

HOW TO CHOOSE LV CAPACITORS FOLLOWING YOUR OPERATING CONDITIONS



The operating conditions are very important to the capacitors and can strongly influence the life expectancy. This is why, different categories of capacitors, with different levels of resistance, must be chosen according to operating conditions.

Capacitors must be selected in function of:

- Ambient temperature,
- Expected over-current related to voltage disturbances including maximum sustained over voltage,
- Requested life expectancy,
- Maximum number of switching during the year.



HARMONICS AND CAPACITORS

Capacitors are strongly sensitive to harmonics and particularly to harmonic currents. Harmonic currents are caused by non-linear loads connected to the distribution system. The presence of harmonics in electrical systems means that current and voltage are distorted and deviate from sinusoidal waveforms.

This phenomenon is particularly dangerous for capacitors since their impedance decreases proportionally to the order of the harmonics present with consequent capacitor overload and shortening steadily the life.

In some situations, resonance effect can occur as a result of amplification of harmonic currents and a very high voltage distortion.



NON-LINEAR LOADS

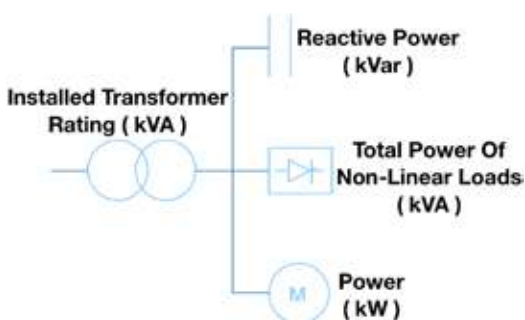
Considering what has been said before it is always necessary to keep in mind the level of harmonics in your network before choosing any kind of equipment especially Power Factor Correction one.

A significant parameter is the cumulated power of the non-linear loads generating harmonic currents.

Since the harmonics are caused by non-linear loads, an indicator for the magnitude of harmonics is the ratio of the total power of non-linear loads to the supply transformer rating.

$$N_{LL} = \frac{\text{Total Power of Non - Linear Loads}}{\text{Instaled Transformer Rating}}$$

EXAMPLE OF CALCULATIONS OF NON-LINEAR LOADS



Installed transformer rating: 500 kVA

Total power of non-linear loads: 115 kVA

$$N_{LL} = (115 / 500) \times 100 = 23\%$$



INTACT BASE RCM-INB-3: Capacitors designed to be used in standard conditions when there aren't any significant non-linear loads.

NLL < 10%

INTACT PLUS (Heavy Duty) RCM-INP-3: Capacitors for working in difficult conditions, resistant to voltage overloads or when the limited quantity of non-linear loads are installed.

Particularity – largely increased current resistance.

NLL < 20%

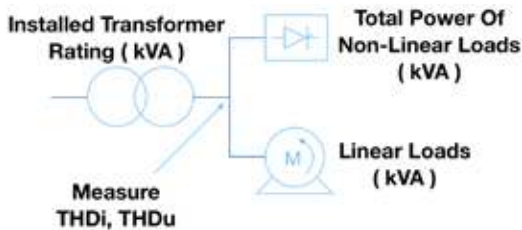
INTACT ALLPOWER (Extra Heavy Duty) RCM-INA-3: Highly reliable capacitors for operating in harsh environments or with a significant level of non-linear loads. Resistant to high overloads in current and voltage. Intact ALLPOWER is also resistant to high temperatures.

NLL < 25%

INTACT R-POWER RCM-INR-3: Capacitors to be used with detuned harmonic reactor. This is the optimal solution for reactive power compensation in networks where there is a significant quantity of non-linear loads, therefore the use of reactors is mandatory.

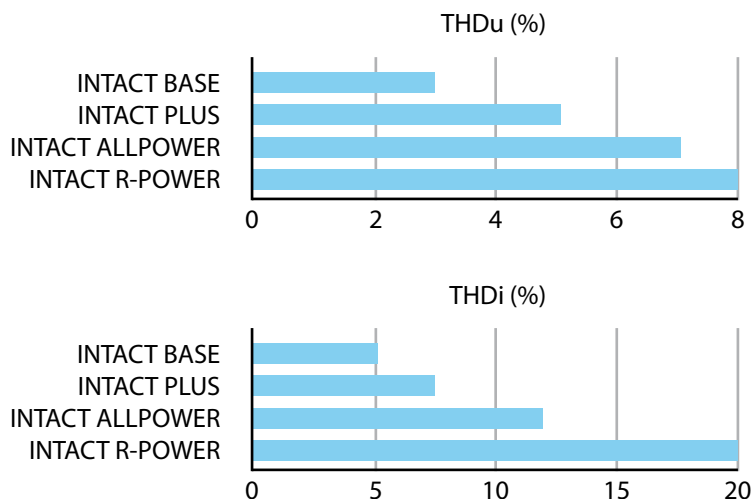
NLL < 30%

CAPACITORS SELECTION TAKING IN MIND LEVEL OF HARMONICS



As said before the percentage of non-linear loads NLL is a very important indicator of magnitude of harmonics but a more detailed estimation of the magnitude of harmonics can be made with measurements.

Significant indicators are current harmonic distortion THDi and voltage harmonic distortion THDu. Both values must be measured at the transformer secondary without connected capacitors. According to the measured distortion, different technologies of capacitors shall be selected.



Note:

The capacitor type should be selected according to the most restrictive measurement. For Example, a measurement is giving the following results:

- THDi = 14,0%
- THDu = 4,0%

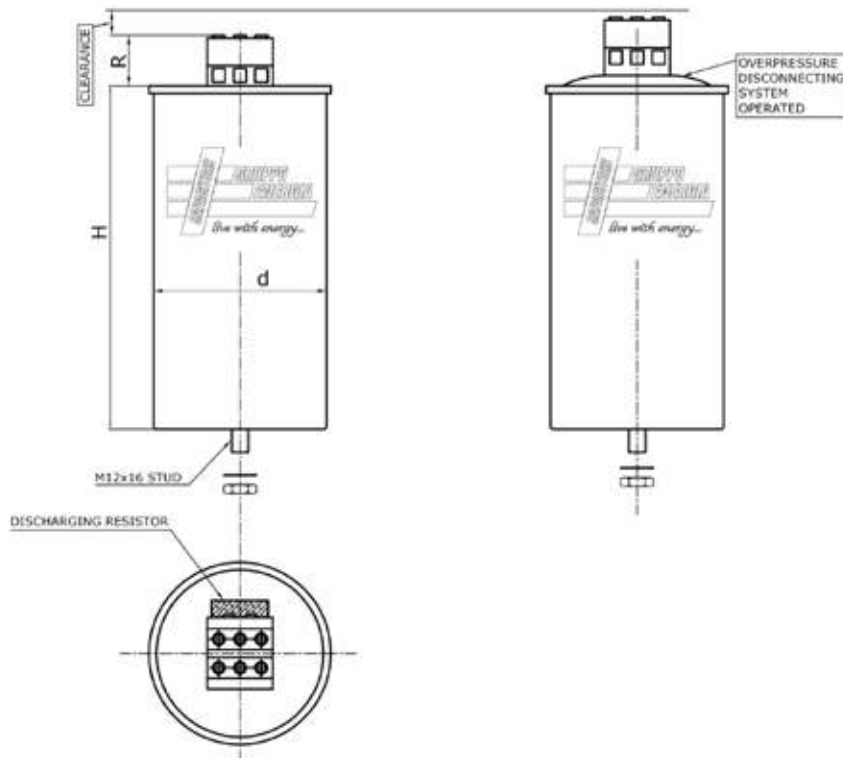
INTACT R-POWER with Detuned Reactor has to be selected.

Capacitor Family	Type	Applications	Max. Conditions
Intact Base RCM - INB - 3	Standard Capacitor	<ul style="list-style-type: none"> • Networks with non significant non-linear loads • Standard over-current • Standard operating temperature • Normal switching frequency • Standard life expectancy 	<ul style="list-style-type: none"> • NLL < 10% • 1,5 In • 55 °C • 5000 / year • Up to 100000 h*
Intact Plus RCM - INP - 3	Heavy Duty Capacitor	<ul style="list-style-type: none"> • Few non-linear loads • Significant over-current • High operating temperature • Significant switching frequency • Long life expectancy 	<ul style="list-style-type: none"> • NLL < 20% • 1,8 In • 60 °C • 7000 / year • Up to 160000 h*
Intact AllPower RCM - INA - 3	Extra Heavy Duty Capacitor	<ul style="list-style-type: none"> • Significant number of non-linear loads (up to 25%) • Significant over-current • Extreme temperature conditions • Frequent switching frequency • Extra long life expectancy 	<ul style="list-style-type: none"> • NLL < 25% • 2,5 In • 60 °C • 10000 / year • Up to 180000 h*
Intact R-Power + Detuned Harmonic Reactor RCM - INR - 3	Capacitor For Critical Applications	<ul style="list-style-type: none"> • High level of non-linear loads (up to 30%) • Significant over-current • Standard operating temperature • Significant switching frequency • Long life expectancy 	<ul style="list-style-type: none"> • NLL < 30% • 1,5 In • 55 °C • 7000 / year • Up to 160000 h*

Advise For You:

It is highly recommended to do harmonic study and detailed load study before selecting the capacitor family. For more informations don't hesitate to contact Gruppo Energia team.

CONSTRUCTION DIAGRAM



CASE

- Expansion: Maximum 12 mm.
- Clearance: Minimum 15 mm.

MOUNTING

- M12 threaded bolt
- Tightening torque: T= 10 Nm.
- Toothed washer: DIN 6789.
- Hexagonal nut: DIN 439.

TERMINALS

- Finger-proof terminal: Yes.
- **MT 16**
 - For 16 mmq cable.
 - M4 terminal screw.
 - Tightening torque: T= 1,3 Nm
 - R = 33 ±2
- **MT 25**
 - For 25 mmq cable.
 - M5 terminal screw.
 - Tightening torque: T= 2,5 Nm
 - R = 33 ±2
- **MT 35**
 - For 35 mmq cable.
 - M5 terminal screw.
 - Tightening torque: T= 3,0 Nm
 - R = 43 ±2

* The maximum life expectancy is given considering standard operating conditions as rated voltage (Un), rated current (In), 35 °C ambient temperature.

* Attention: The life expectancy will be reduced if capacitors are used at maximum working conditions.

TECHNICAL CHARACTERISTICS INTACT BASE RCM-INB

General

Standards:	IEC 60831-1:2014, UL810, VDE 0560-46:2014-11
Origin:	100% made in Italy
Voltage range:	220 V to 690 V
Frequency:	50 Hz / 60 Hz
Power range:	1 kVar to 62,5 kVar
Dielectric losses:	< 0,2 W/kVar
Total losses:	< 0,5 W/kVar
Capacitance tolerance:	± 5%
Voltage test between terminals:	2,15 Un, 50 Hz, 10 seconds (routine test)
Voltage test between terminals:	3,00 Un, 50 Hz, 60 seconds (type test)
Voltage test terminal / case:	≤ 525 V 3000 V, 50 Hz for 10 seconds or > 525 V 3660 V, 50 Hz for 10 seconds
Insulation level:	3 / 8 kV
External discharge resistor:	50 V in 1 min. 1 kVar - 30 kVar or 75 V in 3 min. 30,5 kVar - 62,5 kVar
Cooling:	Natural air or forced ventilation

Operating Conditions

Ambient temperature:	-25 °C / 55 °C
Humidity:	up to 95%
Altitude above sea level:	2000 m.
Overvoltage:	Un+10% for 8 hrs. daily Un+15% for 30 min. daily Un+20% for 5 min. daily Un+30% for 1 min. daily
Overcurrent:	up to 1,5 x In (Including Harmonics)
Inrush current:	up to 180 x In
Service life:	up to 100.000 hrs.
Harmonic presence:	NLL < 10%

Safety Features

Safety:	Overpressure disconnecter on 3 phase + Incorporated fuses + Self-healing + Discharge device
Protection degree:	IP20

Construction

Casing:	Aluminium can
Dielectric:	Polypropylene film with slope metallisation and wave-cut
Impregnation:	Polyurethane resin, Non-PCB

Installation

Mounting position:	Vertical preferable for better cooling
Fastening & Earthing:	Through 1 point, screw M12 at the bottom

