

# R.2

Power factor correction  
and harmonic filtering



Power capacitors, LV

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## Power capacitors, LV

### Prismatic capacitors

The **CS** dry-type prismatic capacitor range covers all power and voltage requirements, from 50 to 60 Hz.

The design, manufacturing and testing processes of capacitors with prismatic technology guarantee the production of top quality and long lasting capacitors.

### Technology

Prismatic capacitors are equipped with different basic capacities. These capacities are configured to obtain the voltage and power required

- **Basic capacities**

Basic capacities are produced with metallised polypropylene and are encapsulated in thermo-hardened polyurethane resin. This system provides a high electric and mechanical rigidity to basic capacities.

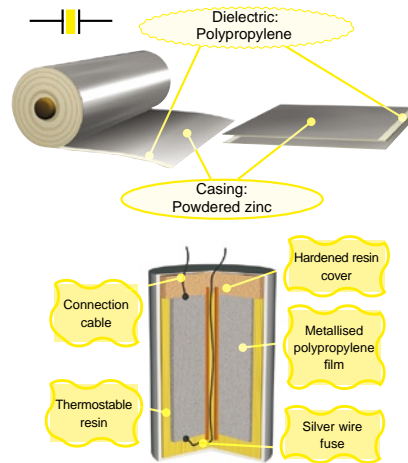
- **Capacitor**

The set of basic capacities is introduced in a metallic casing and filled in with Vermiculite. This component provides a high safety to the set of basic capacities, given its dielectric properties and as a non-flammable inert material.

### Protection levels

In case of a fault:

- **Level 1.** The zinc layer evaporates when it reaches the "fault" point (de-metallized zone), so that the arc disappears
- **Level 2.** In the case of high currents (high voltage, harmonics), the internal fuse disconnects the basic capacity
- **Level 3.** If the fault is not limited by the fuse, gases are generated inside the faulty capacitor, so that lifting the overpressure cover disconnects the basic capacitor
- **Level 4.** For a greater security, the VERMICULITE (inert and fireproof) prevents any form of deflagration



### Advantages of CS prismatic capacitors

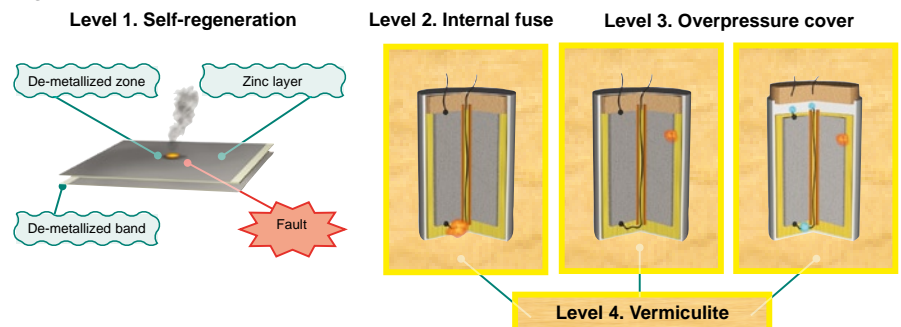
This technology offers the following advantages:

- **Continuity of the service**

In case of the fault of a basic capacity, it is disconnected and it does not affect the rest, continuing with the unit's normal operation.

- **Greater protection**

Each basic capacity is equipped with protections, whereby the Vermiculite carries out the global protection tasks. This system lengthens the unit's working life.



### Prismatic capacitor range

The range of **CS** prismatic capacitors is structured in different types, depending on the maximum power of the unit. These different types facilitate the ca-

pacitor bank assembly tasks in cabinets with different sizes.

This allows the reduction of volume and, therefore, cost.

Range	Type of capacitor	Maximum power	Voltages	Frequency
Low power	CV Type	25 kvar	230 to 480 V a.c.	50 ... 60 Hz
Medium power	CQ Type	50 kvar	230 to 480 V a.c.	50 ... 60 Hz
High power: · Electromechanical capacitor banks · Static system capacitor banks	CS Type CS-6B Type	100 kvar	230 to 1,000 V a.c.	50 ... 60 Hz
Filters: · Electromechanical capacitor banks · Static system capacitor banks	CF Type CF-6B Type	100 kvar	230 to 1,000 V a.c.	50 ... 60 Hz

See details of each type in the technical features table

### Features

Features	
Overcurrent	1.3 times the rated current permanently
Overvoltage	10 % 8 over 24 hours 15 % up to 15 minutes over 24 hours 20 % up to 5 minutes over 24 hours 30 % up to 1 minute over 24 hours
Insulation level	3 / 15 kV
Power tolerance	-5 ... +15%
Discharge resistance	75 V/3 min
Frequency	50 ... 60 Hz
Losses: · Dielectric · Total	< 0.2 W / kvar < 0.5 W / kvar
Protections	· Dielectric regeneration · Internal fuse. Overpressure system. Vermiculite
Construction features	
Enclosure	Treated and painted steel, colour RAL 3005,RAL 7035
Terminals: · Power · Earth	· M6 for CV, M10 for CQ, CS, CS-6B, CF, CF-6B · M6
Torque value	· CV 5 Nm · CQ, CS, CS-6B, CF, CF-6B: 15 Nm
Degree of protection	IP 42 with terminal cover
Ambient conditions	
Class C temperature:	
Daily mean	40 °C
Annual mean	30 °C
Maximum	50 °C
Minimum	-40 °C
Relative humidity	80 %
Altitude	2,000 m
Assembly conditions	
Type of assembly	Vertical
Ventilation	Natural or forced, depending on the cabinet's design
Distance between capacitors	Minimum, 4 cm
Standards	
CEI 60831-1, CEI 70/7, UNE 20827, UNE 20010, BS 1650, VDE 560	

**Tubular capacitors**

The **CLZ** tubular capacitor range is composed of capacitors with a tubular casing, of the dry-type, covering a wide range of power and voltage ratings, at 50 and 60 Hz.

The design, manufacturing and testing processes of **CLZ** tubular capacitors guarantee the production of top quality and long lasting capacitors.

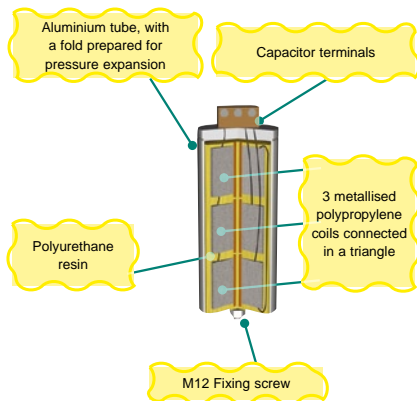
**New technology**

**New refrigeration technology.**

**CLZ** capacitors up to 25 kvar offer a new refrigeration technology that employs nitrogen gas, offering a top-performance, harmless and fireproof refrigeration system.

**Small dimensions and high dissipation**

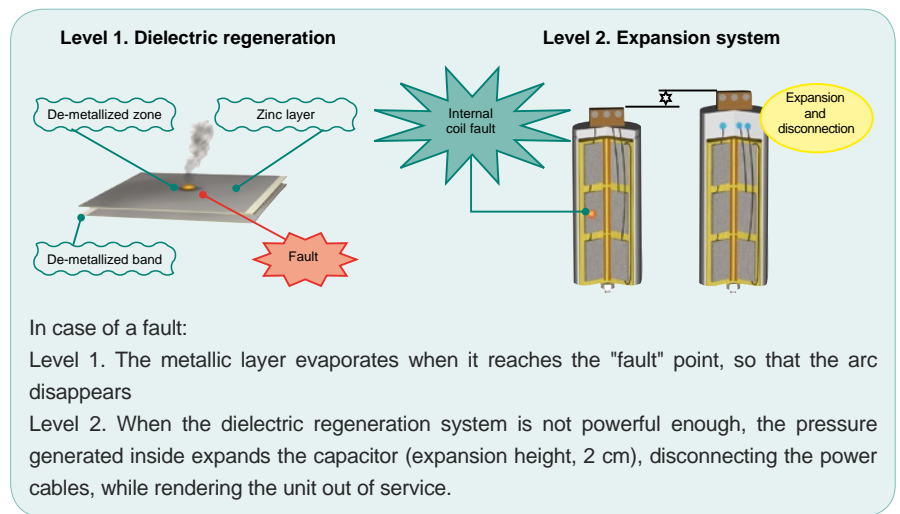
- Diameters: 85, 110 and 136 mm.
- Reduced capacitor height
- Aluminium casing



**Protection levels**

In case of a fault:

- **Level 1.** The metallic layer evaporates when it reaches the "fault" point, so that the arc disappears
- **Level 2.** When the dielectric regeneration system is not powerful enough, the pressure generated inside expands the capacitor (expansion height, 2 cm), disconnecting the power cables, while rendering the unit out of service.



In case of a fault:

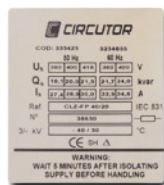
- Level 1. The metallic layer evaporates when it reaches the "fault" point, so that the arc disappears
- Level 2. When the dielectric regeneration system is not powerful enough, the pressure generated inside expands the capacitor (expansion height, 2 cm), disconnecting the power cables, while rendering the unit out of service.

**New inert gas refrigeration technology and aluminium casing**



**New technology**

New inert gas refrigeration technology and aluminium casing



**Multi-mark labels**

Use of a plate with a power equivalent to 220/230/240 V, 400/440 V, 460 V, 480/520/550 V (50 or 60 Hz)



**IP 20 Degree of protection (up to 30 kvar)**

With terminal cover **TLCZ-FP** IP 54

### Tubular capacitor range

There are two types of construction types in the **CLZ** capacitor range:

- **CLZ-FPT** type with an IP 00 protection degree. Electrical connection with FASTON terminal

- **CLZ-FP** type with an IP 20 protection degree. Electrical connection with terminals

Range	Type of capacitor	Maximum power	Voltages	Frequency
Low power	CLZ-FPT Type	7.5 kvar	230 to 480 V	50 ... 60 Hz
High power	CLZ-FP Type	50 kvar	230 to 520 V	50 ... 60 Hz

### Features

Features	
Overcurrent	1.3 times the rated current permanently
Overvoltage	10 % 8 over 24 hours 15 % up to 15 minutes over 24 hours 20 % up to 5 minutes over 24 hours 30 % up to 1 minute over 24 hours
Insulation level	3 / 15 kV
Tolerance	-5 ... +15 %
Discharge resistance	75 V, 3 min, 50 Hz
Frequency	50 ... 60 Hz
Losses: . Dielectric . Total	< 0.2 W / kvar < 0.5 W / kvar
Protections	CLZ system levels: . Dielectric regeneration . Expansion system
Construction features	
Enclosure	Aluminium
Power terminals	M10
Fixing screw	M12
Degree of protection	IP 00 for CLZ-FPT and CLZ-FP >30 kvar IP 20 for CLZ-FP ≤ 30 kvar IP 54 for CLZ-FP, with terminal cover
Ambient conditions	
Class D temperature: Daily mean Annual mean Maximum Minimum	45 °C 35 °C 55 °C -25 °C
Relative humidity	80 %
Altitude	2,000 m
Assembly conditions	
Type of assembly	Vertical
Ventilation	Natural or forced, depending on the cabinet's design
Distance between capacitors	Minimum, 2 cm
Standards	
CEI 60831-1, CEI 70/7, UNE 20827, UNE 20010, BS 1650, VDE 560	

