

# Mains power protection

## ESP M2/M4 Series



Combined Type 1, 2 and 3 tested protector (to BS EN 61643) for use on the main distribution board directly feeding electronic equipment such as computers, communication and control equipment, particularly where a structural Lightning Protection System (LPS) is employed. For use at boundaries up to LPZ 0 to protect against flashover (typically the main distribution board location) through to LPZ 3 to protect sensitive electronic equipment.

### Features & benefits

- Very low let-through voltage (enhanced protection to BS EN 62305) between all sets of conductors (phase to neutral, phase to earth and neutral to earth - Full Mode protection)
- Full mode design capable of handling high energy partial lightning currents as well as allowing continual operation of protected equipment
- Innovative multiple thermal disconnect technology, for safe disconnection from faulty or abnormal supplies (without compromising protective performance)
- Three way visual indication of protection status
- 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)
- Unique flashing warning of potentially fatal neutral to earth supply faults (caused by incorrect earthing, wiring errors or unbalanced conditions)
- Robust steel housing
- Protector base provides ultra low inductance earth bond to metal panels
- Convenient holes for flat mounting

### Application

Use ESP M2 versions on main distribution board for buildings with a Class III or IV structural LPS fitted or exposed 3 phase power lines where no LPS is fitted. Use ESP M4 versions on main distribution board for buildings with a Class I or II LPS fitted.

### Installation

Install in parallel, within the power distribution board, 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. Phase/live connecting leads should be fused with HRC fuses, a switchfuse, MCCB or type 'C' MCB. For TT installations, contact Furse.

### Accessories

Weatherproof enclosures:

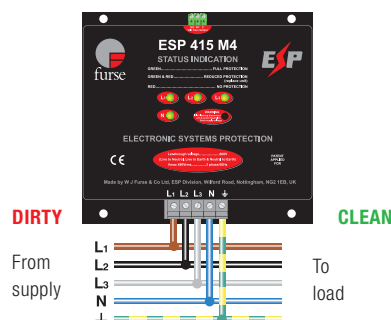
#### WBX M2

For use with the ESP XXX M2

#### WBX M4

For use with the ESP XXX M4

Parallel connection to three phase star (4 wire and earth) supplies (fuses not shown for clarity)



**NOTE:** For main distribution boards with multiple metallic services (gas, water, telecom/data lines) entering and for sub-distribution boards, the ESP M1 Series are more suited. If your supply is fused at 16 Amps, or less, the in-line protection (ESP 240 or 120-5A (or -16A) and ready-boxed derivatives) may be suitable. If you need to mount the display panel separately from the main protector unit, use the ESP XXX M2R or ESP XXX M4R.

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## ESP M2/M4 Series

### ESP M2/M4 Series - Technical specification

Electrical Specification	ESP 415 M2	ESP 415 M4	ESP 480 M2	ESP 480 M4
Nominal voltage - Phase-Neutral $U_0$ (RMS)	240 V	240 V	277 V	277 V
Maximum voltage - Phase-Neutral $U_c$ (RMS)	280 V	280 V	350 V	350 V
Temporary Overvoltage TOV $U_T^{(1)}$	350 V	350 V	402 V	402 V
Short circuit withstand capability	25 kA/50 Hz			
Working voltage (RMS)	346-484 V	346-484 V	402-600 V	402-600 V
Frequency range	47-63 Hz			
Max. back-up fuse (see installation instructions)	200 A	315 A	200 A	315 A
Leakage current (to earth)	< 500 $\mu$ A	< 1000 $\mu$ A	< 500 $\mu$ A	< 1000 $\mu$ A
Indicator circuit current	< 20 mA	< 40 mA	< 20 mA	< 40 mA
Volt free contact: <sup>(2)</sup>	Screw terminal			
– Current rating	1 A			
– Nominal voltage (RMS)	250 V			

Transient Specification	ESP 415 M2	ESP 415 M4	ESP 480 M2	ESP 480 M4
<b>Type 1 (BS EN/EN), Class I (IEC)</b>				
Nominal discharge current 8/20 $\mu$ s (per mode) $I_n$	40 kA	80 kA	40 kA	80 kA
Let-through voltage $U_p$ at $I_n^{(3)}$	900 V	900 V	1 kV	1 kV
Impulse discharge current 10/350 $\mu$ s $I_{imp}$ (per mode) <sup>(4)</sup>	8 kA	16 kA	8 kA	16 kA
Let-through voltage $U_p$ at $I_{imp}^{(2)}$	750 V	750 V	850 V	850 V
Impulse discharge current (per phase) $I_{imp}^{(5)}$	12.5 kA	25 kA	12.5 kA	25 kA
<b>Type 2 (BS EN/EN), Class II (IEC)</b>				
Nominal discharge current 8/20 $\mu$ s (per mode) $I_n$	40 kA	80 kA	40 kA	80 kA
Let-through voltage $U_p$ at $I_n^{(3)}$	900 V	900 V	1 kV	1 kV
Maximum discharge current $I_{max}$ (per mode) <sup>(4)</sup>	80 kA	160 kA	80 kA	160 kA
Maximum discharge current $I_{max}$ (per phase)	160 kA	320 kA	160 kA	320 kA
<b>Type 3 (BS EN/EN), Class III (IEC)</b>				
Let-through voltage at $U_{oc}$ of 6 kV 1.2/50 $\mu$ s and $I_{sc}$ of 3 kA 8/20 $\mu$ s (per mode) <sup>(6)</sup>	590 V	570 V	670 V	650 V

Mechanical Specification	ESP 415 M2	ESP 415 M4	ESP 480 M2	ESP 480 M4
Temperature range	-40 to +80 °C			
Connection type	Screw terminal			
Conductor size (stranded)	25 mm <sup>2</sup>	50 mm <sup>2</sup>	25 mm <sup>2</sup>	50 mm <sup>2</sup>
Earth connection	Screw terminal			
Volt free contact	Connect via screw terminal with conductor up to 1.5 mm <sup>2</sup> (stranded)			
Degree of protection (IEC 60529)	IP20			
Case material	Steel			
Weight: – Unit	2.35 kg	3.9 kg	2.35 kg	3.9 kg
– Packaged	2.5 kg	4.2 kg	2.5 kg	4.2 kg
Dimensions	226 mm x 204 mm x 78 mm	226 mm x 204 mm x 125 mm	226 mm x 204 mm x 78 mm	226 mm x 204 mm x 125 mm

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

<sup>(2)</sup> Minimum permissible load is 5 V DC, 10 mA to ensure reliable operation

<sup>(3)</sup> The maximum transient voltage let-through of the protector throughout the test ( $\pm 5\%$ ), phase to neutral, phase to earth and neutral to earth

<sup>(4)</sup> The electrical system, external to the unit, may constrain the actual current rating achieved in a particular installation

<sup>(5)</sup> Rating is considered as the current capability of the protector for equipotential bonding near the service entrance

<sup>(6)</sup> Combination wave test within BS EN/IEC 61643, IEEE C62.41-2002 Location Cats C1 & B3, SS 555:2010, AS/NZS 1768-2007, UL 1449 mains wire-in

