

Construction

- Dielectric: Polypropylene film
- Non PCB, Resin or oil impregnated
- Extruded round aluminium can with stud

Features

- Single phase
- Naturally air cooled or forced air cooling
- Indoor mounting

Typical applications

PFC and detuned systems
(normal or filter type capacitor banks)

Terminals

Fast-on terminal

Mounting parts

Threaded stud at bottom of can
Max. torque = 10 Nm for M12(Q 63.5mm)



POWER FACTOR CORRECTION CAPACITORS

Cylindrical Single-Phase Dry Type Capacitor

CSC TYPE

| | |
|---------------------------------------|---|
| Rated voltage U_r | $U_r=230\sim 525$ volt |
| Rated frequency F_r | $F_r=50/60$ HZ |
| Capacitance tolerance | -5/+10% |
| Mean life expectancy | 100 000 operating hours |
| Case/shape | Aluminum/cylindrical |
| Safety | Self-healing technology, overpressure disconnecter, |
| Standard | CEI EN 60831-1/2 |
| Maximum rating | |
| Max permissible overcurrent I_{max} | $1.3 \cdot I_n$ |
| Max permissible overvoltage U_{max} | $U_r+10\%$ (up to 8h daily) $U_r+15\%$ (up to 30m daily) $U_r+20\%$ (up to 5m daily) $U_r+30\%$ (up to 1m daily) |
| Number of switching operations | Max. 5 000 switching per year according IEC 831 |
| Transient inrush current (max) I_s | $100 \cdot I_r$ |
| Losses: | |
| Dielectric | < 0.2 W/kvar |
| Total | < 0.5 W/kvar |
| Insulating voltage | 3/15 KV ($U_r < 660$ V) |
| Terminal voltage test | $2.15 \cdot U_r$, 10s |
| Temperature class | -25/D Max. temp. 55 °C Max. mean 24h = 45 °C Max. mean 1year = 35 °C |
| Enclosure | IP00 |
| Permissible maximum humidity | 95% |
| Maximum permissible altitude | 2 000m above sea level |
| Mounting position | Upright |
| Mounting and grounding | Threaded M12 |

POWER FACTOR CORRECTION CAPACITORS

Cylindrical Single-Phase Dry Type Capacitor

CSC TYPE

Rated voltage: 230 VAC, 50/60 Hz

| Type | 50 Hz | | 60 Hz | | Cn μf | d*h mm | Weight Approx kg | Drawing code see next page |
|-------|----------------|---------|----------------|---------|----------|-----------|------------------------|-------------------------------|
| | Output kvar | Ir A | Output kvar | Ir A | | | | |
| CSC23 | 0.41 | 1.78 | 0.5 | 2.17 | 25 | 40*103 | 0.30 | 1 |
| CSC23 | 0.83 | 3.61 | 1 | 4.34 | 50 | 45*128 | 0.30 | 2 |
| CSC23 | 1.66 | 7.2 | 2 | 8.7 | 100 | 60*138 | 0.36 | 4 |

Rated voltage: 400 VAC, 50/60 Hz

| Type | 50 Hz | | 60 Hz | | Cn μf | d*h mm | Weight Approx kg | Drawing code see next page |
|-------|----------------|---------|----------------|---------|----------|-----------|------------------------|-------------------------------|
| | Output kvar | Ir A | Output kvar | Ir A | | | | |
| CSC40 | 0.83 | 2.075 | 1 | 2.5 | 16.6 | 40*103 | 0.30 | 1 |
| CSC40 | 1.66 | 4.15 | 2 | 5 | 33.3 | 55*128 | 0.32 | 3 |
| CSC40 | 2.08 | 5.2 | 2.5 | 6.25 | 41.4 | 55*128 | 0.32 | 3 |
| CSC40 | 3.33 | 8.3 | 4 | 10 | 66.6 | 60*138 | 0.36 | 4 |
| CSC40 | 4.16 | 10.4 | 5 | 12.5 | 82.7 | 60*138 | 0.36 | 4 |

