INTRODUCTION

This document explains how to install Furse ESP Surge Protection Devices (SPDs) for RF communication installations:

ESP RF/N **ESP RF/N-HF**
ESP RF/SMA **ESP RF/SMA-HF**
ESP RF/TNC **ESP RF/TNC-HF**
ESP RF/BNC
ESP RF/DIN

1. Safety note:

Warning! Installation by person with electrotechnical expertise only.

Warnung! Installation nur durch elektrotechnische Fachkraft.

Avvertenza! Fare installare solo da unelettricista qualificato.

Avertissement! Installation uniquement pardes personnes qualifiées en électrotechnique.

Advertencia! La instalación deberá ser realizada únicamente por electricistas especializados.

2. Before installation

2.1 Be sure that the ESP SPD's bandwidth will not restrict the system.

	Bandwidth
ESP RF/**	DC-3500 MHz
ESP RF/**-HF	DC-7000 MHz

2.2 Check that signal loss caused by insertion of the unit does not interfere with normal system operation.

	Insertion Loss over Bandwidth
All ESP RF Series	< 0.2 dB

2.3 Ensure that the characteristic impedance of the ESP SPD matches that of the system on to which it is to be installed.

	Characteristic Impedance
All ESP RF Series	50 Ω

2.4 Ensure the system's maximum line voltage (RMS) never exceeds the maximum working voltage of the ESP SPD. Otherwise the ESP SPD will clamp signal voltages as though they were transient overvoltages.

	Max RF V_{PEAK}	Voltage V_{RMS}	Max RF Power
ESP RF/N	320 V	228 V	780 W
ESP RF/DIN	320 V	228 V	780 W
ESP RF/SMA	320 V	228 V	780 W
ESP RF/BNC	320 V	228 V	780 W
ESP RF/TNC	320 V	228 V	780 W
ESP RF/N-HF	320 V	228 V	780 W
ESP RF/SMA-HF	160 V	114 V	190 W
ESP RF/TNC-HF	160 V	114 V	190 W

Note: Incorrect application may result in damage to the SPD and put the system at risk.

3. Installation

3.1 Series connection

Furse ESP SPDs are connected in series with the RF line.
The dirty, or line side of the ESP SPD should be connected to the cable carrying the incoming transient overvoltages.
The output or clean side of the SPD is connected to the protected equipment (see Figures 1 & 2).

3.2 SPD location

ESP SPDs are usually located either:

(a) near to where the line requiring protection enters or leaves the building, or

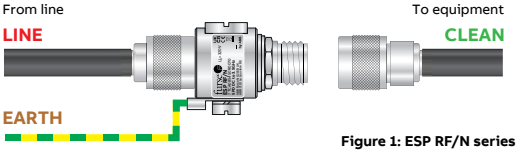


Figure 1: ESP RF/N series connection

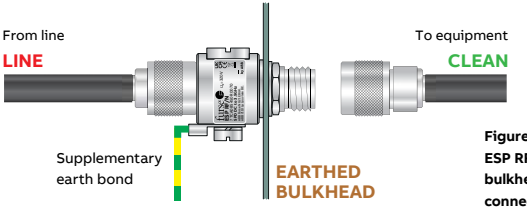


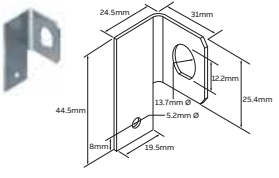
Figure 2: ESP RF/N series bulkhead connection

(b) close to the equipment being protected (or actually within its control panel).

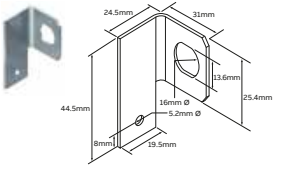
It is important that the ESP SPD's connection to earth (or SPD earth bond) is kept short (see Section 3.7 - Earthing).

