NOVOS 3 x (EPD)

Room operating unit for temperature measurement
Optional: Humidity | CO_2 | VOC

thermokon®
HOME OF SENSOR TECHNOLOGY

Data sheet

Subject to technical changes
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novos



»APPLICATION

Room operating unit with recording room temperature, optional with humidity, CO_2 or VOC. The maintenance-free sensor creates the conditions for a pleasant indoor climate and well-being. Typical applications are schools, office buildings, hotels, cinemas or similar.

»TYPES AVAILABLE

Room operating unit – active potentiometer

NOVOS 3 P <sensor>



NOVOS 3 TD <sensor>



NOVOS 3 PTD <sensor>



»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. Unauthorized modifications are prohibited! The product must not be used in relation to any equipment that in case of 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 installation. Do not connect to live/operating equipment.

Please comply with

- Local laws, health & safety regulations, technical standards and regulations
- The state of the technology at the time of installation
- This data sheet and installation manual

»PRODUCT TESTING AND CERTIFICATION

CE

Declaration of conformity
The declaration of conformity of the products is available on our website:
https://www.thermokon.de/direct/en-gb/categories/novos-3-x

»NOTES ON DISPOSAL



The crossed-out wheelie 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

»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 must be considered when measuring temperature. In case of a fixed operating voltage (±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).

»APPLICATION NOTICE FOR HUMIDITY SENSORS

At regular environmental conditions, 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 or fingerprints)
- Aggressive chemicals
- Ambient conditions (e.g. condensation on measuring elements)

Do not touch the sensor elements!

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

»INFORMATION ABOUT SELF-CALIBRATION FEATURE CO_2

All gas sensors are subject to drift. The degree of drift is dependent on the use of components and product design. In addition, the following environmental conditions, among others, can accelerate/favor the aging and wear of the sensors:

- Mechanical stress (also due to temperature fluctuation)
- Contamination (e.g. dust or fingerprints)
- Aggressive chemicals
- Ambient conditions (high humidity or condensation on measuring elements)

An internal self-calibration function with dual channel technology compensates for the caused drift. Thermokon sensors are for permanent use (e.g. hospitals).

»INFORMATION ABOUT INDOOR AIR QUALITY CO_2

EN 13779 defines several classes for indoor air quality:

Category	CO_2 content above the content in outdoor air in ppm		Description
	Typical range	Standard value	
IDA1	<400 ppm	350 ppm	Good indoor air quality
IDA2	400..600 ppm	500 ppm	Standard indoor air quality
IDA3	600..1.000 ppm	800 ppm	Moderate indoor air quality
IDA4	>1.000 ppm	1.200 ppm	Poor indoor air quality

»USER INFORMATION FOR VOC AIR QUALITY SENSORS

Volatile organic compounds (VOC) are gaseous and vaporous substances of organic origin present in the air. VOC sensors detect the major portion of air quality that is perceived olfactorily (through the sense of smell) by humans (e.g. body odors, tobacco smoke, emissions from materials such as furniture, carpets, paints, adhesives, etc.).

The VOC value is an application-specific indicator of indoor air quality and does not provide any information about the composition of the substances present.

A VOC sensor oxidises the organic molecules that come into contact with it, causing the resistance of the semiconductor to change. The VOC index (0...500) describes the air quality relative to the learned indoor air conditions. A value of 100 corresponds to “normal” indoor air quality (reference value determined dynamically over approximately 8 days); values below 100 indicate an improvement, while values above 100 indicate a deterioration in air quality. If the room is not ventilated despite high index values, the value will gradually approach 100 again, as the sensor learns the poor air as the new “normal”.

The sensor must not be exposed to direct drafts, as these can significantly influence and distort the measurement result. Any contact with the sensitive sensors must be avoided and will void the warranty.

