System pro *E* power
Capacitor Bank

General information X/2
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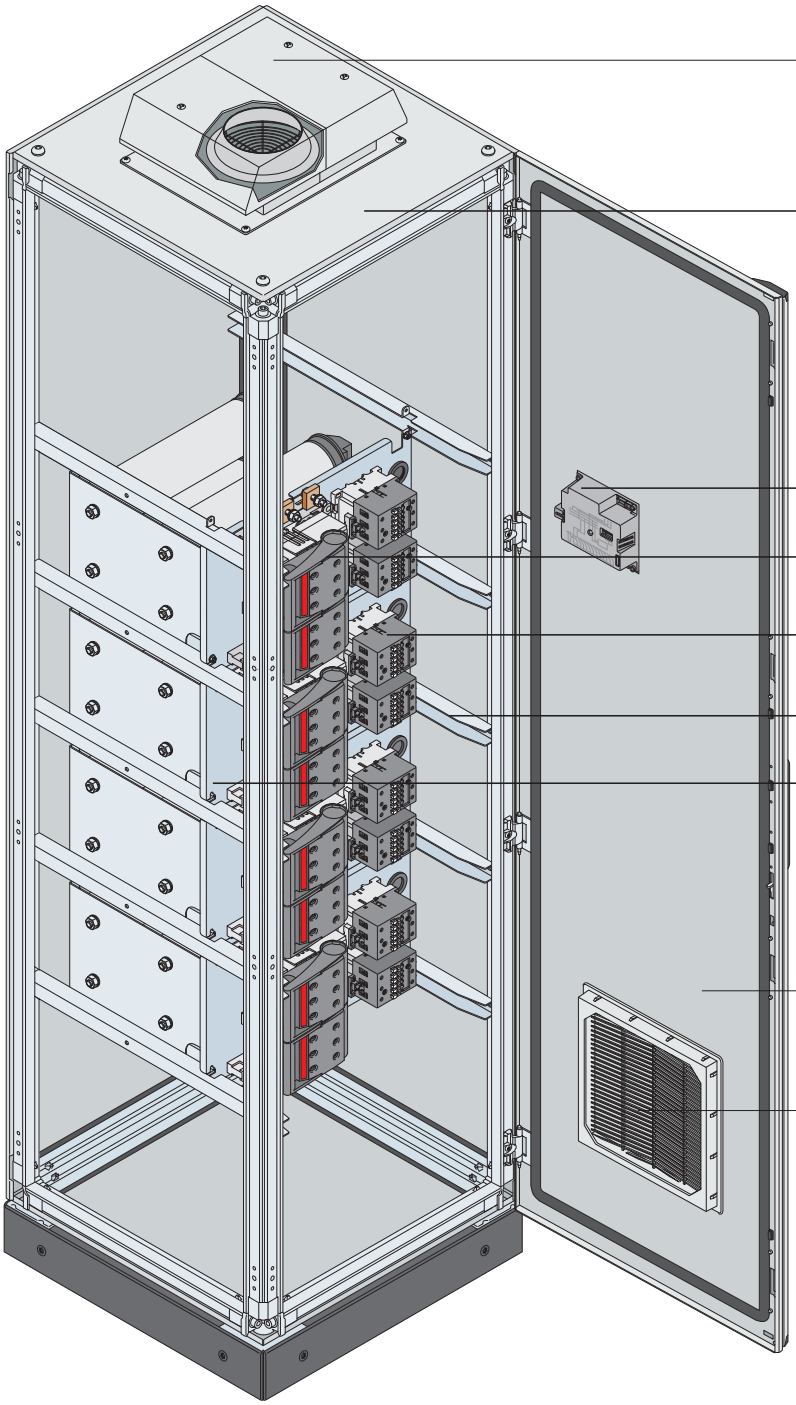
System pro *E* power
General information

Capacitor bank application

For the application, ABB provides preassembled capacitor unit ready for the installation with protection devices. So-called capacitor power module PMOD has a standard range from 220 until 690V and ratings starting from 6.25 kvar up to 100 kvar in one module (option with de-tuning reactor included up to 50 kvar). The maximum rating in one single cubicle is 400 kvar (without reactors) or 300 kvar with detuning reactors.
The PMOD unit includes withdrawable shelve, capacitors, detuning reactor if specified, UA contactor and fuse protection device XLP00 EasyLine. PMOD equipped with front insulators/busbar supports of 60mm inter-axial distance between the phases and with the maximum holding capacity of 30x10mm bar. It is mandatory to add supporting rails to fix the PMOD unit.



