


INSTALLATION INSTRUCTIONS



PRODUCT SERIES
DSD110-1S(R)-xxx

1. PREPARATION

 **DANGER:** *Electrical shock or burn hazard. Qualified personnel should only install this product. Failure to lockout electrical power during installation or maintenance can result in fatal electrocution or severe burns. Before making any connections to this electrical panel please ensure that power has been removed from all associated wiring, electrical panels, and other electrical equipment.*

 **CAUTION NOTES :**

1. The installation of this DIN Surge Diverter (DSD) should follow all applicable national electrical codes.
2. Check to ensure that the power frequency line voltage does not exceed the maximum continuous operating voltage U_c of the DSD.
3. Prior to installation, ensure that the DSD is of the correct voltage, current, and frequency.
4. The ground (earth) terminal must be connected to a low impedance earth (<10 ohms) for correct operation.
5. Do not perform a "Flash Test" or use a Megger to test circuits that are protected with these DSD units. This may damage the DSD(s) and affect the insulation readings being performed.
6. Follow all instructions to ensure correct and safe operation and observe nationally recognized codes of authorities having jurisdiction.
7. Do not attempt to open or tamper with the DSD unit in any way as this may compromise performance and will void warranty.

2. INTRODUCTION

The DIN Surge Diverter (DSD) series has been designed to provide one mode of protection to single-phase power distribution systems. Units can be connected (L-N), (L-G) or (N-G) depending on the type of power distribution system.

Multiple DSD units can be used to provide multi-modes of protection or to protect three-phase distribution systems. When protecting three phase systems, it is also possible to use the purpose designed three-phase DSD series.

DSD units are available with maximum continuous operating voltages U_c of: 150V, 275V and 440V for the protection of distribution systems with nominal RMS voltages of 120Vac, 240Vac and 380Vac, respectively. DSD units may also be used to protect DC power systems – ref. Table 1.

3. QUICK INSTALLATION OVERVIEW

Please follow the sequence indicated:

1. First, ensure that power is removed from the area and the circuits to be connected.
2. Install earth leakage protection (RCD) if appropriate or where required by national codes and authorities having jurisdiction. Note: When connecting surge protection L-G it is preferable to install the device before the RCD to avoid "nuisance tripping" which may occur when the SPD operates.
3. Connect wiring to the two primary terminals indicated.
4. Connect the alarm terminals ("R" models only) if remote monitoring is required.
5. Apply power and observe correct operation of the DSD and status indication.

4. MOUNTING

DSDs are designed to clip to 35mm (top hat) DIN rails (standard EN50022) set in the horizontal position with the DSD securing clips towards the bottom of the rail and the label text facing the correct way up.

NOTE: DSD modules must be installed in an enclosure or switch board panel in such a way that :

- The location of this enclosure prevents the temperature of the DSD unit(s) from exceeding its maximum specified rating.

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- Adequate electrical and safety protection is provided by the enclosure to all exposed terminals.
- The location and type of enclosure meets the specified environmental requirements and prevents the ingress of moisture and water.
- The indicator status of the DSD can be readily inspected.

5. ELECTRICAL CONNECTION

When connecting the DSD on the input side of the distribution panel wiring, it is usual to wire the DSD L-N (L1, L2, L3 to N on 3 phase systems). When connecting the DSD to the output side of the panel wiring, it is usual to wire it L-PE/PEN.

- On TN-C networks, three DSD units are required. L1, L2, L3 should be protected to PEN.
- On TN-S networks, four DSD units are required. L1, L2, L3 should be protected to N, and N should be protected to PE.
- On TT networks, three DSD units and a SGD unit are required. L1, L2, L3 should be protected to N using the DSD units, and N should be protected to PE using the SGD unit.
- On IT networks, four DSD units are required. L1, L2, L3, N should be protected to PE using 440V DSD units on a normal 230V system.

The interconnecting wiring should:

- Be as short as possible (preferably not exceeding 300mm (12").
- Avoid sharp bends >100mm radius is recommended.
- Have the conductors twisted together where possible.

Failure to follow this practice may result in a higher than desired residual let-through voltage after the DSD.

Terminals will allow connection of 25mm² multi-strand wiring or 35mm² single-strand – ref. Table 1. The wire insulation should be stripped back 8mm (5/16").

7. RESIDUAL CURRENT DETECTORS (RCD)

When an RCD is used, it is preferable that the DSD modules be installed prior to (upstream of) this device to avoid nuisance tripping which may occur during transient activity.

8. FUSING AND ISOLATION

Overcurrent protection must be installed in the upstream circuit of every DSD unit if the mains supply is > 100A. This is to provide protection to the DSD, the load and the wiring in the case of a fault – ref. Table 1 for suitable fuse ratings.

NOTE: Operation of this over-current protection under excessive surge conditions may occur removing protection

from the circuit. The Remote Status contacts should be monitored for this possibility.

9. STATUS INDICATION

DSD modules incorporate an internal thermal disconnect element, which automatically disconnects the varistor from the network in the event of a thermal overload. A failure of the module itself, or a sustained abnormal over-voltage on the power network could cause this situation. Should the internal disconnect operate, a red flag appears in the transparent window of the Status Indicator(s) on the front of the DSD.

10. MAINTENANCE & TESTING

Before removing a DSD module from service, ensure that the power has been removed and if possible “locked out”. Qualified personnel should only undertake replacement of DSD modules. Replacement plug-in modules are available.

NOTE: It is very important to ensure that the new module is of the same type and voltage as that being replaced.

NOTE: DSD units should be inspected periodically, and also following any periods of lightning or transient voltage activity. Check the Status Indicator and replace the module if failure is indicated as detailed under STATUS INDICATION.

11. REMOTE STATUS

The DSD “R-series” provides for remote status monitoring via voltage-free relay contacts. Failure of the DSD is signified by the N/C contacts (11,14) opening and the N/O contacts (11,12) closing. Ensure that the voltage and current ratings of the contacts are not exceeded – ref. Table 1.

NOTE: Depending how the DSD relay contacts are used (N/O or N/C), loss of power to the DSD may be incorrectly interpreted as a failure of the DSD module itself. Visual inspection of the DSD’s Status Indicator flag is required to clarify this situation.

Table 1. DSD operating specifications

Max. continuous operating voltage U_c (AC/DC)	150/200 V 275/350 V 440/580 V
Nominal discharge current I_n	5 kA 8/20
Max. discharge current I_{max}	10 kA 8/20
Protection level U_p @ I_n	< 0.9 kV < 1.1 kV < 1.4 kV
Temperature range	-40°C to +80°C
Main terminals – wire cross section / backup fuse	multi-strand 25 mm ² / max 100 AgL single-strand 35 mm ² / max 100 AgL
Mounting arrangement	35 mm top hat fixing DIN rail
Standards compliance	CE, IEC 61643-1
Remote status contacts	0.5 A / 250 VAC; 3 A / 125 VAC 1.5 mm ² wire cross section