

# NOVOS 3 x (EPD)

Room operating unit temperature, optional with humidity | CO<sub>2</sub> | VOC

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

## Datasheet

Subject to technical alteration  
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# novos



### » APPLICATION

Room operating unit with recording room temperature, optional with humidity, CO<sub>2</sub> 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. 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

## » 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.**

## » INFORMATION ABOUT SELF-CALIBRATION FEATURE CO<sub>2</sub>

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 (dust / fingerprints e.g.)
- Abrasive chemicals
- Environmental influences (high humidity / condensation on measuring element)

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

## » INFORMATION ABOUT INDOOR AIR QUALITY CO<sub>2</sub>

EN 13779 defines several classes for indoor air quality:

Category	CO <sub>2</sub> 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

## » APPLICATION NOTICE FOR AIR QUALITY SENSORS VOC

Volatile organic compounds (VOC) are gaseous and vaporous substances of organic origin in the air. VOC-sensors monitor the significant part of humanly olfactory sensed air quality. (e.g. body odour | tobacco smoke | odour of materials, furniture, carpets, paint, adhesives, ...)

**The VOC-Value is an application-specific indication for air quality and doesn't provide any information about individual components of VOC**

A VOC sensor oxidises the organic molecules that collide with it, which results in changing the resistance of the semiconductor.

**Any contact with the sensitive sensors must be avoided and will invalidate the warranty.**

The VOC Sensor is factory calibrated and can be calibrated via NOVOSapp subsequently, if needed.

## » TECHNICAL DATA

Measuring values	temperature, optional humidity, CO <sub>2</sub> , VOC			
Output voltage	<b>TRV   VV   3xV   4xV</b> 0..10 V or 0..5 V, min load 10 kΩ (live-zero configuration 1..10/2..10 V via Thermokon NOVOSapp)			
Output Amp	<b>TRA   AA</b> 4..20 mA, max. load 500 Ω			
Power supply	<b>TRV   VV   3xV   4xV</b> 15..35 V = or 19..29 V ~ SELV		<b>TRA   AA</b> 15..35 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 parameterized via Thermokon NOVOSapp			
Set point (P)	potentiometer, active output <b>TRV</b> : 0..10 V   <b>TRA</b> : 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, color can be set (from 7 colors) via Jumper, factory default white			
Enclosure	PC V0, pure white, design cover (optional)			
Protection	IP20 according to DIN EN 60529			
Cable entry	Opening rear side, predetermined breaking points on underside, drill mark on top side			
Connection electrical	tool-free mountable spring terminal, max. AWG16 (1,5 mm <sup>2</sup> )			
Ambient condition	-4..+158 °F, max. 85% non-condensing, with CO <sub>2</sub> 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	zur Konfiguration ist ein zusätzlicher Programmier-Dongle (Bluetooth) notwendig (siehe Zubehör)			
» <b>Temperature (optional)</b>				
Output signal range temp. <i>*scaling analogue output</i>	+40..+140 °F (default setting), selectable from 4 temperature ranges -30..+130   +40..+140   0..+100   +40..+90 °F, configurable via NOVOSapp			
Accuracy temperature	±0,5K (typ. at 70 °F)			
» <b>Humidity (optional, only for variant NOVOS 3 P TRV/TRA, potentiometer_active)</b>				
Measuring range humidity <i>(optional configurable)</i>	<b>relative humidity</b> (default) 0..100% rH	<b>Enthalpy</b> 0..37 BTU/lb	<b>absolute humidity</b> 0..1,5   0..2,3 g/ft <sup>3</sup>	<b>dew point</b> +32..+122   -4..+176 °F
	configurable via Thermokon NOVOSapp or BUS			
Accuracy humidity	±2% between 10..90% rH (typ. at 70 °F)			
» <b>CO<sub>2</sub> (optional, only for variant NOVOS 3 P TRV/TRA, potentiometer_active)</b>				
Measuring range CO <sub>2</sub>	0..2000 ppm   0..5000 ppm (configurable via Thermokon NOVOSapp or BUS)			
Accuracy CO <sub>2</sub>	±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')			
» <b>VOC (optional, only for variant NOVOS 3 P TRV/TRA, potentiometer_active)</b>				
Measuring range VOC	0..100 %			
Sensor	VOC sensor (heated metal oxide semiconductor)			

## » MOUNTING ADVICES

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 / ...

