em
B3 -- SPD for antenna s em

SPD Installation

SPDs may be installed at the equipment location or at the shelter or building wall. Always consider the distance that any surge discharge current could travel, and observe proper bonding practices to achieve highest equipment protection. To ensure optimal voltage protection level and avoid data errors from compromised signal reference, it is important to ensure a single point ground reference. The installation diagram below shows an additional bonding conductor installed between the SPD ground conductor and the earth reference at the protected equipment rack.



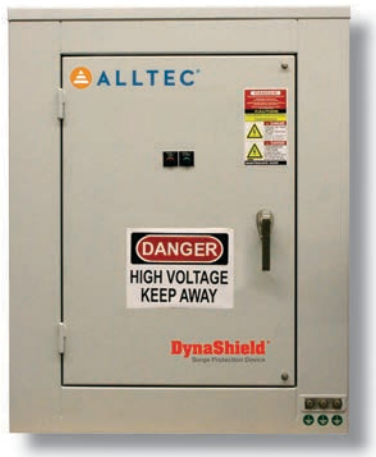
Section 2

AC Power Products

DynaShield®

Medium Voltage Surge Protection Device

AMV Series



FEATURES

- Premium Grade Station Class MOVs
- Hermetically Sealed Surge Capacitors
- Fused Power Inputs
- Bus Bar Interconnections
- Status Lamps and Remote Alarm Contacts
- Internal and External Grounding Points

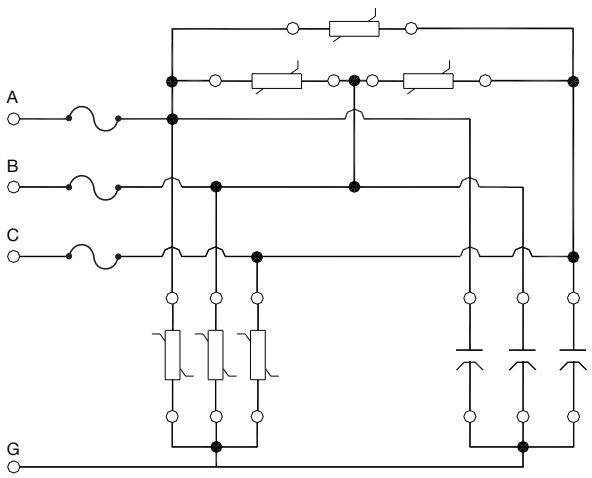
ALLTEC's AMV Series of medium voltage surge protection devices operate as electronic shock absorbers that are activated by high voltage bursts of transient energy originating on the high voltage power system. They employ Station Class Metal Oxide Varistors (MOV) to serve as a facility's first line of defense against surge related damage. Both Normal and Common Mode protection circuits equalize surge current between Phases, and from Phase to Ground. Designed for easy installation at building entrances to protect electrical distributions ranging from 2.4kV to 34.5kV.

AMV products work in tandem with low voltage SPD systems to enhance a facility's overall protection system. They divert lightning and non-lightning induced surge energy that could otherwise overload their smaller low voltage surge protective equipment counterparts.

Custom configured, hermetically sealed low-loss/low-inductance surge capacitors bolster the AMV's protection capabilities to help safeguard transformer, motor, and generator windings against insulation breakdowns on electrical loads.

A single AMV Series SPD can be deployed to protect individual transformers, rotating machines, or groups of small motors drawing power from a common motor control center (MCC), or at MCCs supplying power to explosion proof motor loads operating in hazardous locations.

Schematic

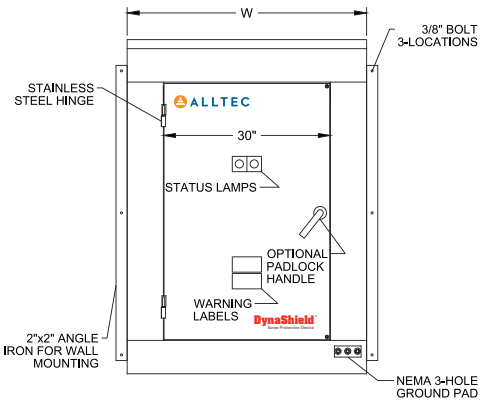


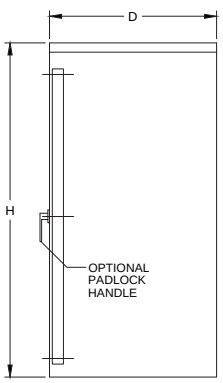
Current Limiting Fuses

Station Class Metal Oxide Varistors

Hermically Sealed Surge Capacitors

Dimensions





EXTERIOR ENCLOSURE LAYOUT
(60"H x 43"W x 30"D)

Part Number	System Voltage (kV)		H (In.)	W (In.)	D (In.)	Weight (lbs)
	Nominal	Maximum				
AMV 2400D	2.4	2.54	54.0	43.0	30.0	325
AMV 4160Y	4.16/2.4	4.4/2.54	54.0	43.0	30.0	325
AMV 4160D	4.16	4.4	54.0	43.0	30.0	325
AMV 4160Y-HRG	4.16	4.4	54.0	43.0	30.0	325
AMV 4800D	4.8	5.08	54.0	43.0	30.0	325
AMV 6900D	6.9	7.26	68.0	43.0	30.0	475
AMV 8320Y	8.32/4.8	8.8/5.08	68.0	43.0	30.0	475
AMV 12000Y	12/6.98	12.7/7.33	68.0	43.0	30.0	475
AMV 12470Y	12.47/7.2	13.2/7.62	68.0	43.0	30.0	475
AMV 13200Y	13.2/7.62	13.97/8.07	68.0	43.0	30.0	475
AMV 13800Y	13.8/7.97	14.52/8.38	68.0	43.0	30.0	475
AMV 13800D	13.8	14.52	68.0	43.0	30.0	475
AMV 20780Y	20.78/12	22/12.7	68.0	43.0	30.0	475
AMV 22860Y	22.86/13.2	24.2/13.87	68.0	43.0	30.0	475
AMV 23000D	23	24.34	68.0	43.0	30.0	475
AMV 24940Y	24.94/14.4	26.4/15.24	68.0	43.0	30.0	475

BENEFITS:

- Increased distribution equipment and motor reliability
- Operational Status Indicators
- Custom Configurable and Custom Enclosure Sizing
- Custom mounting options connections to motors, generators, and compressor housings
- AMV SPDs can be custom designed for original equipment manufacturers

ALLTEC's AMV medium voltage surge protection devices can be equipped with these popular options:

- Padlockable Handle
- Locking Handle
- Kirk Key Interlock
- Integral Disconnect
- Stainless Steel Enclosure
- Custom Sized Enclosures
- Motor-Generator Terminal Box Mounting
- Neutral Grounding Resistor
- Over-Current CTs
- Differential-Current CTs

DynaShield®

Medium Voltage Surge Protection Device

AMV - C Series

FEATURES

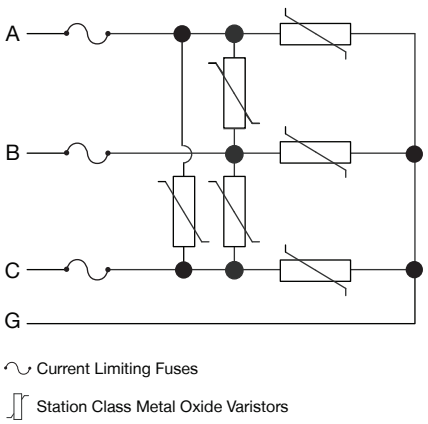
- Fused Power Inputs
- Low Impedance Copper Interconnections
- Galvanized Steel Enclosure NEMA 1, 3R, and 12
- Stainless Steel Fastening hardware
- External Grounding Points

ALLTEC's AMV - C Series medium voltage surge protection devices deliver the first line of defense at the motor starter level against lightning generated, and high frequency switching surges. They may be used to protect transformers, generators, and variable frequency drives against surge related damage. They prevent equipment insulation breakdowns as they shunt the surge current between Phases and to Ground. AMV - C SPD products operate in tandem with a facility's low voltage SPD systems by reducing the amount of surge energy that could otherwise overload the smaller low voltage surge protection equipment.

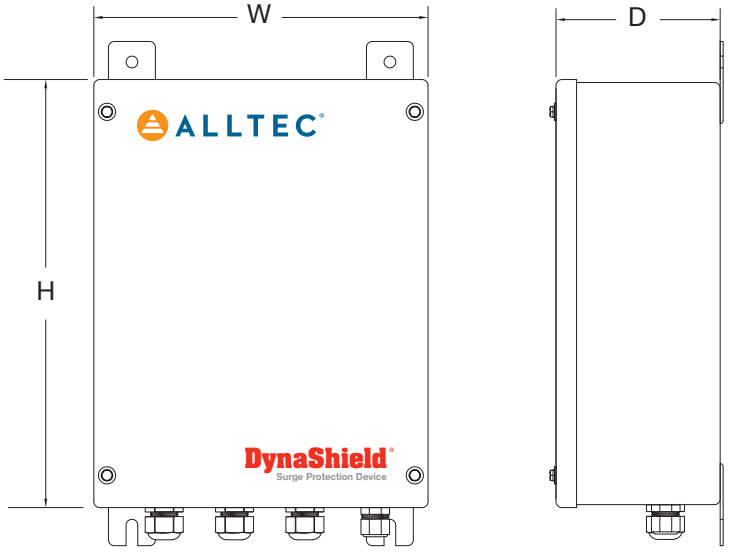
AMV - C SPD products are designed for easy installation to protect medium voltage equipment ranging from 2.4kV to 13.8kV.

The AMV - C product's compact design is achieved by encapsulating the SPD's internal fuses and MOVs in a UL rated, high dielectric potting compound to accommodate the proper dielectric between the phase and ground conductors. Their small size enables their direct application on motor starters and switchgear. They may be mounted inside or on the outside of most medium voltage switchgear and motor starter compartments. They can also be installed within most motor and transformer terminal housings to provide complete protection against all surge activity that can damage or fatigue motor or transformer insulation systems.

Schematic



Dimensions

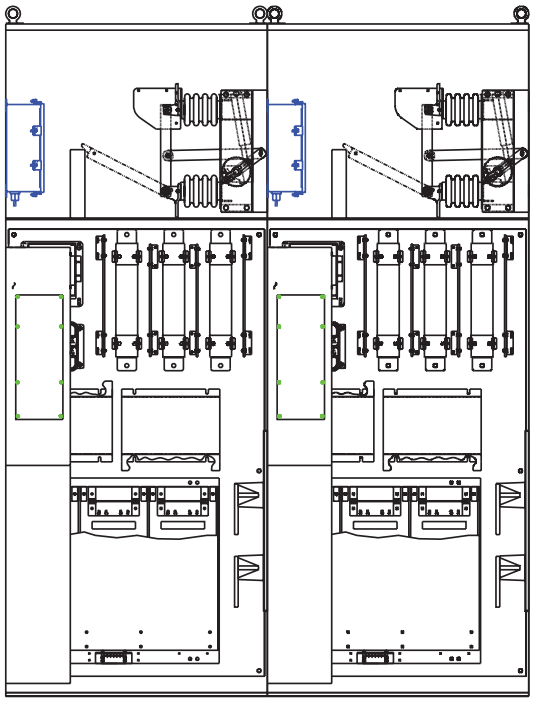


Part Number	System Voltage (kV)		H (In.)	W (In.)	D (In.)	Weight (lbs)
	Nominal	Maximum				
AMV-C 2400D	2.4	2.54	24.0	12.0	4.25	120
AMV-C 4160Y	4.16/2.4	4.4/2.54				
AMV-C 4160D	4.16	4.4				
AMV-C 4160Y-HRG	4.16	4.4				
AMV-C 4800D	4.8	5.08				
AMV-C 6900D	6.9	7.26				
AMV-C 8320Y	8.32/4.8	8.8/5.08				
AMV-C 12000Y	12.0/6.93	12.7/7.33	29.0	13.0	4.25	240
AMV-C 12470Y	12.47/7.2	13.2/7.62				
AMV-C 13200Y	13.2/7.62	13.97/8.07				
AMV-C 13800Y	13.8/7.97	14.52/8.38				
AMV-C 13800D	13.8	14.52				

❖NOTE Dimensions subject to change.

BENEFITS:

- Compact design, allowing installation within motor starter/switchgear cubicles and transformer/motor termination compartments
- Increased distribution equipment and motor reliability
- Simple and low cost installation
- Can be mounted in any position and requires no floor space
- Limits lightning and switching transients, reducing motor insulation fatigue and failure
- Extends the service life of low voltage SPDs that can be overly stressed by surge energy originating from unprotected medium voltage systems



AMV-Cs mounted inside 4.16kV medium Voltage Motor Control Centers. Each motor is provided with Surge Protection Devices. AMV-C products can alternatively be mounted to the top, side, or front of the MCC.

DynaShield®

Surge Protection Device

AC Power Products Selection Guide

The ALLTEC Surge Protection Device Selection Guide provides a better understanding of which surge protection should be installed to ensure safeguarding your entire equipment and facility.

Connection	Lugs	Modular	Yes		PT-PM Series **P. 2-8 and P. 2-9**
					PD Series **P. 2-12**
			No		PT-PB Series **P. 2-8 and P. 2-9**
	Wire Leads				ADSx Series **P. 2-10 and P. 2-11**

Mounting	DIN Rail	Location	AC Class I		AD CS Series **P. 2-16 - P. 2-17** KSB 50 Series **P. 2-18** KSB 110 Series **P. 2-19**
			AC Class I&II		AD CM 25 Series **P. 2-20** KSB I+II Series **P. 2-21**
			AC Class II “UL”		AD1 Series AD2 Series AD3 Series **P. 2-22 and P. 2-23**
			AC Class II “KEMA”		AD M(G)40 Series **P. 2-24 - P. 2-26**
			AC Class III		KSB 3S Series **P. 2-27**
	Screw Mount				LP Series **P. 2-15**
					AM Series **P. 2-13 & P. 2-14**
					RD AC Series **P. 2-28**

DynaShield®

Surge Protection Device

PT-PM & PT-PB Series

The DynaShield® PB Series of AC surge protection devices are fast responding, high current handling devices designed to protect sensitive electronic equipment and systems from transient over voltages. Proprietary Voltage Reactive Circuitry allow for superior voltage protection levels at high surge currents.

The SPDs are Listed to ANSI/UL 1449 3rd Edition as both Type 1 and Type 2 suppressors, and are designed to meet the demanding protection requirements of Commercial and Industrial environments. Selected Type 2 models offer UL1283 Listed Frequency Reactive Circuitry (FRC) to attenuate EMI/RFI noise up to -50dB @ 100kHz.

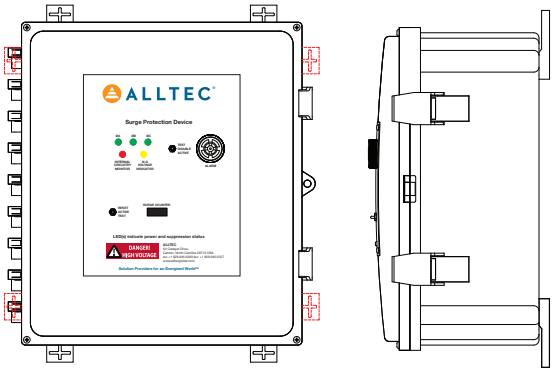
Easy to use front panel diagnostics include bright LEDs to indicate the status for each phase, Audible Alarm, Surge Counter, and dry relay contacts for remote annunciation. A dedicated LED (excluding Delta configurations) illuminates when the integrity of the Neutral/Ground bond has been compromised.

FEATURES

- ANSI/UL 1449 3rd Edition Type 1 and Type 2
- UL 1283 Listed EMI/RFI Filtering Available with Type 2 models
- Status LEDs, Surge Counter, Audible Alarm, Remote Alarm Contacts
- Replaceable suppression modules (PM Series)

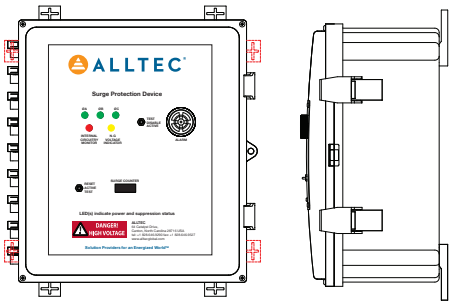
Dimensions

PT-PM Series



NEMA 4X Enclosure
Size: 14 x 12 x 6 inches (356 x 305 x 152 mm)

PT-PB Series



NEMA 4X Enclosure
Size: 10 x 8 x 4 inches (254 x 203 x 102 mm)

Specifications

Model	PT-PM 100 PT-PB 100	PT-PM 200 PT-PB 200	PT-PM 300
Agency Listings	ANSI/UL 1449 3rd Edition Type 1 and Type 2 - ETL Listing, UL 1283		
Short Circuit Current Rating (SCCR)	200 kAIC		
Maximum Continuous Operating Voltage (MCOV)	< 125%		
Location Type	Type 1 / Type 2		
Suppression Technology	Thermally protected Metal Oxide Varistor (MOV)		
Nominal Discharge Current I_N (8x20µs)	20 kA	20 kA	20 kA
Maximum Discharge Current I_{max} (8x20µs)	100 kA	200 kA	300 kA
Short Circuit Current Rating (SCCR)	200 kAIC		
Response Time	≤ 25 ns		
EMI/RFI Filter (Type 2 Models)	Maximum -50 dB at 100 kHz		
Visual Status Indication	LEDs, Audible Alarm, Relay Alarm, Surge Counter, Built in Test		
Contact Switch Capacity	AC: 250V/0.5 A; DC: 250V/0.1A; 125V/0.2 A; 75V/0.5A		
Location Category	Outdoor / Indoor Only		
Method of Mounting	Wall / Panel mount		
Standard Enclosure	Polycarbonate		
Enclosure Protection Level	IP 65 (NEMA 4)		
Weight (Max)	4.53 kg (10 lbs)		
Power Connection Wire Size	Multi strand 25 mm^2 (#4 AWG), Length 860 mm (34")		
Maximum Wire Size Contacts	1.5 mm^2 (#16 AWG)		
Operating Temperature	-40°C to +80°C		
Relative Humidity	≤ 95% non condensing		
Altitude	≤ 3000 m		
Suppression Module Inflammability Rating	Thermoplastic, UL 94 V-0		

Selection Chart

Part Number: PT- **PM or PB** - **F or Ø** - **KKK** - **VVVV** - **SD** - **N, WP, or SS**

Model	Filter	kA Rating	Voltage Code	Diagnosis	Enclosure Type

Model Selection

Part Number	Service Voltage	MCOV	Voltage Protection Rating (VPR)			
			L-N	L-G	N-G	L-L
PT-P*-F-*1S1-SD*	120/240V 2 Ø Split	150	600	600	600	1200
PT-P*-F-*3Y1	120/208V 3 Ø Wye	150	600	600	600	1200
PT-P*-0-*3D1-SD*	120/240V 3 Ø HL Delta	150/320	600/1000	600/1000	600	1200/1500
PT-P*-0-*3N2	240V 3 Ø Delta	320	N/A	1000	N/A	1200
PT-P*-F-*3Y22	220/380V 3 Ø Wye	320	1000	1000	1000	2000
PT-P*-F-*3Y23	230/400V 3 Ø Wye	320	1000	1000	1000	2000
PT-P*-F-*3Y2	277/480V 3 Ø Wye	320	1000	1000	1000	2000
PT-P*-0-*3N4	480V 3 Ø Delta	550	N/A	1800	N/A	4000

DynaShield®

Surge Protection Device

ADSx Series

c UL us LISTED

FEATURES

- UL 1449 3rd Edition Type 1 and Type 2
- Thermally Protected MOV technology
- Surge Current Rating up to 300 kA
- 200 kAIC Fault Current Rating
- UL 1283 Listed EMI/RFI Filtering Available

Product Description

The DynaShield® ADSx Series of hardwired AC surge protection devices are fast responding devices designed to offer superior voltage protection levels at high surge currents to protect sensitive electronic equipment and systems from damaging transient surge events.

The SPDs are listed to UL / cUL 1449 3rd Edition. Type 1 and Type 2 and are offered with surge current ratings of 50 kA, 100kA, 200kA and 300 kA to meet the most demanding protection requirements. The SPDs meet UL96A Lightning Protection Master Label requirements (@20kA In).

Diagnostics include easy to see status LEDs and dry contacts for remote annunciation.

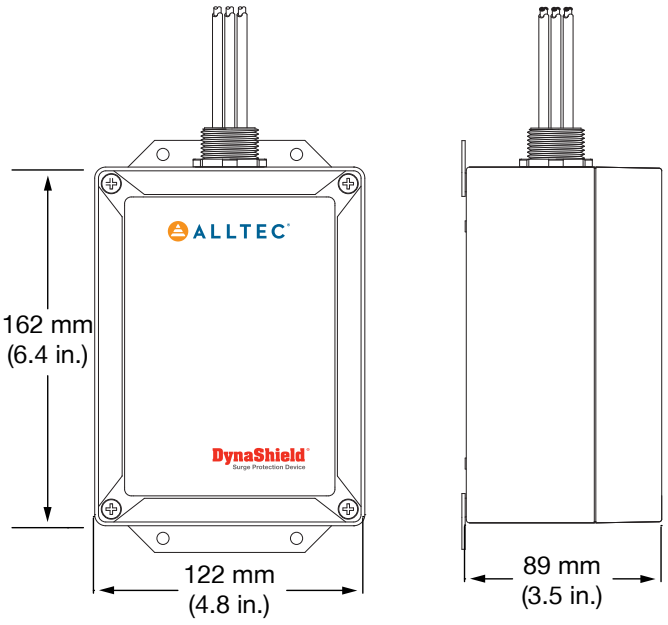
The ADSx2F models are Type 2 cUL Listed and offer complimentary UL 1283 Listed Frequency Reactive Circuitry (FRC) to attenuate EMI/RFI noise up to -50dB @ 100kHz.

Standard polycarbonate NEMA 4X enclosure allows for outdoor or indoor installation. Ruggedized enclosures available in NEMA 4 painted steel or NEMA 4X Stainless steel.

