

SAFE GROUND®

GROUND STATUS

NO CONNECTION



POOR



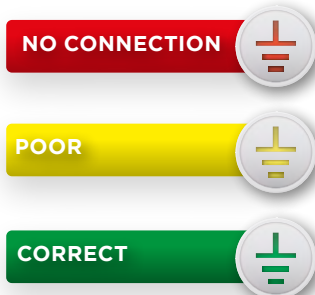
CORRECT



SAFEGROUND®

Monitoring the grounding system in the surge protection device itself

SAFEGROUND® is the first protection device on the market that, in addition to indicating that it is properly wired, guarantees that there is an adequate path to ground, which is essential if the protection device is to shunt the energy peaks to ground effectively.



GROUND STATUS INDICATOR

Continuous LED display of ground status.



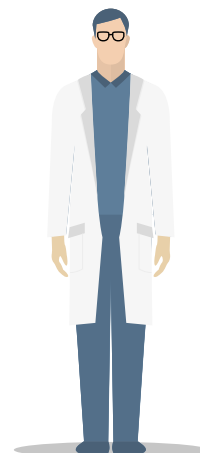
SAFEGROUND TECHNOLOGY

SAFEGROUND® is based on the impedance loop technology already patented, sold and implemented by Cirprotec in thousands of protection solutions.

NO EARTH, NO PROTECTION

SAFEGROUND® the premium solution for the most demanding installations

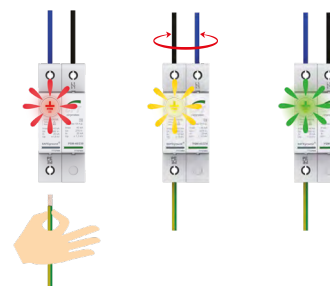
- ✓ SAFEGROUND®'s **simple** information makes it the **ideal ally** for both **unskilled personnel and maintenance professionals specialised** in ground connections.
- ✓ **Helps avoid** situations that might cause **power cuts, repair costs**, with the resultant **damage** to your **brand image**.
- ✓ Provides **additional information about the grounding system**, with potential synergies for protection and safety in general, not just for surge protection.



Confirmation of proper installation

Almost 30 years of experience in the sector confirm that it is relatively common for wiring errors to occur during the installation of surge protection devices. These errors result in the loss of protection or risks to the installation itself.

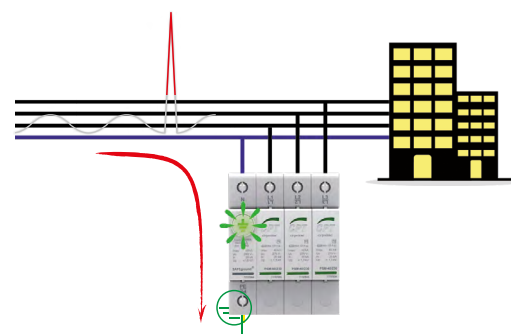
When the SAFEGROUND® LED is green, it means that the protection device is properly wired and powered up.



Effective surge protection

Even when equipped with surge protection devices, the electrical installation may still be subject to the effects of overvoltage if the ground connection is inadequate or in poor condition.

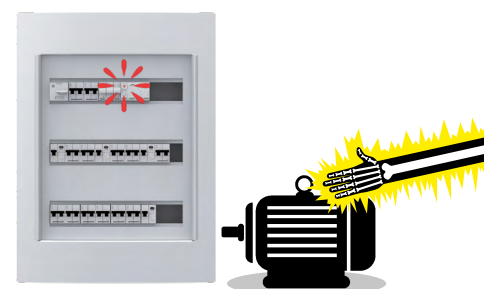
When the SAFEGROUND® LED is green, it indicates that the ground path is good enough to shunt the energy peaks to ground effectively..



Safety information in the event of indirect contact

Just as happens with surge protection devices, the safety of the electrical installation in the event of indirect contact is based on there being a grounding connection.

