

# *Fixed COSYS PFC system*

Operating instructions **EN**



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# WARRANTY CONDITIONS

The warranty conditions are set out in the sales contract; in all other cases, the following conditions shall apply.

The manufacturer guarantees its product against any manufacturing or operating faults caused by errors in design, choice of materials or manufacture, in accordance with the conditions set out below.

The manufacturer may - without prior notice – modify its product in order to bring it into line with the warranty conditions or replace defective parts.

The manufacturer's warranty shall not apply in the following cases:

- Faults caused by designs or parts used without consent, or supplied, by the buyer.
- Replacements or repairs resulting from normal wear and tear of parts and equipment
- Damage or injury caused by negligence on the user's part
- Insufficient maintenance or incorrect use of products.
- PFC system not adapted to the network.

The warranty's validity period is 12 months following installation of the equipment, and may not exceed 18 months from the supply date.

Parts replacements, repairs or modifications carried out by the manufacturer during the warranty period may under no circumstances be grounds for extending the

length of the warranty period.

In order to benefit from this warranty, buyers must expressly inform the manufacturer - within a maximum of 8 days, beyond which the warranty shall expire – of any faults in the design, materials or manufacture, giving precise evidence to support their claim.

Defective parts replaced free of charge by the manufacturer must be made available to the manufacturer, as they remain its sole property.

The warranty shall not apply if the buyer has carried out modifications or repairs to the manufacturer's products without its prior consent.

The manufacturer's liability is limited to the obligations described above (repairs or replacements); all other types of damage shall be excluded.

# GENERAL SAFETY AND USAGE INSTRUCTIONS



The conditions set out below are likely to cause operating faults and reduce the PFC system's service life:

- Current, voltage and frequency which are not to specification.
- The presence of harmonics.
- Operation or storage outside the temperature limits.
- The use of switches without current limiting resistors.
- Operation: where there are shocks or vibrations, excessive or rapid temperature variations, or in an explosive or corrosive environment.
- Installation at an altitude > 2,000 m or below sea level.

- a. This manual sets out the essential instructions relating to safety, connection and use of the fixed PFC system.
- b. This system must only be installed by specialist personnel with the necessary skills.
- c. The PFC system must be installed in a vertical position.
- d. The cable must be connected to earth before the connections are made.
- e. Do not expose the equipment to rain or splashes of water.
- f. Keep the enclosure clean using a dry cloth.
- g. We recommend that you keep this manual in a place which is accessible to all.
- h. The maintenance and checking operations described in the "Maintenance" paragraph on page 11 must be carried out at least once every 12 months. Failure to follow this instruction shall release Socomec from all liability with regard to the incorrect operation of the equipment and the consequences thereof.
- i. The maintenance operations must only be carried out by authorised personnel with the appropriate training.
- j. This system satisfies the European Community directives applicable to this product. This is indicated by the following marking:



- k. Compliance with standards CEI 61439-1/-2 and EN 61439-1/-2.

# SYSTEM DESCRIPTION

## General points

The equipment consists of a series of racks of capacitors installed in an enclosure. Depending on the models, other equipment may be present:

- anti-harmonic device.
- fuse combination switch.

## Function

COSYS fixed PFC system are designed to offset variable reactive energy. Reactive energy may be consumed by a factory or production unit.

## Construction

- Power from 17.5 to 60 kvar.
- Harmonics from 0 to 100% in 4 stages: PFC21, PFC22, PFC23, PFC24.
- Cable input at the bottom (can be the top if required).
- Base plate optional
- Thermal regulation with fan (depending on equipment).

## General characteristics

- Self-healing capacitors.
- Capacitor cut off from the automatic circuit in case of removal.
- Steel panel enclosure colour RAL 7035.
- IP rating IP20, IP30 depending on model.
- Rated voltage: 400 V three-phase.
- Rated frequency: 50 Hz.
- Operating temperature: -5°C to 40°C.
- Tolerance on capacitor capacity value: -5, +5%.
- Discharge device on each bank: < 50 V after 1 minute.
- Capacitor internal connection: delta.

