

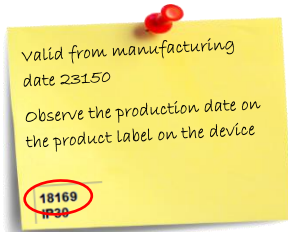
# WRF06 RC RS485 BACnet MS/TP

Room controller

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

## Datasheet

Subject to technical alteration  
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(Illustration shows. Insert switch range with support ring, frame optionally available depending on switch range)

## » APPLICATION

The visually appealing flush-mounted room controller can be supplied in the most common switch ranges and various colour variants and serves for individual temperature control in living, hotel and office rooms. Depending on the type, continuous or 2-point valves for heating or cooling can be controlled. The removable terminal allows easy pre-wiring.

## » TYPES AVAILABLE

### Room controller temperature + humidity (optional)

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

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

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

## » 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 wheellie 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 / ...

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## » 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.**

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## » 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**

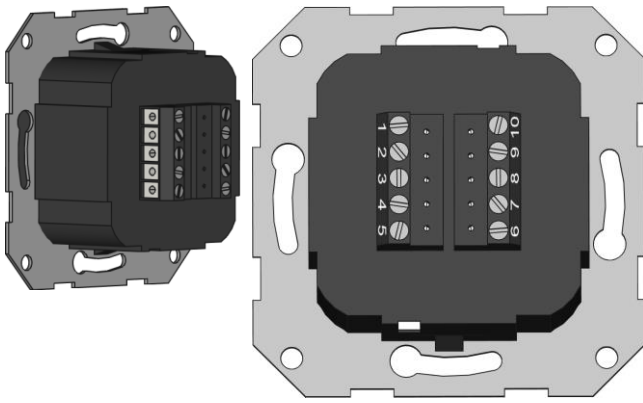
Measuring values <i>(type-dependent)</i>	temperature, humidity	
Output Voltage <i>(type-dependent)</i>	<b>AO2V</b> 2x 0..10 V, heating & cooling, (min. load 10 kΩ)	
	<b>OVR   OVT</b> 1x 0..10 V cooling, (min. load 10 kΩ)	
Output switching contact <i>(type-dependent)</i>	<b>DO2R</b> 2x floating contact 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 BACnet MS/TP <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 <i>(type-dependent)</i>	<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 mm)	
Notes	for other frame designs please request	

» **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



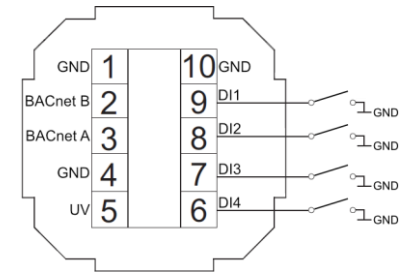
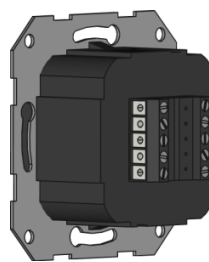
IO module



The BUS cabling for all device versions is carried out via terminals 2 and 3 in the flush-mounted main device.

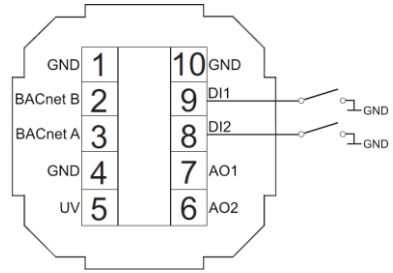
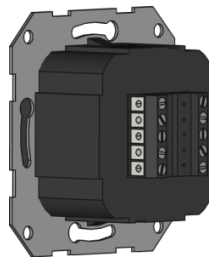
WRF06 (rH) DI4

GND	1	10	GND
BACnet B	2	9	DI1 – Digital Input 1
BACnet A	3	8	DI2 – Digital Input 2
GND	4	7	DI3 – Digital Input 3
15..24 V =   24 V ~	5	6	DI4 – Digital Input 4



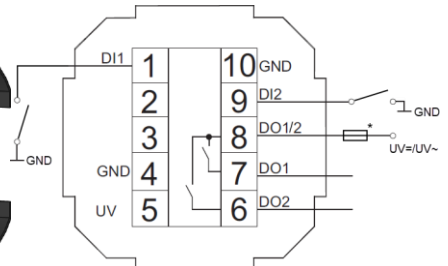
WRF06 (rH) AO2V

GND	1	10	GND
BACnet B	2	9	DI1 – Digital Input 1
BACnet A	3	8	DI2 – Digital Input 2
GND	4	7	AO1 – Heating (0..10V)
15..24 V =   24 V ~	5	6	AO2 – Cooling (0..10V)



