



RTVS1

230 VAC transformer controller with Modbus RTU communication

The RTVS1 series of transformer fan speed controllers regulate the rotational speed of single-phase voltage controllable motors in five steps by varying the output voltage. They are equipped with auto-transformer(s) and feature Modbus RTU communication, TK monitoring for thermal motor protection. The unit can be used in both manual mode and automatic mode. In manual mode, the unit functions as a 5-step controller. In automatic mode, the unit can be connected to a Sentera device allowing the unit to be used for demand-based ventilation.

Key features

- Controlled via Modbus RTU
- TK monitoring for thermal motor protection
- Automatic and manual control mode
- Automatic mode: from low to high or from high to low
- Selectable output update interval from 5 s to 10 min
- LED status indication
- Modbus RTU communication via RJ45 connectors
- Demand based ventilation in automatic mode

Technical specifications

Supply voltage	230 VAC / 50–60 Hz	
Operating modes	Automatic	Fan speed based on input from external Sentera device connected to the RJ45 Master connector
	Manual	Fan speed based on user input via Modbus Holding Register 12
Unregulated output	230 VAC / 10 A (resistive)	
Enclosure	plastic (R-ABS, UL94-V0, grey RAL 7035)	
Protection standard	IP54 (according to EN 60529)	
Ambient conditions	Temperature	-10–35 °C
	Rel. humidity	5–85 % rH (non-condensing)

Article codes

Article code	Rated max. current [A]	Fuse (5*20 mm) [A]	Current rating, no load [A]
RTVS1-15L22	1,5	T-2,5 A-H	0,04
RTVS1-25L22	2,5	T-4 A-H	0,06
RTVS1-35L22	3,5	T-5 A-H	0,08
RTVS1-50L22	5	T-8 A-H	0,1
RTVS1-75L22	7,5	T-10 A-H	0,12

Voltage

Steps	0	-	1	2	3	4	5
Wires		-					
Regulated output [VAC]							
Voltages**	0	80*	110	140	170	190	230

*Available but not connected.

**Because more than 5 output voltages are available, it is possible to adjust the 5 steps by changing the internal wiring.

Area of use

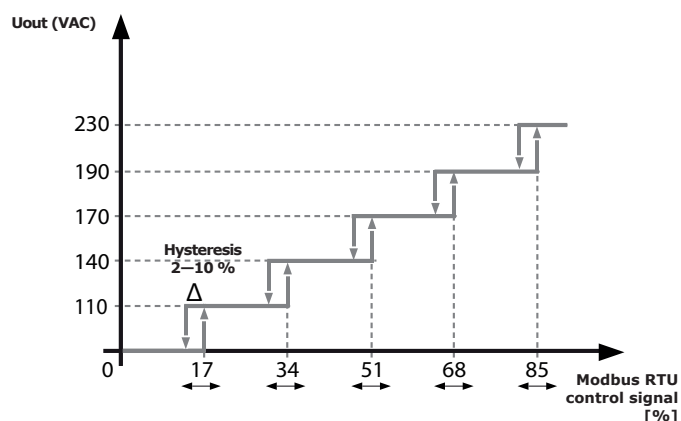
- Fan speed control of voltage controllable motors (pumps and fans) in ventilation systems
- For indoor use only
- Demand based ventilation in greenhouses, sheds and stables
- Ventilation based on temperature, relative humidity, carbon dioxide, air quality (TVOC), carbon monoxide or nitrogen dioxide*

*Selection can be made via RTVS1 Modbus holding register 18.

