

Welcome to GESINNE GS



Energy savings and efficiency
for your company

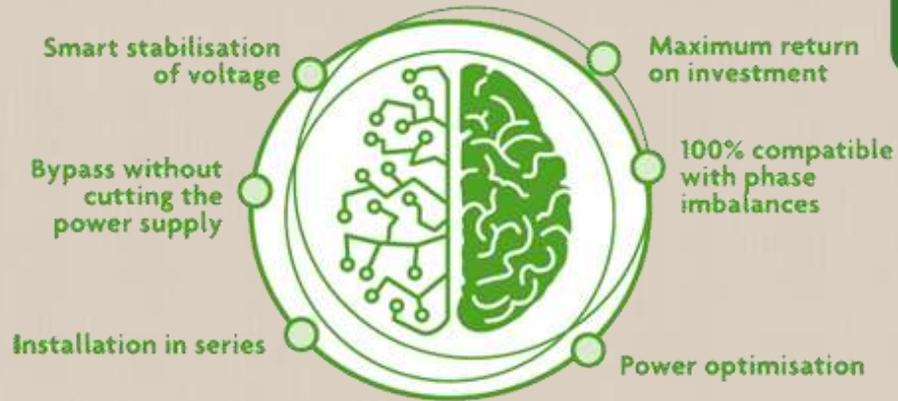
Degree of innovation

GESINNE GS is a **patented power supply optimization system** marketed internationally by **ENEA Grupo®**.

It is installed in series and, by means of smart controlling voltage levels, it achieves a reduction in the electric energy consumption at customers' facilities.

It not only achieves significant savings in a facility's power consumption but also protects them from possible grid oscillations.

Main features

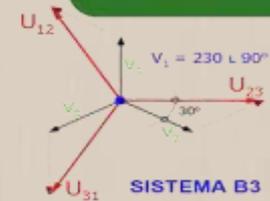
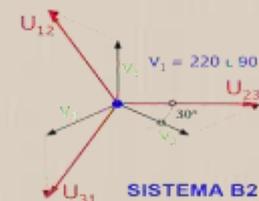
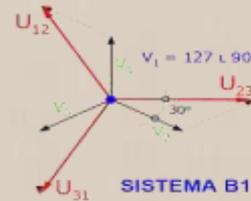




Technical Issues

Currently, in Spain, there are three power supply systems simultaneously operated, with different voltage levels:

B1(127/220 V), B2 (220/380 V) y B3 (230/400 V).



**All the supply systems have a $\pm 7\%$ tolerance on the nominal voltage by law (RD 1955/2000).
The electrical equipments have, as a standard, a 10% tolerance.**

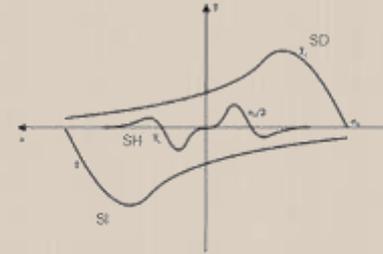
RANGES AND TOLERANCE ON ELECTRIC DEVICES

RMS VOLTAGE	NOMINAL	MIN	MAX
B2 SYSTEM	220	204.6	235.4
B3 SYSTEM	230	213.9	246.1
B2 SYSTEM	380	353.4	406.6
B3 SYSTEM	400	372	428
STANDARD DEVICES	230	207	253
	400	380	440

Technical Issues

Voltage and current imbalance

- **Voltage imbalance:** it occurs when in a three-phase system there are differences between the r.m.s. value of the signals voltage, whether or not it has a distributed or non-distributed neutral wire.
- **Current imbalance:** it occurs when in a three-phase system there are not the same current in all of the phases. This kind of imbalance cause: overheating in the receivers, in the power cables, circulating current by the neutral conductor (in a three-phase system with a distributed neutral, if the system is balanced, there are not circulating current by the neutral conductor)



In three-phase motors, the imbalance produces overheating, bearing wears and reduction in service life and performance.

A 5% voltage imbalance produces a 75% decrease in its performance.

Recommended values

- The **current** imbalance must not be greater than **10%**.
- The **voltage** imbalance must not be greater than **3%**.