## Product selection table

	Features	Range	Maximum power	Voltage	Frequency	Page
CLZ-FPT		Low power	7.5 kvar	230 to 480 V a.c.	50 ... 60 Hz	<b>9</b>
CLZ-FP		High power	50 kvar	230 to 520 V a.c.	50 ... 60 Hz	<b>11</b>
CV		Low power	25 kvar	230 to 480 V a.c.	50 ... 60 Hz	<b>13</b>
CQ		Medium power	50 kvar	230 to 480 V a.c.	50 ... 60 Hz	<b>15</b>
CS		High power: - Electromechanical capacitor banks	100 kvar	230 to 1,000 V a.c.	50 ... 60 Hz	<b>17</b>
CS-6B		High power: - Static system capacitor banks	100 kvar	230 to 1,000 V a.c.	50 ... 60 Hz	<b>19</b>
CF		Filters: - Electromechanical capacitor banks	100 kvar	230 to 1,000 V a.c.	50 ... 60 Hz	<b>21</b>
CF-6B		Filters: - Static system capacitor banks	100 kvar	230 to 1,000 V a.c.	50 ... 60 Hz	<b>23</b>
CSF		Fixed compensation with fuses	80 kvar	230 / 400 V a.c.	50 ... 60 Hz	<b>25</b>
CSM		Fixed compensation with circuit breaker 10 kA	60 kvar	230 / 400 V a.c.	50 ... 60 Hz	<b>27</b>
CSMM		Fixed compensation with automatic switch 35 kA	100 kvar	230 / 400 V a.c.	50 ... 60 Hz	<b>29</b>
FRF / FRM		Fixed compensation with reactors and fuses (FRF) / automatic (FRM)	80 kvar	230 / 400 V a.c.	50 ... 60 Hz	<b>31</b>



# CLZ-FPT

Tubular capacitor, Faston terminal



## Description

The **CLZ** tubular capacitor range is composed of capacitors with a tubular casing, of the dry-type, covering a wide range of power and voltage ratings, at 50 and 60 Hz. The design, manufacturing and testing processes of **CLZ** tubular capacitors guarantee the production of top quality and long lasting capacitors.

**CLZ** capacitors are composed of three basic units, which are introduced in a cylindrical metallic casing that is filled in with a gel, fulfilling the dielectric and mechanical housing functions.

## Application

Its application is based on the compensation in installations with fixed and variable loads (capacitor banks).

## Features

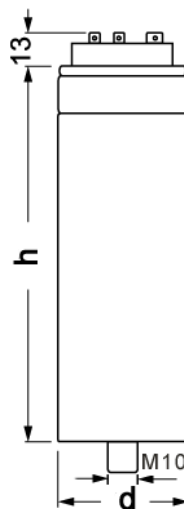
Features		
Overcurrent		1.3 times the rated current permanently
Overvoltage		10 % 8 over 24 hours
		15 % up to 15 minutes over 24 hours
		20 % up to 5 minutes over 24 hours
		30 % up to 1 minute over 24 hours
Insulation level		3 / 15 kV
Tolerance		-5...+15 %
Discharge resistance		75 V / 3 minutes
Frequency		50 or 60 Hz
Losses:	<ul style="list-style-type: none"> <li>• Dielectric</li> <li>• Total</li> </ul>	CLZ system levels: < 0.2 W / kvar < 0.5 W / kvar
Protections		<ul style="list-style-type: none"> <li>• Dielectric regeneration</li> <li>• Expansion system</li> </ul>
Construction features		
Enclosure		Aluminium
Power terminals		Faston type
Fixing screws		M10
Degree of protection		IP 00 for CLZ-FPT and CLZ-FP >30 kvar IP 20 for CLZ-FP ≤ 30 kvar IP 54 for CLZ-FP with terminal cover
Ambient conditions		
Class D temperature:	Daily mean	45 °C
	Annual mean	35 °C
	Maximum	50 °C
	Minimum	-25 °C
Humidity		80 % RH
Altitude		2,000 m
Assembly conditions		
Type of assembly		Vertical
Ventilation		Natural or forced, depending on the cabinet design
Distance between capacitors		Minimum, 2 cm
Standards		
CEI 60831-1, CEI 70/7, UNE 20827, UNE 20010, BS 1650, VDE 560		

## CLZ-FPT

Tubular capacitor, Faston terminal



## Dimensions



Type	d	h
A	50	151
A1	65	155
A2	75	155
A3	75	215

## References

kvar (50 Hz)		kvar (60 Hz)		Dimensions mm (d x h)	Weight (kg)	Type Fig.	Type	Code
400 V	440 V	400 V	440 V					
2	2,5	2,5		50 x 151	0,3	A	CLZ-FPT-44/2.5	R20574
2,5	3	3		50 x 151	0,3	A	CLZ-FPT-44/3	R20575
4	5	5		65 x 155	0,5	A1	CLZ-FPT-43/5	R20578
5	6,25	6		75 x 155	0,7	A2	CLZ-FPT-44/6.25	R20579
6,25	7,5	7,5		75 x 215	1	A3	CLZ-FPT-44/7.5	R2057A

# CLZ-FP

Tubular capacitor with terminal connection



## Description

The **CLZ** tubular capacitor range is composed of capacitors with a tubular casing, of the dry-type, covering a wide range of power and voltage ratings, at 50 and 60 Hz. The design, manufacturing and testing processes of **CLZ** tubular capacitors guarantee the production of top quality and long lasting capacitors.

### New refrigeration technology.

**CLZ** capacitors up to 25 kvar offer a new refrigeration technology that employs nitrogen gas, offering a top-performance, harmless and fireproof refrigeration system.

## Application

Its application is based on the compensation in installations with fixed and variable loads (capacitor banks).

## Features

Features		
Overcurrent		1.3 times the rated current permanently
Overvoltage		10 % 8 over 24 hours
		15 % up to 15 minutes over 24 hours
		20 % up to 5 minutes over 24 hours
		30 % up to 1 minute over 24 hours
Insulation level		3 / 15 kV
Tolerance		-5...+15 %
Discharge resistance		75 V / 3 minutes
Frequency		50 or 60 Hz
Losses:	<ul style="list-style-type: none"> <li>• Dielectric</li> <li>• Total</li> </ul>	CLZ system levels: < 0.2 W / kvar < 0.5 W / kvar
Protections		<ul style="list-style-type: none"> <li>• Dielectric regeneration</li> <li>• Expansion system</li> </ul>
Construction features		
Enclosure		Aluminium
Power terminals		M10
Fixing screws		M12
Degree of protection		IP 00 for CLZ-FPT and CLZ-FP >30 kvar IP 20 for CLZ-FP ≤ 30 kvar IP 54 for CLZ-FP with terminal cover
Ambient conditions		
Class D temperature:	Daily mean	45 °C
	Annual mean	35 °C
	Maximum	50 °C
	Minimum	-25 °C
Humidity		80 % RH
Altitude		2,000 m
Assembly conditions		
Type of assembly		Vertical
Ventilation		Natural or forced, depending on the cabinet design
Distance between capacitors		Minimum, 2 cm
Standards		
CEI 60831-1, CEI 70/7, UNE 20827, UNE 20010, BS 1650, VDE 560		

## CLZ-FP

Tubular capacitor with terminal connection



## Dimensions

Type	d	h	Type	d	h
B	85	175	G	136	220
C	85	245	H	136	261
D	110	220	I	136	355
E	110	245			
F	110	261			

## References

## 230 V

kvar (50 Hz)			kvar (60 Hz)		Dimensions mm (d x h)	Weight (kg)	Type Fig.	Type	Code
220 V	230 V	240 V	220 V	230 V					
2,3	2,5	2,7	2,7	3	85 x 175	1,2	B	CLZ-FP-23/2.5	R20514
3,7	4	4,4	4,4	4,8	85 x 245	1,6	C	CLZ-FP-23/4	R20517
4,6	5	5,4	5,5	6	85 x 245	1,6	C	CLZ-FP-23/5	R20518
5,7	7,5	8,2	8,2	9	110 x 245	2,6	E	CLZ-FP-23/7.5	R2051A
9,1	10	10,9	11	12	110 x 245	2,6	E	CLZ-FP-23/10	R2051C
11,4	12,5	13,6	--	--	136 x 220	3,3	G	CLZ-FP-23/12.5	R2051D
13,7	25	--	--	--	136 x 220	3,3	G	CLZ-FP-23/15	R2051E

## 440 V

400 V	440 V	400 V							
8	10	10	85 x 245	1	C	CLZ-FP-44/10	R2057C		
10	12,5	12	85 x 245	1,2	C	CLZ-FP-44/12.5	R2057D		
12,5	15	15	85 x 245	1,3	C	CLZ-FP-44/15	R2057E		
15	18,2	18	110 x 245	2	E	CLZ-FP-44/18.2	R2057M		
16	20	20	110 x 245	2	E	CLZ-FP-44/20	R2057F		
20	25	--	110 x 245	2,2	E	CLZ-FP-44/25	R2057G		
25	30	--	110 x 245	3,3	E	CLZ-FP-44/30	R2057H		
32	40	--	136 x 261	4,2	H	CLZ-FP-44/40	R2057J		
40	50	--	136 x 355	5,5	I	CLZ-FP-44/50	R2057K		

## 525 V

480 V	525 V	550 V	480 V	525 V					
1,7	2	2,2	2,0	2,4	85 x 175	1,2	B	CLZ-FP-52/2	R20553
2,1	2,5	2,7	2,5	3	85 x 175	1,2	B	CLZ-FP-52/2.5	R20554
2,5	3	3,3	3,0	3,6	85 x 175	1,2	B	CLZ-FP-52/3	R20555
3,3	4	4,4	4,0	4,8	85 x 175	1,2	B	CLZ-FP-52/4	R20557
4,2	5	5,5	5,0	6	85 x 175	1,2	B	CLZ-FP-52/5	R20558
5,2	6,25	6,8	6,2	7,5	85 x 175	1,2	B	CLZ-FP-52/6.25	R20559
6,3	7,5	8,2	7,5	9	85 x 245	1,6	C	CLZ-FP-52/7.5	R2055A
6,7	8	8,7	8	9,6	85 x 245	1,6	C	CLZ-FP-52/8	R2055B
8,4	10	11	10,0	12	85 x 245	1,6	C	CLZ-FP-52/10	R2055C
10,4	12,5	13,7	12,5	15	110 x 220	2,2	D	CLZ-FP-52/12.5	R2055D
12,5	15	16,5	15,0	18	110 x 245	2,6	E	CLZ-FP-52/15	R2055E
16,7	20	22	20,1	24	110 x 245	2,6	E	CLZ-FP-52/20	R2055F

