RTR Energía

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Índex

Capacitors

Medium Voltage

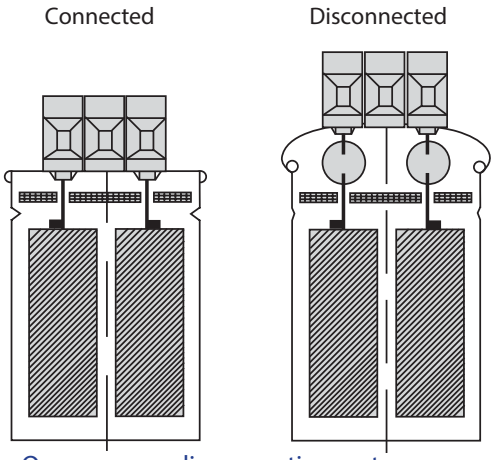
Three-phase Harmonic Filters and Transformers

Controllers

Three phase capacitors with connector

MA/C/CE/TER Series

230/400/415/440/480/525/690 V



Overpressure disconnection system

General Description

RTR Energía S.L. Power capacitors are manufactured with low loss metallized self-healing polypropylene film. Dry type capacitors are filled with a non-toxic an ecological polyurethane resin manufactured by RTR Energía, this resin provides an excellent heat dissipation properties. This series is enclosed in an aluminium can with overpressure disconnection system.

Applications

RTR Energía power capacitors are specially designed for reactive power factor correction using them individually or assembled into automatic capacitor banks series: Mini, Mural, Modular, ST and Compact Series.

Overpressure disconnection system

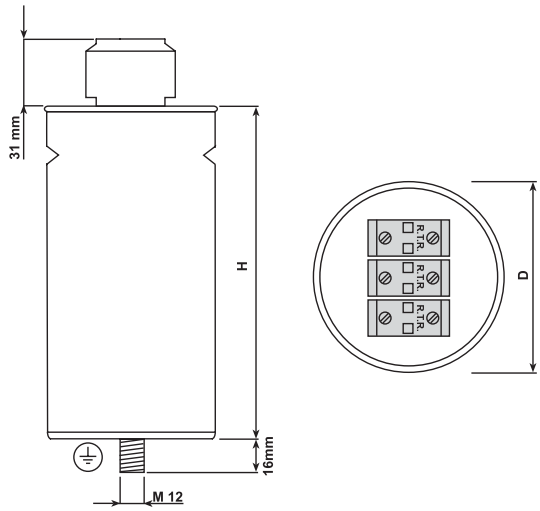
In order to avoid problems caused by overvoltage, harmonics, high temperatures, etc. RTR Energía S.L. power capacitors have been designed with an overpressure disconnection system. When the terminal cover expands, the internal connections are interrupted and disconnecting the capacitor.

Technical Characteristics

Standards	IEC 60831-1/2 EN 60831-1/2
Capacitance tolerance	- 5% + 10%
Frequency	50Hz (60Hz upon request)
Temperature range	-25ºC + 55ºC
Dielectric losses	≤ 0.2 W/KVAr
Total losses*	≤ 0.45 W/KVAr
Maximum over voltage	1,1 x Un **
Maximum over current	1,5 x In
Max. THD in voltage	2%
Max. THD in current	25%
Discharge resistance	Incorporated
Connection	Delta
Casing	Aluminium can
Disconnection system	Overpressure
Dielectric	Metallized polypropilene film
Voltage test between terminals	2,15 x Un 2 sec.
Voltage test terminals to case	3 KV for 10 sec. AC
Terminal type	Connector
Inrush current	Upto 200 x In
Protection	IP 20, indoor mounting
Humidity	Max. 95%
Expected life	120.000 Hrs (Temp. level C)
Altitude	Max. 2000 above sea level

*Without resistors

Dimensions



Dimensions	Cable section
D x H (mm)	mm²
70 x 215	2.5 mm²
85 x 215	6 mm²
100 x 215	10 mm²
100 x 300	10 mm²
120 x 300	25 mm²
136 x 300	50 mm²

**Industrial frequency "8 hours every 24 hours" of fluctuation and regulation of voltage, higher values may cause damages in capacitor . EN 60831-1-1996(20.1)

MA/C/CE/TER 50 Hz Series

Power	Voltage	Dimensions	Code
KVAr	V.c.a	D x H (mm)	
2.5	230 V	70 x 215	C2300255TER0000
5	230 V	85 x 215	C2300505TER0000
7.5	230 V	100 x 215	C2300755TER0000
10	230 V	100 x 300	C2301005TER0000
12.5	230 V	120 x 300	C2301255TER0000
15	230 V	120 x 300	C2301505TER0000
20	230 V	136 x 300	C2302005TER0000

Power	Voltag e	Dimensions	Code
KVAr	V.c.a	D x H (mm)	
2,5	480 V	70 x 215	C4800255TER0000
5	480 V	70 x 215	C4800505TER0000
7.5	480 V	85 x 215	C4800755TER0000
10	480 V	85 x 215	C4801005TER0000
12.5	480 V	100 x 215	C4801255TER0000
15	480 V	100 x 215	C4801505TER0000
20	480 V	100 x 300	C4802005TER0000
25	480 V	120 x 300	C4802505TER0000
30	480 V	120 x 300	C4803005TER0000
35	480 V	120 x 300	C4803505TER0000
40	480 V	136 x 300	C4804005TER0000
50	480 V	136 x 300	C4805005TER0000

Power	Voltage	Dimensions	Code
KVAr	V.c.a	D x H (mm)	
2,5	400 V	70 x 215	C4000255TER0000
5	400 V	70 x 215	C4000505TER0000
7.5	400 V	85 x 215	C4000755TER0000
10	400 V	85 x 215	C4001005TER0000
12.5	400 V	100 x 215	C4001255TER0000
15	400 V	100 x 215	C4001505TER0000
20	400 V	100 x 300	C4002005TER0000
25	400 V	120 x 300	C4002505TER0000
30	400 V	120 x 300	C4003005TER0000
35	400 V	120 x 300	C4003505TER0000
40	400 V	136 x 300	C4004005TER0000
50	400 V	136 x 300	C4005005TER0000

Power	Voltag e	Dimensions	Code
KVAr	V.c.a	D x H (mm)	
2,5	525 V	70 x 215	C5250255TER0000
5	525 V	70 x 215	C5250505TER0000
7.5	525 V	85 x 215	C5250755TER0000
10	525 V	85 x 215	C5251005TER0000
12.5	525 V	100 x 215	C5251255TER0000
15	525 V	100 x 215	C5251505TER0000
20	525 V	100 x 300	C5252005TER0000
25	525 V	120 x 300	C5252505TER0000
30	525 V	120 x 300	C5253005TER0000
35	525 V	120 x 300	C5253505TER0000
40	525 V	136 x 300	C5254005TER0000
50	525 V	136 x 300	C5255005TER0000

Power	Voltage	Dimensions	Code
KVAr	V.c.a	D x H (mm)	
2,5	415 V	70 x 215	C4150255TER0000
5	415 V	70 x 215	C4150505TER0000
7.5	415 V	85 x 215	C4150755TER0000
10	415 V	85 x 215	C4151005TER0000
12.5	415 V	100 x 215	C4151255TER0000
15	415 V	100 x 215	C4151505TER0000
20	415 V	100 x 300	C4152005TER0000
25	415 V	120 x 300	C4152505TER0000
30	415 V	120 x 300	C4153005TER0000
35	415 V	120 x 300	C4153505TER0000
40	415 V	136 x 300	C4154005TER0000
50	415 V	136 x 300	C4155005TER0000

Power	Voltag e	Dimensions	Code
KVAr	V.c.a	D x H (mm)	
2,5	690 V	70 x 215	C6900255TER0000
5	690 V	70 x 215	C6900505TER0000
7.5	690 V	85 x 215	C6900755TER0000
10	690 V	85 x 215	C6901005TER0000
12.5	690 V	100 x 215	C6901255TER0000
15	690 V	100 x 215	C6901505TER0000
20	690 V	100 x 300	C6902005TER0000
25	690 V	120 x 300	C6902505TER0000
30	690 V	120 x 300	C6903005TER0000
35	690 V	120 x 300	C6903505TER0000
40	690 V	136 x 300	C6904005TER0000
50	690 V	136 x 300	C6905005TER0000

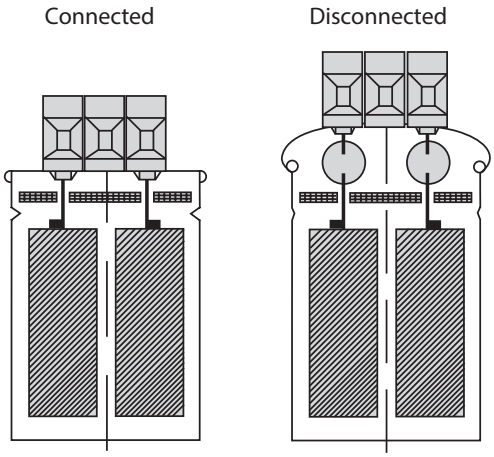
Power	Voltage	Dimensions	Code
KVAr	V.c.a	D x H (mm)	
2,5	440 V	70 x 215	C4400255TER0000
5	440 V	70 x 215	C4400505TER0000
7.5	440 V	85 x 215	C4400755TER0000
10	440 V	85 x 215	C4401005TER0000
12.5	440 V	100 x 215	C4401255TER0000
15	440 V	100 x 215	C4401505TER0000
20	440 V	100 x 300	C4402005TER0000
25	440 V	100 x 300	C4402505TER0000
30	440 V	120 x 300	C4403005TER0000
35	440 V	120 x 300	C4403505TER0000
40	440 V	136 x 300	C4404005TER0000
50	440 V	136 x 300	C4405005TER0000

* Other voltages upon request
* 60 Hz upon request

Reinforced three phase capacitors with connector

MA/C/CE/TER RTF Series

230/400/440/460V, 50Hz



Overpressure disconnection system

General Description

RTR Energía S.L. Power capacitors are manufactured with low loss metallized self-healing polypropylene film. Dry type capacitors are filled with a non-toxic an ecological polyurethane resin manufactured by RTR Energía, this resin provides an excellent heat dissipation properties. This series is enclosed in an aluminium can with overpressure disconnection system.

