

# WRF06 RC RS485 Modbus

Room controller w/o control elements

**thermokon**<sup>®</sup>  
HOME OF SENSOR TECHNOLOGY

## Datasheet

Subject to technical alteration  
Issue date: 10.09.2025 • A141



*(Illustration shows. Insert switch range with support ring, frame optionally available depending on switch range)*

## » APPLICATION

The flush-mounted room sensor, type DI4 with 4 digital inputs is used for temperature detection in individual room control. Type AO2V can be used to control continuous 2-point controllers or 6-way valves for heating or cooling. The removable connection terminal enables pre-wiring.

## » TYPES AVAILABLE

### Room controller temperature + humidity (optional)

- WRF06 RC (rH) DI4 RS485 Modbus
- WRF06 RC (rH) AO2V RS485 Modbus

### Room controller temperature + humidity (optional) with flush mounted-IO module

- WRF06 RC (rH) DO2R RS485 Modbus
- WRF06 RC (rH) DO2T RS485 Modbus
- WRF06 RC (rH) OVR RS485 Modbus
- WRF06 RC (rH) OVT RS485 Modbus

## » SECURITY ADVICE – CAUTION

The installation and assembly of electrical equipment should only be performed by authorized personnel.



The product should only be used for the intended application. Unauthorised modifications are prohibited! The product must not be used in relation with any equipment that in case of a failure may threaten, directly or indirectly, human health or life or result in danger to human beings, animals or assets. Ensure all power is disconnected before installing. Do not connect to live/operating equipment.

Please comply with

- Local laws, health & safety regulations, technical standards and regulations
- Condition of the device at the time of installation, to ensure safe installation
- This data sheet and installation manual

## » PRODUCT TESTING AND CERTIFICATION



### Declaration of conformity

The declaration of conformity of the products are available on our website  
<https://www.thermokon.de/direct/en-gb/categories/wrf06-rc>

## » NOTES ON DISPOSAL



The crossed-out wheeled bin symbol indicates that the product or removable batteries must not be disposed of with household or commercial waste. Within the EU, you are legally obliged to dispose of the product separately and appropriately in accordance with the national laws of your country. Alternatively, please contact your supplier or Thermokon Sensortechnik GmbH. Further information can be found at: [www.thermokon.com](http://www.thermokon.com)

## » MOUNTING ADVISE ROOM SENSORS

The Accuracy of the room sensors are influenced by the technical specifications as well as the positioning and the installation type.

### During Assembly:

- Seal mounting box (if present).
- Installation type, air draught, heat source, radiation heat or direct sunlight can affect the measurement.
- Bulding material specific properties of the installation place (*brick-, concrete-, partition wall, cavity wall, ...*) can affect the measurement.

### Assembly not recommendet in...

- Air draught (e.g.: close to windows / doors / fans ...)
- Near heating sources,
- Direct sunlight
- Niches / between furniture / ...

---

## » BUILD-UP OF SELF-HEATING BY ELECTRICAL DISSIPATIVE POWER

Sensors with electronic components always have a dissipative power, which affects the temperature measurement of the ambient air. The dissipation in active temperature sensors shows a linear increase with rising operating voltage. This dissipative power has to be considered when measuring temperature. In case of a fixed operating voltage ( $\pm 0,2$  V) this is normally done by adding or reducing a constant offset value.

Thermokon transducers can be operated with variable operating voltages. The transducers are set at the factory with a reference operating voltage of 24 V =. At this voltage, the expected measuring error of the output signal will be the least. Other operating voltages, can cause a measurement deviation changing power loss of the sensor electronics.

A recalibration can be carried out directly on the unit or via a software variable (app or bus).