When SAFEGROUND® cannot detect any ground connection, it is advisable to check the installation status.



WIRING SAFETY

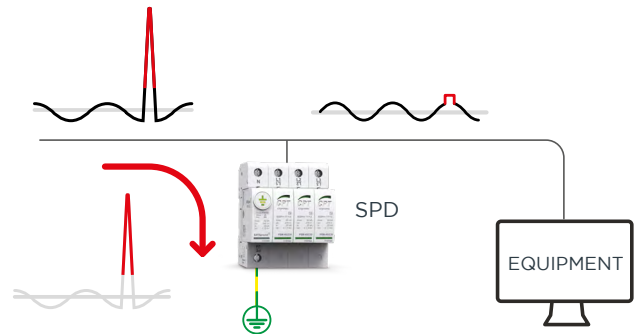
The only protection device on the market that tells you when it is properly installed, avoiding risks due to electrical wiring errors.

SAFEGROUND® Technology

The importance of the ground connection

Surge protection devices discharge excess energy to ground, thus limiting the peak voltage to a value acceptable for the electrical equipment connected.

A ground in proper conditions is therefore an aspect not to overlook when it comes to effective surge protection. Continuously monitoring the state of the ground connection ensures proper operation of surge protection devices.



Operating principle of an SPD

Impedance loop method

The loop impedance method is a system for checking the entire grounding system by acting physically not on earth roads, but solely on the low voltage line.

Sending pulses and measuring the voltage response makes it possible to measure the impedance of the path, which usually includes the grounding system and wiring and the return path through the transformer coil.

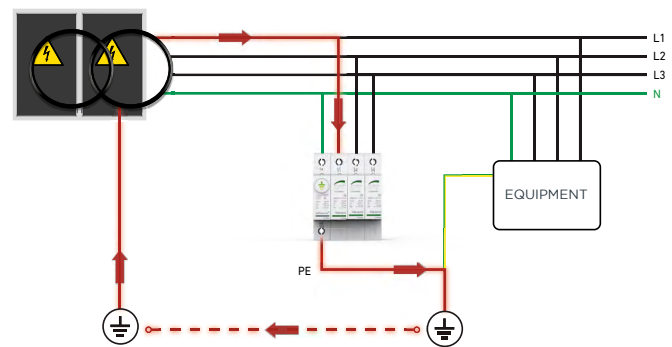


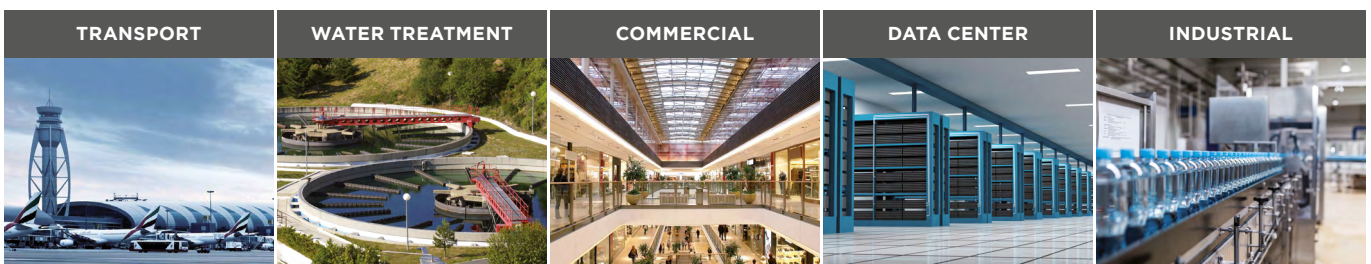
Diagram of loop impedance measuring used by SAFEGROUND®

Patented Cirprotec technology

SAFEGROUND® is based on continuous monitoring technology using the impedance loop technology already patented, sold and implemented by Cirprotec in thousands of protection solutions worldwide.