Rated voltage: 440 VAC, 50/60 Hz

| Type | 50 Hz | | 60 Hz | | Cn μf | d*h mm | Weight Approx kg | Drawing code see next page |
|-------|----------------|---------|----------------|---------|----------|-----------|------------------------|-------------------------------|
| | Output kvar | Ir A | Output kvar | Ir A | | | | |
| CSC44 | 0.83 | 1088 | 1 | 2.27 | 13.6 | 40*103 | 0.30 | 1 |
| CSC44 | 1.66 | 3.77 | 2 | 4.54 | 27.3 | 45*128 | 0.32 | 2 |
| CSC44 | 3.33 | 7.57 | 4 | 9.1 | 54.7 | 60*138 | 0.36 | 4 |

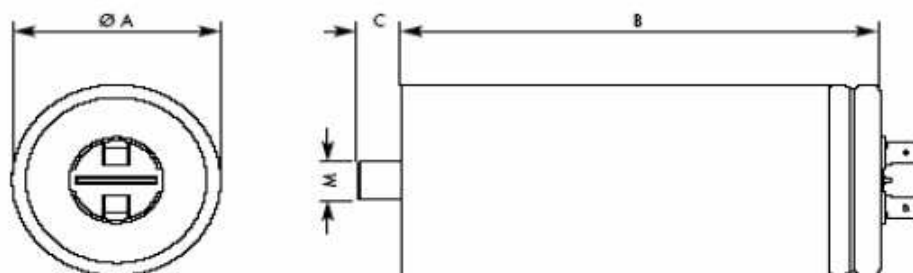
Rated voltage: 460 VAC, 50/60 Hz

| Type | 50 Hz | | 60 Hz | | Cn μf | d*h mm | Weight Approx kg | Drawing code see next page |
|-------|----------------|---------|----------------|---------|----------|-----------|------------------------|-------------------------------|
| | Output kvar | Ir A | Output kvar | Ir A | | | | |
| CSC46 | 0.83 | 1.8 | 1 | 2.17 | 12.5 | 45*128 | 0.32 | 2 |
| CSC46 | 1.66 | 3.6 | 2 | 4.34 | 25 | 55*128 | 0.32 | 3 |
| CSC46 | 3.33 | 7.24 | 4 | 8.7 | 50 | 60*138 | 0.36 | 4 |

*Other vltage on request



Dimensional drawing



| Drawing code | ΦA | B | C | M |
|--------------|----------|-----|------|----|
| 1 | 40 | 103 | 10 | 8 |
| 2 | 45 | 128 | 10 | 8 |
| 3 | 55 | 128 | 12.5 | 12 |
| 4 | 60 | 138 | 12.5 | 12 |

Construction

- Dielectric: Polypropylene film
- Resin impregnated / dry type
- Extruded round aluminium can with stud

Features

- Three phase, delta connected
- Self-healing technology
- Overpressure disconnecter switch
- Filled with self extinguish resin
- Discharge resistor
- Protection cover (optional)
- Naturally air cooled or forced air cooling
- Indoor mounting



Typical applications

For Fix and Automatic Power Factor Correction Systems
(normal or filter type capacitor banks)

Terminals

Terminal board or Screw connections

Mounting parts

Threaded stud at bottom of can
Max. torque = 10 Nm for M12(Q 63.5mm)

