

CAPACITORS & COMPONENTS

FOR LOW VOLTAGE P.F.C.



COMAR
Condensatori

Save Your **Energy.**

Introduction

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A photograph of a modern building facade with large windows and a prominent sign for 'COMAIR Condensatori'. The sign is mounted on a light-colored wall and features the word 'COMAIR' in large, bold, blue letters, with 'Condensatori' in a smaller, blue, cursive font below it. The building has a series of large windows reflecting the sky and trees. The overall scene is brightly lit, suggesting a sunny day.

COMAIR
Condensatori

Introduction

Since 1968 we provide standard products, as well as tailor-made solutions, depending on the needs of the Customer. We are leaders in the production of single-phase and three-phase **capacitors**, **power factor correction** equipment including those with blocking / de-tuning inductances, and **filters** for harmonic reduction.

Installers, design companies and end users find answers to their needs regarding both the correction of the power factor and the reduction of harmonics in electrical networks.

Strengthened by the value that **Made in Italy** represents, we sell in over 90 countries worldwide, thanks to a sales network that guarantees the availability of COMAR solutions for Power Factor Correction on every continent.

Vision

We firmly believe that the increased electricity demand of the developed and emerging countries must be faced first of all with the reduction of waste.

Power Factor Correction plays a fundamental role in the "intelligent" exploitation of the energy currently produced, in fact it postpones and limits the creation of new power plants, and it contributes to the **environment protection**, by reducing atmospheric emissions and non-renewable fuel consumption.

Mission




Provide state-of-the-art engineering solutions that, in addition to compliance with quality and safety standards, are also appreciated by Customers for their flexibility, respect of delivery times, ease of installation and maintenance,



Quality & Certifications

The excellence of COMAR Condensatori products is possible thanks to Italian supply chain, fully under control in our factory located near Bologna. The path to ensure the quality of the methods of design, procurement, production, testing and delivery sees the achievement of the **ISO 9001**, **ISO 14001** and **OHSAS 18001** certifications.

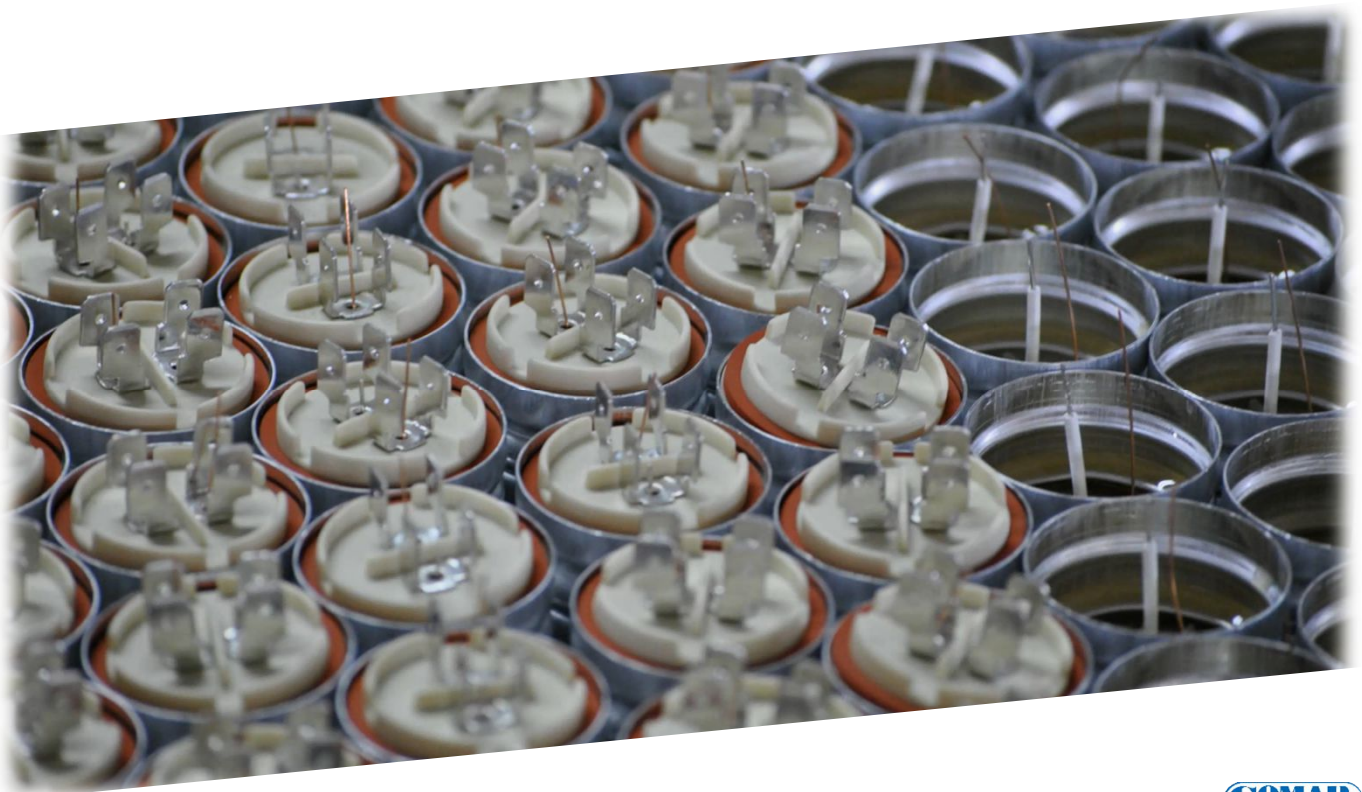
The quality of the company system permeates the products, which comply with the requirements of the main international regulations in the sector. All COMAR solutions, contained in this catalog, comply with the European directives for low voltage, concerning the minimum safety requirements and the emission / immunity of electrical devices:

- IEC/EN 60831-1/2 for capacitors, verified by the laboratories  **IMQ**
- IEC/EN 61439-1/2 and IEC/EN 61921 for P.F.C. equipment, verified by  **DEKRA**  **CESI**

All the products made by COMAR Condensatori are labelled with **CE marking**.

Materials & Environment

Thanks to constant work with suppliers, we guarantee the compliance of our products with the **RoHS** and **REACH** directives. Particular attention is given to the substances published in the SVHC list. We recommend that the out-of-service capacitors are disposed according to the local Laws and Regulations in force in each country. For EU Countries the European Directives 91/156 / EEC, 91/689 / EEC apply and the capacitors disposal shall be in compliance with the European Waste Identification Code (CER 2002).

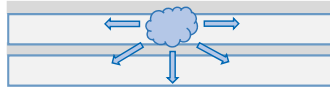


Capacitor Characteristics

Our strength lies both in the design of the P.F.C solution and in the constructive experience of the main element: the capacitor. In fact, our **metallized polypropylene (MKP)** capacitors are made of a bi-oriented polypropylene dielectric with low shrinkage and high mechanical properties. The most relevant feature of this type of film is the **self-healing of the dielectric** that allows the restoration of the electrical functionality:



Dielectric Micro short-circuit



Film and surface metallization melting

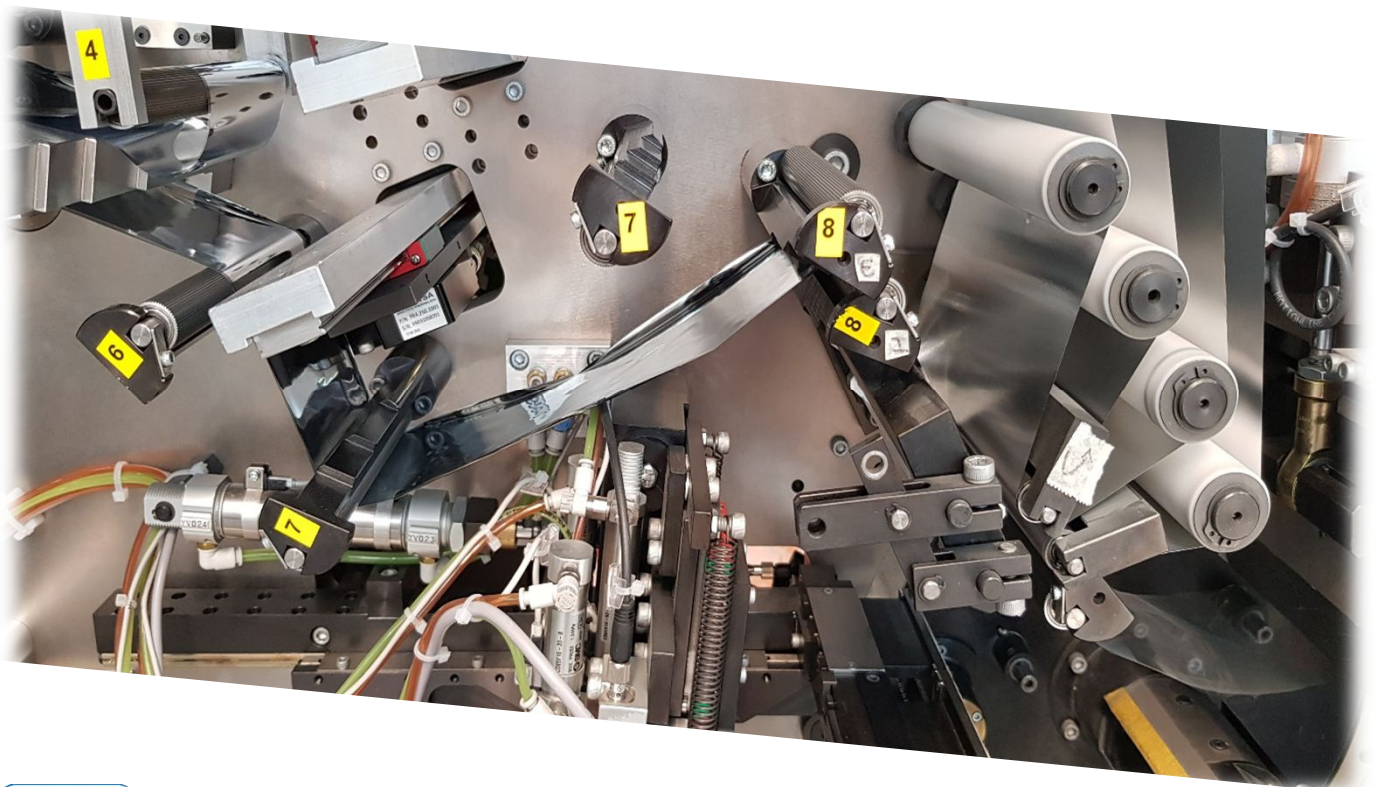


Isolation of the damaged area

The maximum allowable voltage on the capacitors is reported (CEI EN 60831-1) below:

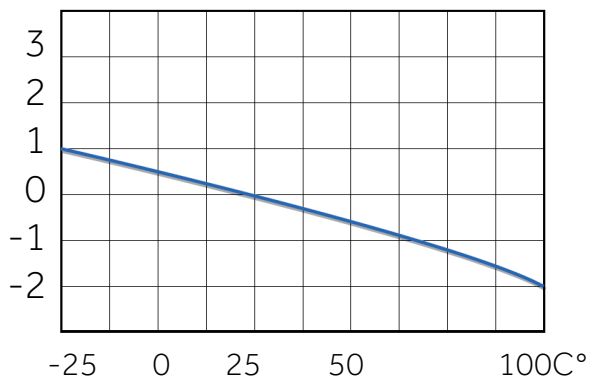
| Type | Overvoltage factor | Maximum duration | Remarks |
|-----------------------|--|------------------|---|
| Industrial frequency* | 1 | continuous | Maximum average value during period of energization |
| Industrial frequency* | 1,1 | 8h every 24h | Adjustment and fluctuations of the mains voltage |
| Industrial frequency* | 1,15 | 30 min every 24h | Adjustment and fluctuations of the mains voltage |
| Industrial frequency* | 1,2 | 5 min | Voltage increase at low load |
| Industrial frequency* | 1,3 | 1 min | Voltage increase at low load |
| Industrial frequency | Value such that the current does not exceed the maximum value of 1.5 In (overcurrent factor consequence of the combined effects of harmonics, overvoltages and capacity tolerance) | | |

* without harmonics

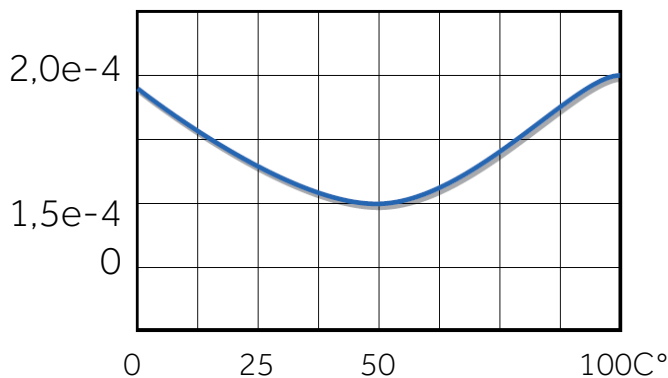


The technological and methodological measures adopted during the construction guarantee that our capacitor keeps its electrical characteristics stable over time. Below are summarized the key characteristics when temperature changes:

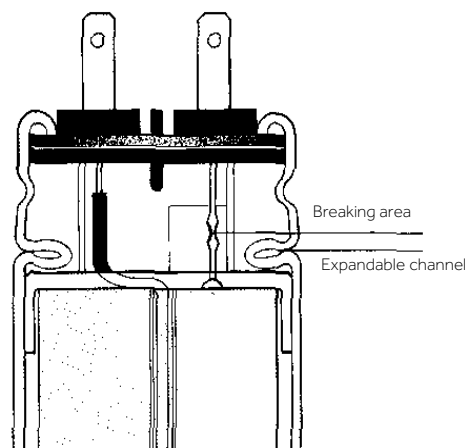
Delta C/C %



Tang. Delta



All capacitors are equipped with an **overpressure safety device** which, in the event of an internal short-circuit, disconnects the capacitor isolating it from the electrical network. This system is mechanical, based on the expansion of the metal housing and the consequent breaking of the internal connection wires.



The formation of electric arcs inside is prevented by the presence of **insulating oil**, of vegetable type, which immediately penetrates the breaking point of the wires.



Fixed P.F.C. of the Transformers and Motors

The **transformers** for the distribution of electrical energy can be made in two different types: oil-filled transformers, whose cooling does not require special aids and transformers insulated in resin, forced or natural cooled. It is always advisable to provide for a **fixed power factor correction of the MV / LV transformers**, since even if they operate without load (for example during the night), they absorb **reactive power** that must be compensated. The calculation of the necessary **capacitive power** can be performed using the approximate formula:

$$Q = I_0\% * \frac{Pn}{100}$$

I_0 = no-load current (supplied by the transformer manufacturer)

Pn = rated power of the transformer

Alternatively, if the requested data is not available, the following table can be used, differentiated by type of transformer with **normal** leakage characteristics.

| Transf. power(kVA) | Trasf. in OIL | Trasf. in RESIN |
|--------------------|---------------|-----------------|
| 100 | 5 | 2,5 |
| 160 | 7,5 | 5 |
| 200 | 7,5 | 5 |
| 250 | 7,5 | 7,5 |
| 315 | 10 | 7,5 |
| 400 | 10 | 7,5 |
| 500 | 12,5 | 7,5 |
| 630 | 15 | 10 |
| 800 | 17,5 | 10 |
| 1000 | 22,5 | 12,5 |
| 1250 | 25 | 15 |
| 1600 | 30 | 20 |
| 2000 | 35 | 22,5 |
| 2500 | 45 | 30 |
| 3150 | 55 | 45 |

One of the most common loads is the **three-phase asynchronous motor**, which can be re-phased locally, with the advantage of having the power cable run through by a lower current. The power of the capacitors must not exceed the no-load reactive power of the motor, due to the risk of self-excitation and resonance phenomena between the capacitor and the inductance of the machine. The following table shows the power factor correction in the case of a cage motor. For motors with wound rotor, an increase of 5% is recommended.

| Rated motor power | | 2 poles | | 4 poles | | 6 poles | | 8 poles | |
|-------------------|------|----------|------|----------|------|----------|------|---------|------|
| | | 3000 rpm | | 1500 rpm | | 1000 rpm | | 750 rpm | |
| HP | kW | no load | load | no load | load | no load | load | no load | load |
| 1 | 0,74 | 0,5 | 0,6 | 0,5 | 0,7 | 0,6 | 0,8 | 0,75 | 1 |
| 2 | 1,5 | 0,8 | 1 | 1 | 1,2 | 1,1 | 1,4 | 1 | 1,5 |
| 3 | 2,2 | 1,1 | 1,4 | 1,2 | 1,5 | 1,4 | 1,8 | 1,5 | 2 |
| 5,5 | 4,1 | 1,7 | 2,2 | 1,9 | 2,5 | 2,1 | 2,8 | 2,5 | 3,5 |
| 7,5 | 5,5 | 2,3 | 3 | 2,5 | 3,4 | 2,8 | 3,7 | 3 | 4,5 |
| 10 | 7,4 | 3 | 4,4 | 3,6 | 4,6 | 4,1 | 5,4 | 4,5 | 6 |
| 15 | 11 | 4 | 6,5 | 5,5 | 7,2 | 6 | 8 | 7 | 9 |
| 30 | 22 | 10 | 12,5 | 11 | 13,5 | 12 | 15 | 12,5 | 16 |
| 50 | 37 | 17,5 | 24 | 20 | 27 | 22 | 30 | 17,5 | 27,5 |
| 100 | 74 | 28 | 45 | 32 | 49 | 37 | 54 | 35 | 55 |
| 150 | 110 | 40 | 64 | 46 | 70 | 52 | 76 | 55 | 80 |
| 200 | 150 | 50 | 81 | 58 | 89 | 65 | 95 | 70 | 105 |
| 250 | 180 | 60 | 98 | 72 | 105 | 82 | 115 | 90 | 130 |
| 350 | 257 | 70 | 113 | 80 | 130 | 90 | 146 | 125 | 185 |



MK-AS • CTB • CT15 - 35 - 50

Single-phase and Three-phase Capacitors



MK-AS

P.F.C. Single-phase Capacitors



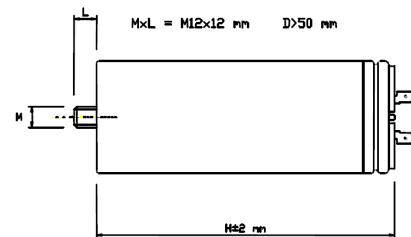
PERFORMANCE DATA

- Capacitance tolerance -5% / +10%.
- Rated frequency 50 Hz (60 Hz on request)
- Supply Single-phase
- Max. allowable voltage 1,1 Un (max. 8 /24 h)
- Safety device Overpressure disconnecter
- Expected life 80.000 / 130.000 hours

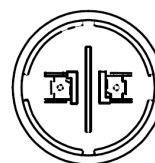
MK-AS capacitors are particularly suitable for harmonic filtering and low voltage **power factor correction**. These cylindrical polypropylene capacitors are made with an aluminium housing and allow **easy assembly**. The construction features of the series make the MK-AS a component of excellent quality and durability.