## 460 V - filtering uses

460 V	440 V	460 V							
6	6,6	7,2	85 x 175	0,9	B	CLZ-FP-46/6.25	R20589		
12,5	13,7	15	85 x 245	1,2	C	CLZ-FP-46/12.5	R2058D		
15	16,5	18	85 x 245	1,4	C	CLZ-FP-46/15	R2058E		
19	20,9	22,8	85 x 245	1,9	C	CLZ-FP-46/19	R2058L		
25	27,4	30	85 x 245	2,1	C	CLZ-FP-46/25	R2058G		
30	32,9	36,6	136 x 220	3	G	CLZ-FP-46/30	R2058H		
460 V	440 V	460 V	Reactance	Code R.					
6	6,6	7,2	R-5-400	P70110	B	CLZ-FP-46/6.25	R20589		
12,5	13,7	15	R-10-400	P70115	C	CLZ-FP-46/12.5	R2058D		
15	16,5	18	R-12.5-400	P70117	C	CLZ-FP-46/15	R2058E		
19	20,9	22,8	R-15-400	P70120	C	CLZ-FP-46/19	R2058L		
25	27,4	30	R-20-400	P70125	C	CLZ-FP-46/25	R2058G		
30	32,9	36,6	R-25-400	P70130	G	CLZ-FP-46/30	R2058H		

# CV

## Low voltage three-phase power capacitors



### Description

The **CV** dry-type prismatic capacitor range covers all power and voltage requirements, from 50 to 60 Hz.

The design, manufacturing and testing processes of tubular capacitors guarantee the production of top quality and long lasting capacitors.

The 4 internal protection levels (self-regulation of the internal fuse, protection cover and vermiculite) make prismatic capacitors the safest units in the market.

### Application

Its application is based on the compensation in installations with fixed and variable loads (capacitor banks).

### Features

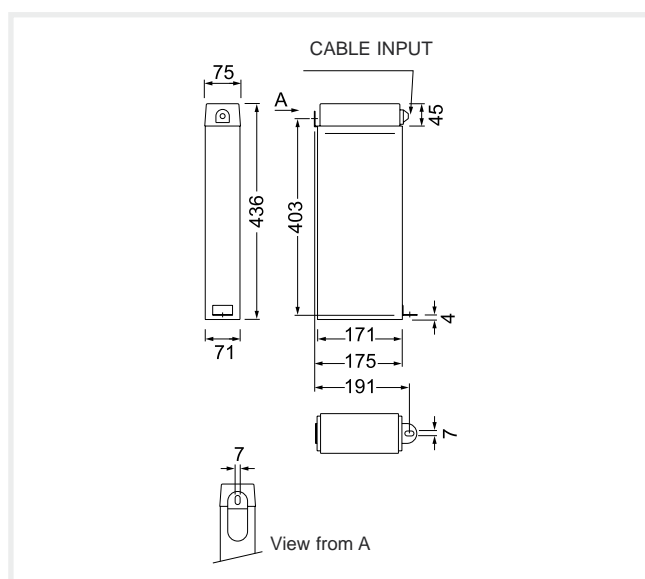
Features		
Overcurrent		1.3 times the rated current permanently
Overvoltage		10 % 8 over 24 hours
		15 % up to 15 minutes over 24 hours
		20 % up to 5 minutes over 24 hours
		30 % up to 1 minute over 24 hours
Insulation level		3 / 15 kV
Power tolerance		-5...+15 %
Discharge resistance		75 V / 3 minutes
Frequency		50 or 60 Hz
Losses:	• Dielectric	< 0.2 W / kvar
	• Total	< 0.5 W / kvar
Protections		• Dielectric regeneration
		• Internal fuse
		• Overpressure system
		• Vermiculite
Construction features		
Enclosure		Treated and painted steel, colour RAL 3005
Terminals:	• Power rating	• M6 for CV, M10 for CQ, CS, CS-6B, CF, CF-6B
	• Earth	• M6
Torque value		• CV 5 Nm • CQ, CS, CS-6B, CF, CF-6B: 15 Nm
Degree of protection		IP 42 with terminal cover
Ambient conditions		
Class C temperature:	Daily mean	40 °C
	Annual mean	30 °C
	Maximum	50 °C
	Minimum	-40 °C
Humidity		80 %
Altitude		2,000 m
Assembly conditions		
Type of assembly		Vertical
Ventilation		Natural or forced, depending on the cabinet design
Distance between capacitors		Minimum, 4 cm
Weight		0.4 kg
Standards		
CEI 60831-1, CEI 70/7, UNE 20827, UNE 20010, BS 1650, VDE 560		

## CV

## Low voltage three-phase power capacitors



## Dimensions



## References

## 230 V

kvar		Weight (kg)	Dim. (mm) width x height x depth	Type	Code
50 Hz	60 Hz				
2,5	3	3	204 x 435 x 75	CV-23/2.5	R20114
3,75	4,5	3,5	204 x 435 x 75	CV-23/3.75	R20116
5	6	3,5	204 x 435 x 75	CV-23/5	R20118
7,5	9	4	204 x 435 x 75	CV-23/7.5	R2011A
10	12,5	4	204 x 435 x 75	CV-23/10	R2011C
12,5	15	4,5	204 x 435 x 75	CV-23/12.5	R2011D
15	17,5	4,5	204 x 435 x 75	CV-23/15	R2011E

## 400 V

kvar		Weight (kg)	Dim. (mm) width x height x depth	Type	Code
50 Hz	60 Hz				
2,5	3	2,5	204 x 435 x 75	CV-40/2.5	R20134
5	4,5	2,5	204 x 435 x 75	CV-40/5	R20138
7,5	9	3	204 x 435 x 75	CV-40/7.5	R2013A
10	12,5	3	204 x 435 x 75	CV-40/10	R2013C
12,5	15	3,5	204 x 435 x 75	CV-40/12.5	R2013D
15	17,5	4,5	204 x 435 x 75	CV-40/15	R2013E
20	25	4,5	204 x 435 x 75	CV-40/20	R2013F
25	30	6,5	204 x 435 x 75	CV-40/25	R2013G

## 440 V

kvar		Weight (kg)	Dim. (mm) width x height x depth	Type	Code
50 Hz	60 Hz				
2,5	3	2	204 x 435 x 75	CV-44/2.5	R20144
5	4,5	2	204 x 435 x 75	CV-44/5	R20148
7,5	9	2,5	204 x 435 x 75	CV-44/7.5	R2014A
10	12,5	2,5	204 x 435 x 75	CV-44/10	R2014C
12,5	15	3	204 x 435 x 75	CV-44/12.5	R2014D
15	17,5	4	204 x 435 x 75	CV-44/15	R2014E
20	25	4	204 x 435 x 75	CV-44/20	R2014F
25	30	6	204 x 435 x 75	CV-44/25	R2014G

## 460 V

kvar		Weight (kg)	Dim. (mm) width x height x depth	Type	Code
50 Hz	60 Hz				
2,5	3	1	204 x 435 x 75	CV-46/2.5	R20154
5	6	1	204 x 435 x 75	CV-46/5	R20158
7,5	9	1,5	204 x 435 x 75	CV-46/7.5	R2015A
10	12,5	1,5	204 x 435 x 75	CV-46/10	R2015C
12,5	15	2	204 x 435 x 75	CV-46/12.5	R2015D
15	17,5	3	204 x 435 x 75	CV-46/15	R2015E

# CQ

## Low voltage three-phase power capacitors



### Description

The **CQ** dry-type prismatic capacitor range covers all power and voltage requirements, from 50 to 60 Hz.

The design, manufacturing and testing processes of prismatic capacitors guarantee the production of top quality and long lasting capacitors.

The 4 internal protection levels (self-regulation of the internal fuse, protection cover and vermiculite) make prismatic capacitors the safest units in the market.

### Application

Its application is based on the compensation in installations with fixed and variable loads (capacitor banks).

### Features

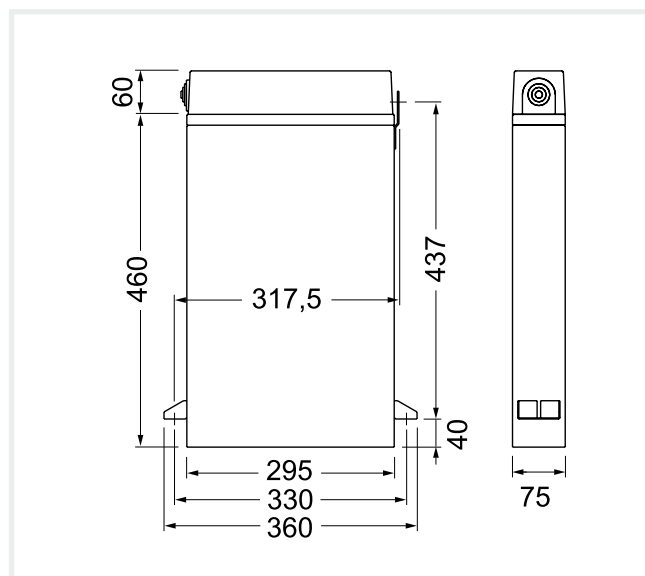
Features		
Overcurrent		1.3 times the rated current permanently
Overvoltage		10 % 8 over 24 hours 15 % up to 15 minutes over 24 hours 20 % up to 5 minutes over 24 hours 30 % up to 1 minute over 24 hours
Insulation level		3 / 15 kV
Power tolerance		-5...+15 %
Discharge resistance		75 V / 3 minutes
Frequency		50 or 60 Hz
Losses:	<ul style="list-style-type: none"> <li>• Dielectric</li> <li>• Total</li> </ul>	< 0.2 W / kvar < 0.5 W / kvar
Protections		<ul style="list-style-type: none"> <li>• Dielectric regeneration</li> <li>• Internal fuse</li> <li>• Overpressure system</li> <li>• Vermiculite</li> </ul>
Construction features		
Enclosure		Treated and painted steel, colour RAL 3005
Terminals:	<ul style="list-style-type: none"> <li>• Power rating</li> <li>• Earth</li> </ul>	<ul style="list-style-type: none"> <li>• M6 for CV, M10 for CQ, CS, CS-6B, CF, CF-6B</li> <li>• M6</li> </ul>
Torque value		<ul style="list-style-type: none"> <li>• CV 5 Nm</li> <li>• CQ, CS, CS-6B, CF, CF-6B: 15 Nm</li> </ul>
Degree of protection		IP 42 with terminal cover
Ambient conditions		
Class C temperature:	Daily mean	40 °C
	Annual mean	30 °C
	Maximum	50 °C
	Minimum	-40 °C
Humidity		80 %
Altitude		2,000 m
Assembly conditions		
Type of assembly		Vertical
Ventilation		Natural or forced, depending on the cabinet design
Distance between capacitors		Minimum, 4 cm
Weight		0.4 kg
Standards		
CEI 60831-1, CEI 70/7, UNE 20827, UNE 20010, BS 1650, VDE 560		

