

# SPD50Ngi Equipotential Coupler

(Neutral-Earth, Equipotential, 50kA/70kA)

## FUNCTIONAL DESCRIPTION

The SPD50NGi is designed for use as an equipotential coupler between separately-grounded systems to provide protection against surge transients. Under normal conditions, the coupler does not conduct, preventing earth loops and inter-circuit coupling. Under surge conditions, the unit conducts, effectively interconnecting the circuits for the duration of the surge. There are two main applications for the SPD50Ngi:

1. In power systems using shunt protection that use a remotely-earthed neutral, the neutral cable must be shunted to earth locally, to divert energy being shunted by the line-neutral SPDs.
2. The device is also intended for use as an equipotential coupler between different earthing systems, when it is required to keep different earthed systems electrically separate (e.g. power and communications earths), whilst coupling them together under surge conditions to minimise damage to connected equipment.

## WARNING

**The SPD50Ngi is NOT to be connected to line (phase) cables under any circumstances. Serious damage or injury may result. This device is intended to be connected between Neutral and Earth, or between separate earth systems only. For Line-Neutral protection, use the Eaton Powerware SPDQM1 for “Quicklag”-style boards, the SPDV60 or SPD120i for DIN mounting or another, suitable device.**

## INSTALLATION INFORMATION – READ AND UNDERSTAND

- Installation should only be carried out by an experienced tradesperson.
- The unit is intended for mounting inside a switchboard or similarly protected environment. For underground burial, refer to the Eaton SPD100Ngi unit.
- Connection is via two cables, with a total length of 800mm. Each cable is 6mm<sup>2</sup>; one black (connect to neutral) and the other green/yellow (connect to earth). The cables should be shortened during installation to use the shortest amount of cable possible, with the arrestor anywhere along the cable. This minimises cable voltage drop under surge conditions\*.

\* Did you know that one metre of straight cable (4mm<sup>2</sup> to 50mm<sup>2</sup>) can exhibit a voltage drop of over 2,000V under surge conditions? This is due to cable inductance, so thicker cables do not help, unless they are as thick as your arm! Sharp bends and excess cable also add inductance, so please keep SPD cables short and direct for best performance. If the Neutral and Earth connection points are a long way apart, use a short length of flexible or thin copper busbar to extend the Earth connection to a closer point. Busbar has very little surge-related voltage drop.

## INSTALLATION

- All wiring must be carried out by suitably qualified personnel according to the applicable standards.

### For N-E SPD applications:

1. Isolate the incoming power circuit before installation.
2. Remove SWB panel and determine where the unit shall be connected. Unit must be installed as close to the connection points as possible, leaving 25-50mm of total cable slack.
3. Trim cables, prepare and terminate. Connect black to neutral and green/yellow to earth.
4. Refit the SWB panel.
5. Reapply power.

### For equipotential bonding applications:

1. Determine where the unit shall be connected. Unit must be installed as close to the connection points as possible, leaving 25-50mm of total cable slack.
2. Trim cables, prepare and terminate. If one of the connections is a mains (power) earth, connect the green/yellow cable to it.

Always use as short a length of cable as necessary. **DO NOT EXTEND CABLES.** If cable is too short, extend the earth connection with a short length of flexible or thin copper busbar. Avoid sharp bends in cables.

### PHYSICAL AND ELECTRICAL SPECIFICATIONS

<b>Model</b>	<b>SPD50NGi</b>
<b>Operation</b>	
Protection mode	Single-mode, connected Neutral-Earth or between separately-earthed systems.
Service type (N-E protection mode only)	TNS or similar (neutral must be grounded either locally or remotely)
System voltage – Un	Applicable to any common LV system voltage.
Test classification (according to IEC61643-1)	Classes I & II
External disconnecter requirements	None.
Operating current	<1mA
Power consumption	<1W
<b>Surge ratings</b>	
Surge current rating In (20 times)	50kA (8/20us)
Surge current rating Ismax (2 times)	70kA (8/20us)
Impulse current rating In (20 times)	12kA (10/350us)
Impulse current rating Ismax (2 times)	17kA (10/350us)
DC breakdown voltage (1mA)	230V +/-20%
Firing voltage (1kV/us)	800V +/-20%
Arc voltage (DC, 1A)	<25V
Response time – initial	<100ns
Response time – full conduction (50kA)	<1us
Alternating discharge current (50Hz, 9cycles)	70A
Cable voltage drop (3kA, 8/20us)	<400V
Residual voltage with full cable length	<1.3kV (3kA, 8/20us)
Residual voltage with minimal cable length (100mm total)	<1.3kV (15kA, 8/20us) <2.5kV (50kA, 8/20us)
<b>Physical</b>	
Connections	6mm <sup>2</sup> cable (black and green/yellow) for connection (unprepared) - 800mm length total.
Mounting	None required for fixed installation (suspended by cable). Use a cable-tie mount for attachment to a surface if desired.
Dimensions	60x15x15 mm (W x D x H) not including cables.
Weight	70g
Operating temperature	-10 to 65°C
Humidity	10-90% non-condensing
<b>Standards</b>	
Designed in accordance with: IEC61643-1, IEC610006-1,2,3,4 ANSI/IEEE C62.41, AS3000 and AS3100.	
Functional testing to IEC61643-1 and ANSI/IEEE C62.41.	
<b>Warranty</b>	12 months, manufacturing and materials

NOTE: - Installation must be carried out by suitably qualified personnel. Please refer to installation instructions for details.