PRODUCT BROCHURE

Power factor controllers RVC and RVT

Precise control and monitoring
of system power quality

Enhancing power quality
In utility, industrial and infrastructure applications

ABB is a pioneering technology leader in electrification products, robotics and motion, industrial automation and power grids, serving customers in utilities, industry and transport & infrastructure globally. Continuing a history of innovation spanning more than 130 years, ABB today is writing the future of industrial digitalization and driving the Energy and Fourth Industrial Revolutions. As title partner of Formula E, the fully electric international FIA motorsport class, ABB is pushing the boundaries of e-mobility to contribute to a sustainable future. ABB operates in more than 100 countries with about 136,000 employees.

ABB offers a wide range of products from 208 V up to 1200 kV that help enhance the reliability, efficiency and quality of power in transmission and distribution grids, power plants and industries while minimizing environmental impact. The wide product range is complemented by a comprehensive service offering.

Power quality is a major concern for transmission and distribution utilities, industries, transport and infrastructure sectors. Poor power quality affects grid reliability, productivity, leads to higher operating costs and penalties for non-compliance with grid codes. ABB is a technology leader with a wide range of products, systems and services that improve power quality including capacitors and filters, power electronics-based compensators and software solutions, across the power value chain for low, medium and high-voltage applications, helping to shape a stronger, smarter and greener grid.

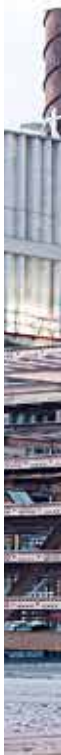
Power factor controllers (PFC) from ABB can be integrated with any capacitor bank and can help control and monitor its operation.

ABB RVC controller became over the years the reference for our customers due to its simplicity, unique design, ease of use while commissioning. It offers to our customers' versatile functions, reliability and robustness.

ABB RVT controller offers extra added features to measure and visualize graphically power quality data, control and correct unbalanced network in any installation.

Their advance control system makes ABB PFC the best in class controllers for both industrial and commercial applications such as buildings, mining, steel industry, chemical, pulp and paper, cement, plastics, printing or food and beverage industry and many others.

ABB power factor controllers are the best choice for panel builders interested in providing the optimal solution for their customers.



RVC controller

User programmable parameters/ measurements: Target cos ϕ, phase shift, C/k, switching delay times and sequence

User-friendly interface

Easy commissioning with automatic set-up of parameters

RVT controller

Complete system measurement

Touchscreen user-friendly interface

Easy commissioning with automatic set-up of parameters

All parameters and measurements available through Modbus RS485

Power factor controllers
Features and benefits

	RVC	RVT
Main functions	Offers monitoring, measurement, control and display of key parameters such as voltage, current, power factor, THDV, steps switching, alarm settings.	Offers measurement, monitoring and display of key parameters such as voltage, current, power factor, THDV and THDI, harmonic spectrum, waveform, steps switching, alarm settings, complete three-phase measurements of power and energy.
Easy commissioning	The “Auto-Set” feature eases the bank commissioning process. The set-up of parameters such as C/ k (sensitivity), active outputs, switching and phase shift is automatic. The text-free, intuitive interface allows for both an easy commissioning and for setting of programmable thresholds.	The “Auto-Set” feature eases the bank commissioning process. The set-up of parameters such as C/ k (sensitivity), active outputs, switching and phase shift is automatic. The color touchscreen enables a quick display of customer waveform and harmonic spectrum.
User-friendly interface	Fully graphical user interface with icons and 3 main buttons on the front of the controller.	The graphical user interface of the RVT is available with a color touchscreen (320 x 240 pixels). The screen menu is designed to be intuitive and flexible, providing better user experience and available in several languages including English, French, German, Spanish and simplified Chinese.
Communication	No communication available.	RVT has versatile communication interfaces. By default a USB port is available and it can be used with an add-on RS485 adapter to communicate via Modbus RTU. RVT 12-3P provides an RJ45 Ethernet port with Modbus TCP/ IP communication protocol. The optional PQ-Link software enables a remote communication via computer to ease the commissioning.
Availability for LV, MV and HV banks	Not available for MV/ HV capacitor banks.	By connecting a voltage measurement transformer (VT/ PT) to the RVT voltage measurements inputs, and setting the proper scaling factor, the RVT is able to control a MV or HV capacitor bank just like a LV capacitor bank. The maximum measurement voltage at the RVT voltage measurement terminals is 690 Vac.
Wide voltage supply range	Supply voltage from 100 V to 440 Vac.	Supply voltage from 100 V to 460 Vac.
Current transformers	Both 5A and 1A CT’s may be connected to the RVC and RVT controllers.	
Multiple digital inputs	Not available.	Two digital inputs can be used: one to switch from a day to a night power factor setting and vice versa, and one that is an input for an external alarm signal.
Efficient switching strategy	The switching strategy combines integral, direct, linear or circular switching to address various needs: - Control the cos ϕ in presence of rapidly varying loads, - Reduce the number of switching, - Avoid unnecessary intermediary switching, - Increase the lifetime of the capacitors and contactors.	The switching strategy combines integral or normal, direct or progressive, linear or circular switching to address various needs: - Control the cos ϕ in presence of rapidly varying loads, - Reduce the number of switching, - Avoid unnecessary intermediary switching, - Increase the lifetime of the capacitors and contactors.