**Remark: Occurring draught leads to a better carrying-off of dissipative power at the sensor. Thus temporally limited fluctuations might occur upon temperature measurement.**

---

## » APPLICATION NOTICE FOR HUMIDITY SENSORS

At regular environmental condition, it is recommended to calibrate the sensor annually to check the compliance with the accuracy required in the application. The following conditions can damage the sensor element or lead in long term to loss of the specified accuracy:

- Mechanical stress
- Contamination (e.g. dust / fingerprints)
- Aggressive chemicals
- Ambient conditions (e.g. condensation on measuring element)



**Do not touch the sensor elements!**

**Re-calibration or exchange of the sensor element are not subject of the general warranty.**

» **TECHNICAL DATA**

Measuring values (type-dependent)	temperature, humidity	
Output Voltage (type-dependent)	<b>AO2V</b> 2x 0..10 V, heating & cooling, (min. load 10 kΩ)	
	<b>OVR   OVT</b> 1x 0..10 V cooling, (min. load 10 kΩ)	
Output switching contact (type-dependent)	<b>DO2R</b> 2x floating contact NO for 24 V =/~, load max. 3 A, heating & cooling	
	<b>OVR</b> 1x floating contact NO for 24 V =/~, load max. 3 A, heating	
	<b>OVT</b> 1x floating contact Triac for 24 V ~, load max. 1 A, cooling	
	<b>DO2T</b> 2x floating contact Triac for 24 V ~, load max. 1 A, heating & cooling	
Network technology	RS485 Modbus <b>Fail-safe Biasing required</b>	
Power supply	<b>AO2V   OVR   DO2R   DI4</b> 15..24 V = (±10%) or 24 V ~ (±10%) SELV	<b>OVT   DO2T</b> 24 V ~ (±10%) SELV
power consumption*	typ. 0,9 W (24 V =)   1 VA (24 V ~)	
Measuring range temperature	0..+50 °C	
Measuring range humidity	0..100% rH non-condensing	
Accuracy temperature	±0,5 K (typ. at 21 °C)	
Accuracy humidity	±2% between 10..90% (typ. at 21 °C)	
Inputs (type-dependent)	<b>DI4</b> 4x inputs digital for floating contacts	
Protection	IP20 according to EN 60529	
Connection electrical	terminal block, max. 1,5 mm <sup>2</sup>	
Ambient condition	0..+50 °C, max. 85% rH non-condensing	
Mounting	flush mounted in standard EU box (Ø=60 mm, min. depth=45 mm), DO2T, DO2R, OVR, OVT with IO extension need 2 flush-mounting boxes (Ø=60 mm) and double frame (alternatively, the IO unit can be mounted in a deep flush-mounted box or be detached up to 10 m)	
Notes	for other frame designs please request	

**\*Power supply**

When several BUS devices are supplied by one 24 V AC voltage supply, it is to be ensured that all "positive" operating voltage input terminals (+) of the field devices are connected with each other and all "negative" operating voltage input terminals (-) (=reference potential) are connected together (in-phase connection of field devices).

In case of reversed polarity at one field device, a supply voltage short-circuit would be caused by that device. The consequential short-circuit current flowing through this field may cause damage to it.

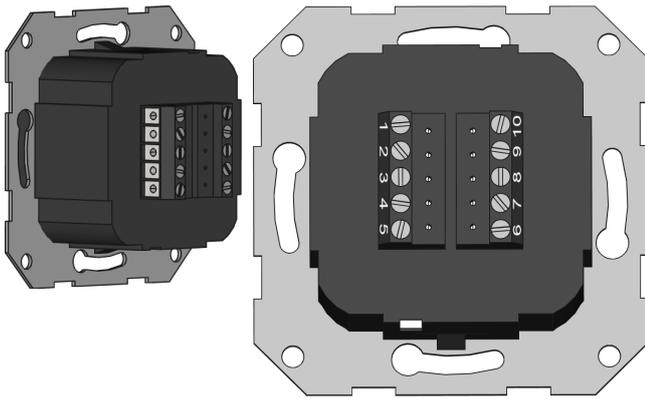
Therefore, pay attention to correct wiring.