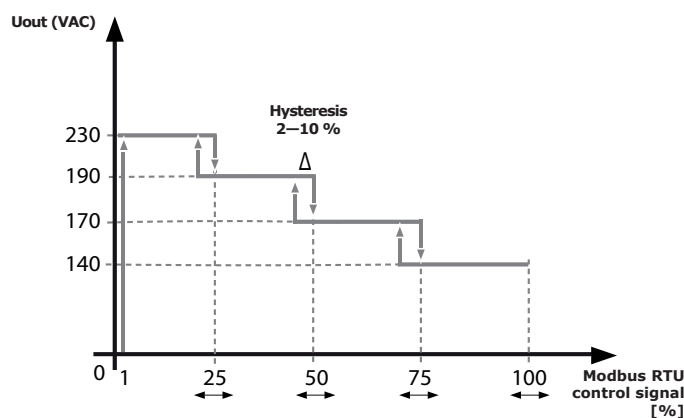


Operational diagram

Automatic mode 'Forward': Low to high speed



Automatic mode 'Reverse': High to low speed

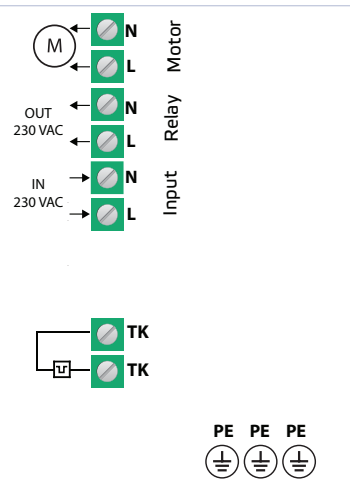
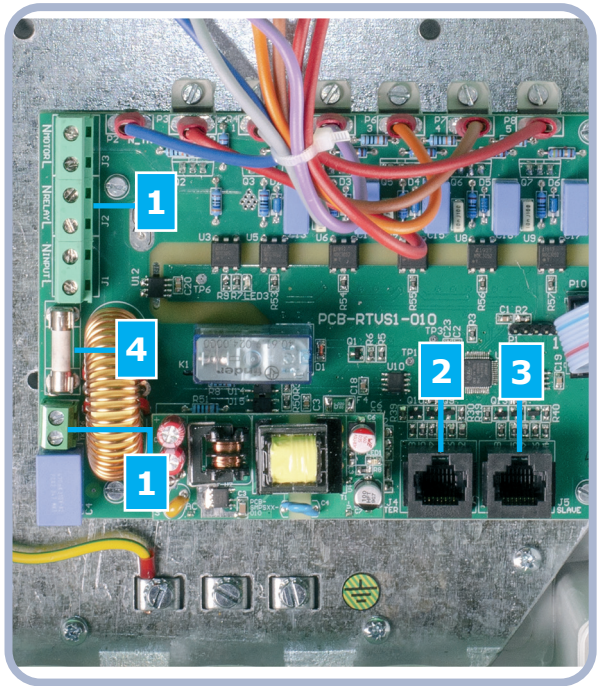


RTVS1

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Legend



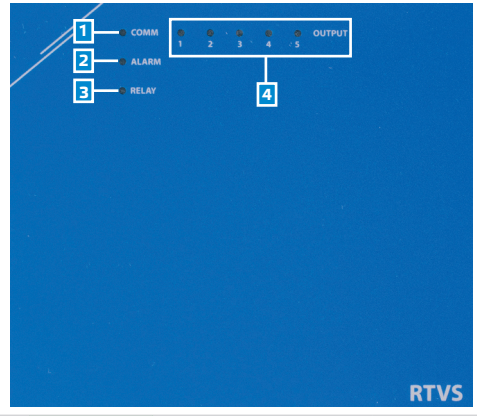
- 1 - Terminal block
- 2 - RJ45 master socket
- 3 - RJ45 gateway
- 4 - Fuse

To connect a Sentera devices* for automatic control. (In case no device is connected, RTVS1 can be manually controlled via Modbus holding register 12)

To connect a computer with 3SModbus software, Sentera internet gateway or a BMS system**

* Possible combinations can be found on our website.
 ** We advise using the CNVT-USB-RS485 converter to connect RTVS1 to the USB port of your PC.

Indications



1 - Comm LED	Continuous	Device powered; no Modbus RTU communication			
	Blinking	Active Modbus RTU communication			
2 - Alarm LED	Continuous	High priority problem: ADC error, EEPROM error, Frequency error, TK active, Overheating, Overcurrent, Overload, Sensor fault			
	Blinking	<table border="1"> <tr> <td>Once every 2,5 s</td> <td>No Modbus communication with article</td> </tr> <tr> <td>Twice every 2,5 s</td> <td>No Modbus communication with connected Sentera device (sensor or digital potentiometer)</td> </tr> </table>	Once every 2,5 s	No Modbus communication with article	Twice every 2,5 s
Once every 2,5 s	No Modbus communication with article				
Twice every 2,5 s	No Modbus communication with connected Sentera device (sensor or digital potentiometer)				
3 - Relay LED	On	Unregulated output = 230 VAC			
	Off	Unregulated output = 0 VAC			
4 - Output LEDs	On	Indication of currently active step			

Standards

- Low Voltage Directive 2014/35/EC:
- EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
- EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
- EMC Directive 2014/30/EC:
 - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
 - EN 61000-6-1:2007 Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments
 - EN 61000-6-3:2007 Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments Amendments A1:2011 and AC:2012 to EN 61000-6-3
- WEEE Directive 2012/19/EC
- RoHS Directive 2011/65/EC