RVT
Accessories

—
01 RS Modbus adapter
—
02 Temperature probe selection screen and external probes
—
03 IP54 gasket accessory

RS485 Modbus adapter
The Modbus adapter is an optional accessory which enables communication via Modbus RTU with a monitoring system. It enables to monitor and display all RVT parameters (including harmonic spectra and tables).

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01

External probes for temperature measurement
Up to eight temperature probes may be connected to RVT through a daisy chain network (to know more on how to connect temperature probes, please refer to the Installation and Operating Instructions manual). In the event of exceeding the temperature threshold, RVT closes the fan relay. Information on the measured temperature can be recorded with the event logging function.

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02

IP54
RVT front plate offers an IP43 protection degree in its standard version. A gasket accessory enhances the standard RVT protection degree to IP54.

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03


Pasta e più

RVC and RVT
Technical specifications

Parameters	RVC	RVT
Operating voltage	100 Vac to 440 Vac	From 100 up to 460 Vac/ Vdc
Voltage measurement	100 Vac to 440 Vac	Up to 690 Vac or higher with voltage transformer
Consumption	15 VA max	15 VA max
Voltage tolerance	±10% on indicated operating voltages	±10% on indicated operating voltages
Measurement category (according to IEC 61010-1)	CAT III	CAT III
Accuracy	1% full scale	1% full scale
Frequency range	50 or 60 Hz +/- 5% (automatic adjustment to network frequency)	From 45 to 65 Hz (automatic adjustments to network frequency)
Current input	5 A or 1 A (RMS) (class 1 C.T.)	5 A or 1 A (RMS) (class 1 C.T.)
Current input impedance	<0.1 Ohm	<0.1 Ohm
Number of outputs	RVC-3: 3 outputs	RVT6: 6 outputs
	RVC-6: 6 outputs	RVT12: 12 outputs
	RVC-8: 8 outputs	RVT12-3P: 12 outputs (three-phase measurement feature)
	RVC-10: 10 outputs	
	RVC-12: 12 outputs	
Output contact rating	Max. continuous current: 1.5 A	Max. continuous current: 1.5 A (ac) – 0.3 A (110 Vdc)
	Max. peak current: 5 A	Max. peak current: 5 A
	Max. voltage: 440 Vac	Max. voltage: 440 Vac
Alarm contact rating (voltage free contact)	NO contact	NO contact
	Max. continuous current: 5 A	Max. continuous current: 5 A
	Rated/ max. breaking voltage: 250 Vac/ 440 Vac	Rated/ max. breaking voltage: 250 Vac/ 440 Vac
Fan contact rating (voltage free contact)	-	NO contact
		Max. continuous current: 1.5 A (ac)
		Rated/ max. breaking voltage: 250 Vac/ 440 Vac
Digital inputs (isolated optocoupler)	-	Input 1 (rated 15-24 Vac/ Vdc): day/ night cos ϕ selection
		Input 2(rated 15-24 Vac/ Vdc): External input alarm/ protection/ disconnection
Power factor setting	From 0.7 inductive to 0.7 capacitive	From 0.7 inductive to 0.7 capacitive
Starting current setting (C/ k)	0.01 to 5 A	0.01 to 5 A
Switching time between steps	Programmable from 1 s to 999 s	Programmable from 1 s to 18 h
Switching sequences	1:1:1:1:1:….:1 - 1:2:2:2:2:…..:2	1:1:1:1:1:….:1 - 1:2:2:2:2:…..:2
	1:2:4:4:4:….:4 - 1:1:2:4:8:….:8	1:2:4:4:4:….:4 - 1:1:2:4:8:….:8
	1:2:3:3:3:….:3 - 1:2:3:6:6:….:6	1:2:3:3:3:….:3 - 1:2:3:6:6:….:6
	and other customer programmable sequences	and other customer programmable sequences
Mode of switching	The modes of switching for all the programmable switching sequences are integral, direct, linear or circular	The modes of switching for all the programmable switching sequences are normal or integral, progressive or direct, linear or circular
Power outage release	Quick automatic disconnection in less than 20 ms (50 Hz) in case of power outage or voltage drop	Quick automatic disconnection in less than 20 ms (50 Hz) in case of power outage or voltage drop
Modbus baud rate	-	300 - 600 - 1200 - 2400 - 4800 - 9600 - 19200 - 38400 – 57600 bps
USB device connection	-	Available