## CQ

## Low voltage three-phase power capacitors



## Dimensions



## References

## 230 V

kvar		Weight (kg)	Dim. (mm) width x height x depth	Type	Code
50 Hz	60 Hz				
10	12,5	4,9	360 x 520 x 75	CQ-23/10	R2031C
12,5	15	4,9	360 x 520 x 75	CQ-23/12.5	R2031D
15	17,5	4,9	360 x 520 x 75	CQ-23/15	R2031E
20	25	6,4	360 x 520 x 75	CQ-23/20	R2031F
25	30	7,9	360 x 520 x 75	CQ-23/25	R2031G
30	35	7,9	360 x 520 x 75	CQ-23/30	R2031H

## 400 V

kvar		Weight (kg)	Dim. (mm) width x height x depth	Type	Code
50 Hz	60 Hz				
10	12,5	4	360 x 520 x 75	CQ-40/10	R2033C
12,5	15	4,5	360 x 520 x 75	CQ-40/12.5	R2033D
15	17,5	5	360 x 520 x 75	CQ-40/15	R2033E
20	25	6	360 x 520 x 75	CQ-40/20	R2033F
25	30	6	360 x 520 x 75	CQ-40/25	R2033G
30	35	6	360 x 520 x 75	CQ-40/30	R2033H
40	50	7	360 x 520 x 75	CQ-40/40	R2033J
50	60	9	360 x 520 x 75	CQ-40/50	R2033K

## 440 V

kvar		Weight (kg)	Dim. (mm) width x height x depth	Type	Code
50 Hz	60 Hz				
15	17,5	4,1	360 x 520 x 75	CQ-44/15	R2034E
20	25	4,9	360 x 520 x 75	CQ-44/20	R2034F
25	30	4,9	360 x 520 x 75	CQ-44/25	R2034G
30	35	4,9	360 x 520 x 75	CQ-44/30	R2034H
40	50	6	360 x 520 x 75	CQ-44/40	R2034J
50	60	7,9	360 x 520 x 75	CQ-44/50	R2034K

## 460 V

kvar		Weight (kg)	Dim. (mm) width x height x depth	Type	Code
50 Hz	60 Hz				
10	12,5	4,1	360 x 520 x 75	CQ-46/10	R2035C
12,5	15	4,1	360 x 520 x 75	CQ-46/12.5	R2035D
15	17,5	4,1	360 x 520 x 75	CQ-46/15	R2035E
20	25	4,9	360 x 520 x 75	CQ-46/20	R2035F
25	30	4,9	360 x 520 x 75	CQ-46/25	R2035G
30	35	4,9	360 x 520 x 75	CQ-46/30	R2035H
40	50	7,9	360 x 520 x 75	CQ-46/40	R2035J
50	60	7,9	360 x 520 x 75	CQ-46/50	R2035K
60	-	8,1	360 x 520 x 75	CQ-46/60	R2035L

# CS

## Low voltage three-phase power capacitors

### Description

The **CS** dry-type prismatic capacitor range covers all power and voltage requirements, from 50 to 60 Hz.

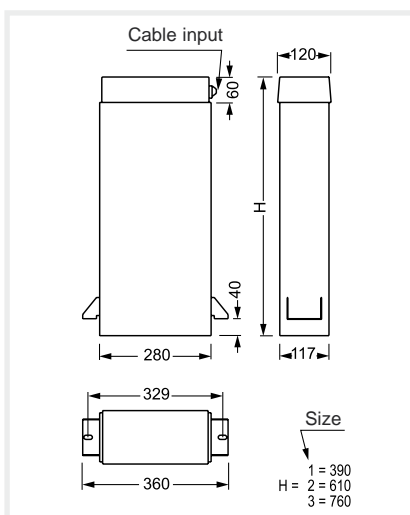
The design, manufacturing and testing processes of prismatic capacitors guarantee the production of top quality and long lasting capacitors.

The 4 internal protection levels (self-regulation of the internal fuse, protection cover and vermiculite) make prismatic capacitors the safest units in the market.

### Application

Its application is based on the compensation in installations with fixed and variable loads (capacitor banks).

### Dimensions



### Features

Features		
Overcurrent		1.3 times the rated current permanently
Overvoltage		10 % 8 over 24 hours 15 % up to 15 minutes over 24 hours 20 % up to 5 minutes over 24 hours 30 % up to 1 minute over 24 hours
Insulation level		3 / 15 kV
Power tolerance		-5...+15 %
Discharge resistance		75 V / 3 minutes
Frequency		50 or 60 Hz
Losses:	<ul style="list-style-type: none"> <li>• Dielectric</li> <li>• Total</li> </ul>	<ul style="list-style-type: none"> <li>&lt; 0.2 W / kvar</li> <li>&lt; 0.5 W / kvar</li> </ul>
Protections		<ul style="list-style-type: none"> <li>• Dielectric regeneration</li> <li>• Internal fuse</li> <li>• Overpressure system</li> <li>• Vermiculite</li> </ul>
Construction features		
Enclosure		Treated and painted steel, colour RAL 3005
Terminals:	<ul style="list-style-type: none"> <li>• Power rating</li> <li>• Earth</li> </ul>	<ul style="list-style-type: none"> <li>• M6 for CV, M10 for CQ, CS, CS-6B, CF, CF-6B</li> <li>• M6</li> </ul>
Torque value		<ul style="list-style-type: none"> <li>• CV 5 Nm</li> <li>• CQ, CS, CS-6B, CF, CF-6B: 15 Nm</li> </ul>
Degree of protection		IP 42 with terminal cover
Ambient conditions		
Class C temperature:	<ul style="list-style-type: none"> <li>Daily mean</li> <li>Annual mean</li> <li>Maximum</li> <li>Minimum</li> </ul>	<ul style="list-style-type: none"> <li>40 °C</li> <li>30 °C</li> <li>50 °C</li> <li>-40 °C</li> </ul>
Humidity		80 %
Altitude		2,000 m
Assembly conditions		
Type of assembly		Vertical
Ventilation		Natural or forced, depending on the cabinet design
Distance between capacitors		Minimum, 4 cm
Weight		0.4 kg
Standards		
		CEI 60831-1, CEI 70/7, UNE 20827, UNE 20010, BS 1650, VDE 560

## CS

## Low voltage three-phase power capacitors



## References

## 230 V

kvar		Weight (kg)	Dim. (mm) width x height x depth	Type	Code
50 Hz	60 Hz				
10	12,5	6,5	360 x 390 x 120	CS-23/10	R2021C
12,5	15	8	360 x 390 x 120	CS-23/12,5	R2021D
15	17,5	8	360 x 390 x 120	CS-23/15	R2021E
20	25	11,5	360 x 390 x 120	CS-23/20	R2021F
25	30	13	360 x 390 x 120	CS-23/25	R2021G
30	35	14,5	360 x 610 x 120	CS-23/30	R2021H
40	50	15	360 x 610 x 120	CS-23/40	R2021J
50	60	16,5	360 x 760 x 120	CS-23/50	R2021K

## 400 V

kvar		Weight (kg)	Dim. (mm) width x height x depth	Type	Code
50 Hz	60 Hz				
15	17,5	6,5	360 x 390 x 120	CS-40/15	R2023E
20	25	7,5	360 x 390 x 120	CS-40/20	R2023F
25	30	7,5	360 x 390 x 120	CS-40/25	R2023G
30	35	8	360 x 390 x 120	CS-40/30	R2023H
40	50	9,5	360 x 390 x 120	CS-40/40	R2023J
50	60	12	360 x 390 x 120	CS-40/50	R2023K
60	70	13	360 x 610 x 120	CS-40/60	R2023L
80	95	15	360 x 610 x 120	CS-40/80	R2023Q
100	120	18,5	360 x 610 x 120	CS-40/100	R2023R

## 440 V

kvar		Weight (kg)	Dim. (mm) width x height x depth	Type	Code
50 Hz	60 Hz				
15	17,5	4,1	360 x 390 x 120	CS-44/15	R2024E
20	25	4,9	360 x 390 x 120	CS-44/20	R2024F
25	30	4,9	360 x 390 x 120	CS-44/25	R2024G
30	35	4,9	360 x 390 x 120	CS-44/30	R2024H
40	50	6,4	360 x 390 x 120	CS-44/40	R2024J
50	60	9,5	360 x 390 x 120	CS-44/50	R2024K
60	70	9,5	360 x 390 x 120	CS-44/60	R2024L
80	95	12,5	360 x 610 x 120	CS-44/80	R2024Q
100	120	15,6	360 x 760 x 120	CS-44/100	R2024R

## 460 V

kvar		Weight (kg)	Dim. (mm) width x height x depth	Type	Code
50 Hz	60 Hz				
15	17,5	6	360 x 390 x 120	CS-46/15	R2025E
20	25	6,5	360 x 390 x 120	CS-46/20	R2025F
25	30	7	360 x 390 x 120	CS-46/25	R2025G
30	35	8	360 x 390 x 120	CS-46/30	R2025H
40	50	9,5	360 x 390 x 120	CS-46/40	R2025J
50	60	12	360 x 610 x 120	CS-46/50	R2025K
60	70	13	360 x 610 x 120	CS-46/60	R2025L
80	95	15	360 x 760 x 120	CS-46/80	R2025Q
100	120	18,5	360 x 760 x 120	CS-46/100	R2025R

## 480 V

kvar		Weight (kg)	Dim. (mm) width x height x depth	Type	Code
50 Hz	60 Hz				
8	10	4,9	360 x 390 x 120	CS-48/10	R288AC
12,5	15	4,9	360 x 390 x 120	CS-48/15	R288AE
16,7	20	4,9	360 x 390 x 120	CS-48/20	R288AF
20,8	25	6,4	360 x 390 x 120	CS-48/25	R288AG
25	30	7,9	360 x 390 x 120	CS-48/30	R288AH
33,3	40	7,9	360 x 610 X 120	CS-48/40	R288AJ
41,7	50	11	360 x 610 X 120	CS-48/50	R288AK
50	60	14	360 x 610 X 120	CS-48/60	R288AL
66,7	80	17,1	360 x 760 X 120	CS-48/80	R288AQ
83,8	100	17,1	360 x 760 X 120	CS-48/100	R288AR