Applications

Oversized to support over voltage and equipped with overpressure disconnection system. The capacitors are assembled in automatic capacitors banks series: Mini, Mural, Modular, ST and Compact Series.

Overpressure disconnection system

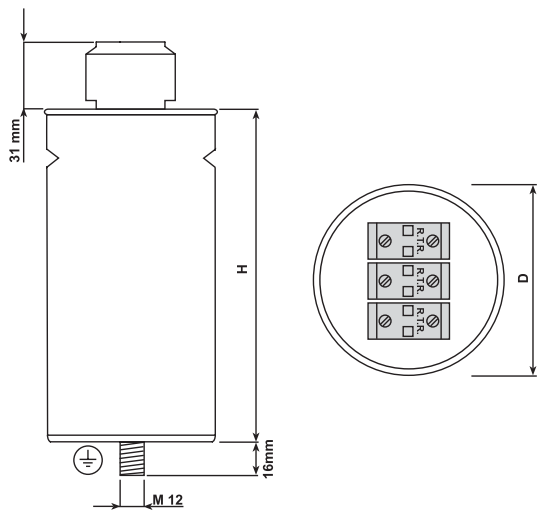
In order to avoid problems caused by overvoltage, harmonics, high temperatures, etc. RTR Energía S.L. power capacitors have been designed with an overpressure disconnection system. When the terminal cover expands, the internal connections are interrupted and disconnecting the capacitor.

Technical Characteristics

Standards	IEC 60831-1/2 EN 60831-1/2
Capacitance tolerance	- 5% + 10%
Frequency	50Hz (60Hz upon request)
Temperature range	-25ºC + 55ºC
Dielectric losses	≤ 0.2 W/KVAr
Total losses*	≤ 0.45 W/KVAr
Maximum over voltage	1,15 x Un
Maximum over current	1,5 x In
Max. THD in voltage	3%
Max. THD in current	30%
Discharge resistance	Incorporated
Connection	Delta
Casing	Aluminium can
Disconnection system	Overpressure
Dielectric	Metallized polypropilene film
Voltage test between terminals	2,15 x Un 2 sec.
Voltage test terminals to case	3 KV for 10 sec. AC
Terminal type	Connector
Inrush current	Upto 200 x In
Protection	IP 20, indoor mounting
Humidity	Max. 95%
Expected life	130.000 Hrs (Temp. level D)
Altitude	Max. 2000 above sea level

*Without resistors

Dimensions



Dimensions	Cable section
D x H (mm)	mm²
70 x 215	2.5
85 x 215	6
100 x 215	10
100 x 300	10
120 x 300	25
136 x 300	50

**Industrial frequency "30 min every 24 hours" of fluctuation and regulation of voltage, higher values may cause damages in capacitor. EN 60831-1-1996(20.1)

MA/C/CE/TER RTF 50 Hz Series

Powe r	Voltag e	Dimensions	Code
KVAr	V.c.a	D x H (mm)	
2.5	230 V	70 x 21 5	C2300255R TFTER0
5	230 V	100 x 215	C2300505R TFTER0
7.5	230 V	100 x 300	C2300755R TFTER0
10	230 V	120 x 300	C2301005R TFTER0
15	230 V	136 x 300	C2301005R TFTER0

Power	Voltag e	D imensions	Code
KVAr	V.c.a	D x H (mm)	
2,5	400 V	70 x 21 5	C4000255R TFTER0
5	400 V	70 x 21 5	C4000505R TFTER0
7.5	400 V	85 x 21 5	C4000755R TFTER0
10	400 V	100 x 215	C4001005R TFTER0
12.5	400 V	100 x 215	C4001255R TFTER0
15	400 V	100 x 300	C4001505R TFTER0
20	400 V	100 x 300	C4002005R TFTER0
25	400 V	120 x 300	C4002505R TFTER0
30	400 V	120 x 300	C4003005R TFTER0
35	400 V	136 x 300	C4003505R TFTER0
40	400 V	136 x 300	C4004005R TFTER0

Power	Voltag e	D imensions	Code
KVAr	V.c.a	D x H (mm)	
2.5	440 V	70 x 21 5	C4400255R TFTER0
5	440 V	70 x 21 5	C4400505R TFTER0
7.5	440 V	85 x 21 5	C4400755R TFTER0
10	440 V	100 x 215	C4401005R TFTER0
12.5	440 V	100 x 215	C4401255R TFTER0
15	440 V	100 x 300	C4401505R TFTER0
20	440 V	100 x 300	C4402005R TFTER0
25	440 V	120 x 300	C4402505R TFTER0
30	440 V	136 x 300	C4403005R TFTER0
35	440 V	136 x 300	C4403505R TFTER0
40	440 V	136 X 300	C4404005R TFTER0

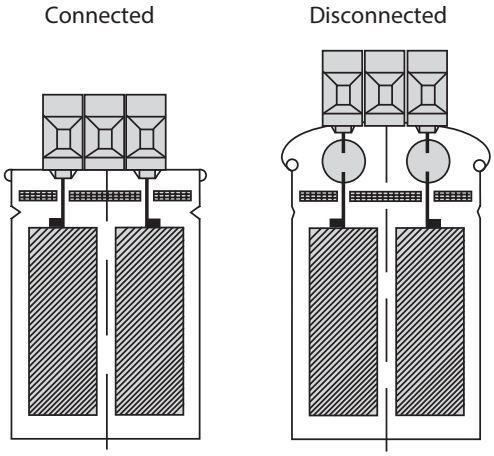
Power	Voltag e	D imensions	Code
KVAr	V.c.a	D x H (mm)	
2.5	460 V	70 x 21 5	C4600255R TFTER0
5	460 V	70 x 21 5	C4600505R TFTER0
7.5	460 V	85 x 21 5	C4600755R TFTER0
10	460 V	100 x 215	C4601005R TFTER0
12.5	460 V	100 x 215	C4601255R TFTER0
15	460 V	100 x 300	C4601505R TFTER0
20	460 V	100 x 300	C4602005R TFTER0
25	460 V	120 x 300	C4602505R TFTER0
30	460 V	136 x 300	C4603005R TFTER0
35	460 V	136 x 300	C4603505R TFTER0
40	460 V	136 X 300	C4604005R TFTER0

* Other voltages upon request
* 60 Hz upon request

Three phase capacitors with connector for harmonics filter applications

MA/C/CE/TER RCT Series

230/400/440/480V, 50Hz



Overpressure disconnection system

General Description

RTR Energía S.L. Power capacitors are manufactured with low loss metallized self-healing polypropylene film. Dry type capacitors are filled with a non-toxic an ecological polyurethane resin manufactured by RTR Energía, this resin provides an excellent heat dissipation properties. This series is enclosed in an aluminium can with overpressure disconnection system.

Applications

Capacitors specially designed to install with 189 Hz (other frequencies upon request) three phase harmonic filters. These power capacitors are assembled into Arm´s series Automatic capacitor bank.

Overpressure disconnection system

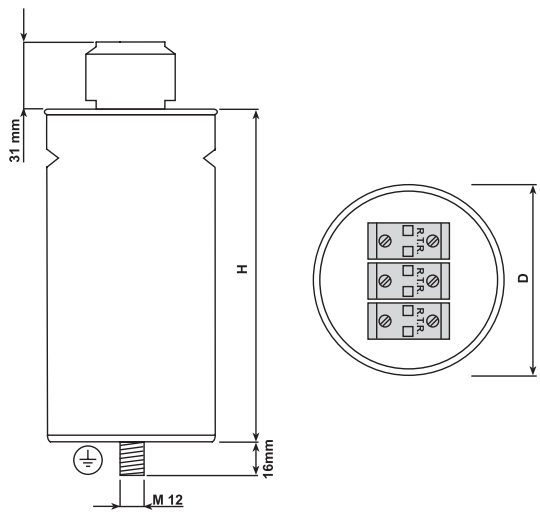
In order to avoid problems caused by overvoltage, harmonics, high temperatures, etc. RTR Energía S.L. power capacitors have been designed with an overpressure disconnection system. When the terminal cover expands, the internal connections are interrupted and disconnecting the capacitor.

