

ESP M1 Series



- LPZ**
 $0_B \rightarrow 3$
- MAINS TEST TYPE**
1 + 2 + 3
- ACTIVE VOLT-FREE CONTACT**
- FULL MODE Bonding + Equipment Protection**
- ENHANCED Low let-through voltage**
- 3-WAY + N-E FAULT STATUS INDICATION**

Combined Type 1, 2 and 3 tested protector (to BS EN 61643) for use on mains power distribution systems primarily to protect connected electronic equipment from transient overvoltages on the mains supply, e.g. computer, communications or control equipment. For use at boundaries up to LPZ 0_B to protect against flashover (typically the main distribution board location, with multiple metallic services entering) through to LPZ 3 to protect sensitive electronic equipment.

Features and benefits

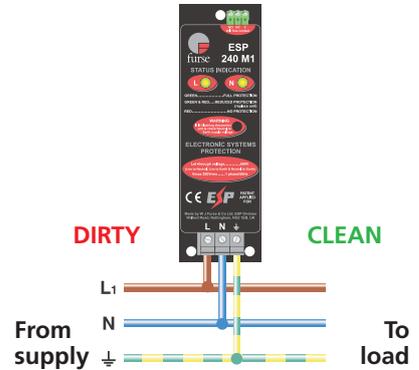
- ✓ Very low let-through voltage (enhanced protection to BS EN 62305) between all sets of conductors (phase to neutral, phase to earth, neutral to earth – Full Mode protection)
- ✓ Full mode design capable of handling partial lightning currents as well as allowing continual operation of protected equipment
- ✓ Repeated protection in lightning intense environments
- ✓ Innovative multiple thermal disconnect technology for safe disconnection from faulty or abnormal supplies (without compromising protective performance)
- ✓ Three way visual indication of protection status and advanced pre-failure warning so you need never be unprotected
- ✓ Remote indication facility allows pre-failure warning to be linked to a building management system, buzzer or light
- ✓ Changeover active volt free contact enables the protector to be used to warn of phase loss (i.e. power failure, blown fuses etc)
- ✓ Flashing warning of potentially fatal neutral to earth supply faults (due to incorrect earthing, wiring errors or unbalanced conditions)
- ✓ Robust steel housing
- ✓ Base provides ultra low inductance earth bond to metal panels
- ✓ Compact size for installation in the power distribution board
- ✓ ESP 240 M1 has Network Rail Approval PA05/01832. NRS PADS reference 086/047149



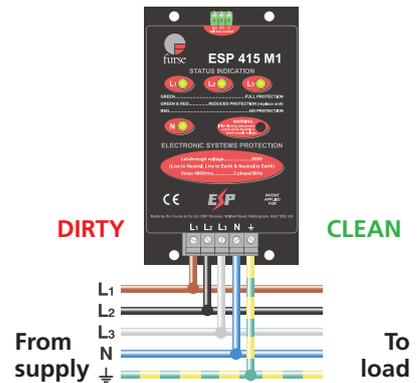
ESP 415 M1 installed within a control panel on the mains input to protect the panel's control systems. Note the remote indication connection (top of protector)

Installation

Install in parallel, within the power distribution board or directly (via fuses) on to the supply feeding equipment.



Parallel connection of single phase protectors ESP 240 M1, ESP 120 M1 or ESP 277 M1 (fuses not shown for clarity)



Parallel connection of ESP 415 M1, ESP 208 M1 or ESP 480 M1 to three phase star (4 wire and earth) supplies (fuses not shown for clarity)

At distribution boards, the protector can be installed either on the load side of the incoming isolator, or on the closest outgoing way to the incoming supply. Connect, with very short connecting leads, to phase(s), neutral and earth.