TECHNICAL DATA

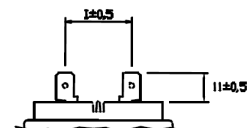
| | |
|-------------------------------|---|
| Dielectric | Self-healing metallised polypropylene (MKP). |
| Case | Aluminium. |
| Execution | Vegetable oil, PCB free. On request: dry type, in resin. |
| Fastening | M12 bolt. Nut and washer (included). |
| Degree of protection | IP 00. |
| Test voltage | 2,15 Un / 10 sec between terminals. 3000 Vac / 10 sec between terminal and case. |
| Dielectric losses | ≤ 0,2 W / kvar. |
| Total losses of the capacitor | ≤ 0,4 W / kvar. |
| Discharge resistors | Included (50V residual within 30 sec). |
| Safety device | Overpressure disconnecter |
| Max. voltage / time variation | < 30V / μs |
| Temperature class category | -25°C / D. |
| Ambient temperature | Max value: +55°C. Average daily: +45°C Average yearly: +35°C |
| Type of service | Continuous – indoor. |



Faston Dopplo 6,3
Double tinned faston 6,3



I = 24 mm D > 55 mm



QUALITY AND TESTING

| | |
|---------------------|---|
| Regulations | IEC / EN 60831-1/2; <u>certified by IMQ (V1927)</u> . |
| European directives | Low voltage: 2014/35/CE; Electromagnetic compatibility: 2014/30/CE. |

CONFIGURATIONS

Table

| Code | Rated power (kvar) | Capacitance (μ f) | Rated voltage (Vn) | Dimensions (D x H) | Fastening | Terminals |
|---------|-----------------------|---------------------------|-----------------------|-----------------------|-----------|---------------|
| 8490461 | 3,60 | 66,6 | 415 | 60 x 141 | M12 | Double Faston |
| 8490496 | 5,68 | 105 | 415 | 65 x 185 | M12 | Double Faston |
| 8490431 | 1,88 | 31 | 440 | 60 x 107 | M12 | Double Faston |
| 8490438 | 2,34 | 38,5 | 440 | 60 x 107 | M12 | Double Faston |
| 8490465 | 3,34 | 55 | 440 | 60 x 131 | M12 | Double Faston |
| 8490479 | 4,68 | 77 | 440 | 60 x 131 | M12 | Double Faston |
| 8490384 | 5,10 | 84 | 440 | 60 x 185 | M12 | Double Faston |
| 8490492 | 5,59 | 92 | 440 | 65 x 185 | M12 | Double Faston |
| 8490639 | 3,02 | 38,5 | 500 | 65 x 107 | M12 | Double Faston |
| 8490556 | 4,39 | 56 | 500 | 65 x 185 | M12 | Double Faston |
| 8490562 | 4,86 | 62 | 500 | 65 x 157 | M12 | Double Faston |
| 8490577 | 6,04 | 77 | 500 | 65 x 185 | M12 | Double Faston |
| 8490621 | 1,99 | 21 | 550 | 60 x 107 | M12 | Double Faston |
| 8490650 | 4,75 | 50 | 550 | 65 x 185 | M12 | Double Faston |

Series of **DMP** capacitors, which guarantee longer life thanks to **wave-cut** technology:

| Code | Rated power (kvar) | Capacitance (μ f) | Rated voltage (Vn) | Dimensions (D x H) | Fastening | Terminals |
|---------|-----------------------|---------------------------|-----------------------|-----------------------|-----------|---------------|
| 8490540 | 3,66 | 38,5 | 550 | 65 x 107 | M12 | Double Faston |
| 8490766 | 6,33 | 66,6 | 550 | 65 x 185 | M12 | Double Faston |
| 8490767 | 7,32 | 77 | 550 | 65 x 185 | M12 | Double Faston |

Other solutions are available upon request.



CTB capacitors, available in three terminations, are the ideal solution to compensate for small loads. When assembled on racks, they can be used in automatic P.F.C. equipment. They are equipped with an **overpressure safety device**.

PERFORMANCE DATA

- Capacitance tolerance -5% / +10%.
- Rated frequency 50 Hz (60 Hz on request)
- Supply Three-phase
- Max. allowable voltage 1,1 Un (max. 8 /24 h)
- Safety device Overpressure disconnector
- Expected life 130,000 hours

HARMONIC CONTENT (in absence of resonance)

THD(I)max. = 10% on the network

TECHNICAL DATA

| | |
|-------------------------------|--|
| Dielectric | Self-healing metallised polypropylene (MKP). |
| Case | Aluminium. |
| Execution | Resin (dry type). |
| Fastening | M12 threaded bolt for ground fixing. Nut and washer included. |
| Degree of protection | IP 40 (with cover for the version $\varnothing 70 \div 85$ mm). IP 20 (with clamp for the version $\varnothing \geq 100$ mm). |
| Test voltage | 2,15 Un / 10 seconds between terminals. 3000 Vac / 10 seconds between terminal and case. |
| Dielectric losses | $\leq 0,2$ W / kvar. |
| Total losses of the capacitor | $\leq 0,4$ W / kvar. |
| Discharge resistors | Included (75V residues within 3 minutes). For $\varnothing \leq 70$ mm, located internally.. |
| Max. voltage / time variation | $< 25V / \mu s$ |
| Temperature class category | -25°C / C (on request: -25 ° C / D). |
| Ambient temperature | Max value: +50°C. Average daily: +40°C Average yearly: +30°C |
| Type of service | Continuous. |

TERMINATIONS

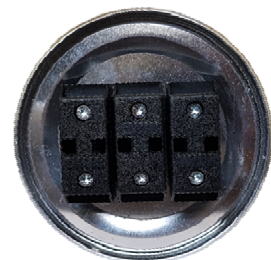
faston 6,3



threaded screw M8



clamp



QUALITY AND TESTING

Regulations IEC EN 60831-1 : 2015. IEC EN 60831-2 : 2015.
European directives Low voltage: 2014/35/CE.

CONFIGURATIONS

Notes

- In order to make capacitor banks, it is necessary to use suitable discharge resistors and current peak limiting systems upon insertion, compatibly with the characteristics of the capacitors (25 A / μ F).

Table

THD(I)max. = 10% on the network

| Code | Capacitance μ F | 50 Hz | | | Terminals | Dimensions D x H | Code |
|----------|------------------------|-------|-----|------|------------|---------------------|-----------|
| | | kVAr | V | A | | | |
| 8302475 | 3 x 31 | 5 | 415 | 7 | faston 6,3 | resina | 70 x 200 |
| 8302481 | 3 x 47 | 7,5 | 415 | 10,4 | faston 6,3 | resina | 70 x 200 |
| 8302579 | 3 x 62 | 10 | 415 | 14 | M8 | resina | 85 x 200 |
| 8302588 | 3 x 77 | 12,5 | 415 | 17,4 | M8 | resina | 85 x 200 |
| 8302599 | 3 x 92 | 15 | 415 | 20,9 | M8 | resina | 85 x 295 |
| 8302600 | 3 x 123 | 20 | 415 | 27,8 | M8 | resina | 85 x 295 |
| 8302622 | 3 x 154 | 25 | 415 | 34,8 | morsetto | resina | 100 x 285 |
| 8304811 | 3 x 55 | 10 | 440 | 13,1 | M8 | resina | 85 x 200 |
| 8304813 | 3 x 66 | 12,5 | 440 | 16,4 | M8 | resina | 85 x 200 |
| 8304804 | 3 x 109 | 20 | 440 | 26,2 | morsetto | resina | 100 x 350 |
| 83048085 | 3 x 137 | 25 | 440 | 32,8 | morsetto | resina | 100 x 350 |
| 8304838 | 3 x 164 | 30 | 440 | 39,4 | morsetto | resina | 120 x 350 |
| 8304852 | 3 x 219 | 40 | 440 | 52,5 | morsetto | resina | 136 x 350 |
| 8304854 | 3 x 274 | 50 | 440 | 65,6 | morsetto | resina | 136 x 350 |
| 8306790 | 3 x 69 | 15 | 480 | 18 | M8 | resina | 85 x 295 |
| 8306799 | 3 x 115 | 25 | 480 | 30 | morsetto | resina | 120 x 225 |
| 83068075 | 3 x 154 | 33,4 | 480 | 40,2 | morsetto | resina | 136 x 230 |
| 83068115 | 3 x 38 | 10 | 525 | 11 | M8 | resina | 85 x 200 |
| 8307031 | 3 x 48 | 12,5 | 525 | 13,7 | M8 | resina | 85 x 200 |
| 8307032 | 3 x 57,8 | 15 | 525 | 16,5 | M8 | resina | 85 x 295 |
| 8306819 | 3 x 77 | 20 | 525 | 22 | morsetto | resina | 100 x 350 |
| 8306827 | 3 x 96 | 25 | 525 | 27,5 | morsetto | resina | 120 x 350 |
| 8306832 | 3 x 115 | 30 | 525 | 33 | morsetto | resina | 120 x 350 |
| 8306840 | 3 x 154 | 40 | 525 | 44 | morsetto | resina | 136 x 350 |
| 8306910 | 3 x 67 | 10 | 690 | 8,4 | morsetto | resina | 100 x 285 |
| 8306900 | 3 x 83 | 12,5 | 690 | 10,5 | morsetto | resina | 100 x 285 |
| 8306920 | 3 x 133 | 20 | 690 | 16,7 | morsetto | resina | 100 x 285 |
| 8306925 | 3 x 167 | 25 | 690 | 20,9 | morsetto | resina | 120 x 350 |