Technical Characteristics

Standard	EN 6 0831-1/2
Capacitance tolerance	- 5% + 10%
Frequency	50Hz (60Hz upon request)
Temperature range	-25ºC + 55ºC
Dielectric losses	≤ 0.2 W/KVAr
Total losses*	≤ 0.45 W/KVAr
Maximum over voltage	1,15 x Un
Maximum over current	1,5 x In
Max. THD in voltage	Specific design for harmonics
Max. THD in current	30%
Discharge resistance	Incorporated
Connection	Delta
Casing	Aluminium can
Disconnection system	Overpressure
Dielectric	Metallized polypropilene film
Voltage test between terminals	2,15 x Un 2 sec.
Voltage test terminals to case	3 KV for 10 sec. AC
Terminal type	Connector
Inrush current	Upto 200 x In
Protection	IP 20, indoor mounting
Humidity	Max. 95%
Altitude	Max. 2000 above sea level

*Without resistors

Dimensions



Dimensions	Cable section
D x H (mm)	mm²
70 x 215	2.5
85 x 215	6
100 x 215	10
100 x 300	10
120 x 300	25
136 x 300	50

**Industrial frequency "30 min every 24 hours" of fluctuation and regulation of voltage, higher values may cause damages in capacitor. EN 60831-1-1996(20.1)

MA/C/CE/TER RCT 50 Hz Series

Powe r	Voltage	Dimensions	Code
KVAr	V.c.a	D x H (mm)	
2.5	230 V	70 x 21 5	C2300255TER0RCT
5	230 V	80 x 21 5	C2300505TER0RCT
7.5	230 V	100 x 215	C2300755TER0RCT
10	230 V	100 x 300	C2301005TER0RCT
12.5	230 V	100 x 300	C2301005TER0RCT
15	230 v	120 x 300	C2301505TER0RCT
20	230 V	136 x 300	C2302005TER0RCT
25	230 V	136 x 300	C2302505TER0RCT

Power	Voltage	Dimensions	Code
KVAr	V.c.a	D x H (mm)	
2,5	400 V	70 x 21 5	C4000255TER0RCT
5	400 V	70 x 21 5	C4000505TER0RCT
7.5	400 V	85 x 21 5	C4000755TER0RCT
10	400 V	100 x 215	C4001005TER0RCT
12.5	400 V	100 x 215	C4001255TER0RCT
15	400 V	100 x 300	C4001505TER0RCT
20	400 V	100 x 300	C4002005TER0RCT
25	400 V	120 x 300	C4002505TER0RCT
30	400 V	120 x 300	C4003005TER0RCT
35	400 V	136 x 300	C4003505TER0RCT
40	400 V	136 x 300	C4004005TER0RCT

Power	Voltage	Dimensions	Code
KVAr	V.c.a	D x H (mm)	
2.5	440 V	70 x 21 5	C4400255TER0RCT
5	440 V	70 x 21 5	C4400505TER0RCT
7.5	440 V	85 x 21 5	C4400755TER0RCT
10	440 V	100 x 215	C4401005TER0RCT
12.5	440 V	100 x 215	C4401255TER0RCT
15	440 V	100 x 300	C4401505TER0RCT
20	440 V	100 x 300	C4402005TER0RCT
25	440 V	120 x 300	C4402505TER0RCT
30	440 V	120 x 300	C4403005TER0RCT
35	440 V	136 x 300	C4403505TER0RCT
40	440 V	136 X 300	C4404005TER0RCT

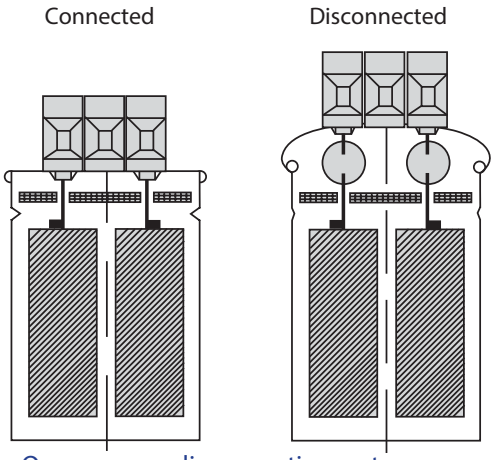
Power	Voltage	Dimensions	Code
KVAr	V.c.a	D x H (mm)	
2.5	480 V	70 x 21 5	C4800255TER0RCT
5	480 V	70 x 21 5	C4800505TER0RCT
7.5	480 V	85 x 21 5	C4800755TER0RCT
10	480 V	100 x 215	C4801005TER0RCT
12.5	480 V	100 x 215	C4801255TER0RCT
15	480 V	100 x 300	C4801505TER0RCT
20	480 V	100 x 300	C4802005TER0RCT
25	480 V	120 x 300	C4802505TER0RCT
30	480 V	120 x 300	C4803005TER0RCT
35	480 V	136 x 300	C4803505TER0RCT
40	480 V	136 X 300	C4804005TER0RCT

* Other voltages upon request
* 60 Hz upon request

Three phase capacitors with connector

DW Series New Compact Design

230/400/415/440/480/525 V



Overpressure disconnection system

General Description

RTR Energía S.L. Power capacitors are manufactured with low loss metallized self-healing polypropylene film. Dry type capacitors are filled with a non-toxic an ecological polyuretha- ne resin manufactured by RTR Energía, this resin provides an excellent heat dissipation properties. This series is enclosed in an aluminium can with overpressure disconnection system.

Applications

RTR Energía power capacitors are specially designed for reac - tive power factor correction using them individually or assem - bled into automatic capacitor banks series: Mini, Mural, Modu - lar, ST and Compact Series.

Overpressure disconnection system

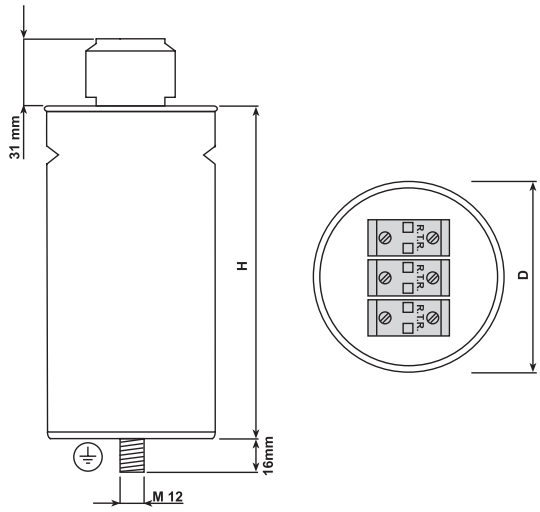
In order to avoid problems caused by overvoltage, harmonics, high temperatures, etc. RTR Energía S.L. power capacitors have been designed with an overpressure disconnection sys - tem. When the terminal cover expands, the internal connec - tions are interrupted and disconnecting the capacitor.

Technical Characteristics

Standard	IEC 60831-1/2 EN 60831-1/2
Capacitance tolerance	- 5% + 10%
Frequency	50Hz (60Hz upon request)
Temperature range	-25ºC + 55ºC
Dielectric losses	≤ 0.2 W/KVAr
Total losses*	≤ 0.45 W/KVAr
Maximum over voltage	1,1 x Un **
Maximum over current	1,5 x In
Max. THD in voltage	2%
Max. THD in current	25%
Discharge resistance	Incorporated
Connection	Delta
Casing	Aluminium can
Disconnection system	Overpressure
Dielectric	Metallized polypropilene film
Voltage test between terminals	2,15 x Un 2 sec.
Voltage test terminals to case	3 KV for 10 sec. AC
Terminal type	Connector
Inrush current	Upto 200 x In
Protection	IP 20, indoor mounting
Humidity	Max. 95%
Expected life	100.000 Hrs (Temp. level C)
Altitude	Max. 2000 above sea level

*Without resistors

Dimensions



Dimensions	Cable section
D x H (mm)	mm²
70 x 215	4
85 x 215	6
100 x 215	10
120 x 215	16
136 x 215	25

**Industrial frequency "8 hours every 24 hours" of fluctuation and regulation of voltage, higher values may cause damages in capacitor . EN 60831-1-1996(20.1)

50 Hz DW Series

Power	Voltage	Dimensions	Code
KVAr	V.c.a	D x H (mm)	
5	230 V	85 x 215	D2300505TER000 0
7.5	230 V	100 x 21 5	D2300755TER000 0
10	230 V	120 x 21 5	D2301005TER000 0
12.5	230 V	136 x 21 5	D2301255TER000 0
15	230 V	136 x 21 5	D2301505TER000 0

Power	Voltage	Dimensions	Code
KVAr	V.c.a	D x H (mm)	
10	400 V	85 x 215	D4001005TER000 0
12.5	400 V	85 x 215	D4001255TER000 0
15	400 V	100 x 21 5	D4001505TER000 0
20	400 V	120 x 21 5	D4002005TER000 0
25	400 V	120 x 21 5	D4002505TER000 0
30	400 V	136 x 21 5	D4003005TER000 0
35	400 V	136 x 21 5	D4003505TER000 0

