

Permanent Power Supply

PPS2

The PPS2 concept was developed to allow permanent PD monitoring on HV cable joints when there is no LV power available at the manholes.

The PPS2 gets the required energy from the High Voltage power line under monitoring by means of one or more toroidal units clamped on the HV power cable(s).

PPS2 is able to continuously supply up to 60W @ 24Vdc when the HV cable is energized.

PPS2 provides "Power Good" signal able to verify the suitability of the power supply for the electronic equipment of the PD Monitoring system.

PPS2 is able to provide a synchronization signal needed for Partial Discharge identification during post-processing stage.



PPS2 Approach

The clamp transformer & the electronic control unit

PPS2 is made up of two main devices: the clamp toroidal transformer and the electronic controlled supply unit. Depending on the power level required from the PD system, the PPS2 is able to supply up to 60W using up to three clamp transformers.

PPS2 scope and field of applications

PPS2 is useful to provide power supply to the PD system installed on HV cable when AC line voltage is not available. PPS2 will be able to provide required power when the HV cable is on-line and its current is sufficiently high. Field of applications:

- Cable joints in manholes or vaults;
- Cable joints in tunnel;
- Outdoor cable terminations

HV line short circuit detection feature

PPS2 is designed to withstand High Voltage line failure occurrences such as temporary overload and short circuit conditions. An internal detection and self limiting circuitry guarantees PPS2 and the connected equipment survives in case of such events.

PPS2 installation features

The toroidal clamp transformer(s), held by the HV cable, can fit cables up to 180 mm (7 in) maximum diameter.

The electronic unit is connected to the toroid(s) through a cable a few meters long.

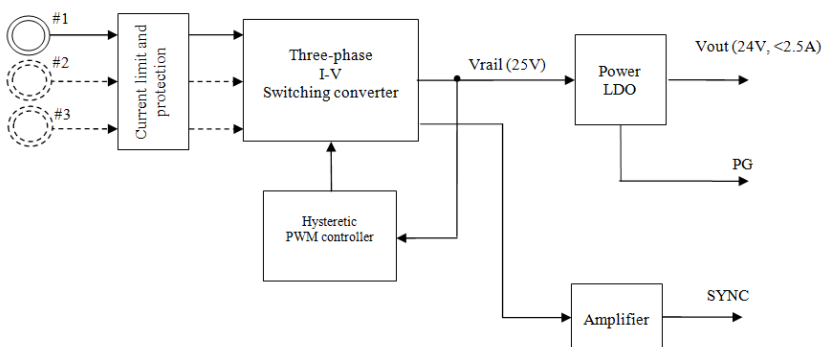
In order to allow PPS2 installation, the HV cable cannot be completely buried; the PPS2 installation is feasible only when the HV cable is in a tunnel or the HV cable joints are in manholes or pits, allowing access to a HV cable section where to install the PPS2 toroid(s).

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Electrical Technical Specifications

Max output power	60 W (using up to 3 toroids)
Scalable output power	using from one up to three toroids
Output voltage	24 Vdc \pm 5%
Output current	Up to 2.5 A
“Power Good” signal	Open collector, <24Vdc, <20mA
Synchronization signal (V)	15 Vp/p, square wave
Sync phase shift respect primary current	6° \pm 5°
Supply current	0 ÷ 2kA (per phase)
Min power cable current @ Pout=10W	250 A (1-phase) / 110A per phase (3-phase)
Min power cable current @ Pout=20W	480 A (1-phase) / 200A per phase (3-phase)
Short circuits protection on HV line	Integrated in the PPS2 electronic unit