## 500 V

kvar		Weight (kg)	Dim. (mm) width x height x depth	Type	Code
50 Hz	60 Hz				
10	12,5	7	360 x 390 x 120	CS-50/10	R202CD
15	17,5	8	360 x 390 x 120	CS-50/15	R202CE
20	25	8,5	360 x 390 x 120	CS-50/20	R202CF
25	30	9	360 x 390 x 120	CS-50/25	R202CG
30	35	9	360 x 390 x 120	CS-50/30	R202CH
40	50	14	360 x 390 x 120	CS-50/40	R202CJ
50	60	15	360 x 390 x 120	CS-50/50	R202CK
60	70	17	360 x 390 x 120	CS-50/60	R202CL
80	95	22	360 X 760 X 120	CS-50/80	R202CQ

## 550 V

kvar		Weight (kg)	Dim. (mm) width x height x depth	Type	Code
50 Hz	60 Hz				
10	12,5	7	360 x 390 x 120	CS-55/10	R2026C
15	17,5	8	360 x 390 x 120	CS-55/15	R2026E
20	25	8,5	360 x 390 x 120	CS-55/20	R2026F
25	30	9	360 x 390 x 120	CS-55/25	R2026G
30	35	9	360 x 390 x 120	CS-55/30	R2026H
40	50	14	360 x 390 x 120	CS-55/40	R2026J
50	60	15	360 x 390 x 120	CS-55/50	R2026K
60	70	17	360 x 390 x 120	CS-55/60	R2026L
70	84	21	360 X 760 X 120	CS-55/70	R2026M

## 690 V

kvar		Weight (kg)	Dim. (mm) width x height x depth	Type	Code
50 Hz	60 Hz				
10	12,5	4,9	360 x 390 x 120	CS-69/10	R202BC
15	17,5	4,9	360 x 390 x 120	CS-69/15	R202BE
20	25	4,9	360 x 390 x 120	CS-69/20	R202BF
25	30	6,4	360 x 390 x 120	CS-69/25	R202BG
30	35	7,9	360 x 610 X 120	CS-69/30	R202BH
40	50	7,9	360 x 390 x 120	CS-69/40	R202BJ
50	60	11	360 x 390 x 120	CS-69/50	R202BK
60	70	14	360 x 390 x 120	CS-69/60	R202BL
80	95	17,1	360 x 610 X 120	CS-69/80	R202BQ
100	-	22	360 x 610 X 120	CS-69/100	R202BR

## 1100 V

kvar		Weight (kg)	Dim. (mm) width x height x depth	Type	Code
50 Hz	60 Hz				
10	12	5,5	360 x 390 x 120	CS-110/10	R2027C
20	24	7,5	360 x 390 x 120	CS-110/20	R2027F
30	36	9,5	360 x 610 X 120	CS-110/30	R2027H
40	48	12	360 x 610 X 120	CS-110/40	R2027J
50	60	17	360 x 610 X 120	CS-110/50	R2027K
60	72	17,5	360 x 610 X 120	CS-110/60	R2027L
70	84	18,5	360 x 760 X 120	CS-110/70	R2027M

# CS-6B

Low voltage three-phase power capacitors. Dual-voltage



## Description

The **CS** dry-type prismatic capacitor range covers all power and voltage requirements, from 50 to 60 Hz.

The design, manufacturing and testing processes of prismatic capacitors guarantee the production of top quality and long lasting capacitors.

The 4 internal protection levels (self-regulation of the internal fuse, protection cover and vermiculite) make prismatic capacitors the safest units in the market.

## Application

Its application is based on the compensation in installations with fixed and variable loads (capacitor banks). Application for static systems.

## Features

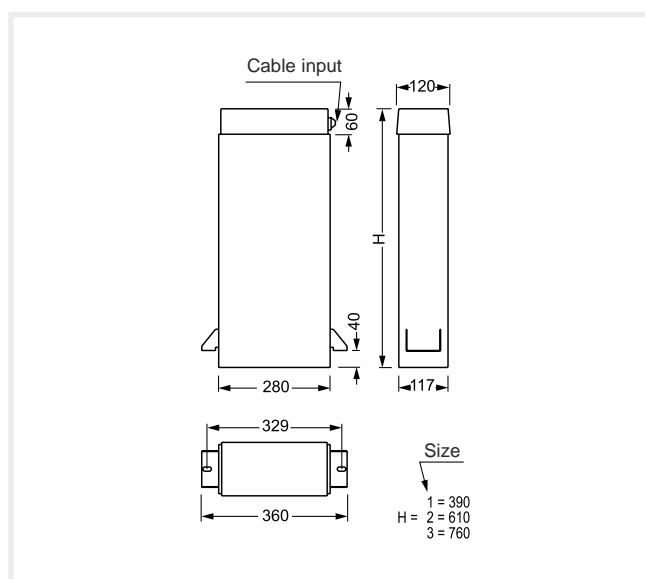
Features		
Overcurrent		1.3 times the rated current permanently
Overvoltage		10 % 8 over 24 hours 15 % up to 15 minutes over 24 hours 20 % up to 5 minutes over 24 hours 30 % up to 1 minute over 24 hours
Insulation level		3 / 15 kV
Power tolerance		-5...+15 %
Discharge resistance		75 V / 3 minutes
Frequency		50 or 60 Hz
Losses:	<ul style="list-style-type: none"> <li>• Dielectric</li> <li>• Total</li> </ul>	< 0.2 W / kvar < 0.5 W / kvar
Protections		<ul style="list-style-type: none"> <li>• Dielectric regeneration</li> <li>• Internal fuse</li> <li>• Overpressure system</li> <li>• Vermiculite</li> </ul>
Construction features		
Enclosure		Treated and painted steel, colour RAL 3005
Terminals:	<ul style="list-style-type: none"> <li>• Power rating</li> <li>• Earth</li> </ul>	<ul style="list-style-type: none"> <li>• M6 for CV, M10 for CQ, CS, CS-6B, CF, CF-6B</li> <li>• M6</li> </ul>
Torque value		<ul style="list-style-type: none"> <li>• CV 5 Nm</li> <li>• CQ, CS, CS-6B, CF, CF-6B: 15 Nm</li> </ul>
Degree of protection		IP 42 with terminal cover
Ambient conditions		
Class C temperature:	Daily mean Annual mean Maximum Minimum	40 °C 30 °C 50 °C -40 °C
Humidity		80 %
Altitude		2,000 m
Assembly conditions		
Type of assembly		Vertical
Ventilation		Natural or forced, depending on the cabinet design
Distance between capacitors		Minimum, 4 cm
Weight		0.4 kg
Standards		
CEI 60831-1, CEI 70/7, UNE 20827, UNE 20010, BS 1650, VDE 560		

## CS-6B

Low voltage three-phase power capacitors.  
Dual-voltage



## Dimensions



## References

## DUAL-VOLTAGE 230 / 400 V

kvar		Weight (kg)	Dim. (mm) width x height x depth	Type	Code
50 Hz	60 Hz				
5	6	6,5	360 x 390 x 120	CS-2340/5	R20288
7,5	9	6,5	360 x 390 x 120	CS-2340/7.5	R2028A
10	12,5	8	360 x 390 x 120	CS-2340/10	R2028C
12,5	15	9	360 x 390 x 120	CS-2340/12.5	R2028D
15	17,5	9	360 x 390 x 120	CS-2340/15	R2028E
20	25	12	360 x 390 x 120	CS-2340/20	R2028F
25	30	14,5	360 x 390 x 120	CS-2340/25	R2028G
30	35	15	360 x 610 x 120	CS-2340/30	R2028H
40	50	15,5	360 x 610 x 120	CS-2340/40	R2028J

## DUAL-VOLTAGE 400 / 690 V

kvar		Weight (kg)	Dim. (mm) width x height x depth	Type	Code
50 Hz	60 Hz				
5	6	2,5	360 x 610 x 120	CS-4069/5	R20298
7,5	9	3,5	360 x 610 x 120	CS-4069/7.5	R2029A
10	12,5	4,5	360 x 610 x 120	CS-4069/10	R2029C
12,5	15	5	360 x 610 x 120	CS-4069/12.5	R2029D
15	17,5	6	360 x 610 x 120	CS-4069/15	R2029E
20	25	6,5	360 x 610 x 120	CS-4069/20	R2029F
25	30	7	360 x 610 x 120	CS-4069/25	R2029G
30	35	7,5	360 x 610 x 120	CS-4069/30	R2029H
40	50	8,5	360 x 610 x 120	CS-4069/40	R2029J
50	60	10,5	360 x 610 x 120	CS-4069/50	R2029K
60	70	13,5	360 x 610 x 120	CS-4069/60	R2029L
75	95	15	360 x 610 x 120	CS-4069/75	R2029P

Note: Dual-voltage capacitors can be used for the fixed compensation of motors.

# CF

## Capacitor for detuned filters



### Description

**CF** Capacitors have been designed for their installation with the reactors of the **RB** series. In other words, reactors for detuned filters at 7 % (189 Hz).

**CF** capacitors for detuned filters have been designed with the following in mind:

- Operating voltage of the network
- Voltage increases caused by the filter reactance
- Inductive power consumed by the reactance
- Safety margin to protect against potential harmonic overloads

Therefore, the capacitor is dimensioned to deliver the power desired at the network's service voltage

### Application

Its application is focused on the compensation of installations under fixed and variable loads (capacitor banks) with a high content of harmonics and/or the risk of resonance.