Technical Solution



As we have seen, the electrical system have currently several supply systems in use, with tolerances and operating ranges. In addition, **the electrical equipments (receivers) are designed to work in both systems, and with tolerance ranges greater than those of the electric grid.**

How do we improve the efficiency?

Setting a **voltage value** that will allow our receivers to work within the ranges established and, in turn, its energy consumption is kept at a minimum.





How does GESINNE GS work?

- The voltage levels in the grid are constantly checked by Gesinne, which **dynamically adjusts** the output voltage values in real time, achieving a stable output and preventing the arrival of the fluctuations and spikes of the electrical mains to the installation.
- This voltage intelligent control is made **independently for each phase**, using 3 single phase transformers instead of one three-phase transformer. By doing this we remove the phase imbalances, having the three of them the same voltage.
- In addition, Gesinne has a safety **bypass**, that disconnect the equipment from mains. When it is disconnected, electric current arrives to the installation directly from the grid, without cuts or micro-cuts.





Power electronics

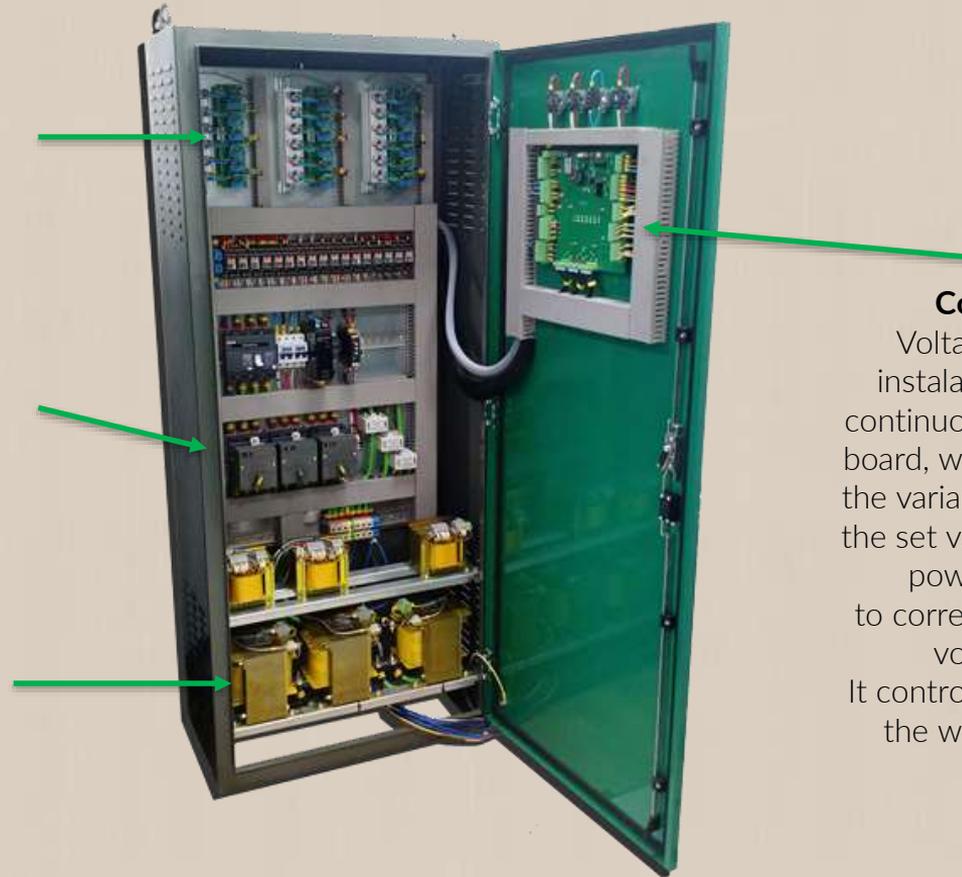
It controls transformers functioning based on the signals sent by the control board.

Safety functions

The safety **bypass** can automatically disconnects the equipment from mains, in case of errors, overloads and other circumstances, allways without cuts or micro-cuts. It guarantees supply continuity.

