

Mains power protection

ESP D1 Series (Single phase)



*NOTE: product label design may vary.

Combined Type 1, 2 and 3 tested protector (to BS EN 61643) for use on single 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. 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
- 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. 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 live, neutral and earth.

Accessories

Weatherproof enclosure:

WBX D4

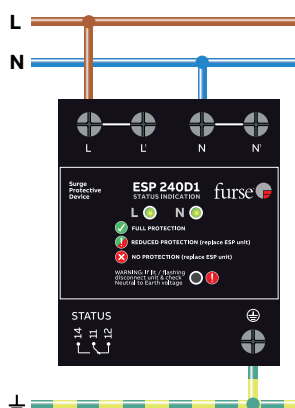
ABB Order code: 7TCA085410R0032

Metallic enclosure:

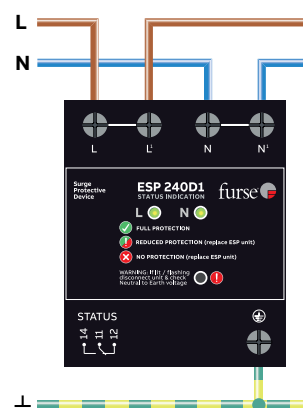
MBX D4

ABB Order code: 7TCA085400R0649

Parallel connection of ESP 120 D1, ESP 240 D1 and ESP 277 D1 series to single phase supplies (fuses not shown for clarity).



Series connection of ESP 120 D1, ESP 240 D1 and ESP 277 D1 to single phase supplies up to 125 A (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 16 Amps, or less, the in-line protectors (and their ready-boxed derivatives) may be more suitable.

ESP D1 Series (Single phase) - Technical specification

Electrical specification	ESP 120 D1	ESP 240 D1	ESP 277 D1
ABB order code	7TCA085460R0069	7TCA085460R0086	7TCA085460R0096
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 $U_T^{(1)}$	175 V / 229 V	337 V / 442 V	403 V / 529 V
Short circuit withstand capability	25 kA/50 Hz		
Working voltage (RMS)	90-150 V	200-280 V	232-350 V
Frequency range	47-63 Hz		
Max. back-up fuse (see installation instructions)	≤ 125 A		
Leakage current (to earth)	< 250 μ A		
Indicator circuit current	< 10 mA		
Volt free contact: ⁽²⁾	Screw terminal		
- Current rating	1 A		
- Nominal voltage (RMS)	250 V		
Transient specification	ESP 120 D1	ESP 240 D1	ESP 277 D1
Type 1 (BS EN/EN), Class I (IEC)			
Nominal discharge current 8/20 μ 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 μ s I_{imp} (to earth) ⁽⁵⁾	6.25 kA		
Total discharge current 10/350 μ s I_{total} (total to earth) ^(4,5)	12.5 kA		
Type 2 (BS EN/EN), Class II (IEC)			
Nominal discharge current 8/20 μ 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) ⁽⁴⁾	40 kA, 40 kA		
Type 3 (BS EN/EN), Class III (IEC)			
Let-through voltage at U_{oc} of 6 kV 1.2/50 μ s and I_{sc} of 3 kA 8/20 μ s (per mode) ^(3,6)	400 V	600 V	680 V
Mechanical specification	ESP 120 D1	ESP 240 D1	ESP 277 D1
Temperature range ⁽⁷⁾	-40 to +80 °C		
Connection type	Screw terminal - maximum torque 4.5Nm		
Conductor size (stranded)	25 mm ²		
Earth connection	Screw terminal - maximum torque 4.5Nm		
Volt free contact	Connect via screw terminal with conductor up to 1.5 mm ² (stranded) - maximum torque 0.25 Nm		
Degree of protection (IEC 60529)	IP20		
Case material	FR Polymer UL-94 V-0		
Weight	0.4 kg		
Dimensions to DIN 43880 - HxDxW ⁽⁸⁾	90 mm x 88 mm x 72 mm (4TE)		

⁽¹⁾ Temporary Overvoltage TOV rating is for durations of 5 seconds (withstand and 120 minutes (safe fail) tested to BS EN/IEC 61643.

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

⁽³⁾ The maximum transient voltage let-through of the protector throughout the test ($\pm 10\%$), phase to neutral, phase to earth and neutral to earth.

⁽⁴⁾ Rating is considered as the current capability of the protector for equipotential bonding near the service entrance.

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

⁽⁶⁾ Combination wave test within IEC/BS EN 61643, IEEE C62.41-2002 Location Cats C1 & B3, S5 555:2010, AS/NZS 1768-2007, UL 1449 mains wire-in.

⁽⁷⁾ Temperature range of SPD within a 20°C ambient temperature. An increase in ambient temperature will de-rate the SPD upper temperature limit accordingly.

⁽⁸⁾ The remote signal contact (removable) adds 10 mm to height.

