PX 10000

Full Static Reactive Power Control for Low Voltage Network

SMART POWER FACTOR CONTROL

PowerWorx is a power factor control and electrical quantities monitoring device for low voltage network.

PowerWorx is static regulator of reactive power, fully electronic and without switched capacitors: it continuously delivers the exact amount of reactive power, both **inductive** or **capacitive**, as required by the load.
The absence of capacitors makes the device immune to harmonics disturbances ot the network and grants high reliability.

PowerWorx provides a web user interface (IUW) allowing remote control and real time data provisioning.
The connection to the data interface is available through LAN or GPRS (for version with integrated modem).

Device application

PowerWorx is a modular, compact size and easy to install device. It is suitable for all types of loads (inductive, capacitive, rapid changing and with harmonics) and therefore flexible for any installation requirement (within the limits of its rated characteristics).

PowerWorx can be installed as stand-alone unit or also many units can be parallelized in a single point of the grid to reach the required reactive power needed for the load. Alternatively, it is possible to install several **PowerWorx** units at different points of the LV grid to create a distributed power factor correction and monitoring system.

PowerWorx can be applied for power factor control and monitoring in:

- Industrial users
- Services sector
- Single machineries
- Distributed renewable energy production plan

In addition, **PowerWorx** can be used to realize coordinated systems for power factor control for LV public and private distribution grids.

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Improved effectiveness

PowerWorx provides instantaneously the exact value of reactive power needed by the load, thus maximizing the saving deriving from the power factor control. This behaviour is evident by comparing PowerWorx with the traditional systems.

The following diagram (Fig. 1) shows a comparison between the power factor control executed by the **PowerWorx** (green line) and by a traditional three-banks system (blue line), in case of a variable load (red line).

Note that **PowerWorx** starts working as soon as the load requires reactive power, while the traditional system waits until the threshold of the minimum step power is reached. Moreover, if the next threshold is never reached, the traditional system does not switches the next capacitor banks even though the reactive power currently delivered is not enough for an optimal power factor correction.

The portions of areas within the green and blue lines measures the higher efficiency of the **PowerWorx** in the power factor control.

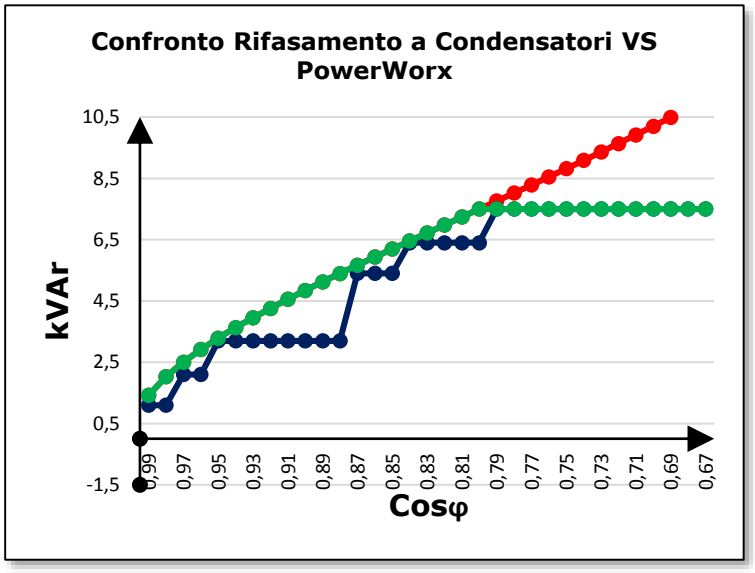

Fig. 1 - Traditional PF correction vs PowerWorx

Electrical quantities measured by PowerWorx, threephase and monophase:

- Voltages rms
- Currents rms
- Load active powers
- Load reactive powers
- Supplied reactive powers
- Supplied currents
- Voltage and Current THD
- Network frequency
- Load power factor
- Grid power factor (compensated)

Included accessories

PowerWorx comes with the following accessories:

- Current transducers: split core CT (vd. Technical specifications)
- Wiring cables (3Ph+N+T)

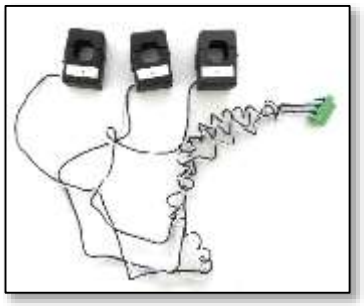

Fig. 2 – Split core CT

Fig. 3 - Web User Interface (IUW)

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Technical Specifications mod. PX10000

Wiring & Ranges	Wiring	5 wires L1, L2, L3, N, T
	Thermal Magnetic Circuit Breaker	4 poles C16
	Rated voltage (Un)	400 Vac @ 50 Hz
	Working range	From -20% Un to +10% Un
Reactive power compensation	Max three-phase reactive power:	10 kVAr
	Manual or automatic reactive power correction:	from 0,5 to 10 kVAr
Consumption	Standby	12 VA
	Run	90 VA
	Energy efficiency	> 98,5 %
Operating conditions	Temperature	-10°C + 55°C
	Max altitude	2000 m above sea level
	Relative humidity	0 a 90% uncondensed
Data interface	Ethernet type:	100 BaseT
	Connector:	RJ45
Voltage inputs	Number of channels:	3 P +N+T
	Overloading:	+20% permanent
	Terminal blocks:	removable 7,65 mm
Current inputs from CT	Number of channels:	3 (L1, L2, L3)
	Transducers:	split core CT
	CT ratio:	3000:1
	Terminal blocks:	removable 3,81 mm
	Rated primary current:	0.1 – 200A
	Internal diameter:	16 - 24 mm
	Maximum phase current (balanced):	**200 Arms**
	Maximum measured load (threephase balanced):	**138 kVA**
	Wiring calbles length:	1,5 m
	Terminals plugs:	5 mm

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Measure	Phase locked synchronous sampling Converters: A/D 13 bit Compliance: EN61557-12 (PMD_SD)
Accuracy class	Voltage: Class 0,5 Current: Class 1 Active and reactive power: Class 2 Frequency: Class 0,5 Voltage and Current harmonics, THD Class 5
Clock	Format: yyyy/mm/dd hh:mm:ss Sincronization: from NTP
User Interface	Switch – **Run/Standby** LED green POWER: Power (led ON in case of correct electronics supply voltage) LED red WARNING: Alarm (led ON in case of wrong phase sequence and/or mismatched CT coupling) LED green RUN: led ON when reactive power correction is active (run mode active) LED red FAULT: Fault LED yellow MODEM: Modem status (if internal modem installed)
Safety	Standard: EN61010-1 Voltage inputs: CAT III / 300 V IP degree: IP44, IP55 on request Terminals: IP20 (EN60529), IP55 on frequest
EMC	Emissions: EN61000–6–4 Immunity: EN61000–6–2
Enclosure	Size: 320 x 550 x 200 mm Material: Metal Weight: 20 kg
Reliability	MTBF: 33 years Avg. lifetime: 8 years