EN0480K forced ventilation outlet
Pag. .....X/X

PTBO50.. top with the cutout for outlet
Pag. .....X/X

RVC/RVT power factor controller
Pag. .....X/X

XLP00-A60/60 fuse switch-disconnector
Pag. .....X/X

UA..RA contactor
Pag. .....X/X

PFRJ0500 rail for PMOD
Pag. .....X/X

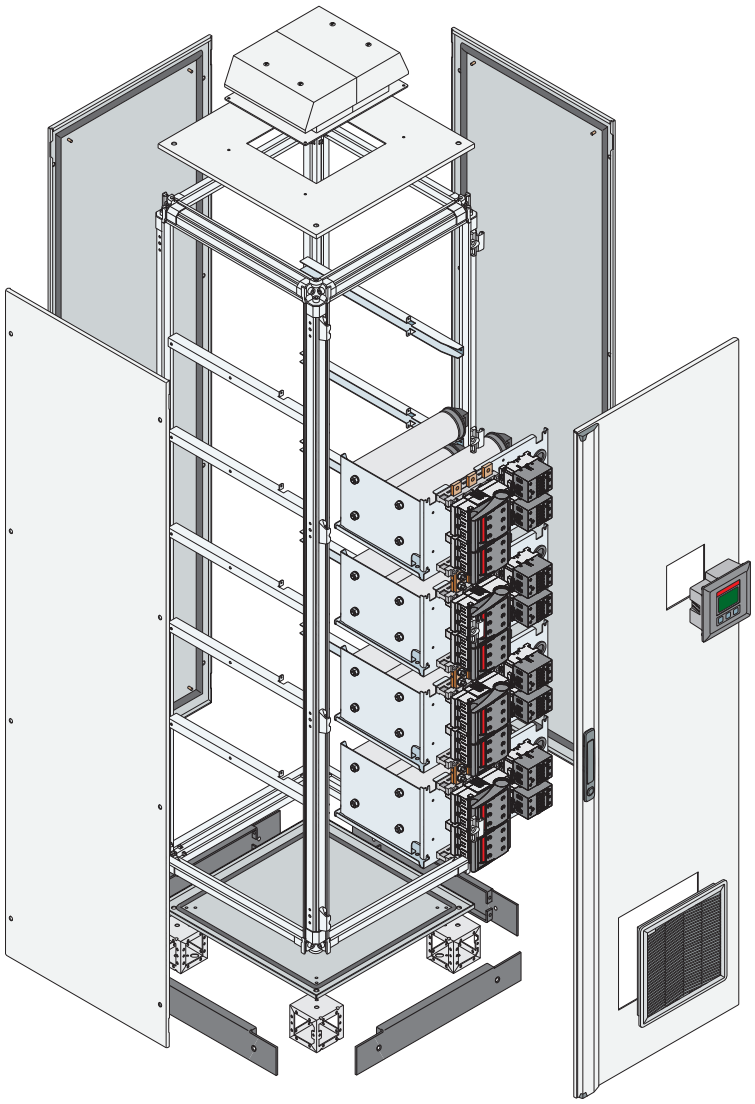
PMOD capacitor unit
Pag. .....X/X

PDLB… door with cutout for EN0325K air inlet
Pag. .....X/X

EN0325K natural ventilation inlet IP21/54
Pag. .....X/X

Example of IP54 capacitor bank completing

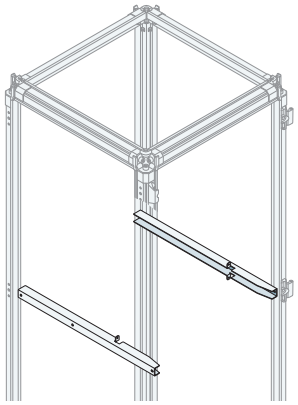
Column 2000x500x500mm, 400kvar - 4x100kvar (8 steps of 50 kvar), 400V, standard clean network*, without de-tuning reactors.



Quantity	Order code	Part	Description
1	PUPM2000	Structure	No.4 galvanized sheet metal uprights 2000mm
2	PCFM0500	Structure	No.4 width/depth crosspieces galvanized sheet metal
1	PTBB5050	Structure	IP65 blind bottom, W500/D500mm
1	PTBO5055	Structure	IP65 open bottom, W500/D500mm for "mushroom"
3	PPEB2056	Structure	Blind rear/side panel IP65, H2000/W500mm
1	PDLB2052	Structure	IP65 Door with the cutout for EN0325K air inlet
1	PPAM0100	Structure	No.4 plinth angle pieces
2	PPFM1050	Structure	No.2 front/rear plinth flanges W500mm
5	PFRJ0500	Kit	No.2 support rails for fixing capacitor bank drawer
1	EN0325K	Kit	IP21/54 natural ventilation inlet
1	EN0484K	Kit	IP54 forced ventilation outlet 230V 50/60Hz "mushroom"
1	EN0101K	Kit	NO ventilation thermostat
4	2GCA297404A0045	Equipment	PMOD XLP unit 100kvar (2 steps of 50), 400V
1	2GCA294985A0050	Equipment	RVC8 power factor controller, 8 steps

*suitable for installation when there are less than 15% of nonlinear loads and no resonance

System pro *E* power
Order codes



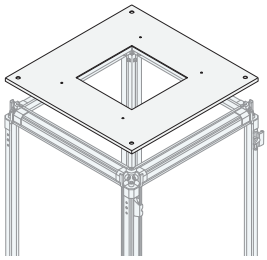
Capacitor mounting set for System pro E power

Compatible with the 500mm width of the structure. Can be combined with the horizontal main busbar system and depth more than or equal 500mm. The design is feasible with the any protection degree parts of the System, from IP40 to IP65 (the cubicle will be de-rated to IP23 or IP54).

Fixing rails for PMOD capacitor module

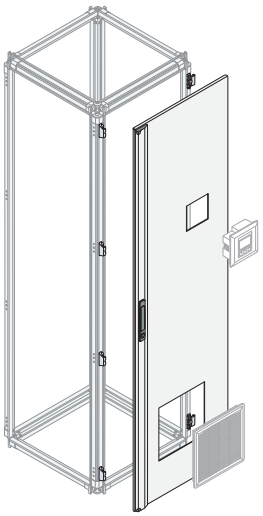
Mandatory to chose one pack for one module.