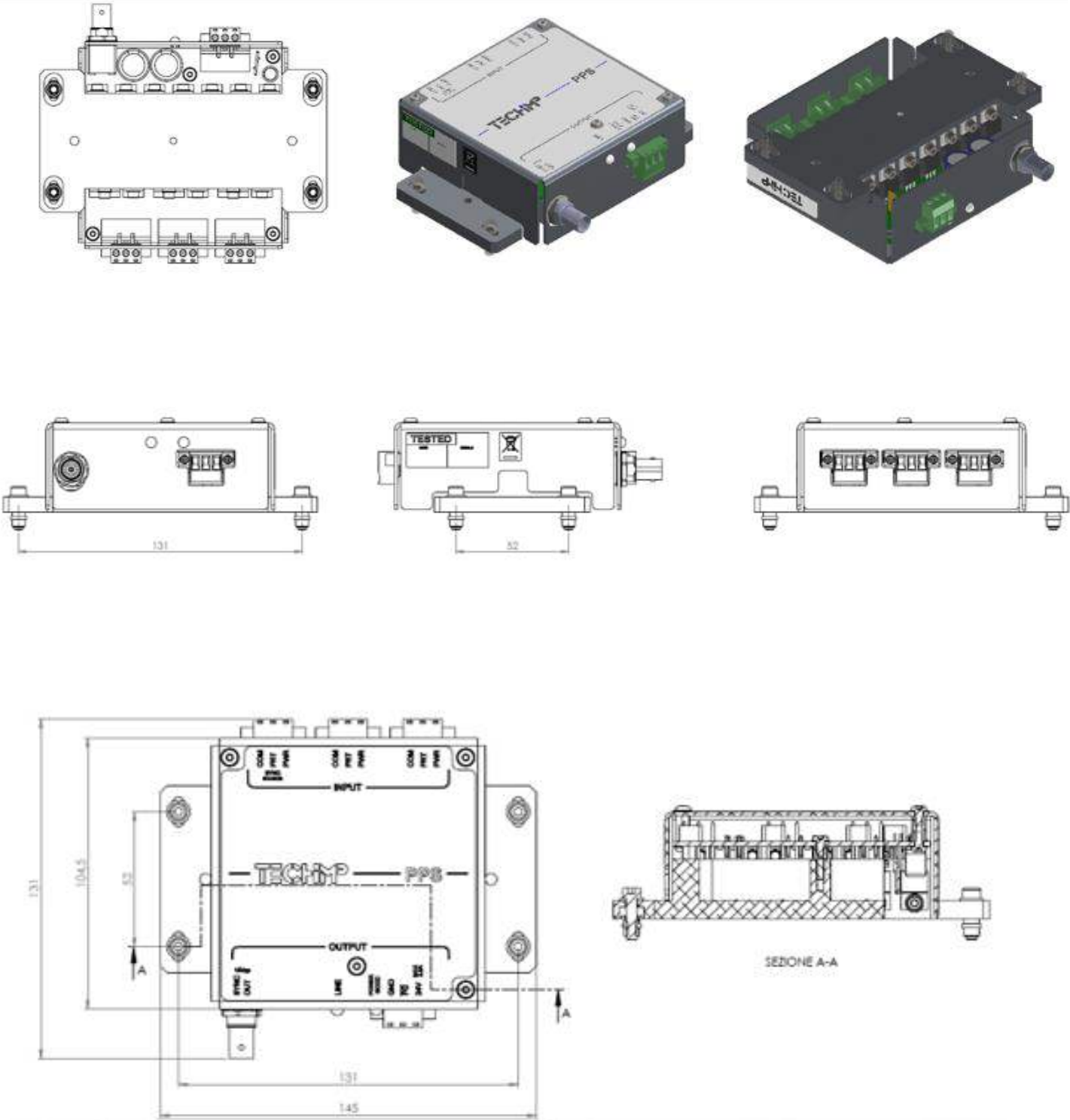
PPS2 Functional Scheme



Mechanical Technical Specifications

HV cable max diameter	180 mm
HV cable min diameter	70 mm
Toroid dimensions	Φ370mm x 75mm (without IP68 protection cover) Φ400mm x 100mm (with IP68 protection cover)
Toroid weight	≈5 kg
Toroid connections	3x removable screw terminals (for each toroid)
Cable length (between toroid and electronic)	10m
Synchronization connector	BNC
Indicators	LED Power Good (green); LED Line (green)
Protection Degree	Up IP68 (on demand)

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