



Electronic power controllers
with "inverter" technology

PATENT PENDING



Innovation sees the light

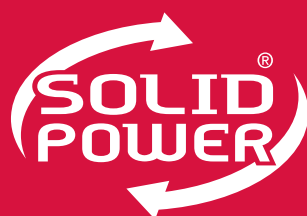
The CEP Solid Power units are currently the most avant-garde technological answer when it comes to monitoring and regulating lighting systems. They are new generation solid state machines that use "inverter" technology for the very first time in this type of equipment. A solution that provides concrete advantages in terms of performance, reliability and long-life. In particular:

from a constructional aspect

- no more moving electromechanical components (relays and brushes);

when it comes to efficiency

- the output voltage is stabilized and reduced, reconstructing a perfect sinusoid in phase with the input voltage;
- Power Factor compensation in the system depending on the load applied to the machine;
- energy savings even when the machine is in the by-pass status.



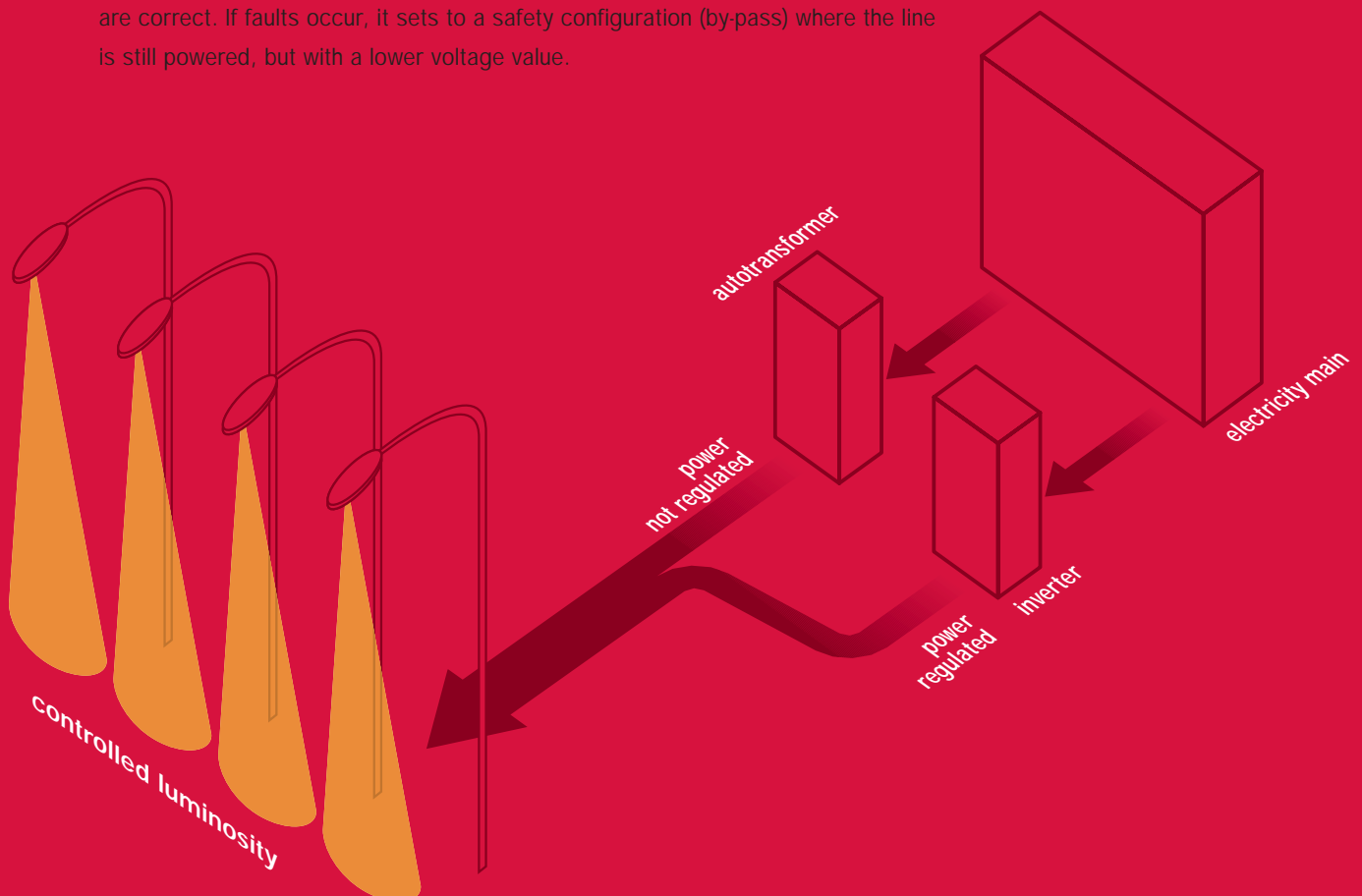
The heart of the system: "inverter" technology