VOC index	Classification	Meaning	Recommendation
0 – 100	Better air quality	Lower VOC load than the learned reference level of the previously measured indoor air quality (see Section 4.2), e.g. after ventilation, when using an air purifier, or with low room occupancy.	No action needed
100	Reference value (baseline)	Corresponds to the “normal” indoor air quality learned by the algorithm. On Thermokon devices, this reference is determined dynamically over approx. 8 days (see Section 4.2).	Normal condition
100 – 500	Worse air quality	Higher VOC load than the learned reference level, e.g. due to cooking, cleaning agents, high occupancy, or emissions from new furniture or fresh paint.	Ventilation or air purification are recommended; at high values (> 350) intense ventilation is recommended

» TECHNICAL DATA

Measuring values	Temperature, humidity (optional), CO_2 (optional), VOC (optional)	
Output voltage	***TRV | VV | 3 x V | 4 x V*** 0..10 V or 0..5 V, min load 10 kΩ (live-zero configuration 1..10/2..10 V via Thermokon NOVOSapp)	
Output Amp	***TRA | AA*** 4..20 mA, max. load 500 Ω	
Power supply	***TRV | VV | 3 x V | 4 x V*** 15..35 V = or 19..29 V ~ SELV	***TRV | VV | 3 x V | 4 x V*** 15..35 V = or 19..29 V ~ SELV
Power consumption	Typ. 0,4 W (24 V =) | 0,8 VA (24 V ~)	
Display *(optional)*	ePaper, as measured value display, display can be parameterised via Thermokon NOVOSapp	
Set point (P)	Potentiometer, active output **TRV:** 0..10 V | **TRA:** 4..20mA	
Button (T)	For presence detection, with LED (TD), floating contact, switching capacity max. 0,6 W (24 V=)	
LED (D)	For status feedback, colour can be set via Jumper (choose from 7 colours), factory default white	
Enclosure	PC V0, pure white, design cover (optional)	
Degree of Protection	IP20, according to DIN EN 60529	
Cable entry	Open rear side, predetermined breaking points at the bottom, drill marks on the top	
Electrical connection	Tool-free mountable spring terminal, max. AWG 16	
Ambient condition	-4..+158 °F, max. 85 % (non-condensing), with CO_2 or VOC sensor operating temperature range +32..+122 °F	
Mounting	Surface mounted on flush-mounting box (Ø = 2.36 in. | 60 mm) or to be mounted flat onto the surface using screws, base part can be mounted and wired separately	
Notes	For configuration, an optional programming dongle (Bluetooth) is available (refer to accessories)	

» **Temperature** *(optional)*

Output signal range temp. **scaling analogue output*	+40..+140 °F (default setting), selectable from 4 temperature ranges -30..+130 | +40..+140 | 0..+100 | +40..+90 °F, configurable via NOVOSapp
Accuracy temperature	±0,5 K (typ. at 70 °F

» **Humidity** *(optional, only for variant NOVOS 3 P TRV/TRA, potentiometer_active)*

Measuring range humidity *(optional configurable)*	**Relative humidty** (default) 0..100 % rH	**Enthalpy** 0..37 BTU/lb	**Absolute humidity** 0..1,5 | 0..2,3 g/ft³	**Dew point** +32..+122 | -4..+176 °F
	Configurable via Thermokon NOVOSapp or BUS			
Accuracy humidity	±2 % between 10..90 % rH (typ. at 70 °F)			

» **CO_2** *(optional, only for variant NOVOS 3 P TRV/TRA, potentiometer_active)*

Measuring range CO_2	0..2000 ppm | 0..5000 ppm (configurable via Thermokon NOVOSapp or BUS)
Accuracy CO_2	±50 ppm +3 % of reading (typ. at 70 °F, 50 % rH, 1015 hPa)
Calibration	Self-calibration dual channel
Sensor	NDIR (non-dispersive, infrared)
Display *(optional)*	RGB LED indicating air quality (traffic light function 'TLF')

» **VOC** *(optional, only for variant NOVOS 3 P TRV/TRA, potentiometer_active)*

Measuring range VOC	VOC index: 0..500
Sensor	Heated metal oxide semiconductor

»MOUNTING ADVICE

The Accuracy of the room sensors is 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.
- Building material specific properties of the installation place *(brick-, concrete-, partition wall, cavity wall)* can affect the measurement.