Transformers and Autotransformers

Single phase systems are the final actuators, making the regulation independently for each phase.



Control board

Voltage levels in the installation are checked continuously by the control board, which also calculates the variance with respect to the set value. It controls the power electronics, to correct and stabilize the voltage values. It controls the operation of the whole equipment.



Solution of specific problems and Range of equipment

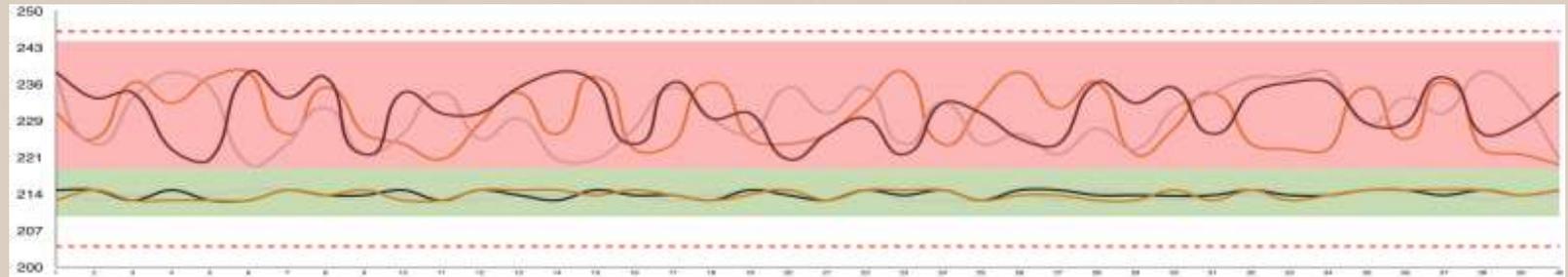
Model	Technical concept	objective
Basic model	It reduces dynamically the voltage to a given reference, so the output voltage doesn't depend on the input one. Separate control for each phase (single-phase transformers). Manual bypass.	Active energy saving, no voltage dispersion or variability, protection against voltage surges and spikes. Imbalance total correction. All this also increases the lifetime of the receptors and reduces the maintenance works.
Options	Technical concept	objective
Automatic optimal voltage reference	Firmware that dynamically finds the optimal voltage reference.	Optimal voltage level to achieve the highest possible savings in each moment.
Voltage increasing	Transformers polarity reversal to allow voltage increasing.	Capacity to cope with undervoltages, preventing maintenance problems.
Automatic Bypass	Circuit that allows the disconnection of the equipment from mains, without cuts or micro-cuts.	Ensured the continuity of supply in case of eventual anomalies en el equipo.
Oversized Bypass (plus model)	Overload protection without cuts (only available together with the automatic Bypass option)	In overcurrent situations, Gesinne can activate its safety bypass, so the overcurrent can be assumed directly from the grid. This allows the installation of a Gesinne device dimensioned to the power that is usually used, optimizing the return of investment.
Telemetry	It allows to see the data remotely.	It allows to see the grid conditions.
Remote management	Remote management of the equipment.	It allows the grid and device monitoring and remote configuration of the device.

- GESINNE GS-55
- GESINNE GS-110
- GESINNE GS-175
- GESINNE GS-275
- GESINNE GS-435
- GESINNE GS-550
- GESINNE GS-690
- GESINNE GS-859
- GESINNE GS-1100
- GESINNE GS-1000