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Wiring and connections

Terminal block

N	MOTOR	Regulated output to motor, neutral
L		Regulated output to motor, line
Pe		Protective earth terminal
N	RELAY	Unregulated output 230 VAC that can be activated manually via Modbus Holding register 15 or automatically according to the settings of Holding register 19
L		
N	INPUT	Power supply, neutral
L		Power supply, phase (230 VAC / 50–60 Hz)
TK		Input - TK monitoring for thermal motor protection
TK		

2 - RJ45 master socket - to connect a Sentera device for demand based fan speed control in automatic mode

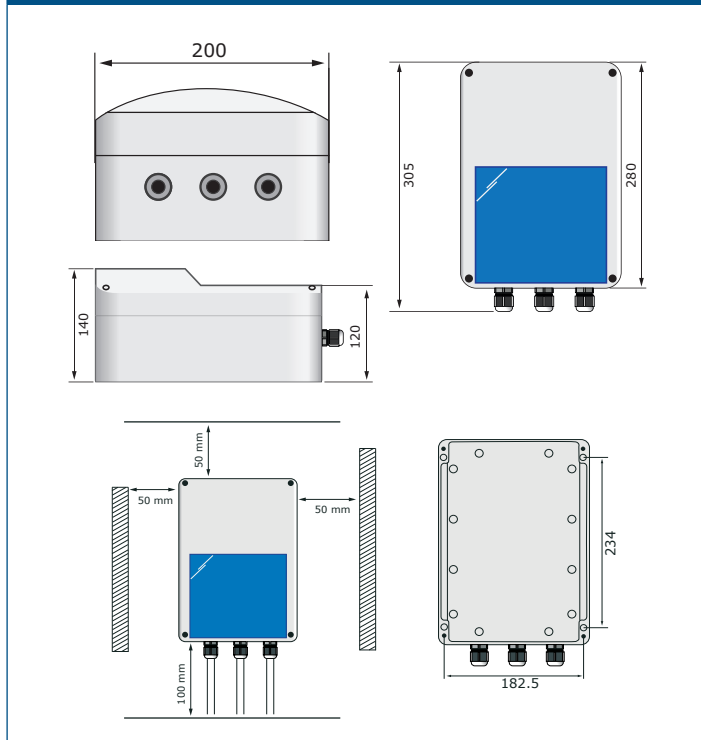
Pin 1	24 VDC	Supply voltage
Pin 2		
Pin 3	A	Modbus RTU communication, signal A
Pin 4		
Pin 5	/B	Modbus RTU communication, signal /B
Pin 6		
Pin 7	GND	Ground, supply voltage
Pin 8		

3 - RJ45 gateway - to connect a computer with 3SModbus software, Sentera internet gateway or a BMS system

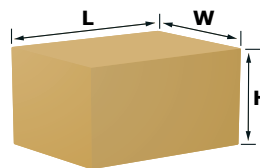
Pin 1		Do not connect to your computer
Pin 2		
Pin 3	A	Modbus RTU communication, signal A
Pin 4		
Pin 5	/B	Modbus RTU communication, signal /B
Pin 6		
Pin 7		Do not connect to your computer
Pin 8		



Fixing and dimensions



Packaging



Article code	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RTVS1-15L22	Unit (1 pc.)	325	210	155	3,5 kg	3,9 kg
RTVS1-25L22	Unit (1 pc.)	325	210	155	4 kg	4,4 kg
RTVS1-35L22	Unit (1 pc.)	325	210	155	5 kg	5,4 kg
RTVS1-50L22	Unit (1 pc.)	325	210	155	5,6 kg	6 kg
RTVS1-75L22	Unit (1 pc.)	325	210	155	7,75 kg	8,15 kg

Global Trade Item Number (GTIN)

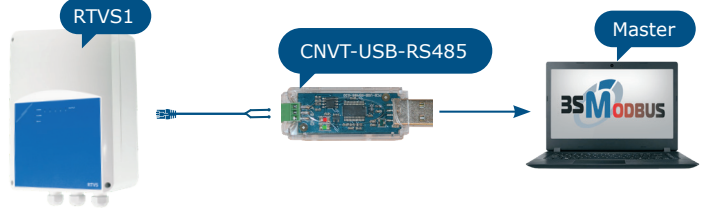
Packaging	RTVS1-15L22	RTVS1-25L22	RTVS1-35L22	RTVS1-50L22	RTVS1-75L22
Unit	05401003017449	05401003017456	05401003017463	05401003017470	05401003017487



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Application example 1: Manual mode - control via Modbus holding register 12



Application example 2: Automatic mode - demand based ventilation