Assembly not recommended:

- in air draughts (e.g.: close to windows/doors/fans)
- near heating sources,
- in direct sunlight
- niches/between furniture

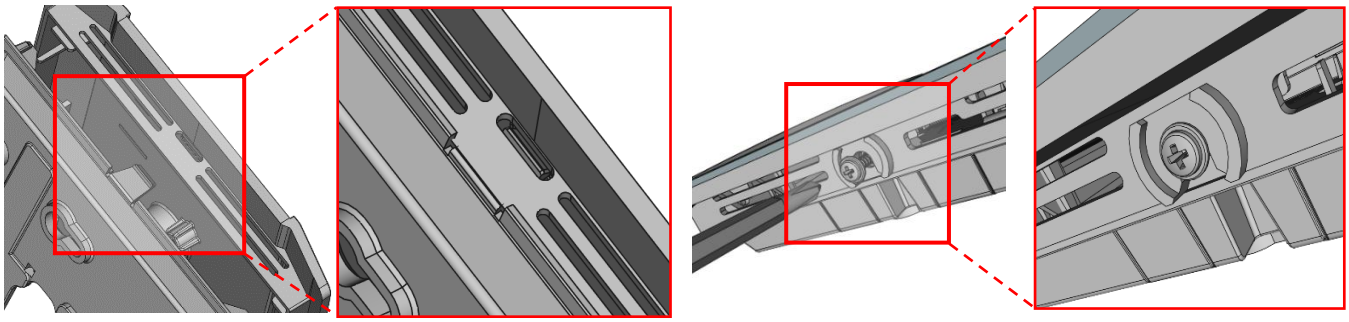
Please make sure that the device is de-energised if you want to install it!

The installation can be performed on the flat wall surface or on a flush-mounted box. A representative place should be selected. Sunshine and draft, e.g. in the installation tube should be avoided, so that the measurement result is not falsified. Seal the end of the installation tube.

- for wiring, the upper part of the device must be removed from the base plate. Base plate and upper part are detachable connected to each other by means of locking lugs.
- the base plate is mounted on the flat wall surface with wall plugs and screws.
- finally, the device is attached to the base plate and fixed with the screw.
- internal connecting wires must be routed in such a way that they do not press against the PCB or the sensors. Excess cable must be stored in the flush-mounted wall box.

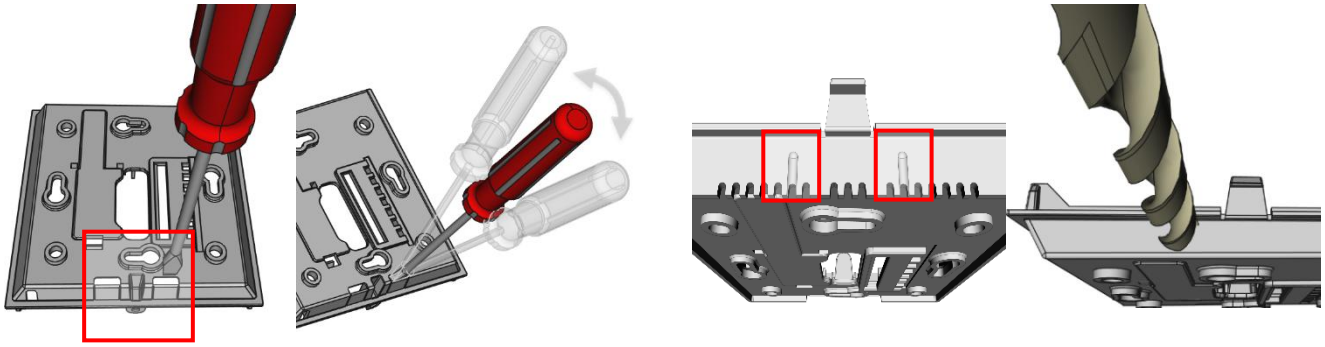
Housing open/close

Snap the upper part of the housing into the locking lug on the upper side	Fix the upper part of the housing on the underside with the screw



Cable entry

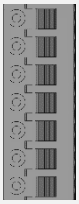
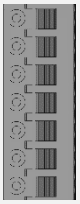
There are predetermined breaking points for 2 optional cable entries on the underside of the base plate	On the upper side of the base plate there are 2 grits as position for a drill hole max. Ø 6 mm



When using a drill, you should absolutely ensure that the base plate is firmly clamped. Before drilling, the pressure must be reduced and carefully drilled. A sudden break-through of the drill bit can be the result.