Description	Order code	ABB code		Package/ No. pcs
N.2 support rails for fixing capacitor bank drawer	PFRJ0500	1STQ005045B0000		1/2



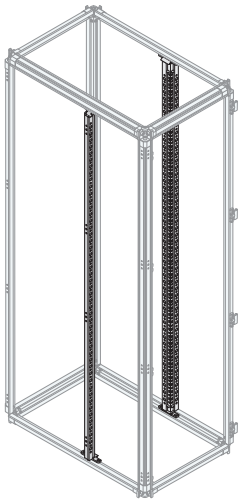
Open top prepared for the “mushroom” air outlet installation, forced ventilation

Description	Dimensions (mm) W	D	Order code	ABB code		Package/ No. pcs
Open top with cut-out for EN0480K air outlet IP23	500	500	PTBO5052	1STQ005037B0000		1/1
Open top with cut-out for EN0480K air outlet IP23	500	700	PTBO5072	1STQ005038B0000		1/1
Open top with cut-out for EN0480K air outlet IP23	500	900	PTBO5092	1STQ005039B0000		1/1
Open top with cut-out for EN0485K air outlet IP54	500	500	PTBO5055	1STQ005040B0000		1/1
Open top with cut-out for EN0485K air outlet IP54	500	700	PTBO5075	1STQ005041B0000		1/1
Open top with cut-out for EN0485K air outlet IP54	500	900	PTBO5095	1STQ005042B0000		1/1



Door with the cutout for the EN0325K air inlet and RVC/RVT controller

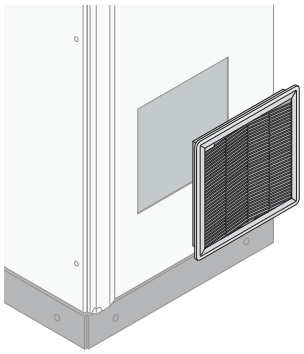
Description	Dimensions (mm) H	D	Order code	ABB code		Package/ No. pcs
Door with cutout for air inlet and controller	2000	500	PDLB2052	1STQ005043B0000		1/1
Door with cutout for air inlet and controller	1800	500	PDLB1852	1STQ005044B0000		1/1



Intermediate uprights

Mandatory to order 2 pieces for the structure of 700 and 900mm depth. It will provides additional fixing points for PFRJ0500 rails at the back.

Description	Dimensions H (mm)	Order code	Codice ABB		Package/ No. pcs
No.1 galv. sheet metal upright	1800	PUCM1800	1STQ007742A0000		1/1
No.1 galv. sheet metal upright	2000	PUCM2000	1STQ007743A0000		1/1

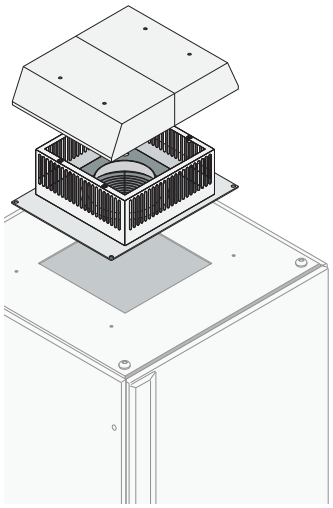


Accessories for the internal ventilation and hitting dissipation

Ventilation inlet IP21/54 to be placed on the frontal door

Gratings made of insulating material (self-extinguishing ABS UL94V-0) RAL7035 colour, complete with high dust collection capacity filter cloth (600g/m2), able to reduce maintenance interventions (cleaning by means of washing in water or by beating).
Degree of protection IP21 without filter, IP54 with filter according to IEC 60529.

Description	Dimensions (mm) W	H	Order code			Package/ No. pcs
IP21/54 natural ventilation inlet	325	325	EN0325K			1/1



Forced ventilation outlet “mushroom” IP23 to be placed on the roof

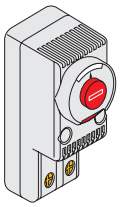
RAL 7035 colour, complete with self-adhesive gasket; consumption 58/78W, capacity 550/590m3/h. Operating temperature from -20 °C to + 60 °C, noise 68/71dB(A).

Description	Dimensions (mm) W	D	H	Order code			Package/ No. pcs
IP23 forced ventilation outlet 230V 50/60Hz	375	295	119	EN0480K			1/1
IP23 forced ventilation outlet 115V 50/60Hz	375	295	119	EN0482K			1/1

Forced ventilation outlet “mushroom” IP54 to be placed on the roof

Structure made up of plastic PC/ABS , with the top part in aluminum, painted RAL 7035 with polyurethane foam gasket. Consumption 70/83W, capacity 420/480m3/h. Electrical life 59000h. Weight 2,1kg.