RCM-INB CAPACITOR RATED VOLTAGE 400 V / 415 V - 3 PHASE - 50 Hz / 60 Hz

POWER AT SYSTEM VOLTAGE 50 Hz		POWER AT SYSTEM VOLTAGE 60 Hz		In 50 Hz CURRENT		In 60 Hz CURRENT		RATED CAPACITANCE	AVAILABLE DIMENSIONS*			TERMINAL TYPE	PCS/BOX	PCS/BOX	PCS/BOX
400 V kVar	415 V kVar	400 V kVar	415 V kVar	400 V A	415 V A	400 V A	415 V A		3 x μ F	\varnothing x H (7)	\varnothing x H (8)				
2,5	2,7	3,0	3,2	3,6	3,7	4,3	4,5	16,6	85 x 130	85 x 185	-	MT 16	9	-	-
5	5,4	6,0	6,5	7	7,5	8,7	9,0	33,2	85 x 130	85 x 185	-	MT 16	9	-	-
6,25	6,72	7,5	8,1	9,02	9,34	10,8	11,2	41,4	85 x 130	85 x 185	-	MT 16	9	-	-
10	10,8	12,0	12,9	14	15,0	17,3	18,0	66,3	85 x 225	-	-	MT 16	9	-	-
12,5	13,4	15,0	16,1	18,0	18,7	21,6	22,5	82,9	85 x 225	-	-	MT 16	9	-	-
15	16,1	18,0	19,4	22	22,5	26,0	26,9	99,5	100 x 225	85 x 260	-	MT 25/16	9	5	-
20	21,5	24,0	25,8	29	29,9	34,6	35,9	132,6	116 x 225	100 x 260	85 x 285	MT 25	9	5	-
25	26,9	30,0	32,3	36	37,4	43,3	44,9	165,8	116 x 225	-	100 x 300	MT 25	-	5	-
30	32,3	36,0	38,7	43	44,9	51,9	53,9	198,9	136 x 225	116 x 260	116 x 285	MT 25	-	5	4
40	43,0	48,0	51,6	58	59,9	69,3	71,9	265,3	116 x 285	-	-	MT 25	-	5	-
50	53,8	60,0	64,6	72	74,8	86,6	89,8	331,6	136 x 300	-	-	MT 35	-	-	4
62,5	67,3	-	-	90,2	93,6	-	-	414,6	136 x 375	-	-	MT 35	-	-	2

RCM-INB CAPACITOR RATED VOLTAGE 440 V / 450 V - 3 PHASE - 50 Hz / 60 Hz

POWER AT SYSTEM VOLTAGE 50 Hz		POWER AT SYSTEM VOLTAGE 60 Hz		In 50 Hz CURRENT		In 60 Hz CURRENT		RATED CAPACITANCE	AVAILABLE DIMENSIONS*			TERMINAL TYPE	PCS/BOX	PCS/BOX	PCS/BOX
440 V kVar	450 V kVar	440 V kVar	450 V kVar	440 V A	450 V A	440 V A	450 V A		3 x μ F	\varnothing x H (7)	\varnothing x H (8)				
2,5	2,6	3,0	3,1	3,3	3,4	3,9	4,0	13,7	85 x 130	85 x 185	-	MT 16	9	-	-
5	5,2	6,0	6,3	7	6,7	7,9	8,0	27,4	85 x 130	85 x 185	-	MT 16	9	-	-
6,25	6,5	7,5	7,9	8,20	8,4	9,8	10,1	34,3	85 x 130	85 x 185	-	MT 16	9	-	-
10	10,5	12,0	12,5	13	13,4	15,7	16,1	54,8	85 x 225	85 x 185	-	MT 16	9	-	-
12,5	13,1	15,0	15,7	16,4	16,8	19,7	20,1	68,5	85 x 225	-	-	MT 16	9	-	-
15	15,7	18,0	18,8	20	20,1	23,6	24,1	82,2	100 x 225	85 x 260	-	MT 25 / 16	9	5	-
20	20,9	24,0	25,1	26	26,8	31,5	32,2	109,6	116 x 225	100 x 260	85 x 285	MT 25	9	5	-
25	26,1	30,0	31,4	33	33,5	39,3	40,2	137	116 x 225	-	100 x 300	MT 25	-	5	-
30	31,4	36,0	37,6	39	40,2	47,2	48,3	164,4	136 x 225	116 x 260	100 x 300	MT 25	-	5	4
40	41,8	48,0	50,2	52	53,6	62,9	64,4	219,2	116 x 285	-	-	MT 25	-	5	-
50	52,3	60,0	62,7	66	67,1	78,7	80,5	274	136 x 300	-	-	MT 35	-	-	4
62,5	65,3	-	-	82,0	83,8	-	-	342,5	136 x 375	-	-	MT 35	-	-	2

RCM-INB CAPACITOR RATED VOLTAGE 525 V / 550 V - 3 PHASE - 50 Hz / 60 Hz

POWER AT SYSTEM VOLTAGE 50 Hz		POWER AT SYSTEM VOLTAGE 60 Hz		In 50 Hz CURRENT		In 60 Hz CURRENT		RATED CAPACITANCE	AVAILABLE DIMENSIONS*			TERMINAL TYPE	PCS/BOX	PCS/BOX	PCS/BOX
525 V kVar	550 V kVar	525 V kVar	550 V kVar	525 V A	550 V A	525 V A	550 V A		3 x μ F	\varnothing x H (7)	\varnothing x H (8)				
2,5	2,7	3,0	3,3	2,7	2,9	3,3	3,4	9,6	85 x 130	85 x 185	-	MT 16	9	-	-
5	5,5	6,0	6,6	5	5,7	6,6	6,9	19,2	85 x 130	85 x 185	-	MT 16	9	-	-
6,25	6,9	7,5	8,2	6,87	7,2	8,3	8,7	24,1	85 x 225	85 x 185	-	MT 16	9	-	-
10	11,0	12,0	13,2	11	11,5	13,2	13,8	38,5	100 x 225	85 x 260	-	MT 25 / 16	9	5	-
12,5	13,7	15,0	16,4	13,7	14,4	16,5	17,3	48,1	100 x 225	100 x 260	85 x 285	MT 25 / 16	9	5	-
15	16,4	18,0	19,7	16	17,3	19,8	20,7	57,7	116 x 225	100 x 260	100 x 300	MT 25	-	5	-
20	21,9	24,0	26,3	22	23,0	26,4	27,6	77,0	136 x 225	116 x 260	100 x 300	MT 25	-	5	-
25	27,4	30,0	32,9	27	28,8	33,0	34,5	96,2	136 x 225	-	116 x 285	MT 25	-	5	4
30	32,9	36,0	39,5	33	34,5	39,6	41,5	115,5	136 x 300	-	-	MT 25	-	-	4
40	43,9	48,0	52,7	44	46,1	52,8	55,3	154,0	136 x 300	-	-	MT 25	-	-	4
50	54,9	60,0	65,8	55	57,6	66,0	69,1	192,5	136 x 375	-	-	MT 25	-	-	2

Up to 37,5 kVar 400 V or 50 kVar 525 V capacitors are also available in single-phase version.
Other capacitor powers and voltages are available on request. Contact us info@gruppoenergia.it

*All dimensions are in "mm" and will be confirmed at the time of order.