»WIRING DIAGRAM

0..5/..10 V

NOVOS 3 P TRV, Poti_active *Additional physical measurand possible**	NOVOS 3 TD TRV	NOVOS 3 PTD TRV, Poti_active
 |–AOU5– →* |–AOU4– →* |–AOU3– →* |–AOU2– → 0..10 V | *Temperature* |–AOU1– → 0..10 V | *Poti* |–GND– ← 0 V⊥ |–UB+– ← 15..35 V⎓/19..29 V∿	 |–D– ← 24 V⎓ | *Diode* |–T– → 0 V⊥ | *Button* |–AOU1– → 0..10 V | *Temperature* |–GND– ← 0 V⊥ |–UB+– ← 15..35 V⎓/19..29 V∿	 |–D– ← 24 V⎓ | *Diode* |–T– → 0 V⊥ | *Button* |–AOU2– → 0..10 V | *Temperature* |–AOU1– → 0..10 V | *Poti* |–GND– ← 0 V⊥ |–UB+– ← 15..35 V⎓/19..29 V∿

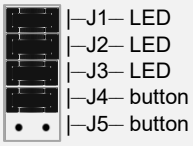
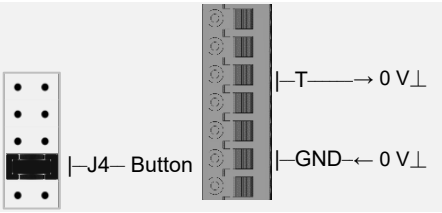
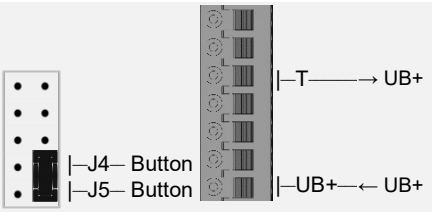
4..20mA

NOVOS 3 P TRA, Poti_active
 |–AOI2– → 4..20 mA | *Temperature* |–AOI1– → 4..20 mA | *Poti* |–GND– ← 0 V⊥ |–UB+– ← 15..35 V⎓

** Connect the variants with the measuring values humidity, CO_2 or VOC according to the wiring diagram in the device.*

» CONFIGURATION

The jumper settings will select the color of the LED and the control of the button.

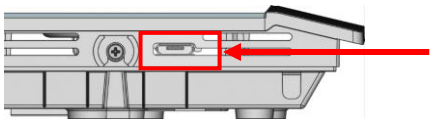
Factory default settings	Button connection	
	To GND *(factory default)*	To UB+
 **LED color: white** **Button connection: GND**		

Red	Green	Blue	Yellow	Magenta	Turquoise	White *(factory default)*
						

» THE CONFIGURATION IS PERFORMED IN POWERED STATE. THE FOLLOWING OPTIONS ARE AVAILABLE FOR CONFIGURING THE DEVICE:

Device connection	Micro USB	Micro USB
Configuration adapter	Thermokon USB interface 	USB Bluetooth dongle 
Configuration software	PC/notebook with uConfig software *Parameterization via desktop PC/notebook with uConfig software, via Thermokon USB interface* – Item No. 597838*	Smartphone/tablet with NOVOSapp *Parameterization with mobile devices via Bluetooth and NOVOSapp. A separately available Bluetooth dongle* is required – Item no. 668262*

