

# VDE Prüf- und Zertifizierungsinstitut

## GUTACHTEN MIT FERTIGUNGSÜBERWACHUNG CERTIFICATE OF CONFORMITY WITH FACTORY SURVEILLANCE

GRUPPO ENERGIA s.r.l.  
Via Cavezzo 36  
25045 CASTEGNATO BS  
ITALY

ist berechtigt, für ihr Produkt /  
is authorized to use for their product  
**Leistungs-Parallelkondensator -  
Dreiphaseneinheit in Dreieckschaltung**

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DN EN 60811-1 / VDE 0488-40:2014-11, EN 60811-2:2014  
DN EN 60811-2 / VDE 0488-41:2014-11, EN 60811-2:2014



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## CERTIFICATE OF COMPLIANCE

Certificate Number 20140422-E365338  
Report Reference E365338-20140422  
Issue Date 2014-APRIL-22

Issued to: GRUPPO ENERGIA SRL  
Via Cavezzo 36  
25045 Castegnato Bs ITALY

This is to certify that COMPONENT - CAPACITORS, CONSTRUCTION ONLY  
representative samples of Series L/L/M CP.

Have been investigated by UL in accordance with the  
Standard(s) indicated on this Certificate.

Standard(s) for Safety: U.S. National Standard: UL 810, standard for Capacitors  
Canadian National Standard, CSA C22.2 No. 190,  
Capacitors for Power Factor Correction

Additional Information: See the UL Online Certifications Directory at  
[www.ul.com/database](http://www.ul.com/database) for additional information

Only those products bearing the UL Recognized Component Marks for the U.S. and Canada should be  
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The UL Recognized Component Mark for the U.S. generally consists of the manufacturer's identification and  
catalog number, model number or other product designation as specified under "Marking" for the particular  
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Recognized components are incomplete in certain constructional features or restricted in performance  
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Look for the UL Recognized Component Mark on the product.

William R. Conroy  
Director, North American Certification Programs  
UL LLC

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## CERTIFICATE OF COMPLIANCE

Certificate Number 20160402-E365338  
Report Reference E365338-20160401  
Issue Date 2016 APRIL 02

Issued to: GRUPPO ENERGIA SRL  
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This is to certify that COMPONENT - CAPACITORS, CONSTRUCTION ONLY  
representative samples of USR, CNR Component - Capacitors, Construction Only,  
Series DCM, may be prefixed by EP, followed by additional  
letters and numbers; Series GCMR, followed by additional  
letters and numbers. V ac rated capacitors

USR Component - Capacitors, Construction Only, Series  
DCM, may be prefixed by EP, followed by additional letters  
and numbers; Series GCMR, followed by additional letters  
and numbers. V ac rated capacitors and V dc rated  
capacitors.

Have been investigated by UL in accordance with the  
Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 810 Standard for Capacitors, CSA C22.2 No. 190:14  
Standard for Capacitors for Power Factor Correction.

Additional Information: See the UL Online Certifications Directory at  
[www.ul.com/database](http://www.ul.com/database) for additional information

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Recognized components are incomplete in certain constructional features or restricted in performance  
capabilities and are intended for use as components of complete equipment submitted for investigation rather  
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installation and use in complete equipment submitted to UL LLC.

Look for the UL Certification Mark on the product.

Eric Mahoney  
Eric Mahoney, Director North American Certification Program  
UL LLC

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## GRUPPO ENERGIA SRL

Registered and Operative Site:  
Via Cavezzo, 36 - 25045 CASTEGNATO (BS) - ITALY

Bureau Veritas Italia spa certifies that the Management System of the  
above organisation has been audited and found to be in accordance  
with the requirements of the management system standards detailed below

Standard

**ISO 9001:2015**

Scope of certification

Design and manufacture of single-phase and three-phase electrical  
capacitors for power factor correction of industrial plants, lamps,  
motors; design and manufacture of capacitors for power electronics  
applications; development and production of contactors, regulators  
and power factor reactors (chokias).

EA Sector(s) 18

Certification cycle start date: 10 January 2018

Subject to the continued satisfactory operation of the organisation's  
Management System, this certificate expires on: 11 January 2021

Original certification date: 13 January 2006

Certificate No. 17241879

Version: N. 1 Revision date: 10 January 2015

ANDEA FERRI - Local National Manager

Certification Body  
Bureau Veritas Italia SpA Viale Monza, 347 - 20122 Milano, Italia



Further specifications regarding the scope of this certificate and the applicability of the  
management system requirements may be obtained by consulting the organisation.  
To check the certificate validity status enter the website  
<http://www.bureauveritas.com/it/>

### USEFUL INFORMATION ABOUT POWER

In our electrical network there are three types of power:

**Active Power:** is the real power transmitted to our loads (motors, computers, soldering equipment, etc) from the network. The active power "P" is measured in kW.

**Reactive Power:** is the power used to generate electromagnetic fields in motors, machines, transformers, welding systems, etc. The reactive power fluctuates between the consumer and the energy supplier at the network frequency. Reactive power "Q" is measured in kVar.

**Apparent Power:** is the power, or more correctly the vector combination of active and reactive power. Apparent Power "S" is measured in VA.