Power	Voltage	Dimensions	Code
KVAr	V.c.a	D x H (mm)	
10	415 V	85 x 215	D4151005TER000 0
12.5	415 V	85 x 215	D4151255TER000 0
15	415 V	100 x 21 5	D4151505TER000 0
20	415 V	120 x 21 5	D4152005TER000 0
25	415 V	120 x 21 5	D4152505TER000 0
30	415 V	136 x 21 5	D4153005TER000 0
35	415 V	136 x 21 5	D4153505TER000 0

Power	Voltage	Dimensions	Code
KVAr	V.c.a	D x H (mm)	
10	480 V	85 x 215	D4801005TER0000
12. 5	480 V	85 x 215	D4801255TER0000
15	480 V	100 x 215	D4801505TER0000
20	480 V	120 x 215	D4802005TER0000
25	480 V	120 x 215	D4802505TER0000
30	480 V	136 x 215	D4803005TER0000
35	480 V	136 x 215	D4803505TER0000

Power	Voltage	Dimensions	Code
KVAr	V.c.a	D x H (mm)	
10	440 V	70 x 215	D4401005TER000 0
12.5	440 V	85 x 215	D4401255TER000 0
15	440 V	85 x 215	D4401505TER000 0
20	440 V	100 x 21 5	D4402005TER000 0
25	440 V	120 x 21 5	D4402505TER000 0
30	440 V	120 x 21 5	D4403005TER000 0
35	440 V	136 x 21 5	D4403505TER000 0
40	440 V	136 x 21 5	D4404005TER000 0

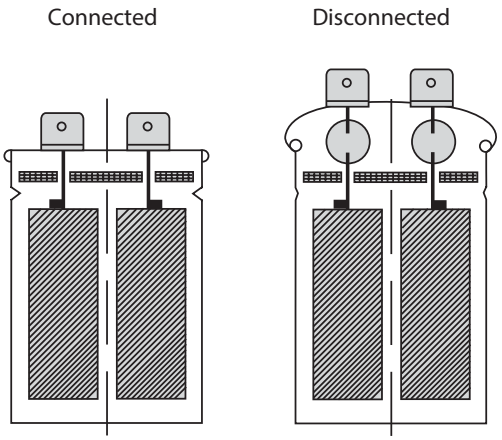
Power	Voltage	Dimensions	Code
KVAr	V.c.a	D x H (mm)	
10	525 V	85 x 215	C5251005TER0000
12. 5	525 V	85 x 215	C5251255TER0000
15	525 V	100 x 215	C5251505TER0000
20	525 V	120 x 215	C5252005TER0000
25	525 V	120 x 215	C5252505TER0000
30	525 V	136 x 215	C5253005TER0000
35	525 V	136 x 215	C5253505TER0000

* Other voltages upon request
* 60 Hz upon request

Single phase capacitors with overpressure disconnection system

EA Series

230/400/415/440/480V, 50Hz



Overpressure disconnection system

General Description

RTR Energía S.L. Power capacitors are manufactured with low loss metallized self-healing polypropylene film. RTR Energía S.L. dry type capacitors are filled with a non-toxic an ecological polyurethane resin manufactured by RTR Energía, this resin provides an excellent heat dissipation properties. This series is enclosed in an aluminium can with overpressure disconnection system.

Applications

RTR Energía power capacitors are specially designed for reac - tive power factor correction using them individually or assem - bled into automatic capacitor banks.

Overpressure disconnection system

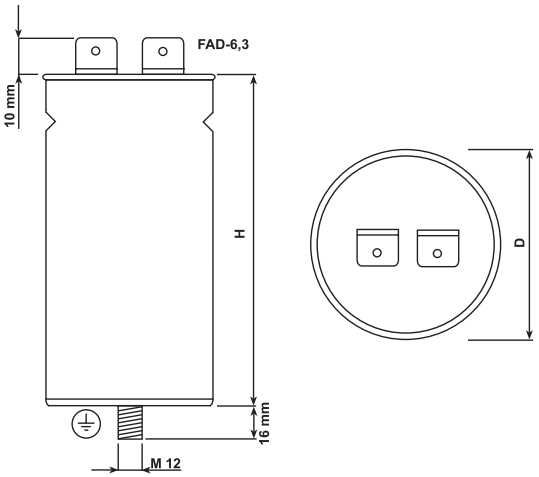
In order to avoid problems caused by overvoltage, harmonics, high temperatures, etc. RTR Energía S.L. power capacitors have been designed with an overpressure disconnection sys - tem. When the terminal cover expands, the internal connec - tions are interrupted and disconnecting the capacitor.

Technical Characteristics

Standard	EN 60831-1/2
Capacitance tolerance	- 5% + 10%
Frequency	50Hz (60Hz upon request)
Temperature range	-25ºC + 55ºC
Dielectric losses	≤ 0.2 W/KVAr
Total losses*	≤ 0.45 W/KVAr
Maximum over voltage	1,1 x Un **
Maximum over current	1,5 x In
Max. THD in voltage	2%
Max. THD in current	25%
Discharge resistance	Incorporated
Connection	Single-phase
Terminals	2x6.3 Qc
Casing	Aluminium can
Disconnection system	Overpressure
Dielectric	Metallized polypropilene film
Voltage test between terminals	2,15 x Un 2 sec.
Voltage test terminals to case	3 KV for 10 sec. AC
Terminal cover	Plastic cover PA-6

*Without resistors

Dimensions



Dimensions	Terminal
D x H (mm)	
70 x 140	FAD 6,3

**Industrial frequency "8 hours every 24 hours" of fluctuation and regulation of voltage, higher values may cause damages in capacitor . EN 60831-1-1996(20.1)

EA 50 Hz Series

Powe r	Voltage	Dimensions	Code
KVAr	V.c.a	D x H (mm)	
0,83	230 V	70 x 14 0	EA023008350000 0
1,67	230 V	70 x 14 0	EA023016750000 0
2,50	230 V	70 x 14 0	EA023025050000 0

Power	Voltage	Dimensions	Code
KVAr	V.c.a	D x H (mm)	
0,83	400 V	70 x 14 0	EA040008350000 0
1,67	400 V	70 x 14 0	EA040016750000 0
2,50	400 V	70 x 14 0	EA040025050000 0
3,33	400 V	70 x 14 0	EA040033350000 0
4,17	400 V	70 x 14 0	EA040041750000 0

Power	Voltage	Dimensions	Code
KVAr	V.c.a	D x H (mm)	
0,83	415 V	70 x 14 0	EA041508350000 0
1,67	415 V	70 x 14 0	EA041516750000 0
2,50	415 V	70 x 14 0	EA041525050000 0
3,33	415 V	70 x 14 0	EA041533350000 0
4,17	415 V	70 x 14 0	EA041541750000 0

Power	Voltage	Dimensions	Code
KVAr	V.c.a	D x H (mm)	
0,83	440 V	70 x 14 0	EA044008350000 0
1,67	440 V	70 x 14 0	EA044016750000 0
2,50	440 V	70 x 14 0	EA044025050000 0
3,33	440 V	70 x 14 0	EA044033350000 0
4,17	440 V	70 x 14 0	EA044041750000 0

Power	Voltage	Dimensions	Code
KVAr	V.c.a	D x H (mm)	
0,83	480 V	70 x 14 0	EA048008350000 0
1,67	480 V	70 x 14 0	EA048016750000 0
2,50	480 V	70 x 14 0	EA048025050000 0
3,33	480 V	70 x 14 0	EA048033350000 0
4,17	480 V	70 x 14 0	EA048041750000 0

* Other voltages upon request
* 60 Hz upon request

1. General information for MV capacitors

1.1 Total film dielectric

RTR Capacitors have a dielectric constituted in general by three polypropylene films “hazy”, rough in both faces, of high purity. This construction, instead of which it uses only two layers of a rough film in a single one of his faces, common in other manufacturers, confers to RTR Capacitors greater secu - rity of operation and greater life utility. The rough of both faces of polypropylene is a condition indispensable for the complete impregnating of the film during the process and, therefore, for the stability of the capacitor in the long term.

1.2 Impregnating biodegradable

RTR Capacitors use exclusive impregnating the nonchlorina - ted MDBT, developed for the most demanding applications by Elf-Atochem(France). This it is characterized by his high flash point, great capacity of gas absorption derived from the internal electrical unloadings, and total environmental compatibility (biodegradable).

1.3 Construction with folio extended and wild fold

RTR Capacitors is constituted by elementary units, each one of them consisting of aluminum folio windings of high purity and polypropylene films. The aluminum laminae excel towards the ends of the coil, and their edges are folded forming a ring anticrown that confers to the condenser a tension of insepción ofpartial unloadings superior to 50% of the nominal value. The laminae are welded to each other and with the next coils by means of special alloys of great adhesion and low point of fusion. This way the use of “abatis”, characteristic of the previous designs is avoided.

