

Mains power protection

ESP 240/XXX Series



Combined Type 1 and 2 tested protector (to BS EN 61643) for use on the main distribution board, particularly where a structural Lightning Protection System (LPS) is employed, for equipotential bonding. For use at boundaries up to LPZ 0 to protect against flashover (typically the main distribution board location) through to LPZ 2 to protect electrical equipment from damage.

Features & benefits

- Enhanced protection (to BS EN 62305) offering low let-through voltage further minimizing the risk of flashover creating dangerous sparking or electric shock
- Repeated protection in lightning intense environments
- Compact, space saving design
- The varistor based design eliminates the high follow current (I_f) associated with spark gap based surge protection
- Indicator shows when the protector requires replacement
- Remote signal contact can indicate the protector's status through interfacing with a building management system

Application

- Use on single phase mains supplies and power distribution systems for protection against partial direct or indirect lightning strikes
- ESP 240/I/XXX versions for use with Class I or II LPS
- ESP 240/III/XXX versions for use with Class III or IV LPS; or exposed overhead single phase power lines where no LPS is fitted
- ESP 240/X/TNS versions also cover TN-C-S earthing systems

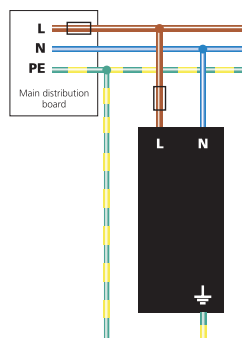
Installation

Protector to be installed in the main distribution board with connecting leads of minimal length. The protector should be fused and is suitable for attachment to a 35 mm top hat DIN rail. The diagrams below illustrate how to wire the appropriate ESP protector according to your chosen electrical system.

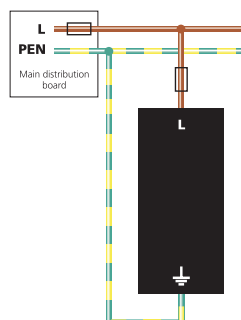
Accessories

Weatherproof enclosure:
WBX D4

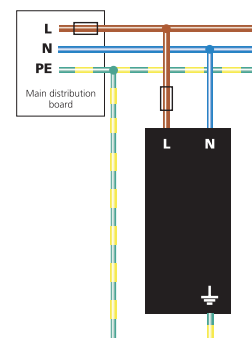
TN-S earthing system



TN-C earthing system



TT earthing system



IMPORTANT: The primary purpose of lightning current or equipotential bonding mains Type 1 Surge Protective Devices (SPDs) is to prevent dangerous sparking caused by flashover to protect against the loss of human life. In order to protect electronic equipment and ensure the continual operation of systems, transient overvoltage mains Type 2 and 3 SPDs such as the ESP M1 Series or ESP D1 Series are further required, typically installed at downstream subdistribution boards feeding sensitive equipment. BS EN/IEC 62305 refers to the correct application of mains Type 1, 2 and 3 SPDs as a coordinated set. For further information, please refer to the Furse Guide to BS EN 62305 Protection against Lightning.

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ESP 240/XXX Series

ESP 240/XXX Series - Technical specification

Electrical Specification	ESP 240/I/TNS	ESP 240/III/TNS	ESP 240/I/TNC	ESP 240/III/TNC	ESP 240/I/TT	ESP 240/III/TT
Nominal voltage - Phase-Neutral U_0 (RMS)	240 V					
Maximum voltage - Phase-Neutral U_c (RMS/DC)	320 V/420 V					
Temporary Overvoltage TOV $U_T^{(1)}$	350 V					
Short circuit withstand capability	25 kA/50 Hz					
Frequency range	47-63 Hz					
Max. back-up fuse (see installation instructions)	250 A					
Leakage current (to earth)	< 2.5 mA	< 2.5 mA	< 2.5 mA	< 2.5 mA	–	–
Volt free contact:	Screw terminal					
– Current rating	0.5 A					
– Nominal voltage (RMS)	250 V					

Transient Specification	ESP 240/I/TNS	ESP 240/III/TNS	ESP 240/I/TNC	ESP 240/III/TNC	ESP 240/I/TT	ESP 240/III/TT
Type 1 (BS EN/EN), Class I (IEC)						
Nominal discharge current $8/20 \mu s$ (per mode) I_n	50 kA	25 kA	50 kA	25 kA	50 kA/100 kA (N-E)	25 kA/50 kA (N-E)
Let-through voltage U_p at $I_n^{(2)}$	< 1.5 kV	< 1.4 kV	< 1.5 kV	< 1.4 kV	< 1.5 kV	< 1.4 kV
Impulse discharge current $10/350 \mu s$ I_{imp} (per mode) ⁽²⁾	50 kA	25 kA	50 kA	25 kA	50 kA/100 kA (N-E)	25 kA/50 kA (N-E)
Let-through voltage U_p at $I_{imp}^{(2)}$	< 1.2 kV	< 1.2 kV	< 1.2 kV	< 1.2 kV	< 1.2 kV	< 1.2 kV
Let-through voltage U_p at 1.2/50 μs (N-E, TT system)	–	–	–	–	< 1.2 kV	< 1.2 kV
Type 2 (BS EN/EN), Class II (IEC)						
Nominal discharge current $8/20 \mu s$ (per mode) I_n	50 kA	25 kA	50 kA	25 kA	50 kA/100 kA (N-E)	25 kA/50 kA (N-E)
Let-through voltage U_p at $I_n^{(2)}$	< 1.5 kV	< 1.4 kV	< 1.5 kV	< 1.4 kV	< 1.5 kV	< 1.4 kV
Maximum discharge current I_{max} (per mode) ⁽³⁾	100 kA	100 kA	100 kA	100 kA	100 kA/160 kA (N-E)	100 kA/100 kA (N-E)

Mechanical Specification	ESP 240/I/TNS	ESP 240/III/TNS	ESP 240/I/TNC	ESP 240/III/TNC	ESP 240/I/TT	ESP 240/III/TT
Temperature range	-40 to +80 °C					
Connection type	Screw terminal					
Conductor size (stranded)	25 mm ²					
Earth connection	Screw terminal					
Degree of protection (IEC 60529)	IP20					
Volt free contact	Connect via screw terminal with conductor up to 1.5 mm ² (stranded)					
Case material	Thermoplastic, UL 94 V-0					
Mounting	Indoor, 35 mm top hat DIN rail					
Weight: – Unit	0.84 kg	0.44 kg	0.44 kg	0.29 kg	0.68 kg	0.44 kg
– Packaged	0.94 kg	0.54 kg	0.54 kg	0.39 kg	0.78 kg	0.54 kg
Dimensions to DIN 43880 - HxDxW ⁽⁴⁾	90 mm x 68 mm x 72 mm (4TE)	90 mm x 68 mm x 36 mm (2TE)	90 mm x 68 mm x 36 mm (2TE)	90 mm x 68 mm x 36 mm (2TE)	90 mm x 68 mm x 72 mm (4TE)	90 mm x 68 mm x 54 mm (3TE)

⁽¹⁾ Temporary Overvoltage rating is for a maximum duration of 5 seconds tested to BS EN/EN/IEC 61643

⁽²⁾ The maximum transient voltage let-through of the protector throughout the test, phase to earth and neutral to earth

⁽³⁾ The electrical system, external to the unit, may constrain the actual current rating achieved in a particular installation

⁽⁴⁾ The remote signal contact (removable) adds 10 mm to height