# INSTALLATION



Failure to follow the installation instructions contained in this manual may compromise the operation and reliability of the PFC system.

## Recommendations relating to installation conditions

Recommended operating temperature: between 15°C and 35°C.

Relative humidity without condensation: 90% max.

Maximum operating altitude: 2,000 m

Take all necessary precautions to prevent splashes of water, paint or other fluids.

The enclosure conforms to protection rating IP20.

It is essential to ensure that there is a clearance of 50 cm above the PFC system to allow adequate ventilation.

## Connecting the input cables

The power is supplied to the terminals provided for this purpose.

The power, control and measurement cables should be connected in accordance with the standards in force and good practice.

The cable bushing plate should be refitted after the cable gland or other cable passage system has been fitted.

Failure to follow this instruction may seriously compromise the ventilation efficiency, reduce the cabinet's level of protection and cause the formation of hazardous material or objects.

## Upstream protection and connection cross section

The selection and co-ordination of the protection devices upstream of the PFC system depend on the nominal current and cable fitting conditions.

The protection devices upstream of the PFC system must conform to the safety standards in force.

The cross section of the cables should be adapted to

the power of the fixed PFC system. Cables should be selected according to the current values shown in the table below, which should be increased by a coefficient of 1.43 in accordance with CEI 60831-1.

## Technical characteristics

### COSYS PFC21

| Power supply<br>Kvar | I nominal<br>A | Upstream protection |               | Figure n°        |               | Height x Width x Depth |                | Weight |                |
|----------------------|----------------|---------------------|---------------|------------------|---------------|------------------------|----------------|--------|----------------|
|                      |                | GG fuse (A)         | Fuserbloc (A) | (without switch) | (with switch) | mm                     | mm with switch | Kg     | Kg with switch |
| 10                   | 14             | 16                  | Consult us    | 1                | 5             | 395x170x80             | 515x560x190    | 4      | 4              |
| 15                   | 22             | 32                  | Consult us    | 2                | 5             | 395x240x80             | 515x560x190    | 6      | 6              |
| 20                   | 29             | 50                  | Consult us    | 3                | 5             | 475x285x150            | 515x560x190    | 10     | 10             |
| 30                   | 43             | 63                  | Consult us    | 3                | 5             | 475x285x150            | 515x560x190    | 11     | 11             |
| 40                   | 58             | 100                 | Consult us    | 4                | 5             | 475x445x150            | 515x560x190    | 15     | 15             |
| 50                   | 72             | 125                 | Consult us    | 4                | 5             | 475x445x150            | 515x560x190    | 16     | 16             |
| 60                   | 87             | 125                 | Consult us    | 4                | 5             | 475x445x150            | 515x560x190    | 18     | 18             |

### COSYS PFC22

| Power supply<br>Kvar | I nominal<br>A | Upstream protection |               | Figure n°        |               | Height x Width x Depth |                | Weight |                |
|----------------------|----------------|---------------------|---------------|------------------|---------------|------------------------|----------------|--------|----------------|
|                      |                | GG fuse (A)         | Fuserbloc (A) | (without switch) | (with switch) | mm                     | mm with switch | Kg     | Kg with switch |
| 10                   | 14             | 16                  | Consult us    | 6                | 6             | 811x600x286            | 811x600x286    | 50     | 50             |
| 15                   | 22             | 32                  | Consult us    | 6                | 6             | 811x600x286            | 811x600x286    | 53     | 55             |
| 20                   | 29             | 50                  | Consult us    | 6                | 6             | 811x600x286            | 811x600x286    | 55     | 57             |
| 30                   | 43             | 63                  | Consult us    | 6                | 6             | 811x600x286            | 811x600x286    | 63     | 65             |
| 40                   | 58             | 100                 | Consult us    | 6                | 6             | 811x600x286            | 811x600x286    | 72     | 75             |
| 50                   | 72             | 125                 | Consult us    | 6                | 6             | 811x600x286            | 811x600x286    | 77     | 80             |