» **TYPE OVERVIEW – FUNCTIONALITY**

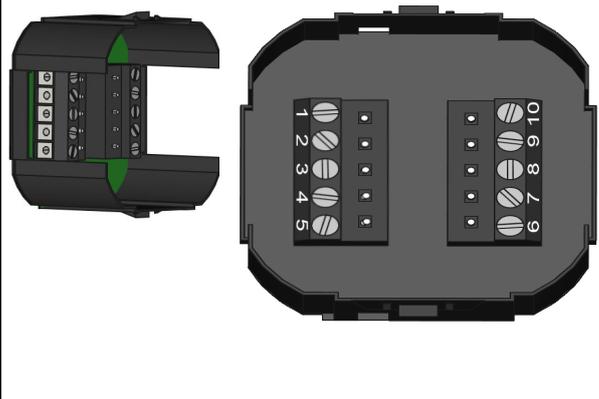
WRF06	Digital Inputs	Internal Controller	0..10 V Heating	0..10 V Cooling	Relay Heating	Relay Cooling	Triac Heating	Triac Cooling	6WV Heating&Cooling
DI4	4								
AO2V	2	•	•	•					•
OVR	2	•		•	•				
OVT	2	•		•	•				
DO2R	2	•			•	•			
DO2T	2	•					•	•	

» **CONNECTION PLAN**

**Main device**

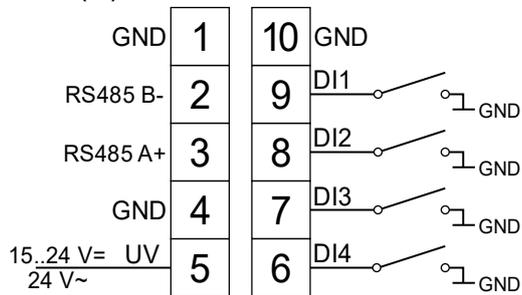


**IO module**

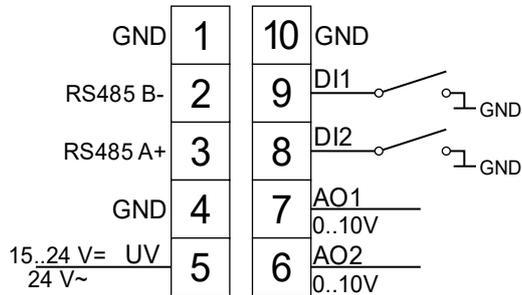


The BUS cabling for all device versions is carried out via terminals 2 and 3 in the flush-mounted main device.  
 DI – Digital Input | AO – Analogue Output | DO – Digital Output