Other solutions are available upon request.

CT15 - 35 - 50

P.F.C. Three-phase Capacitors



The three-phase modular capacitors of the **CT** series, available in three types, are designed for low-voltage power factor correction. The construction of the capacitors is made to guarantee excellent thermal dissipation. Three single-phase units are assembled inside, each equipped with an anti-burst device.

PERFORMANCE DATA

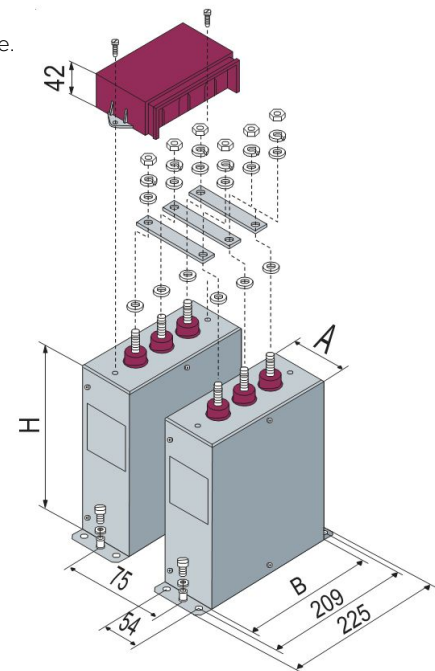
| | |
|--------------------------|---------------------------|
| ■ Capacitance tolerance | -5% / +10 |
| ■ Rated frequency | 50 Hz |
| ■ Supply | Three-phase |
| ■ Max. allowable voltage | 1,1 Un (max. 8 /24 h) |
| ■ Safety device | Overpressure disconnecter |
| ■ Expected life | 80.000 / 130.000 hours |

HARMONIC CONTENT (in absence of resonance)

| | | |
|-------|------------------|----------------|
| CT15: | THD(I)max. = 15% | on the network |
| CT35: | THD(I)max. = 25% | on the network |
| CT50: | THD(I)max. = 35% | on the network |

TECHNICAL DATA

| | |
|-------------------------------|---|
| Dielectric | Self-healing metallised polypropylene (MKP). |
| Case | Metal (external housing). |
| Execution | Vegetable oil, PCB free. On request: dry type, in resin. |
| Fastening | With screw, maximum tightening torque for lead: 7Nm. |
| Degree of protection | IP 40 with cover. |
| Test voltage | 2,15 Un / 10 seconds between terminals. 3000 Vac / 10 seconds between terminal and case. |
| Dielectric losses | ≤ 0,2 W / kvar. |
| Total losses of the capacitor | ≤ 0,4 W / kvar. |
| Discharge resistors | Included (75V residues within 3 minutes). |
| Max. voltage / time variation | 25V / μs |
| Temperature class category | -25°C / D. |
| Ambient temperature | Max value: +55°C. Average daily: +45°C Average yearly: +35°C |
| Type of service | Continuous – indoor. |



QUALITY AND TESTING

| | |
|---------------------|-----------------------------|
| Regulations | IEC / EN 60831-1/2. |
| European directives | Low voltage: 2014/35/CE; E. |

CONFIGURATIONS

Notes

- The parallel connection bars, which allow the modularity of the product, have a maximum capacity of 72A and are included in the supply.
- The dimensions are fixed: A = 70 mm ; B = 210 mm; H = 250 mm
- The assembly of the CT series units is always vertical.
- In order to make capacitor banks, it is necessary to use suitable discharge resistors and current peak limiting systems upon insertion, compatibly with the characteristics of the capacitors (25 A / μ F).

Table

THD(I)max. = 15%

THD(U)max. = 5%

THD(Ic)max. = 50%

| Code | Type | Capacitance μ F | Nominal Parameters | | | Reference Parameters | | | Terminals | Weight kg |
|---------|------|------------------------|--------------------|-----|------|----------------------|---|---|-----------|--------------|
| | | | kVAr | V | A | kVAr | V | A | | |
| 8371105 | CT15 | 3 x 31 | 5 | 415 | 7 | - | - | - | M8 | 2,5 |
| 8371110 | CT15 | 3 x 62 | 10 | 415 | 14,0 | - | - | - | M8 | 3,0 |

THD(I)max. = 25%

THD(U)max. = 9%

THD(Ic)max. = 70%

| Code | Type | Capacitance μ F | Nominal Parameters | | | Reference Parameters | | | Terminals | Weight kg |
|---------|------|------------------------|--------------------|-----|------|----------------------|-----|------|-----------|--------------|
| | | | kVAr | V | A | kVAr | V | A | | |
| 8371505 | CT35 | 3 x 21 | 3,4 | 415 | 4,7 | 4,3 | 440 | 5,7 | M8 | 2,4 |
| 8371510 | CT35 | 3 x 38,5 | 6,25 | 415 | 8,7 | 8,0 | 440 | 10,4 | M8 | 2,8 |
| 8371512 | CT35 | 3 x 77 | 12,5 | 415 | 17,4 | 15,9 | 440 | 20,9 | M8 | 3,3 |

THD(I)max. = 35%

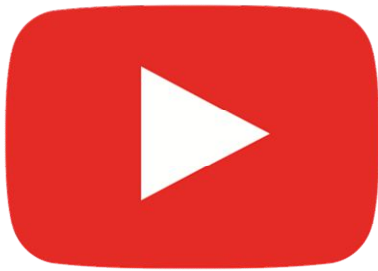
THD(U)max. = 10%

THD(Ic)max. = 80%

| Code | Type | Capacitance μ F | Nominal Parameters | | | Reference Parameters | | | Terminals | Weight kg |
|---------|------|------------------------|--------------------|-----|------|----------------------|-----|------|-----------|--------------|
| | | | kVAr | V | A | kVAr | V | A | | |
| 8373505 | CT50 | 3 x 21 | 3,4 | 415 | 4,7 | 4,3 | 440 | 5,7 | M8 | 2,4 |
| 8373510 | CT50 | 3 x 38,5 | 6,25 | 415 | 8,7 | 8,0 | 440 | 10,4 | M8 | 2,9 |
| 8373512 | CT50 | 3 x 77 | 12,5 | 415 | 17,4 | 15,9 | 440 | 20,9 | M8 | 3,4 |