### COSYS PFC23

| Power supply<br>Kvar | I nominal<br>A | Upstream protection |               | Figure n°        |               | Height x Width x Depth |                | Weight |                |
|----------------------|----------------|---------------------|---------------|------------------|---------------|------------------------|----------------|--------|----------------|
|                      |                | GG fuse (A)         | Fuserbloc (A) | (without switch) | (with switch) | mm                     | mm with switch | Kg     | Kg with switch |
| 10                   | 14             | 16                  | Consult us    | 6                | 6             | 811x600x286            | 811x600x286    | 50     | 50             |
| 15                   | 22             | 32                  | Consult us    | 6                | 6             | 811x600x286            | 811x600x286    | 53     | 55             |
| 20                   | 29             | 50                  | Consult us    | 6                | 6             | 811x600x286            | 811x600x286    | 55     | 57             |
| 30                   | 43             | 63                  | Consult us    | 6                | 6             | 811x600x286            | 811x600x286    | 63     | 65             |
| 40                   | 58             | 100                 | Consult us    | 6                | 6             | 811x600x286            | 811x600x286    | 72     | 75             |
| 50                   | 72             | 125                 | Consult us    | 6                | 6             | 811x600x286            | 811x600x286    | 77     | 80             |

### COSYS PFC24

| Power supply<br>Kvar | I nominal<br>A | Upstream protection |               | Figure n°        |               | Height x Width x Depth |                | Weight |                |
|----------------------|----------------|---------------------|---------------|------------------|---------------|------------------------|----------------|--------|----------------|
|                      |                | GG fuse (A)         | Fuserbloc (A) | (without switch) | (with switch) | mm                     | mm with switch | Kg     | Kg with switch |
| 10                   | 14             | 16                  | Consult us    | 6                | 6             | 811x600x286            | 811x600x286    | 50     | 50             |
| 15                   | 22             | 32                  | Consult us    | 6                | 6             | 811x600x286            | 811x600x286    | 53     | 55             |
| 20                   | 29             | 50                  | Consult us    | 6                | 6             | 811x600x286            | 811x600x286    | 55     | 57             |
| 30                   | 43             | 63                  | Consult us    | 6                | 6             | 811x600x286            | 811x600x286    | 63     | 65             |
| 40                   | 58             | 100                 | Consult us    | 6                | 6             | 811x600x286            | 811x600x286    | 72     | 75             |
| 50                   | 72             | 125                 | Consult us    | 6                | 6             | 811x600x286            | 811x600x286    | 77     | 80             |

