

6 Earthing (continued)

In extreme cases where even 4m of connecting lead is not sufficient, the incoming line should be re-routed to bring it within 4m of the earth.

If the line cannot be re-routed; the Lightning Barrier can, as a last resort, be connected to the electrical earth local to the equipment being protected.

7 Keep clean lines away from dirty lines

Cables connected to the Lightning Barrier's clean end should never be routed next to dirty line cables or dirty barrier earth bonds. See Figure 7.

If rows of Lightning Barriers are installed close to each other, dirty ('line') lines and earth bonds must be kept at least 5cm apart from 'clean' lines. See Figure 8.

Note: When using the DIN rail foot to provide the Earth to the Lightning Barrier in conjunction with a base plate (i.e. DIN rail not directly bonded onto cabinet chassis) ensure the earth bond to the base plate (or DIN rail itself) is kept clear of the 'clean' lines.

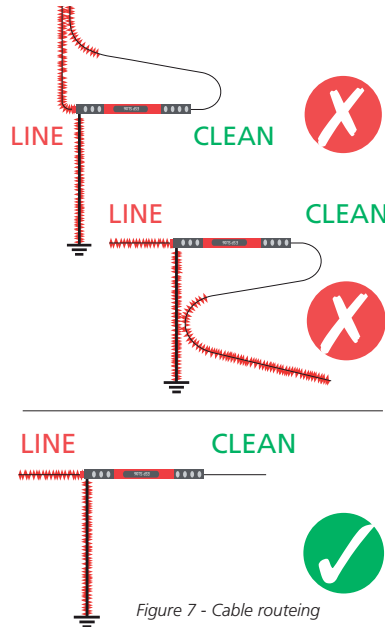


Figure 7 - Cable routing

8 Maintenance/Spares

In the unlikely event of a failure, replacement modules are available, contact sales on +44 (0)115 964 3700.

If a replacement module is required please quote part number with a suffix /M e.g. a replacement module for an ESP SL30 barrier would be ESP SL30/M.

ESP Lightning Barriers contain no user serviceable parts and must be replaced with equivalent genuine Furse modules.

The modules can easily be removed by pressing in the release button and pulling the module away from the base. The module is keyed to prevent it being inserted the wrong way around.

Insulation/Flash testing

The ESP Lightning Barriers can be easily disconnected from the system for insulation testing. When the module is 1cm away from being fully inserted there is a 2nd hold point. Instead of completely removing the module and having to record which point it is required to be replaced in, this point allows the module to be held in place within the base but disconnected from the system's wiring.

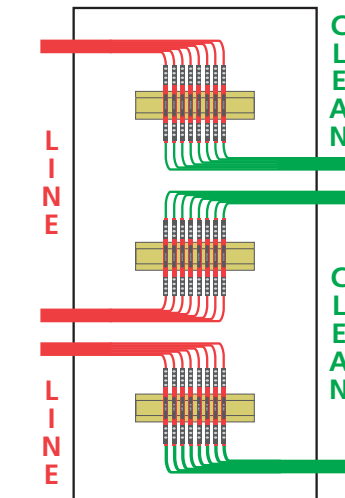


Figure 8 - Positioning of adjacent rows of Lightning Barriers

SAFETY NOTE:

1. Always handle cables by their insulation
2. Never work on Lightning Barriers or their cables during a storm

Intrinsically safe barriers for Hazardous areas - ESP SL**X only

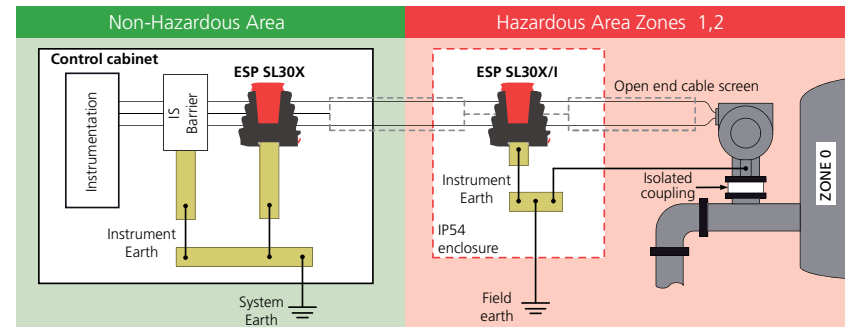


Figure 9 - The ESP SL**X Series can provide protection for the PLC or RTU I/O as well as providing protection for the IS barrier. The isolated screen (ESP SL**X/I) version should be used in zone 1, 2.