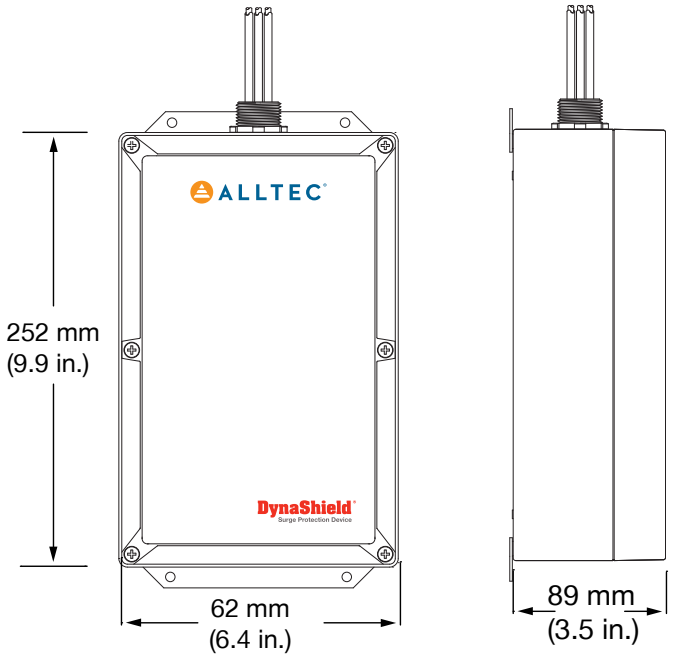
Inquire about additional available configurations.

Dimensions

ADSx2F-050 & ADSx2F-100



ADSx2F-200 & ADSx2F-300



Specifications

Model	ADSx050	ADSx100	ADSx200	ADSx300
UL 1449 Location Type	Type 2			
Connection Type	Parallel Connected			
Agency Listings	UL 1449 3rd Edition, UL 1283, cUL			
Protection Modes	Line to Neutral, Line to Ground, Line to Line, Neutral to Ground			
Operating Frequency Range	47 - 63 Hertz			
Maximum Continuous Operating Voltage (MCOV)	115%			
Maximum Surge Current Rating	50 kA per phase	100 kA per phase	200 kA phase	300 kA phase
Short Circuit Current Rating (SCCR)	200 kAIC			
UL 1449 Nominal Discharge Current (I_N)	20 kA			
50 ohm EMI/RFI Attenuation	63 dB max from 10kHz to 100MHz			
Response Time	< 25 ns			
Status Indication	Status LEDs, Alarm relay contacts			
Enclosure Protection Level	Polycarbonate NEMA 4X			
Dimensions (H x W x D)	6.4" x 4.8" x 3.5"		6.4" x 9.9" x 3.5"	
Weight (Maximum)	5 lbs		10 lbs	
Wire Connections	Stranded #10 AWG			
Wire Lead Length	36 inch			
Operating Temperature	-40 to +65 °C			
Operating Humidity	≤ 95% non condensing			
Altitude	Up to 18,000 feet			

Selection Chart

Part Number: ADSx T - KKK - VVVV - E L

T	KKK	VVVV	E	L
UL Type	kA Rating	Voltage Configuration	Enclosure Type	Custom LED

Model Selection

Part Number	Service Voltage	MCOV	Voltage Protection Rating (VPR)			
			L-N	L-G	N-G	L-L
ADSx2F-200-120S	120 V Single Phase	180 Vac	800 V	800 V	700 V	N/A
ADSx2F-200-120T	120/240 V Split Phase	180 Vac	800 V	800 V	700 V	1200 V
ADSx2F-200-120W	120/208 V 3 Phase Wye	180 Vac	800 V	800 V	700 V	1200 V
ADSx2F-200-127W	127/220 V 3 Phase Wye	180 Vac	800 V	800 V	700 V	1200 V
ADSx2F-200-240S	240 V Single Phase	320 Vac	1200 V	1200 V	1200 V	N/A
ADSx2F-200-220W	220/380 V 3 Phase Wye	320 Vac	1200 V	1200 V	1200 V	2000 V
ADSx2F-200-240D	240 V 3 Phase Delta	320 Vac	N/A	800 V	N/A	1200 V
ADSx2F-200-240W	240/415 V 3 Phase Wye	320 Vac	1200 V	1200 V	1200 V	2000 V
ADSx2F-200-480W	277/480 V 3 Phase Wye	320 Vac	1200 V	1200 V	1200 V	2000 V
ADSx2F-200-480D	480 V 3 Phase Delta	550 Vac	N/A	1200 V	N/A	2500 V
ADSx2F-200-600W	347/600 V 3 Phase Wye	420 Vac	1500 V	1500 V	1500 V	2500 V
ADSx2F-200-600D	600 V 3 Phase Delta	690 Vac	N/A	1500 V	N/A	2500 V

DynaShield®

Surge Protection Device

PD Series

FEATURES:

- Rugged IP65 sealed weather tight enclosure
- Suppression Modules UL 1449 4th Edition - ETL Listed
- Replaceable suppression modules per mode
- Thermally protected MOV design
- Status window and remote alarm contacts

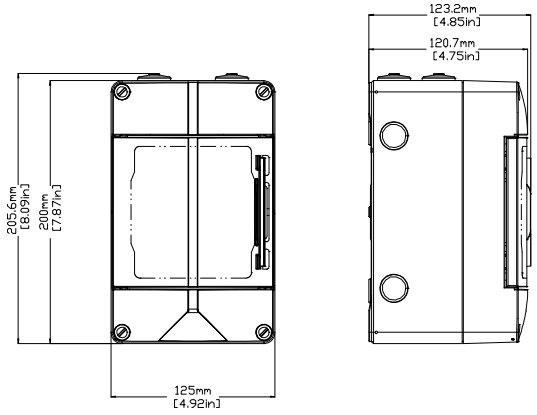
Product Description

The PD Series is designed to protect low voltage AC power supply systems against transient surges at $LPZ0_B$-1 and higher. The SPD offers multi mode protection in a NEMA 4X enclosure, replaceable suppression modules, status window and remote alarm contacts. Ideal for small outdoor AC systems including remote pole mounted equipment.

Specifications

Sample Models		PD-M50-120SC	PD-M50-240SC	PD-M50-240DC	PD-M50-240WC
SPD Components Tested To		UL 1449 4th Edition			
IEC Arrester Category		Category II			
Number Of Ports		Single Port Device			
Technology		Thermally protected Metal Oxide Varistor (MOV) (L-N or L-PE), GDT (N-PE)			
Voltage Configuration		1Ø Single	1Ø Single	3Ø Delta	3Ø Wye
Modes of Protection		1+1; L-N, N-PE	1+1; L-N, N-PE	3+0; L-PE	3+1; L-N, N-PE
Nominal Voltage U_N		120 Vac 1Ø Single	240 Vac 1Ø Single	240 Vac 3Ø Delta	240 Vac 3Ø Wye
Maximum Continuous Operating Voltage U_C	L-N	150V	275 V	320 V	320 V
Nominal Discharge Current I_N (8x20µs)	L-N	20 kA			
	N-PE	20 kA			
Maximum Discharge Current I_{max} (8x20µs)	L-N	50 kA			
	N-PE	50 kA			
Voltage Protection Level	L-N @ In	0.7 kV	1.2 kV	1.2 kV	1.2 kV
	N-PE	1.5 kV	1.5 kV	1.5 kV	1.5 kV
Short Circuit Current Rating		200 kAIC			
Response Time	L-N	≤ 25 ns			
	N-PE	≤ 100 ns			
Visual Status Indication Per Mode		Window: Green = Normal, Red = Replace			
Remote Status		Change over contact			
Contact Switch Capacity		AC: 250V/0.5 A; DC: 250V/0.1A; 125V/0.2 A; 75V/0.5A			
Location Category		Outdoor / Indoor			
Method of Mounting		Wall or Panel mount			
Enclosure		Light gray w/ hinged tinted transparent door			
Enclosure Features		Double membrane seals, sidewalls w/ M20 and M25 knockouts			
Enclosure Rating		Polycarbonate; IP65, NEMA 4X			
Dimension (H x W x D)		125 mm x 200 mm x 124 mm (4.92" x 7.87" x 4.92")			
Mounting Dimension (H x W)		50 mm x 120 mm (1.97" x 4.72")			
Weight (Max)		1.05 kg (2.3 lb)			
Maximum Wire Size		Single strand 35 mm² (#2 AWG), Multi strand 25 mm² (#4 AWG)			
Maximum Wire Size Contacts		1.5 mm² (#16 AWG)			
Operating Temperature		-40°C to +80°C			
Relative Humidity		≤ 95% non condensing			
Altitude		≤ 3000 m			
SPD Component Protection Level		IP 20			
SPD Component Inflammability Rating		Thermoplastic, UL 94 V-0			

Dimensions



Selection Chart

Part Number:

DP	-	M	-	KKK	-	VVVV	-	C
		Type M, MG		kA Rating 50, 100		Voltage Configuration Single, Wye, Delta		Remote Contacts

DynaShield®

Surge Protection Device

AM50 Series

FEATURES:

- Thermally Protected MOV
- 50 kA Discharge Capacity
- Fast Response
- LED status indication
- Remote alarm contacts

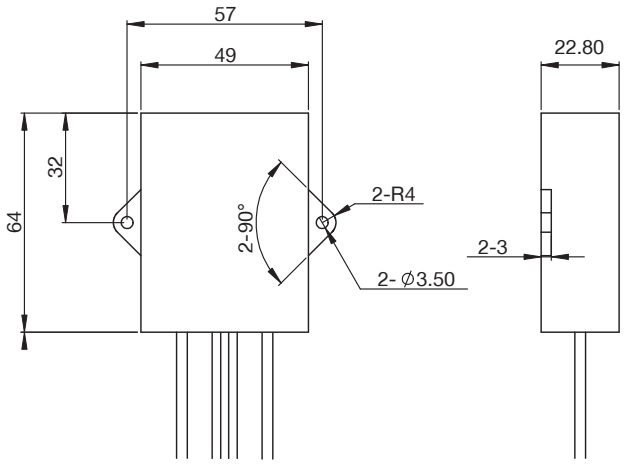
Product Description

The AM50 Series is designed to protect single phase low voltage AC power supply systems against transient surges at $LPZ0_B$-1 and higher. The SPD offers single mode protection in a compact NEMA 4X enclosure with bright LED status indication and dry contacts for remote monitoring. Ideal for industrial single phase applications including LED Lighting, SCADA systems and remote instrumentation.

Specifications

Model	AM50-120SC	AM50-240SC	AM50-277SC	AM50-480SC
Tested To	IEC61643-11:2011			
IEC Arrester Category	Class II			
Number Of Ports	Single Port Device			
Technology	Metal Oxide Varistor (MOV)			
Nominal Operating Voltage U_N	120 Vac	240 Vac	277 Vac	480 Vac
Maximum Continuous Operating Voltage U_C	150 V	275 V	320 V	550 V
Nominal Discharge Current I_N (8x20µs)	20 kA			
Maximum Discharge Current I_{max} (8x20µs)	40 kA			
Voltage Protection Level U_P @ 1.2/50	0.6 kV	0.9 kV	1.0 kV	1.2 kV
Response Time	< 25 ns			
Visual Status Indication	LED: Blue = Normal, Dark = Replace			
Remote Status Indication	Change over contact			
Contact Switch Capacity	AC: 250V/0.5 A; DC: 250V/0.1A; 125V/0.2 A; 75V/0.5A			
Location Category	Outdoor / Indoor			
Method of Mounting	Two mounting tabs			
Dimension (H x W x D)	3.5” x 2.3” x 1.4”			
Weight (Max)	0.2 lb (0.11 kg)			
Wire Size (Power)	Multi strand #16 AWG (1.5 mm²), Length 10”			
Wire Size (Contacts)	Multi strand #22 AWG (0.16 mm²), Length 10”			
Operating Temperature	-40°C to +80°C			
Relative Humidity	≤ 95% non condensing			
Altitude	≤ 3000 m			
Enclosure Protection Level	NEMA 4X			
SPD Module Housing Rating	Thermoplastic; Inflammability rating: UL 94 V-0			

Dimensions



DynaShield®

Surge Protection Device

AM2-25 Series

FEATURES:

- 25 kA Maximum Discharge Capacity
- Thermally Protected MOV
- Protection modes L-G, N-G
- Bright LED status indication
- Waterproof

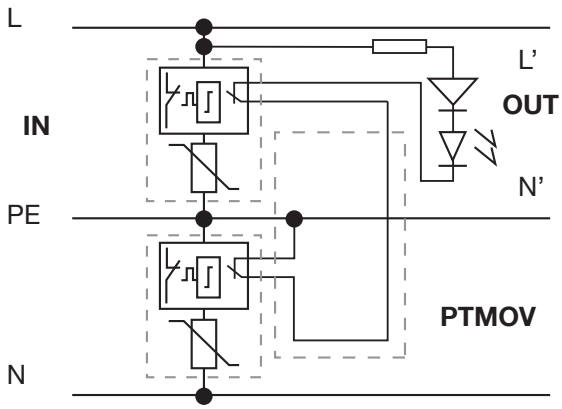
Product Description

The AM2-25 Series is designed to protect single phase low voltage AC power supply systems against transient surges at $LPZ0_B$-1 and higher. The SPD offers two mode protection in a compact NEMA 4X enclosure with bright LED status indication. Ideal for industrial single phase applications including LED Lighting, SCADA systems and remote instrumentation.

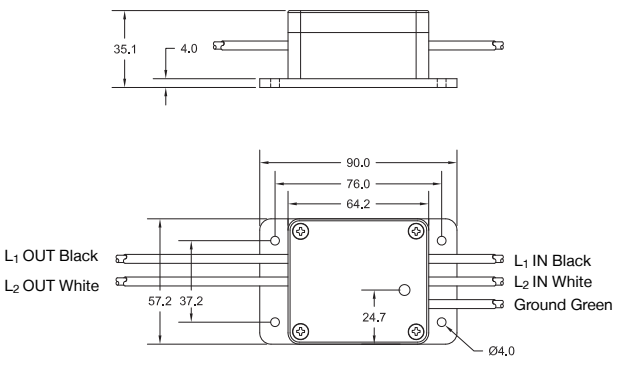
Specifications

Model	AM2-25-120S	AM2-25-240S	AM2-25-277S	AM2-25-480S
Tested To	IEC61643-11:2011			
Category IEC, VDE	Class II, C			
Number Of Ports	Single Port Device			
Modes of Protection	L-G, N-G			
Technology	Thermally Protected MOV			
Nominal Operating Voltage (U_N)	120 Vac	240 Vac	277 Vac	480 Vac
Maximum Continuous Operating Voltage (U_C)	150 V	275 V	320 V	550 V
Nominal Discharge Current I_N (8x20µs)	10 kA			
Maximum Discharge Current I_{max} (8x20µs) Type 2	25 kA			
Voltage Protection Level Vpr (6kV/3kA, 8x20µs)	600 V	900 V	1000 V	1500 V
Response Time	≤ 25 ns			
Visual Status Indication	LED: Blue = Normal, Dark = Replace			
Location Category	Waterproof			
Method of Mounting	Panel Mount			
Dimension (H x W x D)	3.6" x 2.3" x 1.4" (90 mm x 58 mm x 35 mm)			
Weight (Max)	0.74 lb (0.33 kg)			
Wire Size (Power)	Black: Multi strand #12 AWG (3.31 mm^2)			
Wire Size (Power)	White: Multi strand #12 AWG (3.31 mm^2)			
Wire Size (Ground)	Green: Multi strand #12 AWG (3.31 mm^2)			
Operating Temperature	-40°C to +85°C			
Relative Humidity	≤ 95% non condensing			
Altitude	≤ 3000 m			
Enclosure Protection Level	IP 65			
Housing Inflammability Rating	Thermoplastic; Inflammability rating: UL 94 V-0			

Schematic



Dimensions



DynaShield®

Surge Protection Device

PT-LP Series

FEATURES:

- ANSI/UL 1449 3rd Edition
- Thermally protected MOV
- Series or Parallel connection option
- Terminal block or hardwired
- LED status

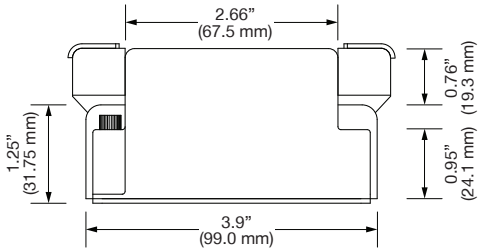
Product Description

The LP Series is designed to protect single phase low voltage AC power supply systems against transient surges at $LPZ0_B$-1 and higher. The SPDs are UL1449 3rd Edition Type 4 recognized components for use in Type 2 applications, and offer multi mode protection in a compact NEMA 4 enclosure with bright LED status indication. Ideal for industrial single phase applications including LED Lighting and SCADA systems.

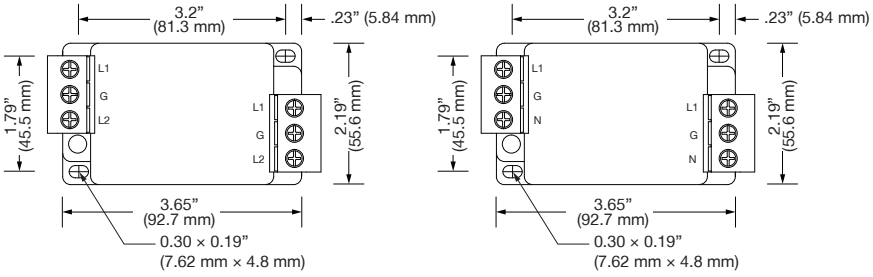
Specifications

Model	PT-LP-040-1P1-FLA*	PT-LP-040-1P2-FLA*	PT-LP-040-1P4-FLA*
Tested To	ANSI/UL 1449 3rd Edition		
IEC Arrester Category	Type 4 component suitable for Type 2 application		
Number Of Ports	Single Port Device		
Technology	Thermally protected Metal Oxide Varistor (MOV)		
Nominal Operating Voltage U_N	120 Vac 1Ø	240 Vac 1Ø	480 Vac 1Ø
Maximum Continuous Operating Voltage U_C	150 V	275 V	550 V
Nominal Discharge Current I_N (8x20µs)	3 kA		
Maximum Discharge Current I_{max} (8x20µs)	40 kA		
Voltage Protection Level (L-N)	1200 V	1800 V	3000 V
(L-G)	700 V	1000 V	1800 V
(N-G)	700 V	1000 V	1800 V
Fusing	Coordinated Surge and Thermal Fusing		
Response Time	≤ 25 ns		
EMI/RFI Filter	-50 dB at 100 kHz		
Visual Status Indication	LED: Green = Normal, Dark = Replace		
Location Category	Outdoor/Indoor		
Method of Mounting	Wall / Panel mount		
Enclosure Protection Level	ABS, Weatherproof, IP 65 (NEMA 4)		
SPD Installation Options	Parallel or Series wire connection style available		
Connection Options	TB: Terminal Block W5: #10 AWG #6 AWG Ground TB-W5: Terminal Block w/ #6 AWG Ground		
Dimension (H x W x D)	99 mm x 55.6 mm x 43.4 mm (3.9" x 2.2" x 1.7")		
Mounting Hole Dimensions (H x W)	81.3 mm x 45.5 mm (3.2" x 1.8")		
Weight (Max)	0.425 kg (0.94 lb)		
Wire Size (Power)	Multi strand 6 mm² (#10 AWG), Length 305 mm (12")		
Wire Size (Ground)	Multi strand 16 mm² (#6 AWG), Length 559 mm (22")		
Operating Temperature	-40°C to +80°C		
Relative Humidity	≤ 95% non condensing		
Altitude	≤ 3000 m		

Schematic



Dimensions



DynaShield®

Surge Protection Device

AD CS25 Series

FEATURES:

- Class I (B) arrester IEC 61643-11:2011
- DIN rail mounting
- Hybrid Spark Gap + GDT design
- Maximum energy capability
- Remote alarm contacts

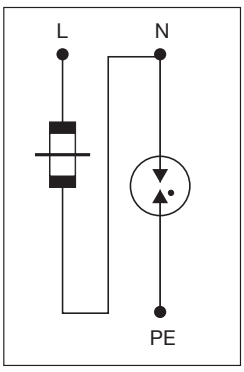
Product Description

The AD CS Series is a lightning and surge arrester designed to protect low voltage AC power systems against transient surges at $LPZ0_A$-1 and higher. The SPD offers high energy Multi Air Gap design in convenient DIN rail mounting. Ideal for high lightning environments where critical equipment is potentially exposed to large surge currents.

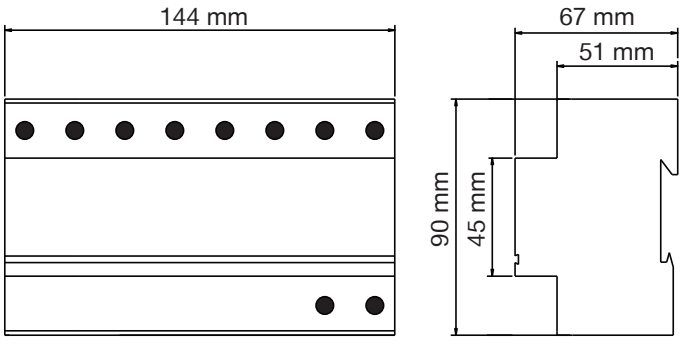
Specifications

Model		AD CS25-275-4C	AD CS25-320-4C	AD CS25-385-4C	AD CS25-440-4C
Tested To		IEC61643-11:2011			
IEC / VDE Arrester Category		Class I (B)			
Number Of Ports		Single Port Device			
Technology		Spark Gap and Gas Discharge Tube			
Maximum Continuous Operating Voltage U_C	L-N	275 V	320 V	385 V	440 V
	N-PE	255 V	255 V	255 V	350 V
Nominal Discharge Current I_N (8x20µs)	L-N	25 kA			
	N-PE	50 kA			
Impulse Current I_{imp} (10x350µs)	L-N	25 kA			
	N-PE	50 kA			
Voltage Protection Level U_P @ I_N (8x20µs)		1.5 kV	1.5 kV	1.8 kV	2.0 kV
Short Circuit Current Rating I_{SCCR}	L-N	10 kArms			
Follow Current Interrupt Rating I_{fi} (@ 255 Vac)	L-N	≥ 10 kArms			
	N-PE	≥ 100 kArms			
Residual Current at U_C		None			
Response Time		≤ 100 ns			
Remote Status Indication		Change over contact			
Contact Switch Capacity		AC: 250V/0.5 A; DC: 250V/0.1A; 125V/0.2 A; 75V/0.5A			
Location Category		Indoor Only			
Method of Mounting		Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3			
Dimension (H x W x D)		90 mm x 144 mm x 64.7 mm (3.6" x 5.7" x 2.5"), 8 modules, DIN 43880			
Weight (Max)		0.33 kg (0.74 lb)			
Maximum Wire Size		Single strand 35 mm^2 (#2 AWG), Multi strand 25 mm^2 (#4 AWG)			
Maximum Wire Size Contacts		1.5 mm^2 (#16 AWG)			
Operating Temperature		-40°C to +80°C			
Relative Humidity		≤ 95% non condensing			
Altitude		≤ 3000 m			
Enclosure Protection Level		IP 20			
Housing Inflammability Rating		Thermoplastic, UL 94 V-0			

Schematic



Dimensions



DynaShield®

Surge Protection Device

AD CS50-4C Series

FEATURES:

- Class I (B) arrester IEC 61643-11:2011
- DIN rail mounting
- Hybrid Spark Gap + GDT design
- Maximum energy capability
- Remote alarm contacts

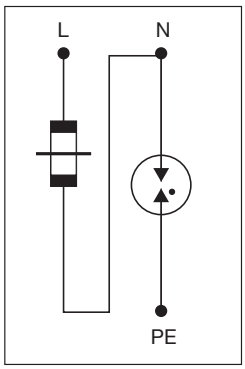
Product Description

The AD CS Series is a lightning and surge arrester designed to protect low voltage AC power systems against transient surges at $LPZ0_A$-1 and higher. The SPD offers high energy Multi Air Gap design in convenient DIN rail mounting. Ideal for high lightning environments where critical equipment is potentially exposed to large surge currents.