# INSTALLATION

Figure 1

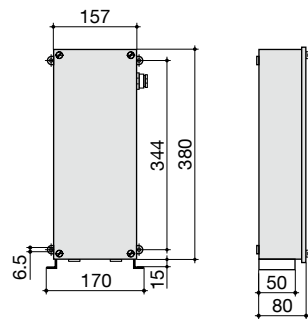


Figure 2

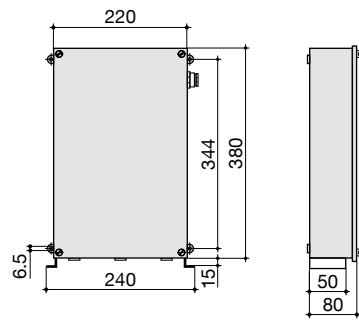


Figure 3

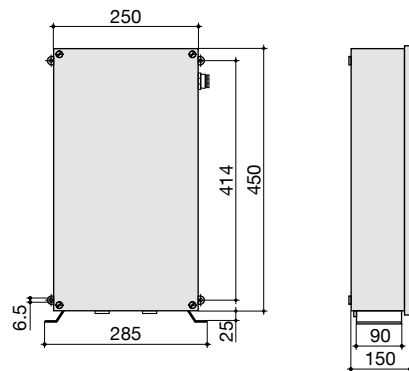


Figure 4

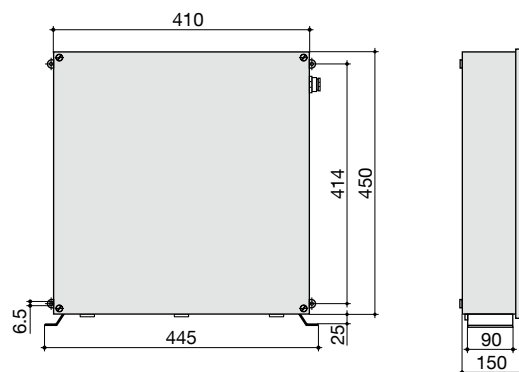


Figure 5

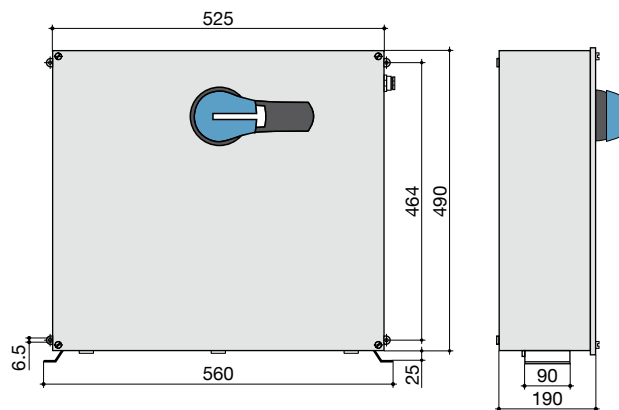
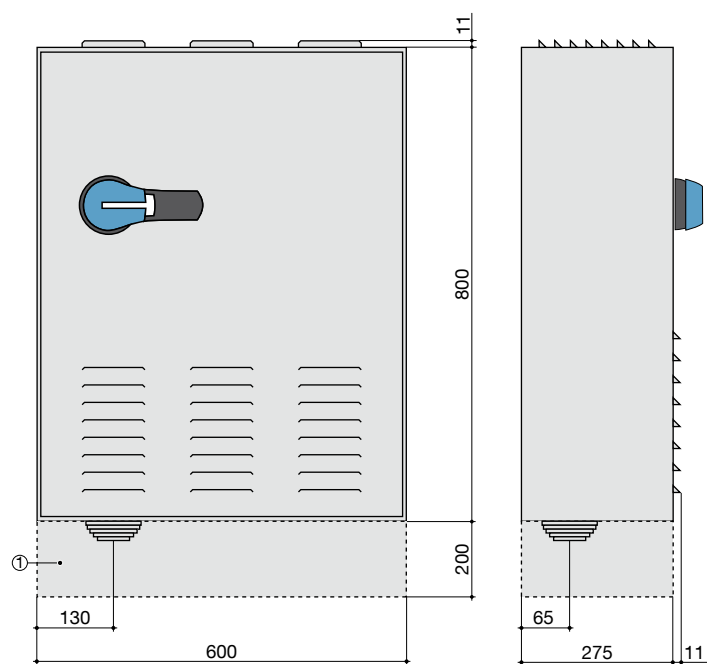


Figure 6



1: base plate optional

# COMMISSIONING AND MAINTENANCE

## Checking the equipment

Before commissioning the equipment, ensure that all connections are correctly tightened, as the terminals may become loose during transportation of the equipment from the production plant to the site (switch).

## Powering up

Once the operations in the previous paragraph have been carried out, the equipment can be started by closing the upstream panel protection and the PFC system cabinet switch (depending on the model).

## Maintenance

Routine maintenance of this equipment involves periodically checking (at least once every year) the following components:

- Auxiliary circuit fuses
- Capacitor fuses
- Cleanliness of the ventilation grille and the filter to ensure proper ventilation of the enclosure
- Retightening of the terminals
- Visual inspection of the capacitors by replacing those that are causing deforming of the upper part of the outer enclosure.

**SOCOMEc** can also offer:

- maintenance
- audit
- start-up
- training for your staff



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