

Power Factor Controller RVT

Quick start



Installation

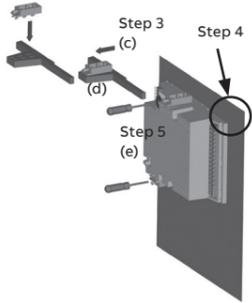
Step 1: Slide the RVT (a) perpendicularly to the capacitor bank cubicle (b).
 Step 2: Rotate the RVT to insert it into the capacitor bank cubicle.



Note: cut-out dimensions are 138x138 mm.

Step 3: insert the mounting bracket (c) in the corresponding fixation holes (d) of the RVT.
 Step 4: pull the mounting bracket backwards.

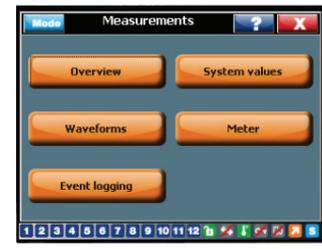
Step 5: turn the screw (e) into the mounting bracket and tighten until the RVT is secured in place.



[More information in detailed manuals](#)



Touch screen



← Title bar
 ← Setting area
 ← Status bar

- active output (inactive output are not highlighted)
- bank settings unlocked
- bank settings locked
- settings can only be done through the communication
- settings can be done through the user interface or the communication
- temperature alarm (alarm relay is activated) or warning (fan/warning relay is activated)
- no temperature alarm nor warning (alarm and fan/warning relays are not activated)
- warning level achieved (the fan/warning relay is activated)
- alarm activated (alarm relay is activated)
- no alarm activated (alarm relay is not activated)
- settings locked by hardware switch at the back of the controller
- settings unlocked by hardware switch at the back of the controller
- demand to switch ON step(s)
- demand to switch OFF step(s)
- no demand to switch steps
- automatic mode (steps are switched automatically according settings)
- manual mode (steps can be switched manually)
- set mode (settings can be done)
- mode change
- validation
- online help
- next page
- close window

Commissioning

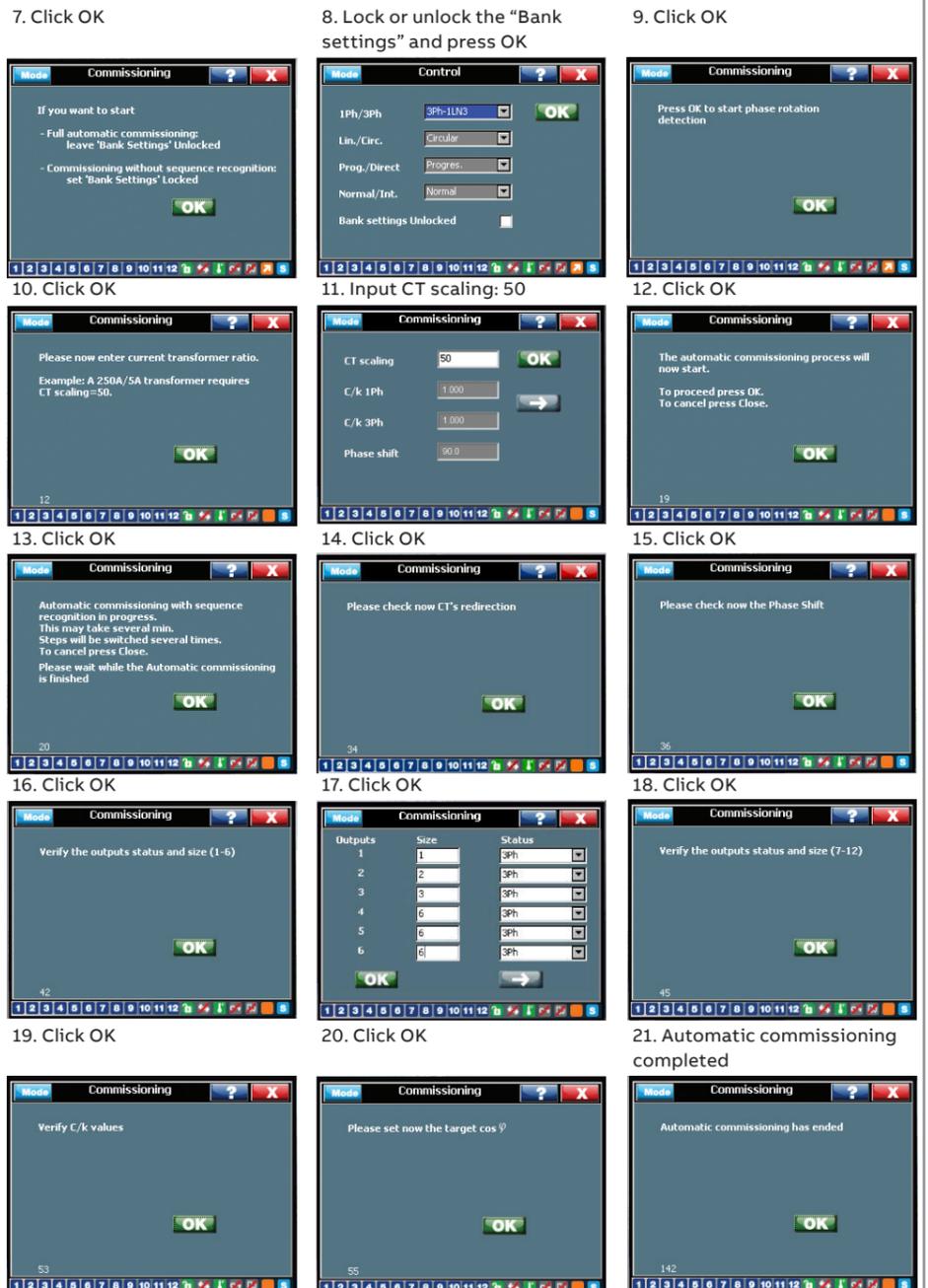
Before commissioning (both auto and guided), please make sure that:

- RVT is unlocked (both soft and hardware lock)
- RVT is in SET mode
- CTs are properly connected

Parameters to set	Guided commissioning	Auto commissioning
1Ph/3Ph (CT and voltage connection type)	X	X
Phase rotation only	X	O
CT ratio before phase shift	X	X
CT redirection	X	O
Phase shift	X	O
PT ratio (for MV banks)	X	X
V Nominal	X	X
ON-Delay	X	O
OFF-Delay	X	O
Output status and size	X	O
Q step (minimal step size)	X	O
C/k (start current)	X	O
Target cos φ	X	X

X: manual setting required; O: auto setting

1. Start screen, click „Settings“
2. Click commissioning
3. Click automatic



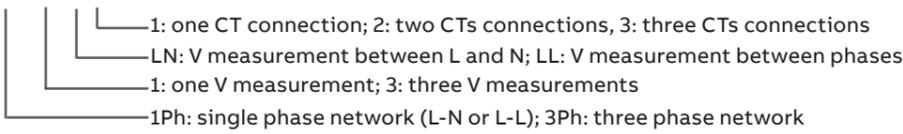
Messages during an automatic commissioning process	Recommended actions
Phase rotation was detected to be wrong. L2 and L3 phases will be internally inverted. Press OK to validated	Press OK.
Error: Step size too small	Adapt the step size or the CT ratio.
Error: CT not sensing any current	Check that the CT's short-circuit bridge are removed, that CT's connections are correctly wired and start the Auto commissioning again.
Error: Load changing too fast	Restart the Auto commissioning procedure under more stable conditions or set the parameters manually.
Error: Too wide phase dispersion in input nr ,X' ,Y' ,Z'	Check capacitor and contactor connections. Check capacitor currents for each phase.
Error: At least two CT inputs sensing the same line current	Check CT's installation.
Error: No significant current in input nr ,X' ,Y' ,Z'	Check that CT's short-circuit bridge is removed, that CT's connections are correctly wired and start the Auto commissioning again.
Error: Inconsistent phase shift	Check CT's connections and installation. Check capacitor and contactor connections. Check capacitor currents for each phase.
Error: Unbalanced step or CT ratio different in lines for output nr ,A' ,B' ,C' ,D'	Check that CT's ratios are the same value. Check capacitor and contactor connections. Check capacitor currents for each phase.
Error: Too big step difference	Check sequence and reactive power value per output.