The differentiating factor in this technological development (patent pending), is the incorporation of this technology into the confined space of a surge protection device, providing added value to the piece of equipment, and taking advantage of the positive synergy between the grounding system and the protectors.

SAFEGROUND® is not intended to be a resistance meter; rather **it helps provide relevant information about the surge protector and potentially about the installation.**



Effectiveness depending on the ground connection

No earth, no protection

If the surge protection device does not have an adequate path to earth for discharging voltage peaks, the protector will be forced to operate under sub-optimal conditions.

The effectiveness of surge protectors is indeed closely linked to the earthing system, since a high impedance path may increase the exposure of sensitive equipment to the effects of the overvoltage.

Hydraulic simile

To understand the relationship between the quality of the earth connection and the effectiveness of overvoltage protection, people often use a very intuitive hydraulic simile.

If we equate the energy of the overvoltage to a specific volume of liquid, the earth connection may be thought of like a funnel. There is a direct relationship between the diameter of the funnel opening and the quality of the earth connection. Once the funnel has drained the entire volume of liquid, the overvoltage will have been shunted to earth and the equipment will see a completely normal voltage.

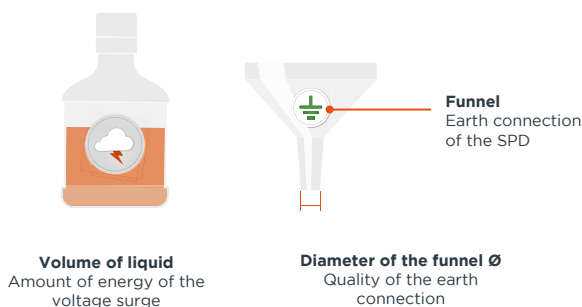
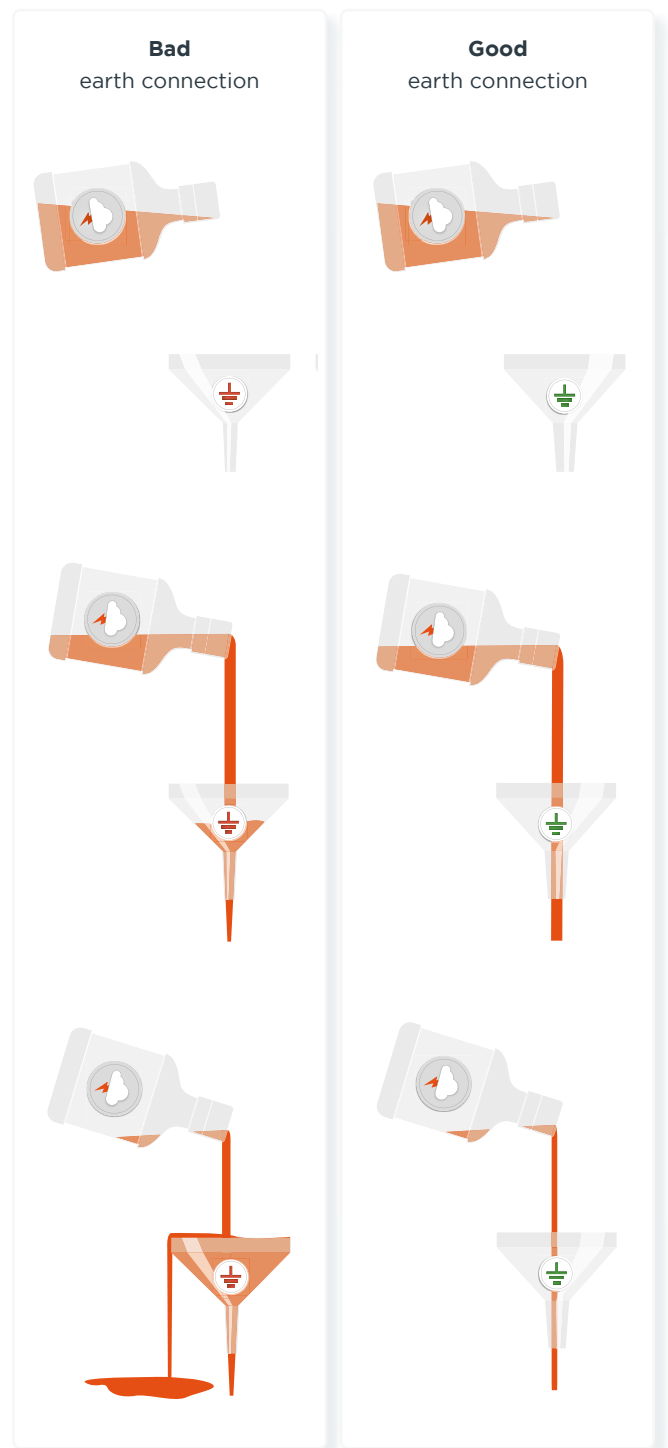


