

E f E
EFICIENCIA ENERGÉTICA

SYSTEMS REPORT

INDEX

1. **EfE SYSTEMS** Page 2
2. **FUNCTIONALITY** Page 2
3. **EfE SYSTEMS RESULTS AND BENEFITS** Page 4
4. **SPECIFICATIONS AND AVAILABLE SYSTEMS** Page 5
5. **LEGALIZATION** Page 6
6. **GUARANTEES** Page 7
7. **INSTALLATION** Page 7
8. **RESULTS MEASURING** Page 8
9. **PROCESS TO DEFINE AN INSTALLATION** Page 9
10. **WHERE TO INSTALL EfE SYSTEMS?** Page 11
11. **SOME RESULTS** Page 12

1. Efe SYSTEMS

Efe systems are:

ELECTRONIC BIDIRECTIONAL STABILIZING FILTERS

- ✓ Stabilize the current and balance the phases. At the same time, erase wave variations to make the most of peaks for reuse, optimizing the electric management and reducing the consumption.
- ✓ Are bidirectionals. The parallel connection allows to filter the incoming and outgoing energy, reducing the installation harmonics.

Efe systems improve the performance of the electric energy, avoiding leaks. For that reason we considerate the system an ecologic product.

The advanced technology of the components creates a **long duration system, null maintenance and huge efficiency.**

**DESIGNED FOR ELECTRIC INSTALLATIONS PROTECTION:
THE PERFECT COMPLEMENT FOR ANY INSTALLATION**

2. FUNCTIONALITY

The electric power arrives at our installations with **INTENSITY FLUCTUATIONS**. If we add to those the ones generated by the installation components (**HARMONICS**), we find ourselves in a situation of **ELECTRIC WAVE VARIATION** (energetic aggressiveness), cause of breakdowns and deterioration.

Electric power is made up of:

- ✓ **ACTIVE ENERGY** (force): flows trough the copper cable
- ✓ **REACTIVE ENERGY** (movement): external magnetic field

We have to find a balance between both.

When these balance is broken (decompensation), we have leaks:

- ✓ an **active** energy leak, goes to the floor
- ✓ a **reactive** energy leak, goes trough the external part of the cable back to the company meter

How E f E system works

The system stabilizes the current and erases harmonics, making the energy arrive at the installation components (motors, lights, etc.) with minimum changes.

Besides, decompensations are minimized (usual in engine starts and other components), reducing the active and reactive leaks.

When you connect it in parallel, the system absorbs the current peaks, incoming and outgoing ones, reusing it.

With all these functions, you improve considerably the energetic management, optimizing the consumption.

E f E SYSTEMS ACT AGAINST ENERGETIC AGGRESSIVENESS

- ▶ Regulate the incoming network energy stabilizing it and avoiding leaks.
- ▶ Reduce or eliminate the peaks generated by the own elements of our installation (harmonics).
- ▶ Reduce the decompensation between active and reactive.

Important considerations regarding the active energy regulation

✓ **E f E** systems avoid reactive decompensation, but don't store it to compensate like a reactive battery would do. For this reason, most of the time reduces but doesn't erase it.