### Features

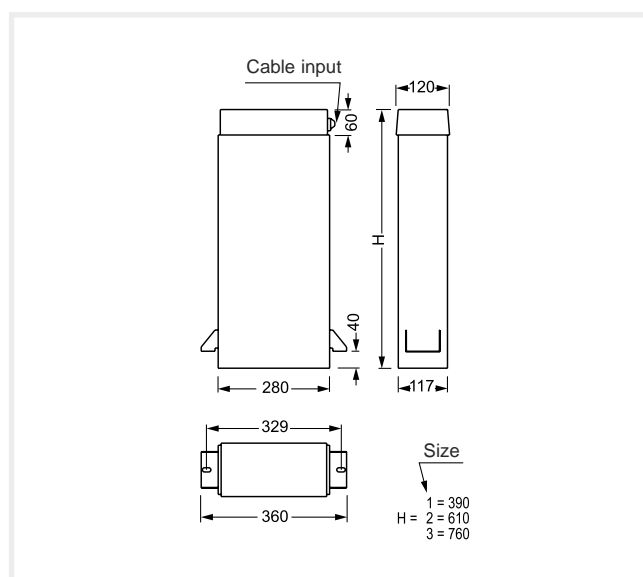
Features		
Overcurrent		1.3 times the rated current permanently
Overvoltage		10 % 8 over 24 hours 15 % up to 15 minutes over 24 hours 20 % up to 5 minutes over 24 hours 30 % up to 1 minute over 24 hours
Insulation level		3 / 15 kV
Power tolerance		-5...+15 %
Discharge resistance		75 V / 3 minutes
Frequency		50 or 60 Hz
Losses:	<ul style="list-style-type: none"> <li>• Dielectric</li> <li>• Total</li> </ul>	<ul style="list-style-type: none"> <li>&lt; 0.2 W / kvar</li> <li>&lt; 0.5 W / kvar</li> </ul>
Protections		<ul style="list-style-type: none"> <li>• Dielectric regeneration</li> <li>• Internal fuse</li> <li>• Overpressure system</li> <li>• Vermiculite</li> </ul>
Construction features		
Enclosure		Treated and painted steel, colour RAL 3005
Terminals:	<ul style="list-style-type: none"> <li>• Power rating</li> <li>• Earth</li> </ul>	<ul style="list-style-type: none"> <li>• M6 for <b>CV</b>, M10 for <b>CQ</b>, <b>CS</b>, <b>CS-6B</b>, <b>CF</b>, <b>CF-6B</b></li> <li>• M6</li> </ul>
Torque value		<ul style="list-style-type: none"> <li>• <b>CV</b> 5 Nm</li> <li>• <b>CQ</b>, <b>CS</b>, <b>CS-6B</b>, <b>CF</b>, <b>CF-6B</b>: 15 Nm</li> </ul>
Degree of protection		IP 42 with terminal cover
Ambient conditions		
Class C temperature:	Daily mean	40 °C
	Annual mean	30 °C
	Maximum	50 °C
	Minimum	-40 °C
Humidity		80 %
Altitude		2,000 m
Assembly conditions		
Type of assembly		Vertical
Ventilation		Natural or forced, depending on the cabinet design
Distance between capacitors		Minimum, 4 cm
Weight		0.4 kg
Standards		
CEI 60831-1, CEI 70/7, UNE 20827, UNE 20010, BS 1650, VDE 560		

## CF

## Capacitor for detuned filters



## Dimensions



## References

## CF 230 V

kvar (*)	Weight (kg)	For reactance	Type	Code
5	6	R-5-230	CF 26 / 6.3	R2112A
10	7	R-10-230	CF 26 / 12.5	R2112D
15	9,5	RB-15-230	CF 26 / 18	R2112E
20	12	RB-20-230	CF 26 / 25	R2112G
25	14	RB-25-230	CF 26 / 30	R2112H
30	16	RB-30-230	CF 26 / 37	R2112J
40	20	RB-40-230	CF 26 / 48	R2112K
50	21	RB-50-230	CF 26 / 60	R2112L

## CF 460 V

kvar (*)	Weight (kg)	For reactance	Type	Code
5	6	R-5-400	CF 46 / 6	R2115A
10	6	R-10-400	CF 46 / 12.5	R2115D
12,5	6,5	R-12.5-400	CF 46 / 15	R2115E
15	6,5	R-15-400	CF 46 / 19	R2115F
20	7	RB-20-400	CF 46 / 25	R2115G
25	8	RB-25-400	CF 46 / 30	R2115H
30	9,5	RB-30-400	CF 46 / 37	R2115J
40	12	RB-40-400	CF 46 / 50	R2115K
50	16	RB-50-400	CF 46 / 62	R2115L
60	18,5	RB-60-400	CF 46 / 74	R2115P
80	20	RB-80-400	CF 46 / 100	R2115R

## CF 790 V

kvar (*)	Weight (kg)	For reactance	Type	Code
5	6	RE-5-400	CF 79 / 6	R211DA
10	6	RE-10-400	CF 79 / 12.5	R211DD
15	6,5	RE-15-400	CF 79 / 19	R211DF
20	7,5	RE-20-400	CF 79 / 25	R211DG
25	8	RE-25-400	CF 79 / 30	R211DH
30	9,5	RE-30-400	CF 79 / 37	R211DI
40	12	RE-40-400	CF 79 / 50	R211DK
50	16	RBE-50-400	CF 79 / 62	R211DL
60	18,5	RBE-60-400	CF 79 / 74	R211DP
80	19	RBE-80-400	CF 79 / 100	R211DR

\*NOTE The filtering unit supplies a voltage of 400/230 V to the network. To compensate the reactance's overvoltage effect, the capacitor has been dimensioned to support 460/260 V and a power exceeding 25% of that stated in all columns

# CF-6B

Special capacitor for harmonic filters of the FRE Series



## Description

CF Capacitors have been designed for their installation with the reactors of the **RB** Series; reactors for a detuned filters at 7 % (189 Hz).

CF capacitors for detuned filters have been designed with the following in mind:

- Operating voltage of the network
- Voltage increases caused by the filter reactance
- Inductive power consumed by the reactance
- Safety margin to protect against potential harmonic overloads

Therefore, the capacitor is dimensioned to deliver the power desired at the network's service voltage.

## Application

Its application is focused on the compensation of installations under fixed and variable loads (capacitor banks) with a high content of harmonics and/or the risk of resonance. Application for static systems.

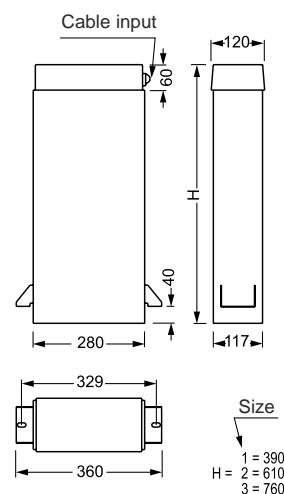
## Features

Features		
Overcurrent		1.3 times the rated current permanently
Overvoltage		10 % 8 over 24 hours 15 % up to 15 minutes over 24 hours 20 % up to 5 minutes over 24 hours 30 % up to 1 minute over 24 hours
Insulation level		3 / 15 kV
Power tolerance		-5...+15 %
Discharge resistance		75 V / 3 minutes
Frequency		50 or 60 Hz
Losses:	• Dielectric • Total	< 0.2 W / kvar < 0.5 W / kvar
Protections		• Dielectric regeneration • Internal fuse • Overpressure system • Vermiculite
Construction features		
Enclosure		Treated and painted steel, colour RAL 3005
Terminals:	• Power rating • Earth	• M6 for CV, M10 for CQ, CS, CS-6B, CF, CF-6B • M6
Torque value		• CV 5 Nm • CQ, CS, CS-6B, CF, CF-6B: 15 Nm
Degree of protection		IP 42 with terminal cover
Ambient conditions		
Class C temperature:	Daily mean	40 °C
	Annual mean	30 °C
	Maximum	50 °C
	Minimum	-40 °C
Humidity		80 %
Altitude		2,000 m
Assembly conditions		
Type of assembly		Vertical
Ventilation		Natural or forced, depending on the cabinet design
Distance between capacitors		Minimum, 4 cm
Weight		0.4 kg
Standards		
CEI 60831-1, CEI 70/7, UNE 20827, UNE 20010, BS 1650, VDE 560		

## CF-6B

Special capacitor for harmonic filters of the FRE Series

## Dimensions



## References

## CF 460-6B V

kvar (*)	Weight (kg)	For reactance	Type	Code
5	6	RE-5-400	CF -46 / 6-6B	R2125A
10	6	RE-10-400	CF -46 / 12.5-6B	R2125D
15	6,5	RE-15-400	CF -46 / 19-6B	R2125F
20	7	RBE-20-400	CF -46 / 25-6B	R2125G
25	8	RBE-25-400	CF -46 / 30-6B	R2125H
30	9,5	RBE-30-400	CF -46 / 37-6B	R2125J
40	12	RBE-40-400	CF -46 / 50-6B	R2125K
50	16	RBE-50-400	CF -46 / 62-6B	R2125L
60	18,5	RBE-60-400	CF -46 / 74-6B	R2125P
80	18,5	RBE-80-400	CF -46 / 100-6B	R2125R

## CF 260-6B V

kvar (*)	Weight (kg)	For reactance	Type	Code
5	7	RE-5-230	CF -26 / 6.3-6B	R2122A
10	8	RE-10-230	CF -26 / 12.5-6B	R2122D
15	10,5	RE-15-230	CF -26 / 18-6B	R2122E
20	13	RBE-20-230	CF -26 / 25-6B	R2122G
25	15	RBE-22-230	CF -26 / 30-6B	R2122H
30	17	RBE-30-230	CF -26 / 37-6B	R2122J
40	21	RBE-40-230	CF -26 / 48-6B	R2122K

NOTE: The power stated is the real power supplied by the filtering unit to the network at a voltage of 400/230 V. To compensate the reactance overvoltage effect, the capacitor has been dimensioned for 460/260 V and for a power that exceeds 25% of that stated for all columns.

# CSF

Three-phase power capacitor with fuse protection



## Description

The **CSF** capacitors with fuse protection are fixed compensation units that have been designed for reactive energy compensation purposes in motors and transformers with constant load levels. It includes a general protection with **NH-00** fuses with high rupture power (HRP).

## Application

Its application is mainly based on the compensation of transformers and motors. In general, they are used for the compensation of installations with constant loads.

## Features

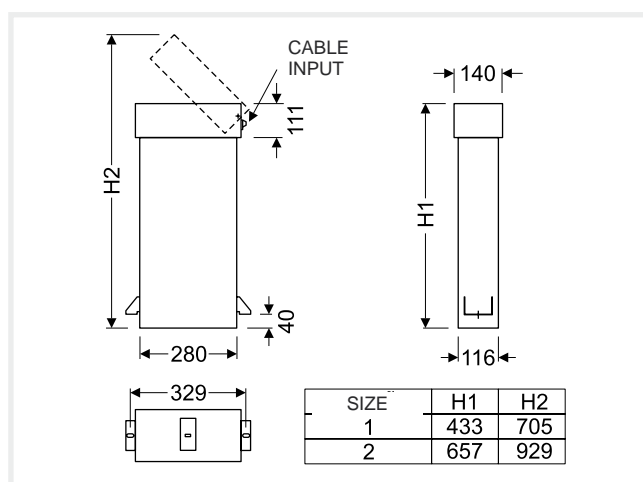
Features		
Operating voltage		230, 400 V (for other voltages, please ask)
Support voltage	400 V	440 V
Capacity tolerance		± 10%
Unit composed of		<b>CS</b> Capacitor + General protection fuses of the <b>NH-00</b> type with high rupture power (HRP)
Insulation level		3 / 15 kV
Discharge resistance		75 V / 3 minutes
Overcurrent		1.3 times the rated current permanently
Overvoltage		10% 8 over 24 hours 15% up to 15 minutes over 24 hours 20% up to 5 minutes over 24 hours 30% up to 1 minutes over 24 hours
Frequency		50 or 60 Hz
Losses:	<ul style="list-style-type: none"> <li>• Dielectric</li> <li>• Total</li> </ul>	< 0.2 W / kvar < 0.5 W / kvar
Protections		<ul style="list-style-type: none"> <li>• Dielectric regeneration</li> <li>• Internal fuse</li> <li>• Overpressure system</li> <li>• Vermiculite</li> </ul>
Construction features		
Terminals:	<ul style="list-style-type: none"> <li>• Power rating</li> <li>• Earth</li> </ul>	<ul style="list-style-type: none"> <li>• M6 for <b>CV</b>, M10 for <b>CQ</b>, <b>CS</b>, <b>CS-6B</b>, <b>CF</b>, <b>CF-6B</b></li> <li>• M6</li> </ul>
Torque value		<ul style="list-style-type: none"> <li>• <b>CV</b> 5 Nm</li> <li>• <b>CQ</b>, <b>CS</b>, <b>CS-6B</b>, <b>CF</b>, <b>CF-6B</b>: 15 Nm</li> </ul>
Ambient conditions		
Class D temperature:	Daily mean	45 °C
	Annual mean	35 °C
	Maximum	50 °C
	Minimum	-25 °C
Humidity		80 % RH
Altitude		2,000 m
Assembly conditions		
Degree of protection		IP 21
Type of assembly		Vertical
Ventilation		Natural or forced, depending on the option
Colour		RAL 7035: Grey / RAL 3005: Maroon
Standards		
CEI 60831-1, CEI 70/7, UNE 20827, UNE 20010, BS 1650, VDE 560		

