

# Power Factor Controller RVT

The ultimate Power Factor Controller



# RVT : The Ultimate Power Factor Controller

## Measurements and Monitoring:

- Active power (kW)
- Apparent power (kVA)
- Reactive power (kvar)
- Reactive power (kvar) to reach the target cos φ
- Voltage (V)
- Current (A)
- Temperatures (°C or °F)
- Total Harmonic Distortion on Voltage : THD V (%)
- Total Harmonic Distortion on Current : THD I (%)
- Frequency (Hz)
- Measurements:
- Cos φ
- Voltage Harmonics : U2 up to U49 (%-spectrum)
- Current Harmonics : I2 up to I49 (%-spectrum)
- Number of steps needed to reach the target cos φ
- Number of switching per output

## Programmable parameters:

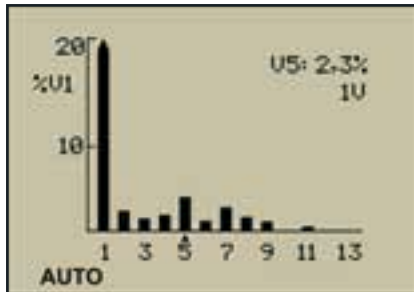
- Target cos φ (day/night)
- Target cos φ in regenerative mode
- Phase shift (for special connections)
- C/k (starting current)
- Switching sequence (customizable)
- Number of active outputs
- Switching delay times (on/off/reset)
- Switching strategy (linear or circular - normal or integral - direct or progressive)
- Alarm thresholds
- Single phase or three phase connection

## Easy commissioning with automatic setting of:

- Phase shift (for special connections)
- C/k (starting current)
- Number of outputs
- Switching sequence

## Communication:

- Printer connection
- Fieldbus adapter
- Input: day / night cos φ
- Input: external alarm
- Output: alarm relay
- Output: fan relay



Voltage harmonics spectrum



Voltage monitoring



Help message

## Powerful features

### Full graphics display

With its large dimensions and the clear positioning of information, prompts and icons, the RVT graphics display offers a high level of readability and an unprecedented level of viewing comfort.

### Menu navigation

The clever organization of menus and items makes the navigation easy and intuitive.

### HELP button

The Help button gives you an instant access to a comprehensive description of all RVT's features and functionality.



### Network information and capacitor bank monitoring

The RVT computes and displays network and capacitor bank information such as voltage, current, harmonics spectra and much more.

### Multi-language support

The RVT allows you to choose its working language (presently English and French).

### Protective transparent door

The keypad and display are protected by a transparent door.



### Guided navigation and programming

Information and warning messages guide you all the way in the menu navigation and RVT programming.

### Fully automatic set-up

C/k, active outputs, switching sequence and phase shift may be automatically set-up.

### Easy commissioning

The fully automatic set-up of the RVT makes the commissioning quick and easy.

### Programmable protection thresholds

Programmable thresholds allow you to protect the capacitor bank against such event as over and undervoltage, overtemperature and excessive harmonic distortion.



### High ambient temperature rating

The RVT is suitable for hot environments thanks to its maximum ambient temperature rating of 70°C.

### Multi-voltage and multi-frequency

The RVT may be connected to voltages in the range 100-440Vac, 50 or 60Hz.

### Works with 5A and 1A CT's

Both 5A and 1A CT's may be connected to the RVT

## Powerful features

### Customizable measurements overview

The RVT allows you to sort your preferred data in such a way that they are viewed first on the graphics display.



### Day - night target cos φ

The RVT allows the programming of two different target cos φ values.

### Locking switch

Unauthorised use may be blocked by a switch at the back of the RVT.

### Alarm logging

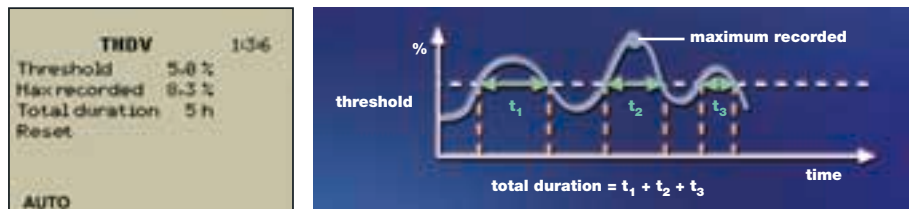
The last five alarm messages are recorded and may be consulted at any time.