### POWER FACTOR CORRECTION

Generally energy suppliers charge not only active power, but also reactive power. This is because higher reactive power means a higher apparent power, and thus a higher current must be supplied.

In order to save on reactive power costs, it is recommended to generate reactive energy at the load level through capacitors. These produce reactive current in opposite to the energy absorbed by loads.

This process is called power factor correction and the result is a reduction of apparent power and an improvement of power factor.

### ADVANTAGES OF POWER FACTOR CORRECTION

- Savings on electricity bills
- Eliminating penalties on reactive energy and decreasing kVA demand
- Reducing power losses generated in the transformers and conductors of the installation
- Increasing available power
- Reducing installation size of conductor cross-section
- Reducing voltage drops in the installation

### POWER FACTOR CORRECTION AND HARMONICS

In networks featured by high harmonic levels there could be grid problems caused by resonant circuit between capacitors and inductance of the transformer. In order to avoid them, it is recommended to use capacitors and harmonic reactors to create another resonance frequency circuit. This circuit has a specific tuning frequency, that allows the filtration of harmonic currents and reduces the distortion level of the network.

### CALCULATION OF THE REQUIRED REACTIVE POWER

Our aim is to determine the required reactive power  $Q_c$  (kVar) to install, in order to improve the power factor  $\cos\phi$  and reduce the apparent power S

$$Q_c = P * k$$

$Q_c$  = Required reactive power

P = Active power of the load to be compensated

k = Conversation coefficient from the table below

#### Calculation Example

Load Power (P): 100 kW

Original  $\cos\phi$ : 0,55

Desired  $\cos\phi$ : 0,94

Coefficient from the table: 1,156

$$Q_c = 100 * 1,156 = 115,6 \text{ kVar}$$

## “K” CALCULATION TABLE

Original cosφ	Desired cosφ										
	0.9	0.91	0.92	0.93	0.94	0.95	0.96	0.97	0.98	0.99	1
0.45	1.500	1.529	1.559	1.589	1.622	1.656	1.693	1.734	1.781	1.842	1.985
0.46	1.446	1.475	1.504	1.535	1.567	1.602	1.639	1.680	1.727	1.788	1.930
0.47	1.394	1.422	1.452	1.483	1.515	1.549	1.586	1.627	1.675	1.736	1.878
0.48	1.343	1.372	1.402	1.432	1.465	1.499	1.536	1.577	1.625	1.685	1.828
0.49	1.295	1.323	1.353	1.384	1.416	1.450	1.487	1.528	1.576	1.637	1.779
0.50	1.248	1.276	1.306	1.337	1.369	1.403	1.440	1.481	1.529	1.590	1.732
0.51	1.202	1.231	1.261	1.291	1.324	1.358	1.395	1.436	1.484	1.544	1.687
0.52	1.158	1.187	1.217	1.247	1.280	1.314	1.351	1.392	1.440	1.500	1.643
0.53	1.116	1.144	1.174	1.205	1.237	1.271	1.308	1.349	1.397	1.458	1.600
0.54	1.074	1.103	1.133	1.163	1.196	1.230	1.267	1.308	1.356	1.416	1.559
0.55	1.034	1.063	1.092	1.123	1.156	1.190	1.227	1.268	1.315	1.376	1.518
0.56	0.995	1.024	1.053	1.084	1.116	1.151	1.188	1.229	1.276	1.337	1.479
0.57	0.957	0.986	1.015	1.046	1.079	1.113	1.150	1.191	1.238	1.299	1.441
0.58	0.920	0.949	0.979	1.009	1.042	1.076	1.113	1.154	1.201	1.262	1.405
0.59	0.884	0.913	0.942	0.973	1.006	1.040	1.077	1.118	1.165	1.226	1.638
0.60	0.849	0.878	0.907	0.938	0.970	1.005	1.042	1.083	1.130	1.191	1.333
0.61	0.815	0.843	0.873	0.904	0.936	0.970	1.007	1.048	1.096	1.157	1.299
0.62	0.781	0.810	0.839	0.870	0.903	0.937	0.974	1.015	1.062	1.123	1.265
0.63	0.748	0.777	0.807	0.837	0.870	0.904	0.941	0.982	1.030	1.090	1.233
0.64	0.716	0.745	0.775	0.805	0.838	0.872	0.909	0.950	0.998	1.058	1.201
0.65	0.685	0.714	0.743	0.774	0.806	0.840	0.877	0.919	0.966	1.027	1.169
0.66	0.654	0.683	0.712	0.743	0.775	0.810	0.847	0.888	0.935	0.996	1.138
0.67	0.624	0.652	0.682	0.713	0.745	0.779	0.816	0.857	0.905	0.966	1.108
0.68	0.594	0.623	0.652	0.683	0.715	0.750	0.787	0.828	0.875	0.936	1.078
0.69	0.565	0.593	0.623	0.654	0.686	0.720	0.757	0.798	0.846	0.907	1.049
0.70	0.536	0.565	0.594	0.625	0.657	0.692	0.729	0.770	0.817	0.878	1.020
0.71	0.508	0.536	0.566	0.597	0.629	0.663	0.700	0.741	0.789	0.849	0.992
0.72	0.480	0.508	0.538	0.569	0.601	0.635	0.672	0.713	0.761	0.821	0.964
0.73	0.452	0.481	0.510	0.541	0.573	0.608	0.645	0.686	0.733	0.794	0.936
0.74	0.425	0.453	0.483	0.514	0.546	0.580	0.617	0.658	0.706	0.766	0.909
0.75	0.398	0.426	0.456	0.487	0.519	0.553	0.590	0.631	0.679	0.739	0.882
0.76	0.371	0.400	0.429	0.460	0.493	0.526	0.563	0.605	0.652	0.713	0.855
0.77	0.344	0.373	0.403	0.433	0.466	0.500	0.537	0.578	0.626	0.686	0.829
0.78	0.318	0.347	0.376	0.407	0.439	0.474	0.511	0.552	0.599	0.660	0.802
0.79	0.292	0.320	0.350	0.381	0.413	0.447	0.484	0.525	0.573	0.634	0.776
0.80	0.266	0.294	0.324	0.355	0.387	0.421	0.458	0.499	0.547	0.608	0.750
0.81	0.240	0.268	0.298	0.329	0.361	0.395	0.432	0.473	0.521	0.581	0.724
0.82	0.214	0.242	0.272	0.303	0.335	0.369	0.406	0.447	0.495	0.556	0.698
0.83	0.188	0.216	0.246	0.277	0.309	0.343	0.380	0.421	0.469	0.530	0.672
0.84	0.162	0.190	0.220	0.251	0.283	0.317	0.354	0.395	0.443	0.503	0.646
0.85	0.135	0.164	0.194	0.225	0.257	0.291	0.328	0.369	0.417	0.477	0.620
0.86	0.109	0.138	0.167	0.198	0.230	0.265	0.302	0.343	0.390	0.451	0.593
0.87	0.082	0.111	0.141	0.172	0.204	0.238	0.275	0.316	0.364	0.424	0.567
0.88	0.055	0.084	0.114	0.145	0.177	0.211	0.248	0.289	0.337	0.397	0.540
0.89	0.028	0.057	0.086	0.117	0.149	0.184	0.221	0.262	0.309	0.370	0.512
0.90	0.000	0.029	0.058	0.089	0.121	0.156	0.193	0.234	0.281	0.342	0.484
0.91		0.000	0.030	0.060	0.093	0.127	0.164	0.205	0.253	0.313	0.456
0.92			0.000	0.031	0.063	0.097	0.164	0.175	0.223	0.284	0.426
0.93				0.000	0.032	0.067	0.104	0.145	0.192	0.253	0.395
0.94					0.000	0.034	0.071	0.112	0.160	0.220	0.363
0.95						0.000	0.037	0.078	0.126	0.186	0.329
0.96							0.000	0.041	0.089	0.149	0.292
0.97								0.000	0.048	0.108	0.251
0.98									0.000	0.061	0.203
0.99										0.000	0.142
1											0.000