## CSF

Three-phase power capacitor with fuse protection



## Dimensions



## References

## CSF 230 V / 50 Hz

kvar	Interrupting power	(A)	Fuses (A)	Cable section (mm <sup>2</sup> )	Weight (kg)	Dimensions (mm) width x height x depth	Type	Code
5	50 kA	13	20	6	9	280 x 433 x 140	CSF - 5 - 230	R20618
7,5	50 kA	19	35	6	9,5	280 x 433 x 140	CSF - 7.5 - 230	R2061A
10	50 kA	25	50	10	10,5	280 x 433 x 140	CSF - 10 - 230	R2061C
12,5	50 kA	31	63	10	10,5	280 x 433 x 140	CSF - 12.5 - 230	R2061D
15	50 kA	38	80	16	12	280 x 433 x 140	CSF - 15 - 230	R2061E
20	50 kA	50	100	25	13,5	280 x 433 x 140	CSF - 20 - 230	R2061F
25	50 kA	63	125	35	16	280 x 433 x 140	CSF - 25 - 230	R2061G
30	50 kA	75	160	50	17	280 x 657 x 140	CSF - 30 - 230	R2061H
40	50 kA	100	160	70	19	280 x 657 x 140	CSF - 40 - 230	R2061J

## CSF 440 V / 50 Hz

kvar	Interrupting power	(A)	Fuses (A)	Cable section (mm <sup>2</sup> )	Weight (kg)	Dimensions (mm) width x height x depth	Type	Code	
440 V	400 V								
5	4	50 kA	6,6	16	6	9	280 x 433 x 140	CSF - 5 - 440	R20958
7,5	6	50 kA	10	20	6	9	280 x 433 x 140	CSF - 7.5 - 440	R2095A
10	8	50 kA	13	25	6	9	280 x 433 x 140	CSF - 10 - 440	R2095C
12,5	10	50 kA	16	35	6	9,5	280 x 433 x 140	CSF - 12.5 - 440	R2095D
15	12,5	50 kA	20	50	6	9,5	280 x 433 x 140	CSF - 15 - 440	R2095E
20	17	50 kA	26	50	10	10,5	280 x 433 x 140	CSF - 20 - 440	R2095F
25	21	50 kA	33	50	10	10,5	280 x 433 x 140	CSF - 25 - 440	R2095G
30	25	120 kA	39	80	16	12	280 x 433 x 140	CSF - 30 - 440	R2095H
37,5	31	120 kA	49	100	25	13,5	280 x 433 x 140	CSF - 37.5 - 440	R2095J
50	42	120 kA	66	125	35	16	280 x 433 x 140	CSF - 50 - 440	R2095K
60	50	120 kA	79	160	50	17	280 x 657 x 140	CSF - 60 - 440	R2095L
75	63	120 kA	103	160	70	19	280 x 657 x 140	CSF - 75 - 440	R2095P
100	80	120 kA	131	200	70	19,5	280 x 657 x 140	CSF - 100 - 440	R2095Q

## CSF 550 V / 50 Hz

kvar	Interrupting power	(A)	Fuses (A)	Cable section (mm <sup>2</sup> )	Weight (kg)	Dimensions (mm) width x height x depth	Type	Code
10	50 kA	11	25	6	9	280 x 433 x 140	CSF - 10 - 550	R2066C
15	50 kA	16	35	6	9	280 x 433 x 140	CSF - 15 - 550	R2066E
20	50 kA	21	50	6	9,5	280 x 433 x 140	CSF - 20 - 550	R2066F
25	50 kA	26	63	10	10,5	280 x 433 x 140	CSF - 25 - 550	R2066G
30	50 kA	32	80	16	12	280 x 433 x 140	CSF - 30 - 550	R2066H
40	50 kA	42	100	25	13,5	280 x 433 x 140	CSF - 40 - 550	R2066J
50	50 kA	53	125	35	16	280 x 433 x 140	CSF - 50 - 550	R2066K
60	50 kA	63	160	70	18	280 x 433 x 140	CSF - 60 - 550	R2066L
70	50 kA	74	160	70	19	280 x 433 x 140	CSF - 70 - 550	R2066M

# CSM

Three-phase power capacitor with circuit-breaker protection



## Description

The **CSM** capacitors with circuit breaker protection are fixed compensation units that have been designed for reactive energy compensation purposes in motors and transformers with constant load levels. They include a general circuit breaker protection for the capacitor.

## Application

Its application is mainly based on the compensation of transformers and motors. In general, they are used for the compensation of installations with constant loads.

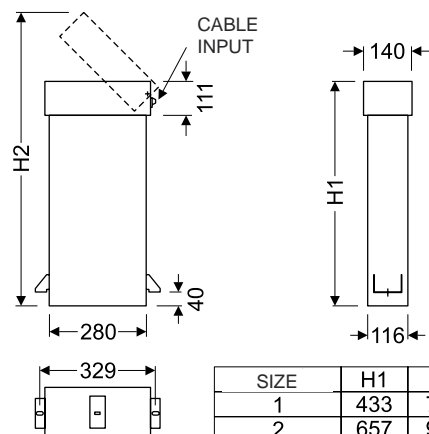
## Features

Features		
Operating voltage		230, 400 V (for other voltages, please ask)
Support voltage 400 V		440 V
Capacity tolerance		± 10%
Unit composed of		<b>CS Capacitor</b> General three-pole protection circuit breaker
Insulation level		3 / 15 kV
Discharge resistance		75 V / 3 minutes
Overcurrent		1.3 times the rated current permanently
Overvoltage		10 % 8 over 24 hours 15 % up to 15 minutes over 24 hours 20 % up to 5 minutes over 24 hours 30 % up to 1 minute over 24 hours
Frequency		50 or 60 Hz
Losses:	<ul style="list-style-type: none"> <li>• Dielectric</li> <li>• Total</li> </ul>	< 0.2 W / kvar < 0.5 W / kvar
Protections		<ul style="list-style-type: none"> <li>• Dielectric regeneration</li> <li>• Internal fuse</li> <li>• Overpressure system</li> <li>• Vermiculite</li> </ul>
Construction features		
Terminals:	<ul style="list-style-type: none"> <li>• Power rating</li> <li>• Earth</li> </ul>	<ul style="list-style-type: none"> <li>• M6 for <b>CV</b>, M10 for <b>CQ, CS, CS-6B, CF, CF-6B</b></li> <li>• M6</li> </ul>
Torque value		<ul style="list-style-type: none"> <li>• <b>CV</b> 5 Nm</li> <li>• <b>CQ, CS, CS-6B, CF, CF-6B</b>: 15 Nm</li> </ul>
Ambient conditions		
Class D temperature:	Daily mean	45 °C
	Annual mean	35 °C
	Maximum	50 °C
	Minimum	-25 °C
Humidity		80% RH
Altitude		2,000 m
Assembly conditions		
Degree of protection		IP 21
Type of assembly		Vertical
Ventilation		Natural or forced, depending on the option
Colour		RAL 7035: Grey / RAL 3005: Maroon
Standards		
CEI 60831-1, CEI 70/7, UNE 20827, UNE 20010, BS 1650, VDE 560		

## CSM

Three-phase power capacitor with circuit-breaker protection

## Dimensions



## References

## CSM 230 V / 50 Hz

kvar	Interrupting power	(A)	Automatic switch	Cable section (mm <sup>2</sup> )	Weight (kg)	Dimensions (mm) width x height x depth	Type	Code
5	10 kA	13	20	6	9	280 x 433 x 140	CSM - 5 - 230	R20718
7,5	10 kA	19	35	6	9,5	280 x 433 x 140	CSM - 7.5 - 230	R2071A
10	10 kA	25	50	10	10,5	280 x 433 x 140	CSM - 10 - 230	R2071C
12,5	10 kA	31	63	10	10,5	280 x 433 x 140	CSM - 12.5 - 230	R2071D
15	10 kA	38	80	16	11	280 x 433 x 140	CSM - 15 - 230	R2071E
20	10 kA	50	100	25	13,5	280 x 433 x 140	CSM - 20 - 230	R2071F
25	10 kA	63	125	35	16	280 x 433 x 140	CSM - 25 - 230	R2071G
30	10 kA	75	160	50	17	280 x 657 x 140	CSM - 30 - 230	R2071H

## CSM 440 V / 50 Hz

kvar	Interrupting power	(A)	Automatic switch	Cable section (mm <sup>2</sup> )	Weight (kg)	Dimensions (mm) width x height x depth	Type	Code	
440 V	400 V								
5	4	10 kA	6,6	10	6	9	280 x 433 x 140	CSM - 5 - 440	R20948
7,5	6	10 kA	10	16	6	9	280 x 433 x 140	CSM - 7.5 - 440	R2094A
10	8	10 kA	13	20	6	9	280 x 433 x 140	CSM - 10 - 440	R2094C
12,5	10	10 kA	16	25	6	9,5	280 x 433 x 140	CSM - 12.5 - 440	R2094D
15	12,5	10 kA	20	32	6	9,5	280 x 433 x 140	CSM - 15 - 440	R2094E
20	17	10 kA	26	40	10	10,5	280 x 433 x 140	CSM - 20 - 440	R2094F
25	21	10 kA	33	50	10	10,5	280 x 433 x 140	CSM - 25 - 440	R2094G
30	25	10 kA	39	63	16	11	280 x 433 x 140	CSM - 30 - 440	R2094H
37,5	31	10 kA	49	80	25	12	280 x 433 x 140	CSM - 37.5 - 440	R2094J
50	42	10 kA	66	100	35	16,5	280 x 433 x 140	CSM - 50 - 440	R2094K
60	50	10 kA	79	160	50	17,5	280 x 657 x 140	CSM - 60 - 440	R2094L
75	66	10 kA	105	160	50	18	280 x 657 x 140	CSM - 75 - 440	R2094M

Interrupting power 15 kA

# CSMM

Three-phase power capacitor with automatic protection



## Description

The **CSMM** capacitors with automatic switch protection are fixed compensation units that have been designed for reactive energy compensation purposes in motors and transformers with constant load levels. Including a general protection system with an automatic switch for the capacitor.

