

ESP M1R, M2R, M4R Series



- FULL MODE**
Bonding +
Equipment
Protection
- MAINS**
TEST
TYPE
1 + 2 + 3
- ENHANCED**
Low let-through
voltage
- ACTIVE**
VOLT-FREE
CONTACT
- 3-WAY + N-E**
FAULT
STATUS
INDICATION
- LPZ**
M1R $0_B \rightarrow 3$
M2R $0_A \rightarrow 3$
M4R $0_A \rightarrow 3$
- REMOTE**
INDICATION
LED **DISPLAY**

Combined Type 1, 2 and 3 tested protector (to BS EN 61643-11) 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. Remote display allows both display and protector unit to be mounted in their optimum positions. For use at boundaries up to LPZ 0_A 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

- ✓ The remote display means the protector can be mounted close to the incoming feed or first way on the distribution board and the display in an easily visible position, e.g. on front of cabinet
- ✓ 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 abnormal or faulty supplies
- ✓ Remote display gives three way visual indication of protection status and is easily installed using standard drilling tools
- ✓ Plug-in cable connections between protector and display enable easy connection (1m cable supplied as standard)
- ✓ 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), and sturdy ABS housing (display)
- ✓ Base provides ultra-low inductance earth bond to metal panels
- ✓ Remote display comes with integral fixings and a panel drilling template



Front view of a cabinet with the display unit, easily visible, mounted on the front of the door, whilst the protector unit is installed deep within

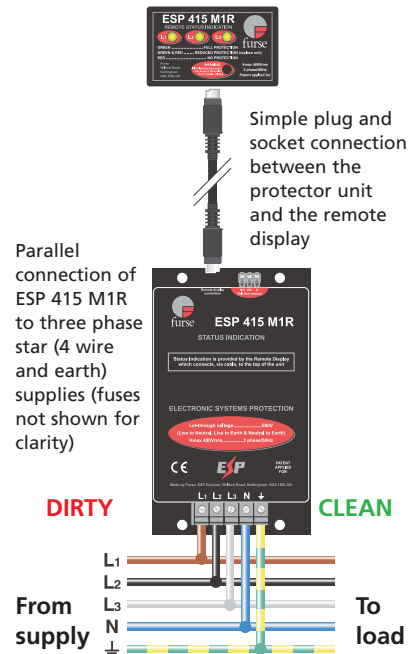
Application

Use ESP M1R versions on main distribution panel for buildings with multiple metallic services (e.g. gas, water, telephone lines) and on sub-distribution boards feeding sensitive equipment. Use ESP M2R versions on main distribution panel for buildings with a Class III or IV structural LPS fitted or exposed 3 phase power lines where no LPS is fitted. Use ESP M4R versions on main distribution panel for buildings with a Class I or II LPS fitted.

Installation

Installation of the protector unit is identical to the ESP M1, M2 or M4 Series.

Position remote display, making sure that the cable is long enough, is unimpeded within the cabinet, and allows a minimum of 60mm behind the panel front (for the interconnection cable).



Accessories

- ESP RLA-1**
Spare 1 metre cable assembly
- ESP RLA-4**
Spare 4 metre cable assembly
- ESP RDU**
Spare display unit

For three phase applications where a remote display is unnecessary, use the respective ESP M1, M2 or M4 Series.

Electrical specification	IMPROVED	NEW	NEW	NEW	NEW	NEW
	ESP 415 M1R	ESP 480 M1R	ESP 415 M2R	ESP 480 M2R	ESP 415 M4R	ESP 480 M4R
Nominal voltage - Phase-Neutral U_o (RMS)	240V	277V	240V	277V	240V	277V
Maximum voltage - Phase-Neutral U_c (RMS)	280V	350V	280V	350V	280V	350V
Temporary Overvoltage TOV U_t^1	350V	405V	350V	405V	350V	405V
Short circuit withstand capability	25kA, 50Hz					
Working voltage (RMS)	346-484V	402-600V	346-484V	402-600V	346-484V	402-600V
Frequency range	47-63Hz					
Max. back-up fuse (see installation instructions)	125A	125A	200A	200A	315A	315A
Leakage current (to earth)	<250 μ A	<250 μ A	<500 μ A	<500 μ A	<1000 μ A	<1000 μ A
Indicator circuit current	<10mA	<10mA	<20mA	<20mA	<40mA	<40mA
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.

Under fault conditions, the remote display will go blank if the L1 phase loses power or becomes faulty. This is due to the isolation requirements needed for circuitry mounted externally to the main protector unit.

Transient specification	ESP 415 M1R	ESP 480 M1R	ESP 415 M2R	ESP 480 M2R	ESP 415 M4R	ESP 480 M4R
	Type 1 (BS EN/EN), Class I (IEC)					
Nominal discharge current 8/20 μ s (per mode) I_n	20kA	20kA	40kA	40kA	80kA	80kA
Let-through voltage U_p at I_n^1	900V	1kV	900V	1kV	900V	1kV
Impulse discharge current 10/350 μ s I_{imp} (per mode) ²	4kA	4kA	8kA	8kA	16kA	16kA
Let-through voltage U_p at I_{imp}^1	750V	850V	750V	850V	750V	850V
Impulse discharge current (per phase) I_{imp}^3	6.25kA	6.25kA	12.5kA	12.5kA	25kA	25kA
Type 2 (BS EN/EN), Class II (IEC)						
Nominal discharge current 8/20 μ s (per mode) I_n	20kA	20kA	40kA	40kA	80kA	80kA
Let-through voltage U_p at I_n^1	900V	1kV	900V	1kV	900V	1kV
Maximum discharge current I_{max} (per mode) ²	40kA	40kA	80kA	80kA	160kA	160kA
Maximum discharge current I_{max} (per phase)	80kA	80kA	160kA	160kA	320kA	320kA
Type 3 (BS EN/EN), Class III (IEC)						
Let-through voltage U_p at U_{oc}^1 of 6kV 1.2/50 μ s and I_{sc} of 3kA 8/20 μ s (per mode) ⁴	600V	680V	590V	670V	570V	650V

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 415 M1R	ESP 480 M1R	ESP 415 M2R	ESP 480 M2R	ESP 415 M4R	ESP 480 M4R
Temperature range	-40 to +70°C					
Connection type	Screw terminal					
Conductor size (stranded)	16mm ²	16mm ²	25mm ²	25mm ²	50mm ²	50mm 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					
Display connection	6 way 1 metre interconnection cable - 4 metre cable optional (ESP RLA-4)					
Case material	Unit – Steel, Display – ABS					
Weight – unit	1.1kg	1.1kg	2.45kg	2.45kg	4kg	4kg
– packaged	1.2kg	1.2kg	2.55kg	2.55kg	4.3kg	4.3kg