## TECHNICAL SPECIFICATIONS FOR CBAS-3 FOR NETWORK WITHOUT HARMONICS



### Electrical Specifications

Standards:	IEC 60439-1/2, IEC 61921, IEC 60831-1/2
Origin:	100% made in Italy
Connection type:	Three-phase (3P4W)
Voltage range:	220 V to 690 V
Frequency:	50 Hz / 60 Hz
Power range:	5 kVar to 1500 kVar (other on request)
Power losses:	< 2 W/kVar
Capacitance tolerance:	-5% +10%
Maximum permissible over current:	1,36 x In for network without harmonics
Maximum permissible over voltage:	1,1 Un, 8 h every 24 h
Insulation voltage:	690 V
Connection:	Top or Bottom

### Enclosure

Degree of protection:	IP40 (other on request)
Protection against direct contact, open door:	IP00 (other on request)
Color:	RAL7035

### Controller

Yes

### Head Circuit Protection

Fuse Switch Disconnecter:	Up to 80 kVar
Load Break Switch:	From 80 kVar

### Step (Capacitors)

Capacitors Type:	Intact Base
Capacitor Rated Voltage:	440 V
Capacitor Maximum Overcurrent:	1,5 In
Overpressure protection:	Available on three phases
Discharge resistor:	Yes, 50 V – 1 min

### Step (Contactors)

Contactors Type:	CSC
Operation:	Dedicated to capacitor switching

### Cooling

Forced cooling:	Yes
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### Environment

Installation:	Indoor
Ambient temperature:	-5 °C to 45 °C (other on request)
Average daily temperature:	+35 °C
Humidity:	up to 95%
Maximum altitude:	2000 m