Figure 2 compares what happens to a bad earth connection (funnel on the left - small opening) to what happens to a good one (funnel on the right - big opening) in the event of an overvoltage. We can see how an earth connection with higher resistance (funnel on the left) is saturated with the energy of the discharge (the funnel overflows because it is incapable of draining fast enough). Intuitively, **this prolongs the time during which the equipment to be protected is subjected to the effects of overvoltage**, and which therefore suffer more wear (the funnel takes longer to empty due to its smaller opening).

Since all the equipment is referenced to earth, this can even lead to **the current, unable to find a better escape route**, doing direct **damage to the equipment** and rendering the protection ineffective.

In the extreme case of loss or **lack of an earth connection**, the **surge protection device becomes totally ineffective**.



A poor earth connection means reduced capacity to discharge the overvoltage compared to a good connection. Slower dissipation of the overvoltage means the equipment is exposed to its effects for longer. In the absence of an optimum discharge path, the voltage surge will overwhelm sensitive equipment.

PSM-40 SG

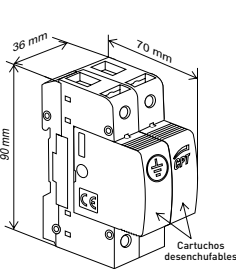


Technical features

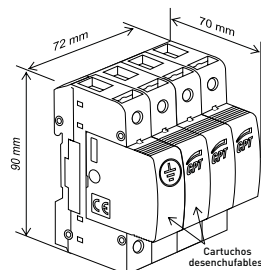
Model		PSM2-40/230 SG 77727756	PSM4-40/400 SG 77727806
Designation according to EN 61643-11		Type 2	
Designation according to IEC 61643-11		Class II	
Nominal voltage AC 50-60 Hz	U_n [V]	230 3 10%	230/400 3 10%
Max. continuous operating voltage (L-N)	U_c [V]	275	
Min. continuous operating voltage (L-N)	U_c [V]	195	
Max. continuous operating voltage (N-PE)	U_c [V]	265	
Maximum discharge current (8/20)	I_{max} [kA]	40	
Nominal discharge current (8/20)	I_n [kA]	20	
Voltage protection level (L-N) at I_n	U_p [kV]	$\leq 1,3$	
Voltage protection level (N-PE) at I_n	U_p [kV]	$\leq 1,5$	
Maximum back-up fuse	[A gL]	125	
Short circuit withstand	I_{cc} [kA]	25	
Response time (L-N)	t_A [ns]	25	
Response time (N-PE)	t_A [ns]	100	
Following current (N-PE)	I_n [A]	100	
Insulating material & flammability class		PA66 CT1 ; V-0	
End of life indication		Si	
Dynamic thermal disconnection (L-N)		Si	
IP Code		IP20	
Range °C		-30 °C... + 80°C	
Certifications			
Other product standards		IEC/EN 61557-3 ; IEC/EN 61010:1 ; IEC/EN 61000-4-13	