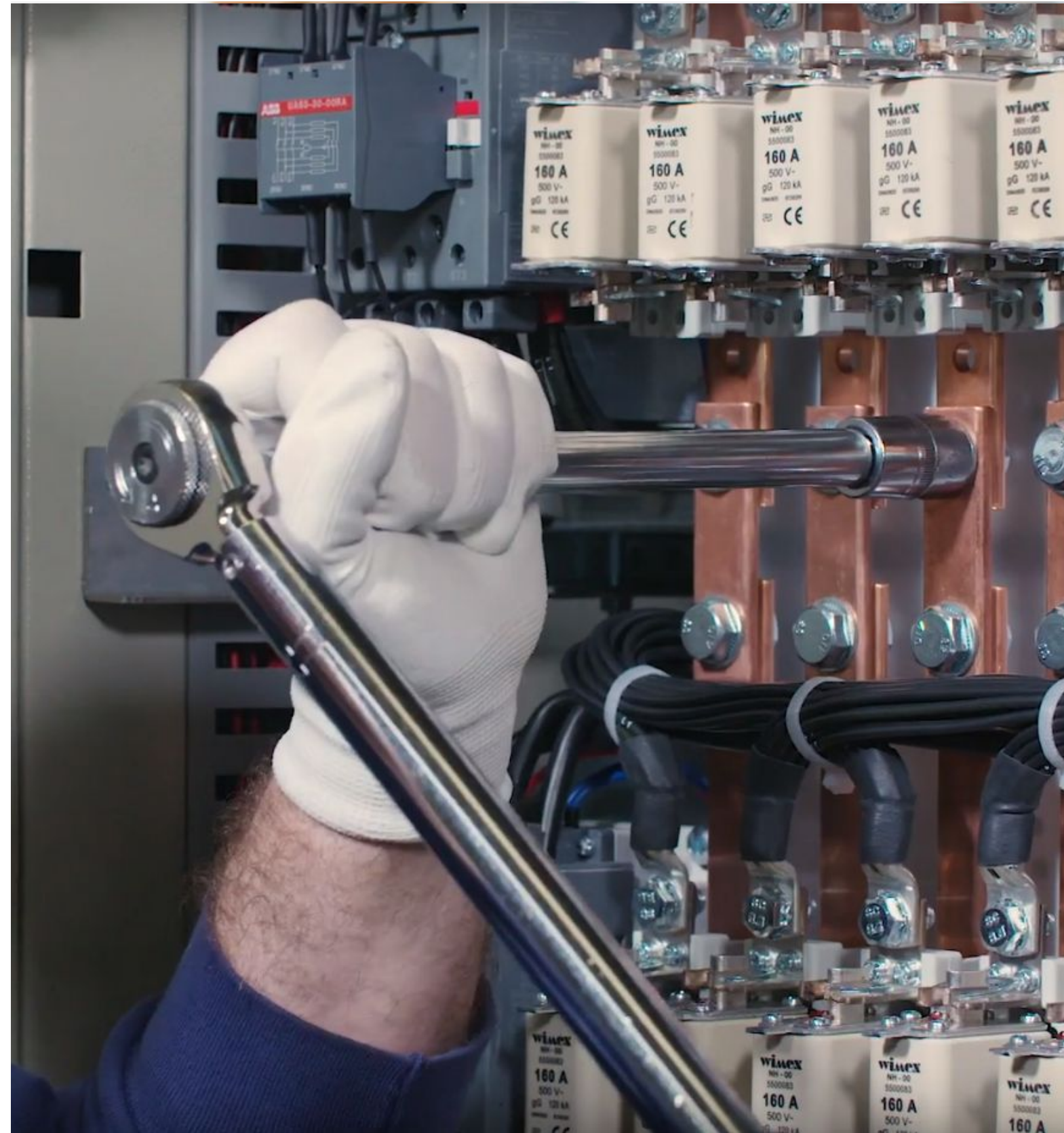
Other solutions are available upon request.

Watch our **Videos!**



Video tutorials of our PFC solutions are available on our **Youtube** channel!

www.youtube.com





RPC • RCM • RCL

Modular Racks





The **RPC** capacitor racks have been specifically designed for installation inside panels made up of a modular structure suitable for housing 19-inch racks. This dimension is the market standard for hardware elements (eg UPS, servers, routers, ...) to be inserted into cabinets for **Data** and **Power Centers**.

PERFORMANCE DATA

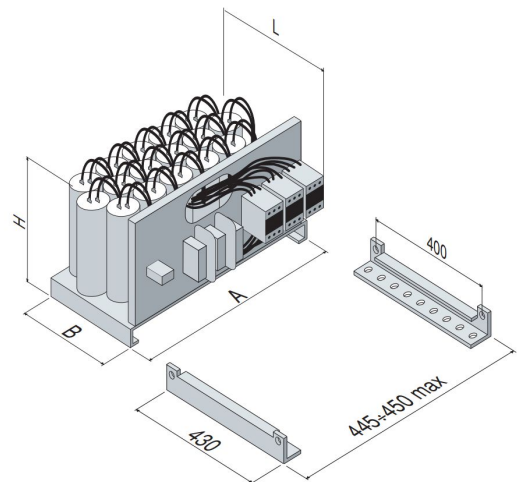
- Capacitance tolerance -5% / +10
- Rated frequency 50 Hz
- Supply Three-phase + ground
- Max. allowable voltage 1,1 Un (max. 8 /24 h)
- Safety device Overpressure disconnecter
- Auxiliary circuits 230 Vac (110 Vac on request)

HARMONIC CONTENT (in absence of resonance)

- RPC-B15: THD(I)max. = 15% on the network
- RPC-B50: THD(I)max. = 35% on the network

TECHNICAL DATA

| | |
|----------------------|---|
| Frame | In galvanized steel sheet. |
| Ventilation | Not provided. By the installer / assembler. |
| Installation | Indoor, in carpentry not exposed to direct sunlight. |
| Degree of protection | IP 00. |
| Fuses | Capacitive banks are protected by three fuses. The protection system of the power circuits (fuses NH-00 curve gG) foresees the use of fuses with high breaking capacity (100kA). |
| Contactors | Suitable for switching capacitive loads with pre-insertion resistors. |
| Capacitors | <p>Single-phase capacitors in self-regenerable metallised polypropylene (MKP), equipped with an explosion-proof device and discharge resistance. They are impregnated in vegetable oil, free of PCBs. Triangle connection. Type of continuous service.</p> <ul style="list-style-type: none"> • rated voltage / max. voltage: - B15: 415 Vac / 450 Vac - B50: 500 Vac / 550 Vac • overvoltage: 1.1 x Un (8h / 24h) • current overload: 1.3 x In • tolerance on capacity: -5% / + 10% • dissipation losses: ≤0.4 W / kvar |
| Thermal category | -25°C / D. |
| Room temperature | -5°C / +40°C |



QUALITY AND TESTING

| | |
|---------------------|---|
| Regulations | IEC / EN 60831-1/2. EN 61921. |
| European directives | Low voltage: 2014/35/CE; Electromagnetic compatibility: 2014/30/CE. |

CONFIGURATIONS

Notes

- Rated power is expressed at 415 V - 50 Hz.
- To protect the capacitor banks, an insulation and protection device must be installed in the power supply line. Racks must be grounded.

The racks are available in two different versions, for applications with different voltage harmonic content allowed on the network

RPC-B15: THD(I)max. = 15% on the network
 THD(Ic)max. = 50% on the capacitors

RPC-B50: THD(I)max. = 35% on the network
 THD(Ic)max. = 80% on the capacitors

Table

| Code | Type | Qn (kvar) | In (A) | Power per bank | | | Steps combination (n) | Dimensions A x B x L x H (mm) | Weight (kg) |
|---------------|---------|--------------|-----------|----------------|------|----|-----------------------------|----------------------------------|----------------|
| | | | | | | | | | |
| 8701412250320 | RPC-B15 | 25 | 35 | 12,5 | 12,5 | | 2 x 12,5 | 440 x 340 x 490 x 270 | 11 |
| 8701412375320 | RPC-B15 | 37,5 | 52 | 12,5 | 25 | | 3 x 25 | 440 x 340 x 490 x 270 | 13 |
| 8701412500320 | RPC-B15 | 50 | 70 | 12,5 | 12,5 | 25 | 4 x 12,5 | 440 x 340 x 490 x 270 | 17 |
| 8701412750320 | RPC-B15 | 75 | 104 | 25 | 25 | 25 | 3 x 25 | 440 x 340 x 490 x 270 | 19 |
| 8701413100320 | RPC-B15 | 100 | 139 | 25 | 25 | 50 | 4 x 25 | 440 x 340 x 490 x 270 | 23 |
| 8701414010320 | RPC-B15 | 100 | 139 | 50 | 50 | | 2 x 50 | 440 x 340 x 490 x 270 | 23 |
| 8721412250350 | RPC-B50 | 25 | 35 | 12,5 | 12,5 | | 2 x 12,5 | 440 x 340 x 490 x 270 | 13 |
| 8721412375350 | RPC-B50 | 37,5 | 52 | 12,5 | 25 | | 3 x 25 | 440 x 340 x 490 x 270 | 15 |
| 8721412500350 | RPC-B50 | 50 | 70 | 12,5 | 12,5 | 25 | 4 x 12,5 | 440 x 340 x 490 x 270 | 19 |
| 8721412750350 | RPC-B50 | 75 | 104 | 25 | 25 | 25 | 3 x 25 | 440 x 340 x 490 x 270 | 21 |
| 8721413100350 | RPC-B50 | 100 | 139 | 25 | 25 | 50 | 4 x 25 | 440 x 340 x 490 x 270 | 25 |
| 8721414010350 | RPC-B50 | 100 | 139 | 50 | 50 | | 2 x 50 | 440 x 340 x 490 x 270 | 25 |

Other solutions are available upon request.



The **RCM** series capacitor racks are designed for our **G6E** and **G8E** type cabinets. Inside each rack are assembled single-phase capacitor terns. In the case of a high level of harmonic current distortion, versions with blocking reactors (**AAR** / ... series) are available.