WRF06 (rH) DO2R IO-module

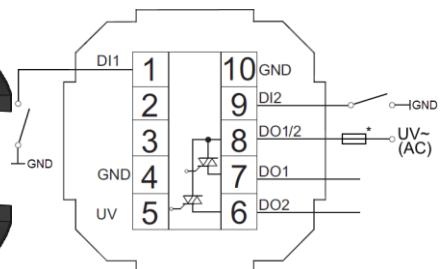
DI2 - Digital Input 2	1	10	GND
	2	9	DI1 – Digital Input 1
	3	8	max. 24 V (DO1   DO2)*
GND	4	7	DO1 – Heating (Relay)
15..24 V =   24 V ~	5	6	DO2 – Cooling (Relay)



\*Protect supply line with circuit breakers (3A max)

WRF06 (rH) DO2T IO-module

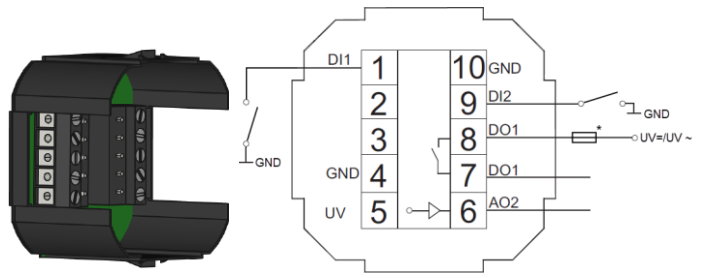
DI2 – Digital Input 2	1	10	GND
	2	9	DI1 – Digital Input 1
	3	8	max. 24 V~ (DO1   DO2)*
GND	4	7	DO1 – Heating (Triac)
15..24 V =   24 V ~	5	6	DO2 – Cooling (Triac)



\*Protect supply line with circuit breakers (1A max)

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

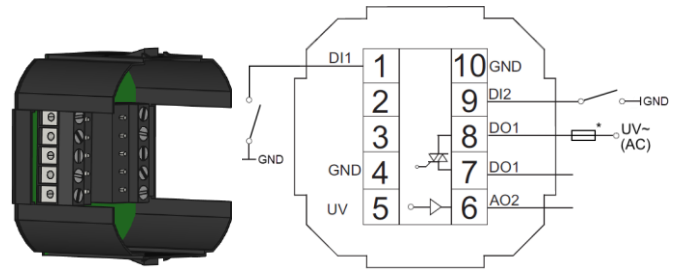
DI2 – Digital Input 2	1	10	GND
	2	9	DI1 – Digital Input1
	3	8	max. 24 V (DO1   DO2)*
GND	4	7	DO1 – Heating (Relay)
15..24 V =   24 V ~	5	6	AO2 – Cooling (0..10V)



\*Protect supply line with circuit breakers (3A max)

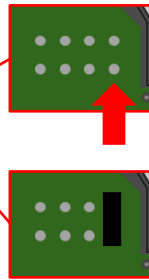
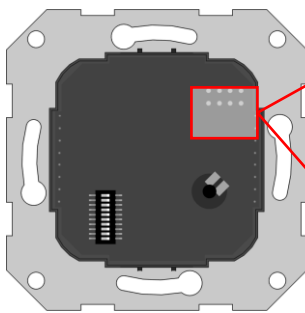
**WRF06 (rH) OVT IO-module**

DI2 – Digital Input 2	1	10	GND
	2	9	DI1 – Digital Input1
	3	8	max. 24V~ (DO1)*
GND	4	7	DO1 – Heating (Triac)
15..24 V =   24 V ~	5	6	AO2 – Cooling (0..10V)



\*Protect supply line with circuit breakers (1A max)

**» DIP SWITCH CONFIGURATION / TERMINATION**

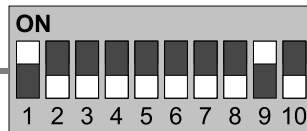


Always BUS termination (**120 Ω**) at the last device of the line!

