SD range

Surge protection device

Introduction

The SD range of devices protects electronic circuits from high voltage transients and temporary overloads on signal and power lines. This is achieved by diverting the transient current to earth and limiting the signal line voltage for the duration of the surge. Earthing is provided simply by clipping the SD unit to an earthed DIN rail. Screw terminals are provided to connect cable screens to earth.

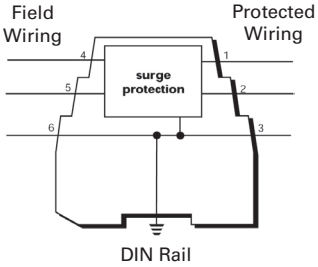

Fig. 1 Two wire SD protection unit

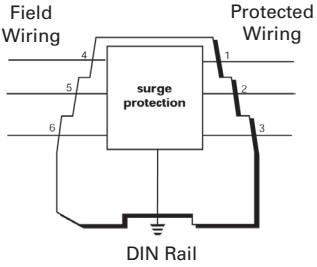

Fig. 2 Three wire SD protection unit

Installation

These units are suitable for use in hazardous area circuits as described in IEC/EN60079-14. Because of their intended safety function they must be removed when performing the 500V insulation test.

SD devices are mounted as follows (see Fig. 3):

a) Hook the earthing clamp at the field side of the base of the SD unit over one flange of the DIN rail (1).
b) Press down the protected area end of the SD unit firmly until it clicks into position (2).
c) Check that the SD unit is securely clamped into place on both field and protected sides

Note: it is essential to check that the earth connection has been made securely.

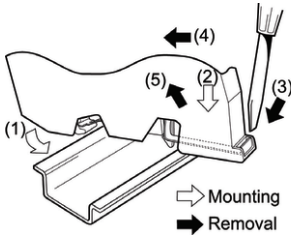

Fig. 3 Mounting/removing an SD unit

d) To remove, insert the blade of a screwdriver down the protected side of the SD unit (3) and lever the handle gently towards the SD unit (4) and upwards to disengage the spring, freeing the unit from the rail (5).
e) When connecting the signal wires, if using an electric screwdriver the torque setting should be between 0.2 and 0.4Nm maximum.

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Earthing

Correct earthing procedures are essential for effective and safe surge protection. Each SD unit has its earth connection made onto the DIN rail. Connection to the surge earth is made using an ETL7000 earth terminal clamped to the DIN rail at either, or preferably both, ends of a row of SD surge protectors. See Fig. 4).

a) Locate the earth terminal next to the SDs at the end of the row.
b) Hook the earthing clamp over the flange of the DIN rail. Press down the other end of the terminal until it locates over the DIN rail. Firmly tighten the clamping screw in the central hole on top of the terminal. Check that the earth terminal is properly clamped to ensure that the earth connection has been made securely.
c) The earth connection of the SD should be made to the earth reference of the equipment to be protected. In practice, the earth connection (via ETL7000 terminals) is usually made to the OV reference earth box in the equipment cubicle. The earth connection should be 1 metre in length and use wire size[3] 2.5mm[2].

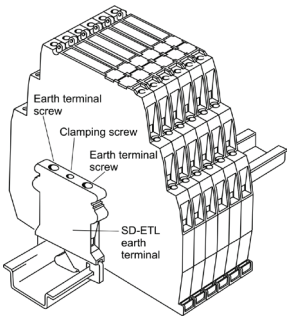


Fig. 4 Fitting the earth terminal

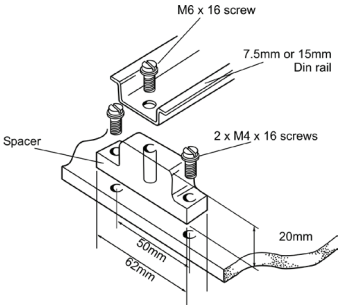


Fig. 5 Mounting the ISP7000 insulated spacer

Note: The overall earthing system is critical to effective operation of the surge protector. This may require re-routing of the system earthing and the installation instructions should be checked carefully. If the system requires the DIN rail to be isolated from the mounting plate then use ISP7000 insulating spacers (see Fig. 5).

Replaceable fuses

(Only fitted in selected versions) See Fig. 6. SD replaceable fuses protect the SD unit and associated circuitry against wiring errors and circuit faults that may develop during operation. They also act as "disconnects" providing a useful mechanism for reaking the circuit between the protected area and the field equipment during commissioning, maintenance or fault finding. The 250mA fuses are packaged in plastic assemblies and spare assemblies for replacement purposes are available in packs of 5 (SD-F25). In addition, packs of 50mA (SD-F05) fuses are available for cases where the lower current limit is more appropriate. The procedure for using and replacing a secondary fuse is

a) Raise the latched end of the plastic SD identifier (if fitted) and pivot it upwards to provide access to the top of the barrier.
b) With the tip of a small screwdriver, gently lever the fuse package upwards until it can be gripped between two fingers.
c) Pull it upwards until a slight resistance is felt – this is the "disconnect" position used to isolate protected and field equipment during commissioning, maintenance and faultw finding procedures.
d) Use slightly greater force to withdraw the fuse assembly completely.

e) Insert the replacement fuse and press down firmly into place (with the top of the package flush with the top of the SD unit) or reset the latched assembly similarly.

Note: the replacement fuses are non-polarised and can be inserted either way round.

f) Carefully pivot the identifier and clip it back into place.