Description	Dimensions (mm) W	D	H	Order code			Package/ No. pcs
IP54 forced ventilation outlet 230V 50/60Hz	324	324	94	EN0485K			1/1
IP54 forced ventilation outlet 115V 50/60Hz	324	324	94	EN0484K			1/1

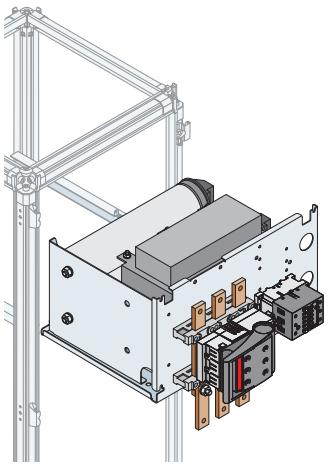


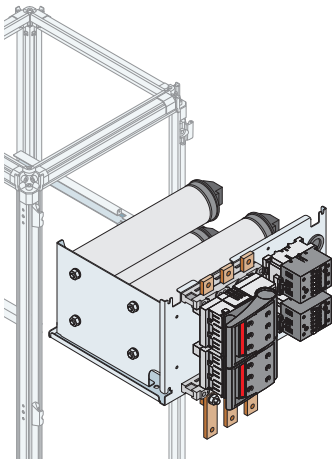
IP20 Thermostat, NO - cooling

Grey RAL 7035 colour; electrical life 100,000 cycles. Dimensions (HxWxD) 68x29x45mm, can be mounted on DIN rail. Temperature scale: -10 / +80 °C. Power supply: 12-60VDC or 110-250VAC, 50/60Hz.

Description	Dimensions (mm) W	D	H	Order code			Package/ No. pcs
NO ventilation thermostat	29	45	68	EN0101K			1/1

System pro *E* power
Order codes





Power capacitors module PMOD QCap (preassembled by the factory)

QCap power module is all-in-one pre-wired power module, which includes capacitor – QCap type, contactor, fuses and reactors (if existing). QCap power module provides all advantages of QCap dry capacitor technology in a compact case, delivering high performance within a small footprint.

Connection between PMOD has to be realized by copper bars 30*10.

U network (V) (1)*	Detuning Reactor (%) (2)	Rated Power Qc (kvar) (4)	Net Output Power Q (kvar) (3)	Comments	ABB code		Package/ No. pcs
50 Hz Network							
400	-	25	25	1 step	2GCA297400A0045		1/1
400	5,67	26,5	25	1 step	2GCA297405A0045		1/1
400	7	26,9	25	1 step	2GCA297406A0045		1/1
400	12,5	28,6	25	1 step	2GCA297407A0045		1/1
400	-	50	50	1 step	2GCA297401A0045		1/1
400	-	50	50	2 steps 25+25	2GCA297402A0045		1/1
400	5,67	53	50	1 step	2GCA297408A0045		1/1
400	7	53,8	50	1 step	2GCA297409A0045		1/1
400	12,5	57,2	50	1 step	2GCA297410A0045		1/1
400	-	75	75	2 steps 25+50	2GCA297403A0045		1/1
400	-	100	100	2 steps 50+50	2GCA297404A0045		1/1

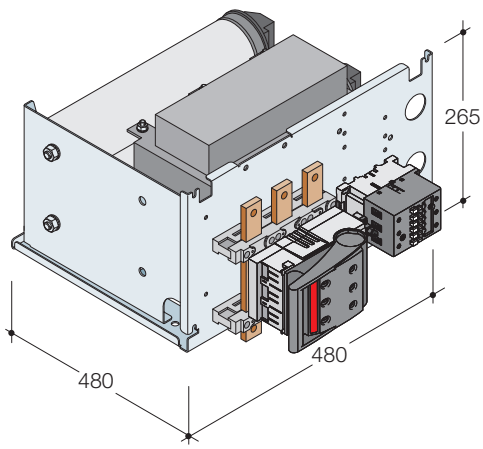
QCap power module offers a number of exceptional features like: high voltage withstand capability, excellent peak current handling capacity, high capacitance stability, long life even under high electrical stress, low losses, exceptional reliability and safety.
More ratings and voltages available, please contact us.

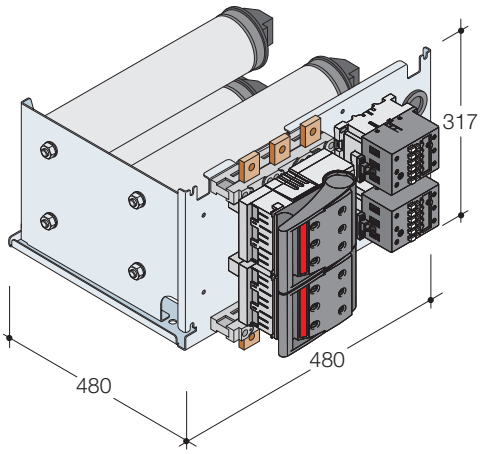
(1) U network is the nominal network voltage.

(2) Value of the reactor (if existing) connected in series with the capacitor.

(3) The net output power Q is the reactive power delivered to the network by both the capacitor and its detuning reactor (if existing) under nominal network voltage.

(4) Qc is the reactive power directly at capacitor terminals under nominal voltage (note: Qc ≥ Q due to reactor impact).





Power Factor Controller RVC & RVT

RVC controller - Accurate control and monitoring of capacitor banks

The RVC standard range of controllers can be used to control cos ϕ in industrial and commercial networks. Application examples include power factor control in buildings, mining steel industry, chemical, pulp and paper, cement, plastics, printing and food industries. The RVC operates at 100/440V - 50/60 Hz (automatic adjustment to voltage and network frequency). The RVC is available in 3, 6, 8, 10 and 12 outputs versions.