# AUTOMATIC PFC CAPACITOR BANKS

## CBAS-3

### CBaS-3 400 V 50 Hz - Reactive Power: 5 kvar – 37,5 kvar Wall Mounted Enclosures

ORDER CODE	Power 400 V	Power 415 V	Current 400 V	Smallest Step	REGULATION	No. of Electrical Steps	No. of Physical Steps	Main Circuit Breaker	Enclosure Size W x D x H (mm)*	Weight Kg
	A	V	A	A		A	V	A		
3CBA5S400A1,2W2	5	5,4	7,2	1,25	1,25 ÷ 1,25 ÷ 2,5	4	3	Fuse Switch Disconnector	406 x 200 x 506	25
3CBA6,2S400A1,2W2	6,25	6,7	9,0	1,25	1,25 ÷ 2,5 ÷ 2,5	5	3	Fuse Switch Disconnector	406 x 200 x 506	27
3CBA8,7S400A1,2W2	8,75	9,4	12,6	1,25	1,25 ÷ 2,5 ÷ 5	7	3	Fuse Switch Disconnector	406 x 200 x 506	27
3CBA12,5S400A2,5W2	12,5	13,5	18,1	2,5	2,5 ÷ 5 ÷ 5	5	3	Fuse Switch Disconnector	406 x 200 x 506	30
3CBA15S400A2,5W2	15	16,1	21,7	2,5	2,5 ÷ 2,5 ÷ 5 ÷ 5	6	4	Fuse Switch Disconnector	406 x 200 x 506	30
3CBA18,7S400A1,2W2	18,75	20,2	27,1	1,25	1,25 ÷ 2,5 ÷ 5 ÷ 10	15	4	Fuse Switch Disconnector	406 x 200 x 506	33
3CBA20S400A2,5W2	20	21,5	28,9	2,5	2,5 ÷ 2,5 ÷ 5 ÷ 10	8	4	Fuse Switch Disconnector	406 x 200 x 506	33
3CBA27,5S400A2,5W2	27,5	29,6	39,7	2,5	2,5 ÷ 5 ÷ 10 ÷ 10	11	4	Fuse Switch Disconnector	406 x 200 x 506	35
3CBA30S400A5W2	30	32,3	43,4	5	5 ÷ 5 ÷ 10 ÷ 10	6	4	Fuse Switch Disconnector	406 x 200 x 506	35
3CBA33,7S400A3,7W2	33,75	36,3	48,8	3,75	3,75 ÷ 7,5 ÷ 7,5 ÷ 15	9	4	Fuse Switch Disconnector	406 x 200 x 506	37
3CBA37,5S400A7,5W2	37,5	40,4	54,2	7,5	7,5 ÷ 15 ÷ 15	5	3	Fuse Switch Disconnector	406 x 200 x 506	37

### CBaS-3 400 V 50 Hz - Reactive Power: 37,5 kvar - 80 kvar Wall Mounted Enclosures

ORDER CODE	Power 400 V	Power 415 V	Current 400 V	Smallest Step	REGULATION	No. of Electrical Steps	No. of Physical Steps	Main Circuit Breaker	Enclosure Size W x D x H (mm)*	Weight Kg
	A	V	A	A		A	V	A		
3CBA37,5S400A6,2W3	37,5	40,4	54,2	6,25	6,25 ÷ 6,25 ÷ 12,5 ÷ 12,5	6	4	Fuse Switch Disconnector	606 x 300 x 806	47
3CBA40S400A5W3	40	43,1	57,8	5	5 ÷ 5 ÷ 10 ÷ 20	8	4	Fuse Switch Disconnector	606 x 300 x 806	49
3CBA43,7S400A6,2W3	43,75	47,1	63,2	6,25	6,25 ÷ 12,5 ÷ 25	7	3	Fuse Switch Disconnector	606 x 300 x 806	51
3CBA46,9S400A3,1W3	46,9	50,5	67,8	3,15	3,15 ÷ 6,25 ÷ 12,5 ÷ 25	15	4	Fuse Switch Disconnector	606 x 300 x 806	52
3CBA50S400A3,1W3	50	53,8	72,3	3,15	3,15 ÷ 3,15 ÷ 6,25 ÷ 12,5 ÷ 25	16	5	Fuse Switch Disconnector	606 x 300 x 806	53
3CBA50S400A6,2W3	50	53,8	72,3	6,25	6,25 ÷ 6,25 ÷ 12,5 ÷ 25	8	4	Fuse Switch Disconnector	606 x 300 x 806	52
3CBA50S400A12,5W3	50	53,8	72,3	12,5	12,5 ÷ 12,5 ÷ 25	4	3	Fuse Switch Disconnector	606 x 300 x 806	52
3CBA59S400A3,1W3	59	63,5	85,3	3,15	3,15 ÷ 6,25 ÷ 12,5 ÷ 12,5 ÷ 25	19	5	Fuse Switch Disconnector	606 x 300 x 806	56
3CBA62,5S400A6,2W3	62,5	67,3	90,3	6,25	6,25 ÷ 6,25 ÷ 12,5 ÷ 12,5 ÷ 25	10	5	Fuse Switch Disconnector	606 x 300 x 806	55
3CBA62,5S400A12,5W3	62,5	67,3	90,3	12,5	12,5 ÷ 25 ÷ 25	5	3	Fuse Switch Disconnector	606 x 300 x 806	54
3CBA68,7S400A6,2W3	68,75	74,0	99,3	6,25	6,25 ÷ 12,5 ÷ 25 ÷ 25	11	4	Fuse Switch Disconnector	606 x 300 x 806	55
3CBA71,9S400A3,1W3	71,9	77,4	103,9	3,15	3,15 ÷ 6,25 ÷ 12,5 ÷ 25 ÷ 25	23	5	Fuse Switch Disconnector	606 x 300 x 806	59
3CBA75S400A6,2W3	75	80,7	108,4	6,25	6,25 ÷ 6,25 ÷ 12,5 ÷ 25 ÷ 25	12	5	Fuse Switch Disconnector	606 x 300 x 806	61
3CBA75S400A12,5W3	75	80,7	108,4	12,5	12,5 ÷ 12,5 ÷ 25 ÷ 25	6	4	Fuse Switch Disconnector	606 x 300 x 806	59
3CBA80S400A20W3	80	86,1	115,6	20	20 ÷ 20 ÷ 20 ÷ 20	4	4	Fuse Switch Disconnector	606 x 300 x 806	60