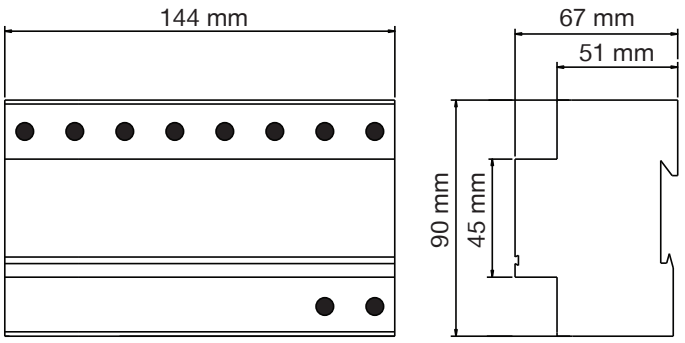
Specifications

Model	AD CS50-275-4C	AD CS50-320-4C	AD CS50-385-4C	AD CS50-440-4C
Tested To	IEC61643-11:2011			
IEC / VDE Arrester Category	Class I (B)			
Number Of Ports	Single Port Device			
Technology	Spark Gap and Gas Discharge Tube			
Maximum Continuous Operating Voltage U_C L-N	275 V	320 V	385 V	440 V
N-PE	255 V	255 V	255 V	350 V
Nominal Discharge Current I_N (8x20µs) L-N/ N-PE	50 kA / 100 kA			
Impulse Current I_{imp} (10x350µs) L-N / N-PE	50 kA / 100 kA			
Voltage Protection Level U_P	1.5 kV	1.5 kV	1.8 kV	2.0 kV
Short Circuit Current Rating I_{SCCR} L-N	10 kArms			
Follow Current Interrupt Rating I_{fi} (@ 255 Vac) L-N	≥ 10 kArms			
N-PE	≥ 100 kArms			
Residual Current at U_C	None			
Response Time	≤ 100 ns			
Remote Status Indication	Change over contact			
Contact Switch Capacity	AC: 250V/0.5 A; DC: 250V/0.1A; 125V/0.2 A; 75V/0.5A			
Location Category	Indoor Only			
Method of Mounting	Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3			
Dimension (H x W x D)	90 mm x 144 mm x 64.7 mm (3.6" x 5.7" x 2.5"), 8 modules, DIN 43880			
Weight (Max)	0.33 kg (0.74 lb)			
Maximum Wire Size	Single strand 35 mm² (#2 AWG), Multi strand 25 mm² (#4 AWG)			
Maximum Wire Size Contacts	1.5 mm² (#16 AWG)			
Operating Temperature	-40°C to +80°C			
Relative Humidity	≤ 95% non condensing			
Altitude	≤ 3000 m			
Enclosure Protection Level	IP 20			
Housing Inflammability Rating	Thermoplastic, UL 94 V-0			

Schematic



Dimensions



DynaShield®

Surge Protection Device

KSB 50 1T 255V & KSB 50 1T 255V LED

FEATURES:

- Class I (B) arrester
- 50 kA Impulse Current
- Multiple encapsulated Spark Gap
- LED status indication & Remote alarm contacts (KSB 50 1T 255V LED only)

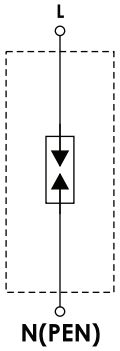
Product Description

The KSB 1 Series is a lightning and surge arrester designed to protect low voltage AC power systems against transient surges at $LPZ0_A$-1 and higher. The SPD offers high energy encapsulated Spark Gap design in convenient DIN rail mounting. Ideal for high lightning environments where critical equipment is potentially exposed to large surge currents.

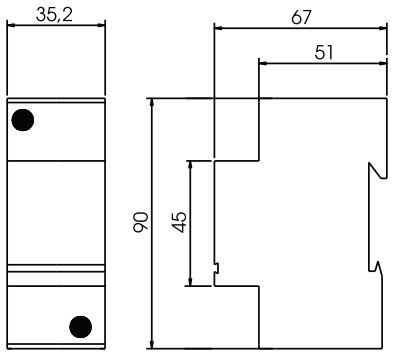
Specifications

Model	KSB 50 1T 255V	KSB 50 1T 255V LED
Tested To	IEC61643-1	
IEC Arrester Category	Class I (B)	
Number Of Ports	Single Port Device	
Technology	Multiple Encapsulated Spark Gap	
Maximum Continuous Operating Voltage U_C	255 V	
Nominal Discharge Current I_N (8x20µs)	50 kA	
Impulse Current Iimp (10x350µs)	50 kA	
Voltage Protection Level	< 2.0 kV	
Lightning Impulse Charge Q	25 As	
Specific Energy W/R	600 kJ/Ω	
Follow Current Interrupting Rating at Uc	3 kA	
Short Circuit Withstand Capability Ip	25 kA	
Response Time	≤ 100 ns	
Recommended Over-current Protection	500A gL/gG	
Visual Status Indication	---	LED: Green = Normal, Red = Replace
Remote Status Indication	---	Change over contact
Contact Switch Capacity	---	AC: 250V/0.5 A; DC: 250V/0.1A; 125V/0.2 A; 75V/0.5A
Location Category	Indoor Only	
Method of Mounting	Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3	
Dimension (H x W x D)	90 mm x 35.2 mm x 67 mm (3.6" x 1.4" x 2.6"), 2 modules, DIN 43880	
Weight (Max)	0.23 kg (0.50 lb)	
Maximum Wire Size	Single strand 35 mm² (#2 AWG), Multi strand 25 mm² (#4 AWG)	
Operating Temperature	-40°C to +80°C	
Relative Humidity	≤ 95% non condensing	
Enclosure Protection Level	IP 20	
Housing Inflammability Rating	Thermoplastic, UL 94 V-0	

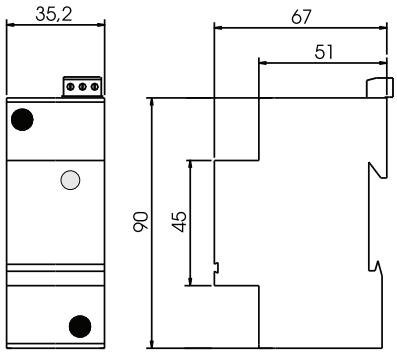
Schematic



Dimensions



KSB 50 1T 255V



KSB 50 1T 255V LED

DynaShield®

Surge Protection Device

KSB 110 1T 255V NP

FEATURES:

- Class I (B) arrester IEC 61643-1
- N-PE 100 kA Impulse Current
- < 2 kV Voltage Protection Level
- Multiple encapsulated Spark Gap
- DIN rail mounting

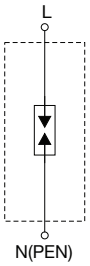
Product Description

The KSB 1NP Series is a lightning and surge arrester designed for N-PE protection in low voltage AC power systems against transient surges at $LPZ0_A$-1 and higher. The SPD offers high energy encapsulated Spark Gap design in convenient DIN rail mounting. Ideal for high lightning environments where critical equipment is potentially exposed to large surge currents.

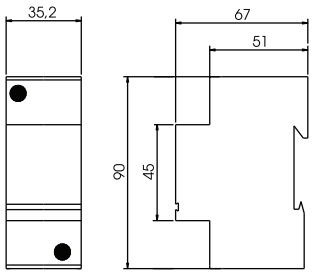
Specifications

Model	KSB 110 1T 255V NP
Tested To	IEC61643-1
IEC Arrester Category	Class I (B)
Number Of Ports	Single Port Device
Technology	Multiple Encapsulated Spark Gap
Maximum Continuous Operating Voltage U_C	255 V
Maximum Discharge Current I_{max} (8x20µs)	150 kA
Nominal Discharge Current I_N (8x20µs)	75 kA
Impulse Current I_{imp} (10x350µs)	100 kA
Voltage Protection Level U_P @ I_N (8x20µs)	< 2.0 kV
Lightning Impulse Charge Q	55 As
Specific Energy W/R	300 kJ/Ω
Follow Current Interrupting Rating at U_C	100 A
Temporary Overvoltage TOV	1200 V; 0.2s
Response Time	≤ 100 ns
Recommended Over-current Protection	500A gL/gG
Location Category	Indoor Only
Method of Mounting	Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3
Dimension (H x W x D)	90 mm x 35.2 mm x 67 mm (3.6" x 1.4" x 2.6"), 2 modules, DIN 43880
Weight (Max)	0.36 kg (0.79 lb)
Maximum Wire Size	Single strand 35 mm² (#2 AWG), Multi strand 25 mm² (#4 AWG)
Operating Temperature	-40°C to +80°C
Relative Humidity	≤ 95% non condensing
Enclosure Protection Level	IP 20
Housing Inflammability Rating	Thermoplastic, UL 94 V-0

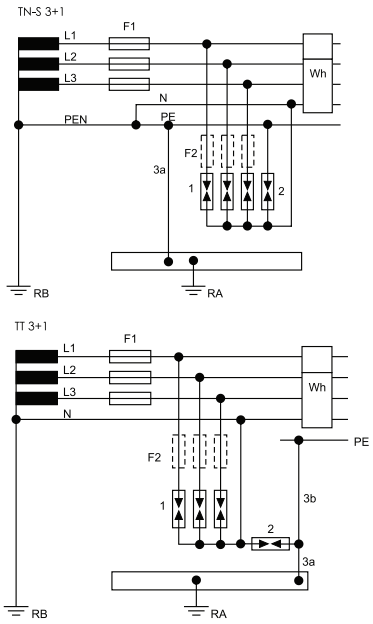
Schematic



Dimensions



Connections



1	Multiple spark gap KSB 50 1T 255V
2	Total current spark gap KSB 110 1T 255V NP
3a, 3b	Earthing wires for arresters
F1	Main back-up fuse of service main
F2	Recommended back-up fuse 315AgL/gG (only if the main back-up fuse F1 is fitted with back-up fuses > 315AgL/gG)
RA	Grounding of the equipment
RB	Grounding system

DynaShield®

Surge Protection Device

AD CM25 Series

FEATURES:

- Class I + II + III (B+C+D) arrester
- Hybrid MOV + GDT design
- Thermally protected
- Status window
- Remote alarm contacts

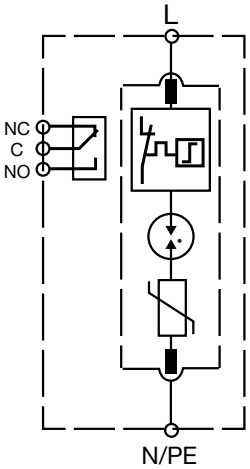
Product Description

The AD CM25 Series is designed to protect single phase low voltage AC power supply systems against transient surges at $LPZ0_A$-1 and higher. The SPD offers high energy hybrid MOV and GDT design in convenient DIN rail mounted package.

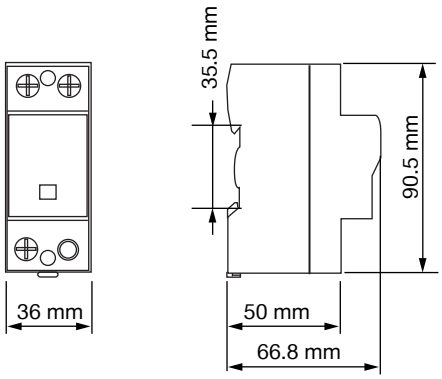
Specifications

Model	AD CM25-275-C	AD CM25-320-C	AD CM25-385-C
Designed To	IEC61643-11:2011, UL 1449 3rd Edition		
IEC Arrester Category	Class I+II (B+C)		
Number Of Ports	Single Port Device		
Technology	Metal Oxide Varistor and Gas Discharge Tube		
Maximum Continuous Operating Voltage U_C	275 V	320 V	385 V
Nominal Discharge Current I_N (8x20µs)	25 kA		
Maximum Discharge Current I_{max} (8x20µs)	120 kA		
Impulse Current I_{imp} (10x350µs)	25 kA		
Voltage Protection Level U_P @ I_N (8x20µs)	1.0 kV	1.2 kV	1.2 kV
@ 3kA	0.6 kV	0.6 kV	0.6 kV
Response Time L-N	≤ 25 us		
Recommended Over-current Protection	315A gL/gG		
Visual Status Indication	Window: Green = Normal, Red = Replace		
Remote Alarm Annunciation	Change over contact		
Contact Switch Capacity	AC: 250V/0.5 A; DC: 250V/0.1A; 125V/0.2 A; 75V/0.5A		
Location Category	Indoor Only		
Method of Mounting	Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3		
Dimension (H x W x D)	90.5 mm x 36 mm x 66.8 mm (3.6" x 21.4" x 2.6"), 8 modules, DIN 43880		
Weight (Max)	0.7 kg (1.4 lb)		
Maximum Wire Size	Single strand 35 mm² (#2 AWG), Multi strand 25 mm² (#4 AWG)		
Maximum Wire Size Contacts	1.5 mm² (#16 AWG)		
Operating Temperature	-40°C to +80°C		
Relative Humidity	≤ 95% non condensing		
Altitude	≤ 2000 m (6562 ft)		
Enclosure Protection Level	IP 20		
Housing Inflammability Rating	Thermoplastic, UL 94 V-0		

Schematic



Dimensions



DynaShield®

Surge Protection Device

KSB 1+2 1T 255V

FEATURES:

- Class I + II (B+C) arrester
- DIN rail with replaceable modules
- Thermally protected
- Status window
- Remote alarm contacts

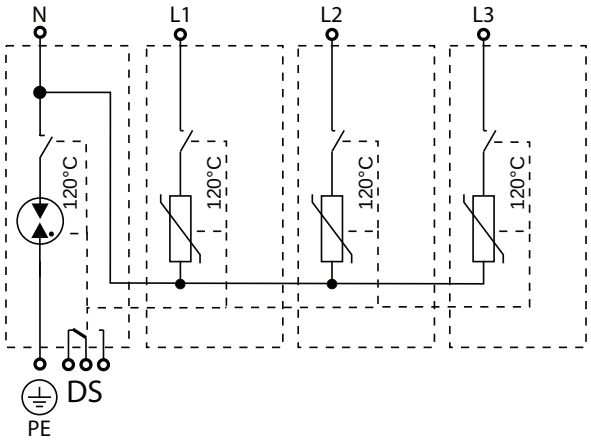
Product Description

The KSB 1+2T 255V is designed to protect three phase low voltage AC power supply system against transient surges at $LPZ0_A$-1 and higher. The SPD offers convenient DIN rail base with replaceable MOV and GDT suppression protection modules.

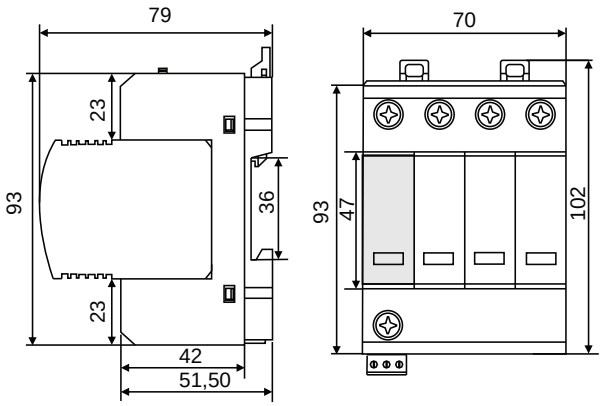
Specifications

Model	KSB 1+2 1T 255V
Designed To	IEC61643-11:2011, UL 1449 3rd Edition
IEC Arrester Category	Class I+II (B+C)
Number Of Ports	Single Port Device
Technology	Metal Oxide Varistor and Gas Discharge Tube
Nominal Voltage U_N	240 Vac
Maximum Continuous Operating Voltage U_C	385 V
Nominal Discharge Current I_N (8x20µs)	20 kA
Maximum Discharge Current Imax (8x20µs)	40 kA
Impulse Current I_{imp} (10x350µs)	7 kA (L-N); 25 kA (N-PE)
Voltage Protection Level Up	1.7 kV
Follow Current If	100 Arms
Residual Current at U_C	No
Temporary Overvoltage TOV	335 V / 5s (L-N); 1200 V / 0.2s (N-PE)
Response Time	≤ 25 ns (L-N); ≤ 100 ns (N-PE)
Recommended Over-current Protection	160A gL/gG
Visual Status Indication	Window: Green = Normal, Red = Replace
Remote Alarm Annunciation	Change over contact
Contact Switch Capacity	AC: 250V/0.5 A; DC: 250V/0.1A; 125V/0.2 A; 75V/0.5A
Location Category	Indoor Only
Method of Mounting	Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3
Dimension (H x W x D)	93 mm x 70 mm x 79 mm (3.6" x 2.8" x 3.1"), 4 modules, DIN 43880
Weight (Max)	0.33 kg (0.75 lb)
Maximum Wire Size	Single strand 35 mm² (#2 AWG), Multi strand 25 mm² (#4 AWG)
Maximum Wire Size Contacts	1.5 mm² (#16 AWG)
Operating Temperature	-40°C to +80°C
Relative Humidity	≤ 95% non condensing
Altitude	≤ 2000 m (6562 ft)
Enclosure Protection Level	IP 20
Housing Inflammability Rating	Thermoplastic, UL 94 V-0

Schematic



Dimensions



DynaShield®

Surge Protection Device

AD* Series

FEATURES:
- UL 1449 4th Edition
- 50kA surge current capacity
- SCCR 200kAIC
- Easy installation
- Environmentally friendly

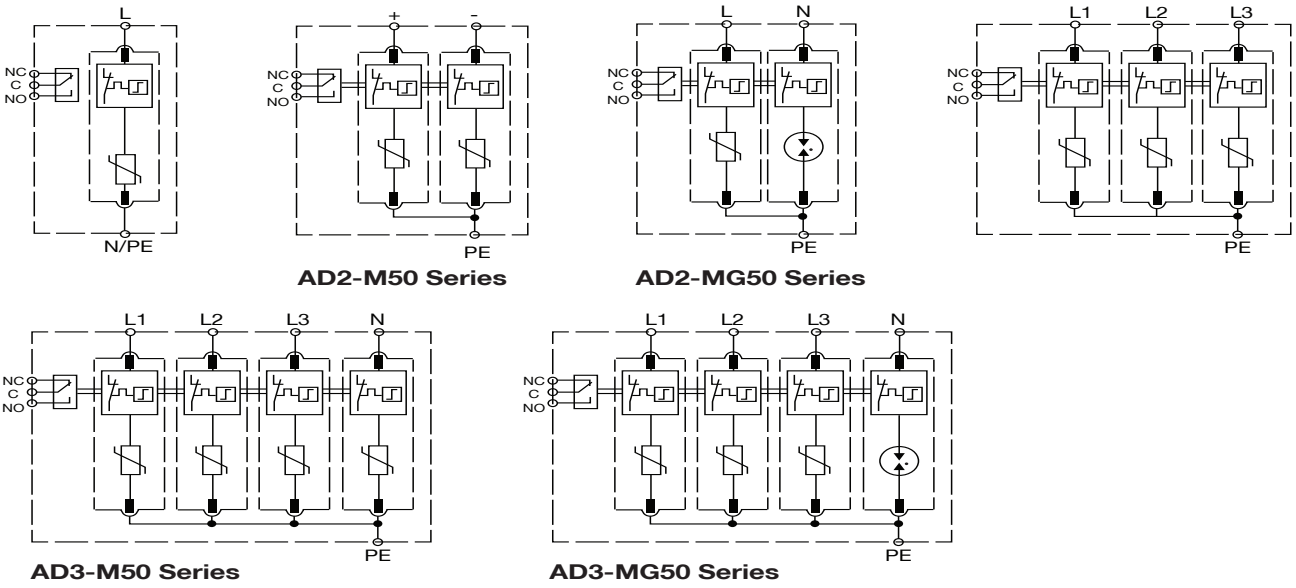
Product Description

The AD M(G)50 Series are designed to protect low voltage AC power systems against transient surges at LPZ0$_B$-1 and higher. The SPDs are UL1449 4th Edition Type 4 recognized components for use in Type 2 applications, and offer convenient DIN rail base with replaceable thermally protected MOV / GDT in suppression modules, status window and remote alarm contacts. Available in single pole, 2 pole, 3 pole and 4 pole integrated assemblies to protect all common low voltage AC

Specifications

Models	AD1-50-xxx-1C	AD2-M(G)50-xxx-2C	AD3-M50-xxx-3C	AD3-M(G)-xxx-4C
Tested To				
IEC Arrester Category				
Number Of Ports				
Technology				
Maximum Continuous Operating Voltage U_C				
Nominal Discharge Current I_N (8x20µs)				
Maximum Discharge Current I_{max} (8x20µs) Type 2				
Voltage Protection Level @ 3kA (8x20µs)				
UL Short Circuit Current Rating (SCCR)				
Response Time				
Recommended Over-Current Protection				
Visual Status Indication				
Remote Alarm Indication				
Contact Switch Capacity				
Location Category				
Method of Mounting				
Dimension (H x W x D) - 1 module				
Weight (Max) - 1 module				
Maximum Wire Size				
Maximum Wire Size Contacts				
Operating Temperature				
Relative Humidity				
Altitude				
Enclosure Protection Level				
Housing Inflammability Rating				
Certifications				

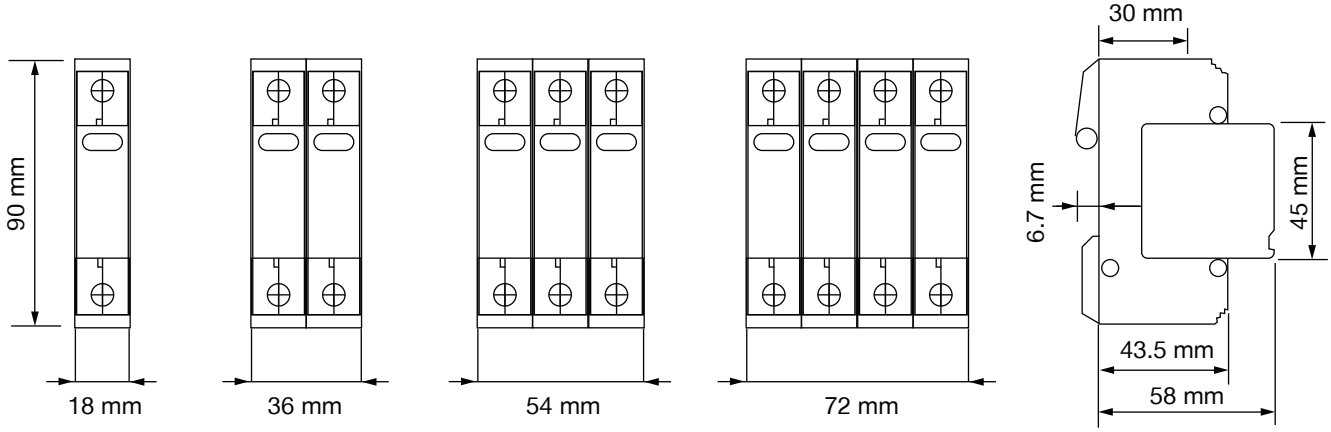
Schematic



C power applications.