Description	ABB code		Package/ No. pcs
RVC3 power factor controller programmable up to 3 outputs	2GCA294983A0050		1/1
RVC6 power factor controller programmable up to 6 outputs	2GCA294984A0050		1/1
RVC8 power factor controller programmable up to 8 outputs	2GCA294985A0050		1/1
RVC10 power factor controller programmable up to 10 outputs	2GCA294986A0050		1/1
RVC12 power factor controller programmable up to 12 outputs	2GCA294987A0050		1/1

Capacitor bank series is simple and easy to operate thanks to the automatic functions provided by the RVC controller:
- User-friendly interface
- Easy commissioning
- Complete automatic set-up
- Display of: Cos φ , V, I, THDV, THDI
- Multiple built-in protections
- Not affected by harmonics
- Designed for hot environments (+60°C)
- Hardware and software switches
- Switching time between steps are programmable from 1s to 999s (independent of reactive load)
- Switching sequences are user defined
- Quick automatic disconnection in less than 20ms (50Hz) in case of power outage or voltage drop

RVT controller -The smart PFC for automatic capacitor bank

The RVT Touch Screen operates at 100/440V - 50/60 Hz (automatic Cos φ adjustment to voltage and network frequency). Three phase model: RVT12-3P (for both balanced and unbalanced network) with 12 outputs.

Description	ABB code		Package/ No. pcs
RVT6 Touch Screen power factor controller	2GCA291720A0050		1/1
RVT12 Touch Screen power factor controller	2GCA291721A0050		1/1
RVT12-3P Touch Screen power factor controller 3 phases	2GCA291722A0050		1/1

For enhanced functionality, ABB recommends its advanced RVT controller with the following features:
- Complete three-phase measurements of powers and harmonics
- Communication: Ethernet, USB, Modbus and Modbus TCP, complete graphical display, touchscreen
- Multi-language support
- Programmable warning/protection threshold
- Up to 8 temperature probes connections
- Real time clock

Options only for RVT

Description	ABB code		Package/ No. pcs
Temperature probe (up to 8 connections with daisy chain)	2GCA291864A0050		1/1
IP 54 gasket	2GCA292040A0050		1/1
OPC Server Software	2GCA286141A0050		1/1
RS485 Modbus adapter	2GCA291880A0050		1/1
PQ LINK Software	2GCA292820A0050		1/1

System pro *E* power
Declaration on tested configuration and overall technical specification

Robust type tested design

Capacitor bank is considered as low voltage switchgear and needs to be verified by type tests and routine tests. The low-voltage System pro E power factor correction banks are type tested according to IEC 61921 and IEC61439-1. Particularly, the characteristics below are checked according to IEC61439 part 1 clause 10: Design verification:

- 10.10 Verification of temperature rise;
- 10.9 Dielectric properties;
- 10.11 Short-circuit withstand strength;
- 10.4 Clearances and creepage distances;
- 10.13 Mechanical operation;
- 10.3 Degree of protection;
- 10.5 Effectiveness of the protective circuit.

The Panelbuilder shall complete only routine tests. The routine tests shall be made on every assembly and are intended to detect faults in materials and workmanship. They shall be carried out on every new assembly after its construction, or on each transport unit (see IEC 61439-1 clause 11). Another routine test at the place of installation is not required. Routine tests include:

a) inspection of the assembly including inspection of wiring and, if necessary, an electrical operation test (see 7.3.1). See the relevant clauses of IEC 61439-1;
b) dielectric test (see 7.3.2). See the relevant clauses of IEC 61439-1;
c) checking of protective measures and of the electrical continuity of the protective circuit (see 7.3.3). See the relevant clauses of IEC 61439-1;
d) verification of insulation resistance (see 7.3.4). See the relevant clauses of IEC 61439-1.

These tests may be carried out in any order.

Technical specification

Working ambient temperature	-5°C (23°F)/+40°C (104°F) according to EN 61921
Connection	Three-phase, balanced network
Protection	IP23/IP54, protected against direct and accidental contact
Execution	Indoor
Ventilation	Forced air cooling
Power factor setting	From 0.7 inductive to 0.7 capacitive
Starting current setting (C/k)	From 0.01A to 3A for the RVC controller
	From 0.01A to 5A for the RVT controller
Operation	During operation, RVC (RVT) controller displays:
	- the number of active outputs
	- the inductive or capacitive power factor
	- the alarm conditions; target cos j, over/under voltage, THDV, over temperature
	- the demand for switching on/off a capacitor step
Losses at 400V 50 Hz	Without reactors: less than 1.5 Watt/kvar
	With reactors: less than 5.5 Watt/kvar
Capacitors QCap type	Dry type self-healing according to IEC 60831-1&2
	Dielectric: 2.15 Un between terminals during 10 sec at rated frequency
	Acceptable overvoltage: +10% max. (maximum 8h/day) as per IEC 60831-1
	Acceptable overcurrent: +30% permanently
	Temperature range: -25°C/+55°C (class D according to IEC 60831-1&2)
Reactors	Dry type resin embedded according to IEC 289, IEC 76
	Maximum harmonic pollution: 8% THDV with specific spectrum
Standards	IEC 61921, IEC 61439-1&2
	IEC 60831-1&2 (capacitors)
	CE marked