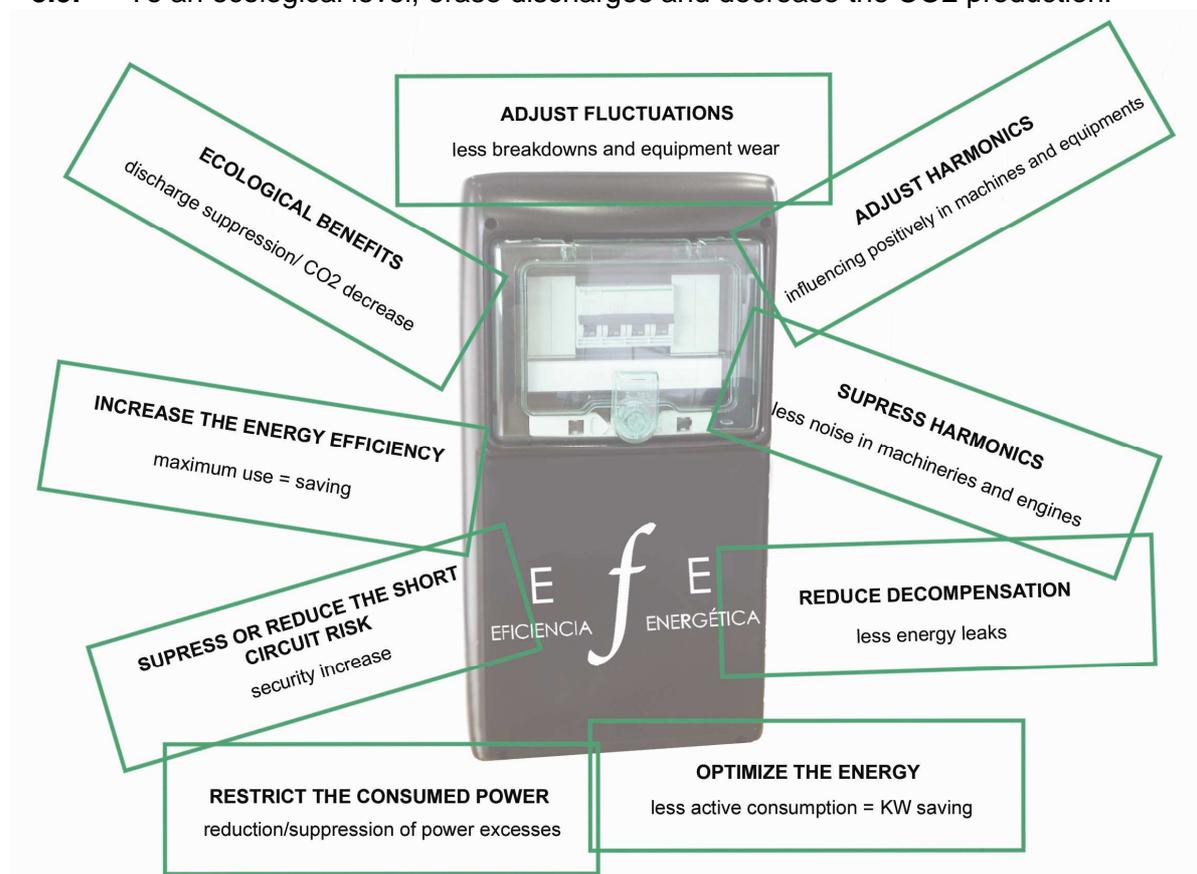
✓ If you have a reactive battery installed, the system will protect it like all the other installed components, because the system works as a harmonics filter and makes it work less because it reduces the decompensation.

E f E SYSTEMS REDUCE THE REACTIVE PRODUCTION

You may need to install a battery to compensate the remaining energy, but without a filter, so the cost will be lower.

3. BENEFITS AND RESULTS OF E f E SYSTEMS

- 3.1** Regulate the fluctuations of the energy reception and avoids micro power cuts up to 4 milliseconds, cause of breakdowns and premature wear of the electric equipment.
- 3.2.** Regulate the fluctuations generated by parts of our installation (engines, vans, fluorescents, etc.) known as harmonics, cause of similar problems mentioned in the previous point.
- 3.3.** The harmonics suppression erases annoying noises (machinery, engines, etc.).
- 3.4.** Reduce decompensation and, as a consequence, the amount of reactive energy returned to the electric company, getting an optimum performance, avoiding unnecessary leaks and erasing the problems that these imbalance may cause.
- 3.5.** The optimum energetic management reduces active energy consumption, with savings in KW.
- 3.6.** For the same reason, the consumed electric power is reduced, reducing or even erasing the electric power peaks.
- 3.7.** Generate a higher heat stability, increasing the safety and efficiency of the installation.
- 3.8.** Increase the energy efficiency in a considerable way.
- 3.9.** To an ecological level, erase discharges and decrease the CO2 production.



4. SPECIFICATIONS AND AVAILABLE SYSTEMS

DATA SHEET

Technical specifications E f E

- Rated voltage: from 100 to 450 volts, single-phase or three-phase
- Absorbed power: 5 W
- Amperometric consumption: 2W
- Nominal frequency: 50 Hz / 60 Hz
- Operating temperature: -15° / + 60° C
- Humidity: 86% to 20° C in the absence of condensation
- Size of the equipments: 23,6 cm x 46 cm x 16 cm
- Standards: IP 65 to IEC 60529 / EN 50102 IK 09
- Electric wiring: covered cables for PCI socket
- Exterior: flame retardant insulation and double insulation (Class II).
Flame resistance and abnormal heat: 650 ° C to IEC 60695-2-1
- Estimated life: 10 years



Available systems

Seven, depending of the maximum power that the installation can work with:

- ▶ up to 58 KW
- ▶ up to 100 KW
- ▶ up to 200 KW
- ▶ up to 300 KW
- ▶ up to 500 KW
- ▶ up to 1000 KW

We make Taylor-made systems from 500 KW

IMPORTANT

- ▶ **EfE** systems don't require any maintenance (savings in costs).
- ▶ We have available a technical support to solve any problem.
- ▶ Service Point (Barcelona and Vigo).