1.4 Under stress

RTR Energía S.L. uses conservative criteria of design that imply the application of dielectric efforts (kV/ mm) relatively low on the materials. Like consequence, the capacitors are of dimensions somewhat greater than those of other marks, with an expec - tation of greater life utility.

1.5 Inner fuses

RTR Energía S.L. incorporates to a great part of their range of MV. capacitors (specially for the greater powers) with the option of individual inner fuses by coil, of new design. Such they allow to isolate the possible failure of anyone of the elements of the capacitor and other elements can still work in normal condition. The fuses are separated to each other, so that it is impossible that the performance of one of them causes the catuación of the fuse next to. In addition, the condensers with internal fuses allow simpler, light and economic constructions.

1.6 Dielectric low losses

The characteristics of their design, the rigorous selection of the manufacture materials and the artisan care put in their construc - tion and process give like result capacitors of low losses, which is translated in smaller this form and operating temperatures, a greater life utility.

2. Tecnical characteristics and dimensions for three-phase capacitors

• Standard	IEC 871-1/4
• Voltage test terminal to terminal	1 - 7,2 kV
• Frequency	50 - 60 Hz
• Losses	<0.15 W/KVAr
• Temperature	-5+50ºC
• Dielectric liquid	MDBT Nonchlorinated
• Residual Voltage	10% Un later 5 min.
• Dielectric	Polypropylene
• Fuses	Optional
• Use	Indoor-Inclemency
• Altitude	1000 m s.n.m.
• Maximum over voltage.	1.1 x Un
• Maximum over current	1.3 x In
• Tolerance	-5 + 15%
• Vltage test	4,3 x Un (10 sec

2.1 Aproximated dimensions

Notes:

1. In these tables the equipments of use have been included mas commonly nevertheless they can be made for other voltages, frequencies, etc.

2. The height corresponding to the fin of fixation (C) could be changed according to the needs of the assembly.

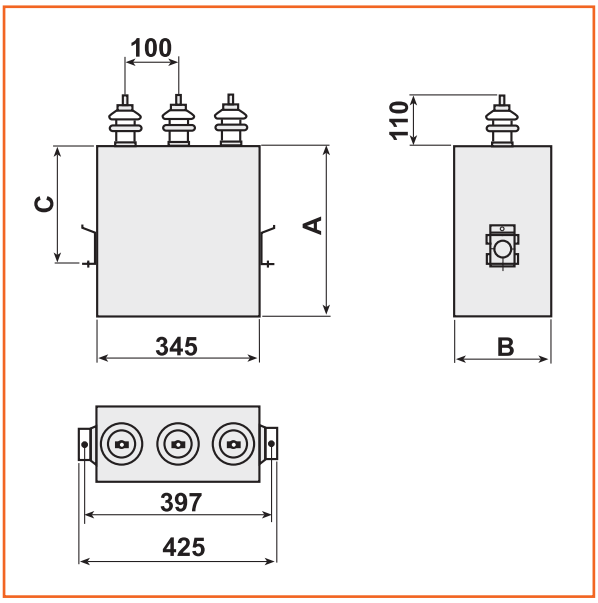
3. Also is possible the construction of single-phase capacitors with one point or two isolated points.

4. The dimensions and others characteristics are subject to changes without previous notice

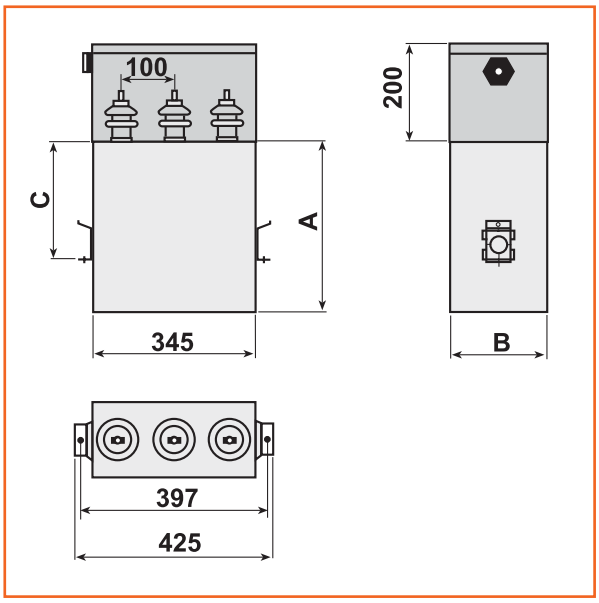
2.2 Range from 1 to 1,2 kV

Power (kVAr)		Dimensions			Weight
a 50 Hz	a 60 Hz	A (mm)	B (mm)	C (mm)	Kg.
10	12	200	135	130	15
15	18	200	135	130	16
25	30	200	135	130	17
50	60	260	135	230	20
100	120	450	135	230	32

BIL = 25 kV
without terminal cover



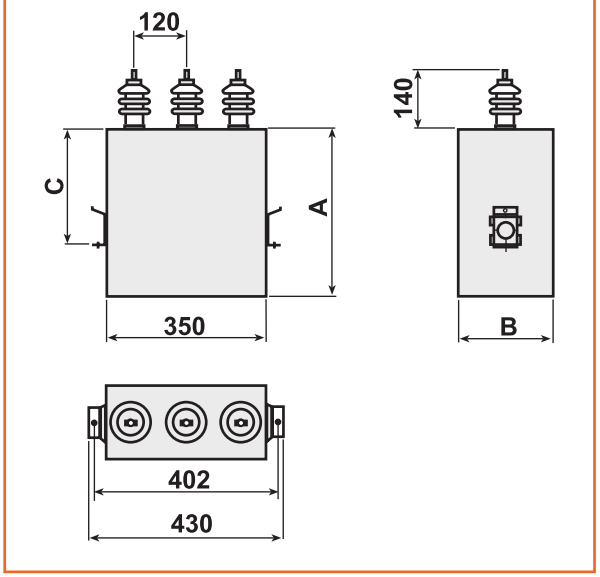
BIL = 25 kV
with terminal cover



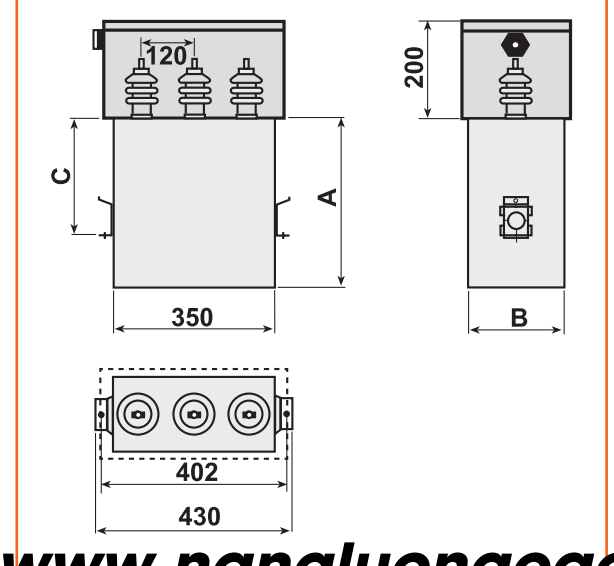
2.3 Range from 2 to 3,6 kV

Power (kVAr)		Dimensions			Weight
a 50 Hz	a 60 Hz	A (mm)	B (mm)	C (mm)	Kg.
25	30	200	135	130	15
50	60	200	135	130	17
75	90	300	135	230	21
83.3	100	300	135	230	22
100	120	320	135	230	25
150	180	500	135	230	35
167	200	500	135	230	35
200	240	580	135	230	40
250	300	660	135	230	49
300	360	680	160	230	55

BIL = 40 kV
without terminal cover



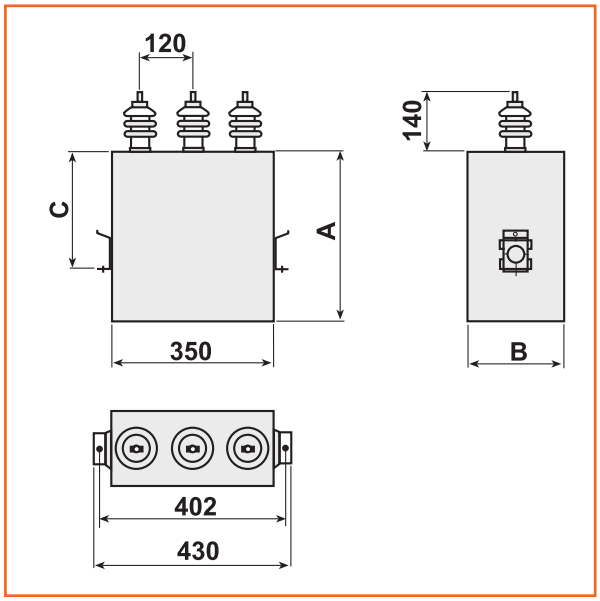
BIL = 40 kV
with terminal cover



2.4 Range from 4 to 7,2 kV

Power (kVAr)		Dimensions			Weight
a 50 Hz	a 60 Hz	A (mm)	B (mm)	C (mm)	Kg.
25	30	260	135	130	16
50	60	260	135	130	18
75	90	320	135	230	22
83.3	100	320	135	230	23
100	120	360	135	230	26
150	180	460	135	230	36
167	200	500	135	230	36
200	240	600	135	230	41
250	300	700	135	230	50
300	360	720	160	230	56