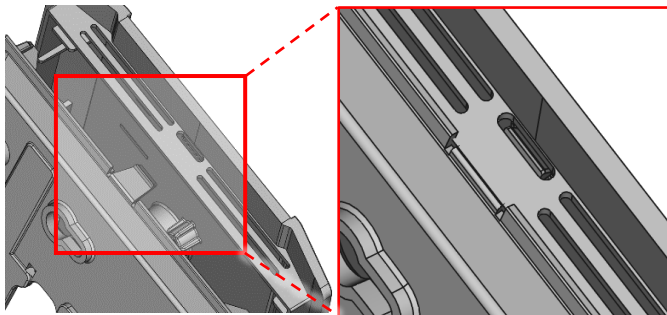
Please make sure that the device is de-energized if you want to install it!

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.

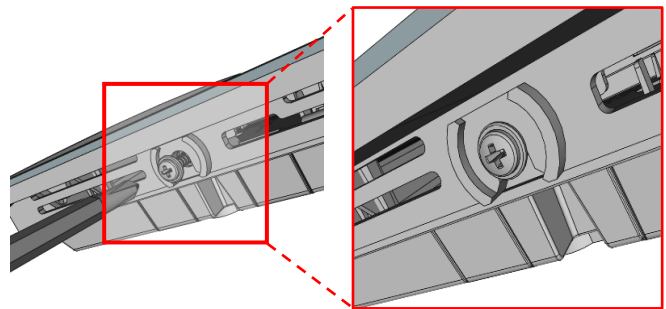
- For wiring, the upper part of the device must be removed from the base plate. Base plate and upper part are detachably connected to each other by means of locking lugs.
- The mounting of the base plate on the flat wall surface is done with rawplugs and screws.
- Finally, the device is attached to the base plate and fixed with the screw.

### Housing open / close

Snap the upper part of the housing into the locking lug on the upper side

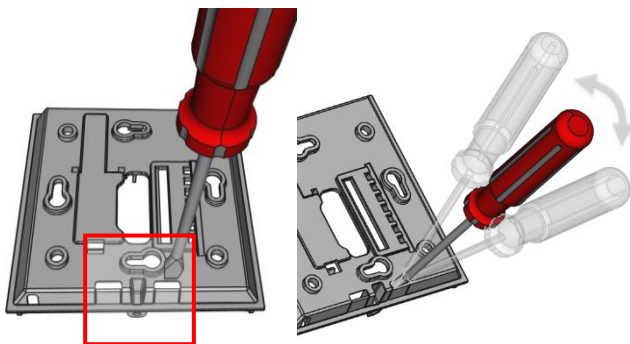


Fix the upper part of the housing on the underside with the screw included in the delivery.

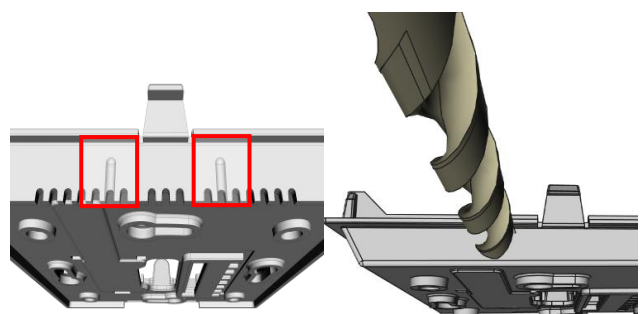


### Cable entry

There are predetermined breaking points for 2 optional cable entries on the underside of the base plate




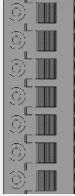

On the upper side of the base plate there are 2 grits as position for a drill hole max. Ø 0.24 in. | 6 mm




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.