System pro *E* power
Technical characteristics of the components

Qcap capacitor technical specification

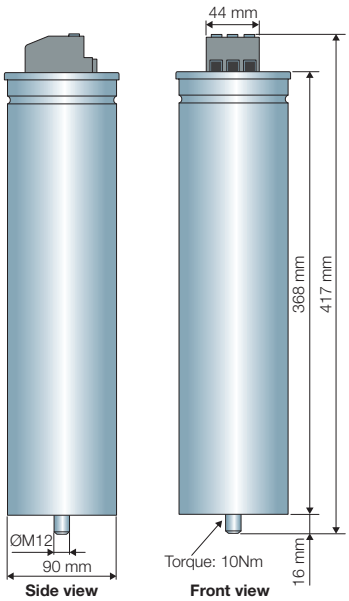
QCap is a cylindrical type capacitor. It is based on ABB‘s latest technologies and developments and is a result of more than a century‘s knowledge on electrical engineering and over 70 years of expertise on capacitor technologies.

Network voltage range	From 220 to 690 V.
Frequency	50 and 60 Hz
Connection	Three-phase
Net output power	From 2.5 to 30 kvar
Tolerance on capacitance	2.5-12.5 kvar: - 5 % / + 10 % 15-30 kvar: 0 % / + 10%
Losses	< 0.2 Watt/kvar (dielecrtic only) < 0.35 Watt/kvar (typical without discharge resistor) < 0.5 Watt/kvar (including discharge resistor)
Discharge resistor	Include. Discharge to 50 V in 1 minute
Maximum permissible current	1.3 x In for continuos operation
Tolerance on voltage	1.1 x Un for maximum 8 hours in every 24 hours (according to IEC 60831)
Case material	Recyclable aluminium
Color	Raw aluminium
Fixing	1 stud (M12). Recommended torque: 10 Nm
Dimensions (DxH)	90x417 mm
Weight	3 Kg
Terminals	Cage screws. Recommended torque: 2 Nm
Minimum distance above unit	20 mm
Minimum distance between capacitors	30 mm
Earth	Earth connection on the enclosure fixation
Execution	Indoor use only
Installation	Horizontal or vertical*
Temperature range	-25°C / +55°C (class D according to IEC 60831)
Altitude	Up to 2000 m without derating. For higher altitudes consult ABB.
Protection degree	IP20
Standards	CE and CSA (with US indicator complyng with UL810)

*In case of horizontal mounting, it is advised to add reinforcements to support the QCap in case of shock or vibrations during use. The same advice is applicable to transport conditions.

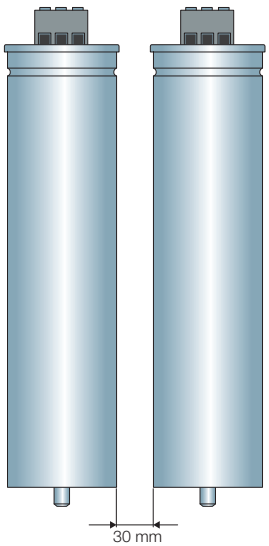
Dimensions

Total H	Can H	D	D fixation screw H	H fixation screw
401 mm	368 mm	90 mm	M12	16 mm

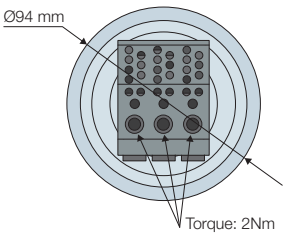


Side view

Front view



Minimum distance between units



Top view

System pro *E* power
Technical characteristics of the components

RVC power factor controller

Measuring system	Micro-processor system for balanced three-phase networks or sinle-phase networks.
Operating voltage	100V to 440V.
Voltage tolerance	±10% on indicated operating voltages.
Frequency range	50 or 60 Hz ±5% (automatic adjustments to network frequency).
Measurng circuit terminals (L2, L3 and k, l)	CAT III rated.
Current Input	1A or 5A (RSM)
Current Input impedance	<0.1 Ohm (recommended CT class 1.0, 10 VA min).
Consumption of the controller	8 VA max.
Output contact rating	Max. continuous current: 1.5A; Max. peak current: 5A. Max. voltage: 440 Vac. Terminal A is rated for a continuous current of 16A.
Alarm contact	Normally open contact. Max. continuous current: 5A. Rated/max. breaking voltage: 250Vac/440Vac.
Power factor setting	From 0.7 inductive to 0.7 capacitive.
Starting current setting (C/k)	0.01 to 3A. Automatic measurement of C/k.
Number of outputs	RCV-3: programmable up to 3 outputs - RCV-6: programmable up to 6 outputs RCV-8: programmable up to 8 outputs - RCV-10: programmable up to 10 outputs RCV-12: programmable up to 12 outputs
Switching time between step	Programmable from 1s tp 999s (independent of reactive load).
Switching sequences	Used defined
Mode of switching	The mode of switching for all the programmable switching sequences is integral, direct, circular or linear.
Saving-function	All programmed parameters and modes are saved in a non-volable memory.
Power outage release	Quick automatic disconnection in less than 20ms [50Hz] in case of power outage or voltage drop.
Power outage reset delay time	40 s.
Operating temperature	-10° C to 70° C.
Storage temperature	-30° C to 85° C.
Mounting position	Vertical panel mounting.
Dimensions	144x144x43 mm (hxwxd)
Cut-out dimensions	138x138 mm(hxw)
Weight	0.4 kg (unpacked)
Connector	Spring clamp terminal block
Front plate protection	IP43
Relative humidity	Maximum 95%, non condensing
Other features	Overvoltage and undervoltage protection. Autodaptation to the phase-rotation of the network and the CT terminals. Not affected by harmonics. working with generative and regenerative loads. LCD contrast automatically compensated with temperature.
Standards	CE marked.