POWER FACTOR CORRECTION CAPACITORS

Cylindrical Three-Phase Dry Type Capacitor

CRT TYPE

Technical data and specification

| Characteristics | |
|---------------------------------------|---|
| Rated power | 2.5 up to 30 kvar |
| Rated voltage U_r | $U_r=230\sim 440$ volt |
| Rated frequency F_r | $F_r=50/60$ HZ |
| Capacitance tolerance | -5/+10% |
| Case/shape | Aluminum/cylindrical |
| Safety | Self-healing technology, overpressure disconnecter, |
| Installation | Indoor |
| Maximum rating | |
| Max permissible overcurrent I_{max} | $1.3 \cdot I_n$ |
| Max permissible overvoltage U_{max} | $U_r+10\%$ (up to 8h daily) $U_r+15\%$ (up to 30m daily) $U_r+20\%$ (up to 5m daily) $U_r+30\%$ (up to 1m daily) |
| Transient inrush current (max) I_s | $100 \cdot I_r$ |
| Losses: | |
| Dielectric | < 0.2 W/kvar |
| Total | < 0.5 W/kvar |
| Test data | |
| Insulating voltage | 3/15 KV ($U_r < 660V$) |
| Terminal voltage test | $2.15 \cdot U_r$, 10s |
| $\tan \delta$ (50Hz) | < 0.5 W/kvar |
| Climatic category / -25/D | |
| Temperature class | -25/D Min. temp. -25 °C Max. temp. +55°C Max. mean 1year = 35 °C |
| Permissible maximum humidity | 95% |
| Maximum permissible altitude | 2 000m above sea level |
| Mean life expectancy | |
| Mean life expectancy | 100 000 operating hours |
| Number of switching operations | Max. 5 000 switching per year according IEC 831 |

| Design data | |
|------------------------|--|
| Dimension | See dimensional drawing at page 5 |
| Weight approx | 1~2.5 Kg (see on selection guide tables at page 4) |
| Mounting position | Any mounting position possible. |
| Mounting and grounding | Threaded bolt M12 |
| Enclosure | IP00, IP20(with cover) |

| Terminals | |
|------------------------|--------------------------|
| Degree of protection | Isolated terminals, IP20 |
| Max. torque | 1.2 Nm |
| Terminal cross section | 16 mm ² |
| Max. terminal current | 50 A |
| Creepage distance | 12.7 mm |
| Clearance | 9.6 mm |

| Safety | |
|-------------------------|---------------------------|
| Mechanical safety | Overpressure disconnecter |
| Discharge resistor time | < 3 minutes to 75 V |

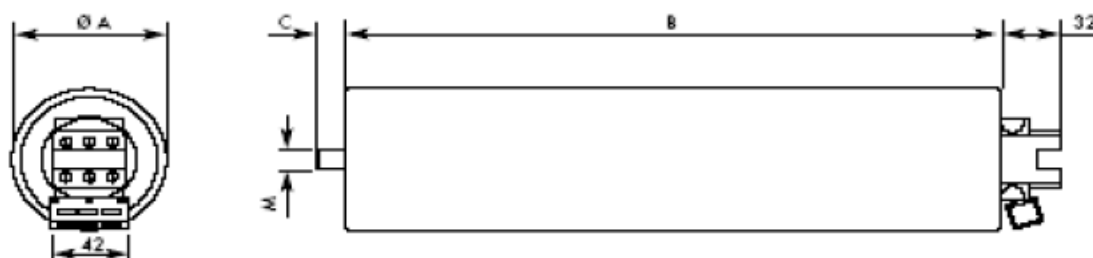
| Reference Standards | |
|---------------------|--|
| IEC EN 60831-1 | |
| IEC EN 60831-2 | |