Inverter technology, with solid state switches, converts direct current into alternate current with the main advantage of powering equipment at mains voltage and monitoring the amplitude, frequency and phase, thus allowing the wave shape to be completely reconstructed.

In the Solid Power system, a current rectifier is installed on the supply side of the inverter. This rectifier converts three-phase alternate mains current into direct current by means of a three-phase jumper with diodes, levelled by a condenser and then converted back into alternate current again by an IGBT jumper with variable frequency and voltage values that can be selected within a determined range. No mechanical or electromechanical component is activated when the regulations are made, either for adjustments concerning the input voltage variation or for voltage variations required for lowering or raising the light flux.

After the lamp warming-up phase, Solid Power self-configures to suit the adjustment previously programmed by the user, and keeps the output voltage regulated by means of its static converter with built-in inverter, a high frequency IGBT system that uses the pulse width modulation technique to regulate the output voltage. The completely static system is able to provide 3 single-phase sinusoidal voltage values with variable amplitude and phase at its output. The three single-phase voltage values can be regulated separately so as to obtain different light flux reductions on each phase, both as to value and duration. The inverter also keeps all the electrical parameters of the line under control, constantly checking to make sure that the values are correct. If faults occur, it sets to a safety configuration (by-pass) where the line is still powered, but with a lower voltage value.



Let's shed a light on the advantages of Solid Power

Quality of the wave shape

Sinusoidal reconstruction of the wave shape during the load powering voltage regulating and stabilizing phase. CEP Solid Power regulates, stabilizes and monitors the mains voltage (it stabilizes the output voltage, reconstructing a perfect sinusoid in phase with the input voltage and adding it to that of the mains, while keeping the output voltage under constant control).

Efficiency and reliability

Reduction in maintenance costs since there are no moving electromechanical parts. Fully solid state machine.

Stabilizing speed

Ten times faster than the version without inverter when it comes to compensating for interference along the line, thus allowing transitory phenomena on the controller's input and output to be kept under control in a better way. This achieves a dual advantage: all the tiny voltage variations sustained by the lamps are quickly compensated, while voltage variation or mains power variation phenomena are instantly countered.

By-pass operation

The NO-BREAK function provides unbroken lighting during the by-pass status (machine not connected) plus at least 15% energy savings.

Compensated power factor correction

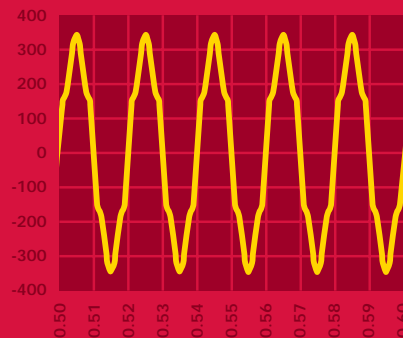
In the standard HSP version, compensations for alterations in the power factor correction of the system occur at 0.95 for load side values of up to 0.7. Compensation ranges from 0.25 to 0.30 of the overall power factor for lower load side values (minimum level 0.4).

In the version with HSP-R power factor correction function, besides power voltage stabilizing and regulation, the power factor of the system is effectively corrected thanks to the ratio between power used and inverter power.