RCM-INB 400 V / 440 V - 3 PHASE - 50 Hz / 60 Hz

ORDER CODE	CAPACITOR POWER 50 Hz	CAPACITOR POWER 60 Hz	RATED CAPACITANCE	In 50 Hz CURRENT	In 60 Hz CURRENT	Un SYSTEM VOLTAGE	Ur RATED VOLTAGE	DIMENSIONS*	TERMINAL TYPE	PCS/BOX
	kVar	kVar	3 x μ F	A	A	V	V	ϕ x H	mmq	
3PF2,5C3INB160	2,5	3,0	13,7	3,3	3,9	400	440	85 x 185	MT 16	9
3PF5C3INB160	5	6,0	27,4	6,6	7,9	400	440	85 x 185	MT 16	9
3PF6,25C3INB160	6,25	7,5	34,3	8,2	9,8	400	440	85 x 185	MT 16	9
3PF10C3INB160	10	12,0	54,8	13,1	15,7	400	440	85 x 185	MT 16	9
3PF12,5C3INB160	12,5	15,0	68,5	16,4	19,7	400	440	85 x 225	MT 16	9
3PF15C3INB160	15	18,0	82,2	19,7	23,6	400	440	85 x 225	MT 16	9
3PF20C3INB250	20	24,0	109,6	26,2	31,5	400	440	100 x 225	MT 25	5
3PF25C3INB250	25	30,0	137,0	32,8	39,3	400	440	100 x 260	MT 25	5
3PF30C3INB250	30	36,0	164,4	39,4	47,2	400	440	100 x 285	MT 25	5
3PF40C3INB250	40	48,0	219,2	52,5	63,0	400	440	116 x 285	MT 25	5
3PF50C3INB350	50	60,0	274,0	65,6	78,7	400	440	136 x 300	MT 35	4
3PF62,5C3INB350	62,5	-	342,5	82,0	-	400	440	136 x 375	MT 35	2

RCM-INB 400 V / 480 V - 3 PHASE - 50 Hz / 60 Hz

ORDER CODE	CAPACITOR POWER 50 Hz	CAPACITOR POWER 60 Hz	RATED CAPACITANCE	In 50 Hz CURRENT	In 60 Hz CURRENT	Un SYSTEM VOLTAGE	Ur RATED VOLTAGE	DIMENSIONS*	TERMINAL TYPE	PCS/BOX
	kVar	kVar	3 x μ F	A	A	V	V	ϕ x H	mmq	
3PF2,5C5INB160	2,5	3,0	11,5	3,0	3,6	400	480	85 x 185	MT 16	9
3PF5C5INB160	5	6,0	23,0	6,0	7,2	400	480	85 x 185	MT 16	9
3PF6,25C5INB160	6,25	7,5	28,8	7,5	9,0	400	480	85 x 185	MT 16	9
3PF10C5INB160	10	12,0	46,1	12,0	14,4	400	480	85 x 225	MT 16	9
3PF12,5C5INB160	12,5	15,0	57,6	15,0	18,0	400	480	85 x 225	MT 16	9
3PF15C5INB160	15	18,0	69,1	18,0	21,6	400	480	85 x 260	MT 16	9
3PF20C5INB250	20	24,0	92,1	24,1	28,9	400	480	100 x 260	MT 25	5
3PF25C5INB250	25	30,0	115,1	30,1	36,1	400	480	100 x 260	MT 25	5
3PF30C5INB250	30	36,0	138,2	36,1	43,3	400	480	100 x 285	MT 25	5
3PF40C5INB250	40	48,0	184,2	48,1	57,7	400	480	136 x 300	MT 25	4
3PF50C5INB350	50	60,0	230,3	60,1	72,1	400	480	136 x 300	MT 35	4
3PF62,5C5INB350	62,5	-	287,8	75,2	-	400	480	136 x 375	MT 35	2

RCM-INB 400 V / 525 V - 3 PHASE - 50 Hz / 60 Hz

ORDER CODE	CAPACITOR POWER 50 Hz	CAPACITOR POWER 60 Hz	RATED CAPACITANCE	In 50 Hz CURRENT	In 60 Hz CURRENT	Un SYSTEM VOLTAGE	Ur RATED VOLTAGE	DIMENSIONS*	TERMINAL TYPE	PCS/BOX
	kVar	kVar	3 x μ F	A	A	V	V	ϕ x H	mmq	
3PF2,5C7INB160	2,5	3,0	9,6	2,7	3,3	400	525	85 x 185	MT 16	9
3PF5C7INB160	5	6,0	19,2	5,5	6,6	400	525	85 x 185	MT 16	9
3PF6,25C7INB160	6,25	7,5	24,1	6,9	8,2	400	525	85 x 185	MT 16	9
3PF10C7INB160	10	12,0	38,5	11,0	13,2	400	525	85 x 225	MT 16	9
3PF12,5C7INB160	12,5	15,0	48,1	13,7	16,5	400	525	85 x 225	MT 16	9
3PF15C7INB160	15	18,0	57,7	16,5	19,8	400	525	85 x 260	MT 16	9
3PF20C7INB250	20	24,0	77,0	22,0	26,4	400	525	100 x 225	MT 25	5
3PF25C7INB250	25	30,0	96,2	27,5	33,0	400	525	100 x 260	MT 25	5
3PF30C7INB250	30	36,0	115,5	33,0	39,6	400	525	100 x 285	MT 25	5
3PF40C7INB250	40	48,0	154,0	44,0	52,8	400	525	116 x 285	MT 25	5
3PF50C7INB250	50	60,0	192,5	55,0	65,9	400	525	136 x 300	MT 35	4
3PF62,5C7INB350	62,5	-	240,6	68,7	-	400	525	136 x 375	MT 35	2

Up to 37,5 kVar 400 V or 50 kVar 525 V capacitors are also available in single-phase version.
Other capacitor powers and voltages are available on request. Contact us info@gruppenergia.it

*All dimensions are in "mm" and will be confirmed at the time of order.

