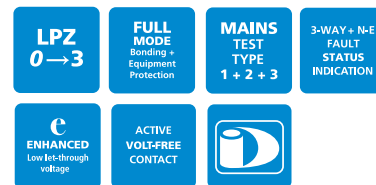


# Mains power protection

## ESP D1 Series (Three phase)



Combined Type 1, 2 and 3 tested protector (to BS EN 61643) for use on three phase mains power distribution systems primarily to protect connected electronic equipment from transient overvoltages on the mains supply, e.g. computer, communications or control equipment. Innovative remote display options allow both protector and display to be mounted in their optimum position. For use at boundaries up to LPZ 0 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 & benefits

- Very low let-through voltage (enhanced protection to IEC/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
- ESP XXX D1R or ESP XXX D1R/LCD units (where XXX = 208, or 415, or 480) have a remote display that allows the protector to be mounted close to the incoming feed or distribution board with the display being mounted in a visible
- ESP XXX D1/LCD or ESP XXX D1R/LCD units have backlit LCD intelligent display offering clear status information that can be rotated for side mounting to facilitate short connecting leads
- 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)
- Through terminal facility allows series connection on low current supplies to eliminate high additive voltage associated with connecting leads on units installed in parallel
- Compact space saving DIN housing

### Installation

Install in parallel, within the power distribution board or directly (via fuses) on to the supply feeding equipment. Can be installed in series for low current supplies - see installation instructions. For ESP D1R or D1R/LCD units, position remote display, making sure that the cable is long enough, is unimpeded within the cabinet, and allows a minimum of 60 mm behind the panel front (for the

interconnection cable). 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 phases, neutral and earth. For TT installations, contact Furze.

### Accessories

Weatherproof enclosure:

#### WBX D8

ABB Order code:  
7TCA085410R0033

#### ESP RLA HD-1

ABB Order code:  
7TCA085460R0304

Spare 1 m cable assembly for  
ESP XXX D1R or ESP XXX D1R/  
LCD

#### ESP RLA HD-2

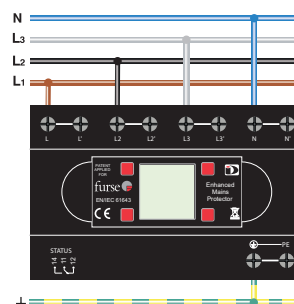
ABB Order code:  
7TCA085460R0305

Spare 2 m cable assembly for  
ESP XXX D1R or ESP XXX D1R/  
LCD

#### ESP RLA HD-4

ABB Order code:  
7TCA085460R0156

Spare 4 m cable assembly for  
ESP XXX D1R or ESP XXX D1R/  
LCD



Parallel connection of  
ESP 415 D1, ESP 208 D1  
and ESP 480 D1 series  
to three phase star  
(4 wire and earth)  
supplies (fuses not  
shown for clarity)

**NOTE:** If you desire a protector with an extra high maximum surge current use the ESP M2 or ESP M4 series. If your supply is fused at 32 Amps, or less, the in-line protectors (and their ready-boxed derivatives) may be more suitable.