Rated voltage: 400 VAC, 50 Hz

| Type | 50 Hz | | Cn µf | Diametere mm | Height mm | Weight kg | Drawing code see next page |
|----------------|----------------|---------|----------|-----------------|--------------|--------------|-------------------------------|
| | Output kvar | Ir A | | | | | |
| CRT-78M-02-400 | 2.5 | 3.6 | 3*16.5 | 75 | 210 | 1 | 1 |
| CRT-78M-05-400 | 5 | 7.2 | 3*33 | 75 | 210 | 1 | 1 |
| CRT-78M-07-400 | 7.5 | 10.8 | 3*50 | 75 | 247 | 1.2 | 2 |
| CRT-78M-10-400 | 10 | 14.4 | 3*66 | 85 | 247 | 1.8 | 3 |
| CRT-78M-12-400 | 12.5 | 18 | 3*83 | 85 | 285 | 2 | 4 |
| CRT-78M-15-400 | 15 | 21.7 | 3*100 | 85 | 360 | 2.3 | 5 |
| CRT-78M-20-400 | 20 | 28.9 | 3*133 | 85 | 360 | 2.3 | 5 |
| CRT-78M-25-400 | 25 | 36.1 | 3*166 | 100 | 295 | 2.8 | 6 |
| CRT-78M-30-400 | 30 | 43.3 | 3*199 | 100 | 373 | 2.8 | 7 |

* Other Voltages on request

Dimensional drawing



| Drawing code | ΦA | B | C | M |
|--------------|----------|-----|----|----|
| 1 | 75 | 210 | 16 | 12 |
| 2 | 75 | 247 | 16 | 12 |
| 3 | 85 | 247 | 16 | 12 |
| 4 | 85 | 285 | 16 | 12 |
| 5 | 85 | 360 | 16 | 12 |
| 6 | 100 | 295 | 16 | 12 |
| 7 | 100 | 373 | 16 | 12 |

Construction

- Dielectric: Polypropylene film
- Resin impregnated / dry type
- Extruded round aluminium can with stud

Features

- Three phase, delta connected
- Self-healing technology
- Overpressure disconnecter switch
- Filled with self extinguish resin
- Discharge resistor
- Protection cover (optional)
- Naturally air cooled or forced air cooling
- Indoor mounting

Typical applications

For Fix and Automatic Power Factor Correction Systems
(normal or filter type capacitor banks)

Terminals

Terminal board

Mounting parts

Threated stud at bottom of can
Max. torque = 10 Nm for M12(Q 63.5mm)



Technical data and specification

| Characteristics | |
|---------------------------------------|---|
| Rated power | 2.5 up to 20 kvar |
| Rated voltage U_r | $U_r=400$ volt |
| Rated frequency F_r | $F_r=50/60$ Hz |
| Capacitance tolerance | -5/+10% |
| Case/shape | Aluminum/cylindrical |
| Safety | Self-healing technology, overpressure disconnecter, |
| Installation | Indoor |
| Maximum rating | |
| Max permissible overcurrent I_{max} | $1.3 \cdot I_n$ |
| Max permissible overvoltage U_{max} | $U_r+10\%$ (up to 8h daily) $U_r+15\%$ (up to 30m daily) $U_r+20\%$ (up to 5m daily) $U_r+30\%$ (up to 1m daily) |
| Transient inrush current (max) I_s | $100 \cdot I_r$ |
| Losses: | |
| Dielectric | < 0.2 W/kvar |
| Total | < 0.5 W/kvar |
| Test data | |
| Insulating voltage | 3/15 KV ($U_r < 660V$) |
| Terminal voltage test | $2.15 \cdot U_r$, 10s |
| $\tan \delta$ (50Hz) | < 0.5 W/kvar |
| Climatic category / -25/D | |
| Temperature class | -25/D Min. temp. -25 °C Max. temp. +55 °C Max. mean 1year = 35 °C |
| Permissible maximum humidity | 95% |
| Maximum permissible altitude | 2 000m above sea level |
| Mean life expectancy | |
| Mean life expectancy | 100 000 operating hours |
| Number of switching operations | Max. 5 000 switching per year according IEC 831 |

| Design data | |
|------------------------|---|
| Dimension | See dimensional drawing at page 5 |
| Weight approx | 1~2.5 Kg (see on selection guide tables at page 4) |
| Mounting position | Any mounting position possible. |
| Mounting and grounding | Threaded bolt M12 |
| Enclosure | IP00, IP20(with cover), IP54(for polemounted purpose) |

| Terminals | |
|------------------------|--------------------------|
| Degree of protection | Isolated terminals, IP20 |
| Max. torque | 1.2 Nm |
| Terminal cross section | 16 mm ² |
| Max. terminal current | 50 A |
| Creepage distance | 12.7 mm |
| Clearance | 9.6 mm |

| Safety | |
|-------------------------|---------------------------|
| Mechanical safety | Overpressure disconnecter |
| Discharge resistor time | < 3 minutes to 75 V |