TECHNICAL CHARACTERISTICS INTACT PLUS RCM-INP

General

Standards:	IEC 60831-1:2014, UL810, VDE 0560-46:2014-11
Origin:	100% made in Italy
Voltage range:	220 V to 550 V
Frequency:	50 Hz / 60 Hz
Power range:	2,5 kVar to 50 kVar
Dielectric losses:	< 0,2 W/kVar
Total losses:	< 0,5 W/kVar
Capacitance tolerance:	± 5%
Voltage test between terminals:	2,15 Un, 50 Hz, 10 seconds (routine test)
Voltage test between terminals:	3,00 Un, 50 Hz, 60 seconds (type test)
Voltage test terminal / case:	≤ 525 V 3000 V, 50 Hz for 10 seconds or > 525 V 3660 V, 50 Hz for 10 seconds
Insulation level:	3 / 8 kV
External discharge resistor:	50 V in 1 min. 1 kVar - 30 kVar or 75 V in 3 min. 30,5 kVar - 62,5 kVar
Cooling:	Natural air or forced ventilation

Operating Conditions

Ambient temperature:	-45 °C / 60 °C
Humidity:	up to 95%
Altitude above sea level:	2000 m.
Overvoltage:	Un+10% for 8 hrs. daily Un+15% for 30 min. daily Un+20% for 5 min. daily Un+30% for 1 min. daily
Overcurrent:	up to 1,8 x In (Including Harmonics)
Inrush current:	up to 250 x In
Service life:	up to 160.000 hrs.
Harmonic presence:	NLL < 20%

Safety Features

Safety:	Overpressure disconnecter on 3 phase + Incorporated fuses + Self-healing + Discharge device
Protection degree:	IP20

Construction

Casing:	Aluminium can
Dielectric:	Special polypropylene film with slope metallisation and wave-cut
Impregnation:	Special polyurethane resin, Non-PCB

Installation

Mounting position:	Vertical preferable for better cooling
Fastening & Earthing:	Through 1 point, screw M12 at the bottom

RCM-INP CAPACITOR RATED VOLTAGE 400 V / 415 V - 3 PHASE - 50 Hz / 60 Hz

POWER AT SYSTEM VOLTAGE 50 Hz		POWER AT SYSTEM VOLTAGE 60 Hz		In 50 Hz CURRENT		In 60 Hz CURRENT		RATED CAPACITANCE	AVAILABLE DIMENSIONS*			TERMINAL TYPE	PCS/BOX	PCS/BOX	PCS/BOX
400 V kVar	415 V kVar	400 V kVar	415 V kVar	400 V A	415 V A	400 V A	415 V A	3 x μ F	\varnothing x H (7)	\varnothing x H (8)	\varnothing x H (9)	mmq	\varnothing 85	\varnothing 100 \varnothing 116	\varnothing 136
2,5	2,7	3,0	3,2	3,6	3,7	4,3	4,5	16,6	85 x 130	85 x 185	-	MT 16	9	-	-
5	5,4	6,0	6,5	7	7,5	8,7	9,0	33,2	85 x 130	85 x 185	-	MT 16	9	-	-
6,25	6,72	7,5	8,1	9,02	9,34	10,8	11,2	41,4	85 x 185	-	-	MT 16	9	-	-
10	10,8	12,0	12,9	14	15,0	17,3	18,0	66,3	85 x 225	-	-	MT 16	9	-	-
12,5	13,4	15,0	16,1	18,0	18,7	21,6	22,5	82,9	100 x 225	85 x 260	-	MT 25 / 16	9	5	-
15	16,1	18,0	19,4	22	22,5	26,0	26,9	99,5	100 x 225	-	85 x 285	MT 25 / 16	9	5	-
20	21,5	24,0	25,8	29	29,9	34,6	35,9	132,6	116 x 225	100 x 260	100 x 300	MT 25	9	5	-
25	26,9	30,0	32,3	36	37,4	43,3	44,9	165,8	136 x 225	116 x 260	100 x 300	MT 25	-	5	4
30	32,3	36,0	38,7	43	44,9	51,9	53,9	198,9	136 x 225	-	116 x 285	MT 25	-	5	4
40	43,0	48,0	51,6	58	59,9	69,3	71,9	265,3	136 x 300	-	-	MT 35	-	-	4
50	53,8	60,0	64,6	72	74,8	86,6	89,8	331,6	136 x 375	-	-	MT 35	-	-	2

RCM-INP CAPACITOR RATED VOLTAGE 440 V / 450 V - 3 PHASE - 50 Hz / 60 Hz

POWER AT SYSTEM VOLTAGE 50 Hz		POWER AT SYSTEM VOLTAGE 60 Hz		In 50 Hz CURRENT		In 60 Hz CURRENT		RATED CAPACITANCE	AVAILABLE DIMENSIONS*			TERMINAL TYPE	PCS/BOX	PCS/BOX	PCS/BOX
440 V kVar	450 V kVar	440 V kVar	450 V kVar	440 V A	450 V A	440 V A	450 V A	3 x μ F	\varnothing x H (7)	\varnothing x H (8)	\varnothing x H (9)	mmq	\varnothing 85	\varnothing 100 \varnothing 116	\varnothing 136
2,5	2,6	3,0	3,1	3,3	3,4	3,9	4,0	13,7	85 x 130	85 x 185	-	MT 16	9	-	-
5	5,2	6,0	6,3	7	6,7	7,9	8,0	27,4	85 x 130	85 x 185	-	MT 16	9	-	-
6,25	6,5	7,5	7,9	8,20	8,4	9,8	10,1	34,3	85 x 185	-	-	MT 16	9	-	-
10	10,5	12,0	12,5	13	13,4	15,7	16,1	54,8	85 x 225	-	-	MT 16	9	-	-
12,5	13,1	15,0	15,7	16,4	16,8	19,7	20,1	68,5	100 x 225	85 x 260	-	MT 25 / 16	9	5	-
15	15,7	18,0	18,8	20	20,1	23,6	24,1	82,2	100 x 225	85 x 260	-	MT 25 / 16	9	5	-
20	20,9	24,0	25,1	26	26,8	31,5	32,2	109,6	116 x 225	100 x 260	-	MT 25	9	5	-
25	26,1	30,0	31,4	33	33,5	39,3	40,2	137	136 x 225	116 x 260	100 x 300	MT 25	-	5	4
30	31,4	36,0	37,6	39	40,2	47,2	48,3	164,4	136 x 225	-	116 x 285	MT 25	-	5	4
40	41,8	48,0	50,2	52	53,6	62,9	64,4	219,2	136 x 300	-	-	MT 35	-	-	4
50	52,3	60,0	62,7	66	67,1	78,7	80,5	274	136 x 375	-	-	MT 35	-	-	2