PERFORMANCE DATA

- Capacitance tolerance -5% / +10
- Rated frequency 50 Hz
- Supply Three-phase + ground
- Max. allowable voltage 1,1 Un (max. 8 /24 h)
- Safety device Overpressure disconnecter
- Auxiliary circuits 230 Vac (110 Vac on request)

HARMONIC CONTENT (in absence of resonance)

| | | |
|-------------|-------------------|----------------|
| RCM-B15: | THD(I)max. = 15% | on the network |
| RCM-B35: | THD(I)max. = 25% | on the network |
| RCM-B50: | THD(I)max. = 35% | on the network |
| RCM-AAR/... | THD(I)max. = 100% | on the network |

TECHNICAL DATA

| | |
|----------------------|---|
| Frame | In galvanized steel sheet. |
| Ventilation | Not provided. By the installer / assembler. |
| Installation | Indoor, in carpentry not exposed to direct sunlight. |
| Degree of protection | IP 00. |
| Fuses | Capacitive banks are protected by three fuses. The protection system of the power circuits (fuses NH-00 curve gG) foresees the use of fuses with high breaking capacity (100kA). |
| Contactors | Suitable for switching capacitive loads. |
| Capacitors | <p>Single-phase capacitors in self-regenerable metallised polypropylene (MKP), equipped with an explosion-proof device and discharge resistance. They are impregnated in vegetable oil, free of PCBs. Triangle connection. Type of continuous service.</p> <ul style="list-style-type: none"> • rated voltage / max. voltage: <ul style="list-style-type: none"> - B15: 415 Vac / 450 Vac - B35: 440 Vac / 500 Vac - B50: 500 Vac / 550 Vac - AAR/...: 500 Vac / 550 Vac • overvoltage: 1.1 x Un (8h / 24h) • current overload: 1.3 x In • tolerance on capacity: -5% / + 10% • dissipation losses: ≤0.4 W / kvar |
| Detuning reactors | <p>For series AAR/100 - AAR/600 - AAR/D20:</p> <ul style="list-style-type: none"> • Tuning frequency: 189 Hz (p = 7%) • Power losses: 6 W / kvar (AVG) <p>For series AAR/138:</p> <ul style="list-style-type: none"> • Tuning frequency: 138 Hz (p = 14%) • Power losses: 6,5 W / kvar (AVG) |
| Thermal category | -25°C / D. |
| Room temperature | -5°C / +40°C |

QUALITY AND TESTING

| | |
|---------------------|---|
| Regulations | IEC / EN 60831-1/2. EN 61921. |
| European directives | Low voltage: 2014/35/CE; Electromagnetic compatibility: 2014/30/CE. |

CONFIGURATIONS

Notes

- **Rated power** is expressed at **415 V - 50 Hz for the RCM-B...** series, at **400 V - 50 Hz for the RCM-AAR / ...** Series
- To protect the capacitor banks, an insulation and protection device must be installed in the power supply line. Racks must be grounded.

The racks are available in different versions, for applications with different harmonic content in current or different harmonic content in voltage (series with inductances), admitted on the capacitors.

Without blocking reactors :

RCM-B15: THD(I)max. = 15% on the network
THD(Ic)max. = 50% on the capacitors

RCM-B35: THD(I)max. = 25% on the network
THD(Ic)max. = 70% on the capacitors

RCM-B50: THD(I)max. = 35% on the network
THD(Ic)max. = 80% on the capacitors

With blocking reactors (and thermal probe 130°C, N.C.):

RCM-AAR/100: THD(I)max. = 100% on the network
THD(U)max. = 3% on the network

RCM-AAR/138: THD(I)max. = 100% on the network
THD(U)max. = 6% on the network

RCM-AAR/600: THD(I)max. = 100% on the network
THD(U)max. = 6% on the network

RCM-AAR/D20: THD(I)max. = 100% on the network
THD(U)max. = 20% on the network

Table

| Code | Type | Qn (kvar) | In (A) | Power per bank | | | Steps combination (n) | Dimensions A x B x L x H (mm) | Weight (kg) |
|---------------|-------------|--------------|-----------|----------------|----|----|-----------------------------|----------------------------------|----------------|
| | | | | | | | | | |
| 8701412500420 | RCM-B15 | 50 | 70 | 50 | | | 1 x 50 | 532 x 375 x 480 x 300 | 15 |
| 8701412750420 | RCM-B15 | 75 | 104 | 75 | | | 1 x 75 | 532 x 375 x 480 x 300 | 17 |
| 8701413050420 | RCM-B15 | 50 | 70 | 25 | 25 | | 2 x 25 | 532 x 375 x 480 x 300 | 18 |
| 8701413075420 | RCM-B15 | 75 | 104 | 25 | 50 | | 3 x 25 | 532 x 375 x 480 x 300 | 20 |
| 8701413100420 | RCM-B15 | 100 | 139 | 50 | 50 | | 2 x 50 | 532 x 375 x 480 x 300 | 23 |
| 8701413150420 | RCM-B15 | 150 | 209 | 75 | 75 | | 2 x 75 | 532 x 375 x 480 x 300 | 29 |
| 8701414015420 | RCM-B15 | 150 | 209 | 25 | 50 | 75 | 6 x 25 | 532 x 375 x 480 x 300 | 30 |
| 8791412500440 | RCM-B35 | 50 | 70 | 50 | | | 1 x 50 | 532 x 375 x 480 x 300 | 15 |
| 8791412750440 | RCM-B35 | 75 | 104 | 75 | | | 1 x 75 | 532 x 375 x 480 x 300 | 17 |
| 8791413050440 | RCM-B35 | 50 | 70 | 25 | 25 | | 2 x 25 | 532 x 375 x 480 x 300 | 18 |
| 8791413075440 | RCM-B35 | 75 | 104 | 25 | 50 | | 3 x 25 | 532 x 375 x 480 x 300 | 20 |
| 8791413100440 | RCM-B35 | 100 | 139 | 50 | 50 | | 2 x 50 | 532 x 375 x 480 x 300 | 23 |
| 8791413150440 | RCM-B35 | 150 | 209 | 75 | 75 | | 2 x 75 | 532 x 375 x 480 x 300 | 29 |
| 8791414015440 | RCM-B35 | 150 | 209 | 25 | 50 | 75 | 6 x 25 | 532 x 375 x 480 x 300 | 30 |
| 8721412500450 | RCM-B50 | 50 | 70 | 50 | | | 1 x 50 | 532 x 375 x 480 x 300 | 15 |
| 8721412750450 | RCM-B50 | 75 | 104 | 75 | | | 1 x 75 | 532 x 375 x 480 x 300 | 17 |
| 8721413050450 | RCM-B50 | 50 | 70 | 25 | 25 | | 2 x 25 | 532 x 375 x 480 x 300 | 18 |
| 8721413075450 | RCM-B50 | 75 | 104 | 25 | 50 | | 3 x 25 | 532 x 375 x 480 x 300 | 20 |
| 8721413100450 | RCM-B50 | 100 | 139 | 50 | 50 | | 2 x 50 | 532 x 375 x 480 x 300 | 23 |
| 8721413150450 | RCM-B50 | 150 | 209 | 75 | 75 | | 2 x 75 | 532 x 375 x 480 x 300 | 29 |
| 8721414015450 | RCM-B50 | 150 | 209 | 25 | 50 | 75 | 6 x 25 | 532 x 375 x 480 x 300 | 30 |
| 8731402125750 | RCM-AAR/100 | 12,5 | 18 | 12,5 | | | 1 x 12,5 | 532 x 375 x 480 x 300 | 24 |
| 8731402250750 | RCM-AAR/100 | 25 | 36 | 25 | | | 1 x 25 | 532 x 375 x 480 x 300 | 30 |
| 8731402500750 | RCM-AAR/100 | 50 | 72 | 50 | | | 1 x 50 | 532 x 375 x 480 x 300 | 44 |
| 8731402750750 | RCM-AAR/100 | 75 | 108 | 75 | | | 1 x 75 | 532 x 375 x 480 x 300 | 56 |
| 8731403050750 | RCM-AAR/100 | 50 | 72 | 25 | 25 | | 2 x 25 | 532 x 375 x 480 x 300 | 64 |
| 8731403075750 | RCM-AAR/100 | 75 | 108 | 25 | 50 | | 3 x 25 | 532 x 375 x 480 x 300 | 69 |
| 8831402125700 | RCM-AAR/138 | 12,5 | 18 | 12,5 | | | 1 x 12,5 | 532 x 375 x 480 x 300 | 26 |
| 8831402225700 | RCM-AAR/138 | 25 | 36 | 25 | | | 1 x 25 | 532 x 375 x 480 x 300 | 33 |
| 8831402500700 | RCM-AAR/138 | 50 | 72 | 50 | | | 1 x 50 | 532 x 375 x 480 x 300 | 45 |
| 8831403050700 | RCM-AAR/138 | 50 | 72 | 25 | 25 | | 2 x 25 | 532 x 375 x 480 x 300 | 58 |
| 8741402125650 | RCM-AAR/600 | 12,5 | 18 | 12,5 | | | 1 x 12,5 | 532 x 375 x 480 x 300 | 26 |
| 8741402225650 | RCM-AAR/600 | 25 | 36 | 25 | | | 1 x 25 | 532 x 375 x 480 x 300 | 34 |
| 8741402500650 | RCM-AAR/600 | 50 | 72 | 50 | | | 1 x 50 | 532 x 375 x 480 x 300 | 46 |
| 8741403050650 | RCM-AAR/600 | 50 | 72 | 25 | 25 | | 2 x 25 | 532 x 375 x 480 x 300 | 56 |
| 8741403075650 | RCM-AAR/600 | 75 | 108 | 75 | | | 1 x 75 | 532 x 375 x 480 x 300 | 68 |
| 8901402250620 | RCM-AAR/D20 | 25 | 36 | 25 | | | 1 x 25 | 532 x 375 x 480 x 300 | 34 |
| 8901402500620 | RCM-AAR/D20 | 50 | 72 | 50 | | | 1 x 50 | 532 x 375 x 480 x 300 | 46 |

Other solutions are available upon request.