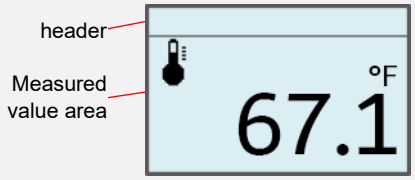
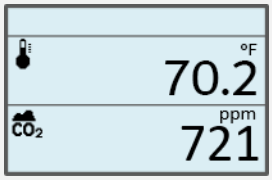
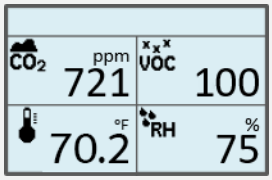
**Commercially available Bluetooth dongles or USB-to-Micro-USB adapter cables are not compatible. You need a mobile device that supports at least Bluetooth version 4.1. The configuration app with the corresponding instructions can be downloaded from the Google Play Store or the Apple App Store.*



Position of the Micro USB port, see bottom of the device, for configuration with Bluetooth dongle or Micro USB programming interface.

» DISPLAY

The display scales automatically depending on the device and the number of measured variables. Parameters such as the display/hiding of measured variables are changed via the app. The software and hardware versions are displayed during the boot process.

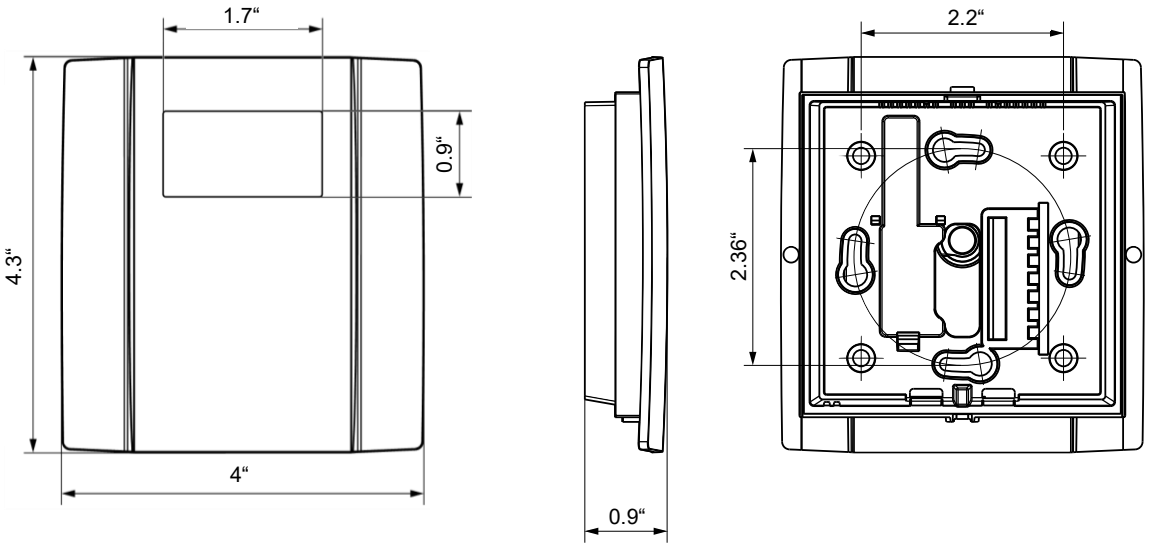
Display		
1 measured value	2 measured values	3 or 4 measured values
		

Symbols			
Measured values*			
	Temperature	Humidity	
	VOC	CO_2	

Additional symbols *(displayed when triggered)*			
SET	Setpoint*	Display of the set target value	Measured value area
	Notice	Internal sensor error (display next to measured variable)	Measured value area

*depending on variant

» DIMENSIONS (MM)



» ACCESSORIES (OPTIONAL)

Wall plugs and screws (2 pcs. each)	Item No. 102209
PSU-UP24 – flush mount power supply, 24 V (AC input: 100..240 V ~ | DC output 24 V = 0,5 A)	Item No. 645737
Bluetooth dongle	Item No. 668262
Thermokon USB interface	Item No. 597838
Mounting bracket (surface mounted) white	Item No. 795050
Mounting bracket (surface mounted) black	Item No. 795074