	150	180	275	320	420	550	AD1-G50-150-1C	AD1-G50-255-1C
	IEC61643-11:2011; ANSI/UL 1449 4th Edition Type 4 tested to Type 1 or 2							
	Class II							
	Single Port Device							
	Thermally protected Metal Oxide Varistor (MOV)						Gas Discharge Tube	
	150 V	180 V	275 V	320 V	420 V	550 V	150V	255V
	20 kA						---	
	50 kA							
	0.6 kV	0.6 kV	0.9 kV	1.2 kV	1.5 kV	1.5 kV	1.2 kV	1.5 kV
	200 kA						---	
	< 25 ns						< 100 ns	
	125A gL/gG Fuse							
	Window: Green = Normal, Red = Replace							
	Change over contact							
	AC: 250V/0.5 A; DC: 250V/0.1A; 125V/0.2 A; 75V/0.5A							
	Indoor Only							
	Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3							
	90 mm x 18 mm x 64.7 mm (3.5" x 0.7" x 2.5"), 1 module, DIN 43880							
	0.33 kg (0.74 lb.)							
	Single strand 35 mm^2 (#2 AWG), Multi strand 25 mm^2 (#4 AWG)							
	1.5 mm^2 (#16 AWG)							
	-40°C to +80°C							
	≤ 95% non condensing							
	---						≤ 3000 m (9843 ft)	
	IP 20							
	Thermoplastic; Inflammability rating: UL 94 V-0							
	RoHS compliant							

Dimensions



DynaShield®

Surge Protection Device

AD M40 Series

KEMA KEUR

FEATURES:

- KEMA, Class II (C) arrester
- DIN rail with replaceable module
- Single Pole MOV design
- Thermally protected
- Status window and remote alarm contacts

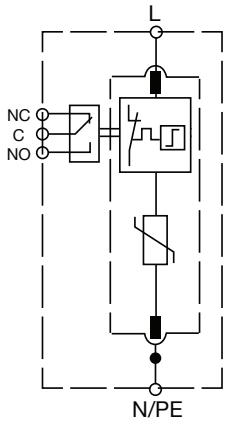
Product Description

The AD M40 Series are designed to protect low voltage AC power systems against transient surges at $LPZ0_B$-1 and higher. The SPDs are KEMA Recognized for Type 2 applications, and offer convenient DIN rail base with replaceable suppression modules, status window and remote alarm contacts. Available in single, two, three and four pole integrated assemblies to protect all common low voltage AC power applications.

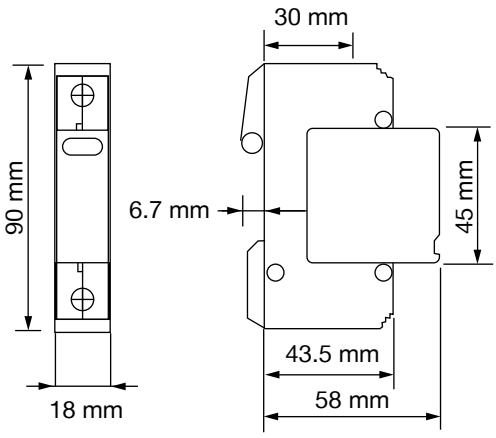
Specifications

Model	AD M40-150-C	AD M40-275-C	AD M40-320-C	AD M40-385-C
Tested To	IEC61643-11:2011			
IEC Arrester Category	Class II (C)			
Protection Modes	L-N (TN/TT/IT), L-PEN (TN)			
Number Of Ports	Single Port Device			
Technology	Metal Oxide Varistor (MOV)			
Maximum Continuous Operating Voltage Uc	150V	275V	320V	385V
Nominal Discharge Current I_N (8x20µs)	20 kA			
Maximum Discharge Current I_{max} (8x20µs)	40 kA			
Voltage Protection Level U_P I_N @ 8/20µs)	0.8 kV	1.5 kV	1.5 kV	1.8 kV
Short Circuit Current Rating	200 kAIC			
Short Circuit Withstand I_P	3 kA			
Response Time	≤ 25 ns			
Visual Status Indication	Window: Green = Normal, Red = Replace			
Remote Status Indication	Isolated Form C Change over contact			
Contact Switch Capacity	AC: 250V/0.5 A; DC: 250V/0.1A; 125V/0.2 A; 75V/0.5A			
Location Category	Indoor Only			
Method of Mounting	Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3			
Dimension (H x W x D)	90 mm x 18 mm x 66 mm (3.6" x 0.7" x 2.6"), 1 module, DIN 43880			
Weight (Max)	0.33 kg (0.74 lb)			
Maximum Wire Size	Single strand 35 mm² (#2 AWG), Multi strand 25 mm² (#4 AWG)			
Maximum Wire Size Contacts	1.5 mm² (#16 AWG)			
Operating Temperature	-20°C to +75°C			
Relative Humidity	≤ 90% non condensing			
Altitude	≤ 3000 m			
Enclosure Protection Level	IP 20			
Housing Inflammability Rating	Thermoplastic, UL 94 V-0			

Schematic



Dimensions



DynaShield®

Surge Protection Device

AD MG40 Series

FEATURES:

- KEMA, Class II (C) arrester
- DIN rail with replaceable module
- Two Pole MOV + GDT design
- Thermally protected
- Status window and remote alarm contacts

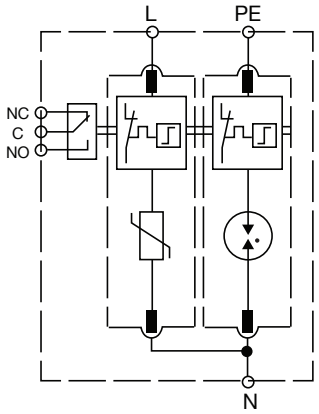
Product Description

The AD MG40 Series are designed to protect low voltage AC power systems against transient surges at LPZ0B-1 and higher. The SPDs are KEMA Recognized for Type 2 applications, and offer hybrid MOV and GDT design in convenient DIN rail base with replaceable suppression module, status window and remote alarm contacts.

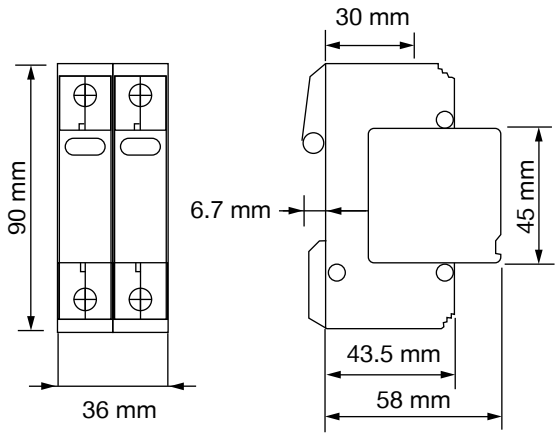
Specifications

Model	AD MG40-150-2C	AD MG40-275-2C	AD MG40-320-2C	AD MG40-385-2C
Tested To	IEC61643-11:2011			
IEC Arrester Category	Class II (C)			
Protection Modes	L-N (TN/TT/IT), L-PEN (TN)			
Number Of Ports	Single Port Device			
Technology	Metal Oxide Varistor and Gas Discharge Tube			
Maximum Continuous Operating Voltage U_C	150V	275V	320V	385V
Nominal Discharge Current I_N (8x20µs)	20 kA			
Maximum Discharge Current I_{max} (8x20µs)	40 kA			
Voltage Protection Level (L-N @ 8/20)	0.8 kV	1.5 kV	1.5 kV	1.8 kV
(N-PE @ 1.2/50)	1.5 kV	1.5 kV	1.5 kV	1.5 kV
Short Circuit Current Rating	200 kAIC			
Short Circuit Withstand I_P	3 kA			
Follow Current Interrupting Rating (N-PE)	100 A			
Response Time (L-N)	≤ 25 ns			
(N-PE)	≤ 100 ns			
Visual Status Indication	Window: Green = Normal, Red = Replace			
Contact switch for remote annunciation	Isolated Form C Change over contact			
Contact Switch Capacity	AC: 250V/0.5 A; DC: 250V/0.1A; 125V/0.2 A; 75V/0.5A			
Location Category	Indoor Only			
Method of Mounting	Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3			
Dimension (H x W x D)	90 mm x 36 mm x 66 mm (3.6" x 1.4" x 2.6"), 2 modules, DIN 43880			
Weight (Max)	0.33 kg (0.74 lb)			
Maximum Wire Size	Single strand 35 mm² (#2 AWG), Multi strand 25 mm² (#4 AWG)			
Maximum Wire Size Contacts	1.5 mm² (#16 AWG)			
Operating Temperature	-20°C to +75°C			
Relative Humidity	≤ 90% non condensing			
Altitude	≤ 3000 m			
Enclosure Protection Level	IP 20			
Housing Inflammability Rating	Thermoplastic, UL 94 V-0			

Schematic



Dimensions



DynaShield®

Surge Protection Device

AD MG40 C Series

FEATURES:

- KEMA, Class II (C) arrester
- DIN rail with replaceable module
- Single Pole MOV + GDT design
- Status window
- Remote alarm contacts

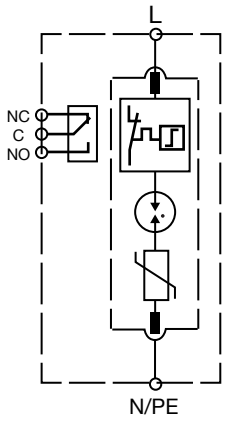
Product Description

The AD MG40 C Series are designed to protect low voltage AC power systems against transient surges at $LPZ0_B$-1 and higher. The SPDs are KEMA Recognized for Type 2 applications, and offer hybrid MOV and GDT design in convenient DIN rail base with replaceable suppression module, status window and remote alarm contacts.

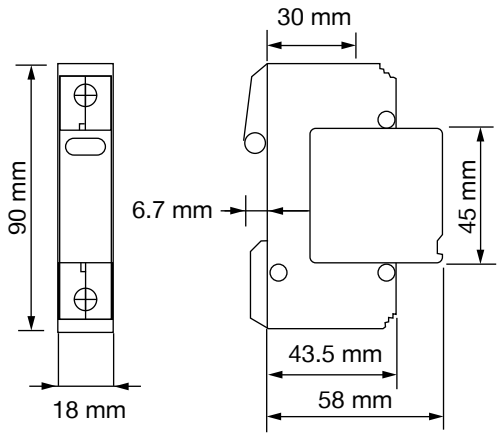
Specifications

Model	AD MG40-275C	AD MG40-320C
Tested To	IEC61643-11:2011	
IEC Arrester Category	Class II (C)	
Protection Modes	L-N (TN/TT/IT), L-PEN (TN)	
Number Of Ports	Single Port Device	
Technology	Metal Oxide Varistor and Gas Discharge Tube	
Maximum Continuous Operating Voltage U_C	275V	320V
Nominal Discharge Current I_N (8x20µs)	20 kA	
Maximum Discharge Current I_{max} (8x20µs)	40 kA	
Voltage Protection Level (U_P @ 1.2/50)	1.5 kV	1.5 kV
Response Time	≤100 ns	
Short Circuit Current Rating	200 kAIC	
Short Circuit Withstand I_P	3 kA	
Visual Status Indication	Window: Green = Normal, Red = Replace	
Contact switch for remote annunciation	Isolated Form C Change over contact	
Contact Switch Capacity	AC: 250V/0.5 A; DC: 250V/0.1A; 125V/0.2 A; 75V/0.5A	
Location Category	Indoor Only	
Method of Mounting	Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3	
Dimension (H x W x D)	90 mm x 18 mm x 64.7 mm (3.6" x 5.7" x 2.5"), 8 modules, DIN 43880	
Weight (Max)	0.33 kg (0.74 lb)	
Maximum Wire Size	Single strand 35 mm² (#2 AWG), Multi strand 25 mm² (#4 AWG)	
Maximum Wire Size Contacts	1.5 mm² (#16 AWG)	
Operating Temperature	-20°C to +75°C	
Relative Humidity	≤ 90% non condensing	
Altitude	≤ 3000 m	
Enclosure Protection Level	IP 20	
Housing Inflammability Rating	Thermoplastic, UL 94 V-0	

Schematic



Dimensions



DynaShield®

Surge Protection Device

KSB 3S Series

FEATURES:

- Class III (D) arrester IEC 61643
- DIN rail mounting
- MOV + GDT design
- LED visual status
- Remote alarm contacts

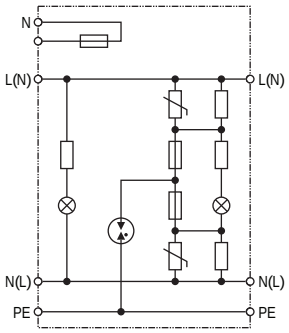
Product Description

The KSB 3S Series are designed to protect low voltage AC power systems against transient surges at LPZ1 and higher. The SPDs offer convenient DIN rail mounting, status LED and remote alarm contacts. Ideal for all low voltage AC power critical applications where low voltage protection level is essential.

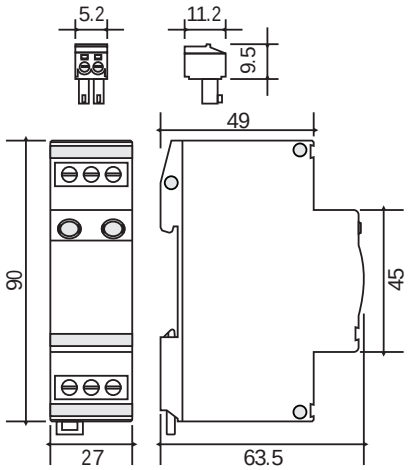
Specifications

Model	KSB 3S 120VR	KSB 3S 230VR
Tested To	IEC61643-11:2011	
IEC Arrester Category	Class III (D)	
Number Of Ports	Single Port Device	
Technology	Metal Oxide Varistor and Gas Discharge Tube	
Nominal Voltage U_N	110 V	220 V
Maximum Continuous Operating Voltage U_C	150 V	320 V
Nominal Current	16 A	
Nominal Discharge Current I_N (8x20µs)	3 kA	
Maximum Discharge Current I_{max} (8x20µs)	10 kA	
Voltage Protection Level U_P (8x20µs)	≤ 0.7 kV	≤ 1.25 kV
Response Time	≤ 25 ns	
Recommended Over-current Protection	16A gL/gG	
Visual Status Indication	LED: Green = Normal, Red = Replace	
Remote Status Indication	Change over contact	
Contact Switch Capacity	AC: 250V/0.5 A; DC: 250V/0.1A; 125V/0.2 A; 75V/0.5A	
Location Category	Indoor Only	
Method of Mounting	Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3	
Dimension (H x W x D)	90 mm x 27 mm x 63.5 mm (3.6" x 1.1" x 2.5")	
Weight (Max)	0.33 kg (0.74 lb)	
Maximum Wire Size	Single strand 35 mm² (#2 AWG), Multi strand 25 mm² (#4 AWG)	
Maximum Wire Size Contacts	1.5 mm² (#16 AWG)	
Operating Temperature	-40°C to +80°C	
Relative Humidity	≤ 95% non condensing	
Altitude	≤ 3000 m	
Enclosure Protection Level	IP 20	
Housing Inflammability Rating	Thermoplastic, UL 94 V-0	
Certification	CE (LVD, EMC)	

Schematic



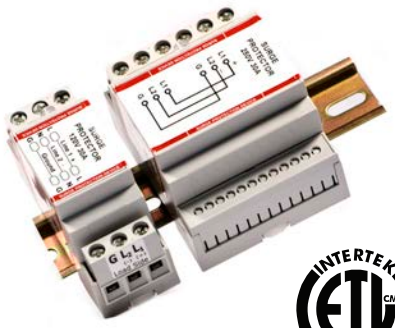
Dimensions



DynaShield®

Surge Protection Device

PT-RD AC Series



FEATURES:

- UL 1449 3rd Edition Type 4 for use in Type 2 applications
- SCCR 100 kAIC
- Series or parallel Installation
- LED status
- Screw or DIN mount

Product Description

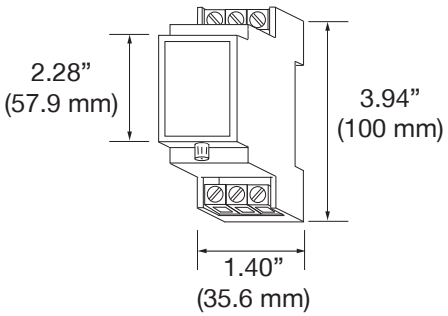
The RD Series is designed to protect single phase low voltage AC power supply system against transient surges at LPZ1 and higher. The SPDs are ANSI/UL 1449 3rd Edition Type 4 recognized components for use in Type 2 applications. The SPDs are complimentary listed to UL 1283 with proprietary Frequency Reactive Circuitry. Ideal for use in SCADA Systems, PLCs and most other sensitive electronic equipment.

Specifications

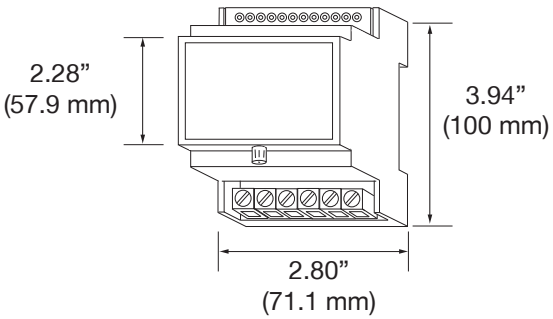
Model	PT-RD-20-120V-30	PT-RD-20-250V-30	PT-RD-40-120V-30	PT-RD-40-250V-30
Tested To	UL 1449 3rd Edition			
SPD Category	Type 4 for use in Type 2 applications			
Number Of Ports	Two Port Device			
Technology	Metal Oxide Varistor (MOV)			
Nominal Operating Voltage Un	120 Vac	240 Vac	120 Vac	240 Vac
Maximum Current	30 A			
Maximum Continuous Operating Voltage U_C	140 V	260 V	140 V	260 V
Nominal Discharge Current I_N (8x20µs)	3 kA	3 kA	3 kA	3 kA
Maximum Discharge Current I_{max} (8x20µs)	20 kA	20 kA	40 kA	40 kA
Voltage Protection Rating Vpr @ I_N (L-N)	600 V	800 V	500 V	800 V
(L-PE)	600 V	800 V	500 V	800 V
(N-PE)	600 V	800 V	600 V	800 V
Response Time	≤ 25 ns			
Visual Status Indication	LED: Green = Normal, Dark = Replace			
Location Category	Indoor Only			
Method of Mounting	Wall mount or Fixed 35 mm DIN rail			
Dimension (H x W x D)	100 mm x 35.6 mm x 57.9 mm (3.94" x 1.4" x 2.3")		100 mm x 71.1 mm x 57.9 mm (3.94" x 2.8" x 2.3")	
Weight (Max)	0.25 kg (0.5 lb)		0.45 kg (0.9 lb)	
Maximum Wire Size	Multi strand 13 mm² (#6 AWG)			
Operating Temperature	-40°C to +80°C			
Relative Humidity	≤ 95% non condensing			
Altitude	≤ 3000 m			
Enclosure Protection Level	IP 20			
Housing Inflammability Rating	Thermoplastic, UL 94 V-0			

Dimensions

20 kA



40 kA



Section 3

DC Power Products

DynaShield®

Surge Protection Device

DC Products Selection Guide

<table>
<tr><td rowspan="5">SPD Mounted External to Equipment</td><td colspan="3">Yes</td><td colspan="2">PD Series
P. 3-3
  </td></tr>
<tr><td rowspan="4">No</td><td rowspan="4">Mounting</td><td rowspan="3">DIN Rail</td><td colspan="3">Location</td></tr>
<tr><td>DC Class II < 500V</td><td>AD M20 Series
P. 3-4
  </td><td>AD M40 Series
P. 3-5
  </td></tr>
<tr><td>DC Class III < 500V</td><td>AD SD Series
P. 3-6
  </td><td></td></tr>
<tr><td>DC Class II > 500V</td><td>AD PM Series
P. 3-7
  </td><td></td></tr>
<tr><td colspan="2">Screw Mount</td><td>RD DC Series
P. 3-8
  </td><td></td></tr>
</table>

DynaShield®

Surge Protection Device

PD M50-048-3C

FEATURES:

- Rugged IP65 sealed weather tight enclosure
- Replaceable suppression modules per mode
- Thermally protected MOV design
- Status window and remote alarm contacts
- Common and Normal Mode Protection

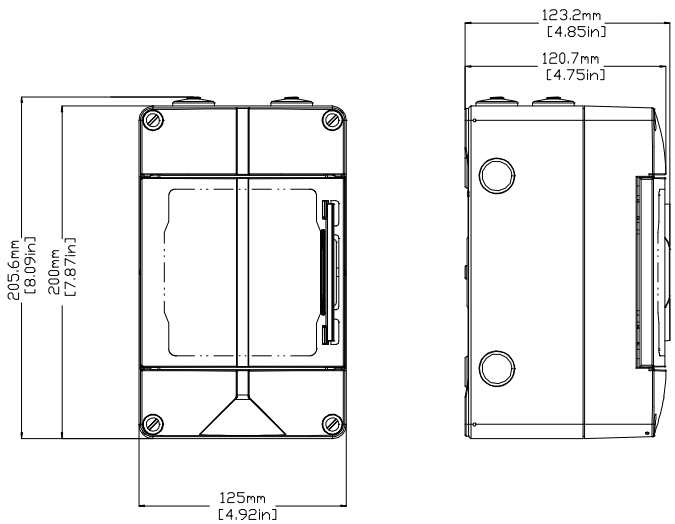
Product Description

The PD M50-048-3C is designed to protect 48V low voltage DC power supply systems against transient surges at $LPZ0_B$-1 and higher. The SPD offers three mode protection in a NEMA 4X enclosure, replaceable suppression modules, status window and remote alarm contacts. Ideal for outdoor 48V DC systems including tower mounted equipment.

