



FULL MODE Bonding + Equipment Protection	MAINS TEST TYPE 2 + 3
ENHANCED Low let-through voltage	LPZ 1→3
STATUS INDICATION + VOLT-FREE CONTACT	

Combined Category C, B tested data link protector (to BS EN 61643-21) and Combined Type 2 and Type 3 tested mains protector (to BS EN 61643-11) suitable for Solid State Interlocking (SSI) mains power and data links. Protectors are Network Rail approved. For use on lines running within buildings at boundaries up to LPZ 1 through to LPZ 3 to protect sensitive electronic equipment.

Features and benefits

- ✓ Accepted for use on Network Rail infrastructure. NRS PADS references: ESP SSI/M – 086/047066; ESP SSI/B – 086/047067; ESP SSI/120AC – 086/047058 and ESP SSI/140AC – 086/047059 (Network Rail Approval PA05/00471)
- ✓ Very low let-through voltage (enhanced protection to BS EN 62305) between all sets of conductors – Full Mode protection (ESP SSI/120AC and ESP SSI/140AC) and all signal lines (ESP SSI/M)
- ✓ ESP SSI/B modified base unit can be permanently wired into the system
- ✓ ESP SSI/M plug-in protection module can be replaced without interfering with the operation of the system
- ✓ ESP SSI/B incorporates a 100Ω terminating resistance that can be connected if required
- ✓ ESP SSI/B can be flat mounted, or a built-in DIN rail foot allows simple clip-on mounting to top-hat or G DIN rails
- ✓ ESP SSI/120AC and ESP SSI/140AC are a compact size for easy installation in trackside cabinets and control rooms
- ✓ ESP SSI/120AC and ESP SSI/140AC have three way visual indication of protector status and advanced pre-failure warning

Application

To prevent transient overvoltage damage to Solid State Interlocking (SSI) systems, protectors should be fitted in trackside cabinets and equipment rooms, on both the data link and the mains power lines.

- ✓ For single phase mains power supplies of 90–150 volts, use the ESP SSI/120AC (formerly ESP 120X)
- ✓ For single phase mains power supplies of 90–165 volts, use the ESP SSI/140AC (formerly S065)
- ✓ For SSI data links, use the ESP SSI/B base unit with the ESP SSI/M protection module

Use ESP PTE002 SSI tester for line-side testing of SSI/M modules.

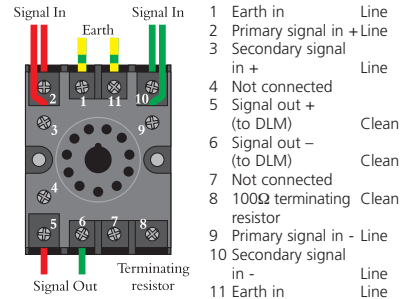
Network Rail Certification

All the products on this page have Network Rail Certificates of Acceptance, allowing them to be used on Network Rail infrastructure.

Installation

ESP SSI/B

Connect in series with the data link either near where it enters the trackside location cabinet or the equipment room.

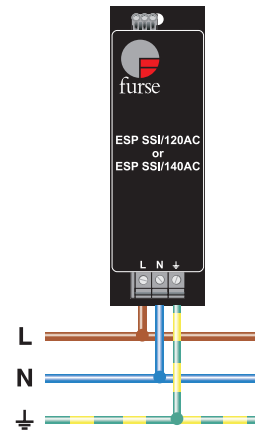


ESP SSI/120AC and ESP SSI/140AC

Install in parallel, within the trackside cabinet or equipment room.

The protector should be installed on the load side of the fuses, at the secondary side of the step-down transformer.

Connect, with very short leads, to phase (BX), neutral (NX or CNX) and earth.



Parallel connection of single phase protectors ESP SSI/120AC and ESP SSI/140AC (fuses not shown for clarity)



Furse transient overvoltage protectors are maintenance free and have long lifetimes – essential criteria for trackside equipment

Electrical specification

	ESP SSI/M
Maximum signal voltage ¹	7V
Maximum common mode stand-off voltage	90Vrms
Current rating	100mA
In-line resistance (per line, ±10%)	4.5Ω
Leakage (Line to line impedance) (Line to earth impedance)	>1MΩ >10kΩ
Differential Bandwidth (50Ω system)	10MHz

¹ Maximum signal voltage (DC or AC peak) measured at 200μA.