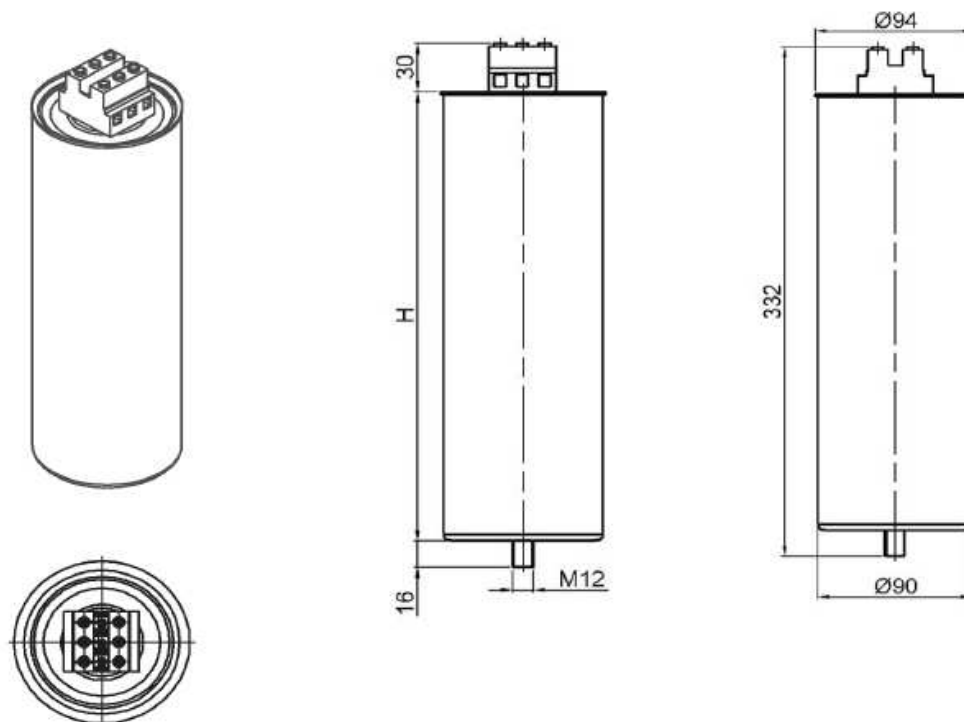
| Reference Standards | |
|----------------------------|--|
| IEC EN 60831-1 | |
| IEC EN 60831-2 | |

Rated voltage: 400 VAC, 50 Hz

| Type | 50 Hz | | Cn µf | Diametere mm | BOX Height mm | MAX Height mm | Drawing code see next page |
|-----------------|----------------|---------|----------|-----------------|------------------|------------------|-------------------------------|
| | Output kvar | Ir A | | | | | |
| CTC1-11A-02-400 | 2.5 | 3.6 | 3*16.5 | 90 | 173 | 232 | 1 |
| CTC1-11A-05-400 | 5 | 7.2 | 3*33 | 90 | 173 | 232 | 1 |
| CTC1-11A-07-400 | 7.5 | 10.8 | 3*50 | 90 | 173 | 232 | 1 |
| CTC1-11A-10-400 | 10 | 14.4 | 3*66 | 90 | 173 | 232 | 1 |
| CTC1-11A-12-400 | 12.5 | 18 | 3*83 | 90 | 286 | 345 | 2 |
| CTC1-11A-15-400 | 15 | 21.7 | 3*100 | 90 | 286 | 345 | 2 |
| CTC1-11A-17-400 | 17.5 | 25.3 | 3*116 | 90 | 286 | 345 | 2 |
| CTC1-11A-20-400 | 20 | 28.9 | 3*133 | 90 | 286 | 345 | 2 |