Specifications

Sample Models	PD M50-048-3C
Designed To	IEC61643-11:2011; UL1449 4th
Category IEC/VDE	II/ C
Number Of Ports	Single Port Device
Technology	Thermally protected Metal Oxide Varistor (MOV)
Modes of Protection	V+ to V-, V+ to PE, V- to PE
Nominal Voltage Un	48 Vdc
Maximum Continuous Operating Voltage U_C	75 Vdc
Nominal Discharge Current I_N (8x20µs)	20 kA
Maximum Discharge Current I_{max} (8x20µs)	40 kA
Voltage Protection Level U_P @ I_N +/-	350V
-/PE (@1.2/50)	800V
Recommended Over Current Protection	125A gL/gG
Response Time	≤ 25 ns
Visual Status Indication Per Mode	Window: Green = Normal, Red = Replace
Remote Status Indication	Change over contact
Contact Switch Capacity	AC: 250V/0.5 A; DC: 250V/0.1A; 125V/0.2 A; 75V/0.5A
Location Category	Outdoor / Indoor
Method of Mounting	Wall or Panel mount
Enclosure	Light gray w/ hinged tinted transparent door
Enclosure Features	Double membrane seals, sidewalls w/ M20 and M25 knockouts
Enclosure Rating	Polycarbonate; IP65, NEMA 4X
Dimension (H x W x D)	125 mm x 200 mm x 124 mm (4.92" x 7.87" x 4.92")
Mounting Dimension (H x W)	50 mm x 120 mm (1.97" x 4.72")
Weight (Max)	1.05 kg (2.3 lb)
Maximum Wire Size	Single strand 35 mm² (#2 AWG), Multi strand 25 mm² (#4 AWG)
Maximum Wire Size Contacts	1.5 mm² (#16 AWG)
Operating Temperature	-40°C to +80°C
Relative Humidity	≤ 95% non condensing
Altitude	≤ 3000 m
SPD Component Protection Level	IP 20
SPD Component Inflammability Rating	Thermoplastic, UL 94 V-0

Dimensions



*Enclosure can vary depend on protection modes and options.

DynaShield®

Surge Protection Device

AD M20 Series

FEATURES:

- Class II (C) arrester
- DIN rail with replaceable module
- Single Pole MOV design
- Status window
- Remote alarm contacts

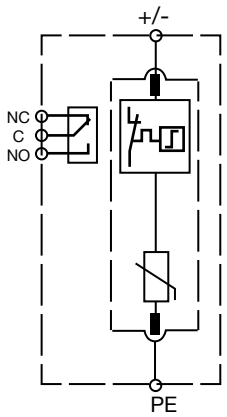
Product Description

The AD M20 Series are designed to protect low voltage DC power supply systems against transient surges at $LPZ0_B$-1 and higher. The SPDs offer convenient DIN rail base with replaceable suppression module, status window and remote alarm contacts.

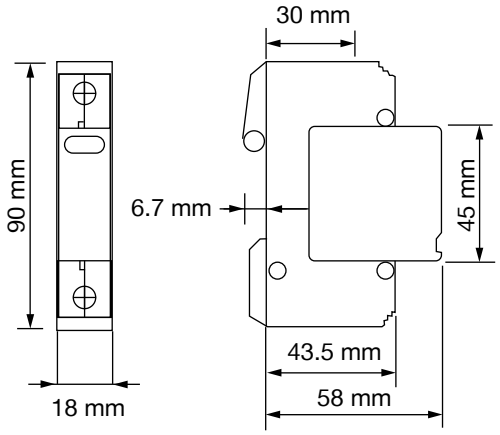
Specifications

Model	AD M20-24-C	AD M20-48-C
Tested To	IEC61643-11:2011	
IEC Arrester Category	Class II (C)	
Protection Modes	L-N	
Number Of Ports	Single Port Device	
Technology	Metal Oxide Varistor (MOV)	
Nominal Voltage U_N	24 Vdc	48 Vdc
Maximum Continuous Operating Voltage U_C	38 Vdc	56 Vdc
Nominal Discharge Current I_N (8x20µs)	10 kA	
Maximum Discharge Current I_{max} (8x20µs)	20 kA	
Voltage Protection Level (U_P @ 8/20)	200 V	280 V
Recommended Over Current Protection	125 A gL/gG	
Response Time	≤ 25 ns	
Visual Status Indication	Window: Green = Normal, Red = Replace	
Remote Status Indication	Change over contact	
Contact Switch Capacity	AC: 250V/0.5 A; DC: 250V/0.1A; 125V/0.2 A; 75V/0.5A	
Location Category	Indoor Only	
Method of Mounting	Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3	
Dimension (H x W x D)	90 mm x 18 mm x 66 mm (3.6" x 0.7" x 2.6"), 1 module, DIN 43880	
Weight (Max)	0.33 kg (0.74 lb)	
Maximum Wire Size	Single strand 35 mm² (#2 AWG), Multi strand 25 mm² (#4 AWG)	
Maximum Wire Size Contacts	1.5 mm² (#16 AWG)	
Operating Temperature	-40°C to +80°C	
Relative Humidity	≤ 90% non condensing	
Altitude	≤ 3000 m	
Enclosure Protection Level	IP 20	
Housing Inflammability Rating	Thermoplastic, UL 94 V-0	

Schematic



Dimensions



DynaShield®

Surge Protection Device

AD M40-48-C

FEATURES:

- Class II (C) arrester
- DIN rail with replaceable module
- Single Pole MOV design
- Status window
- Remote alarm contacts

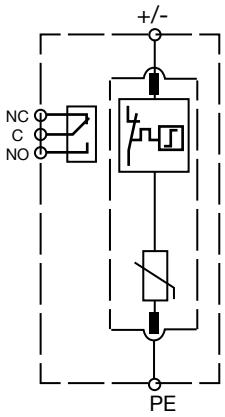
Product Description

The AD M40 Series are designed to protect low voltage DC power supply systems against transient surges at $LPZ0_B$-1 and higher. The SPDs offer convenient DIN rail base with replaceable suppression module, status window and remote alarm contacts.

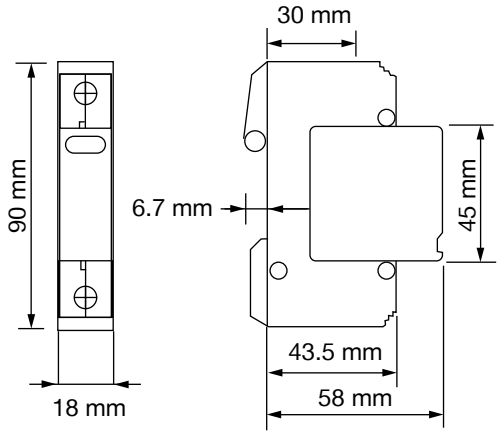
Specifications

Model	AD M40-48-C
Tested To	IEC61643-11:2011
IEC Arrester Category	Class II (C)
Protection Modes	L-N (TN/TT/IT), L-PEN (TN)
Number Of Ports	Single Port Device
Technology	Metal Oxide Varistor (MOV)
Nominal Voltage Un	48 Vdc
Maximum Continuous Operating Voltage U_C	75 Vdc
Nominal Discharge Current I_N (8x20µs)	20 kA
Maximum Discharge Current I_{max} (8x20µs)	40 kA
Voltage Protection Level (U_P @ 8/20)	350 V
Follow Current	No
Recommended Over Current Protection	125 A gL/gG
Response Time	≤ 25 ns
Visual Status Indication	Window: Green = Normal, Red = Replace
Remote Status Indication	Change over contact
Contact Switch Capacity	AC: 250V/0.5 A; DC: 250V/0.1A; 125V/0.2 A; 75V/0.5A
Location Category	Indoor Only
Method of Mounting	Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3
Dimension (H x W x D)	90 mm x 18 mm x 66 mm (3.6" x 0.7" x 2.6"), 1 module, DIN 43880
Weight (Max)	0.33 kg (0.74 lb)
Maximum Wire Size	Single strand 35 mm² (#2 AWG), Multi strand 25 mm² (#4 AWG)
Maximum Wire Size Contacts	1.5 mm² (#16 AWG)
Operating Temperature	-40°C to +80°C
Relative Humidity	≤ 90% non condensing
Altitude	≤ 3000 m
Enclosure Protection Level	IP 20
Housing Inflammability Rating	Thermoplastic, UL 94 V-0

Schematic



Dimensions



DynaShield®

Surge Protection Device

AD SD2-24

FEATURES:

- Class III (D) arrester
- Hybrid MOV + GDT design
- Low voltage protection level
- Status LED

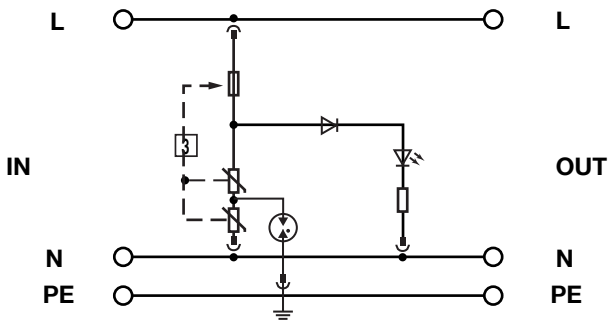
Product Description

The AD SD2-24 Surge Protection Device (SPD) is designed for protecting low voltage power supply systems at LPZ 2-3 and higher. The SPD offers MOV and GDT design with status LED in a convenient DIN rail mount package.

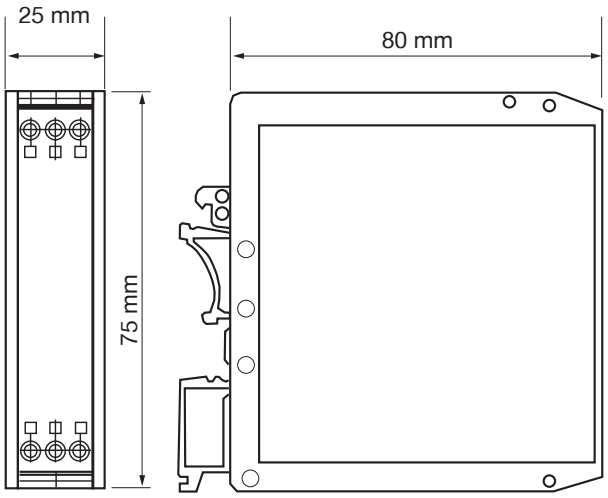
Specifications

Model		AD SD2-24
Tested To		IEC61643-11:2011
IEC Arrester Category		Class III (D)
Number Of Ports		Single Port Device
Technology		Metal Oxide Varistor and Gas Discharge Tube
Protection Modes		Transverse and Common Mode
Maximum Continuous Operating Voltage U_C	L-N	48 V/34 Vac
Nominal Discharge Current I_N (8x20µs)	L-N	1 kA
Maximum Discharge Current I_{max} (8x20µs)	L-N	2 kA
Voltage Protection Level U_P @ I_N	L/N-PE	< 180 V
	L-N	< 380 V
Open Circuit Voltage U_{CC}		2 kV
Maximum Load Current (IEC)		26 A
Response Time	L-N	≤ 25 ns
	L/N-PE	≤ 100 ns
Recommended Over Current Protection		25A gL/gG
Visual Status Indication		LED: Green = Normal, Off = Replace
Location Category		Indoor Only
Method of Mounting		Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3
Dimension (H x W x D)		80 mm × 74 mm × 25 mm (3.2" x 2.9" x 1.0")
Weight (Max)		0.1 kg (3.5 oz)
Maximum Wire Size		Multi strand 2.5 mm² (#14 AWG)
Operating Temperature		-40°C to +70°C
Relative Humidity		≤ 95% non condensing
Altitude		≤ 3000 m
Enclosure Protection Level		IP 20
Housing Inflammability Rating		Thermoplastic, UL 94 V-0

Schematic



Dimensions



DynaShield®

Surge Protection Device

AD PM50 Series

FEATURES:

- Class II Arrestor
- DIN rail with replaceable module
- Thermally protected
- Status window
- Remote alarm contacts

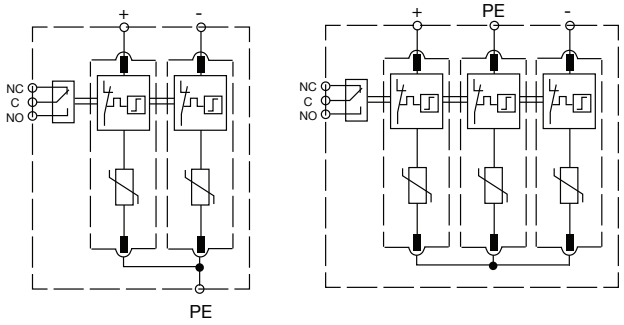
Product Description

The AD PM50 Series are designed to protect high voltage DC photovoltaic and wind power systems against transient surges at $LPZ0_B$-1 and higher. The SPDs are UL1449 3rd Edition Recognized Type 4 for Type 2 applications, offer convenient DIN rail base with replaceable suppression modules, status window and remote alarm contacts. Available in 2 pole or 3 pole integrated assemblies to protect all common high voltage DC applications.

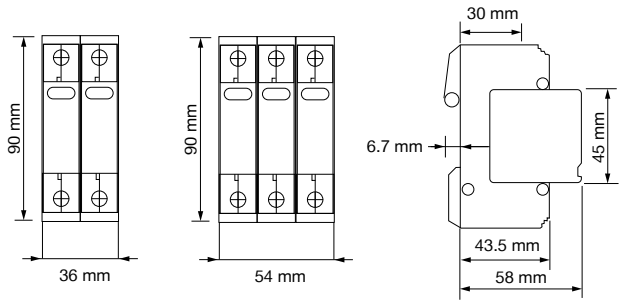
Specifications

Model	AD PM50 -500-2C	AD PM50 -600-2C	AD PM50 -600-3C	AD PM50 -750-2C	AD PM50 -750-3C	AD PM50 -1000-3C	AD PM50 -1200-3C
Designed & Tested To	IEC61643-11:2011; UL 1449 3rd Edition						
IEC Arrester Category	Class II						
Number Of Ports	Single Port Device						
Technology	Thermally protected Metal Oxide Varistor (MOV)						
Nominal Operating Voltage (U_N)	500 Vdc	600 Vdc	600 Vdc	750 Vdc	750 Vdc	1000 Vdc	1200 Vdc
Maximum Continuous Operating Voltage (U_C)	560 Vdc	670 Vdc	700 Vdc	825 Vdc	840 Vdc	1120 Vdc	1340 Vdc
Nominal Discharge Current I_N (8x20µs)	20 kA						
Maximum Discharge Current I_{max} (8x20µs)	50 kA						
Voltage Protection Level U_P	1.5 kV	1.5 kV	2 kV	2 kV	2.8 kV	3 kV	3 kV
Short Circuit Current Rating (SCCR)	200 kA						
Response Time	< 25 ns						
Visual Status Indication	Window: Green = Normal, Red = Replace						
Remote Status Indication	Change over contact						
Contact Switch Capacity	AC: 250V/0.5 A; DC: 250V/0.1A; 125V/0.2 A; 75V/0.5A						
Location Category	Indoor Only						
Method of Mounting	Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3						
Dimension (H x W x D) (2 pole)	90 mm x 36 mm x 64.7 mm (3.6" x 1.4" x 2.5") DIN 43880						
Dimension (H x W x D) (3 pole)	90 mm x 54 mm x 64.7 mm (3.6" x 2.1" x 2.5") DIN 43880						
Weight (Max) 2 pole / 3 pole	0.66 kg (1.45 lb) / 0.99 kg (2.18 lb)						
Maximum Wire Size	Single strand 35 mm^2 (#2 AWG), Multi strand 25 mm^2 (#4 AWG)						
Maximum Wire Size Contacts	1.5 mm^2 (#16 AWG)						
Enclosure Protection Level	IP 20						
Housing Inflammability Rating	Thermoplastic; Inflammability rating: UL 94 V-0						

Schematic



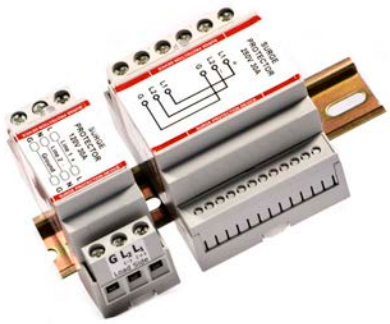
Dimensions



DynaShield®

Surge Protection Device

PT-RD DC Series



FEATURES:

- Peak Surge current up to 20 kA
- Continuous current up to 30 A
- Series or parallel installation
- LED status
- Screw or DIN mount

Product Description

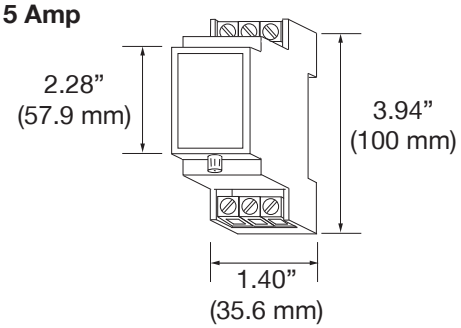
The RD Series is designed to protect DC power supply system against transient surges at LPZ1 and higher. Ideal for use in SCADA Systems, PLCs and most other sensitive electronic equipment.

Specifications

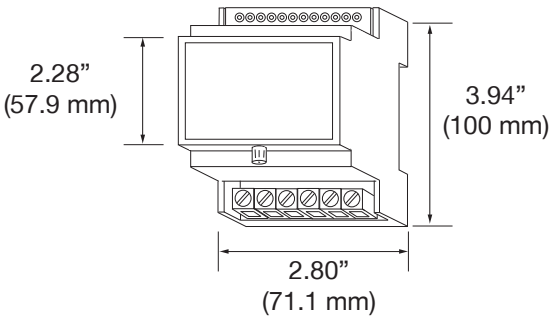
Model	PT-RD-05-05V-05A	PT-RD-20-12V-15A	PT-RD-10-24V-15A	PT-RD-20-24V-30A	PT-RD-20-48V-30A
Tested To	IEC 61643-11, IEEE C62.45				
IEC Arrester Category	Class II				
Number Of Ports	Two Port Device				
Technology	Metal Oxide Varistor (MOV)				
Nominal Voltage U_N	5 V	12 V	24 V	24 V	48 V
Maximum Current	5 A	15 A	15 A	30 A	30 A
Maximum Continuous Operating Voltage U_C	10 Vdc	16 Vdc	30 Vdc	30 Vdc	70 Vdc
Nominal Discharge Current I_N (8x20µs)	3 kA	3 kA	3 kA	3 kA	3 kA
Maximum Discharge Current I_{max} (8x20µs)	5 kA	20 kA	10 kA	20 kA	20 kA
Voltage Protection Level U_P @ I_N (8x20µs)	142 V	165 V	188 V	180 V	204 V
Response Time	≤ 25 ns				
Visual Status Indication	LED: Green = Normal, dark = Replace				
Location Category	Indoor Only				
Method of Mounting	Wall mount or Fixed 35 mm DIN rail				
Dimension (H x W x D)	100 mm x 35.6 mm x 57.9 mm (3.94" x 1.4" x 2.3")			100 mm x 71.1 mm x 57.9 mm (3.94" x 2.8" x 2.3")	
Weight (Max)	0.25 kg (0.5 lb)			0.45 kg (0.9 lb)	
Maximum Wire Size	Multi strand 2.08 mm² (#14 AWG)			Multi strand 13 mm² (#6 AWG)	
Operating Temperature	-40°C to +80°C				
Relative Humidity	≤ 95% non condensing				
Altitude	≤ 3000 m				
Enclosure Protection Level	IP 20				
Housing Inflammability Rating	Thermoplastic, UL 94 V-0				

Dimensions

5 or 15 Amp



30 Amp



Section 4

Data Signal Products

DynaShield®

Surge Protection Device

KSB LD Series

FEATURES:

- D sub connection
- Hybrid Silicon + GDT design
- Includes 4-40 lock screws
- Fast response
- Excellent voltage protection level

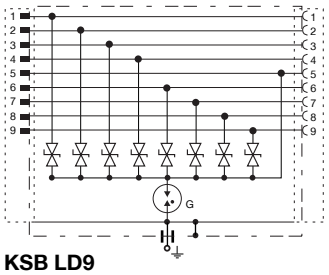
Product Description

The KSB LD Series is a Surge Protection Device designed to protect single D sub connector for data signals with transmission rates up to 2 Mbps.

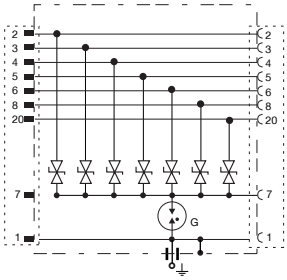
Specifications

Model	KSB LD 9	KSB LD 25
Number Of Ports	Two Port Device	
Technology	Hybrid Silicon Diode and Gas Discharge Tube	
Nominal Voltage U_N	6 V	12 V
Maximum Continuous Operating Voltage U_C	8 V (6 V)	15 V (12 V)
Nominal Discharge Current I_N (8x20µs)	250 A	
Maximum Discharge Current I_{max} (8x20µs)	500 A	
Voltage Protection Level U_P (8x20µs) Line - SG	≤ 30 V	≤ 45 V
SG - Ground	≤ 500 V	
Voltage Protection Level U_P (1 kV/µs) Line - SG	≤ 24 V	≤ 38 V
SG - Ground	≤ 600 V	
Protected Pins	Pins 1,2,3,4,6,7,8,9, SG Pin 5	Pins 2,3,4,5,6,8,20, SG Pin 7
Maximum Transmission Rate	2 Mbps	
Insertion Loss	≤ 0.5 dB	
Response Time	≤ 5 ns	
Location Category	Indoor Only	
Method of Mounting	In line series	
Connection	Shielded 9 pin D sub; Female / Male	Shielded 25 pin D sub; Female / Male
Dimension (H x W x D)	50 mm x 40 mm x 25 mm (2" x 1.6" x 1")	50 mm x 56 mm x 25 mm (2" x 2.2" x 1")
Weight (Max)	0.08 kg (0.2 lb)	
Grounding	Wire; 2.5 mm² (#14 AWG), Length 275 mm (10.8")	
Operating Temperature	-25°C to +70°C	
Relative Humidity	≤ 95% non condensing	
Altitude	≤ 3000 m	
Enclosure Protection Level	IP 20	
Enclosure Material	Aluminum	

Schematic

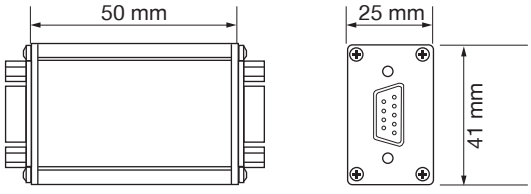


KSB LD9

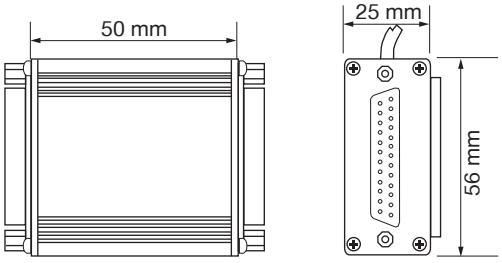


KSB LD25

Dimensions



KSB LD9



KSB LD25

DynaShield®

Surge Protection Device

KSB LB Series

Product Description

The KSB LB Series is a Surge Protection Device family designed to protect single BNC connector for coaxial Video or Ethernet signals with transmission rates up to 10 Mbps.