1 General information

In common with all other electrical apparatus installed in hazardous areas, the Lightning Barriers must only be installed, operated and maintained by competent personnel. The ESP SL**X Series have a group IIC T4 certification making it acceptable for use with all gas/air mixtures.

2 Location

Field instrument protection should take place in Zone 1 and as close as practically possible to the Zone 0 boundary, preferably within 1m to prevent transient voltages from entering Zone 0. Ensure the Lightning Barriers are mounted on a separate DIN rail to the IS Barriers. See figure 9. Ideally, the Lightning Barrier should be installed within the housing of the field instrument, however due to space restrictions it may be necessary to mount the unit in a suitable enclosure available from Furse.

3 Installation

The Lightning Barrier must not be subjected to thermal and/or mechanical stresses in excess of those permitted in the certification documentation, see product datasheet. If necessary the product must be protected by an enclosure to prevent mechanical damage as the Lightning Barrier requires additional protection for use in dust environments.

The Lightning Barrier must not be installed in a location where it may be attacked by aggressive substances and must be protected from excessive dust, moisture and other contaminants by an enclosure.

4 Inspection and Maintenance

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.

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

5 Conditions for safe use

The plastic enclosure must not be rubbed in service as it may present an electrostatic risk. When the surge protection module is fitted, the range of SL**X Series Surge Protection Devices will not meet the 500V insulation requirements to earth. Please refer to *Installation - Section 8, Insulation/Flash testing*, for information of how to disconnect the module for insulation testing.

ESP SLX barriers provide surge protection on the Intrinsically safe (IS) circuits only and do not replace the IS barrier itself.**

6 Marking

The specific ATEX certification and ratings are clearly marked on the product label for each of the ESP SL**X Lightning Barriers. In addition there is a separate label on both the replaceable module and base housing to indicate the manufacturing date.

Introduction

This document explains how to install Furse Electronic Systems Protectors for twisted pair data communication/signal/telephone lines:

ESP SL06
ESP SL15
ESP SL30
ESP SL50
ESP SL110
ESP SL RTD
ESP SL TN

And Surge Protectors for Intrinsically Safe Areas:

ESP SL15X
ESP SL30X

WARNING: Incorrect installation will impair the effectiveness of the ESP units

Before installation

1 Current rating

Ensure that the current passing through the Lightning Barrier does not exceed:

	Current Rating
ESP SL**	750mA
ESP SL**X	750mA
ESP SL RTD	300mA
ESP SL TN	300mA

2 Working voltage

Make sure that the system's maximum line voltage (DC or AC peak) will never exceed the maximum working voltage of the Lightning Barrier. Otherwise the Lightning Barrier will clamp signal voltages as though they were transient overvoltages.

	Normal working Voltage	Maximum working Voltage
ESP SL06	6V	7.79V
ESP SL15	15V	16.7V
ESP SL30	30V	36.7V
ESP SL50	50V	56.7V
ESP SL110	110V	132V
ESP SL RTD	6V	7.79V
ESP SL TN	296V	296V

3 Line resistance

Check that the voltage drop caused by the resistance of the unit does not interfere with the normal operation of the system.

	Line Resistance
ESP SL**	1.0Ω
ESP SL**X	1.0Ω
ESP SL RTD	1.0Ω
ESP SL TN	4.4Ω

4 Bandwidth

Be sure that the Lightning Barrier's bandwidth will not restrict the system bandwidth.

	Bandwidth (-3dB)
ESP 06	1.5MHz
ESP SL15 - ESP SL110	>85MHz
ESP SL**X	>85MHz
ESP RTD	800kHz
ESP TN	20.0MHz

Installation

1 Location

- Lightning Barriers are usually located either:
- Near to where the lines requiring protection enter or leave the building, or
 - Close to the equipment being protected (or actually within its control panel).

Either way, it is important that the Barrier's connection to earth (or barrier earth bond) is kept short. See Section 6 - Earthing.

2 Enclose the Lightning Barrier

Lightning Barriers should be installed within a panel or enclosure.

The Lightning Barrier should be ideally installed within an existing cabinet/ cubicle or in an enclosure to the required IP rating. Suitable enclosures are available from Furse. Lightning Barriers should always be installed in a dry environment.