*Other Voltages on request

Dimensional drawing



| Drawing code | Φ | H | M |
|--------------|--------|-----|----|
| 1 | 90 | 173 | 12 |
| 2 | 90 | 286 | 12 |

Construction

- Dielectric: Polypropylene film
- Resin impregnated / dry type
- Fitted in Steel cubical container (with 60µm thickness painting)

Features

- Three phase, delta connected
- Self-healing technology
- Separate internal fuse for each element
- Void spaces are filled with an inert, non-flammable, humidity absorbant mineral material
- Discharge resistor
- Protection cover
- Naturally air cooled or forced air cooling
- Indoor mounting



Typical applications

For Fix and Automatic Power Factor Correction Systems (normal type capacitor banks)

Terminals

Connection terminals M10
Max. torque = 15 Nm for M10

Technical data and specification

| Characteristics | |
|---|---|
| Rated power | 5 up to 100 kvar |
| Rated voltage Ur | Ur=230~690 volt |
| Rated frequency Fr | Fr=50/60HZ |
| Capacitance tolerance | -5/+10% |
| Case/shape | Steel container (with 60µm thickness painting) |
| Safety | Self-healing technology, Internal fuse, |
| Installation | Indoor |
| Maximum rating | |
| Max permissible overcurrent I _{max} | 1.3*I _n |
| Max permissible overvoltage U _{max} | Ur+10% (up to 8h daily) Ur+15% (up to 30m daily) Ur+20% (up to 5m daily) Ur+30% (up to 1m daily) |
| Transient inrush current (max) I _s | 100*I _r |
| Losses: | |
| Dielectric | < 0.2 W/kvar |
| Total | < 0.5 W/kvar |
| Test data | |
| Insulating voltage | 3/15 KV (Ur<660V) |
| Terminal voltage test | 2.15*Ur, 10s |
| tanσ (50Hz) | < 0.5 W/kvar |
| Climatic category / -40/D | |
| Temperature class | -40/D Min. temp. -40 °C Max. temp. +55 °C |
| Permissible maximum humidity | 95% |
| Maximum permissible altitude | 2 000m above sea level |
| Mean life expectancy | |
| Mean life expectancy | 160 000 operating hours |
| Number of switching operations | Max. 5 000 switching per year according IEC 831 |

| Design data | |
|-------------------|---|
| Dimension | See dimensional drawing at page 5 |
| Weight approx | 4~17 Kg (see on selection guide tables at page 4) |
| Mounting position | Upright |
| grounding | bolt M6 |
| Enclosure | IP2X(with cover) |

| Terminals | |
|-----------------------|--------------------------|
| Degree of protection | Isolated terminals, IP20 |
| Max. torque | 15 Nm |
| Max. terminal current | 150 A |

| Safety | |
|-------------------------|---------------------|
| Mechanical safety | Internal fuse |
| Discharge resistor time | < 5 minutes to 75 V |

| Reference Standards | |
|---------------------|--|
| IEC EN 60831-1 | |
| IEC EN 60831-2 | |
| IEC 70/70A | |
| BS 1650 | |

