

**WARNING**

This equipment must be used  
within stated supply limits.

**ATTENTION!**

Cet équipement doit être utilisé avec  
des limites d'alimentation déterminées.

**ACHTUNG**

Das Gerät darf nur für die angegebene  
Nenn-Spannung eingesetzt werden.

# **DSP 600 SERIES Distribution Surge Protector**

**Installation Instructions**

## Description and Operation

The Distribution Surge Protector 600 Series has been designed as part of a co-ordinated approach, to prevent damage to electrical installations by absorbing transient overvoltages at the main incoming distribution panel.

The 600 Series should not be confused with voltage stabilising transformers intended to hold the power frequency voltage within predetermined levels for a given load. The 600 Series provides protection from voltage spikes that can occur between phases, phase to earth, phase to neutral and neutral to earth thus providing protection in all possible modes. Protection is achieved by matching high energy absorbing elements.

The 600 Series is fitted with two stages of protection which are co-ordinated to ensure that if the first stage ceases to function, the second stage gives continuity of protection at a lower level (50%) and therefore a replacement unit should be fitted as soon as possible.

All 600 Series units are provided with an on-board system of protection status monitoring LED's, except the DSPE600 'R' type which is supplied with a remote monitoring unit, to allow the unit to be installed in areas that are inaccessible for regular inspection.

Under normal conditions the 600 Series will automatically reset after clamping smaller, more commonly occurring surges, and a green Light Emitting Diode (LED) indicates that full protection is present. However, should a surge current, in excess of 30KA, appear on the line it will be clamped by the unit but the first protection stage may possibly suffer damage and fail safe.

In this instance the red LED will be illuminated in addition to the green and although the system will still be adequately protected, the unit should be replaced before a further large surge can remove the second protection stage. There is no protection present when only the red LED is illuminated, although unprotected power is still supplied.

The DSPE600 'N' and 'R' type are supplied with a site fault condition indicator. Should the light on this indicator flash or be permanently illuminated at any time, it is to warn of a high voltage between neutral and earth lines and therefore potentially hazardous site conditions.

The protection status of the 600 Series is indicated by a system of lights as follows:

### Protection Status Indicator Lights

Green - full protection

Red and Green - reduced protection

Red - no protection

### Site Fault Condition Indicator Light (where fitted):

Red - Lit/Flashing - Disconnect unit and check Neutral/Earth voltage

<b>Response Time:</b>	<10ns
<b>Operating Temperature:</b>	-40° to +70° Celsius
<b>Operating Humidity:</b>	0% to 95% without condensation
<b>Status Indication</b>	
<b>Indicator Lights:</b>	Green - full protection Red and green - reduced protection Red - No protection
<b>Site Fault Condition Indicator (where fitted):</b>	Red Lit/Flashing - Disconnect unit and check Neutral to Earth supply voltage
<b>Terminals:</b>	16mm <sup>2</sup> max - Line, Neutral, Earth 2.5mm <sup>2</sup> max - Remote Signalling
<b>Remote Signalling Terminals (where fitted):</b>	Rated at 230V RMS 200mA or 30V DC 2 Amp
<b>Remote Monitoring Unit Connectors (where fitted):</b>	15 Way 'D'
<b>Mounting screws:</b>	Ø 4
<b>Case:</b>	Steel - Epoxy paint
<b>BS6651: 1999</b>	C
<b>Location Category:</b>	
<b>Optional IP65 Enclosure:</b>	Cat No. 2IP-7-0244
<b>Dimensions (mm):</b>	Length      Width      Depth
Single Phase 600 Series	176          42          72
Three Phase 600 Series	176          110        72
Single/Three Phase	245          195        100
Optional Enclosure	

## Installation

**Important** This product should only be installed by an electrician or other suitably qualified personnel. Ensure power is switched off before any installation work is undertaken.

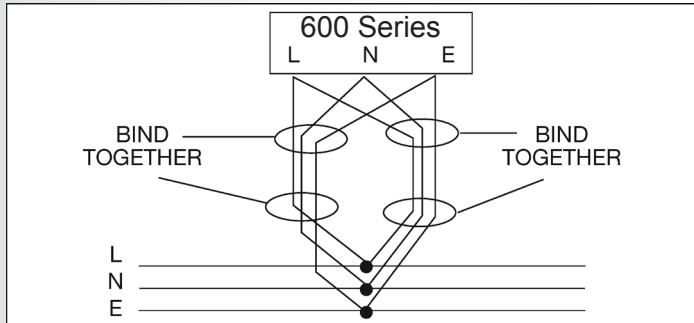
The 600 Series is suitable for direct connection to a supply line fused up to 100A (using 6mm<sup>2</sup> min connecting cables), but can be connected to supply lines with higher fuse ratings by the provision of series fuses between protector and distribution panel rated 50A min - 100A max (IEC269-2). If MCB's are used in place of fuses they should be of type C.

NOTE: It is recommended that the 600 Series is provided with some means of isolation in order to facilitate replacement should this become necessary.

## Connection

The 600 Series is connected in parallel with the supply and therefore carries only the currents associated with the transient being dissipated. Connecting cables should be of suitable cross-section area, (6mm<sup>2</sup> min.) as short as possible, ideally 250mm or less and tightly bound together to reduce inductive effects. The 600 Series connectors accept cable requirements up to 16mm<sup>2</sup>, however 16mm<sup>2</sup> c.s.a. connecting cable requirements can be run as parallel pairs of smaller c.s.a. cable.