BIL = 60 kV
without terminal cover



3. Technical characteristics and dimensions for single-phase capacitors

- Standard ..... IEC 871-1/4
- Frequency ..... 50 - 60 Hz
- Losses ..... <0.15 W/KVAr
- Temperature ..... -5+50ºC
- Dielectric liquid ..... MDBT Nonchlorinated
- Residual Voltage ..... 10% Un later 5 min.
- Dielectric ..... Polypropylene
- Fuses ..... Optional
- Use ..... Indoor - Inclemency
- Altitude ..... 1000 m s.n.m.
- Maximum over voltage ..... 1.1 x Un
- Maximum over current ..... 1.3 x In
- Tolerance ..... -5 + 15%
- Voltage test terminal to terminal ..... 4,3 x Un (10 sec)

3.1 Aproximated dimensions

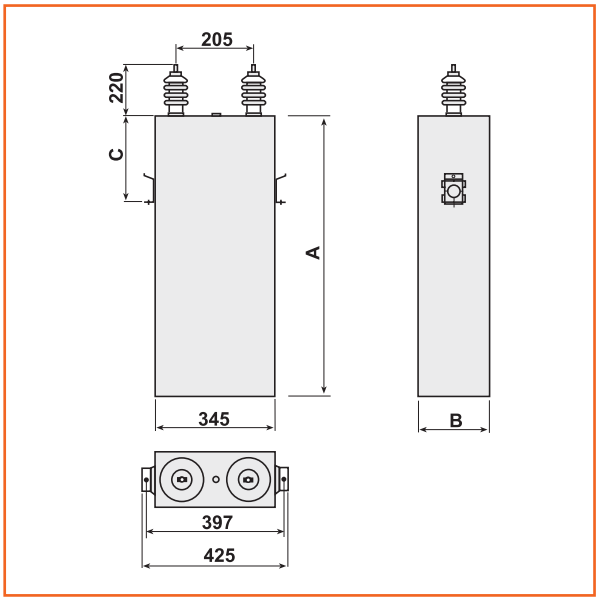
Notes:

1. In these tables the equipments of use have been included mas commonly nevertheless they can be made for other voltages, frequencies, etc.
2. The height corresponding to the fin of fixation (C) could be changed according to the needs of the assembly.
3. Also is possible the construction of single-phase capacitors with one point or two isolated points.
4. The dimensions and others characteristics are subject to changes without previous notice

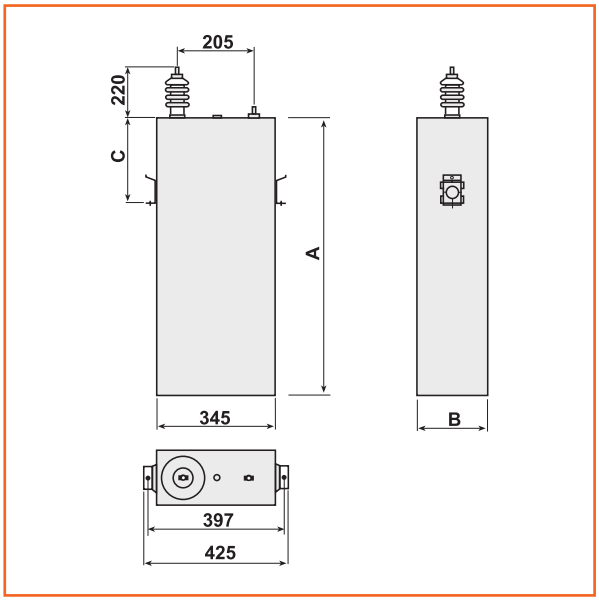
3.2 Range from 6 to 36 kV

Power (kVAr)		Dimensions			Weight
a 50 Hz	a 60 Hz	A (mm)	B (mm)	C (mm)	Kg.
33	40	200	135	130	15
50	60	200	135	130	17
83.3	100	320	135	230	22
100	120	320	135	230	25
150	180	450	135	230	35
167	200	500	135	230	35
200	240	580	135	230	40
250	300	660	135	230	49
300	360	720	160	230	55
333	400	720	160	230	59
400	480	860	160	230	67
500	600	1080	160	230	79

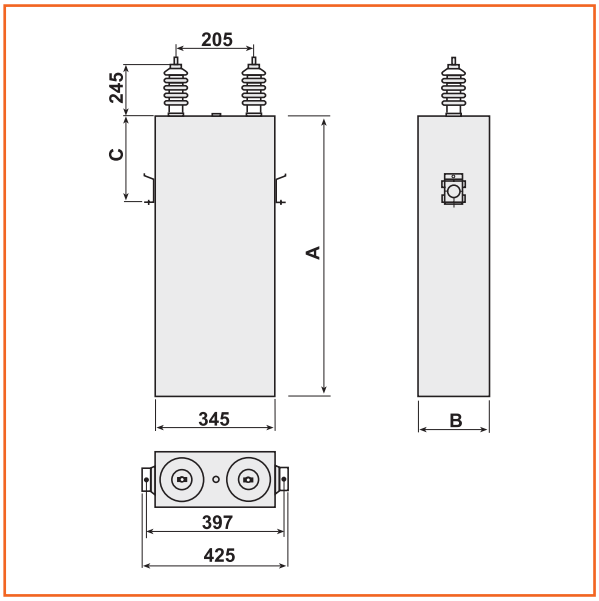
BIL = 95 y 110 kV
2 stud terminals



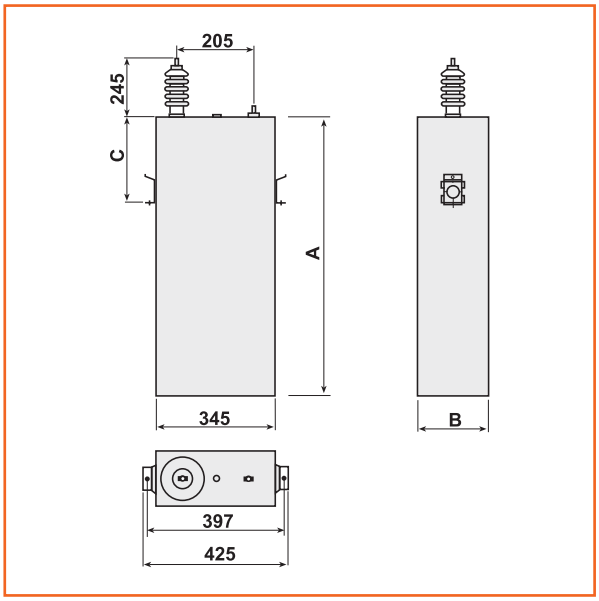
BIL = 95 y 110 kV
1 stud terminal



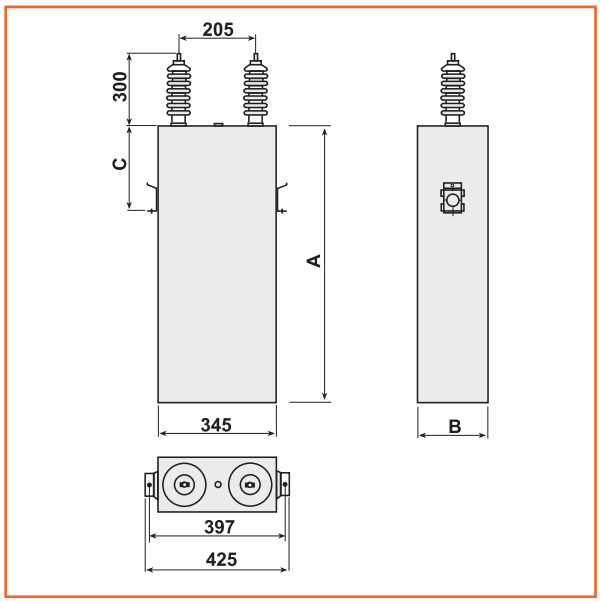
BIL = 125 kV
2 stud terminals



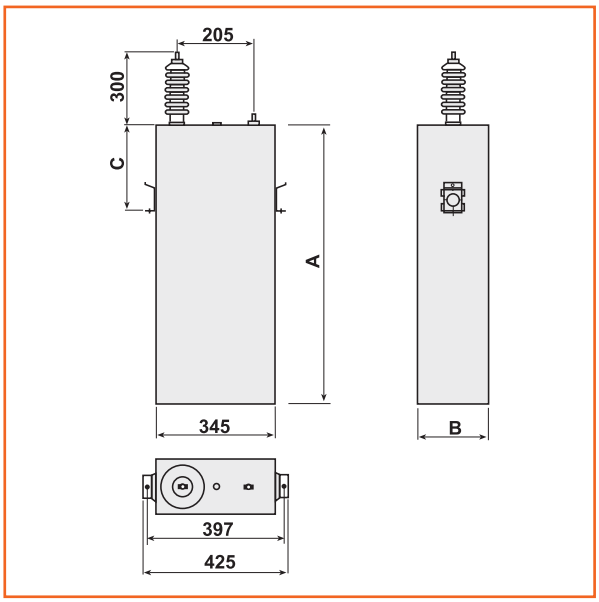
BIL = 125 kV
1 stud terminal



BIL = 150 kV
2 stud terminals



BIL = 150 kV
1 stud terminal



4. Capacitors banks of medium voltage

4.1 Fixed banks for medium voltage overhead distribution lines

Simple, compact, low cost, maintenance-free capacitor banks for pole mounting on overhead distribution feeders. They provide voltage level support and loss reduction, in - creasing power quality offered to costumers.