ESP SSI/B

This is a modified 11 pin 'relay type' socket containing a 100Ω ±5% wire-wound 2.5W resistor connected between terminals 8 and 9. Internal links between terminals 2 & 3, 9 & 10, and 1 & 11.

Transient specification

	ESP SSI/M
Transverse (Differential) 'let-through' voltage ¹ U_p	15V
Common mode 'let-through' voltage ² U_p	250V

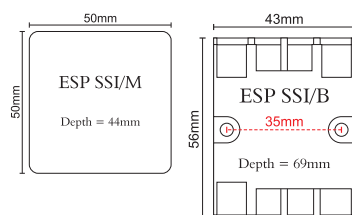
¹ 'Let-through' voltage is the maximum transient voltage 'let-through' to the equipment to be protected. C2 test (to BS EN/EN/IEC 61643-21) 2kV 1.2/50μs. 1kA 8/20μs. 'Let-through' voltage (±10%).

² 'Let-through' voltage is the maximum transient voltage 'let-through' to the equipment to be protected. C2 test (to BS EN/EN/IEC 61643-21) 4kV 1.2/50μs. 2kA 8/20μs. 'Let-through' voltage (±20%).

Mechanical specification

	ESP SSI/M	ESP SSI/B
Temperature range	-25 to +70°C	
Connection type	-	Screw terminal
Fixing connection (SSI/B) - Flat mount	-	Two M4 fixing holes with 35mm centres
- Top Hat Din rail mount	-	An integral clip
- G Din rail mount	-	Two mounting clips with screws
Max load	-	10A, 250V
Casing material	ABS UL94 V-0	
Weight - unit	0.065kg	0.075kg
- packaged (per 50)	3.25kg	3.9kg

Dimensions



ESP SSI/120AC ESP SSI/140AC

Nominal voltage - Phase - Neutral U_o (RMS)	120V	140V
Maximum working voltage - Phase - Neutral U_c (RMS)	150V	165V
Working voltage (RMS)	90-150V	90-165V
Frequency range	47-63Hz	
Current rating (supply) - see installation instructions	100A	
Leakage current (to earth)	<60μA	
Indicator circuit current	<10mA	
Volt free contact ¹	Screw terminal	
- current rating	200mA	
- nominal voltage (RMS)	250V	

¹ Minimum permissible load is 5V DC, 10mA to ensure reliable contact operation.

ESP SSI/120AC ESP SSI/140AC

Let-through voltage (all conductors) Type 2 (BS EN/EN), Class II (IEC)	
Nominal discharge current 8/20μs (per mode) I_n	5kA
Let-through voltage U_p at I_n ¹	460V 540V
Maximum discharge current I_{max} (per mode) ²	20kA
Type 3 (BS EN/EN), Class III (IEC)	
Let-through voltage at U_{oc} of 6kV 1.2/50μs and I_{sc} of 3kA 8/20μs (per mode) ³	400V 500V

¹ The maximum transient voltage let-through of the protector throughout the test (±5%), per mode.

² The electrical system, external to the unit, may constrain the actual current rating achieved in a particular installation.

³ Combination wave test within BS 6651:1999 App. C, Cats C-Low & B-High, IEEE C62.41-2002 Location Cats C1 & B3, SS CP 33:1996 App. F, AS 1768-1991 App. B, Cat B, UL1449 mains wire-in.

ESP SSI/120AC ESP SSI/140AC

Temperature range	-40 to +70°C
Connection type	Screw terminal
Conductor size (stranded)	16mm ²
Earth connection	Screw terminal
Volt free contact	Connect via screw terminal with conductor up to 2.5mm ² (stranded)
Case material	Steel
Weight - unit	0.5kg
- packaged	0.6kg

Dimensions