Dimensions

2 Poles

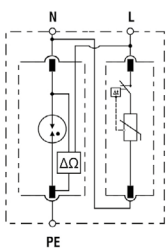


4 Poles

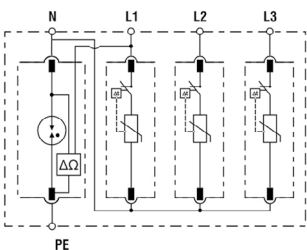


Internal configuration

1Ph+N



3Ph+N



Installation instructions

SAFEGROUND® indications

Main indications

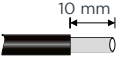
Steady 	· Correct wiring · Surge protection operating at its maximum effectiveness
Flashing 	· Incorrect wiring (single-phase)
Steady 	· Surge protection is not operating at its maximum effectiveness
Steady 	· Ineffective surge protection
Flashing 	· Incorrect wiring · Without grounding connection and no surge protection · Check installation · Potential security risk

Additional indications

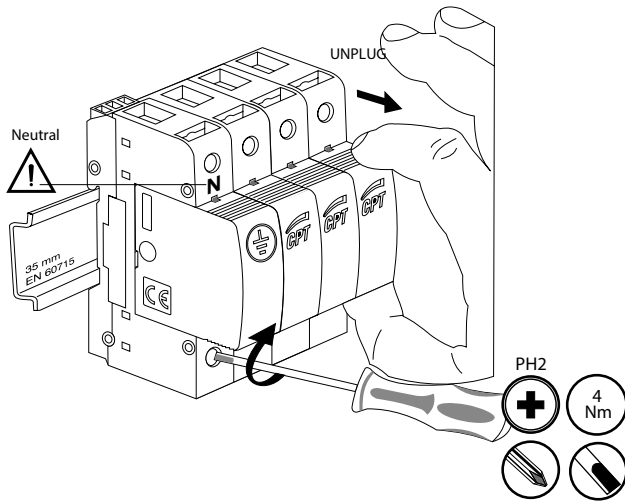
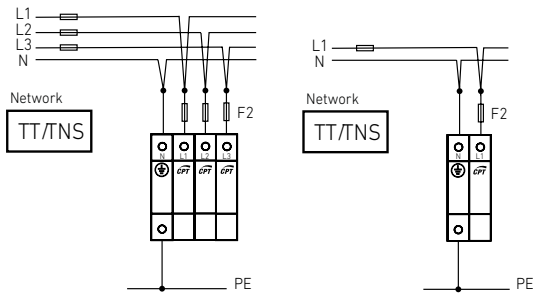
	· Permanent undervoltage < 195V
	· Permanent overvoltage > 275V
	· High potential neutral-ground

SAFEGROUND® installation

Wires

Type of wire	FLEXIBLE 	RIGID 
min. Ø L,N,PE	6 mm ²	
max. Ø L,N,PE	25 mm ²	35 mm ²

Connection



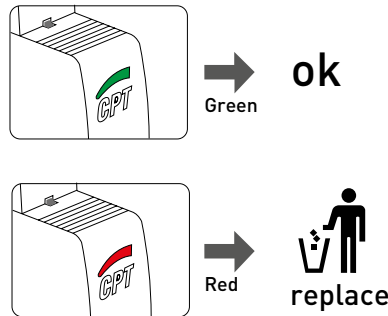
* If there is a red flashing light, check the installation, then disconnect and reconnect the supply to get back to the original indication.

Back-up fuse

Maximum back-up fuse value	
F1 	F1 > 125 A gL ↓ F2 ≤ 125 A gL
F2 	F1 ≤ 125 A gL ↓ Ø

Cartridge replacement (end of life)

(L-N) Visual indication





THE SPECIALIST BRAND IN LIGHTNING AND SURGE PROTECTION

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