RCM-INP CAPACITOR RATED VOLTAGE 525 V / 550 V - 3 PHASE - 50 Hz / 60 Hz

POWER AT SYSTEM VOLTAGE 50 Hz		POWER AT SYSTEM VOLTAGE 60 Hz		In 50 Hz CURRENT		In 60 Hz CURRENT		RATED CAPACITANCE	AVAILABLE DIMENSIONS*			TERMINAL TYPE	PCS/BOX	PCS/BOX	PCS/BOX
525 V kVar	550 V kVar	525 V kVar	550 V kVar	525 V A	550 V A	525 V A	550 V A	3 x μ F	\varnothing x H (7)	\varnothing x H (8)	\varnothing x H (9)	mmq	\varnothing 85	\varnothing 100 \varnothing 116	\varnothing 136
2,5	2,7	3,0	3,3	2,7	2,9	3,3	3,4	9,6	85 x 130	85 x 185	-	MT 16	9	-	-
5	5,5	6,0	6,6	5	5,7	6,6	6,9	19,2	85 x 130	85 x 185	-	MT 16	9	-	-
6,25	6,9	7,5	8,2	6,87	7,2	8,3	8,7	24,1	85 x 225	85 x 185	-	MT 16	9	-	-
10	11,0	12,0	13,2	11	11,5	13,2	13,8	38,5	100 x 225	85 x 260	-	MT 25 / 16	9	5	-
12,5	13,7	15,0	16,4	13,7	14,4	16,5	17,3	48,1	100 x 225	100 x 260	85 x 285	MT 25 / 16	9	5	-
15	16,4	18,0	19,7	16	17,3	19,8	20,7	57,7	116 x 225	100 x 260	100 x 300	MT 25	-	5	-
20	21,9	24,0	26,3	22	23,0	26,4	27,6	77,0	136 x 225	116 x 260	100 x 300	MT 25	-	5	-
25	27,4	30,0	32,9	27	28,8	33,0	34,5	96,2	136 x 225	-	116 x 285	MT 25	-	5	4
30	32,9	36,0	39,5	33	34,5	39,6	41,5	115,5	136 x 300	-	-	MT 25	-	-	4
40	43,9	48,0	52,7	44	46,1	52,8	55,3	154,0	136 x 300	-	-	MT 35	-	-	4
50	54,9	60,0	65,8	55	57,6	66,0	69,1	192,5	136 x 375	-	-	MT 35	-	-	2

Up to 37,5 kVar 400 V or 50 kVar 525 V capacitors are also available in single-phase version.
Other capacitor powers and voltages are available on request. Contact us info@gruppenergia.it

*All dimensions are in "mm" and will be confirmed at the time of order.

TECHNICAL CHARACTERISTICS INTACT ALLPOWER RCM-INA

General

Standards:	IEC 60831-1:2014, UL810, VDE 0560-46:2014-11
Origin:	100% made in Italy
Voltage range:	220 V to 550 V
Frequency:	50 Hz / 60 Hz
Power range:	2,5 kVar to 30 kVar
Dielectric losses:	< 0,2 W/kVar
Total losses:	< 0,5 W/kVar
Capacitance tolerance:	± 5%
Voltage test between terminals:	2,15 Un, 50 Hz, 10 seconds (routine test)
Voltage test between terminals:	3,00 Un, 50 Hz, 60 seconds (type test)
Voltage test terminal / case:	≤ 525 V 3000 V, 50 Hz for 10 seconds or > 525 V 3660 V, 50 Hz for 10 seconds
Insulation level:	3 / 8 kV
External discharge resistor:	50 V in 1 min. 1 kVar - 30 kVar or 75 V in 3 min. 30,5 kVar - 62,5 kVar
Cooling:	Natural air or forced ventilation

Operating Conditions

Ambient temperature:	- 45 °C / 60 °C
Humidity:	up to 95%
Altitude above sea level:	2000 m.
Overvoltage:	Un+10% continuous operation Un+15% for 30 min. daily Un+20% for 5 min. daily Un+30% for 1 min. daily
Overcurrent:	up to 2,5 x In (Including Harmonics)
Inrush current:	up to 280 x In
Service life:	up to 180.000 hrs.
Harmonic presence:	NLL < 25%

Safety Features

Safety:	Overpressure disconnecter on 3 phase + Incorporated fuses + Self-healing + Discharge device
Protection degree:	IP20

Construction

Casing:	Aluminium can
Dielectric:	Special polypropylene film with slope metallisation and wave-cut
Impregnation:	Special polyurethane resin, Non-PCB

Installation

Mounting position:	Vertical preferable for better cooling
Fastening & Earthing:	Through 1 point, screw M12 at the bottom

RCM-INA CAPACITOR RATED VOLTAGE 400 V / 415 V — 3 PHASE — 50 Hz / 60 Hz

POWER AT SYSTEM VOLTAGE 50 Hz		POWER AT SYSTEM VOLTAGE 60 Hz		In 50 Hz CURRENT		In 60 Hz CURRENT		RATED CAPACITANCE	AVAILABLE DIMENSIONS*			TERMINAL TYPE	PCS/BOX	PCS/BOX	PCS/BOX
400 V kVar	415 V kVar	400 V kVar	415 V kVar	400 V A	415 V A	400 V A	415 V A		3 x µF	ø x H (7)	ø x H (8)				
2,5	2,7	3,0	3,2	3,6	3,7	4,3	4,5	16,6	85 x 225	85 x 185	-	MT 16	9	-	-
5	5,4	6,0	6,5	7	7,5	8,7	9,0	33,2	85 x 225	85 x 185	-	MT 16	9	-	-
6,25	6,72	7,5	8,1	9,02	9,34	10,8	11,2	41,4	85 x 225	85 x 185	-	MT 16	9	-	-
10	10,8	12,0	12,9	14	15,0	17,3	18,0	66,3	85 x 225	-	-	MT 16	9	-	-
12,5	13,4	15,0	16,1	18,0	18,7	21,6	22,5	82,9	100 x 225	85 x 260	-	MT 25	-	5	-
15	16,1	18,0	19,4	22	22,5	26,0	26,9	99,5	100 x 225	-	85 x 285	MT 25	9	5	-
20	21,5	24,0	25,8	29	29,9	34,6	35,9	132,6	136 x 225	116 x 260	-	MT 35	-	5	4
25	26,9	30,0	32,3	36	37,4	43,3	44,9	165,8	136 x 225	-	116 x 285	MT 35	-	5	4
30	32,3	36,0	38,7	43	44,9	51,9	53,9	198,9	136 x 300	-	-	MT 35	-	-	4