The **RCL** series racks are designed for our **G9E** type cabinets. Inside each rack are assembled single-phase capacitor terns. The versions shown in the catalog are all equipped with blocking rectors, for applications with a high level of harmonic current distortion.

PERFORMANCE DATA

- Capacitance tolerance -5% / +10
- Rated frequency 50 Hz
- Supply Three-phase + ground
- Max. allowable voltage 1,1 Un (max. 8 /24 h)
- Safety device Overpressure disconnecter
- Auxiliary circuits 230 Vac (110 Vac on request)

HARMONIC CONTENT

| | | |
|--------------|-------------------|----------------|
| RCL-AAR/138: | THD(I)max. = 100% | on the network |
| | THD(U)max. = 6% | on the network |
| RCL-AAR/D20 | THD(I)max. = 100% | on the network |
| | THD(U)max. = 20% | on the network |

TECHNICAL DATA

| | |
|-----------------------------|--|
| Frame | In galvanized steel sheet. |
| Ventilation | Not provided. By the installer / assembler. |
| Installation | Indoor, in carpentry not exposed to direct sunlight. |
| Degree of protection | IP 00. |
| Fuses | Capacitive banks are protected by three fuses. The protection system of the power circuits (fuses NH-00 curve gG) foresees the use of fuses with high breaking capacity (100kA). |
| Contactors | Suitable for switching capacitive loads. |
| Capacitors | <p>Single-phase capacitors in self-regenerable metallised polypropylene (MKP), equipped with an explosion-proof device and discharge resistance. They are impregnated in vegetable oil, free of PCBs. Triangle connection. Type of continuous service.</p> <ul style="list-style-type: none"> • rated voltage / max. voltage: - AAR/138: 500 Vac / 550 Vac - AAR/D20: 550 Vac / 600 Vac • overvoltage: 1.1 x Un (8h / 24h) • current overload: 1.3 x In • tolerance on capacity: -5% / + 10% • dissipation losses: ≤0.4 W / kvar <p>For series AAR/D20:</p> <ul style="list-style-type: none"> • Tuning frequency: 189 Hz (p = 7%) • Power losses: 6 W / kvar (AVG) <p>For series AAR/138:</p> <ul style="list-style-type: none"> • Tuning frequency: 138 Hz (p = 14%) • Power losses: 6,5 W / kvar (AVG) |
| Thermal category | -25°C / D. |
| Room temperature | -5°C / +40°C |

QUALITY AND TESTING

| | |
|----------------------------|---|
| Regulations | IEC / EN 60831-1/2. EN 61921. |
| European directives | Low voltage: 2014/35/CE; Electromagnetic compatibility: 2014/30/CE. |

CONFIGURATIONS

Notes

- Rated power is expressed at 400 V - 50 Hz.
- To protect the capacitor banks, a disconnector and protection device must be installed in the power supply line. Racks must be grounded;
- The «L» dimension refers to the overall dimensions, taking into account the contactor.

The racks are available in two different versions, for applications with different voltage harmonic content allowed on the network

With blocking reactors (and thermal probe 130°C, N.C.):

RCL-AAR/138: THD(I)max. = 100% on the network
THD(U)max. = 6% on the network

RCL-AAR/D20: THD(I)max. = 100% on the network
THD(U)max. = 20% on the network

Table

| Code | Type | Qn (kvar) | In (A) | Power per bank (kvar) | | Steps combination (n) | Dimensions A x B x L x H (mm) | Weight (kg) |
|---------------|-------------|--------------|-----------|--------------------------|----|-----------------------------|----------------------------------|----------------|
| 8831402250900 | RCL-AAR/138 | 25 | 36 | 25 | | 1 x 25 | 732 x 375 x 480 x 300 | 35 |
| 8831402500900 | RCL-AAR/138 | 50 | 72 | 50 | | 1 x 50 | 732 x 375 x 480 x 300 | 43 |
| 8831402750900 | RCL-AAR/138 | 75 | 108 | 75 | | 1 x 75 | 732 x 375 x 480 x 300 | 60 |
| 8831403050900 | RCL-AAR/138 | 50 | 72 | 25 | 25 | 2 x 25 | 732 x 375 x 480 x 300 | 68 |
| 8831403075900 | RCL-AAR/138 | 75 | 108 | 25 | 50 | 3 x 25 | 732 x 375 x 480 x 300 | 80 |
| 8901402250720 | RCL-AAR/D20 | 25 | 36 | 25 | | 1 x 25 | 732 x 375 x 480 x 300 | 44 |
| 8901402500720 | RCL-AAR/D20 | 50 | 72 | 50 | | 1 x 50 | 732 x 375 x 480 x 300 | 70 |
| 8901403050720 | RCL-AAR/D20 | 50 | 72 | 25 | 25 | 2 x 25 | 732 x 375 x 480 x 300 | 74 |
| 8901402750720 | RCL-AAR/D20 | 75 | 108 | 75 | | 1 x 75 | 732 x 375 x 480 x 300 | 85 |

Other solutions are available upon request.



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Power Factor Correction

#capacitors #harmonicfilters #energymonitoring



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2s · Modificato

Do you really believe that #PowerFactorCorrection equipment is all the same?

If you think that the power factor correction equipment is always designed with the same precautions, you are very wrong! Often, to increase their margins, many manufacturers neglect critical aspects, to the detriment of #safety. On the other hand, our cabinets are designed with great expertise and attention, to guarantee reliable solutions with great technical advantages.

#capacitor #filmcapacitor #reactiveenergy #cosphi #energysaving
#powerelectronics #comar #reactors #harmonics

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Safety in COMAR P.F.C. equipment

- Forced ventilation starting from 35°C
- Over temperature alarm at 55°C, internal cabinet
By regulator, disengaging the steps
- Safety alarm for critical temperature above 70°C
Connection of the P.F.C. equipment and opening of a clean contact (normally closed)
- Message for harmonic overload
Managed by P.F. controller and closing of the relative alarm contact
- Alarm for excessive harmonic overload, which can also be caused by resonance conditions between transformer and power factor correction
Managed by P.F. controller, with closing of the relative alarm contact and disconnection of the steps
- Internal thermostat for blocking reactors to stop the step in the event of overload on the inductance
- Fuses and Capacitors with anti-burst device

- Community
- Hashtag
- #capacitors
49 follower
 - #powerfactorcorrection
16 follower
 - #energymonitoring
28 follower

Azienda Certificata UNI EN ISO 9001



BMR 4 • BMR 6 • HPR

P.F. Controllers



BMR 4

Power Factor Controller



The **BMR 4** series of microprocessor-based power factor controllers has been designed to accurately control the electrical magnitudes of the system, such as voltage, current, power factor, current harmonic distortion rate, as well as the ambient temperature and the different powers.

PERFORMANCE DATA

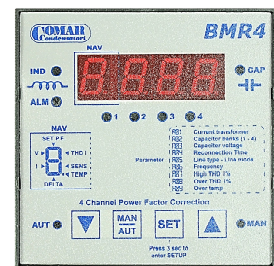
- Supply and measurement voltage: 380 – 415 Vac (on request 230V)
- Rated frequency: 50 / 60 Hz settable
- Power absorbed: 3 VA
- Capacitor Bank insertion time: Adjustable
- Insertion logic: According to the requested power

QUALITY AND TESTING

- Regulations: EN 61000-6-1; EN 61000-6-2; EN 61000-6-3; EN 61000-6-4; EN 60335-1
- European directives: Low voltage: 2014/35/CE; Electromagnetic compatibility: 2014/30/CE.