Reactive Power Range:

- from 75 to 1500 kVAr (50Hz);
- from 90 to 1800 kVAr (60 Hz);
- and voltage level from,3.6 to 36 kV.

4.2 Automatic capacitor banks for medium voltage overhead distribution lines

They provide finer reactive control according to the load. Control strategies based either on time of day, voltage level, VAR demand, temperature or a combination of them. Microprocessor-based controls with metering, event recording, annual programming and remote supervision capacity.
Capacitor switching by means of economical oil switches or maintenance-free vacuum switches with dry, solid foam insulation.

Reactive Power Range:

- from 75 to 1500 kVAr (50Hz);
- from 90 to 1800 kVAr (60 Hz);
- and voltage level from,3.6 to 36 kV.

4.3 Fixed, open type medium voltage capacitor banks for industrial installations and small power substations

When the capacitors are installed at the customer's installation, they provide low power factor penalty reduction or elimination. Floor-or platformmounted banks of reduced footprint. Capacitors connected in simple or double wye with unbalance protection. Various sectionalizing and protection schemes available.

Reactive Power Range:

- from 75 to 20 kVAr (50Hz);
- from 90 to 24 kVAr (60 Hz);
- and voltage level from,3.6 to 36 kV.

4.4 Automatic, open type medium voltage capacitor banks for large industrial installations and power substations

Control strategies based either on time of day, voltage level, VAR demand, temperature or combination of them. Single- or multistage banks, each stage provided with independent switching, protection and inrush current limiting reactors. Off-the-shelf or PLC-based, open-architecture controls. Special control options: Zero-Voltage-Crossing (ZVC) of switches, automatic tripping of bank upon loss of voltage, time-delayed bank reconnection after power restoring.

Reactive Power Range:

- from 75 to 1500 kVAr (50Hz);
- from 90 to 1800 kVAr (60 Hz);
- and voltage level from,3.6 to 36 kV.

4.5 High voltage capacitor banks for large power substations

They provide large amounts of reactive power to the system. All bank components are designed to withstand large short-circuit currents. Capacitors are connected in simple wye, double wye or bridge connection.

Reactive Power Range:

- From 1 to 100 MVAr (50Hz);
- From 1.2 to 120 MVAr (60 Hz);
- and voltage level from 36 kV to 145 kV.

4.6 Metal enclosed capacitor banks

Metal-enclosedcapacitormodules,factory-assembled, ready to install in indoor or outdoor locations. Capacitor switching with vacuum contactors, vacuum switches or vacuum circuit breakers.

Reactive Power Range:

- from 1 to 100 MVAr (50Hz);
- from 1.2 to 120 MVAr (60 Hz);
- and voltage level from 36 kV to 145 kV.

4.7 Fixed capacitor Banks for the mining and oil industries

They are used to supply reactive power to internal power distribu - tion systems in mining and oil fields, and also to provide VARs to well pumps, oil-pumping stations, etc. Sturdy design to withsta nd the harshest environmental conditions without maintenance. No floor preparation works or protective fences required.

Reactive Power Range:

- from 50 kVAr to 6 MVAr (50Hz);
- from 60 kVAr to 7.2 MVAr (60 Hz);
- and voltage level from 2.3 kV to 15 kV.

Three-phase harmonic filters

Copper winding

Constructive Characteristics

Three phase harmonic filters are made of low losses magnetic plates, permanent regime class F (155ºC) copper conductor and 90ºC thermal protection relay.

With the purpose of increasing filters ventilation, windings are separated among them, improving thermal dissipation.

Standard surge factor is 7% and 14% with resonance frequency 189 Hz and 134 Hz for 50 Hz networks.

With this standard values in three phase networks and balanced loads, the 5th (250 Hz) harmonic and higher resonant phenomenons are eliminated avoiding resonance between inductive impedance and three phase capacitors for power factor correction and preventing network capacitors and capacitor banks for overloads.

Technical Characteristics

Complince standard	IEC-60289;IEC-076
Tolerance "L"	3%
Permisible overload	1,07 x In
Linearity Inductance	1,60 x In
Heat insulation	Clase F (155ºC)
Thermal protection	90ºC
Room temperature	45ºC
Proof stress	4KV
Protection degree	IP-00
Detuning factor (p%)	7% - 14%

Rated Voltage: 230 V; Nominal Frequecy: 50 Hz. Resonance fequency: 189 Hz; Detuning factor: 7 %

Power	Inductance	Capacitance	Current	Code
KVAr	mH	µF	A	
2,5	5,07	3x46,63	6,28	RTF23000251895
5	2,53	3x93,27	12,55	RTF23000501895
10	1,27	3x186,53	25,10	RTF23001001895
12,5	1,01	3x233,17	31,38	RTF23001251895
15	0,84	3x279,80	37,65	RTF23001501895
20	0,63	3x373,07	50,20	RTF23002001895
25	0,51	3x466,33	62,76	RTF23002501895
30	0,42	3x559,60	75,31	RTF23003001895
40	0,32	3x746,13	100,41	RTF23004001895

Rated Voltage: 230 V; Nominal Frequecy: 50 Hz. Resonance fequency: 134 Hz; Detuning factor: 14 %

Power	Inductance	Capacitance	Current	Code
KVAr	mH	µF	A	
2,5	10,90	3x43,12	6,28	RTF23000251345
5	5,45	3x86,25	12,55	RTF23000501345
10	2,73	3x172,49	25,10	RTF23001001345
12,5	2,18	3x215,62	31,38	RTF23001251345
15	1,82	3x258,74	37,65	RTF23001501345
20	1,36	3x344,99	50,20	RTF23002001345
25	1,09	3x431,23	62,76	RTF23002501345
30	0,91	3x517,48	75,31	RTF23003001345
40	0,68	3x689,97	100,41	RTF23004001345

Rated Voltage: 400 V; Nominal Frequecy: 50 Hz. Resonance fequency: 189 Hz; Detuning factor: 7 %

Power	Inductance	Capacitance	Current	Code
KVAr	mH	µF	A	
2,5	15,33	3x15,42	3,61	RTF40000251895
5	7,67	3x30,84	7,22	RTF40000501895
10	3,83	3x61,67	14,43	RTF40001001895
12,5	3,07	3x77,09	18,04	RTF40001251895
15	2,56	3x92,51	21,65	RTF40001501895
20	1,92	3x123,35	28,87	RTF40002001895
25	1,53	3x154,18	36,08	RTF40002501895
30	1,28	3x185,02	43,30	RTF40003001895
40	0,96	3x246,69	57,74	RTF40004001895
50	0,77	3x308,36	72,17	RTF40005001895
60	0,64	3x370,04	86,60	RTF40006001895
70	0,55	3x431,71	101,04	RTF40007001895
80	0,48	3x493,38	115,47	RTF40008001895
100	0,38	3x616,73	144,34	RTF40010001895

Rated Voltage: 400 V; Nominal Frequecy: 50 Hz. Resonance fequency: 134 Hz; Detuning factor: 14 %

Power	Inductance	Capacitance	Current	Code
KVAr	mH	µF	A	
2,5	32,98	3x14,26	3,61	RTF40000251345
5	16,49	3x28,52	7,22	RTF40000501345
10	8,25	3x57,03	14,43	RTF40001001345
12,5	6,60	3x71,29	18,04	RTF40001251345
15	5,50	3x85,55	21,65	RTF40001501345
20	4,12	3x114,06	28,87	RTF40002001345
25	3,30	3x142,58	36,08	RTF40002501345
30	2,75	3x171,09	43,30	RTF40003001345
40	2,06	3x228,12	57,74	RTF40004001345
50	1,65	3x285,15	72,17	RTF40005001345
60	1,37	3x342,18	86,60	RTF40006001345
70	1,18	3x399,21	101,04	RTF40007001345
80	1,03	3x456,24	115,47	RTF40008001345
100	0,82	3x570,31	144,34	RTF40010001345

Rated Voltage: 440 V; Nominal Frequecy: 50 Hz. Resonance fequency: 189 Hz; Detuning factor: 7 %