RCM-INA CAPACITOR RATED VOLTAGE 440 V / 450 V — 3 PHASE — 50 Hz / 60 Hz

POWER AT SYSTEM VOLTAGE 50 Hz		POWER AT SYSTEM VOLTAGE 60 Hz		In 50 Hz CURRENT		In 60 Hz CURRENT		RATED CAPACITANCE	AVAILABLE DIMENSIONS*			TERMINAL TYPE	PCS/BOX	PCS/BOX	PCS/BOX
440 V kVar	450 V kVar	440 V kVar	450 V kVar	440 V A	450 V A	440 V A	450 V A		3 x µF	ø x H (7)	ø x H (8)				
2,5	2,6	3,0	3,1	3,3	3,4	3,9	4,0	13,7	85 x 225	85 x 185	-	MT 16	9	-	-
5	5,2	6,0	6,3	7	6,7	7,9	8,0	27,4	85 x 225	85 x 185	-	MT 16	9	-	-
6,25	6,5	7,5	7,9	8,20	8,4	9,8	10,1	34,3	85 x 225	85 x 185	-	MT 16	9	-	-
10	10,5	12,0	12,5	13	13,4	15,7	16,1	54,8	100 x 225	85 x 260	-	MT 25 / 16	9	5	-
12,5	13,1	15,0	15,7	16,4	16,8	19,7	20,1	68,5	100 x 225	-	85 x 285	MT 25	9	5	-
15	15,7	18,0	18,8	20	20,1	23,6	24,1	82,2	116 x 225	100 x 260	85 x 285	MT 25	9	5	-
20	20,9	24,0	25,1	26	26,8	31,5	32,2	109,6	136 x 225	116 x 260	-	MT 25	-	5	4
25	26,1	30,0	31,4	33	33,5	39,3	40,2	137	136 x 225	116 x 260	-	MT 35	-	5	4
30	31,4	36,0	37,6	39	40,2	47,2	48,3	164,4	136 x 225	-	116 x 285	MT 35	-	5	4

RCM-INA CAPACITOR RATED VOLTAGE 525 V / 550 V — 3 PHASE — 50 Hz / 60 Hz

POWER AT SYSTEM VOLTAGE 50 Hz		POWER AT SYSTEM VOLTAGE 60 Hz		In 50 Hz CURRENT		In 60 Hz CURRENT		RATED CAPACITANCE	AVAILABLE DIMENSIONS*			TERMINAL TYPE	PCS/BOX	PCS/BOX	PCS/BOX
525 V kVar	550 V kVar	525 V kVar	550 V kVar	525 V A	550 V A	525 V A	550 V A		3 x µF	ø x H (7)	ø x H (8)				
2,5	2,7	3,0	3,3	2,7	2,9	3,3	3,4	9,6	85 x 225	85 x 185	-	MT 16	9	-	-
5	5,5	6,0	6,6	5	5,7	6,6	6,9	19,2	85 x 225	-	-	MT 16	9	-	-
6,25	6,9	7,5	8,2	6,87	7,2	8,3	8,7	24,1	100 x 225	85 x 225	-	MT 25 / 16	9	5	-
10	11,0	12,0	13,2	11	11,5	13,2	13,8	38,5	116 x 225	-	85 x 285	MT 25 / 16	9	5	-
12,5	13,7	15,0	16,4	13,7	14,4	16,5	17,3	48,1	136 x 225	-	100 x 300	MT 25	-	5	4
15	16,4	18,0	19,7	16	17,3	19,8	20,7	57,7	136 x 225	-	116 x 285	MT 25	-	5	4
20	21,9	24,0	26,3	22	23,0	26,4	27,6	77,0	136 x 300	-	116 x 285	MT 25	-	5	4
25	27,4	30,0	32,9	27	28,8	33,0	34,5	96,2	136 x 300	-	-	MT 25	-	-	4
30	32,9	36,0	39,5	33	34,5	39,6	41,5	115,5	136 x 375	-	-	MT 35	-	-	2

Up to 30 kVar 400 V or 30 kVar 525 V capacitors are also available in single-phase version.
Other capacitor powers and voltages are available on request. Contact us info@gruppenergia.it

*All dimensions are in "mm" and will be confirmed at the time of order.