### CBaS-3 400 V 50 Hz - Reactive Power: 87,5 kvar – 162,5 kvar Wall Mounted Enclosures

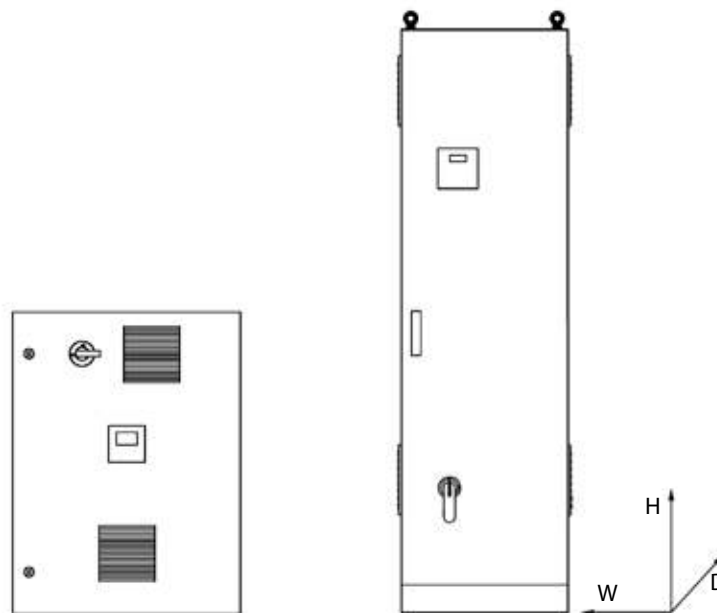
ORDER CODE	Power 400 V	Power 415 V	Current 400 V	Smallest Step	REGULATION	No. of Electrical Steps	No. of Physical Steps	Main Circuit Breaker	Enclosure Size W x D x H (mm)*	Weight Kg
	A	V	A	A		A	V	A		
3CBA87,5S400A12,5W1	87,5	94,2	126,4	12,5	12,5 ÷ 25 ÷ 25 ÷ 25	7	4	Load Break Switch	806 x 300 x 1206	85
3CBA93,7S400A6,2W1	93,75	100,9	135,5	6,25	6,25 ÷ 12,5 ÷ 25 ÷ 25 ÷ 25	15	5	Load Break Switch	806 x 300 x 1206	86
3CBA100S400A12,5W1	100	107,6	144,5	12,5	12,5 ÷ 12,5 ÷ 25 ÷ 25 ÷ 25	8	5	Load Break Switch	806 x 300 x 1206	87
3CBA109,4S400A3,1W1	109,4	117,8	158,1	3,15	3,15 ÷ 6,25 ÷ 12,5 ÷ 12,5 ÷ 25 ÷ 25 ÷ 25	35	7	Load Break Switch	806 x 300 x 1206	87
3CBA118,7S400A6,2W1	118,75	127,8	171,6	6,25	6,25 ÷ 12,5 ÷ 25 ÷ 25 ÷ 25 ÷ 25	19	6	Load Break Switch	806 x 300 x 1206	88
3CBA125S400A6,2W1	125	134,6	180,6	6,25	6,25 ÷ 6,25 ÷ 12,5 ÷ 25 ÷ 25 ÷ 25 ÷ 25	20	7	Load Break Switch	806 x 300 x 1206	89
3CBA133,2S400A16,6W1	133,2	143,4	192,5	16,65	16,65 ÷ 16,65 ÷ 33,3 ÷ 33,3 ÷ 33,3	8	5	Load Break Switch	806 x 300 x 1206	89
3CBA143,7S400A6,2W1	143,75	154,7	207,7	6,25	6,25 ÷ 12,5 ÷ 25 ÷ 25 ÷ 25 ÷ 25 ÷ 25	23	7	Load Break Switch	806 x 300 x 1206	91
3CBA146,9S400A3,1W1	146,9	158,1	212,3	3,15	3,15 ÷ 6,25 ÷ 12,5 ÷ 25 ÷ 25 ÷ 25 ÷ 25 ÷ 25	47	8	Load Break Switch	806 x 300 x 1206	92
3CBA150S400A12,5W1	150	161,5	216,8	12,5	12,5 ÷ 12,5 ÷ 25 ÷ 25 ÷ 25 ÷ 25 ÷ 25	12	7	Load Break Switch	806 x 300 x 1206	93
3CBA162,5S400A12,5W1	162,5	174,9	234,8	12,5	12,5 ÷ 25 ÷ 25 ÷ 25 ÷ 25 ÷ 25 ÷ 25	13	7	Load Break Switch	806 x 300 x 1206	93

\* All dimensions will be confirmed at the time of order.