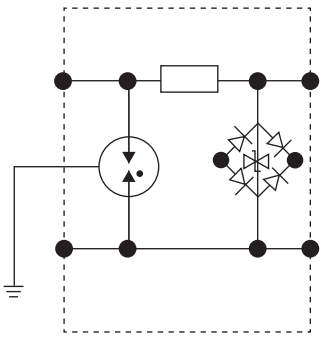
FEATURES:

- 1000 Mbps transmission rate
- DIN rail or In-Line mounting
- Hybrid Silicon + GDT design
- BNC Female / Male connection
- Fast response

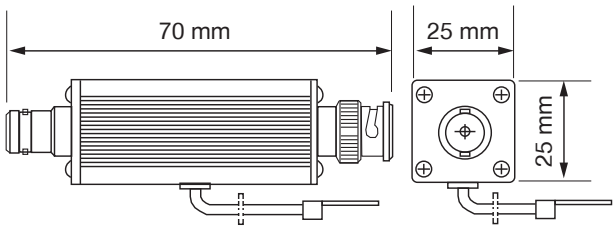
Specifications

Model		KSB LB-5	KSB LB-12	KSB LB-24
Certification		IEC61643:21-2005		
Number Of Ports		Two Port Device		
Technology		Hybrid Silicon Diode and Gas Discharge Tube		
Nominal Voltage U_N		5 V	12 V	24 V
Maximum Continuous Operating Voltage U_C		6 V (5 V~)	15 V (12 V~)	28 V (24 V~)
Nominal Discharge Current I_N (8x20µs)		5 kA		
Maximum Discharge Current I_{max} (8x20µs)		10 kA		
Voltage Protection Level U_P (8x20µs)	(L-L)	≤ 30	≤ 45	≤ 55
	(L-PE)	≤ 500	≤ 500	≤ 500
Voltage Protection Level U_P (1kV/µs)	(L-L)	≤ 24	≤ 38	≤ 48
	(L-PE)	≤ 600	≤ 600	≤ 600
Series Impedance per line		3 Ω		
Maximum Transmission Rate		10 Mbps		
Insertion Loss (10 MHz)		≤ 0.5 dB		
Response Time		≤ 5 ns		
Location Category		Indoor Only		
Method of Mounting		35 mm DIN rail or In line series		
Connection (In / Out)		BNC; Female / Male		
Grounding		Wire; 2.5 mm² (#14 AWG), Length 275 mm (10.8")		
Dimension (H x W x D)		70 mm x 25 mm x 25 mm (2.8" x 1" x 1")		
Weight (Max)		0.08 kg (0.2 lb)		
Operating Temperature		-25°C to +70°C		
Relative Humidity		≤ 95% non condensing		
Altitude		≤ 3000 m		
Enclosure Protection Level		IP 20		
Enclosure Material		Aluminum		

Schematic



Dimensions



DynaShield®

Surge Protection Device

KSB LJ8 Series

FEATURES:

- 1000 Mbps transmission rate
- DIN rail or In-Line mounting
- Hybrid Silicon + GDT design
- Shielded RJ45 jacks
- Fast response

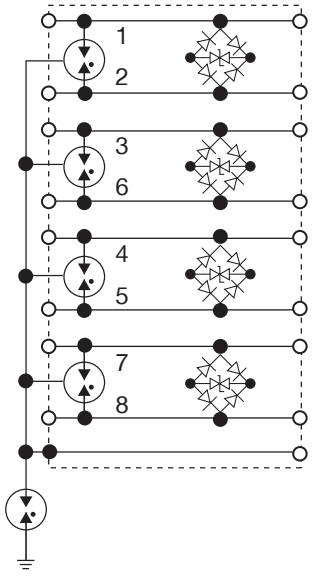
Product Description

The KSB LJ8 Series is a Surge Protection Device family designed to protect single RJ-45 connector for 10BT/100BT/1000BT data signals with transmission rates up to 1000 Mbps.

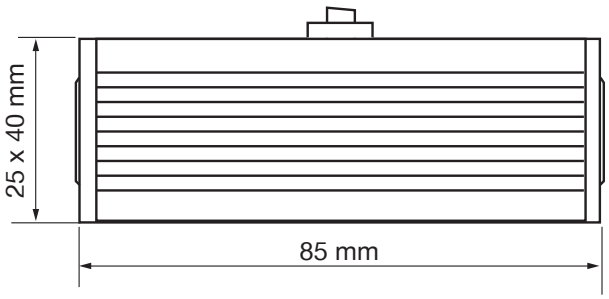
Specifications

Model	KSB LJ8-5	KSB LJ8-12	KSB LJ8-24	KSB LJ8-48
Certification	IEC61643:21-2005			
Number Of Ports	Two Port Device			
Technology	Hybrid Silicon Diode and Gas Discharge Tube			
Nominal Voltage U_N	5 V	12 V	24 V	48 V
Maximum Continuous Operating Voltage U_C	6 V (5 V~)	15 V (12 V~)	28 V (24 V~)	60 V (48 V~)
C2 Nominal Discharge Current I_N (8x20µs) per line	100 A (L-L), 2.5 kA (L-G)			
C2 Total Nominal Discharge Current I_{max} (8x20µs)	400 A (L-L), 20 kA (L-G)			
Nominal Current	1 A			
Voltage Protection Level U_P @C2 (8x20µs) (L-L)	≤ 30	≤ 45	≤ 55	≤ 190
(L-PE)	≤ 600	≤ 600	≤ 600	≤ 600
Voltage Protection Level U_P @C3 (1kV/µs) (L-L)	≤ 24	≤ 38	≤ 48	≤ 145
(L-PE)	≤ 800	≤ 800	≤ 800	≤ 800
Protected Pins	Pins 1/2, 3/6, 4/5, 7/8			
Maximum Transmission Rate	1000 Mbps			
Insertion Loss (80 MHz)	≤ 3.0 dB			
Response Time	≤ 5 ns			
Location Category	Indoor Only			
Method of Mounting	35 mm DIN rail or In line series			
Connection	Shielded RJ-45; Female / Female			
Grounding	Wire; 2.5 mm² (#14 AWG), Length 275 mm (10.8")			
Dimension (H x W x D)	85 mm x 25 mm x 40 mm (3.4" x 1" x 1.6")			
Weight (Max)	0.08 kg (0.2 lb)			
Operating Temperature	-25°C to +70°C			
Relative Humidity	≤ 95% non condensing			
Altitude	≤ 3000 m			
Enclosure Protection Level	IP 20			
Enclosure Material	Aluminum			

Schematic



Dimensions



DynaShield®

Surge Protection Device

KSB RJ24 Series

Product Description

The KSB RJ24 Series is a Surge Protection Device family designed to protect multiple RJ-45 connectors for Ethernet 10/100BaseT, ATM, Token Ring network data signals with transmission rates up to 100 Mbps.

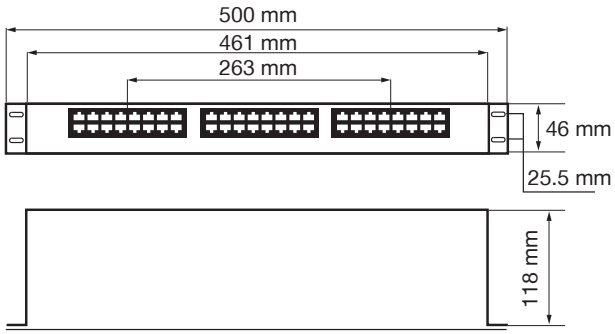
FEATURES:

- 100 Mbps transmission rate
- 19” Rack
- Hybrid Silicon + GDT design
- Shielded RJ45 jacks
- Fast response

Specifications

Model		KSB RJ24-5M	KSB RJ24-12M	KSB RJ24-48M
Certifications		IEC61643:21-2005		
Number Of Ports		Two Port Device		
Technology		Hybrid Silicon Diode and Gas Discharge Tube		
Nominal Voltage U_N		5 V	12 V	48 V
Maximum Continuous Operating Voltage U_C		6 V (5 V~)	15 V (12 V~)	60 V (48 V~)
C2 Nominal Discharge Current I_N (8x20µs) per line		100 A (L-L), 2.5 kA (L-G)		
C2 Total Nominal Discharge Current I_{max} (8x20µs)		400 A (L-L), 10 kA (L-G)		
Nominal Current		1 A		
Voltage Protection Level	L-L	≤ 30	≤ 45	≤ 190
	L-PE	≤ 600	≤ 600	≤ 600
	L-L	≤ 24	≤ 38	≤ 145
		≤ 800	≤ 800	≤ 800
Protected Pins		Pins 1/2, 3/6		
Maximum Transmission Rate		100 Mbps		
Insertion Loss (80 MHz)		≤ 3.0 dB		
Response Time		≤ 5 ns		
Location Category		Indoor Only		
Method of Mounting		19" Rack Mount Enclosure		
Connection		Shielded RJ-45; Female / Female		
Grounding		Rack, Wire; 2.5 mm² (#14 AWG), Length 275 mm (10.8")		
Dimension (H x W x D)		500 mm x 46 mm x 118 mm (19.7” x 1.8” x 4.7”)		
Weight (Max)		0.08 kg (0.2 lb)		
Temperature		-25°C to +70°C		
Relative Humidity		≤ 95% non condensing		
Altitude		≤ 3000 m		
Enclosure Protection Level		IP 20		
Enclosure Material		Painted Steel		

Dimensions



DynaShield®

Surge Protection Device

KSB PVS Series

FEATURES:

- Wall or DIN rail mounting
- Hybrid Silicon + GDT design
- Shielded jacks
- LED status

Product Description

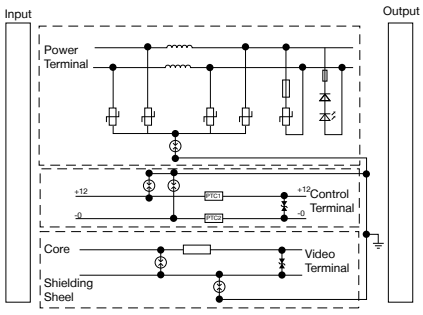
The KSB PVS Series is a Surge Protection Device designed to protect 24 Vdc power supply, video and control signal lines for cameras and equipment found in video surveillance systems.

Specifications

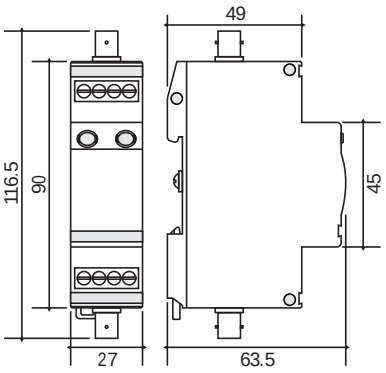
Model		Video Line	Control Line	Power Supply
Tested To		IEC 61643-21:2000; GB 18802.21-2004; YD/T 1542-2006		
Number Of Ports		Two Port Device		
Technology		Hybrid Silicon Diode and Gas Discharge Tube		
Connection		BNC	Terminal	Terminal
Nominal Voltage		5	12	24 Va
Nominal Discharge Current I_N (8x20µs)	L / Shield	2.5 kA	5 kA	5 kA
	Shield / PE	5 kA	5 kA	
Maximum Discharge Current I_{max} (8x20µs)	L / Shield	≤ 25 V	≤ 25 V	10 kA (ENA)
				8 kA (DRA)
	Shield / PE	≤ 25 V	≤ 25 V	
Voltage Protection Level U_P	L / Shield	≤ 25 V	≤ 19 V	≤ 300 V
	Shield / PE	≤ 25 V	≤ 19 V	
Maximum Transmission Rate		16 Mbps		
Series Impedance		1.9 Ω		
Insertion Loss		≤ 0.5 dB		
Response Time		≤ 1 ns	≤ 1 ns	≤ 25 ns
Location Category		Indoor Only		
Grounding		Wire; 1.5 mm² (#14 AWG), Length 300 mm (10.8")		
Operating Temperature		-40°C to +80°C		
Relative Humidity		≤ 95% non condensing		
Enclosure Protection Level		IP 20		
Enclosure Material		Aluminum		
Certifications		CE (LVD, EMC)		

Model	KSB PVS DRA	KSB PVS ENA
Method of Mounting	35 mm DIN rail	Wall mount
Dimension (H x W x D)	116.5 mm x 27 mm x 63.5 mm (4.6" x 1" x 2.5")	141 mm x 74 mm x 30 mm (5.6" x 2.9" x 1.2")
Weight (Max)	0.08 kg (0.2 lb)	0.08 kg (0.2 lb)

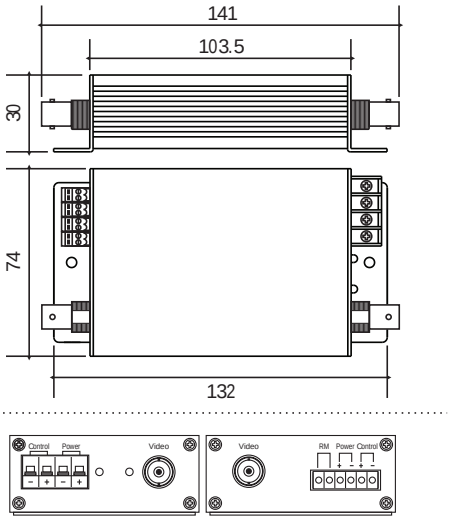
Schematic



Dimensions



KSBC PVS DRA



KSB PVS ENA

DynaShield®

Surge Protection Device

KSB LSA Series

FEATURES:

- Hybrid Silicon + GDT design
- Telephone system applications
- Integrated decoupling resistance
- Easy installation
- Optional earthing busbar

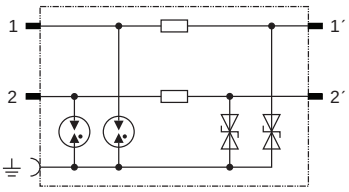
Product Description

The KSB LSA Series is a Surge Protection Device for LSA-PLUS punchdown applications in LPZ 0_B-2 or higher. Provides protection for one pair or two single conductors.

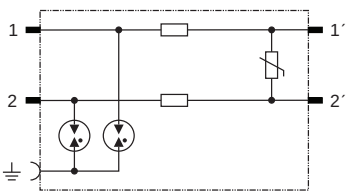
Specifications

Model		KSB LSA 12VR	KSB LSA 24VR	KSB LSA 110VR	KSB LSA 250VR	KSB LSA 110VXC
Certifications		CE (LVD, EMC)				
Test Standards		YD/T 1542-2006; GB 18802.21-2004; IEC 61643-21:2000				
Number Of Ports		Two Port Device				
Technology		Diode + GDT	Diode + GDT	MOV + GDT	MOV + GDT	MOV + GDT
Nominal Voltage U_N		12 V	24 V	110 V	250 V	110 V
Maximum Continuous Operating Voltage U_C		-14V (9.9V~)	-30V (21V~)	-180V (126V~)	275V (194V~)	-120V (84.6V~)
Nominal Current		120 mA	90 mA	370 mA	370 mA	180 mA
Nominal Discharge Current I_N (8x20µs)		5 kA	5 kA	5 kA	5 kA	5 kA
Voltage Protection Level U_P	(L-L)	-	-	≤ 250 V	≤ 400 V	
	(L-PE)	≤ 25 V	≤ 50 V	≤ 600 V	≤ 900 V	≤ 180 V
Bandwidth		2.5 MHz	4.0 MHz	30 MHz	60 MHz	10 MHz
Series Impedance	(L-L)	15 Ω	27 Ω	4.7 Ω	4.7 Ω	22 Ω
Capacitance	(L-L)	-	-	≤ 0.2 nF	≤ 30 pF	-
	(L-PE)	≤ 3 nF	≤ 3 nF	≤ 15 pF	≤ 10 pF	≤ 1 nF
Response Time	(L-L)	≤ 1 ns	≤ 1 ns	≤ 25 ns	≤ 25 ns	≤ 1 ns
	(L-PE)	≤ 1 ns	≤ 1 ns	≤ 100 ns	≤ 100 ns	≤ 1 ns
Location Category		Indoor Only				
Method of Mounting		LSA-PLUS punch down block				
Dimension (H x W x D)		50.2 mm x 9.4 mm x 18 mm (2" x 0.4" x 0.7")		67 mm x 111.5 mm x 22 mm (2.6" x 4.4" x 0.9")		
Weight (Max)		0.08 kg (0.2 lb)				
Grounding		Earthing busbar PN KSB L-10		Mounting Frame		
Operating Temperature		-20°C to +80°C				
Relative Humidity		≤ 95% non condensing				
Altitude		≤ 3000 m				
Enclosure Protection Level		IP 20				
Enclosure Material		Black thermoplastic, UL94-V0				
Certifications		RoHS compliant				

Schematic

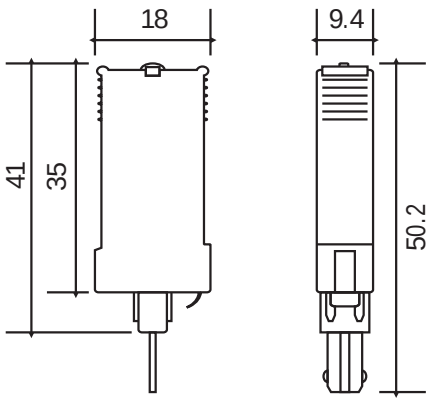


KSB LSA 12V R / 24V R



KSB LSA 110V R / 250V R

Dimensions



DynaShield®

Surge Protection Device

DIN Data Signal Products Selection Guide

Signal Type							
Analog	**Exposure Level LPZ 0_A**						
			KSB 24V LC **P. 4-9**	KSB 48V LC **P. 4-9**	KSB 110V LC **P. 4-9**		
	Exposure Level LPZ 0_B						
	Shield	 No	KSBT 12V SC **P. 4-10**	KSBT 24V SC **P. 4-10**	KSBT 48V SC **P. 4-10**	KSBT 110V SC **P. 4-10**	
		 Yes	KSBC 5V TDD KSBC 5V TDI* **P. 4-12**	KSBT 24V SDD KSBT 24V SDI* **P. 4-12**	KSBT 60V SDD KSBT 60V SDI* **P. 4-12**		
Digital	**Exposure Level LPZ 1**						
			KSBT 12V C **P. 4-11**	KSBT 24V C **P. 4-11**	KSBT 48V C **P. 4-11**	KSBT 60V C **P. 4-11**	
	Exposure Level LPZ 0_A						
			KSB 5V S **P. 4-15**	KSB 24V LD **P. 4-13** KSB 24V H **P. 4-14**	KSB 48V LD **P. 4-13**	KSB 110V LD **P. 4-13**	
	Exposure Level LPZ 0_B						
	Shield	 No	KSBT 12V SD **P. 4-16**	KSBT 24V SD **P. 4-16**	KSBT 48V SD **P. 4-16**	KSBT 110V SD **P. 4-16**	
		Yes	 2 Wire System	KSBC 5V TID KSBC 5V TII* **P. 4-17**	KSBT 24V PID KSBT 24V PII* **P. 4-18**	KSBT 24V SID KSBT 24V SII* **P. 4-17**	KSBT 60V SID KSBT 60V SII* **P. 4-17**
			 3 Wire System	KSBT 5V RID KSBT 5V RII* **P. 4-19**	KSBR 5V TID KSBR 5V TII* **P. 4-20**	KSBR 5V TDD KSBR 5V TDI* **P. 4-21**	

* Isolated Shield

DynaShield®

Surge Protection Device

KSB LC Series

FEATURES

- Hybrid design for LPZ 0_A-2
- Slim 12 mm wide DIN rail mount
- Common mode protection
- Fast response
- Excellent voltage protection level

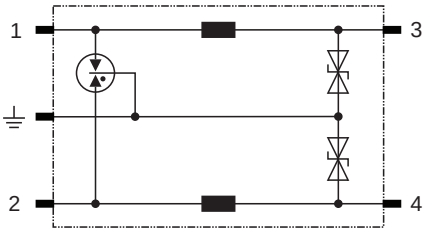
Product Description

The KSB LC series designed for use at LPZ 0_A-2 or higher to protect 2 wire unbalanced analog circuits, such as 4-20 mA loops, 110V telephone, ADSL or ISDN applications. The SPDs offer convenient DIN rail mounted base with replaceable suppression protection modules.