5. LEGALIZATION



The EfE systems go with the corresponding CE certificate

This certificate emission is based on tests made in LACE labs in Barcelona.

Those tests were done for the industrial use (single-phase and three-phase versions) using all the powers and considering all the necessary rules about electric safety and electromagnetic compatibility.

The realized tests prove the most strict fulfillment of the rules established by the European Community about the installation of those kind of systems.

6. GUARANTEES

EfE products have a 3 (three) year guarantee since the moment that are installed, guaranteeing the repair or replacement for a period of time non inferior to 10 (ten) years.

The guarantee covers any manufacture, performance or working defect. In case of any defect of the system during the guarantee period, we will replace it.

Between the 4^o (forth) and 10^o (tenth) year you can purchase a guarantee extension for an annual cost of the 10% of the initial investment.

Will be excluded from the guarantee the wear produced by inappropriate use and/or not according to the indicated instructions, and the damage resulting from non authorized personnel by the manufacturer manipulating the systems.

The manufacturer won't take responsibility for the damage of the systems, direct or indirect, as a result of errors in the mounting or inadequate, erroneous or irrational use of the systems.

IMPORTANT

Any system opened without authorization from the manufacturer, loses the guarantee automatically and could not be returned or refunded.

The systems come with an efficiency additional guarantee. These guarantee says that if the produced energetic saving is less than 8% during the first 6 (six) months, the costumer can return the system and ask for refund. Sometimes, the energetic saving could be less than 8%, but in those cases the costumer will be informed in advance.

If the costumer wants to return the system and be refunded, he has to present:

- ✓ 3 (three) 3 (three) bills later to the system installation (minimum).
- ✓ 3 (three) bills previous to the system installation (minimum).
- ✓ The bills corresponding to the same periods of the previous fiscal year.

If those bills are not enough, 3 (three) more will be demanded. That is, a total of 6 (six) previous bills, 6 (six) later bills and the same ones corresponding to the previous fiscal year.

7. INSTALLATION

The systems installation must be done following the instructions that are attached.

All the systems could be installed in three-phase, with the exception of 18 KW systems, that just works in single-phase. Likewise, the 58 and 100 KW systems could be installed in single-phase.

If the installation is made in three-phase, the three phases and the neutral has to be connected. If it's made single-phase, you just need to connect one phase and the neutral (keeping two other phases free).

The place for the connection always will be the outlet and neutral phase of the principal ICP (in parallel).

INSTALLATION ACCORDING TO THE POWER

We always require just one system and we will connect it to the principal ICP outlet (two or more systems in serial don't work, the service could be done just with one system of the necessary power).

8. RESULTS MEASURING

The valuation of the performance of the **EfE** system must be done based on various parameters:

1. Comparison between the active consumption, before and after the system installation, and compared to the same period of the previous fiscal year.
2. Comparison between reactive consumptions in the same periods, using the documents indicated in the previous point.
3. Comparison of the charges for power excesses, using the same documents.

Measure the saving just in KW is totally limited and insufficient, that's so many factors to considerate. Although, it's the easier to interpret.

OPERATING IMPROVEMENTS

In this case we talk about indirect savings and benefits, that is, that we can't measure with direct processes.

The elimination of the currents aggressiveness, from peaks or harmonics generated from the installation itself, produces a performance's substantial improvement, perceptible by:

- ▶ less breakdowns in machines and engines
- ▶ Disappearance of micro cuts
- ▶ minor impact in light bulbs, spotlights and fluorescents blow
- ▶ better machinery performance
- ▶ elimination of noises in equipment and engines
- ▶ installations and equipments warming reduction
- ▶ elimination of short circuits

For the conclusions to be realistic, we always have to consider:

- ✓ Variations on the installation's use.
- ✓ Fluctuations suffered in the supply.
- ✓ Consumption elements incorporated to the installation.
- ✓ Operating incidences.
- ✓ In general, every thing that can affect the consume in a differential way respect other periods.