POWER FACTOR CORRECTION CAPACITORS

Rectangular Three-Phase Dry Type Capacitor

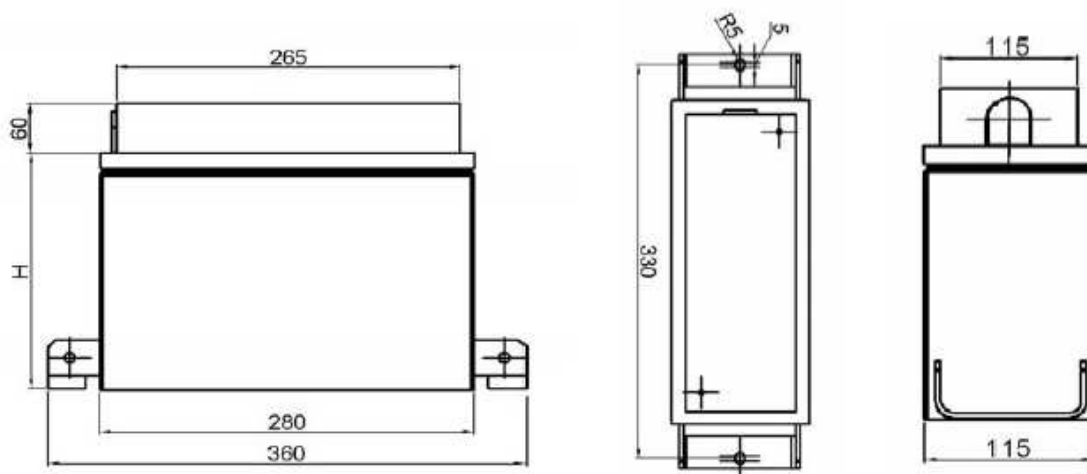
FMN TYPE

Rated voltage: 400 VAC, 50 Hz

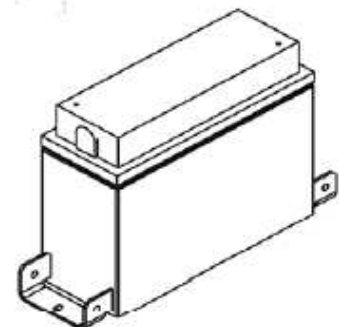
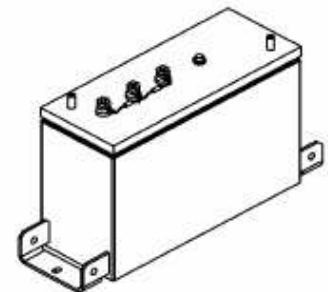
| Type | 50 Hz | | Wide W mm | Length D mm | Height H mm | Weight kg | Drawing code see next page |
|----------|----------------|---------------------|-----------------|-------------------|-------------------|--------------|-------------------------------|
| | Output kvar | I _r A | | | | | |
| FMN 4005 | 5 | 7.2 | 117 | 360 | 180 | 3 | 1 |
| FMN 4010 | 10 | 14.4 | 117 | 360 | 180 | 4 | 1 |
| FMN 4012 | 12.5 | 18 | 117 | 360 | 180 | 4 | 1 |
| FMN 4015 | 15 | 21.6 | 117 | 360 | 180 | 5 | 1 |
| FMN 4020 | 20 | 28.9 | 117 | 360 | 180 | 5 | 1 |
| FMN 4025 | 25 | 36.1 | 117 | 360 | 230 | 6 | 2 |
| FMN 4030 | 30 | 43.3 | 117 | 360 | 230 | 6 | 2 |
| FMN 4040 | 40 | 57.8 | 117 | 360 | 270 | 8 | 3 |
| FMN 4050 | 50 | 72.2 | 117 | 360 | 330 | 9 | 4 |
| FMN 4060 | 60 | 86.7 | 117 | 360 | 460 | 11 | 5 |
| FMN 4075 | 75 | 108.3 | 117 | 360 | 460 | 14 | 5 |
| FMN 4080 | 80 | 115.6 | 117 | 360 | 460 | 14 | 5 |
| FMN 4099 | 100 | 144.5 | 117 | 360 | 550 | 17 | 6 |

*Other Voltages on request

Dimensional drawing



| Drawing code | D | W | H |
|--------------|-----|-----|-----|
| 1 | 360 | 117 | 180 |
| 2 | 360 | 117 | 230 |
| 3 | 360 | 117 | 270 |
| 4 | 360 | 117 | 330 |
| 5 | 360 | 117 | 460 |
| 6 | 360 | 117 | 550 |



