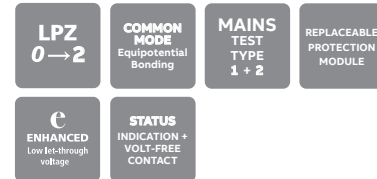


# Mains power protection

## ESP 415T1 Surge Protection Series



**Combined Type 1 and 2 tested Surge Protective Device SPD (to BS EN 61643) for use on the main distribution board, particularly where a structural Lightning Protection System (LPS) is employed, for equipotential bonding. For use at boundaries up to LPZ 0 to protect against flashover (typically the main distribution board location) through to LPZ 2 to protect electrical equipment from damage.**



### Features & benefits

- Enhanced protection (to IEC/BS EN 62305) offering low let-through voltage further minimizing the risk of flashover creating dangerous sparking or electric shock
- Repeated protection in lightning intense environments
- Pluggable module design (with anti-vibration locking clip) allows for simple replacement at end-of-life

- Compact, space saving design
- Indicator shows when the SPD protection modules requires replacement
- Remote signal contact can indicate the protector's status through interfacing with a building management system

### Application

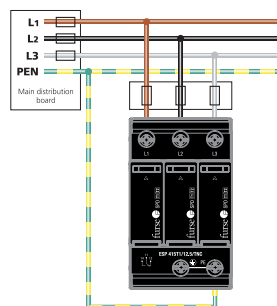
- Use on three phase mains supplies and power distribution systems for protection against partial direct or indirect lightning strikes
- ESP 415T1/25/XXX versions for use with Class I or II LPS
- ESP 415T1/12.5/XXX versions for use with Class III or IV LPS; or exposed overhead three phase power lines where no LPS is fitted
- ESP 415T1/X/TNS versions also cover TN-C-S earthing systems

### Installation

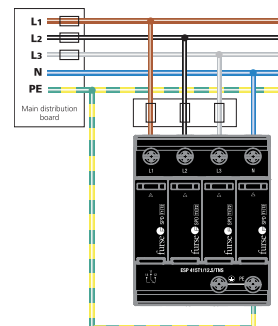
The SPD is to be installed in the main distribution board with connecting leads of minimal length. The protector should be fused and is suitable for attachment to a 35 mm top hat DIN rail. The diagrams below illustrate how to wire the appropriate ESP protector according to your chosen electrical system.

- |  |  |
|--|--|
| Weatherproof enclosure:<br><b>WBX D4</b><br>ABB order code:<br>7TCA085410R0032 | Metallic enclosure:<br><b>MBX D4</b><br>ABB order code:<br>7TCA085400R0649 |
| SPD replacement modules:   |  |
| <b>ESP 240T1/25/M</b> (25 kA L-N)<br>7TCA085460R0374                           |  |
| <b>ESP 240T1/12.5/M</b> (12.5 kA L-N)<br>7TCA085460R0373                       |  |
| <b>ESP N-PE/T1/100/M</b> (100 kA N-E)<br>7TCA085460R0375                       |  |
| <b>ESP N-PE/T1/50/M</b> (50 kA N-E)<br>7TCA085460R0376                         |  |

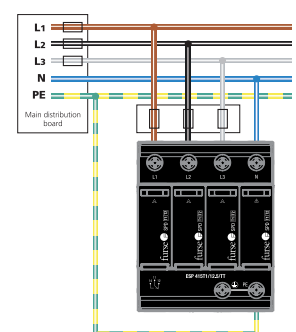
**TN-C earthing system**



**TN-S earthing system**



**TT earthing system**



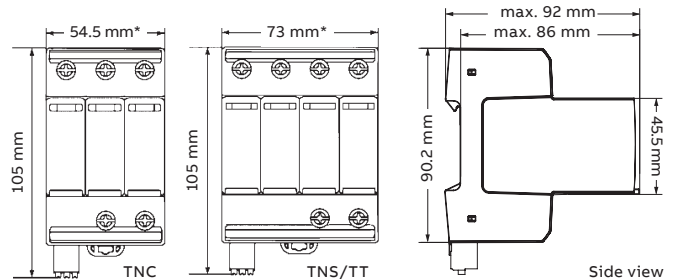
NOTE: Remote contact connections not shown, for clarity.

**IMPORTANT:** The primary purpose of lightning current or equipotential bonding mains Type 1 Surge Protective Devices (SPDs) is to prevent dangerous sparking caused by flashover to protect against the loss of human life. In order to protect electronic equipment and ensure the continual operation of systems, transient overvoltage mains Type 2 and 3 SPDs such as the ESP M1 Series or ESP D1 Series are further required, typically installed at downstream subdistribution boards feeding sensitive equipment. IEC/BS EN 62305 refers to the correct application of mains Type 1, 2 and 3 SPDs as a coordinated set. For further information, please refer to the Furse Guide to BS EN 62305 Protection against lightning.