## ESP D1 Series (Three phase) - Technical specification

Electrical specification	ESP 208 D1 <sup>(1)</sup>	ESP 415 D1 <sup>(1)</sup>	ESP 480 D1 <sup>(1)</sup>
<b>ABB order code</b>	7TCA085460R0077	7TCA085460R0105	7TCA085460R0133
Nominal voltage - Phase-Neutral $U_o$ (RMS)	120 V	240 V	277 V
Maximum voltage - Phase-Neutral $U_c$ (RMS)	150 V	280 V	350 V
Temporary Overvoltage TOV $U_T^{(2)}$	175 V	350 V	402 V
Short circuit withstand capability	25 kA/50 Hz		
Working voltage (RMS)	156-260 V	346-484 V	402-600 V
Frequency range	47-63 Hz		
Max. back-up fuse (see installation instructions)	≤ 125 A		
Leakage current (to earth)	< 250 $\mu$ A		
Indicator circuit current	< 10 mA		
Volt free contact: <sup>(3)</sup>	Screw terminal		
– Current rating	1 A		
– Nominal voltage (RMS)	250 V		
Transient specification	ESP 208 D1	ESP 415 D1	ESP 480 D1
<b>Type 1 (BS EN/EN), Class I (IEC)</b>			
Nominal discharge current 8/20 $\mu$ s (per mode) $I_n$	20 kA		
Let-through voltage $U_p$ at $I_n$	< 1 kV	< 1.3 kV	< 1.4 kV
Impulse discharge current 10/350 $\mu$ s $I_{imp}$ (to earth) <sup>(5)</sup>	6.25 kA		
Let-through voltage $U_p$ at $I_{imp}$	< 1 kV	< 1.2 kV	< 1.3 kV
Total discharge current 10/350 $\mu$ s $I_{total}$ (total to earth) <sup>(5,6)</sup>	25 kA		
<b>Type 2 (BS EN/EN), Class II (IEC)</b>			
Nominal discharge current 8/20 $\mu$ s (per mode) $I_n$	20 kA		
Let-through voltage $U_p$ at $I_n$	< 1 kV	< 1.3 kV	< 1.4 kV
Maximum discharge current $I_{max}$ (L/N-E, L-N) <sup>(5)</sup>	40 kA, 40 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>(4,7)</sup>	400 V	600 V	680 V
Mechanical specification	ESP 120 D1	ESP 240 D1	ESP 277 D1
Temperature range	-40 to +80 °C		
Connection type	Screw terminal - maximum torque 4.5Nm		
Conductor size (stranded)	25 mm <sup>2</sup>		
Earth connection	Screw terminal - maximum torque 4.5Nm		
Volt free contact	Connect via screw terminal with conductor up to 1.5 mm <sup>2</sup> (stranded) - maximum torque 0.25 Nm		
Display connection (D1R & D1R/LCD versions)	HD-D Type 1 metre interconnection cable / 2 metre cable (ESP RLA HD-2) or 4 metre cable (ESP RLA HD-4) optional		
Degree of protection (IEC 60529)	IP20		
Case material	FR Polymer UL-94 V-0		
Weight: – Unit	0.85 kg		
– Packaged	0.95 kg		
Dimensions to DIN 43880 - HxDxW(8)	90 mm x 88 mm x 144 mm (8TE)		

<sup>(1)</sup> Three phase series (208 V, 415 V or 480 V) include fixed (D1) or remote (D1R) LED or LCD options, e.g. ESP 415 D1, ESP 415 D1/LCD, ESP 415 D1R, ESP 415 D1R/LCD

<sup>(2)</sup> Temporary Overvoltage rating is for a maximum duration of 5 seconds tested to IEC/BS EN 61463

<sup>(3)</sup> Min. permissible load is 5 V DC, 10 mA to ensure reliable operation

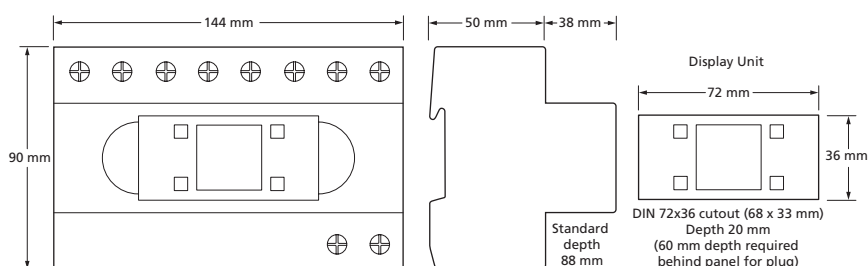
<sup>(4)</sup> The maximum transient voltage let-through of the protector throughout the test ( $\pm 10\%$ ), phase to neutral, phase to earth and neutral to earth

<sup>(5)</sup> The electrical system, external to the unit, may constrain the actual current rating achieved in a particular installation

<sup>(6)</sup> Rating is considered as the current capability of the protector for equipotential bonding near the service entrance

<sup>(7)</sup> Combination wave test within IEC/BS EN 61643, IEEE C62.41-2002 Location Cats C1 & B3, SS 555:2010, AS/NZS 1768-2007, UL 1449 mains wire-in

<sup>(8)</sup> The remote signal contact (removable) adds 10 mm to height



## ABB order codes

Part	ABB order code	Part	ABB order code	Part	ABB order code
<b>ESP 208 D1</b>	7TCA085460R0077	<b>ESP 415 D1</b>	7TCA085460R0105	<b>ESP 480 D1</b>	7TCA085460R0133
<b>ESP 208 D1R</b>	7TCA085460R0337	<b>ESP 415 D1R</b>	7TCA085460R0107	<b>ESP 480 D1R</b>	7TCA085460R0339
<b>ESP 208 D1/LCD</b>	7TCA085460R0338	<b>ESP 415 D1/LCD</b>	7TCA085460R0106	<b>ESP 480 D1/LCD</b>	7TCA085460R0134
<b>ESP 208 D1R/LCD</b>	7TCA085460R0336	<b>ESP 415 D1R/LCD</b>	7TCA085460R0108	<b>ESP 480 D1R/LCD</b>	7TCA085460R0135