**Jumper not set:** Bus Termination not active

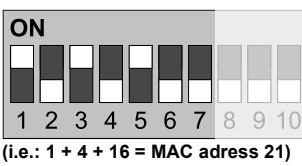
**Jumper set:** Bus Termination active

BACnet Mac address - DIP 1..7  
(binary coded)



(Abbildung zeigt die Werkseinstellung)

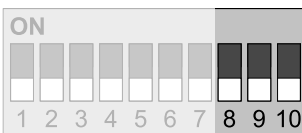
**BACnet Mac addresses**



Dip-switch	ON	ON	ON	ON	ON	ON	ON
	1 2 3 4 5 6 7	1 2 3 4 5 6 7	1 2 3 4 5 6 7	1 2 3 4 5 6 7	1 2 3 4 5 6 7	1 2 3 4 5 6 7	1 2 3 4 5 6 7
Value	on= 2 <sup>0</sup> (1)	on= 2 <sup>1</sup> (2)	on= 2 <sup>2</sup> (4)	on= 2 <sup>3</sup> (8)	on= 2 <sup>4</sup> (16)	on= 2 <sup>5</sup> (32)	on= 2 <sup>6</sup> (64)

**Adress-range 1..127**

**Baud rate - DIP 8 & 9 & 10**



	8 9 10	8 9 10	8 9 10	8 9 10	8 9 10	8 9 10	8 9 10
	off off off	on off off	off on off	on on off	off off on	on off on	off on on
	9600	19200	38400	57600	76800	115200	

**Operating status bus communication**

LED	Colour	Description
STA	green	Lights up permanently during normal operation
RXD	yellow	Blinks when RS485 BACnet telegrams are received
TXD	yellow	Blinks when RS485 BACnet telegrams are sent
ERR	red	Lights up in case of a corrupt bus configuration and internal errors

**Note:**  
During startup, all 4 LEDs blink for a few seconds.

## » CONFIGURATION SOFTWARE AND PROTOCOL DESCRIPTION



### BACnet Objects / BIBBs and PICS:

RS485 BACnet MS/TP Interface

<https://www.thermokon.de/direct/files/wrf0x-rc-bacnet-manual.zip>

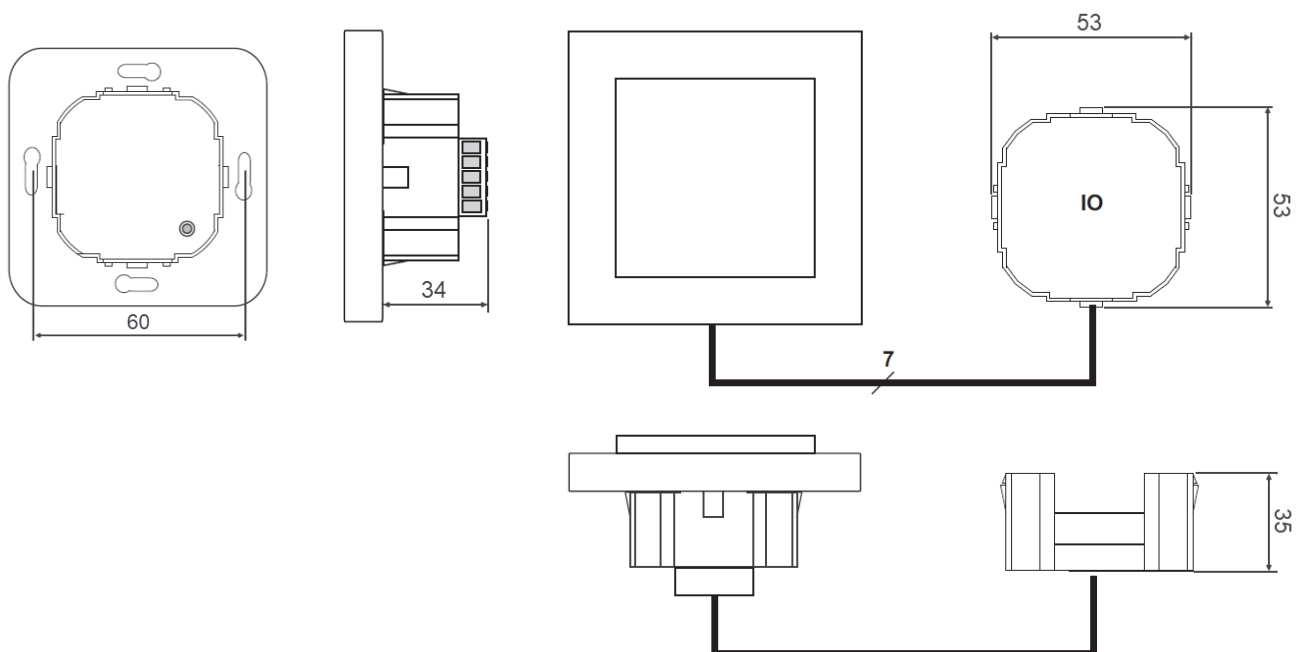
## » MOUNTING ADVICES

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