CBAS-3 400 V 50 Hz - Reactive Power: 100 kvar – 1500 kvar  
Floor Standing Enclosures

ORDER CODE	Power 400 V	Power 415 V	Current 400 V	Smallest Step	REGULATION	No. of Electrical Steps	No. of Physical Steps	Main Circuit Breaker	Enclosure Size W x D x H (mm)*	Max Weight
	A	V	A	A		A	V	A		Kg
3CBA100S400A3,15F4	100	107,6	144,5	3,15	3,15 ÷ 3,15 ÷ 6,25 ÷ 12,5 ÷ 25 ÷ 50	32	6	Load Break Switch	600 x 600 x 1500	200
3CBA125S400A3,15F4	125	134,6	180,6	3,15	3,15 ÷ 3,15 ÷ 6,25 ÷ 12,5 ÷ 25 ÷ 25 ÷ 50	40	7	Load Break Switch	600 x 600 x 1500	
3CBA150S400A6,25F4	150	161,5	216,8	6,25	6,25 ÷ 6,25 ÷ 12,5 ÷ 25 ÷ 50 ÷ 50	24	6	Load Break Switch	600 x 600 x 1500	
3CBA175S400A6,25F4	175	188,4	252,9	6,25	6,25 ÷ 6,25 ÷ 12,5 ÷ 25 ÷ 50 ÷ 75	28	6	Load Break Switch	600 x 600 x 1500	
3CBA200S400A12,5F4	200	215,3	289,0	12,5	12,5 ÷ 12,5 ÷ 25 ÷ 25 ÷ 50 ÷ 75	16	6	Load Break Switch	600 x 600 x 1500	
3CBA225S400A25F4	225	242,2	325,1	25	25 ÷ 50 ÷ 75 ÷ 75	9	4	Load Break Switch	600 x 600 x 1500	300
3CBA250S400A6,25F5	250	269,1	361,3	6,25	6,25 ÷ 6,25 ÷ 12,5 ÷ 25 ÷ 50 ÷ 75 ÷ 75	40	7	Load Break Switch	600 x 600 x 2100	
3CBA275S400A6,25F5	275	296,0	397,4	6,25	6,25 ÷ 6,25 ÷ 12,5 ÷ 25 ÷ 25 ÷ 50 ÷ 75 ÷ 75	44	8	Load Break Switch	600 x 600 x 2100	
3CBA300S400A12,5F5	300	322,9	433,5	12,5	12,5 ÷ 12,5 ÷ 25 ÷ 50 ÷ 50 ÷ 75 ÷ 75	24	7	Load Break Switch	600 x 600 x 2100	
3CBA350S400A12,5F5	350	376,8	505,8	12,5	12,5 ÷ 12,5 ÷ 25 ÷ 50 ÷ 50 ÷ 75 ÷ 75	28	8	Load Break Switch	600 x 600 x 2100	
3CBA400S400A12,5F5	400	430,6	578,0	12,5	12,5 ÷ 12,5 ÷ 25 ÷ 50 ÷ 75 ÷ 75 ÷ 75 ÷ 75	32	8	Load Break Switch	600 x 600 x 2100	350
3CBA450S400A25F5	450	484,4	650,3	25	25 ÷ 50 ÷ 75 ÷ 75 ÷ 75 ÷ 75 ÷ 75	18	7	Load Break Switch	600 x 600 x 2100	
3CBA500S400A12,5F6	500	538,2	722,5	12,5	12,5 ÷ 12,5 ÷ 25 ÷ 25 ÷ 50 ÷ 5 x 75	40	10	Load Break Switch	800 x 600 x 2100	
3CBA550S400A25F6	550	592,1	794,8	25	25 ÷ 25 ÷ 50 ÷ 6 x 75	22	9	Load Break Switch	800 x 600 x 2100	
3CBA600S400A25F6	600	645,9	867,1	25	25 ÷ 50 ÷ 7 x 75	24	9	Load Break Switch	800 x 600 x 2100	
3CBA650S400A25F6	650	699,7	939,3	25	25 ÷ 50 ÷ 50 ÷ 7 x 75	26	10	Load Break Switch	800 x 600 x 2100	650
3CBA700S400A25F6	700	753,5	1011,6	25	25 ÷ 25 ÷ 50 ÷ 8 x 75	28	11	Load Break Switch	800 x 600 x 2100	
3CBA750S400A25F6	750	807,4	1083,8	25	25 ÷ 50 ÷ 9 x 75	30	11	Load Break Switch	800 x 600 x 2100	
3CBA800S400A50P7	800	861,2	1156,1	50	50 ÷ 50 ÷ 100 ÷ 4 x 150	16	7	Load Break Switch	1200 x 600 x 2100	
3CBA900S400A50P7	900	968,8	1300,6	50	50 ÷ 100 ÷ 5 x 150	18	7	Load Break Switch	1200 x 600 x 2100	
3CBA1000S400A50P8	1000	1076,5	1445,1	50	50 ÷ 100 ÷ 100 ÷ 5 x 150	20	8	Load Break Switch	1600 x 600 x 2100	750
3CBA1100S400A50P8	1100	1184,1	1589,6	50	50 ÷ 50 ÷ 100 ÷ 6 x 150	22	9	Load Break Switch	1600 x 600 x 2100	
3CBA1200S400A50P8	1200	1291,8	1734,1	50	50 ÷ 100 ÷ 7 x 150	24	9	Load Break Switch	1600 x 600 x 2100	
3CBA1300S400A50P8	1300	1399,4	1878,6	50	50 ÷ 100 ÷ 100 ÷ 7 x 150	26	10	Load Break Switch	1600 x 600 x 2100	
3CBA1400S400A50P8	1400	1507,1	2023,1	50	50 ÷ 50 ÷ 100 ÷ 8 x 150	28	11	Load Break Switch	1600 x 600 x 2100	
3CBA1500S400A50P8	1500	1614,7	2167,6	50	50 ÷ 100 ÷ 9 x 150	30	11	Load Break Switch	1600 x 600 x 2100	