Parameters	RVC	RVT
Temperature probe input connection	-	Only 2 contacts using 1-wire protocol
		No external power supply mode
		Connection to more nodes in a daisy chain network
		8 temperature probes connection
		8 meters maximum between RVT to temperature probe or between probes
Step configuration	Automatic, fixed, disabled	Automatic, fixed, disabled
Display	LCD display	QVGA 320 x 240 pixels color touchscreen
Adjustable display backlighting	-	Available
Operating temperature	-10°C to 70°C	-20° C to 70° C
Storage temperature	-30°C to 85°C	-30° C to 85° C
Mounting position	Vertical panel mounting	Vertical panel mounting
Dimensions	144 x 144 x 43 mm (h x w x d)	Front plate: 146 x 146 mm (h x w)
	Cut-out: 138 x 138 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	400 g (unpacked)	650 g (unpacked)
Connector	Spring cage clamp terminal block	Spring cage clamp terminal block
Front plate protection	IP43	IP43 (IP54 on request)
Relative humidity	Maximum 95%, non-condensing	Maximum 95 %, non-condensing
Standards	CE marked	CE and UL marked

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Notes:
All parameters and modes are saved in a non-volatile memory.
Power factor correction operation is insensitive to the presence of harmonics.
Both controllers are working with passive and regenerative loads (four-quadrant operation).

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Product line-up

Features	RVC	RVT6 / RVT12	RVT12 - 3P
Article numbers	RVC-3: 2GCA294983A0050	RVT6: 2GCA291720A0050	2GCA291722A0050
	RVC-6: 2GCA294984A0050	RVT12: 2GCA291721A0050	
	RVC-8: 2GCA294985A0050		
	RVC-10: 2GCA294986A0050		
	RVC-12: 2GCA294987A0050		
1/ 3-phase measurements	1 voltage measurement input	1 voltage measurement input	3 voltage measurement inputs
	1 current measurement input	1 current measurement input	3 current measurement inputs
Real time clock	NO	NO	YES
Energy measurements	NO	NO	YES
Ethernet connection	NO	NO	YES
USB host connection	NO	NO	YES
USB device connection	NO	YES	YES
Digital inputs	NO	YES	YES
Alarm/ fan relays	Alarm relay	YES	YES
Output relays	3 – 6 – 8 – 10 – 12	6 or 12	12
Lock switch	NO	YES	YES
RS485 Modbus connection	NO	YES	YES
External temperature probes	NO	YES	YES

ABB's commitment

Quality assurance
At ABB, we are committed to providing the best products and services. Our products comply with or exceed the latest international standards. In addition to type tests in independent laboratories, our certified design and manufacturing processes guarantee the highest quality. We are certified according to the latest relevant ISO quality standards.

Sustainability
For ABB, sustainability is about balancing economic success, environmental stewardship and social progress to benefit all our stakeholders. Sustainability considerations cover how we design and manufacture products, what we offer customers, how we engage suppliers, how we assess risks and opportunities, and how we behave in communities where we operate and towards one another, while striving to ensure the health, security and safety of our employees, contractors and others affected by our activities. We are certified according to the latest relevant ISO quality standards.


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RVC quick start

RVT quick start

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