We recommend to do the results measurement with periods superior to 1 (one) month. The tendency to saving and efficiency of the systems is easily detected, but the exact valuation are complex.

It's very important to consider that, as we seen before, the performance can't be valued just in KW's saving.
The rest of benefits justify the system's usefulness.

9. PROCESS TO DEFINE AN INSTALLATION

First of all, we must know our contracted power in KW (you can see that in any bill or in your installation's contract).

It's very important to know if the supplying company allows you to exceed the contracted power and how much. If it's not clear, you should make an installation measuring to determine.

The system you need to install is the one that covers the real power, not the contracted one, unless they match.

If you install a system with less power than requested, it won't work.

Won't break, but it will be inoperable.

Second of all, we must know our consumption in Euros/month. This information is useful to value better the possible economic saving and our investment's profitability regarding to this parameter.

Imagine an user who has a contracted power of 20 KW and his monthly consumption rise to 2.000 €. If his installation is extremely sophisticated and modern, and he has some quality saving devices, we maybe just will get an 5% saving, that means 100€/month.

The conclusion is that he will recoup a 58 KW system in 12 (twelve) months. Obviously is profitable, if you value just these parameter.

Most cases are less extreme, both in installation type and in expense, and that's why in every case we have to value the possible performance.

Third of all, we must know the type of electric installation. Specially if we have installed some kind of regulation device such as reactive batteries, harmonic filters, stabilizers, etc.

If we don't have any regulation device, the **EfE** efficiency will be bigger, so we easily can prevent a saving between 10% and 15%, just based on KW/month parameter.

Forth of all, we must know the kind of electric structure we have: illumination, machinery, etc.

If you have fluorescents, engines, compressors, thermostats, fans, and, in general, mechanic movement elements, the efficiency of **EfE** will be higher, reaching possibly 15 – 20% minimums in savings, just in KW/month parameters.

You can reach the maximum KW/month saving when:

- ✓ You have a lot of harmonic generating devices in the power supply, like engines, fans, fluorescents, etc.
- ✓ You don't have any regulation devices installed (like reactive batteries).
- ✓ The devices or machines are old.
- ✓ The installation is old and presents an evident deterioration.
- ✓ The engines or rotors operation when starting is constant.
- ✓ The energy arriving from the supplying company is fluctuating and has micro cuts.

In those kind of extreme situations, you can even exceed an 30% saving just in KW/month parameter.

Logically, it's hard to find cases with just the 5% saving as is to find with more than 30% saving, the usual is to find an intermediate value.

It's important to value that the saving don't have to be constant, because the use of installations can change (for example, we use the air conditioning just when it's hot, or we can have variations in the load of work a machinery has to do, etc.).

10. WHERE TO INSTALL Efe SYSTEMS?

The **Efe** systems are the perfect complement for any installation, because it are designed to protect it:



11. SOME RESULTS

All the installations were made in Spain

BUSSINESS	TOWN	KW	SAVING
Gas Station	Girona	40	12%
Restaurant	Barcelona	70	18%
Hotel	Barcelona	90	21%
Supermarket	Tarragona	120	16%
Cold-storage chambers	Sabadell	45	13%
Delicatessen	Barcelona	31	14%
Car Dealer	Barcelona	60	12%
Kitchen and bathroom furniture	Granada	130	17%
Graphic Design	Barcelona	126	14%
Methacrylate Industry	Barcelona	110	20%
Fruit Wholesaler	Barcelona	450	12%
Mill For Making Olive Oil	Jaén	115	18%
Electronic Auto Garage	Barcelona	35	31%
Cable Industry	La Rioja	160	11%
Biological Food	Barcelona	50	18%
Frozen Food	Valencia	55	12%
Offices	Barcelona	25	13%
Car's Paint & Body Work	Barcelona	40	16%
Sports Facilities	Barcelona	750	10%
Gym	Sevilla	180	12%
Tennis Club	Barcelona	90	16%
City Hall	Salamanca	160	11%
Metal Industry	Madrid	150	14%

Average intersectorial saving: 15,26%

Reactive saving: between 30 and 100% (depending on cases)

Minimum Saving: 8%

Average: 65%