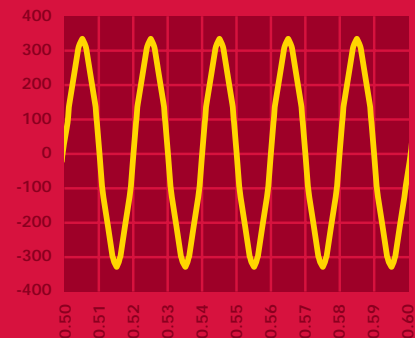
Small size and built-in control panel

The control panel can be installed in the same compartment as the controller. The compatible cabinets are made of SMC (fiberglass-reinforced plastic) CVHP series (720x1394x450 mm) and CVL series (860x1394x450 mm), IMQ certified in compliance with CEI EN 50298 standards.

Sinusoidal reconstruction of the wave shape

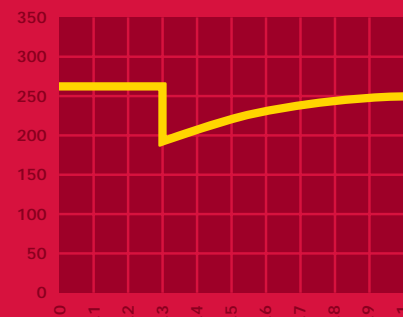


Harmonic distortion of the input and output main of an electromechanical controller

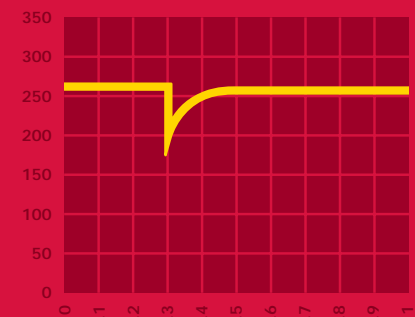


Compensation of the distortion in the main on the load side of the controller with inverter technology

Reaction speed to tiny instantaneous variations in the mains voltage



Electromechanical controller



Controller with inverter technology

Technical specifications

CEP Solid Power components

- Solid Power is a voltage stabilizing/regulating/programming unit entirely made from solid state components. It includes an inverter with digital control and double converter featuring intelligent IGBTs for separate high frequency commutation on the three phases and voltage feedback at the efficacious value setting.
- CEP/HSP series electronic power controller for stabilizing and regulating the powering voltage in lighting systems with threephase power supplies (400V + neutral) in Class II (double insulation).
- Openable protection/control panel pre-engineered for housing equipment to control and turn on systems for GPI versions.
- Programming/monitoring keyboard with 8 numeric and function keys, liquid crystal display with 32 characters on 4 lines (Italian/English) and contrast regulation, which can be removed from its housing in the machine for easy data programming/display.
- Terminal board compartment for connecting the input/output line, indicator/remote control cables.
- RS232 serial socket pre-engineered for telecontrol communication.

Versions

HSP Series

Electronic Power Controller for threephase systems (400V + N). For stabilizing and regulating the powering voltage and for power factor compensation. Available in the 10-15-20-25-30-35-40-50-60-75 KVA threephase power versions.

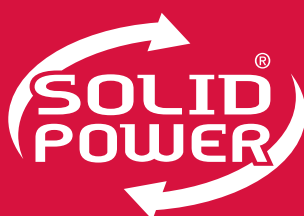
HSP-R Series

Electronic Power Controller for threephase systems (400V + N). For stabilizing and regulating the powering voltage, and for power factor correction in the system. Available in the 10-15-20-25-30-35-40-50-60 KVA threephase power versions.

CEP/.../ HSP CEP/.../ HSP-R	Version in cabinet (CVHP or CVL), IMQ certified in compliance with CEI EN 50298 standards. IP44 protection degree according to standard CEI EN 60529 -IK 10 according to standard CEI EN 50102.
KCEP/.../ HSP KCEP/.../ HSP-R	Open version without cabinet. IP20 protection degree in compliance with CEI EN 60529 standards.
GPI/.../ HSP GPI/.../ HSP-R	Integrated power unit comprising an electronic power controller and control panel installed in the same cabinet (CVHP or CVL). IP44 protection degree in compliance with standard CEI EN 60529 - IK 10 according to standard CEI EN 50102.
KGPI/.../ HSP KGPI/.../ HSP-R	Open version without cabinet. IP20 protection degree in compliance with CEI EN 60529 standards.



The CEP/... and GPI/... versions can be supplied with a top compartment for housing Electricity Board meters.





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