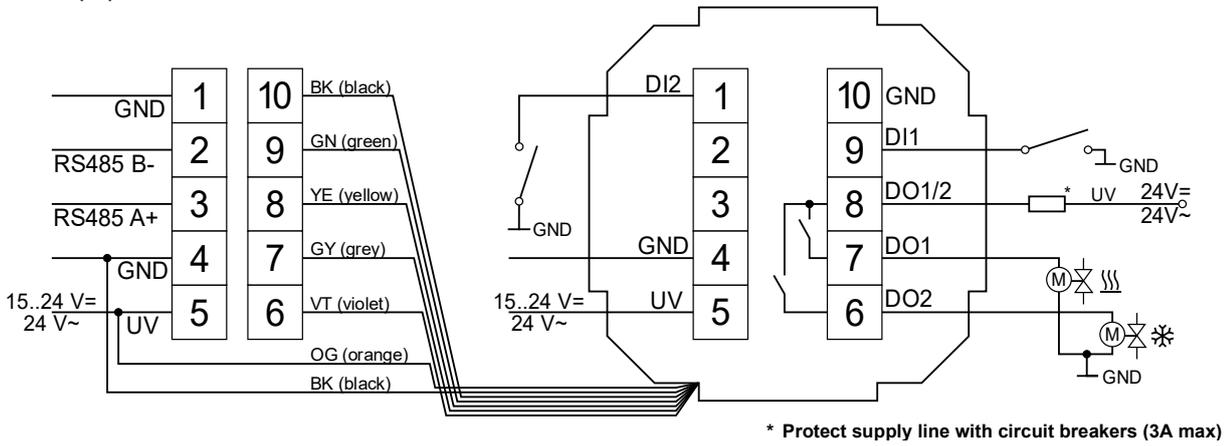
**WRF06 (rH) DI4**



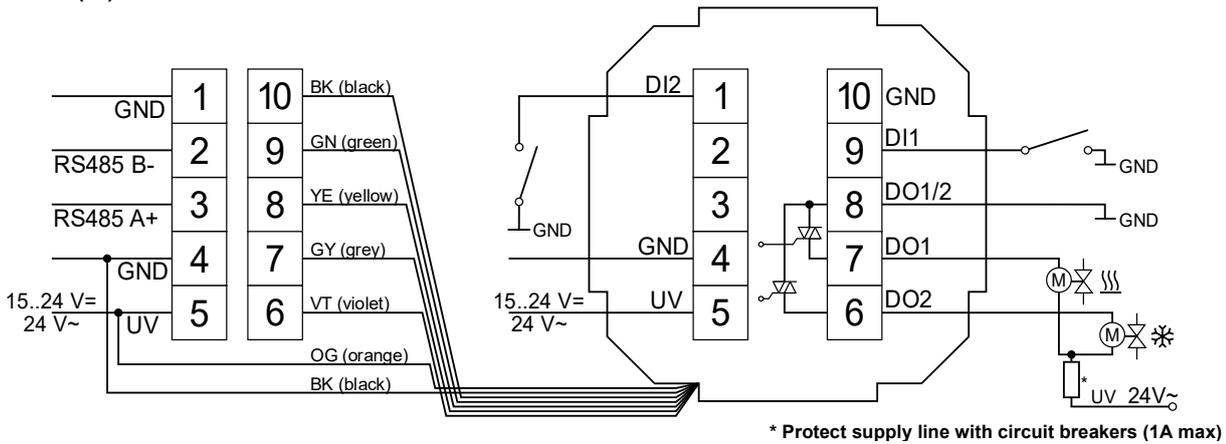
**WRF06 (rH) AO2V**



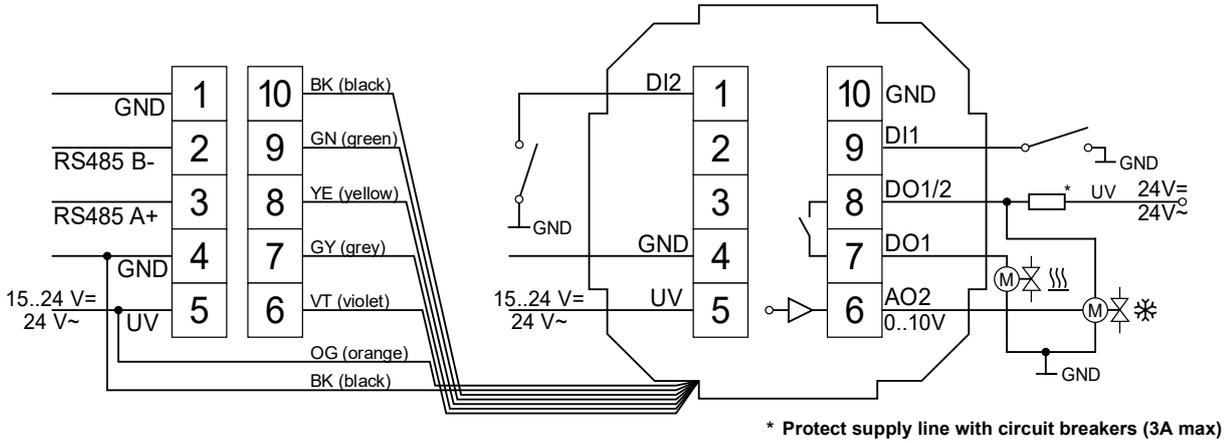
**WRF06 (rH) DO2R IO-module**



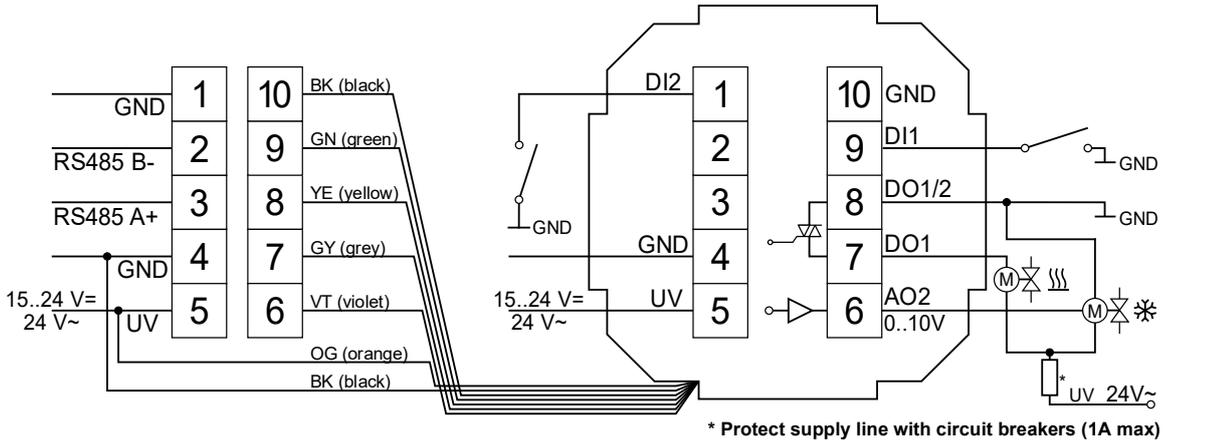
**WRF06 (rH) DO2T IO-modul**

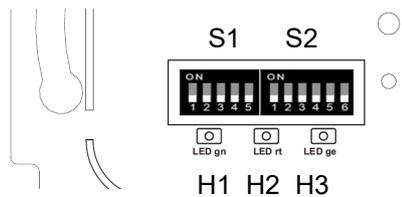


**WRF06 (rH) OVR IO-modul**



**WRF06 (rH) OVT IO-modul**



» **DIP-SWITCH CONFIGURATION**

LED	Description
[H1] Green	Lights up permanently during normal operations
[H2] Red	Lights up in case of a corrupt bus configuration and internal errors
[H3] Yellow	Blinks when RS485 Modbus telegrams are received and sent

## [S1] Modbus adress- DIP 1..5 (binary coded)

Dipswitch	1 = on	2 = on	3 = on	4 = on	5 = on	
Value	2 <sup>0</sup> (1) (factory default)	2 <sup>1</sup> (2)	2 <sup>2</sup> (4)	2 <sup>3</sup> (8)	2 <sup>4</sup> (16)	

## [S2] Mode - DIP 1

1	Mode
off	RTU (factory default)
on	ASCII

## [S2] Baud rate - DIP 2 and 3

2	3	Baud rate
off	off	Baud 9600 (factory default)
on	off	Baud 19200
off	on	Baud 57600

## [S2] Parity – DIP 4 and 5

4	5	Parity
off	off	None – 2-Stopbits
on	off	Even – 1 Stopbit (factory default)
off	on	Odd – 1 Stopbit

## [S2] Termination – DIP 6

6	Termination 120 Ohm
off	Inactive (factory default)
on	Active

» **CONFIGURATION SOFTWARE AND PROTOCOL DESCRIPTION****Modbus Addresses:**

RS485 Modbus interface description

A detailed description of the Modbus addresses can be found at the following link:

<https://www.thermokon.de/direct/files/wrf06-rs485-modbus.zip>**Configuration software:**