TECHNICAL CHARACTERISTICS INTACT R-POWER + DETUNED HARMONIC REACTOR RCM-INR

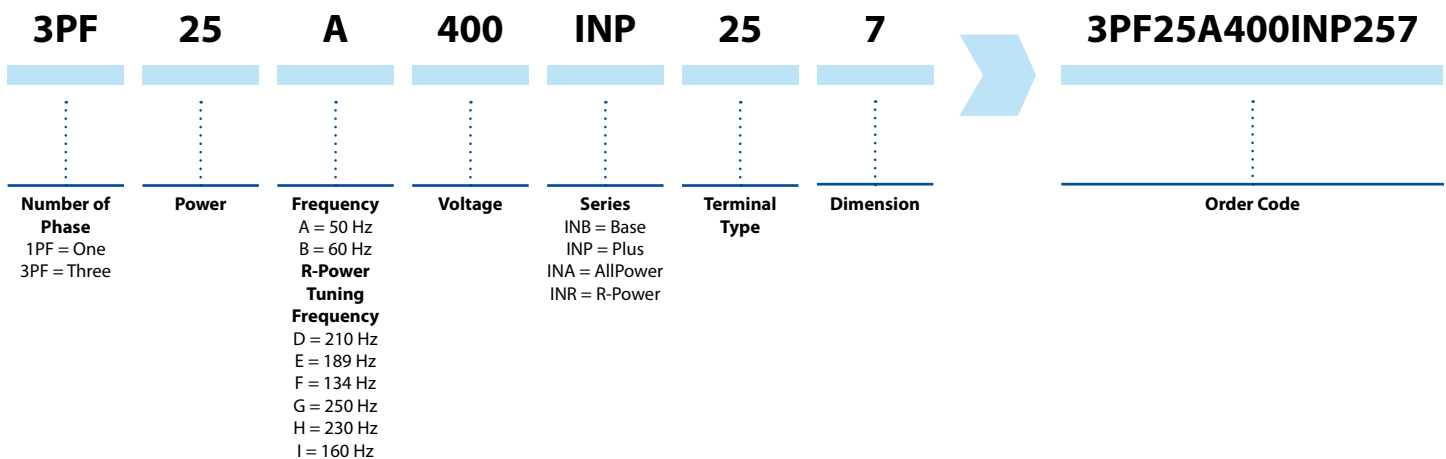
General	
Standards:	IEC 60831-1:2014, UL810, VDE 0560-46:2014-11
Origin:	100% made in Italy
Voltage range:	220 V to 550 V
Frequency:	50 Hz / 60 Hz
Power range:	2,5 kVar to 50 kVar
Dielectric losses:	< 0,2 W/kVar
Total losses:	< 0,5 W/kVar
Capacitance tolerance:	± 5%
Voltage test between terminals:	2,15 Un, 50 Hz, 10 seconds (routine test)
Voltage test between terminals:	3,00 Un, 50 Hz, 60 seconds (type test)
Voltage test terminal / case:	≤ 525 V 3000 V, 50 Hz for 10 seconds or > 525 V 3660 V, 50 Hz for 10 seconds
Insulation level:	3 / 8 kV
External discharge resistor:	50 V in 1 min. 1 kVar - 30 kVar or 75 V in 3 min. 30,5 kVar - 62,5 kVar
Cooling:	Forced ventilation
Operating Conditions	
Ambient temperature:	- 45 °C / 55 °C
Humidity:	up to 95%
Altitude above sea level:	2000 m.
Overvoltage:	Un+10% continuous operation Un+15% for 30 min. daily Un+20% for 5 min. daily Un+30% for 1 min. daily
Overcurrent:	up to 1,8 x In (Including Harmonics)
Inrush current:	up to 250 x In
Service life:	up to 160.000 hrs.
Harmonic presence:	NLL < 30%
Safety Features	
Safety:	Overpressure disconnecter on 3 phase + Incorporated fuses + Self-healing + Discharge device
Protection degree:	IP20
Construction	
Casing:	Aluminium can
Dielectric:	Special polypropylene film with slope metallisation and wave-cut
Impregnation:	Special polyurethane resin, Non-PCB
Installation	
Mounting position:	Vertical preferable for better cooling
Fastening & Earthing:	Through 1 point, screw M12 at the bottom

RCM-INR CAPACITOR RATED VOLTAGE 440 V / 525 V - 3 PHASE - 50 HZ
REACTOR RATED VOLTAGE 400 V - 189 HZ - P=7%

CAPACITOR POWER		POWER REACTOR	TOTAL POWER LC CAPACITOR + REACTOR	RATED CAPACITANCE	RATED INDUCTANCE	In CURRENT	AVAILABLE DIMENSIONS*		TERMINAL TYPE	PCS/BOX	PCS/BOX	PCS/BOX
440 V kVar	525 V kVar	400 V kVar	400 V kVar	3 x μ F	3 x mH	400 V	ϕ x H 440 V (7)	ϕ x H 525 V (8)	mmq	ϕ 85	ϕ 100 ϕ 116	ϕ 136
2,5	3,6	2,2	2,2	13,7	17,30	3,2	85 x 225	85 x 225	MT 16	9	-	-
2,8	4,0	2,5	2,5	15,4	15,33	3,6	85 x 225	85 x 225	MT 16	9	-	-
5	7,1	4,4	4,4	27,4	8,64	6,4	85 x 225	85 x 225	MT 16	9	-	-
5,6	8,0	5,0	5	30,8	7,66	7,2	85 x 225	85 x 225	MT 16	9	-	-
6,25	8,9	5,5	5,5	34,3	6,90	8,0	85 x 225	85 x 225	MT 16	9	-	-
7	10,0	6,25	6,25	38,6	6,13	9,0	85 x 225	85 x 225	MT 16	9	-	-
10	14,2	8,9	8,9	54,8	4,32	12,8	85 x 285	85 x 285	MT 16	9	-	-
11,3	16,0	10	10	61,7	3,83	14,4	85 x 285	85 x 285	MT 16	9	-	-
12,5	17,8	11,1	11,1	68,5	3,46	16,0	85 x 285	100 x 300	MT 16 / 25	9	5	-
14,1	20,0	12,5	12,5	77,1	3,07	18,0	85 x 285	100 x 300	MT 16 / 25	9	5	-
15	21,3	13,3	13,3	82,2	2,88	19,2	85 x 285	100 x 300	MT 16 / 25	9	5	-
16,9	24,0	15	15	92,6	2,50	21,7	100 x 300	100 x 300	MT 25	-	5	-
20	28,5	17,8	17,8	109,6	2,17	25,6	100 x 300	116 x 285	MT 25	-	5	-
22,5	32,0	20	20	123,4	1,90	28,9	116 x 285	116 x 285	MT 25	-	5	-
25	35,6	22,2	22,2	137,0	1,73	32,0	116 x 285	136 x 300	MT 25	-	5	4
28,1	40,0	25	25	154,0	1,53	36,0	116 x 285	136 x 300	MT 25	-	5	4
30	42,7	26,7	26,7	164,4	1,44	38,4	116 x 285	136 x 300	MT 25	-	5	4
33,8	48,1	30	30	185,1	1,30	43,3	136 x 300	136 x 300	MT 25	-	-	4
40	56,9	35,5	35,5	219,2	1,08	51,3	136 x 300	136 x 375	MT 25	-	-	4 / 2
45	64,1	40	40	246,8	0,96	57,7	136 x 300	136 x 375	MT 25	-	-	4 / 2
50	2 x 35,6	44,4	44,4	274,0	0,86	64,1	136 x 375	-	MT 35	-	-	2
56,3	2 x 40	50	50	308,5	0,77	72,1	136 x 375	-	MT 35	-	-	2
2 x 33,8	2 x 48,1	66	66	407,6	0,58	95,3	-	-	-	-	-	-
2 x 40	3 x 40	75	75	463,6	0,51	108,4	-	-	-	-	-	-
2 x 50	4 x 35,6	90	90	549,8	0,43	128,6	-	-	-	-	-	-
2 x 56,3	4 x 40	100	100	622,2	0,38	145,5	-	-	-	-	-	-

Other capacitor powers and voltages are available on request. Contact us info@gruppoenergia.it

HOW TO ORDER?



*All dimensions are in "mm" and will be confirmed at the time of order.