



- ◆ Remote display allows both display and protector unit to be mounted in their optimum positions.
- ◆ Advanced protector for mains supplies and power distribution systems.
- ◆ Available for three-phase supplies of 346–484 volts.

### Application

Typically install in large three-phase cubicle switchboards to protect connected electronic systems, eg computer, communication and control equipment.



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.

### Features & 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, eg on front of cabinet.
- ✓ Very low let-through voltage between all sets of conductors (phase to neutral, phase to earth and neutral to earth).
- ✓ Maximum surge current greatly in excess of the 10kA worst case indicated in BS 6651 and IEEE C62.41.
- ✓ Repeated protection in lightning intense environments, with 20 years predicted lifetime.
- ✓ Innovative multiple thermal disconnect technology, anticipates standards authorities' future demands, for safe disconnection from abnormal or faulty supplies.
- ✓ Slimline, remote display gives three way visual indication of protection status.
- ✓ 1m cable for connection between protector and display as standard.
- ✓ Plug-in cable connections between protector and display enable easy connection.
- ✓ 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.

For three phase applications where a remote display is unnecessary, use the ESP 415 M1.

- ✓ Changeover active volt free contact enables the protector to be used to warn of phase loss (ie 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 for the protector, and sturdy ABS housing for the display.
- ✓ Base provides ultra-low inductance earth bond to metal panels.
- ✓ Protector unit comes with convenient holes for flat mounting.
- ✓ Remote display is easily installed using standard drilling tools.
- ✓ Remote display comes with integral fixings and a panel drilling template.
- ✓ Compact size for installation in the power distribution board.
- ✓ Maintenance free.



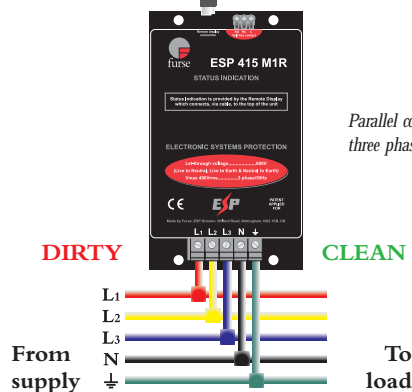
Rear view of cabinet door, showing simple plug-in connection for the cable running between the protector unit and the remote display.

### Installation

Installation of the protector unit is identical to the ESP 415 M1. 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). Use template (found in installation instructions supplied with each unit) to mark holes. Drill, screw in place and plug in connection cable on back of display unit from inside the cabinet.



Simple plug and socket connection between the protector unit and the remote display.



Parallel connection of ESP 415 M1R to three phase star (4 wire and earth) supplies.

### Suitable accessories

Spare 1 metre cable assembly (ESP RLA-1). In applications where a 1 metre connecting cable is insufficient, a 4 metre cable assembly (ESP RLA-4) is available. Spare display unit (ESP RDU).

# Electrical specification

	ESP 415 M1R
Nominal voltage (RMS)	415V
Working voltage (RMS)	346-484V
Frequency range	40-60Hz
Current rating (supply)	Direct connection to supplies up to 100A Connection via series fuses to supplies greater than 100A
Leakage current (to earth)	<250 $\mu$ A
Indicator circuit current	<10mA
Volt free contact*	Screw terminal
- current rating	1A
- nominal voltage (RMS)	250V

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.

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

# Transient specification

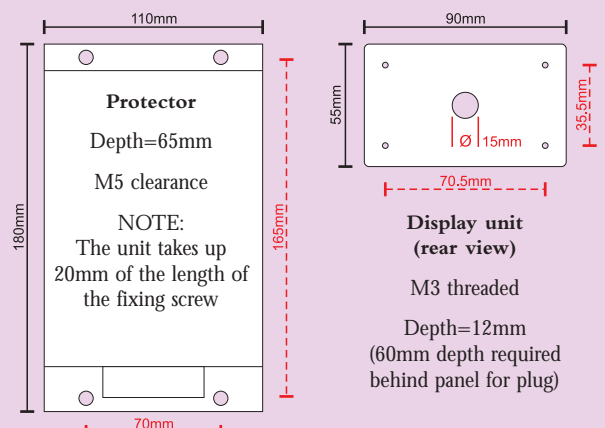
	ESP 415 M1R
Let-through voltage (all conductors) <sup>1</sup>	
6kV 1.2/50 $\mu$ s open circuit voltage,	600V
3kA 8/20 $\mu$ s short circuit current to:	
BS 6651:1999 Appendix C, Cats C-Low & B-High	
IEEE C62.41-1991 <sup>2</sup> Location Cats C1 & B3	
SS CP 33:1996 Appendix F	
AS 1768-1991 Appendix B, Cat B	
UL1449 mains wire-in	
4kV 1.2/50 $\mu$ s open circuit voltage,	570V
2kA 8/20 $\mu$ s short circuit current to:	
IEC 1000-4-5:1995	
2kV 1.2/50 $\mu$ s open circuit voltage,	530V
1kA 8/20 $\mu$ s short circuit current	
5kA 8/20 $\mu$ s to NFC 61-740	690V
2.5kA 8/20 $\mu$ s to BS EN 60099-1:1994	590V
6kV 0.5 $\mu$ s 100kHz ring wave, 500A to:	510V
IEEE C62.41-1991 <sup>2</sup> Location Cat B3	
AS 1768-1991 Appendix B, Cat B	
Maximum surge current <sup>3</sup>	
- between any two conductors	30kA
- total unit to earth	120kA

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

2 Formerly IEEE 587 and ANSI C62.41.

3 Tested with 8/20 $\mu$ s waveshape to BS 6651:1999 Appendix C. Note: The electrical system, external to the unit, may constrain the actual current rating achieved in a particular installation.

# Mechanical specification

	ESP 415 M1R
Temperature range	-40 to +70°C
Connection type	Screw terminal
Conductor size (stranded)	16mm <sup>2</sup>
Earth connection	Screw terminal
Volt free contact	Connect via screw terminal with conductor up to 2.5mm <sup>2</sup> (stranded)
Display connection	6 way interconnection cable (1 metre)
Weight	- unit 1.1kg (Protector unit, cable and remote display) - packaged 1.2kg
Dimensions	 <p>NOTE: The unit takes up 20mm of the length of the fixing screw</p> <p>Display unit (rear view) M3 threaded Depth=12mm (60mm depth required behind panel for plug)</p>