ESP 415T1 Surge Protection Series - Technical specification

Electrical specification	ESP 415T1/ 25/TNS	ESP 415T1/ 12.5/TNS	ESP 415T1/ 25/TNC	ESP 415T1/ 12.5/TNC	ESP 415T1/ 25/TT	ESP 415T1/ 12.5/TT
<b>ABB order code</b>	7TCA085460R0369	7TCA085400R0496	7TCA085400R0497	7TCA085460R0371	7TCA085400R0498	7TCA085460R0372
Nominal voltage - Phase-Neutral $U_o$ (RMS)	240 V					
Maximum voltage - Phase-Neutral $U_c$ (RMS)	275 V	300 V	275 V	300 V	275 V	300 V
Temporary Overvoltage TOV $U_r^{(1)}$ (5s/120m)	337 V / 442 V					
Short circuit withstand capability $I_{SCCR}$	50 kA <sub>RMS</sub> / 50 Hz					
Frequency range	47-63 Hz					
Max. back-up fuse (see installation instructions)	≤ 315 A	≤ 250 A	≤ 315 A	≤ 250 A	≤ 315 A	≤ 250 A
Leakage current (to earth)	≤ 5 μA	≤ 600 μA	≤ 5 μA	≤ 600 μA	≤ 5 μA	≤ 5 μA
Follow current interrupt rating $I_{fi}$	50 kA <sub>RMS</sub>	0	50 kA <sub>RMS</sub>	0	50 kA <sub>RMS</sub> (L-N) 100 A <sub>RMS</sub> (N-E)	0 (L-N) 100 A <sub>RMS</sub> (N-E)
Volt free contact: <sup>(2)</sup>	Push terminal					
- Current rating	1 A					
- Nominal voltage (RMS)	250 V					
Transient specification	ESP 415T1/ 25/TNS	ESP 415T1/ 12.5/TNS	ESP 415T1/ 25/TNC	ESP 415T1/ 12.5/TNC	ESP 415T1/ 25/TT	ESP 415T1/ 12.5/TT
<b>Type 1 (BS EN/EN), Class I (IEC)</b>						
Nominal discharge current 8/20 μs (per mode) $I_n$	25 kA	20 kA	25 kA	20 kA	25 kA (L-N) 100 kA (N-E)	20 kA (L-N) 50 kA (N-E)
Let-through voltage $U_p$ at $I_n$ <sup>(2)</sup>	≤ 1.5 kV	≤ 1.5 kV	≤ 1.5 kV	≤ 1.5 kV	≤ 1.5 kV (L-E) ≤ 1.7 kV (L-N)	≤ 1.5 kV
Impulse discharge current 10/350 μs $I_{imp}$ (to earth) <sup>(3)</sup>	25 kA	12.5 kA	25 kA	12.5 kA	25 kA (L-N) 100 kA (N-E)	12.5 kA (L-N) 50 kA (N-E)
Total discharge current 10/350 μs $I_{total}$ (total to earth) <sup>(4,5)</sup>	100 kA	50 kA	75 kA	37.5 kA	100 kA	50 kA
Let-through voltage $U_p$ at 1.2/50 μs (N-E, TT system)	-	-	-	-	< 1.2 kV	< 1.2 kV
<b>Type 2 (BS EN/EN), Class II (IEC)</b>						
Nominal discharge current 8/20 μs (per mode) $I_n$	25 kA	20 kA	25 kA	20 kA	25 kA (L-N) 100 kA (N-E)	20 kA (L-N) 50 kA (N-E)
Let-through voltage $U_p$ at $I_n$ <sup>(2)</sup>	≤ 1.5 kV	≤ 1.5 kV	≤ 1.5 kV	≤ 1.5 kV	≤ 1.5 kV (L-E) ≤ 1.7 kV (L-N)	≤ 1.5 kV
Maximum discharge current $I_{max}$ (per mode) <sup>(3)</sup>	65 kA	50 kA	65 kA	50 kA	65 kA (L-N) 150 kA (N-E)	50 kA (L-N) 100 kA (N-E)
Mechanical specification	ESP 415T1/ 25/TNS	ESP 415T1/ 12.5/TNS	ESP 415T1/ 25/TNC	ESP 415T1/ 12.5/TNC	ESP 415T1/ 25/TT	ESP 415T1/ 12.5/TT
Temperature range	-40 to +80 °C					
Connection type	Screw terminal - maximum torque 4.5 Nm					
Conductor size (solid/stranded) <sup>(5)</sup>	35 mm <sup>2</sup>					
Earth connection	Screw terminal - maximum torque 4.5 Nm					
Degree of protection (IEC 60529)	IP20					
Volt free contact	Push-fit connection for conductor up to 1.5 mm <sup>2</sup> , rated AC 250 V, 1 A					
Case material	Thermoplastic UL-94 V-0					
Mounting	Indoor, 35 mm top hat DIN rail					
Weight	0.69 kg	0.65 kg	0.51 kg	0.51 kg	0.69 kg	0.68 kg
Dimensions to DIN 43880 - HxDxW <sup>(4)</sup>	90.2 mm x 92 mm x 73 mm* (4TE)	90.2 mm x 92 mm x 73 mm* (4TE)	90.2 mm x 92 mm x 54.5 mm* (3TE)	90.2 mm x 92 mm x 54.5 mm* (3TE)	90.2 mm x 92 mm x 73 mm* (4TE)	90.2 mm x 92 mm x 73 mm* (4TE)

<sup>(1)</sup> Temporary Overvoltage TOV rating is for durations of 5 seconds (withstand) and 120 minutes (safe fail) tested to BS EN/IEC 61643. TT versions have 1200V withstand for 200ms (N-E)  
<sup>(2)</sup> The maximum transient voltage let-through of the protector throughout the test, phase to neutral and neutral to earth  
<sup>(3)</sup> The electrical system, external to the unit, may constrain the actual current rating achieved in a particular installation  
<sup>(4)</sup> The remote signal contact (removable) adds 15 mm to height  
<sup>(5)</sup> Conductor size (flexible) is 25 mm<sup>2</sup>  
 \*Maximum dimension (this applies to all dimensions).



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