Power	Inductance	Capacitance	Current	Code
KVAr	mH	µF	A	
2,5	18,55	3x12,74	3,28	RTF44000251895
5	9,28	3x25,48	6,56	RTF44000501895
10	4,64	3x50,97	13,12	RTF44001001895
12,5	3,71	3x63,71	16,40	RTF44001251895
15	3,09	3x76,45	19,68	RTF44001501895
20	2,32	3x101,94	26,24	RTF44002001895
25	1,86	3x127,42	32,80	RTF44002501895
30	1,55	3x152,91	39,36	RTF44003001895
40	1,16	3x203,88	52,49	RTF44004401895
50	0,93	3x254,85	65,61	RTF44005001895
60	0,77	3x305,81	78,73	RTF44006001895
70	0,66	3x356,78	91,85	RTF44007001895
80	0,58	3x407,75	104,97	RTF44008001895
100	0,46	3x509,69	131,22	RTF44010001895

Rated Voltage: 440 V; Nominal Frequecy: 50 Hz. Resonance fequency: 134 Hz; Detuning factor: 14 %

Power	Inductance	Capacitance	Current	Code
KVAr	mH	µF	A	
2,5	39,91	3x11,78	3,28	RTF44000251345
5	19,95	3x23,57	6,56	RTF44000501345
10	9,98	3x47,13	13,12	RTF44001001345
12,5	7,98	3x58,92	16,40	RTF44001251345
15	6,65	3x70,70	19,68	RTF44001501345
20	4,99	3x94,27	26,24	RTF44002001345
25	3,99	3x117,83	32,80	RTF44002501345
30	3,33	3x141,40	39,36	RTF44003001345
40	2,49	3x188,53	52,49	RTF44004401345
50	2,00	3x235,66	65,61	RTF44005001345
60	1,66	3x282,80	78,73	RTF44006001345
70	1,43	3x329,93	91,85	RTF44007001345
80	1,25	3x377,06	104,97	RTF44008001345
100	1,00	3x471,33	131,22	RTF44010001345

Automatic reactive power controller

PR-2D Series

PR-2D 144 x 144

Code	Tipo PR-2D
REG03DPR2500000	PR-2D 3 Steps
REG06DPR2500000	PR-2D 6 Steps
REG12DPR2500000	PR-2D 12 Steps

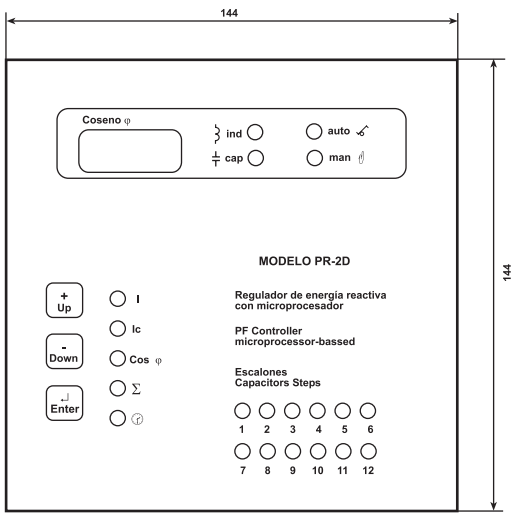
Technical Characteristics

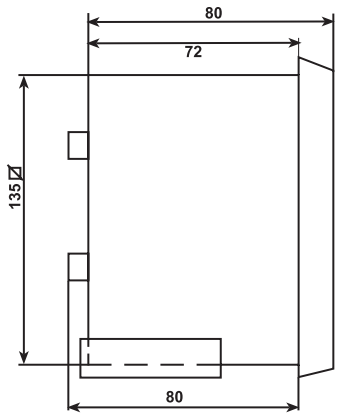
Voltage supply	230 V
Voltage measurement	110-690 V
Frequency	50-60 Hz
Current Transformer	x/5 A
C/K setting	Automatic ajustement, allows re-adjustements between 0,05 and 0,95
Cos j setting	0.85 IND a 0.95 CAP
Cos j indicator	Digital
Tendendy indicator	luminous indicator
Capacitor status	luminous indicator
Measurement system	A1 - Automatic, A2-Semiautomatic, A3 - Manual
Visualization	Secondary signal T.I.
Connect time	10 to 20 sec.
Programing	1:1:1; 1:2:2; 1:2:4; 1:1:2; 1:1:2:2:4
Manual connection pulsers	4 seg
Number of steps	3,6 and 12

Mechanical Characteristics

Front panell	144 x 144 mm
Mounting aperture	138 x 138 mm
Depth	95 mm
Mounting	Brackets
Real connection	Plug-in connector
Protection	IP 41
Temperature	-10 + 60 ºC
Weight	1,25 Kg

Dimensions





Automatic reactive power controller

PR-5D Series

PR-5D 96 x 96

Code	Tipo PR-5D
REG05DPR5500000	PR-5D 5 Steps
REG07DPR5500000	PR-5D 7 Steps

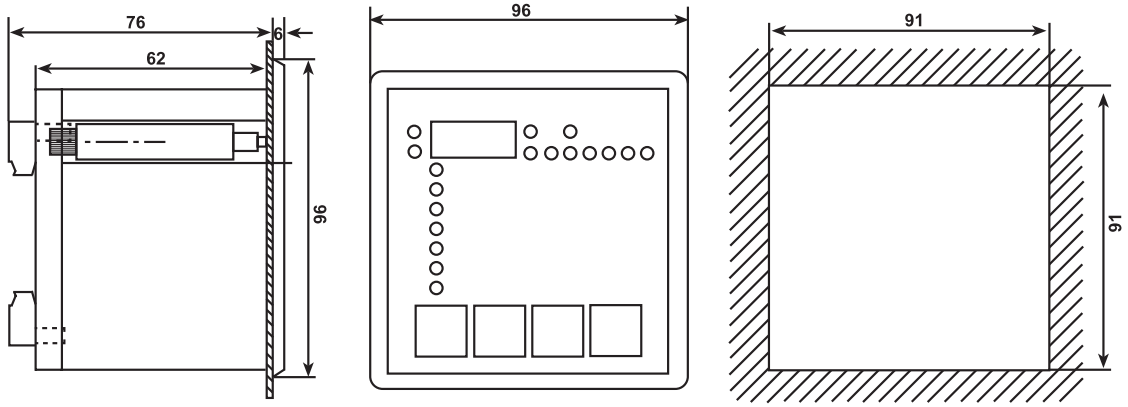
Technical Characteristics

Voltage supply	380...415 Vac
Frequency	50-60 Hz
Cos j	0.8 IND...0.80 CAP
Cos j indicator	Digital
Tendendy indicator	Luminous indicator
Capacitor status	Luminous indicator
Connect time	5...240 seg.
Programing	1:1:1; 1:2:2; 1:2:4:4; 1:2:4:8;
Number of steps	5, 7

Mechanical Characteristics

Front panell	96 x 96 mm
Mounting aperture	91 x 91 mm
Depth	65 mm
Protection	IP 54
Mounting	Brackets
Real connection	Plug-in connector
Temperature	-20 + 60 ºC
Weight	440...460 g

Dimensions



Automatic reactive power controller

PR-8D Series

Code	Tipo PR-8D
REG06DPR8500000	PR-8D 6 Steps
REG12DPR8500000	PR-8D 12 Steps

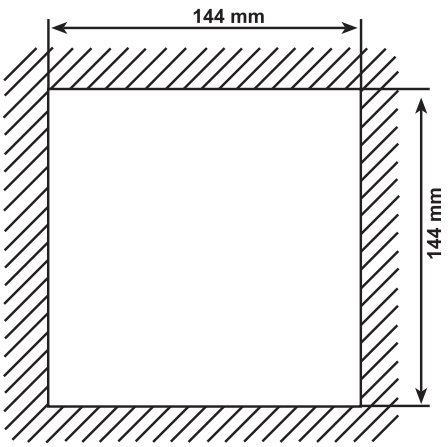
Technical Characteristics

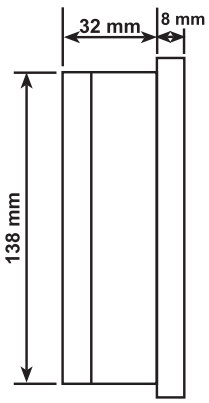
Supply voltage	(phase-neutral) 220 VAC
Rang of operation	(0.8-1.1) x Un
Frequency	50Hz
Power consumption	<1 VA
Contact's current	Máx. 3 A / 240 VCA
Current meaurement rang	0.1 -6ACA
Display rang	0.00-1.00Ind. y Cap.
Min. time of connection & disconnection	50 mA
Accuracy	1% +- dígito
Ratio of current transformer	5/5...10000/5 A
Max. time of connection & disconnection	10...60 s
Min. time of connection & disconnection	2...10 s
Value of IND. P.F. adjustment	10%...50%
Value of CAP. P.F. adjustment	5%...50%
Display	LED of 4 digit

Mechanical Characteristics

Protection dig.	IP 20
Protection dig. of contacts	IP 00
Amtient temp.	-5ºC...+50ºC
Humidity	15%...95%
Type of installation	Panel mounting
Dimensions	144x144x40 mm

Dimensions





Certificado del
Sistema de Gestión de la Calidad

RTR ENERGÍA, S.L.

AENOR

IQNet

THE INTERNATIONAL CERTIFICATION NETWORK

CERTIFICATE

Quality Management System

ISO 9001:2008

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