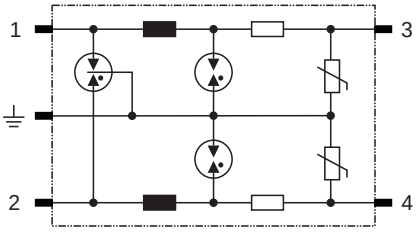
Specifications

Model		KSB 24V LC	KSB 48V LC	KSB 110V LC
Tested To		IEC61643-21:2000; YD/T 1542-2006; GB 18802.21-2004		
Number Of Ports		Two Port Device		
Technology		Diode + GDT	Diode + GDT	MOV + GDT
Protection Modes		Common Mode		
Nominal Voltage U_N		24 V	48 V	110 V
Nominal Current I_L		0.5 A	0.5 A	1 A
Maximum Continuous Operating Voltage U_C		26 V (19 V~)	55 V (39 V~)	170 V (120 V~)
Lightning Impulse Current I_{imp} (10x350µs)	(L-L)	2.5 kA	2.5 kA	2.5 kA
	(L-PE)	5 kA	5 kA	5 kA
Nominal Discharge Current I_N (8x20µs)	Total	20 kA	20 kA	20 kA
Voltage Protection Level at I_{imp}	(L-L)	≤ 90 V	≤ 150 V	≤ 600 V
	(L-PE)	≤ 45 V	≤ 75 V	≤ 300 V
Bandwidth		5.1 MHz	8.5 MHz	24 MHz
Capacitance	(L-L)	0.7 nF	0.3 nF	0.2 nF
	(L-PE)	1.3 nF	0.6 nF	0.4 nF
Series Impedance		2.2 Ω	2.2 Ω	4 Ω
Response Time		≤ 5 ns	≤ 5 ns	≤ 25 ns
Location Category		Indoor Only		
Method of Mounting		Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3		
Dimension (H x W x D)		92 mm x 12 mm x 64.5 mm (3.6" x 0.5" x 2.5")		
Weight (Max)		0.33 kg (0.74 lb)		
Maximum Wire Size		Multi strand 2.5 mm² (#12 AWG)		
Operating Temperature		-40°C to +80°C		
Relative Humidity		≤ 95% non condensing		
Altitude		≤ 3000 m		
Enclosure Protection Level		IP 20		
Housing Inflammability Rating		Thermoplastic, UL 94 V-0		
Certifications		CE (LVD, EMC)		

Schematic

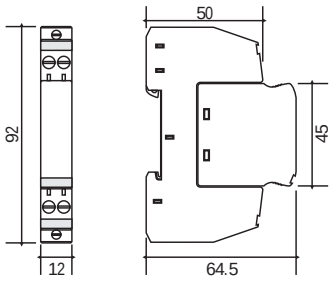


KSB 24V LC / 48V LC



KSB 110V LC

Dimensions



DynaShield®

Surge Protection Device

KSBT SC Series

FEATURES

- Hybrid Silicon + GDT design
- Slim 6 mm wide DIN rail mount
- Common mode protection
- Fast response
- Excellent voltage protection level

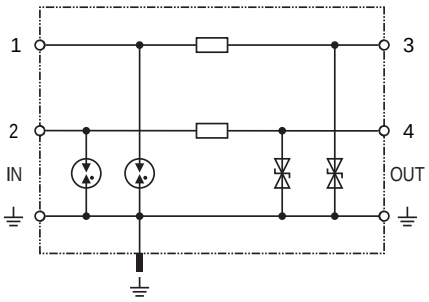
Product Description

The KSBT SC Series designed for use at LPZ 0_B-2 or higher to protect 2 wire unbalanced analog signals typically used in measurement and control circuits such as thermocouples. The SPDs offer convenient DIN rail mounting in a slim 6 mm wide package.

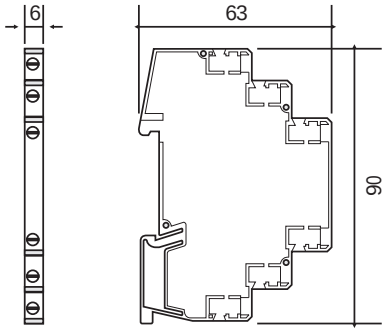
Specifications

Model	KSBT 12V SC	KSBT 24V SC	KSBT 48V SC	KSBT 110V SC
Tested To	IEC61643-21:2000; YD/T 1542-2006; GB 18802.21-2004			
Number Of Ports	Two Port Device			
Technology	Hybrid Silicon Diode and Gas Discharge Tube			
Protection Modes	Common mode; 2 wire signal with ground			
Nominal Voltage U_N	12 V	24 V	48 V	110 V
Nominal Current I_L	0.5 A	0.5 A	0.5 A	0.5 A
Maximum Continuous Operating Voltage U_C	14 V (9.5 V~)	33 V (23 V~)	55 V (38.5 V~)	170 V (120 V~)
Nominal Discharge Current I_N (8x20µs) Per Line	5 kA			
Nominal Discharge Current I_N (8x20µs) Total	10 kA			
Voltage Protection Level at I_N (L-L)	≤ 55 V	≤ 100 V	≤ 175 V	≤ 500 V
(L-PE)	≤ 40 V	≤ 65 V	≤ 100 V	≤ 270 V
Voltage Protection Level at 1 kV/µs (L-L)	≤ 36 V	≤ 90 V	≤ 160 V	≤ 460 V
(L-PE)	≤ 19 V	≤ 45 V	≤ 80 V	≤ 230 V
Bandwidth	2.5 MHz	6 MHz	10 MHz	16 MHz
Capacitance (L-L)	1.2 nF	0.5 nF	0.3 nF	0.2 nF
(L-PE)	2.4 nF	1 nF	0.6 nF	0.4 nF
Series Impedance	1.8 Ω	1.8 Ω	1.8 Ω	1.8 Ω
Response Time	≤ 5 ns			
Location Category	Indoor Only			
Method of Mounting	Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3			
Dimension (H x W x D)	90 mm x 6 mm x 63 mm (3.6" x 0.2" x 2.5")			
Weight (Max)	0.05 kg (0.1 lb)			
Maximum Wire Size	Multi strand 2.5 mm² (#12 AWG)			
Operating Temperature	-40°C to +80°C			
Relative Humidity	≤ 95% non condensing			
Altitude	≤ 3000 m			
Enclosure Protection Level	IP 20			
Housing Inflammability Rating	Thermoplastic, UL 94 V-0			
Certifications	CE (LVD, EMC)			

Schematic



Dimensions



DynaShield®

Surge Protection Device

KSBT C Series

FEATURES

- Slim profile 6 mm DIN rail module
- Bi-directional silicon diode design
- Common mode protection
- 10 A nominal current
- Fast response

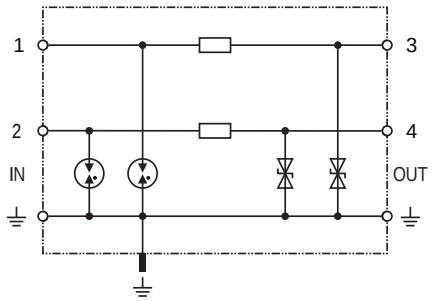
Product Description

The KSBT C series is designed for use at LPZ 1-2 or higher to protect 2 wire single pair unbalanced analog circuits, such as 4-20 mA loops.

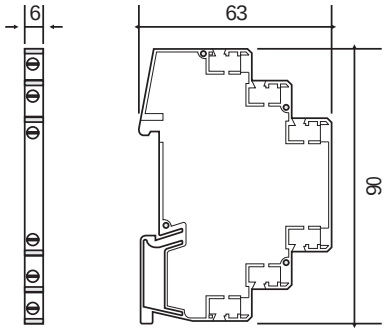
Specifications

Model	KSBT 12VC	KSBT 24VC	KSBT 48VC	KSBT 60VC
Tested To	IEC61643-11:2011			
Number Of Ports	Two Port Device			
Protection Mode	Common Mode			
Technology	Silicon Diode			
Nominal Voltage U_N	12 V	24 V	48 V	60 V
Nominal Current I_N	10 A			
Maximum Continuous Operating Voltage U_C	13V (9V~)	48V (19.5V~)	58V (41V~)	70V (49.5V~)
Lightning Impulse Current I_{imp} (10x350µs) Per Line	0.5 kA	0.5 kA	0.5 kA	0.5 kA
Nominal Discharge Current I_N (8x20µs) Per Line	0.4 kA	0.3 kA	0.15 kA	0.12 kA
Nominal Discharge Current I_N (8x20µs) Total	0.8 kA	0.6 kA	0.3 kA	0.24 kA
Voltage Protection Level at I_N	≤ 25 V	≤ 48 V	≤ 90 V	≤ 110 V
Voltage Protection Level at 1 kV / µs	≤ 18 V	≤ 38 V	≤ 78 V	≤ 95 V
Bandwidth	2.5 MHz	5.5 MHz	11 MHz	14 MHz
Capacitance (L - L)	1.2 nF	0.6 nF	0.3 nF	0.25 nF
Response Time	≤ 5 ns			
Location Category	Indoor Only			
Method of Mounting	Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3			
Dimension (H x W x D)	90 mm x 6 mm x 63 mm (3.6" x 0.24" x 2.5")			
Weight (Max)	0.33 kg (0.74 lb)			
Maximum Wire Size	Multi strand 2.5 mm² (#12 AWG)			
Operating Temperature	-40°C to +80°C			
Relative Humidity	≤ 95% non condensing			
Altitude	≤ 3000 m			
Enclosure Protection Level	IP 20			
Housing Inflammability Rating	Thermoplastic, UL 94 V-0			

Schematic



Dimensions



DynaShield®

Surge Protection Device

KSBC & KSBT Series

FEATURES

- Hybrid Silicon + GDT design
- Slim 7 mm wide DIN rail mount
- Common mode protection
- Fast response
- Excellent voltage protection level

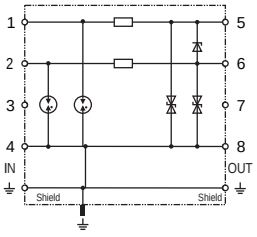
Product Description

The KSBC and KSBT series are designed for use at LPZ 0_B-2 or higher to protect shielded 2 wire unbalanced analog signals typically used in measurement, control or thermocouple circuits. The *DI versions contains a GDT between the shield & ground. The SPDs offer convenient DIN rail mounting in a slim 7 mm wide package.

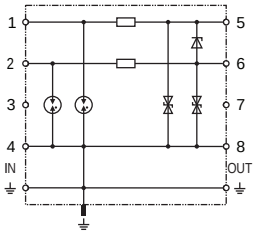
Specifications

Model	KSBC	KSBT	KSBT
	5V TDD 5V TDI*	24V SDD 24V SDI*	60V SDD 60V SDI*
Tested To	IEC61643-21:2000; YD/T 1542-2006; GB 18802.21-2004		
Number Of Ports	Two Port Device		
Technology	Hybrid Silicon Diode and Gas Discharge Tube		
Protection Modes	L-L, L-G L-L, L-G, S-G*	L-L, L-S L-L, L-S*	L-L, L-S L-L, L-S*
Nominal Voltage U_N	5 V	24 V	60 V
Maximum Continuous Operating Voltage U_C	7.5 V	30 V	70 V
Maximum Load Current	100 mA	250 mA	250 mA
Nominal Discharge Current I_N (8x20µs)	10 kA		
Maximum Discharge Current I_{max} (8x20µs)	20 kA		
Lightning Discharge Current I_{imn} (10x350µs)	1 kA		
Voltage Protection Level at 4 kV (1.2/50µs) (L-L)	≤ 25 V	≤ 60 V	≤ 115 V
(L-PE)	≤ 800 V	≤ 60 V | ≤ 800 V*	≤ 115 V | ≤ 800 V*
(L-Shield)	≤ 25 V	≤ 60 V	≤ 115 V
(Shield-PE)	--- | ≤ 800 V*	--- | ≤ 800 V*	--- | ≤ 800 V*
Series Impedance	4.7 Ω	4.7 Ω	10 Ω
Response Time	≤ 5 ns		
Location Category	Indoor Only		
Method of Mounting	Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3		
Dimension (H x W x D)	98 mm x 7 mm x 95 mm (3.85” x 0.28” x 3.74”)		
Weight (Max)	0.05 kg (0.1 lb)		
Maximum Wire Size	Multi strand 2.5 mm² (#12 AWG)		
Operating Temperature	-40°C to +80°C		
Relative Humidity	≤ 95% non condensing		
Altitude	≤ 3000 m		
Enclosure Protection Level	IP 20		
Housing Inflammability Rating	Thermoplastic, UL 94 V-0		
Certification	CE (LVD, EMC)		

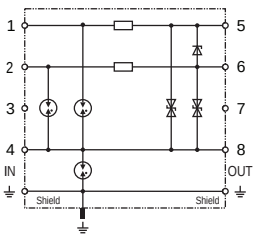
Schematic



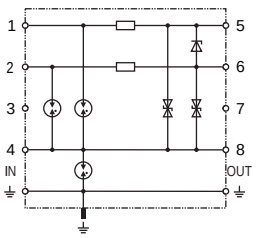
KSBC 5V TDD



KSBT 24V SDD / 60V SDD

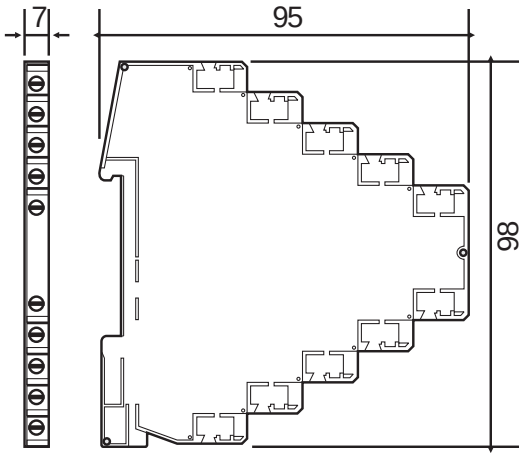


KSBC 5V TDI*



KSBT 24V SDI* / 60V SDI*

Dimensions



DynaShield®

Surge Protection Device

KSB LD Series

FEATURES

- Hybrid design for LPZ 0_A-2
- Slim 12 mm wide DIN rail mount
- Balanced mode protection
- Fast response
- Excellent voltage protection level

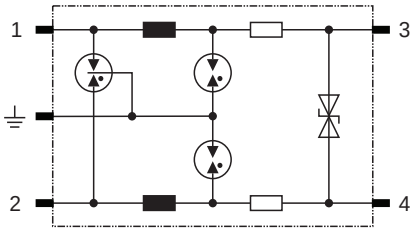
Product Description

The KSB *LD series is designed for use at LPZ 0_A-2 or higher to protect 2 wire balanced digital signals typically used in measurement and control circuits, 110V telephone, ADSL or ISDN applications. The SPDs offer convenient 12 mm wide DIN rail base with replaceable suppression module.

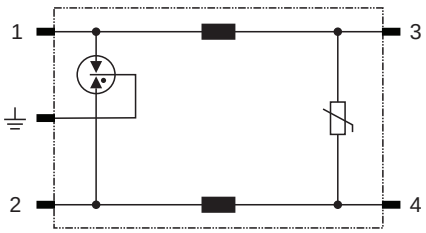
Specifications

Model		KSB 24V LD	KSB 48V LD	KSB 110V LD
Tested To		IEC61643-21:2000; YD/T 1542-2006; GB 18802.21-2004		
Number Of Ports		Two Port Device		
Technology		Diode & GDT	Diode & GDT	MOV & GDT
Protection Mode		L-G		
Nominal Voltage U_N		24 V	48 V	110 V
Nominal Current I_L		0.5 A	0.5 A	1 A
Maximum Continuous Operating Voltage U_C		26 V (19 V~)	55 V (39 V~)	170 V (120 V~)
Nominal Discharge Current I_N (8x20µs)		20 kA	20 kA	20 kA
Lightning Impulse Current I_{imp} (10x350µs) (L-L)		2.5 kA	2.5 kA	2.5 kA
	(L-PE)	5 kA	5 kA	5 kA
Voltage Protection Level Up @ I_{imp}	(L-L)	≤ 40 V	≤ 80 V	≤ 300 V
	(L-PE)	≤ 700 V	≤ 700 V	≤ 700 V
Bandwidth		5.0 MHz	8.0 MHz	9 MHz
Capacitance	(L-L)	0.9 nF	0.6 nF	0.6 nF
	(L-PE)	7 nF	7 nF	7 nF
Series Impedance		2.2 Ω	2.2 Ω	4 Ω
Response Time		≤ 5 ns	≤ 5 ns	≤ 25 ns
Location Category		Indoor Only		
Method of Mounting		Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3		
Dimension (H x W x D)		92 mm x 12 mm x 64.5 mm (3.6" x 0.5" x 2.5")		
Weight (Max)		0.33 kg (0.74 lb)		
Maximum Wire Size		Multi strand 2.5 mm² (#12 AWG)		
Operating Temperature		-40°C to +80°C		
Relative Humidity		≤ 95% non condensing		
Altitude		≤ 3000 m		
Enclosure Protection Level		IP 20		
Housing Inflammability Rating		Thermoplastic, UL 94 V-0		
Certifications		CE (LVD, EMC)		

Schematic

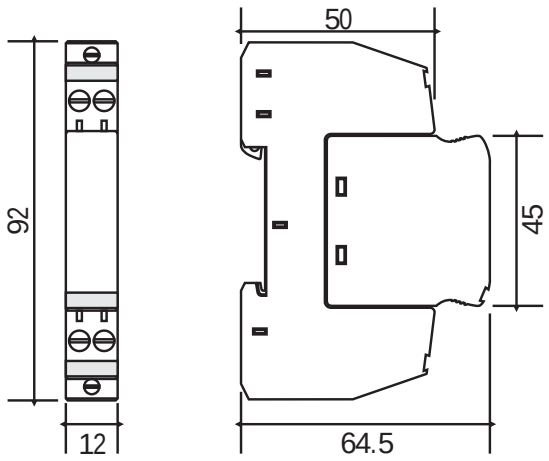


KSB 24V LD / 48V LD



KSB 110V LD

Dimensions



DynaShield®

Surge Protection Device

KSB 24V H

FEATURES:

- Hybrid Silicon + GDT design
- Slim 12 mm wide DIN rail mount
- Differential mode protection
- Fast response
- Excellent voltage protection level

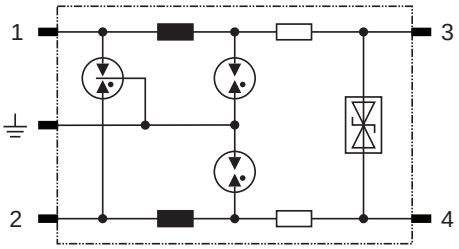
Product Description

The KSB 24VH series is designed for use at LPZ 0_A-2 or higher to protect 2 wire balanced high speed digital signals typically used for video or other high frequency bus. The SPD offers convenient 12 mm wide DIN rail base with replaceable suppression module.

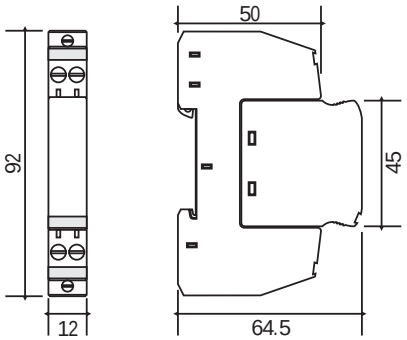
Specifications

Model	KSB 24V H
Tested To	IEC61643-21:2000; YD/T 1542-2006; GB 18802.21-2004
Number Of Ports	Two Port Device
Technology	Hybrid Silicon Diode and Gas Discharge Tube
Protection Mode	Differential mode; 2 wire signal with ground
Nominal Voltage U_N	24 V
Maximum Continuous Operating Voltage U_C	26 V
Maximum Load Current I_L	0.1 A
Nominal Discharge Current I_N (8x20µs)	20 kA
Lightning Impulse Current I_{imp} (10x350µs)	2.5 kA
Voltage Protection Level at I_{imp} (L-L)	≤ 60 V
(L-PE)	≤ 700 V
Bandwidth	100 MHz
Capacitance (L-L)	< 30 pF
(L-PE)	< 15 pF
Series Impedance	2.2 Ω
Response Time	≤ 5 ns
Location Category	Indoor Only
Method of Mounting	Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3
Dimension (H x W x D)	92 mm x 12 mm x 64.5 mm (3.6" x 0.5" x 2.5")
Weight (Max)	0.33 kg (0.74 lb)
Maximum Wire Size	Multi strand 2.5 mm² (#12 AWG)
Operating Temperature	-40°C to +80°C
Relative Humidity	≤ 95% non condensing
Altitude	≤ 3000 m
Enclosure Protection Level	IP 20
Housing Inflammability Rating	Thermoplastic, UL 94 V-0
Certifications	CE (LVD, EMC)

Schematic



Dimensions



DynaShield®

Surge Protection Device

KSB 5V S

FEATURES

- Hybrid Silicon + GDT design
- Slim 12 mm wide DIN rail mount
- Differential mode protection
- Fast response
- Excellent voltage protection level

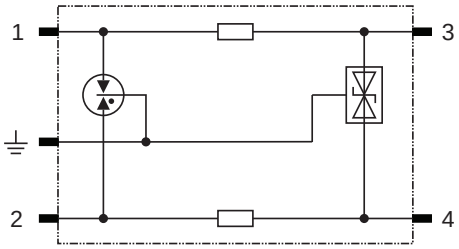
Product Description

The KSB 5VS series is designed for use at LPZ 0_B-2 or higher to protect 2 wire balanced high speed digital signals typically used for video or other high frequency bus. The SPD offers convenient 12 mm wide DIN rail base with replaceable suppression module.

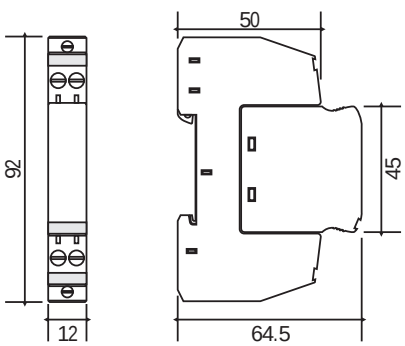
Specifications

Model	KSB 5VS
Tested To	IEC61643-21:2000; YD/T 1542-2006; GB 18802.21-2004
Number Of Ports	Two Port Device
Technology	Hybrid Silicon Diode and Gas Discharge Tube
Protection Modes	Differential mode; 2 wire signal with ground
Nominal Voltage U_N	5 V
Maximum Continuous Operating Voltage U_C	6 V
Maximum Load Current I_L	0.5 A
Nominal Discharge Current I_N (8x20µs)	5 kA
Voltage Protection Level at I_N (L-L)	≤ 48 V
(L-PE)	≤ 68 V
Bandwidth	100 MHz
Capacitance (L-L)	< 25 pF
(L-PE)	< 38 pF
Series Impedance	1.0 Ω
Response Time	≤ 5 ns
Location Category	Indoor Only
Method of Mounting	Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3
Dimension (H x W x D)	92 mm x 12 mm x 64.5 mm (3.6" x 0.5" x 2.5")
Weight (Max)	0.33 kg (0.74 lb)
Maximum Wire Size	Multi strand 2.5 mm² (#12 AWG)
Operating Temperature	-40°C to +80°C
Relative Humidity	≤ 95% non condensing
Altitude	≤ 3000 m
Enclosure Protection Level	IP 20
Housing Inflammability Rating	Thermoplastic, UL 94 V-0
Certifications	CE (LVD, EMC)

Schematic



Dimensions



DynaShield®

Surge Protection Device

KSBT SD Series

FEATURES

- Hybrid Silicon + GDT design
- Slim 6 mm wide DIN rail mount
- Differential mode protection
- Fast response
- Excellent voltage protection level

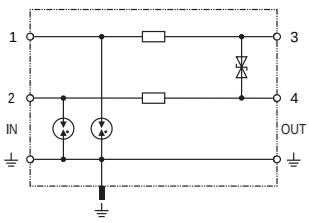
Product Description

The KSBT SD series is designed for use at LPZ 0_B-2 or higher to protect 2 wire balanced digital signals typically used in measurement and control circuits.