### CONSTRUCTION DIAGRAM



Wall Mounted Enclosures

Floor Standing Enclosures

\* All dimensions will be confirmed at the time of order.

## TECHNICAL SPECIFICATIONS FOR CBAF-3 WITH HARMONIC REACTORS

### Electrical Specifications

Standards:	IEC 60439-1/2, IEC 61921, IEC 60831-1/2
Origin:	100% made in Italy
Connection type:	Three-phase (3P4W)
Voltage range:	220 V to 690 V
Frequency:	50 Hz / 60 Hz
Power range:	6,3 kVar to 1075 kVar (other on request)
Power losses:	< 6 W/kVar
Capacitance tolerance:	-5% +10%
Maximum permissible over current:	1,19 x In for network without harmonics
Maximum permissible over voltage:	1,1 Un, 8 h every 24 h
Insulation voltage:	690 V
Connection:	Top or Bottom



### Available Harmonic Reactors

Tuning Frequency:	210 Hz, 189 Hz, 134 Hz, 250 Hz, 230 Hz, 160 Hz (other on request)
Relative Impedance:	5,67%, 7%, 14% (other on request)

### Enclosure

Degree of protection:	IP40 (other on request)
Protection against direct contact, open door:	IP00 (other on request)
Color:	RAL7035

### Head Circuit Protection

Fuse Switch Disconnecter:	Up to 50 kVar
Load Break Switch:	From 50 kVar

### Step (Capacitors)

Capacitors Type:	Intact Base
Capacitor Rated Voltage:	525 V
Capacitor Maximum Overcurrent:	1,5 In
Overpressure protection:	Available on three phases
Discharge resistor:	Yes, 50 V – 1 min

### Step (Contactors)

Contactors Type:	CSC
Operation:	Dedicated to capacitor switching

### Cooling

Forced cooling:	Yes
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### Environment

Installation:	Indoor
Ambient temperature:	-5 °C to 45 °C (other on request)
Average daily temperature:	+35 °C
Humidity:	up to 95%
Maximum altitude:	2000 m

## AUTOMATIC PFC CAPACITOR BANKS WITH HARMONIC REACTORS CBAF-3

**CBaF-3 400 V 50 Hz With Harmonic Filters 189 Hz 7% - L-C Reactive Power: 6,3 kVar – 50 kVar  
Wall Mounted Enclosures**

ORDER CODE	Power 400 V	Power 415 V	Current 400 V	Smallest Step	REGULATION	No. of Electrical Steps	No. of Physical Steps	Main Circuit Breaker	Enclosure Size	Max Weight
	A	V	A	A		A	V	A	W x D x H (mm)*	Kg
3CBA6,3F400C3,1W1	6,3	6,8	9,1	3,15	3,15 ÷ 3,15	2	2	Fuse Switch Disconnector	806 x 300 x 1206	135
3CBA9,4F400C3,1W1	9,4	10,1	13,6	3,15	3,15 ÷ 6,25	3	2	Fuse Switch Disconnector	806 x 300 x 1206	
3CBA15,6F400C3,1W1	15,65	16,8	22,6	3,15	3,15 ÷ 6,25 ÷ 6,25	5	3	Fuse Switch Disconnector	806 x 300 x 1206	
3CBA18,7F400C6,2W1	18,75	20,2	27,1	6,25	6,25 ÷ 12,5	3	2	Fuse Switch Disconnector	806 x 300 x 1206	
3CBA25F400C6,2W1	25	26,9	36,1	6,25	6,25 ÷ 6,25 ÷ 12,5	4	3	Fuse Switch Disconnector	806 x 300 x 1206	
3CBA31,2F400C6,2W1	31,25	33,6	45,2	6,25	6,25 ÷ 12,5 ÷ 12,5	5	3	Fuse Switch Disconnector	806 x 300 x 1206	
3CBA43,7F400C6,2W1	43,75	47,1	63,2	6,25	6,25 ÷ 12,5 ÷ 25	7	3	Fuse Switch Disconnector	806 x 300 x 1206	
3CBA50F400C12,5W1	50	53,8	72,3	12,5	12,5 ÷ 12,5 ÷ 25	4	3	Fuse Switch Disconnector	806 x 300 x 1206	