Efficient vs No Efficient



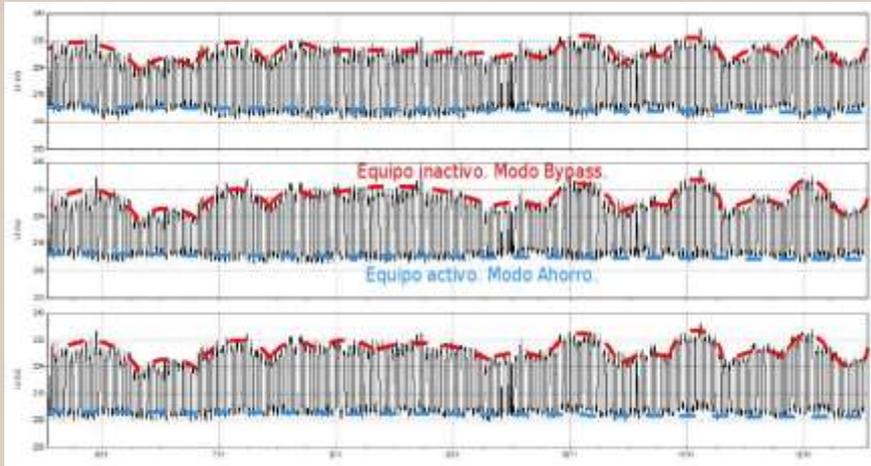
The Red system is a system with no efficiency measure. It has voltage imbalances in all the three phases, and has fluctuations in the voltage values over time.

The Green system is a system with a r.m.s. voltage value, adjusted to appropriate values to enhance the system efficiency. It also has its voltage values well balanced.

Efficient vs No Efficient

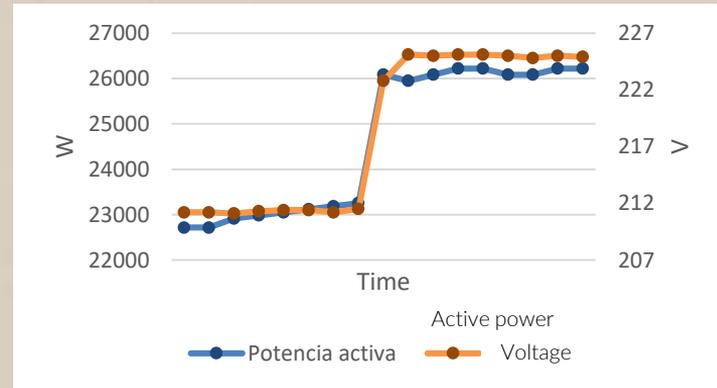


Real Case: correction of voltage variability during a test.



Programmable for EVO Verification Protocol.

The savings produced are demonstrated its applying consecutive test ON/OFF measurements, programming the equipment for voltaje regulation, and analysing the steps that are produced in the active power when the Gesinne system goes on or off.





Efficient vs No Efficient

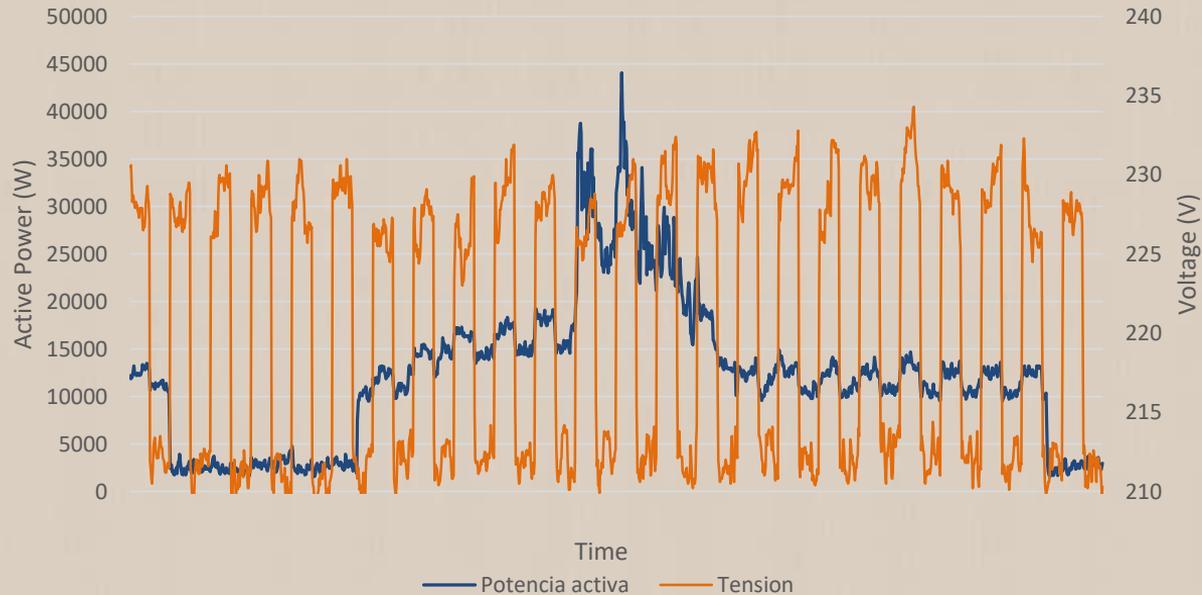
- Voltage stabilization and balancing of the phases assures the optimal performance of the installation's receivers, extending their **service life**.
- Protection against overvoltages and possible phase losses, increase safety.
- Gesinne has a safety **bypass**, that disconnect the equipment from mains, without cuts or micro-cuts.
- All this improves and makes the **maintenance** of the installation easier.
- The power consumption is reduced by the voltage value optimization, resulting in significant economic savings.
- Gesinne has a **high performance** with no heat losses.