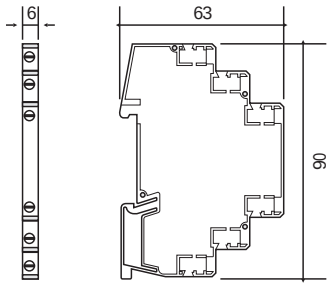
Specifications

Model	KSBT 12V SD	KSBT 24V SD	KSBT 48V SD	KSBT 110V SD
Tested To	IEC61643-21:2000; YD/T 1542-2006; GB 18802.21-2004			
Number Of Ports	Two Port Device			
Technology	Hybrid Silicon Diode and Gas Discharge Tube			
Protection Modes	Differential mode; 2 wire signal with ground			
Nominal Voltage U_N	12 V	24 V	48 V	110 V
Nominal Current I_L	0.5 A	0.5 A	1.7 A	0.5 A
Maximum Continuous Operating Voltage U_C	14 V (9.5 V~)	33 V (23 V~)	55 V (38.5 V~)	170 V (120 V~)
Nominal Discharge Current I_N (8x20µs) Per Line	5 kA			
Nominal Discharge Current I_N (8x20µs) Total	10 kA			
Voltage Protection Level at I_N (L-L)	≤ 25 V	≤ 50 V	≤ 100 V	≤ 260 V
Voltage Protection Level at 1 kV/µs (L-L)	≤ 19 V	≤ 45 V	≤ 70 V	≤ 230 V
(L-PE)	≤ 650 V	≤ 650 V	≤ 650 V	≤ 650 V
Bandwidth	2.5 MHz	6 MHz	10 MHz	16 MHz
Capacitance (L-L)	2.4 nF	1 nF	0.6 nF	0.4 nF
(L-PE)	5 pF	5 pF	10 pF	5 nF
Series Impedance	1.8 Ω	1.8 Ω	4 Ω	1.8 Ω
Response Time	≤ 5 ns			
Location Category	Indoor Only			
Method of Mounting	Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3			
Dimension (H x W x D)	90 mm x 6 mm x 63 mm (3.6" x 0.2" x 2.5")			
Weight (Max)	0.05 kg (0.1 lb)			
Maximum Wire Size	Multi strand 2.5 mm² (#12 AWG)			
Operating Temperature	-40°C to +80°C			
Relative Humidity	≤ 95% non condensing			
Altitude	≤ 3000 m			
Enclosure Protection Level	IP 20			
Housing Inflammability Rating	Thermoplastic, UL 94 V-0			
Certifications	CE (LVD, EMC)			

Schematic



Dimensions



DynaShield®

Surge Protection Device

KSB* ID & KSB* II Series

FEATURES

- Hybrid Silicon + GDT design
- Slim 7 mm wide DIN rail mount
- Common mode protection
- Fast response
- Excellent voltage protection level

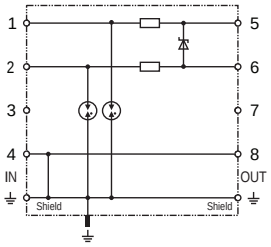
Product Description

The KSB* ID and KSB* II series are designed for use at LPZ 0_B-2 or higher to protect shielded 2 wire balanced digital signals typically used in measurement and control circuits. The KSBC TII and KSBT SII contain a GDT between the shield & ground.

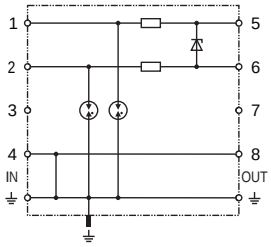
Specifications

Model	KSBC 5V TID 5V TII*		KSBT 24V SID 24V SII*		KSBT 60V SID 60V SII*	
Tested To	IEC61643-21:2000; YD/T 1542-2006; GB 18802.21-2004					
Number Of Ports	Two Port Device					
Technology	Hybrid Silicon Diode and Gas Discharge Tube					
Protection Modes	L-L, L-G L-L, L-G, S-G*		L-L, L-S L-L, L-S*		L-L, L-S L-L, L-S*	
Nominal Voltage U_N	5 V		24 V		60 V	
Maximum Continuous Operating Voltage U_C	7.5 V		30 V		70 V	
Maximum Load Current	100 mA		250 mA		250 mA	
Nominal Discharge Current I_N (8x20µs)	10 kA					
Maximum Discharge Current I_{max} (8x20µs)	20 kA					
Lightning Discharge Current I_{imp} (10x350µs)	1 kA					
Voltage Protection Level at 4 kV (1.2/50µs) (L-L)	≤ 25 V		≤ 60 V		≤ 115 V	
(L-PE)	≤ 800 V					
(L-Shield)	≤ 800 V	≤ 1200 V*	≤ 800 V	≤ 1200 V*	≤ 800 V	≤ 1200 V*
(Shield-PE)	---	≤ 800 V*	---	≤ 800 V*	---	≤ 800 V*
Series Impedance	4.7 Ω		4.7 Ω		10 Ω	
Response Time	≤ 5 ns					
Location Category	Indoor Only					
Method of Mounting	Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3					
Dimension (H x W x D)	98 mm x 7 mm x 95 mm (3.85” x 0.28” x 3.74”)					
Weight (Max)	0.05 kg (0.1 lb)					
Maximum Wire Size	Multi strand 2.5 mm² (#12 AWG)					
Operating Temperature	-40°C to +80°C					
Relative Humidity	≤ 95% non condensing					
Altitude	≤ 3000 m					
Enclosure Protection Level	IP 20					
Housing Inflammability Rating	Thermoplastic, UL 94 V-0					
Certifications	CE (LVD, EMC)					

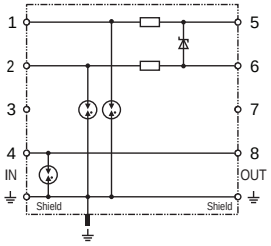
Schematic



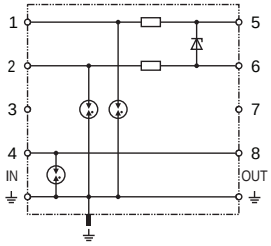
KSBC 5V TID



KSBT 24V SID / 60V SID

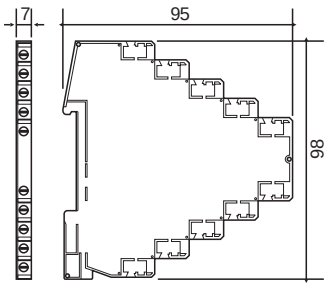


KSBC 5V TII*



KSBT 24V SII* / 60V SII*

Dimensions



DynaShield®

Surge Protection Device

KSBT 24V PID & KSB 24V PII

FEATURES

- Hybrid Silicon + GDT design
- Slim 7 mm wide DIN rail mount
- Common mode protection
- Fast response
- Excellent voltage protection level

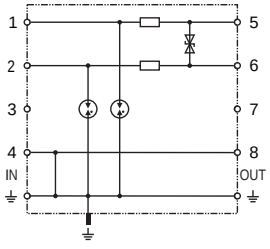
Product Description

The KSBT 24V PID and KSBT 24V PII are designed for use at LPZ 0_B-2 or higher to protect shielded 2 wire balanced digital signals typically used in measurement and control circuits. The KSBT 24V PII contains a GDT between the shield & ground.

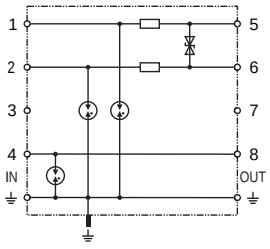
Specifications

Model	KSBT 24V PID	KSBT 24V PII
Tested To	IEC61643-21:2000; YD/T 1542-2006; GB 18802.21-2004	
Number Of Ports	Two Port Device	
Technology	Hybrid Silicon Diode and Gas Discharge Tube	
Protection Modes	L-L, L-G	L-L, L-G, S-G
Nominal Voltage U_N	24 V	
Maximum Continuous Operating Voltage U_c	32 V	
Maximum Load Current	400 mA	
Nominal Discharge Current I_N (8x20µs)	10 kA	
Maximum Discharge Current I_{max} (8x20µs)	20 kA	
Lightning Discharge Current I_{imp} (10x350µs)	1 kA	
Voltage Protection Level at 4 kV (1.2/50µs) (L-L)	≤ 60 V	≤ 60 V
(L-PE)	≤ 800 V	≤ 800 V
(Shield-PE)	---	≤ 800 V
Capacitance (L-L)	≤ 1500 pF	
(L-PE, S-PE)	≤ 100 pF	
Series Impedance	1.5 Ω	
Response Time	≤ 5 ns	
Location Category	Indoor Only	
Method of Mounting	Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3	
Dimension (H x W x D)	98 mm x 7 mm x 95 mm (3.85" x 0.28" x 3.74")	
Weight (Max)	0.05 kg (0.1 lb)	
Maximum Wire Size	Multi strand 2.5 mm² (#12 AWG)	
Operating Temperature	-40°C to +80°C	
Relative Humidity	≤ 95% non condensing	
Altitude	≤ 3000 m	
Enclosure Protection Level	IP 20	
Housing Inflammability Rating	Thermoplastic, UL 94 V-0	
Certifications	CE (LVD, EMC)	

Schematic

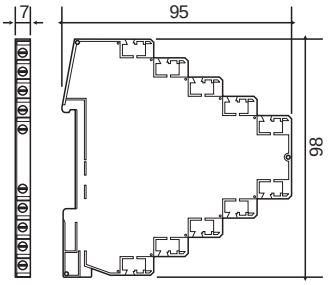


KSBT 24V PID



KSBT 24V PII*

Dimensions



DynaShield®

Surge Protection Device

KSBT 5V RID & KSBT 5V RII

FEATURES

- Hybrid Silicon + GDT design
- Slim 7 mm wide DIN rail mount
- Common mode protection
- Fast response
- Excellent voltage protection level

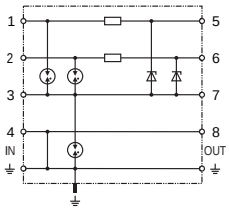
Product Description

The KSBT 5V RID and KSBT 5V RII series are designed for use at LPZ 0_B-2 or higher to protect shielded 3 wire balanced digital signals typically used in measurement and control circuits. The KSBT 5V RII contains a GDT between the shield & ground.

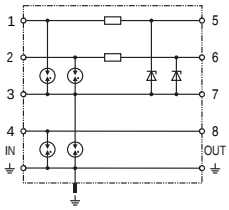
Specifications

Model	KSBT 5V RID	KSBT 5V RII
Tested To	IEC61643-21:2000; YD/T 1542-2006; GB 18802.21-2004	
Number Of Ports	Two Port Device	
Technology	Hybrid Silicon Diode and Gas Discharge Tube	
Protection Modes	L-L, L-G	
Nominal Voltage U_N	5 V	
Maximum Continuous Operating Voltage U_C	6 V	
Maximum Load Current	100 mA	
Nominal Discharge Current I_N (8x20µs)	10 kA	
Maximum Discharge Current I_{max} (8x20µs)	20 kA	
Lightning Discharge Current I_{imp} (10x350µs)	1 kA	
Voltage Protection Level at 4 kV (1.2/50µs) (L-L)	≤ 25 V	
(L-PE)	≤ 25 V	
(L-Shield)	≤ 800 V	
(Shield-PE)	---	
Capacitance (L-L, L-S)	≤ 100 pF	
(L-PE, S-PE)	≤ 300 pF	
Series Impedance	2 Ω	
Response Time	≤ 5 ns	
Location Category	Indoor Only	
Method of Mounting	Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3	
Dimension (H x W x D)	98 mm x 7 mm x 95 mm (3.85" x 0.28" x 3.74")	
Weight (Max)	0.05 kg (0.1 lb)	
Maximum Wire Size	Multi strand 2.5 mm² (#12 AWG)	
Operating Temperature	-40°C to +80°C	
Relative Humidity	≤ 95% non condensing	
Altitude	≤ 3000 m	
Enclosure Protection Level	IP 20	
Housing Inflammability Rating	Thermoplastic, UL 94 V-0	
Certifications	CE (LVD, EMC)	

Schematic

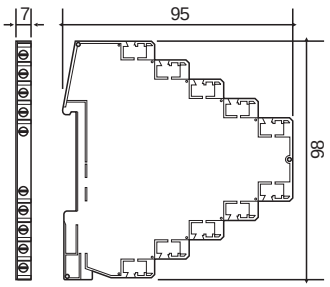


KSBT 5V RID



KSBT 5V RII*

Dimensions



DynaShield®

Surge Protection Device

KSBR 5V TID & KSBR 5V TII

FEATURES

- Hybrid Silicon + GDT design
- Slim 7 mm wide DIN rail mount
- Common mode protection
- Fast response
- Excellent voltage protection level

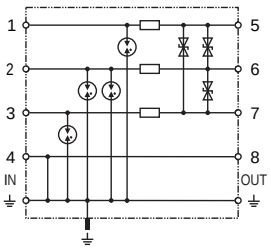
Product Description

The KSBR 5V TID and KSBR 5V TII are designed for use at LPZ 0_B-2 or higher to protect shielded 3 wire balanced digital signals typically used in measurement and control circuits. The KSBR 5V TII contains a GDT between the shield & ground.

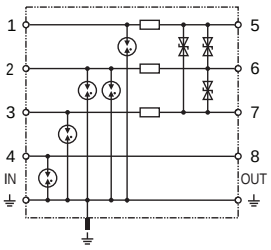
Specifications

Model	KSBR 5V TID	KSBR 5V TII
Tested To	IEC61643-21:2000; YD/T 1542-2006; GB 18802.21-2004	
Number Of Ports	Two Port Device	
Technology	Hybrid Silicon Diode and Gas Discharge Tube	
Protection Modes	L-L, L-G	L-L, L-G, S-G
Nominal Voltage U_N	5 V	
Maximum Continuous Operating Voltage U_C	6 V	
Maximum Load Current	100 mA	
Nominal Discharge Current I_N (8x20µs)	10 kA	
Maximum Discharge Current I_{max} (8x20µs)	20 kA	
Lightning Discharge Current I_{imp} (10x350µs)	1 kA	
Voltage Protection Level at 4 kV (1.2/50µs) (L-L)	≤ 25 V	≤ 25 V
(L-PE)	≤ 800 V	≤ 800 V
(L-Shield)	≤ 1200 V	≤ 800 V
(Shield-PE)	---	≤ 800 V
Series Impedance	5.12 Ω	
Response Time	≤ 5 ns	
Location Category	Indoor Only	
Method of Mounting	Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3	
Dimension (H x W x D)	98 mm x 7 mm x 95 mm (3.85" x 0.28" x 3.74")	
Weight (Max)	0.05 kg (0.1 lb)	
Maximum Wire Size	Multi strand 2.5 mm² (#12 AWG)	
Operating Temperature	-40°C to +80°C	
Relative Humidity	≤ 95% non condensing	
Altitude	≤ 3000 m	
Enclosure Protection Level	IP 20	
Housing Inflammability Rating	Thermoplastic, UL 94 V-0	
Certifications	CE (LVD, EMC)	

Schematic

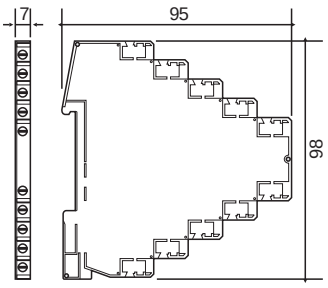


KSBR 5V TID



KSBR 5V TII*

Dimensions



DynaShield®

Surge Protection Device

KSBR 5V TDD & KSBR 5V TDI

FEATURES

- Hybrid Silicon + GDT design
- Slim 7 mm wide DIN rail mount
- Common mode protection
- Fast response
- Excellent voltage protection level

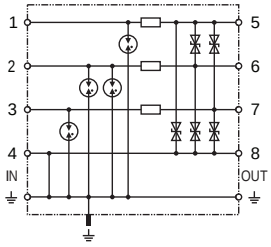
Product Description

The KSBR 5V TDD and KSBR 5V TDI are designed for use at LPZ 0_B-2 or higher to protect shielded 2 wire balanced digital signals typically used in measurement and control circuits. The KSBR 5V TDI contains a GDT between the shield & ground.

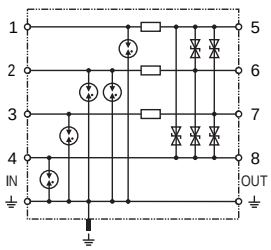
Specifications

Model	KSBR 5V TDD	KSBR 5V TDI
Tested To	IEC61643-21:2000; YD/T 1542-2006; GB 18802.21-2004	
Number Of Ports	Two Port Device	
Technology	Hybrid Silicon Diode and Gas Discharge Tube	
Protection Modes	L-L, L-G	L-L, L-G, S-G
Nominal Voltage U_N	5 V	
Maximum Continuous Operating Voltage U_C	6 V	
Maximum Load Current	100 mA	
Nominal Discharge Current I_N (8x20µs)	10 kA	
Maximum Discharge Current I_{max} (8x20µs)	20 kA	
Lightning Discharge Current I_{imp} (10x350µs)	1 kA	
Voltage Protection Level at 4 kV (1.2/50µs) (L-L)	≤ 25 V	≤ 25 V
(L-PE)	≤ 25 V	≤ 800 V
(L-Shield)	≤ 25 V	≤ 25 V
(Shield-PE)	---	≤ 800 V
Series Impedance	5.12 Ω	
Response Time	≤ 5 ns	
Location Category	Indoor Only	
Method of Mounting	Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3	
Dimension (H x W x D)	98 mm x 7 mm x 95 mm (3.85" x 0.28" x 3.74")	
Weight (Max)	0.05 kg (0.1 lb)	
Maximum Wire Size	Multi strand 2.5 mm² (#12 AWG)	
Operating Temperature	-40°C to +80°C	
Relative Humidity	≤ 95% non condensing	
Altitude	≤ 3000 m	
Enclosure Protection Level	IP 20	
Housing Inflammability Rating	Thermoplastic, UL 94 V-0	
Certifications	CE (LVD, EMC)	

Schematic

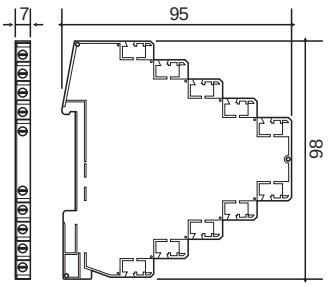


KSBR 5V TDD



KSBR 5V TDI

Dimensions



NOTE

Section 5

Miscellaneous

DynaShield®

Surge Protection Device

KSB SG 10

FEATURES:

- Bonding of separate systems
- 25 kA Lightning Impulse Current
- Round 10 mm copper terminals
- UL 94-V0 plastic encapsulation
- Designed for high exposure environments

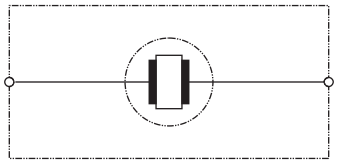
Product Description

The SG10 is an encapsulated spark gap used for lightning equipotential bonding per IEC/EN. Especially designed for connection of separate earthing systems. May be installed inside building, outdoors, in damp rooms and underground.

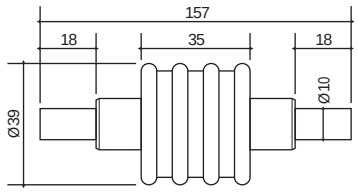
Specifications

Model	KSB SG 10
Isolating Spark Gap	According to EN 62561-3 / IEC 62561-3
Technology	Encapsulated spark gap
Lightning Impulse Current I_{imp} (10/350 µs)	25 kA
Nominal Discharge Current I_N (8/20 µs)	100 kA
Lightning Frequency Sparkover Voltage U_{as}	≤ 1.5 kV
Power Frequency Sparkover Voltage U_{aw} (50 / 60 Hz)	≤ 400 V
Location Category	Outdoor
Connection	Rd 10 mm
Diameter	39 mm (1.54")
Length	101 mm (4")
Weight (Max)	0.2 kg (0.44 lb)
Operating Temperature	-40 °C to +80 °C
Enclosure Protection Level	IP 65
Enclosure Material	Black Thermoplastic coating, UL94-V0
Connection Material	Copper
Certification	CE (LVD, EMC)

Schematic



Dimensions



DynaShield®

Surge Protection Device

KSB IC3

FEATURES:

- Surge threshold 1 kA events
- Stores history of 1000 events
- Low battery LED warning
- Replaceable 3 year lithium battery
- Convenient DIN rail mounting

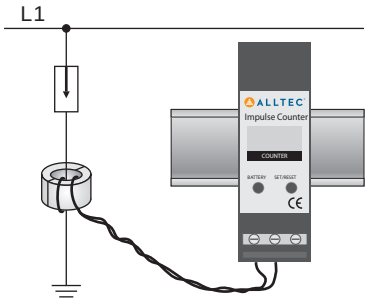
Product Description

The KSB IC3 is a surge Impulse Counter designed to record a history of surge events greater than 1 kA. Convenient DIN rail mounting with 3 digit LCD display and Review / Reset functions. Inductive coil installed around surge current path.

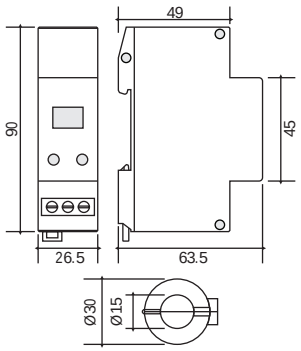
Specifications

Model	KSB IC3
Impulse Response	Records all transient surges greater than 1 kA
Rise Time	8 - 10 µs
Event Sequence	1 s
Inductive Coil Cable	Twisted pair
Inductive Coil Cable Length	1 m
Power Supply	3V battery, replaceable, CR123A type
Estimated Battery Service	3 year
Location Category	Indoor Only
Method of Mounting	Fixed 35 mm DIN rail, Reference EN 50022/DIN46277-3
Dimension (H x W x D)	90 mm x 26.5 mm x 63.5 mm (3.6" x 1" x 2.5"), 1.5 modules, DIN 43880
Weight (Max)	0.33 kg (0.74 lb)
Operating Temperature	0°C to +70°C
Relative Humidity	≤ 95% non condensing
Altitude	≤ 3000 m
Enclosure Protection Level	IP 20
Housing Inflammability Rating	Thermoplastic, UL 94 V-0
Certification	CE (LVD, EMC)

Schematic



Dimensions



Grounding and Bonding Solutions • Surge Suppression • Lightning Protection

ALLTEC®

SOLUTION PROVIDERS FOR AN ENERGIZED WORLD™

WORLD HEADQUARTERS
64 Catalyst Drive
Canton, North Carolina 28716 USA

TEL: +1.828.646.9290
FAX: +1.828.646.9527
EMAIL: info@alltecglobal.com

ALLTEC has offices located across the world.
Go to **www.alltecglobal.com/contact** to
connect with your regional office.

www.alltecglobal.com