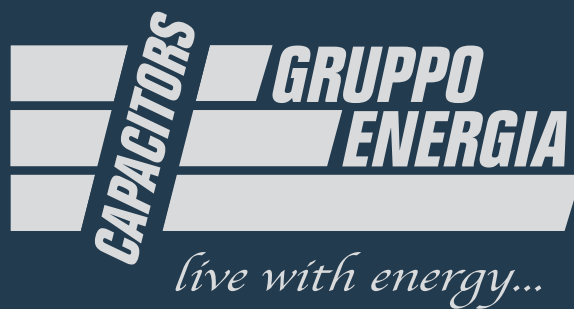
**CBaF-3 400 V 50 Hz With Harmonic Filters 189 Hz 7% - L-C Reactive Power: 75 kVar – 1075 kVar  
Floor Standing Enclosures**

ORDER CODE	Power 400 V	Power 415 V	Current 400 V	Smallest Step	REGULATION	No. of Electrical Steps	No. of Physical Steps	Main Circuit Breaker	Enclosure Size	Max Weight
	A	V	A	A		A	V	A	W x D x H (mm)*	Kg
3CBA75F400C12,5F4	75	80,7	108,4	12,5	12,5 ÷ 12,5 ÷ 25 ÷ 25	6	4	Load Break Switch	600 x 600 x 1500	290
3CBA100F400C12,5F4	100	107,6	144,5	12,5	12,5 ÷ 12,5 ÷ 25 ÷ 50	8	4	Load Break Switch	600 x 600 x 1500	
3CBA125F400C12,5F4	125	134,6	180,6	12,5	12,5 ÷ 12,5 ÷ 25 ÷ 25 ÷ 50	10	5	Load Break Switch	600 x 600 x 1500	
3CBA137,5F400C12,5F4	137,5	148,0	198,7	12,5	12,5 ÷ 25 ÷ 50 ÷ 50	11	4	Load Break Switch	600 x 600 x 1500	420
3CBA150F400C12,5F5	150	161,5	216,8	12,5	12,5 ÷ 12,5 ÷ 25 ÷ 50 ÷ 50	12	5	Load Break Switch	600 x 600 x 2100	
3CBA175F400C12,5F5	175	188,4	252,9	12,5	12,5 ÷ 12,5 ÷ 25 ÷ 25 ÷ 50 ÷ 50	14	6	Load Break Switch	600 x 600 x 2100	
3CBA187,5F400C12,5F5	187,5	201,8	271,0	12,5	12,5 ÷ 25 ÷ 50 ÷ 50 ÷ 50	15	5	Load Break Switch	600 x 600 x 2100	510
3CBA200F400C12,5F6	200	215,3	289,0	12,5	12,5 ÷ 12,5 ÷ 25 ÷ 50 ÷ 50 ÷ 50	16	6	Load Break Switch	800 x 600 x 2100	
3CBA237,5F400C12,5F6	237,5	255,7	343,2	12,5	12,5 ÷ 25 ÷ 4 x 50	19	6	Load Break Switch	800 x 600 x 2100	
3CBA250F400C25F6	250	269,1	361,3	25	25 ÷ 25 ÷ 4 x 50	10	6	Load Break Switch	800 x 600 x 2100	900
3CBA275F400C25F6	275	296,0	397,4	25	25 ÷ 5 x 50	11	6	Load Break Switch	800 x 600 x 2100	
3CBA300F400C12,5F7	300	322,9	433,5	12,5	12,5 ÷ 12,5 ÷ 25 ÷ 5 x 50	24	8	Load Break Switch	1200 x 600 x 2100	
3CBA350F400C12,5F7	350	376,8	505,8	12,5	12,5 ÷ 12,5 ÷ 25 ÷ 6 x 50	28	9	Load Break Switch	1200 x 600 x 2100	1000
3CBA375F400C25F7	375	403,7	541,9	25	25 ÷ 7 x 50	15	8	Load Break Switch	1200 x 600 x 2100	
3CBA400F400C12,5F8	400	430,6	578,0	12,5	12,5 ÷ 12,5 ÷ 25 ÷ 7 x 50	32	10	Load Break Switch	1600 x 600 x 2100	
3CBA450F400C12,5F8	450	484,4	650,3	12,5	12,5 ÷ 12,5 ÷ 25 ÷ 8 x 50	36	11	Load Break Switch	1600 x 600 x 2100	1200
3CBA500F400C12,5F8	500	538,2	722,5	12,5	12,5 ÷ 12,5 ÷ 25 ÷ 9 x 50	40	12	Load Break Switch	1600 x 600 x 2100	
3CBA550F400C25F8	550	592,1	794,8	25	25 ÷ 25 ÷ 10 x 50	22	12	Load Break Switch	1600 x 600 x 2100	
3CBA650F400C25F9	650	699,7	939,3	25	25 ÷ 25 ÷ 50 ÷ 8 x 75	26	11	Load Break Switch	2400 x 600 x 2100	1650
3CBA775F400C25F9	775	834,3	1119,9	25	25 ÷ 50 ÷ 7 x 100	31	9	Load Break Switch	2400 x 600 x 2100	
3CBA825F400C25F9	825	888,1	1192,2	25	25 ÷ 50 ÷ 50 ÷ 7 x 100	33	10	Load Break Switch	2400 x 600 x 2100	
3CBA1075F400C25F10	1075	1157,2	1553,5	25	25 ÷ 50 ÷ 10 x 100	43	12	Load Break Switch	3200 x 600 x 2100	





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