Efficient vs No Efficient

Active power and voltage



Real Case. Effect on the active power produced by voltage reduction and stabilization, in a test with automatic switchings.



What does Gesinne GS do better than other systems?

The equipment can remember the facility's load curve, identify the make-up of the loads and, based on these variables, adjust the voltage to the optimal value.

The power optimisation function can be activated in such a way that the equipment permanently interacts with the facility to achieve the balance of the main values to achieve the minimum power (KW) needed at any given moment for the correct operation of the facility.



FEATURES	COMPARISON WITH OTHER EQUIPMENT:					
	GESINNE GS	VOLTAGE STABILISER	VOLTAGE TRANSFORMER	VOLTAGE DAMPENER	EQUIPMENT BASED ON CONDENSERS	WAVEFORM ADJUSTMENTS
DIMENSIONING TO MAXIMISE RETURN ON INVESTMENT	Green	White	White	White	White	White
REDUNDANT SUPERVISION OF THE GRID INTEGRATED IN THE EQUIPMENT	Green	White	White	White	White	White
GRID ANALYSER WITH INTERACTIVE DISPLAY	Green	White	White	White	White	White
SURGE PROTECTION INCORPORATED WITHOUT DISCONNECTING FROM THE GRID.	Green	White	White	White	White	White
POWER OPTIMISATION	Green	White	White	White	White	White
SMART VOLTAGE STABILISATION	Green	White	White	White	White	White
100% COMPATIBLE WITH PHASE IMBALANCES.	Green	White	White	White	White	White
BYPASS WITHOUT POWER CUT	Green	White	White	White	Light Green	White
VOLTAGE STABILISATION (Independent from input)**	Green	Green	White	White	White	White
VOLTAGE STABILISATION (Dynamically adjustable)***	Green	Green	White	White	White	White
INSTALLATION IN SERIES	Green	Green	Light Green	Light Green	White	Light Green
COMPATIBLE WITH PHASE IMBALANCES +20%	Green	Green	Light Green	Light Green	Light Green	Light Green
FEATURES	FIXED VOLTAGE REDUCTION (Depending on input voltage)***					
	White	White	Orange	Orange	White	Orange
	White	White	White	White	White	Red
FEATURES	HARMONIC DISTORTION OF THE OUTPUT VOLTAGE					
	White	White	White	White	White	Red
FEATURES	HARMONIC DISTORTION OF THE OUTPUT CURRENT					
	White	White	White	White	White	Dark Red

Knowledge and market integration

Main reasons for which clients could chose Gesinne instead of any of the other options existing in the market:



Specialization: it only exist a handful of companies around the world which develop its own energy saving technology, due to the high investment and engineering work needed.



Quality: as noted earlier, the reliability and duration are essential in this kind of products, and in this regard the manufacturing process with own assembling is an advantage.



Guarantee: we are the only manufacturer in the market which offers an unlimited guarantee during 5 years. We also have a global technical service able to resolve quickly any incidence.



Intelligence: the technology is based on an INTELLIGENT control, that can remember the facility's load curve. Nowadays, none of the competitors has this.



Price: the business model and reasonable costs enable to offer prices similar to the market prices, despite having lower product volumes compared with multinationals companies.

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