### Event logging

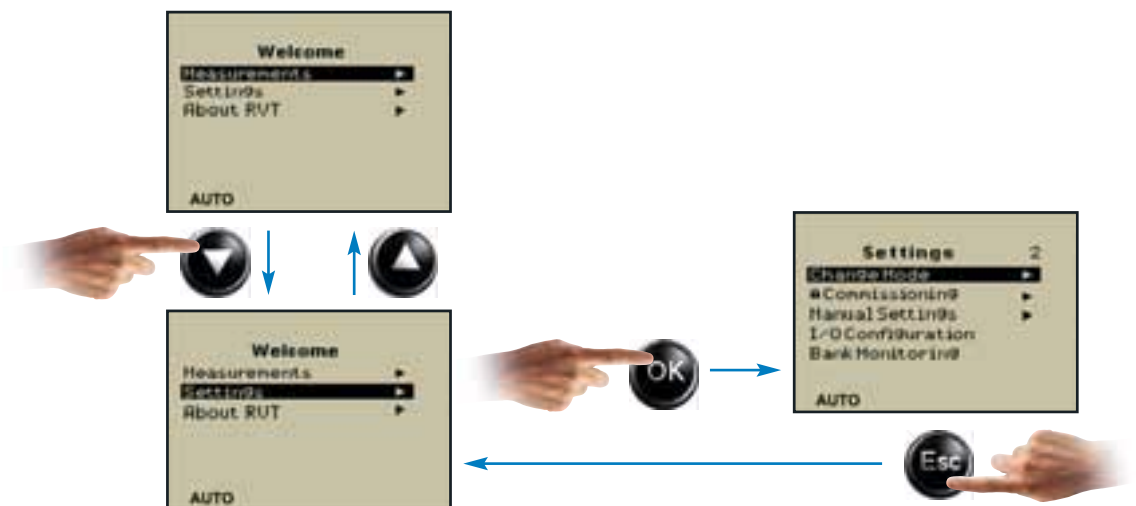
For selected measured parameters and according to the threshold set, the RVT records:

- the maximum value logged between two resets.
- the total duration during which the measured value has exceeded the threshold.

Example: event logging of Total Harmonic Distortion on Voltage



## Menu navigation



# Easy Commissioning

A dedicated menu allows the commissioning of the RVT in only a few simple steps.

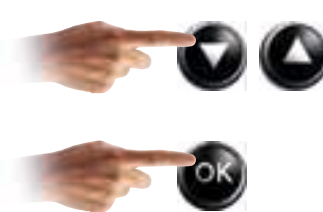
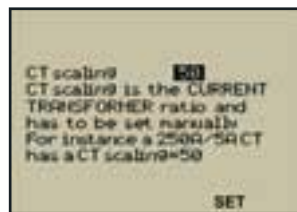
## Select "Automatic" in the commissioning menu



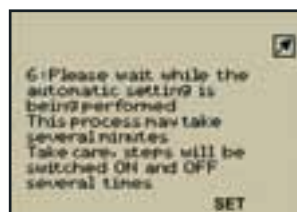
## Validate automatic setting



## Enter the Current Transformer scaling



## Parameters are automatically set



## Enter the target cos φ



## Optional accessories

### External probes for temperature measurements

Two temperature probes may be connected to the RVT.  
The RVT will close the fan relay if a temperature threshold is exceeded.  
Information on temperature may be recorded with the event logging function.

### Fieldbus adapter for communication (available soon)

The RVT fieldbus adapter allows fieldbus communication between the RVT and a supervision system.  
MODBUS communication: by connecting the MODbox to the isolated RS-232 serial port.  
Fieldbus communication: by connecting the TRSLbox to the isolated RS-232 serial port.

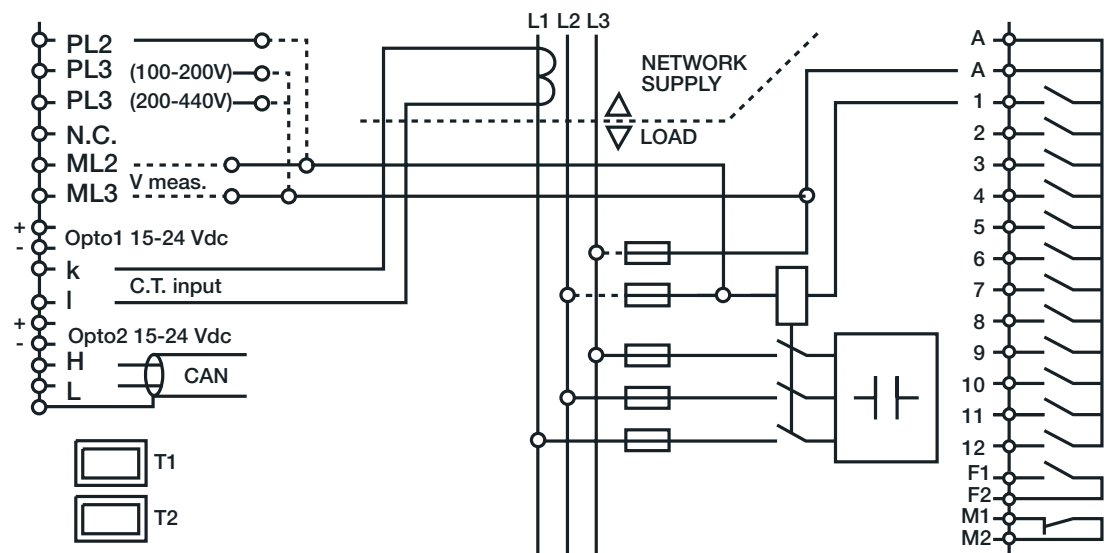
### Extension module for additional outputs (available soon)

Four outputs can be easily added to the RVT by means of an extension module.