Type of connections

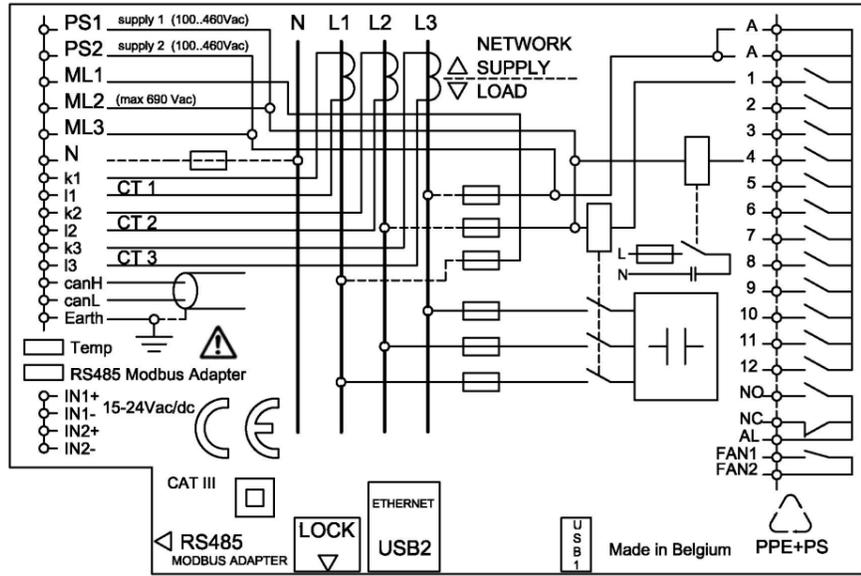
The type of connection defines the ways of RVT measuring current and voltage. RVT allows eight different types of connection topologies based on the type of installation and number of current and voltage transformers:

RVT6 and RVT12		RVT12-3P					
Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	Type 7	Type 8
1Ph-1LL1	3Ph-1LL1	3Ph-1LN1	3Ph-3LL3	3Ph-3LL2	3Ph-3LN3	3Ph-1LL3	3Ph-1LN3

3Ph - 3 LN 3



Wiring diagram



- Three phase model only
- PS1, 2: Power supply
 - ML1-3: Voltage measurements
 - N: Neutral connection
 - k1-3, l1-3: CT connections
 - canH, canL: CAN bus
 - Earth: Grounding
 - Temp: Temperature probe connection
 - RS485 Modbus Adapter: RS485 interface
 - IN1+/-: digital input selecting Day or Night target cos φ
 - IN2+/-: digital input for external alarm activation
 - A: Common source for output relay
 - 1-12: Output relays
 - NO/NC: Output contacts of alarm relay
 - AL: Common source for alarm relay
 - FAN 1-2: FAN/warning output relay
 - USB: USB connection
 - RJ45: Ethernet connection
 - Lock: Hardware lock

Detailed wiring and direct current & voltage measurements capabilities are shown in the table below, which facilitates the selection of different types of connection in terms of installation types and requirements on voltage and current measurements.

For RVT 6 and RVT12, only the type 1, 2 and 3 are available; RVT12-3P is able to connect in all eight different types of connection.

Connection type	Schematics	RVT 12 - 3P Connection	RVT 6 / RVT 12 Connection	Phase shift adjustment	Voltages			Currents			Compensation type							
					L12	L23	L31	L1N	L2N	L3N	L1	L2	L3	N	Full C3 ¹	Full C1 ²	Mixed C3+C1	
1Ph-1LL1				0° by default (see phase shift table)	M			M								yes		
3Ph-1LL1				90° by default (see phase shift table)	M			M								yes		
3Ph-1LN1				0° by default (see phase shift table)				M								yes		
3Ph-3LL3				0° by default (Adjust - phase rotation - CT redirection)	M	M	M	C	C	C	M	M	M	C		yes	yes	yes
3Ph-3LL2				0° by default (Adjust - phase rotation - CT redirection)	M	M	M	C	C	C	M	M	M	C		yes	yes	yes
3Ph-3LN3				0° by default (Adjust - phase rotation - CT redirection)	C	C	C	M	M	M	M	M	M	C		yes	yes	yes
3Ph-1LL3				0° by default (Adjust - CT redirection)				M			M	M	M	C		yes	yes	yes
3Ph-1LN3				0° by default (Adjust - CT redirection)				M			M	M	M	C		yes	yes	yes

¹ C3: three-phase capacitor control

² C1: single-phase capacitor control

Troubleshooting

Faults	Recommended actions
The controller is connected but nothing on display.	Check the voltage setting and the fuses.
The controller does not switch on or off steps although there is a considerable variable inductive load.	Check that the controller is in automatic mode. Check setting of phase shift and C/k. Check the CT short-circuit bridge is removed.
The controller does not seem to activate any steps.	Wait for the delay time between switching and/or the power outage delay time.
The preset power factor is not achieved.	At low or no load, a low power factor can correspond to a very small inductive current. The corresponding capacitor steps are too large for compensation. If the average cos φ over a period of time is too low, the preset cos φ may be increased
All capacitors are switched on although the required reactive power is relatively low.	Check setting of phase and C/k values.

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