Figure 3: Mounting bracket dimensions, for each type

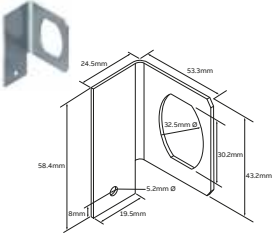
BK-BNC/TNC



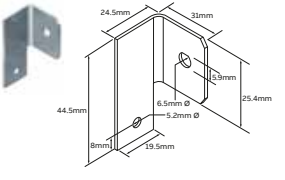
BK-N



BK-DIN



BK-SMA



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Note: Do NOT use power driven screwdrivers to make connections to ESP SPDs. Hand tighten only.

3.3 Fixing methods

ESP RF Series SPDs have two mounting options:

(a) Bulkhead mounting

Once a suitable aperture is made in a bulkhead, the SPD can be fitted and secured (as Figure 2, overleaf).

(b) Bracket mounting

Four right angle bulkhead mounting brackets are available from Furse to enable easier and more flexible mounting (see Figure 3 for images and dimension details):

	Mounting facility
ESP RF/BK-DIN	(DIN connector)
ESP RF/BK-N	(N connector)
ESP RF/BK-SMA	(SMA connector)
ESP RF/BK-BNC/TNC	(BNC/TNC connectors)

Contact Furse for further information.

3.4 Line, clean, screen and earth connections

Cable wires should be terminated with a male type connector (LINE) and female connector (CLEAN).

The line end of the ESP SPD should be connected to the dirty, incoming cable.

The clean end of the ESP SPD should be connected to the cable going to the protected equipment. Cable screens are earthed when connected to the unit (see Section 3.6 - Earthing).

Note: Do NOT use power driven screwdrivers to make connections to ESP SPDs. Hand tighten only.

3.5 Keep clean cables away from dirty cables

Cables connected to the ESP SPD's clean end should never be routed next to dirty line cables or dirty SPD earth bonds (see Figures 1 and 2, overleaf).

If rows of ESP SPDs are installed close to each other, dirty line cables and earth bonds must be kept at least 5 cm apart from clean cables.

3.6 Earthing

SPDs for mains power supplies and ESP SPDs for RF lines should be connected to the same earth point.

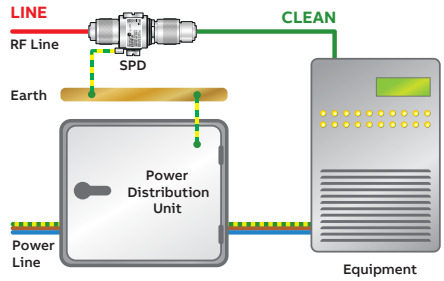

Figure 4: If connection to the main electrical earth is not possible, the SPD can be connected to the earth local to the protected equipment.

The ESP SPD should therefore be bonded to the main electrical earth or earth star point.

The ESP SPD must be connected to earth via the bulkhead or right-angle brackets.

Note: Where the connection to earth through the bulkhead or bracket is poor, then a separate earth wire should be used.

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

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

SPD or base plate earth bonds of 2, 3 or 4 metres are allowed if:

- 2, 3 or 4 parallel earth bonds are used and
- these parallel earth bonds are kept at least 5 cm apart from each other

Where even 4 metres of connecting lead is not sufficient, the incoming cable should be re-routed to bring it within 4 metres of the earth.

In circumstances where the cable cannot be re-routed the ESP SPD can alternatively be connected to the electrical earth local to the equipment being protected (eg the earth bar of the local power distribution board) (see Figure 4).

Environment

Consider the protection of the environment!

Used electrical and electronic equipment must NOT be disposed of with domestic waste. The device contains valuable raw materials which can be recycled. Therefore, contact ABB for disposal of this equipment.

ESP RF Series

for RF communication Surge Protective Devices (SPDs)

INSTALLATION INSTRUCTIONS

Contact us

ABB Ltd
Tower Court
Foleshill Enterprise Park
Courtaulds Way
Coventry CV6 5NX
Tel: 0333 999 9900
Fax: 0333 999 9901
E-Mail: LV.Enquiries@gb.abb.com
Twitter: @ABBUKLVP

www.abb.co.uk/lowvoltage