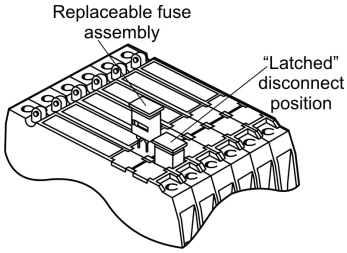


Fig. 6 Fuse replacement

Individual terminal identification

See Fig. 7. BRI7000 identifiers mount on top of individual SD units and are supplied with adhesive labels for identification – the latter also being supplied in separate sheets (BIL7000L) for pre-printing by the user. The installation procedure is:

a) Clip the rounded end of the identifier firmly onto the horizontal pins at the field-side end of the SD unit to form a pivot (1).

b) Push the free end of the identifier downwards until the flange latches into the slot at the protected end of the SD (2).

Note: on SD units with replaceable fuses it is necessary to pivot the identifier upwards (3) to provide access to the fuse.

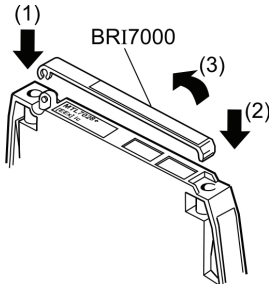


Fig. 7 Installing SD identifier and label

UL497B Listed

Voltage breakdown ratings:

9-10Vdc	SDRTD, SD07, SD07X, SD07R, SD07R3, SD07T3, SD0RX3
21-23Vdc	SD16, SD16X, SD16R, SD16R3, SD16T3, SD16X3
45-47Vdc	SD32, SD32X, SD32R, SD32R3, SD32T3, SD32X3
65-80Vdc	SD55, SD55X, SD55R, SD55R3, SD55T3, SD55X3

SD ATEX Information

The Essential Health and Safety Requirements (Annex II) of the EU Directive 2014/34/EU [the ATEX Directive- safety of apparatus] requires that the installation manual of all equipment used in hazardous areas shall contain certain information. This guide is included to ensure that this requirement is met. It compliments the information presented in this document and does not conflict with that information. It is only relevant to those locations where the ATEX directives are applicable.

1. General

a) In common with all other electrical apparatus installed in hazardous areas, this apparatus must only be installed, operated and maintained by competent personnel. Such personnel shall have undergone training, including instruction on the various types of protection and installation practices, the relevant rules and regulations, and on the general principles of area classification. Appropriate refresher training shall be given on a regular basis. [See clause 4.2 of EN 60079-17

b) The apparatus has been designed and manufactured to satisfy the "essential health and safety requirements" of Annex II of the Directive.

c) This apparatus has been designed to meet the requirements of I.S. electrical apparatus in accordance with EN 50020 and EN50014 and is normally mounted in the hazardous area.

d) This apparatus requires additional protection for use in dust environments.

2. Installation

a) The installation should comply with the appropriate European, national and local regulations, which may include reference to the IEC code of practice IEC 60079-14. In addition particular industries or end users may have specific requirements relating to the safety of their installations and these requirements should also be met. For the majority of installations the Directive 1999/92/EC [the ATEX Directive- safety of installations] is also applicable.

b) The apparatus must not be subjected to mechanical and thermal stresses in excess of those permitted in the certification documentation, this manual and the product specification. If necessary the product must be protected by an enclosure to prevent mechanical damage.

c) The apparatus must not be installed in a position where it may be attacked by aggressive substances and must be protected from excessive dust, moisture and other contaminants by an enclosure.

d) This apparatus is I.S. electrical apparatus and is normally mounted in a hazardous area. It meets the requirements of Category 1 apparatus and may be installed in a Zone 0 location providing that the relevant installation conditions are met.

	WARNING!
⚠	There is a risk of electric shock from surge protection component if touched during a lightning storm or surge event.

3. Inspection and maintenance

a) Inspection and maintenance should be carried out in accordance with European, national and local regulations which may refer to the IEC standard IEC 60079-17. In addition specific industries or end users may have specific requirements which should also be met.

b) If the outer enclosure of the apparatus needs to be cleaned, this should be done with a cloth lightly moistened by a dilute mixture of detergent in water.

4. Special Conditions for Safe Use

a) The plastic enclosure may present an electrostatic risk and must not be rubbed in service.

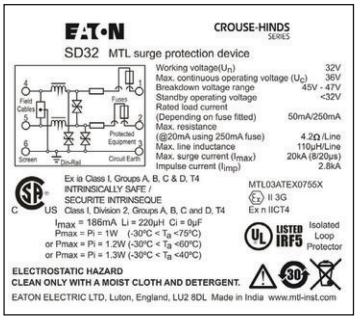
b) The SD**XXX range of surge protection devices will not meet the 500V insulation requirements to earth, therefore suitable precautions must be taken when installing the apparatus.

5. Repair

a) The products cannot be repaired by the user and must be replaced with an equivalent certified product. Repairs should only be carried out by the manufacturer or his authorised agent.

6. Marking

a) The products each have their own markings, a sample of which is reproduced to the right, along with indications of where the markings for the variants differ. addition the serial number and/ or date of manufacture are marked on the individual apparatus. This manual applies to products manufactured and date marked during or after the year 2003.



Notes:

1) The number and subsequent letters will change depending on the product variant.

2) The electrical parameters and simplified circuit diagram will change depending on the product variant.

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