Accessories

Weatherproof enclosures

WBX 3

Use with single phase protectors

WBX 4

Use with three phase protectors

Electrical specification	IMPROVED ESP 120 M1	IMPROVED ESP 208 M1	IMPROVED ESP 240 M1	IMPROVED ESP 415 M1	IMPROVED ESP 277 M1	IMPROVED ESP 480 M1
Nominal voltage - Phase-Neutral U_0 (RMS)	120V	120V	240V	240V	277V	277V
Maximum voltage - Phase-Neutral U_c (RMS)	150V	150V	280V	280V	350V	350V
Temporary Overvoltage TOV U_t^1	208V	208V	415V	415V	480V	480V
Short circuit withstand capability	25kA, 50Hz					
Working voltage (RMS)	90-150V	156-260V	200-280V	346-484V	232-350V	402-600V
Frequency range	47-63Hz					
Max. back-up fuse (see installation instructions)	125A					
Leakage current (to earth)	<250 μ A					
Indicator circuit current	<10mA					
Volt free contact ²	Screw terminal					
– current rating	1A					
– nominal voltage (RMS)	250V					

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

² Minimum permissible load is 5V DC, 10mA to ensure reliable operation.

Transient specification	ESP 120 M1	ESP 208 M1	ESP 240 M1	ESP 415 M1	ESP 277 M1	ESP 480 M1
Type 1 (BS EN/EN), Class I (IEC)						
Nominal discharge current 8/20 μ s (per mode) I_n	20kA					
Let-through voltage U_p at I_n^1	<600V	<600V	<900V	<900V	<1kV	<1kV
Impulse discharge current 10/350 μ s I_{imp} (per mode) ²	4kA					
Let-through voltage U_p at I_{imp}^1	<500V	<500V	<750V	<750V	<850V	<850V
Impulse discharge current (per phase) I_{imp}^3	6.25kA					
Type 2 (BS EN/EN), Class II (IEC)						
Nominal discharge current 8/20 μ s (per mode) I_n	20kA					
Let-through voltage U_p at I_n^1	<600V	<600V	<900V	<900V	<1kV	<1kV
Maximum discharge current I_{max} (per mode) ²	40kA					
Maximum discharge current I_{max} (per phase)	80kA					
Type 3 (BS EN/EN), Class III (IEC)						
Let-through voltage at U_{oc} of 6kV 1.2/50 μ s and I_{sc} of 3kA 8/20 μ s (per mode) ⁴	<390V	<390V	<600V	<600V	<680V	<680V

¹ The maximum transient voltage let-through of the protector throughout the test ($\pm 5\%$), phase to neutral, phase to earth and neutral to earth.

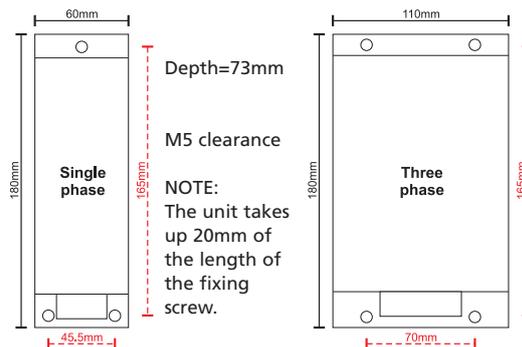
² The electrical system, external to the unit, may constrain the actual current rating achieved in a particular installation.

³ Rating is considered as the current capability of the protector for equipotential bonding near the service entrance.

⁴ 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.

Mechanical specification	ESP 120 M1	ESP 208 M1	ESP 240 M1	ESP 415 M1	ESP 277 M1	ESP 480 M1
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)					
Degree of protection (IEC 60529)	IP20					
Case material	Steel					
Weight – unit	0.6kg	1.0kg	0.6kg	1.0kg	0.6kg	1.0kg
– packaged	0.7kg	1.1kg	0.7kg	1.1kg	0.7kg	1.1kg

Dimensions



If you desire a protector with an extra high maximum surge current use the ESP M2 or M4 series. If your supply is fused at 16 amps, or less, the in-line protectors (ESP 240 (or 120-5A (or -16A) and their ready boxed derivatives) may be more suitable. If you need to mount the display panel separately from the main protector unit, use the ESP M1R series.