WRF06-RS485 Modbus

<https://www.thermokon.de/direct/files/wrf06-lcd-configsoftware.zip>

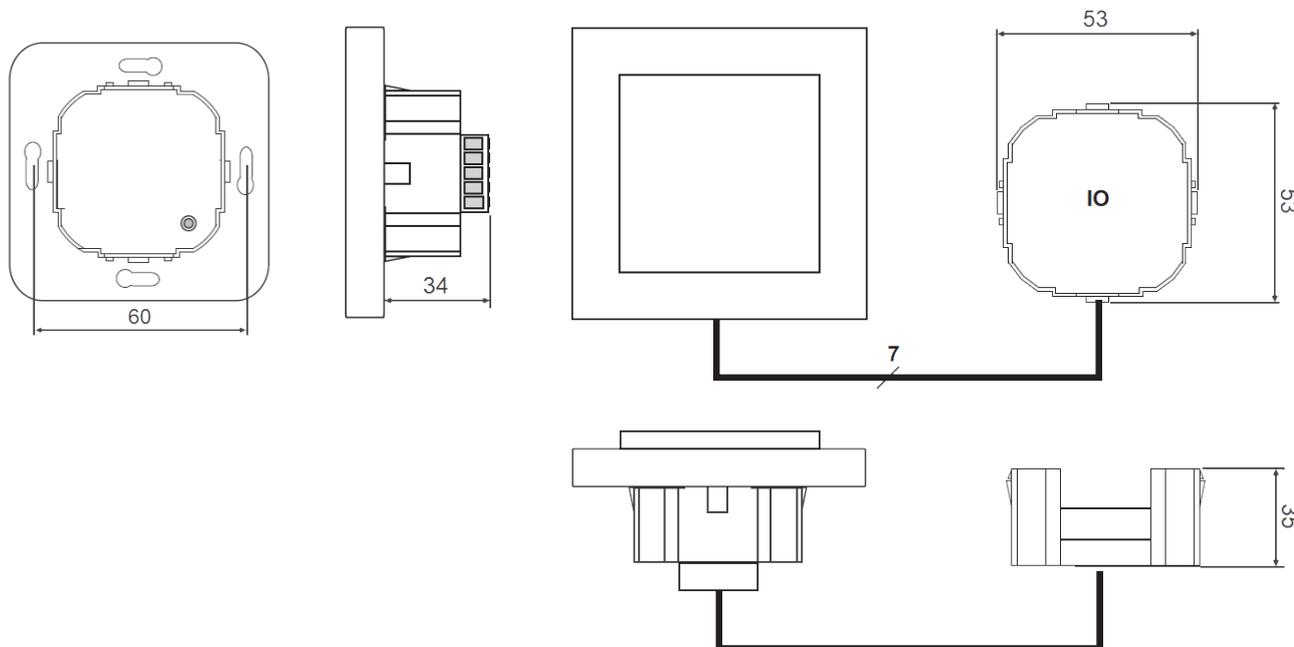
## » MOUNTING ADVICES

The device is designed for mounting on a flush-mounted box. The bus cable is connected to the device by a terminal screw. For pre-wiring, the clamping screw can be removed.

Due to the space for cabling, the use of deep installation boxes is recommended. The screws of the installation box (maximum torque of the screws 0.8 Nm) can fasten the lower part. The installation must be carried out in representative places for the room temperature, in order to avoid a falsification of the measuring result. Direct sunlight and drafts should be avoided. The end of the installation pipe in the flush-mounted box must be sealed in order to prevent drafts in the pipe. To ensure a smooth and accurate installation, it is essential that the installation boxes used are not jut out from the wall surface. The box must be flush with the wall or slightly recessed in the wall.

## » DIMENSIONS (MM)

Outside dimensions are depending on the frame of the respective switch range.



## » ACCESSORIES (OPTIONAL)

PSU-UP24 – flush mount power supply 24 V (AC Input 80..240 V ~ DC Output 24 V = 0,5 A)

Item No. 668293

RS485 Biasing Adapter

Item No. 811378

USB Interface RS485 (incl. driver CD)

Item No. 668293