When pairing conductors they should be bundled as before but separated and routed as pairs although terminated at the same points.



## Length of Connecting Leads

The longer the connecting leads between the 600 Series and power panel, the higher the residual transient voltage.

Recommended Maximum: 500mm (19")

Ideally: 250mm (10")

Each 250mm increase in cable length increases clamping voltage by 25v per 1000A surge current discharged. Always use the shortest length of connecting cable possible.

Bind the phase, neutral and earth conductors tightly, over the entire run from the suppressor to the service panel.

## Remote (where fitted)

A small plug-in connector (where fitted) for the remote indication is provided on the top face of the case. This connector provides volt-free terminals and can be connected N/O or N/C.\* The status of these remote indicator connections change when the first stage protection fuse operates.

\*Remote status when unit is energised.

## Remote Monitoring Unit (where supplied)

A remote monitoring unit is supplied with a 1 metre cable and appropriate plug and socket connectors which allows the 600 Series to be installed in areas that are inaccessible for regular inspection.

## Site Fault Condition Indicator

(where fitted)

Should the light on this indicator flash or be permanently illuminated at any time, it is to warn of a high voltage between neutral and earth lines, and therefore potentially hazardous site conditions.

## Maintenance

The 600 Series has been designed to be mainly maintenance free whilst in service requiring only periodic visual inspection of the status lights (where fitted). Ensure terminal screws remain secure.

At yearly intervals, when convenient, a check should be made on all connections to and between the 600 Series and power input. At other suitable intervals, dependent on site experience, or following lightning activity, monitor status lights (where fitted) on the 600 Series.

If a remote indicator or Remote Monitoring Unit is fitted checking of status need only be at yearly intervals when checking connections as change in status during this period will be automatically indicated.

## Mounting

Terminals fitted to the 600 Series are of the through connection type and the screws visible are live. Therefore the unit should be mounted inside a suitable panel/cupboard accessed only by qualified personnel.

For other mounting applications/positions suitable enclosures are available.

## Important

In order to achieve the most effective protection all earth connections must be referenced to a common point.

The 600 Series should be considered as part of a co-ordinated approach to transient protection and while protecting the primary mains input it should be remembered that any equipment connected following the unit is susceptible to transients that can occur at other points within the system and therefore require local protection.

## Specification

### Mains Supply Voltage:

Single Phase:	230V RMS 50 Hz nominal 200-300V RMS 40-60 Hz range Line, Neutral, Earth.
Three phase	400V RMS 50 Hz nominal L-N 200-300V RMS 40-60 Hz range L-L 350-500V RMS 40-60 Hz range Star - 4 Wire + Earth, Delta - 3 Wire + Earth

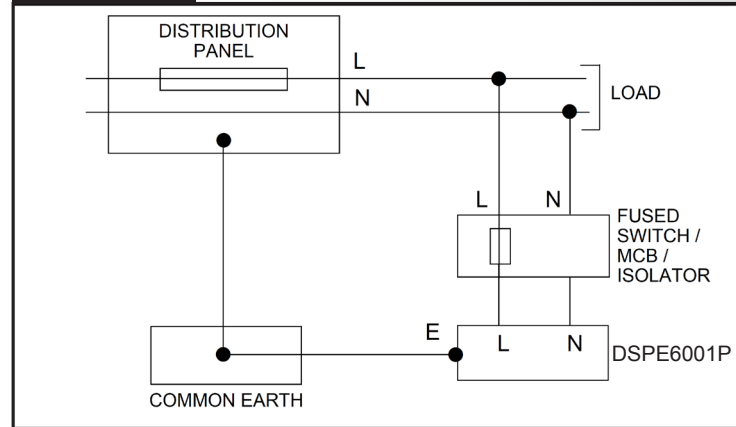
**Mains Supply Current:** The 600 Series is connected in parallel with the supply so the line current in the system is not conducted through the 600 Series.

**Quiescent Current:** To supply the indicator lights and monitoring systems -  
10mA (per phase) without remote signalling.  
18mA (per phase) with remote signalling.

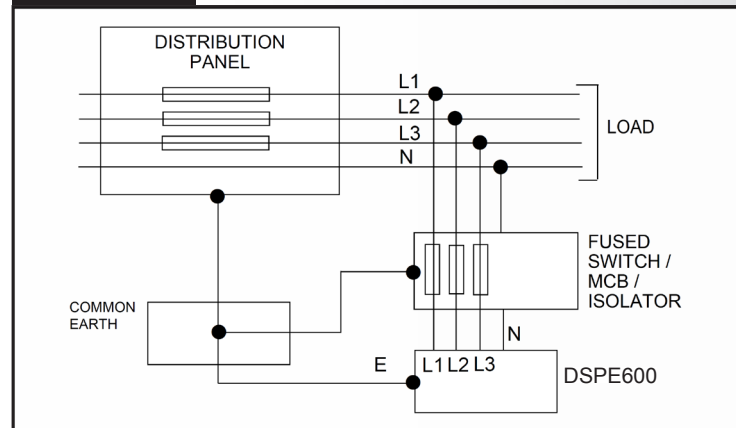
**Leakage Current:** 200  $\mu$ A phase - earth

**Max Surge Current:** 30KA (8/20  $\mu$ s waveform)

## Single Phase



## Three Phase



NB: For IT or TNC systems, link neutral and earth terminals on the DSPE