## Application

Its application is mainly based on the compensation of transformers and motors. In general, they are used for the compensation of installations with constant loads.

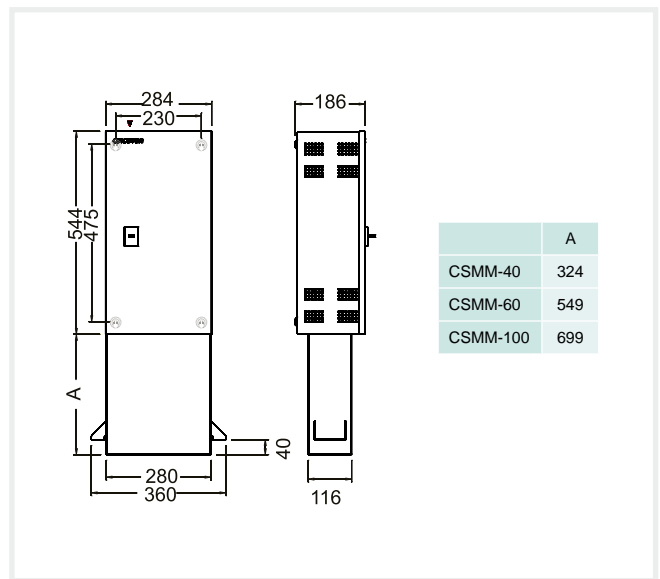
## Features

Features		
Operating voltage		230, 400 V (for other voltages, please ask)
Support voltage 400 V		440 V
Capacity tolerance		± 10%
Unit composed of		<b>CS Capacitor</b> General automatic three-pole protection switch
Insulation level		3 / 15 kV
Discharge resistance		75 V / 3 minutes
Overcurrent		1.3 times the rated current permanently
Overvoltage		10 % 8 over 24 hours 15 % up to 15 minutes over 24 hours 20 % up to 5 minutes over 24 hours 30 % up to 1 minute over 24 hours
Frequency		50 or 60 Hz
Losses:	<ul style="list-style-type: none"> <li>• Dielectric</li> <li>• Total</li> </ul>	< 0.2 W / kvar < 0.5 W / kvar
Protections		<ul style="list-style-type: none"> <li>• Dielectric regeneration</li> <li>• Internal fuse</li> <li>• Overpressure system</li> <li>• Vermiculite</li> </ul>
Construction features		
Terminals:	<ul style="list-style-type: none"> <li>• Power rating</li> <li>• Earth</li> </ul>	<ul style="list-style-type: none"> <li>• M6 for <b>CV</b>, M10 for <b>CQ, CS, CS-6B, CF, CF-6B</b></li> <li>• M6</li> </ul>
Torque value		<ul style="list-style-type: none"> <li>• CV 5 Nm</li> <li>• <b>CQ, CS, CS-6B, CF, CF-6B</b>: 15 Nm</li> </ul>
Ambient conditions		
Class D temperature:	Daily mean	45 °C
	Annual mean	35 °C
	Maximum	50 °C
	Minimum	-25 °C
Humidity		80 % RH
Altitude		2,000 m
Assembly conditions		
Degree of protection		IP 21
Type of assembly		Vertical
Ventilation		Natural or forced, depending on the option
Colour		RAL 7035: Grey / RAL 3005: Maroon
Standards		
CEI 60831-1, CEI 70/7, UNE 20827, UNE 20010, BS 1650, VDE 560		

## CSMM

Three-phase power capacitor with automatic protection

## Dimensions



## References

CSMM 440 V / 50 Hz

kvar		Interrupting power	(A)	Automatic switch	Cable section (mm <sup>2</sup> )	Weight (kg)	Dimensions (mm) width x height x depth	Type	Code
440 V	400 V								
25	21	35 kA	33	63	16	16	360 x 868 x 140	CSMM- 25 - 440	R2173H
37,5	31	35 kA	49	80	25	12	360 x 868 x 140	CSMM- 37.5 - 440	R2173G
50	42	35 kA	66	80	25	17	360 x 868 x 140	CSMM- 50 - 440	R2173J
60	50	35 kA	79	100	35	21	360 x 1093 x 140	CSMM- 60 - 440	R2173K
75	62	35 kA	99	125	50	22	360 x 1093 x 140	CSMM- 75 - 440	R2173L
100	83	35 kA	131	160	70	27	360 x 1243 x 140	CSMM- 100 - 440	R2173M
120	100	35 kA	158	200	95	29	360 x 1243 x 140	CSMM- 120 - 440	R2173N

# FRF / FRM

Fixed capacitor with rejection reactance  $p = 7\%$



## Description

The **FRF / FRM** Series capacitor banks with detuned filters have been designed for reactive energy compensation purposes in motors and transformers with a constant load level, a high content of harmonics and where there is a risk of resonance. Including:

**FRF:** general protection with **NH-00** fuses with a high rupture power (HRP).

**FRM:** general circuit breaker protection for the capacitor.

## Application

Its application is mainly based on the compensation of transformers and motors. In general, it is used for the compensation of installations under constant loads and where there is a high content of harmonics in the network.

## Features

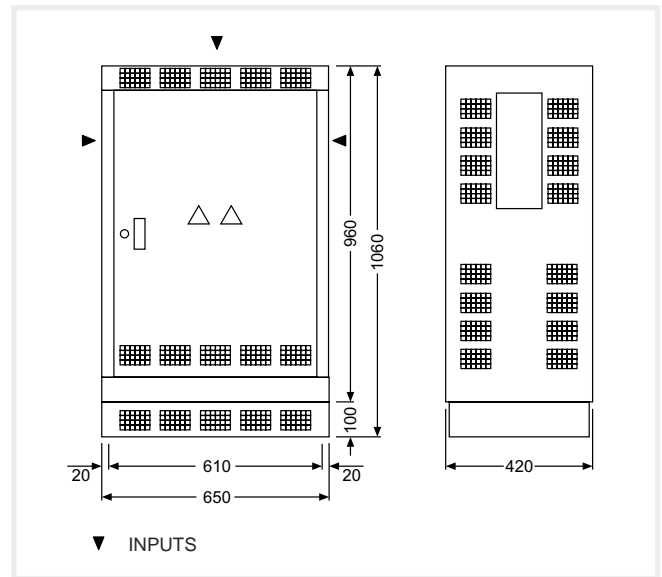
Features		
Operating voltage		230, 400 V (for other voltages, please ask)
Support voltage 400 V		440 V
Capacity tolerance		±10%
Unit composed of		<b>CF Capacitor.</b> <b>FRF:</b> General protection fuse, type NH-00 with a high rupture power (HRP) <b>FRM:</b> General three-pole protection circuit breaker Detuned filters tuned at 189 Hz for the protection against harmonics present in the network and to avoid the problems of resonance with fifth or higher order harmonics. Built-in thermostat for the disconnection of the step in case of excessive temperatures (90 °C)
Insulation level		3 / 15 kV
Discharge resistance		75 V / 3 minutes
Overcurrent		1.3 times the rated current permanently
Overvoltage		10 % 8 over 24 hours 15 % up to 15 minutes over 24 hours 20 % up to 5 minutes over 24 hours 30 % up to 1 minute over 24 hours
Frequency		50 or 60 Hz
Losses:	<ul style="list-style-type: none"> <li>• Dielectric</li> <li>• Total</li> </ul>	< 0.2 W / kvar < 0.5 W / kvar
Protections		<ul style="list-style-type: none"> <li>• Dielectric regeneration</li> <li>• Internal fuse</li> <li>• Overpressure system</li> <li>• Vermiculite</li> </ul>
Construction features		
Terminals:	<ul style="list-style-type: none"> <li>• Power rating</li> <li>• Earth</li> </ul>	<ul style="list-style-type: none"> <li>• M6 for <b>CV</b>, M10 for <b>CQ, CS, CS-6B, CF, CF-6B</b></li> <li>• M6</li> </ul>
Torque value		<ul style="list-style-type: none"> <li>• <b>CV</b> 5 Nm</li> <li>• <b>CQ, CS, CS-6B, CF, CF-6B:</b> 15 Nm</li> </ul>
Ambient conditions		
Class D temperature:	Daily mean	45 °C
	Annual mean	35 °C
	Maximum	50 °C
	Minimum	-25 °C
Humidity		80% RH
Altitude		2,000 m
Assembly conditions		
Degree of protection		IP 21
Type of assembly		Vertical
Ventilation		Natural or forced, depending on the option
Colour		RAL 7035: Grey / RAL 3005: Maroon
Standards		
CEI 60831-1, CEI 70/7, UNE 20827, UNE 20010, BS 1650, VDE 560		

## FRF / FRM

Fixed capacitor with rejection  
reactance  $p = 7\%$



## Dimensions



## References

440 V / 50 Hz  
FRF: HRP Fuse protection

kvar		(A)	Weight (kg)	Cable section (mm <sup>2</sup> )	Dimensions (mm) width x height x depth	Type	Code
440 V	400 V						
25	21	33	78	10	650 x 1060 x 420	FRF-25-440	R55350
37,5	31	47	82	16	650 x 1060 x 420	FRF-37.5-440	R55370
50	42	66	85	25	650 x 1060 x 420	FRF-50-440	R55380
60	50	79	90	35	650 x 1060 x 420	FRF-60-440	R55390
75	62	99	96	50	650 x 1060 x 420	FRF-75-440	R553A0
100	83	131	110	70	650 x 1060 x 420	FRF-100-440	R553B0

440 V / 50 Hz  
FRM: Three-pole automatic protection

kvar		(A)	Weight (kg)	Cable section (mm <sup>2</sup> )	Dimensions (mm) width x height x depth	Type	Code
440 V	400 V						
25	21	33	78	10	650 x 1060 x 420	FRM-25-440	R57350
37,5	31	47	82	16	650 x 1060 x 420	FRM-37.5-440	R57370
50	42	66	85	25	650 x 1060 x 420	FRM-50-440	R57380
60	50	79	90	35	650 x 1060 x 420	FRM-60-440	R57390
75	62	99	96	50	650 x 1060 x 420	FRM-75-440	R573A0
100	83	131	110	70	650 x 1060 x 420	FRM-100-440	R573B0