Construction

- Dielectric: Polypropylene film
- Non PCB, Oil impregnated internal elements
- impregnated with biodegradable ambient compatible PCB free dielectric fluid
- Metallic enclosure painted with epossidic dust paint, colour RAL7032

Features

- Three phase, delta connected
- Self-healing technology
- Overpressure disconnecter switch
- Discharge resistor
- Protection cover
- Naturally air cooled or forced air cooling
- Indoor mounting

Typical applications

For Fix and Automatic Power Factor Correction Systems
(normal or filter type capacitor banks)

Terminals

Connection terminals M8*20 screw
Max. torque = 10 Nm for M8



Technical data and specification

| Characteristics | |
|---|---|
| Rated power | 5 up to 50 kvar |
| Rated voltage Ur | Ur=230~690 volt |
| Rated frequency Fr | Fr=50/60HZ |
| Capacitance tolerance | -5/+10% |
| Case/shape | Metalic enclosure painted with epossidic dust paint, |
| Safety | Self-healing technology, Overpressure disconnecter, |
| Installation | Indoor |
| Maximum rating | |
| Max permissible overcurrent I _{max} | 1.3*I _n |
| Max permissible overvoltage U _{max} | Ur+10% (up to 8h daily) Ur+15% (up to 30m daily) Ur+20% (up to 5m daily) Ur+30% (up to 1m daily) |
| Transient inrush current (max) I _s | 100*I _r |
| Losses: | |
| Dielectric | < 0.2 W/kvar |
| Total | < 0.5 W/kvar |
| Test data | |
| Insulating voltage | 3/15 KV (Ur<660V) |
| Terminal voltage test | 2.15*Ur, 10s |
| tanσ (50Hz) | < 0.5 W/kvar |
| Climatic category | |
| Temperature class | Min. temp. -25 °C Max. temp. +60 °C |
| Permissible maximum humidity | 95% |
| Maximum permissible altitude | 2 000m above sea level |
| Mean life expectancy | |
| Mean life expectancy | 100 000 operating hours |
| Number of switching operations | Max. 5 000 switching per year according IEC 831 |

Design data

| | |
|-------------------|---|
| Dimension | See dimensional drawing at page 5 |
| Weight approx | 4~11 Kg (see on selection guide tables at page 4) |
| Mounting position | Upright |
| Enclosure | IP21 |

Terminals

| | |
|-----------------------|--------------------------|
| Degree of protection | Isolated terminals, IP3X |
| Max. torque | 10 Nm |
| Max. terminal current | 80 A |

Safety

| | |
|-------------------------|---------------------------|
| Mechanical safety | Overpressure disconnecter |
| Discharge resistor time | < 5 minutes to 75 V |

Reference Standards

IEC EN 60831-1

IEC EN 60831-2

Rated voltage: 400 VAC, 50 Hz

| Type | 50 Hz | | Wide mm | Length mm | Height mm | Weight kg |
|----------|----------------|---------|------------|--------------|--------------|--------------|
| | Output kvar | Ir A | | | | |
| RPH 4005 | 5 | 7.2 | 117 | 190 | 265 | 4.5 |
| RPH 4010 | 10 | 14.4 | 117 | 190 | 265 | 5 |
| RPH 4012 | 12.5 | 18 | 117 | 190 | 265 | 5.5 |
| RPH 4015 | 15 | 21.6 | 117 | 190 | 265 | 6 |
| RPH 4020 | 20 | 28.9 | 117 | 190 | 265 | 6.5 |
| RPH 4025 | 25 | 36.1 | 117 | 419 | 265 | 7.5 |
| RPH 4030 | 30 | 43.3 | 117 | 419 | 265 | 8 |
| RPH 4040 | 40 | 57.8 | 117 | 419 | 265 | 9.5 |
| RPH 4050 | 50 | 72.2 | 117 | 419 | 265 | 11 |

*Other Voltages on request

Dimensional drawing