RVT power factor controller

Measuring system	Micro-processor system for balanced three-phase/single-phase networks and unbalanced Individual phase power factor control is available.
Supply voltage	From 100Vac up to 460 Vac.
Consumption	15 VA max.
Connection type for measuring circuit and power supply	Phase-phase or phase-neutral for balanced and unbalanced network.
Voltage tolerance	±10% on indicated supply voltages.
Measurement category (according to IEC 61010-1)	CAT III.
Voltage measurement	Up to 690Vac or higher with voltage transformer.
Accuracy	±1% full scale.
Frequency range	From 45 to 65 Hz (automatic adjustments to network frequency).
Current input	5A or 1A (RMS) (class 1 C.T.).
Current input impedance	<0.1 Ohm.
Power outage release	Automatic disconnection of all capacitors in case of a power outage longer than 20ms.
Number of outputs	RVT6/RVT12 Base Model: programmable up to 6 or 12 outputs. RVT12-3P Three Phase Model: programmable up to 12 outputs.
Output contact rating	Max. continuous current: 1.5A (ac) – 0.3A (110V dc). Max. peak current: 5A. Max. voltage: 440 Vac. Terminal A-A are rated for a continuous current of 18A (9A/terminal).
Alarm contact rating (voltage free contact)	One normally closed contact and one normally open contact. Max. continuous current: 1.5A (ac). Rated voltage: 250Vac (max. breaking voltage: 440Vac).
Fan contact rating (voltage free contact)	Normally open contact. Max. continuous current: 1.5A (ac). Rated voltage: 250Vac (max. breaking voltage: 440Vac).
Power factor setting	From 0.7 inductive to 0.7 capacitive.
Starting current setting (C/k)	0.01 to 5A. Automatic measurement of C/k.
Switching sequences	1:1:1:1:1:….:1 - 1:2:2:2:2:…..:2 - 1:2:4:4:4:….:4 1:2:4:8:8: …..:8 - 1:1:2:2:2:….:2 - 1:1:2:4:4:…..:4 1:1:2:4:8:….:8 - 1:2:3:3:3:… .:3 - 1:2:3:6:6:….:6 1:1:2:3:3……:3 - 1:1:2:3:6…..:6 and any other customer programmable sequence.
Modbus baud rate	300 - 600 - 1200 - 2400 - 4800 - 9600 - 19200 - 38400 – 57600 bps.
CAN connection	Support CAN 2.0B interface (for future use).
USB host connection	For future use.
USB device connection	Available
Temperature probe input connection	Only 2 contacts using 1-wire protocol. - Parasitic supply mode (no need of external power supply) - Connection to more nodes in a daisy chain network - 8 temperature probes connection - 8 meters maximum between RVT to temperature probe or between probes - 64 meters maximum length
Step configuration	Automatic, fixed, disabled.
Display	QVGA 320 x 240 pixels colorful touch-screen.
Adjustable display backlighting	Available
Switching time between steps	Programmable from 1s to 18h.

System pro *E* power
Technical characteristics of the components

RVT power factor controller

Saving-function	All programmed parameters and modes are saved in a non-volatile memory.
Auto adaptation to the connection and phase-rotation of the network	
Auto adaptation to the CT-terminals	
Power Factor correction operation is insensitive to the presence of harmonics.	
Working with passive and regenerative loads (four-quadrant operation).	
Operating temperature	-20° C to 70° C.
Storage temperature	-30° C to 85° C.
Mounting position	Vertical panel mounting.
Dimensions	Front plate: 146 x 146 mm (h x w). Rear side: 205 x 135 mm. Overall: 146 x 211 x 67 mm (h x w x d). Cut out dimensions: 138 x 138 mm (h x w)
Weight	650 g (unpacked).
Connector	Cage clamp type (2.5mm2 single core cable).
Front plate protection	IP 43 (IP54: on request).
Relative humidity	Maximum 95%, non-condensing.
CE and UL marked	

Product line-up

Features	**RVT6/RVT12**	**RVT12 - 3P**
Article number	RVT-6 RVT-12	RVT-12-3P
1 / 3 phase measurements	1 voltage measurement input 1 current measurement input	
Real time clock	NO	YES
Energy measurements	NO	YES
Ethernet connection	NO	YES
USB host connection	NO	YES
USB device connection	YES	YES
Digital inputs	YES	YES
Alarm / fan relays	YES	YES
Output relays	6 or 12	12
Lock switch	YES	YES
RS485 Modbus connection	YES	YES
External temperature probes	YES	YES

De-tuning reactors technical specification

The ABB detuning reactor is state of the art reactor with highest specification requirement in terms of:

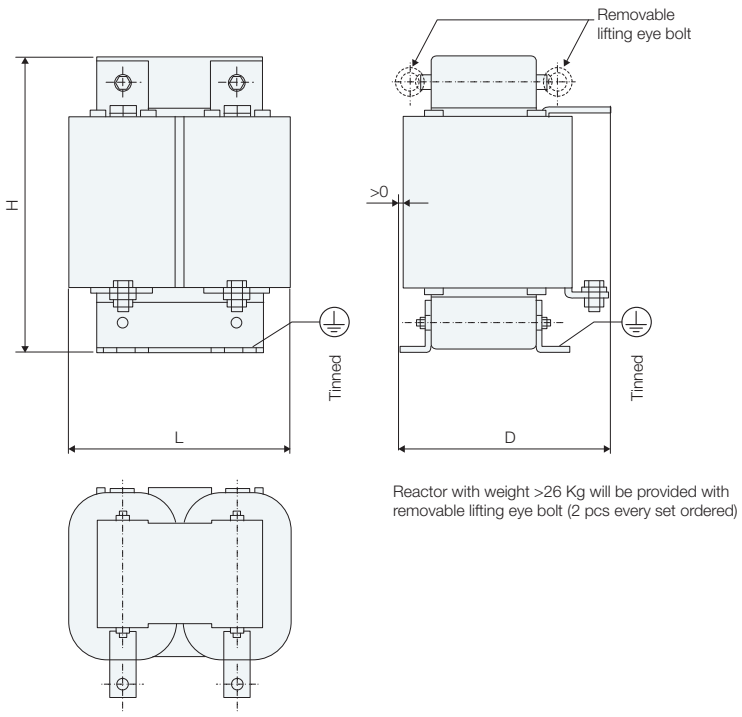
- Superior raw materials quality
- Superior manufacturing quality and quality control
- The smallest range of tolerance about electrical parameters
- Design to operate continuously at nominal power
- The largest reactor linearity in the market (avoid saturation)

More important, ABB design is for a network pollution of 8% THDV:

Network voltage spectrum: U3/U1=0.5%
U5/U1=6%
U7/U1=5%
U11/U1=3.5%
U13/U1=3%
But not exceeding a total THDU of 8%

Assuming the network voltage of 1.1 x Un for I1 and the maximum harmonic voltage spectrum as per above (at 1.0xUn)

Temperatures are defined as: Operational Tmin = -25 °C
Operational Tmax = 50 °C
Storage T min = -40 °C
Storage Tmax = 75 °C



Reactor with weight >26 Kg will be provided with removable lifting eye bolt (2 pcs every set ordered)

More ratings and voltages available, please contact us.

400V, 50Hz	Height - H	Lenght - L	Depth - D
Reactor 25 kvar 7%	205 mm	228 mm	140 mm
Reactor 50 kvar 7%	235 mm	264 mm	155 mm

Voltage	Qnet	Detuning reactor
400 V	6.25 kVAr	-
400 V	12.5 kVAr	-
400 V	25 kVAr	-
400 V	50 kVAr	-
400 V	6.25 kVAr	5,67%
400 V	12.5 kVAr	5,67%
400 V	25 kVAr	5,67%
400 V	50 kVAr	5,67%
400 V	6.25 kVAr	7%
400 V	12.5 kVAr	7%
400 V	25 kVAr	7%
400 V	50 kVAr	7%
400 V	6.25 kVAr	12,50%
400 V	12.5 kVAr	12,50%
400 V	25 kVAr	12,50%
400 V	50 kVAr	12,50%
400 V	25 kVAr	14%
400 V	50 kVAr	14%
415 V	6.25 kVAr	-
415 V	12.5 kVAr	-
415 V	25 kVAr	-
415 V	50 kVAr	-
415 V	12.5 kVAr	7%
415 V	25 kVAr	7%
415 V	50 kVAr	7%
440 V	12.5 kVAr	-
440 V	25 kVAr	-
440 V	50 kVAr	-
440 V	75 kVAr	-
440 V	12.5 kVAr	7%
440 V	50 kVAr	7%

Note: For plain capacitor banks, while not using UA-RA type contactor, it is usual to make cable turns (around 5 turns with 10cm diameter) in order to limit the Inrush current. The contactor informed is the minimum size needed to build the step. It is possible to use higher ratings as well.

System pro *E* power

Technical aspects of the Power factor correction

Overstressing and overheating shorten the life of a capacitor, and therefore the operating conditions (that is temperature, voltage and current) should be strictly controlled. It should be noted that the introduction of a capacitance in a system might produce unsatisfactory operating conditions (for example amplification of harmonics, self-excitation of machines, overvoltage due to switching, unsatisfactory working of audio-frequency remote-control apparatus, etc.).

The choice of components of an assembly shall be carried out with careful reference to compliance between their ambient air temperature category and that of the assembly itself.
It is important to note that power factor component equipment such as fuses, capacitors, reactors, etc. generate a significant amount of heat. It is important to ensure that adequate ventilation is provided in the operating room in order to maintain good air circulation around the PFC unit.

The equipment needed for the automatic correction of power factor in an installation, including controller, fuses, switching devices, capacitors and reactors (chokes), can be installed as an integral part of the main switchboard.
The rated voltage of the PMOD capacitor unit shall be at least equal to the service voltage of the network to which the capacitor is to be connected, account being taken of the influence of the presence of the capacitor itself.

The connection of PFC (power factor correction) equipment onto a system containing harmonics may reduce the life of the PFC equipment. The damaging effects of harmonics can be mitigated by the use of a suitable detuning reactor in series with each capacitor step.