» CONNECTION PLAN\*

0..5/..10V

NOVOS 3 P TRV, Poti_active additional physical measurand possible*	NOVOS 3 TD TRV	NOVOS 3 PTD TRV, Poti_active
 <ul style="list-style-type: none"> <li> —AOU5— →*</li> <li> —AOU4— →*</li> <li> —AOU3— →*</li> <li> —AOU2— → 0..10V   Temperature</li> <li> —AOU1— → 0..10V   Poti</li> <li> —GND— ← 0 V⊥</li> <li> —UB+— ← 15..35V~/19..29V~</li> </ul>	 <ul style="list-style-type: none"> <li> —D— ← 24V~   Diode</li> <li> —T— → 0 V⊥   Button</li> <li> —AOU1— → 0..10V   Temperature</li> <li> —GND— ← 0 V⊥</li> <li> —UB+— ← 15..35V~/19..29V~</li> </ul>	 <ul style="list-style-type: none"> <li> —D— ← 24V~   Diode</li> <li> —T— → 0 V⊥   Button</li> <li> —AOU2— → 0..10V   Temperature</li> <li> —AOU1— → 0..10V   Poti</li> <li> —GND— ← 0 V⊥</li> <li> —UB+— ← 15..35V~/19..29V~</li> </ul>

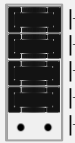
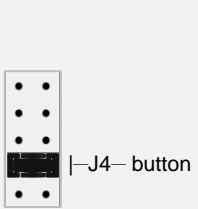

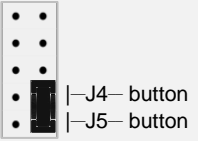
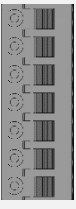
4..20mA








NOVOS 3 P TRA, Poti_active other physical measurand possible*
 <ul style="list-style-type: none"> <li> —AOI2— → 4..20mA   Temperature</li> <li> —AOI1— → 4..20mA   Poti</li> <li> —GND— ← 0 V⊥</li> <li> —UB+— ← 15..35 V~</li> </ul>

\* Connect the variants with the measuring values humidity, CO2 or VOC according to the wiring diagram in the device.

» CONFIGURATION

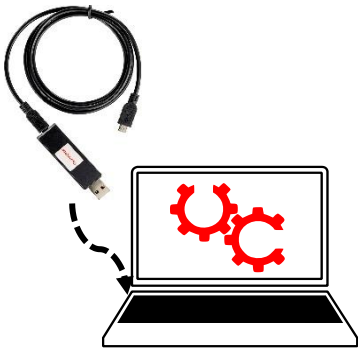

The jumper setting will select the color of the LED and the control of the button.

Factory default	Button connection	
	to GND (factory default)	to UB+
 <ul style="list-style-type: none"> <li> —J1— LED</li> <li> —J2— LED</li> <li> —J3— LED</li> <li> —J4— button</li> <li> —J5— button</li> </ul> <p><b>LED colour: white</b></p> <p><b>Button connection: GND</b></p>	 <ul style="list-style-type: none"> <li> —J4— button</li> </ul>  <ul style="list-style-type: none"> <li> —T— → 0 V⊥</li> <li> —GND— ← 0 V⊥</li> </ul>	 <ul style="list-style-type: none"> <li> —J4— button</li> <li> —J5— button</li> </ul>  <ul style="list-style-type: none"> <li> —T— → UB+</li> <li> —UB+— ← UB+</li> </ul>

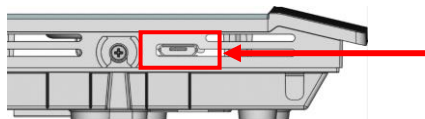
red	green	blue	yellow	magenta	turquoise	white (factory default)
 <ul style="list-style-type: none"> <li> —J1</li> </ul>	 <ul style="list-style-type: none"> <li> —J2</li> </ul>	 <ul style="list-style-type: none"> <li> —J3</li> </ul>	 <ul style="list-style-type: none"> <li> —J1</li> <li> —J2</li> </ul>	 <ul style="list-style-type: none"> <li> —J1</li> <li> —J3</li> </ul>	 <ul style="list-style-type: none"> <li> —J2</li> <li> —J3</li> </ul>	 <ul style="list-style-type: none"> <li> —J1</li> <li> —J2</li> <li> —J3</li> </ul>

» CONFIGURATION

The configuration is performed in powered state. The following options are available for configuring the device:

Device connection	Micro-USB	Micro-USB
Configuration-adapter	<p>Thermokon USB-Interface</p> 	<p>USB-Bluetooth Dongle</p>  <p>GET IT ON Google Play</p> <p>Download on the App Store</p>
Configurations-software	<p>PC/Notebook with uConfig software</p> <p>Partly parameterization with Thermokon software uConfig, via Thermokon USB-Interface* (Art.-No.: 597838)</p>	<p>Smartphone/Tablet with NOVOS App</p> <p>Parameterization with mobile device via bluetooth and NOVOSapp. Separately available Bluetooth Dongle* required: (Art.-No.: 668262)</p>

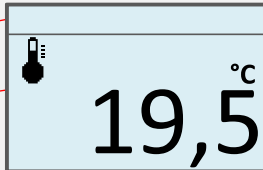
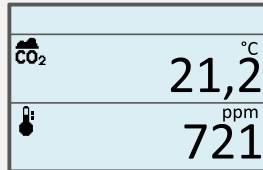
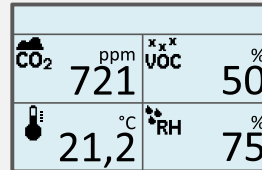
\*Commercially available Bluetooth dongles or USB to Micro-USB adapter cables are not compatible. You need a mobile device that supports at least Bluetooth version 4.1. The configuration app with the corresponding instructions can be downloaded from the Google Play Store or the Apple App Store.



Position of the micro USB port, see bottom of the device, for configuration with Bluetooth dongle or Thermokon USB-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 / 4 Measured values
<p>header</p> <p>Measured value- area</p> 		
Symbols		
Measured values*		
	Temperature	Humidity
	VOC	CO2
Additional symbols (displayed when triggered)		
	Setpoint*	Display of the set target value
	Notice	Internal sensor error (display next to measured variable)
		Measured value area
		Measured value area

\*depending on variant

## » PRODUCT TESTING AND CERTIFICATION



### Declaration of conformity

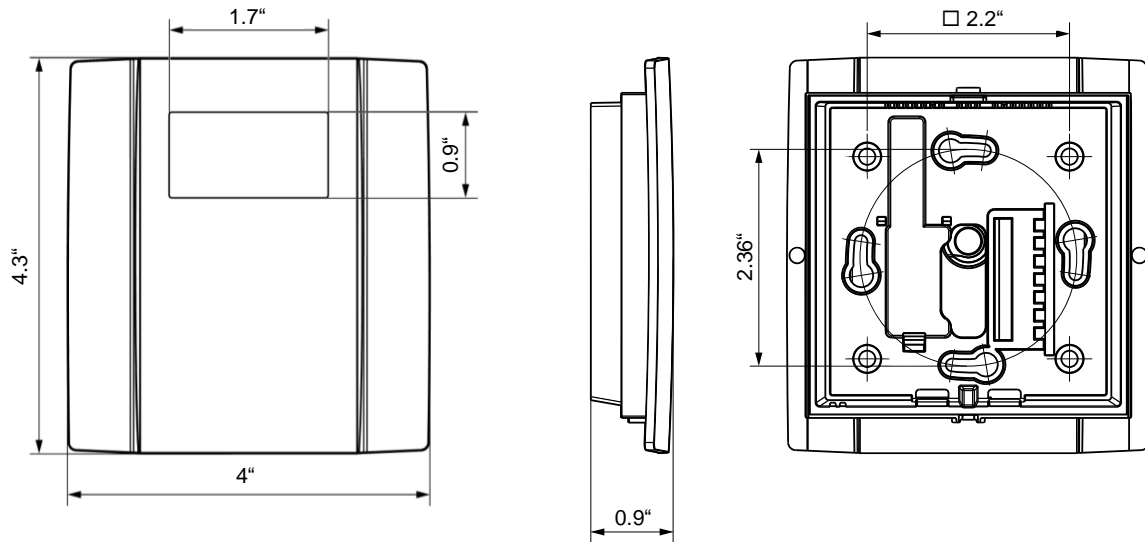
The declaration of conformity of the products are available on our website  
<https://www.thermokon.de/direct/en-gb/categories/novos-3-x>

## » 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)

## » DIMENSIONS (IN.)



## » ACCESSORIES (OPTIONAL)

Rawplugs 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