### Printer connection

The RVT can be connected to a printer through the isolated RS-232 serial port.

## Wiring diagram



**PL2, PL3 :** power supply  
**ML2, ML3 :** measurement  
**OPTO1 :** day/night input  
**k, l :** current transformer  
**OPTO2 :** external alarm input  
**T1, T2 :** temperature probe inputs

**H, L :** CAN : extension module  
**A, A :** output relays' common source  
**1-12 :** outputs  
**F1, F2 :** output relay FAN  
**M1, M2 :** output relay ALARM

## Technical Specifications

### Measuring system:

Micro-processor-based system for balanced three-phase networks or single-phase networks.

### Supply voltage:

From 100Vac up to 440Vac.

### Consumption:

15 VA max.

### Connection type for measuring circuit and power supply:

Phase-phase or phase-neutral

### Voltage tolerance:

+/- 10% on indicated supply voltages.

### Voltage measurement:

Up to 690Vac or higher with voltage transformer.  
Accuracy : 1% full scale.

### Frequency range:

50 or 60 Hz +/- 5% (automatic adjustment to network frequency).

### Current input:

5A or 1A (RMS) (class1 C.T.).

### Current input impedance:

<0.1 Ohm.

### Output contact rating:

- Max. continuous current: 1.5A (ac) – 0.3A (110V dc).
- Max. peak current: 8A.
- Max. voltage: 440 Vac.
- Terminal A-A are rated for a continuous current of 18A (9A/terminal).

### Alarm contact rating (voltage free contact) :

- Normally closed contact.
- Max. continuous current: 1.5A.
- Rated voltage: 250Vac (max. breaking voltage: 440Vac).

### Fan contact rating (voltage free contact) :

- Normally open contact.
- Max. continuous current: 1.5A.
- 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.

### Step configuration:

Automatic, fixed, disabled.

### Full graphics display:

64 x 132 pixels with extra symbols.

### Number of outputs:

RVT 6: programmable up to 6 outputs.  
 RVT 12: programmable up to 12 outputs.  
 The RVT can be connected to an optional four-output extension module (available soon).

### Switching time between steps:

Programmable from 1s to 18h.

### Saving-function:

All programmed parameters and modes are saved in a non-volatile memory.

### Power outage release:

Automatic disconnection of all capacitors in case of a power outage longer than 20ms.

### Automatic adaptation to the phase-rotation of the network and the CT-terminals.

### Insensitivity to harmonics.

### Working with passive and regenerative loads (four-quadrant operation).

### LCD contrast automatically compensated with temperature.

### Operating temperature:

-20° C to 70° C.

### Storage temperature:

- 30° C to 85° C.

### Mounting position:

Vertical panel mounting.

### Dimensions:

Front plate : 144 x 144 mm (h x w).  
 Overall : 144 x 211 x 67 mm (h x w x d).

### Weight:

1.0 kg (unpacked).

### Connector:

Cage clamp type (2.5mm<sup>2</sup> single core cable).

### Front plate protection:

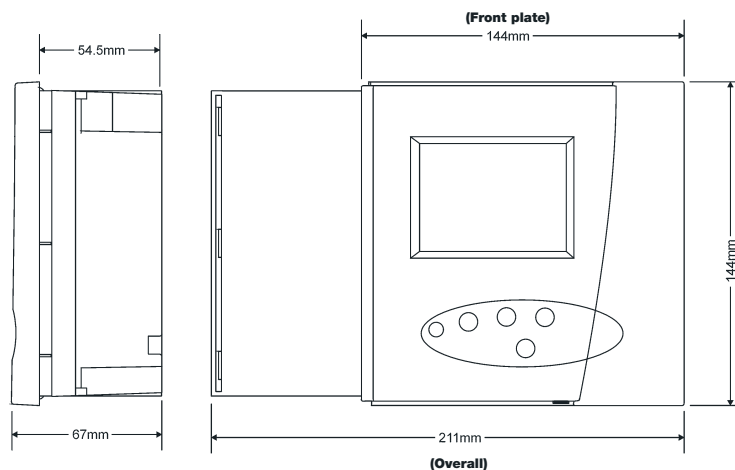
IP 43 (IP54: available soon).

### Relative humidity:

Maximum 95%, non-condensing.

### CE Marked.

## Dimensions





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