3 Series connection

Furse ESP Lightning Barriers are connected in-line (or series) with the data communication, signal, measurement, or telephone line. See Figures 1a and 1b. The dirty, or line side of the protector should be connected to the cable carrying the incoming transient overvoltages. The output or clean side of the protector ensures a transient free signal to the equipment being protected.

4 Fixing methods

Furse ESP Lightning Barriers should be mounted on 35mm DIN rail to EN 50022. See Figure 2. The ESP Lightning Barriers DIN rail release clip features a latch back mechanism to hold the clip off the rail for easy removal and adjustment whilst on the DIN rail. This release clip should be engaged using a terminal screw driver or by hand by pulling the clip out and upwards in the housing. See Figures 3a and 3b.

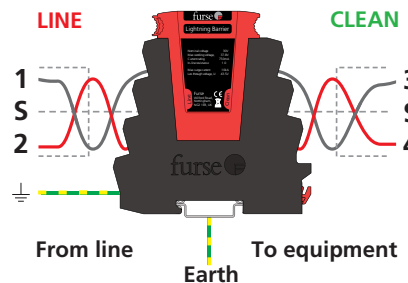


Figure 1a – Series connection of ESP SL** Series, ESP SL**X Series and ESP SL TN.

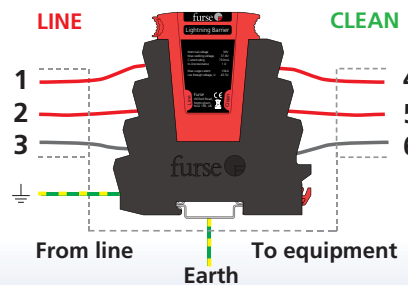


Figure 1b – Series connection of ESP SL RTD.



Figure 2 – Installation on 35mm DIN rail.

5 Connections to line, clean, screen and earth terminals

The clean end of the Lightning Barrier should be connected to the cabling going to the protected equipment. See Figures 1a and 1b.

Cable screens are connected to Earth (DIN rail and Earth terminal) via the terminals marked S, except the ESP SL RTD where the screen could be connected to the Earth terminal marked ⊥.

The screw terminals should be tightened between 0.5 - 1Nm torque (Do not exceed 1Nm).

For isolated screens

For situations where the cable screen needs to be isolated from the local Earth to avoid Earth loops (e.g. Fire alarm panels) the isolated screen version should be used (this has /I suffix in the part code e.g. ESP SL30/I). With the isolated screen version there is no continuity between the Screen and Earth connections in the absence of a transient overvoltage.

The screw terminals will accommodate conductor of up to 4mm². We recommend that these are terminated with a boot lace ferrule.

6 Earthing

Protectors for mains power supplies and Lightning Barriers for data/signal/telephone lines should be connected to the same earth point.

The Lightning Barrier should therefore be bonded to the main electrical earth or earth star point.

This connection should be made, either:

- Through installation on a 35mm DIN rail (which in turn is connected to earth).
- By connecting an earth cable to the barrier via the Barriers Earth terminal marked ⊥. See Figure 1a and 1b.



Figure 3a – Slide out the DIN rail release clip.



Figure 3b – Pull up and release to engage the latchback mechanism.

The best way to ensure a good earth connection when using a DIN rail is to mount the DIN rail in a metal cabinet. The entire length of the DIN rail should be in contact with the metal of the cabinet (if the cabinet is painted this should be removed locally where the rail is to be mounted to give a good electrical connection). The DIN rail should then be bonded to the cabinet at its mounting points and the chassis of the cabinet bonded to the main electrical earth or earth star point.

Alternatively if a non-metal housing is used the DIN rail should be bonded to a metal base plate. The base plate should then be bonded to the earth star point.

The barrier or base plate earth bond should be less than 1m long (otherwise the effectiveness of the protector will be reduced).

10mm² stranded green/yellow cable should be used for this bond.

Barrier or base plate earth bonds of 2, 3 or 4m are allowed if; 2, 3 or 4 parallel earth bonds are used and these parallel earth bonds are kept at least 5cm apart from each other.

...continued overleaf



Thank you for reading this data sheet.

For pricing or for further information, please contact us at our UK Office, using the details below.



UK Office

Keison Products,

P.O. Box 2124, Chelmsford, Essex, CM1 3UP, England.

Tel: +44 (0)1245 600560

Fax: +44 (0)1245 600030

Email: sales@keison.co.uk

Please note - Product designs and specifications are subject to change without notice. The user is responsible for determining the suitability of this product.