TECHNICAL DATA

| | |
|--|---|
| Main features | <ul style="list-style-type: none"> - Primary current setting from 5 A to 10000 A - Measure of $\cos\phi$ on fundamental voltage - current - THDI% threshold setting max - Ventilation intervention threshold setting (FAN) - Over temperature threshold setting - Setting of the adjustment factor from 0,85 IND to 0,95 CAP - Kvar setting for each battery from 0.1 to 6000 - Setting the reconnection time (from 5 to 240s) - Setting of the rated voltage of the capacitors (from 80 to 650V standard pitch) - Setting delayed intervention sensitivity - Setting of delayed and instantaneous THD intervention |
| Alarms | Voltage and current (Max. And min.), Below / over-compensation, harmonic distortion threshold exceeded, temperature measured above the set limit. |
| Displayed values | $\cos\phi$, Vrms, Irms, Room temperature, THDI%, ΔQ , target $\cos\phi$, sampling time measurement. |
| Display / LED | LED with 4-digit 7-segment display, to ensure easy data reading in all environmental conditions; Status of capacitor banks, MAN / AUT, line status IND / CAP, alarms, ... |
| Functioning | Automatic with 2 or 4 quadrants / Manual. |
| Amperometric input Voltmetric input | 0,3 – 5,5A by standard TA / 5A. – /+ 10% of the rated voltage. |
| P.F. regulation | From + 0,85 (inductive) to -0,95 (capacitive). |
| Relay contacts | 5 A / 250 Vac, max. switching 440 V. |
| Degree of protection | IP 41; with cover IP 54 (on request). |
| Operating temperature Storage temperature | -20 / + 55 °C -30 / + 60 °C |



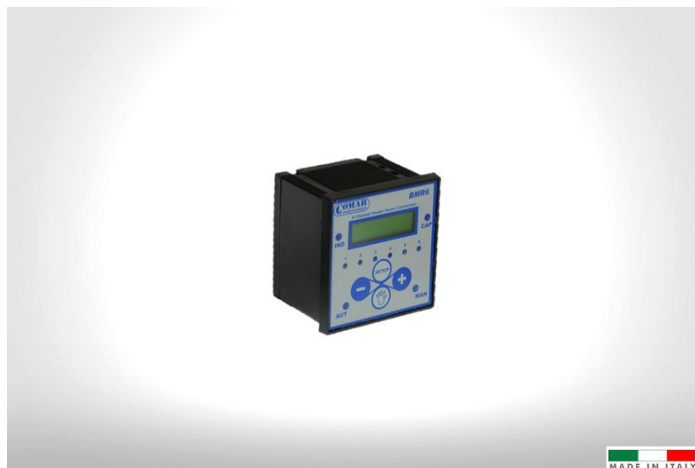
CONFIGURATIONS

Table

| Code | Type | N° controllable Banks | Dimensions b x h x p |
|---------|------|-----------------------|-------------------------|
| 7591600 | BMR4 | 4 | 96 x 96 x 60 |

BMR 6

Power Factor Controller



PERFORMANCE DATA

- Supply and measurement voltage: 380 – 415 Vac (on request 230V)
- Rated frequency: 50 / 60 Hz settable
- Power absorbed: 5 VA
- Capacitor Bank insertion time: Adjustable
- Insertion logic: According to the requested power

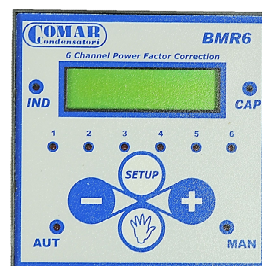
QUALITY AND TESTING

- Regulations: EN 61000-6-1; EN 61000-6-2; EN 61000-6-3
EN 61000-6-4; EN 60335-1
- European directives: Low voltage: 2014/35/CE;
Electromagnetic compatibility: 2014/30/CE.

The **BMR 6** series of microprocessor-based power factor controllers has been designed to accurately control the electrical magnitudes of the system, such as voltage, current, power factor, current harmonic distortion rate, as well as the ambient temperature and the different powers.

TECHNICAL DATA

| | |
|--|---|
| Main features | <ul style="list-style-type: none"> - Primary current setting from 5 A to 10000 A - Measure of $\cos\phi$ on fundamental voltage - current - THDI% threshold setting max - Ventilation intervention threshold setting (FAN) - Over temperature threshold setting - Setting of the adjustment factor from 0,85 IND to 0,95 CAP - Kvar setting for each battery from 0.1 to 6000 - Setting the reconnection time (from 5 to 240s) - Setting of the rated voltage of the capacitors (from 80 to 650V standard pitch) - Setting delayed intervention sensitivity - Setting of delayed and instantaneous THD intervention |
| Alarms | Voltage and current (Max. And min.), Below / over-compensation, harmonic distortion threshold exceeded, temperature measured above the set limit. |
| Displayed values | $\cos\phi$, Vrms, Irms, Room temperature, missing kvar, THDI%, Active power, Reactive power, Apparent power, THDi(max), Vrms MAX, Irms(max), T(max), P(max), Q(max), e A(max). |
| Display / LED | The unit is equipped with a 16-character LCD display with 2 back-lit lines, for easy data reading in all environmental conditions; Status of capacitor banks, MAN / AUT, line status IND / CAP. |
| Functioning | Automatic with 2 or 4 quadrants / Manual. |
| Amperometric input Voltmetric input | 0,3 – 5,5A 5,5A by standard TA / 5A – 40 /+ 10% of the rated voltage (max. 525V). |
| P.F. regulation | From + 0,85 (inductive) to -0,95 (capacitive). |
| Relay contacts | 8 A / 250 Vac, max. switching 440 V. |
| Degree of protection | IP 41; with cover IP 54 (on request). |
| Operating temperature Storage temperature | -20 / + 55 °C -30 / + 60 °C |



CONFIGURATIONS

Table

| Code | Type | N° controllable Banks | Dimensions b x h x p |
|---------|----------------|-----------------------|-------------------------|
| 7591690 | BMR6 | 6 | 96 x 96 x 75 |
| 7591685 | BMR6 + RS 485* | 6 | 96 x 96 x 75 |

*Communication protocol MODBUS RTU



The **HPR** controller is able to guarantee accurate measurements and processing of the main electrical parameters of the system. The capacitor steps are self-configurable, minimizing initial configuration tasks.

TECHNICAL DATA

Main features

- Automatic initialization
- Automatic bank detection and automatic disconnection of defective banks
- CT ratio programmable from 1 to 9600 (CT up to 48000/5 A or 9600/1 A)
- Current and voltage measurement with true effective value
- Measurement of THD% in current, up to the 19th odd harmonic
- Measure of the $\cos\phi$ between voltage and current using the waveform of the fundamental
- Manual and Automatic operation mode
- Digital input: choice between target $\cos\phi 1$ and $\cos\phi 2$, external alarm / low current signaling
- Temperature sensor: internal NTC
- Alarm memory: Storage of the last ten alarms
- In manual each battery can be forced (ON / OFF), ON is used for a fixed compensation

Alarms

Voltage measurement out of tolerance, low / high current alarm $<5\text{mA}$ e $>6\text{A}$, Target compensation not achieved, Capacitor bank power loss below 75%. Threshold limits THDu and THDi exceeded, Max. Hours of operation achieved, Insertions and maximum hours reached by each Bank

Displayed values

$\cos\phi$, VL-L, VL-N, I, Power Factor, Ambient temperature, THD% in voltage and current, maximum values (temperature, voltage, THD), powers (active, reactive and apparent), number of battery insertions. It can also provide useful maintenance warnings, such as the loss of power on the benches, the number of insertions, the actual working time of the capacitor banks.

Display / LED

The unit is equipped with a backlit LCD display, to ensure easy data reading in all environmental conditions; Status of capacitor banks, MAN / AUT, line status IND / CAP

Functioning

Automatic 4 quadrants / Manual.

Amperometric input

0.015 .. 6 A, absorbed power $< 1 \text{ VA}$, CT ratio 1 .. 9600.

P.F. regulation

From + 0,7 (inductive) to -0,7 (capacitive).

Relay contacts

5 A / 250 Vac; 1 A / 400 Vac.

Degree of protection

IP 41 (with cover IP 54) front; IP 20 back.

Operating temperature

-20 / + 70 °C

Storage temperature

-40 / + 85 °C



PERFORMANCE DATA

- Rated voltage 90– 550 Vac
- Rated frequency 50 / 60 Hz self-determined
- Power absorbed 5 VA
- Capacitor Bank insertion time Adjustable
- Control algorithm Automatic (Best fit), LIFO, Progressive, Combined filter

QUALITY AND TESTING

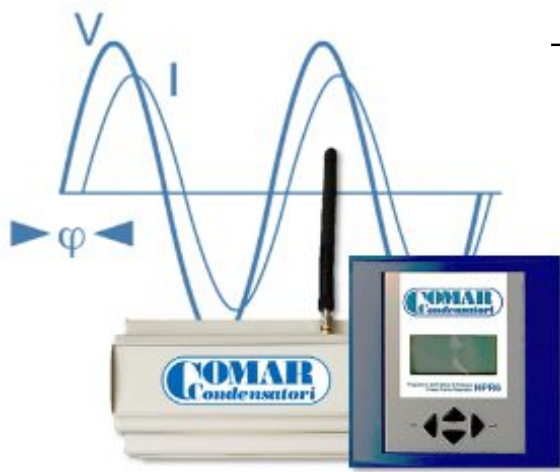
Regulations EC 61010-1; IEC 61006-2; IEC 61006-4: level B IEC 61326-1; UL 61010.

European directives Low voltage: 2014/35/CE; Electromagnetic compatibility: 2014/30/CE.

CONFIGURATIONS

Table

| Code | Type | N° controllable Banks | Dimensions b x h x p |
|----------|----------------------|-----------------------|-------------------------|
| 75993061 | HPR 6 – MB (ModBus) | 6 | 144 x 144 x 58 |
| 75993121 | HPR 12 – MB (ModBus) | 12 | 144 x 144 x 58 |



Try **Cloud Control System!**

The HPR controller can be combined with the **remote monitoring** system of the automatic power factor correction equipment.

Find out how on www.comarcond.com



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Do you have any other question? Feel free to ask:

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Single-phase Capacitors
Three-phase Capacitors
Modular Racks
P.F. Controllers



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