

Datasheet

Subject to technical alteration
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Application

Duct air quality sensor for detection of VOC air quality, and optional humidity combined in one unit. Designed for duct mounted applications with up to 3 0..10 V outputs. The sensor consists of a transmitter with VOC sensor, based on a heated tin oxide semiconductor. With the option board relay two-point controllers or a 2-stage 2-point controller for temperature or humidity can be realized.

Types Available

Duct sensor VOC + temp (opt.) + rH (opt.) – active 1x/2x/3x 0..10 V | 2x 4..20 mA

LK+ VOC V
LK+ VOC VV
LK+ VOC AA
LK+ VOC 3xV

Duct sensor VOC + temp – active 2x 0..10 V + relay

LK+ VOC VV Relay

Options: additional passive temperature sensor
eg: PT100/PT1000/NI1000/NI1000TK5000/NTC10K... and other sensors on request.

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

Notes on Disposal



As a component of a large-scale fixed installation, Thermokon products are intended to be used permanently as part of a building or a structure at a pre-defined and dedicated location, hence the Waste Electrical and Electronic Act (WEEE) is not applicable. However, most of the products may contain valuable materials that should be recycled and not disposed of as domestic waste. Please note the relevant regulations for local disposal.

Build-up of Self-Heating by Electrical Dissipative Power

Temperature 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. As Thermokon transducers work with a variable operating voltage, only one operating voltage can be taken into consideration, for reasons of production engineering. Transducers 0..10 V / 4..20 mA have a standard setting at an operating voltage of 24 V =. That means, that at this voltage, the expected measuring error of the output signal will be the least. For other operating voltages, the offset error will be increased by a changing power loss of the sensor electronics. If a re-calibration should become necessary later directly on the sensor, this can be done by means of the USEapp software and an optional Bluetooth interface.

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

Application Notice for Air Quality Sensors VOC

Unlike CO₂ sensors, which specifically measure CO₂, mixed gas sensors detect a wide range of gases. The sensor signal does not indicate the type of gas or its concentration in ppm. Mixed gas sensors detect gases and vapours consisting of carbohydrates, or more generally gases that can be oxidised (burnt): Odours, perfume, cleaning fluid scent, tobacco smoke, new materials fumigations (furniture, carpets, paint, glue ...).

Unlike CO₂, which humans cannot sense, the amount of odours (VOC) indicates the level of air quality. VOC sensors have proven their value in a multitude of applications for many years.

Measuring principle:

Similar to a catalyst converter the organic molecules are burnt (oxidized) when in contact with the sensor's heated -dioxide surface, adding a small amount of heat combustion. The increased temperature is measured providing a signal proportional to the number of molecules being burnt. CO₂ cannot be detected as it cannot be further oxidized.

Refrain from touching the sensor's element sensitive surface. Touching the sensitive surface element will void warranty.

Information about Calibration VOC

Similar to a catalyst converter the VOC sensor will deteriorate over time, which will affect the sensitivity. This VOC sensor automatically compensates the decrease in sensitivity by dynamic auto-calibration.

The reference level of air quality is derived from the ambient conditions over a 72h period. The lowest reading within this 72h time period will be used as reference level, representing the "clean and fresh air level".

Technical Data

Measuring values	VOC, temperature + humidity (depending on the device)	
Output voltage	1..3x 0..10 V or 0..5 V, min. load 10 k Ω (live-zero configuration via Thermokon USEapp)	
Output Amp	AA 2x 4..20 mA, max. load 500 Ω	
Output passive	passive Options: additional passive temperature sensor eg: PT100/PT1000/Ni1000/Ni1000TK5000/NTC10K... and other sensors on request	
Output switch contact	Relay 2 floating contacts for 24 V ~ or 24 V = / 3 A	
Power supply	VV 3xV Relay 15..35 V = or 19..29 V ~	AA 15..35 V =
Power consumption	max. 2,3 W (24 V =) max. 4,3 VA (24 V ~)	
Measuring range temp.	0..+50 °C (default setting), optionally configurable via Thermokon USEapp	
Measuring range humidity	3xV 0..100% rH non-condensing, optionally configurable via Thermokon USEapp (enthalpy, absolute humidity, dew point)	
Accuracy temperature	V VV AA 3xV Relay $\pm 0,5$ K (typ. at 21 °C)	passive depending on used sensor
Accuracy humidity	3xV $\pm 2\%$ between 10..90% rH (typ. at 21 °C)	
Air speed	min. 0,3 m/s, max. 12 m/s	
Calibration	self-calibration	
Sensor	VOC sensor (heated metal oxide semiconductor)	
Enclosure	enclosure USE-M, PC, pure white, with removable cable entry	
Protection	IP65 according to EN 60529	
Cable entry	V VV AA 3xV Flextherm M20, for wire $\varnothing=4,5..9$ mm, removable	Relay M25 with fourfold cable entry for wire with max. $\varnothing=7$ mm, removable
Connection electrical	removable plug-in terminal, max. 2,5 mm ²	
Pipe	VV AA 3xV Relay PA6, black, $\varnothing=19,5$ mm, length 180 mm	V PA6, black, $\varnothing=19,5$ mm, length 150 mm
Ambient condition	0..+50 °C, max. 85% rH short term condensation	
Mounting	installation is also possible using mounting base	
Notes	mixed gas sensors detect gases and vapours which can be oxidised (burnt): Body odours, tobacco smoke, exhalations emitted by materials (furniture, carpets, paint, glue ...)	

Configuration



The Thermokon bluetooth dongle with micro-USB is required for communication between USEapp and USE-M / USE L (Item No.: 668262). Commercial bluetooth dongles are not compatible.



Application-specific reconfiguration of the devices can be carried out using the Thermokon USEapp. The configuration is carried out in the voltage-supplied state.



The configuration-app and the app description can be found in the Google Play Store or in the Apple App Store.

Application notice

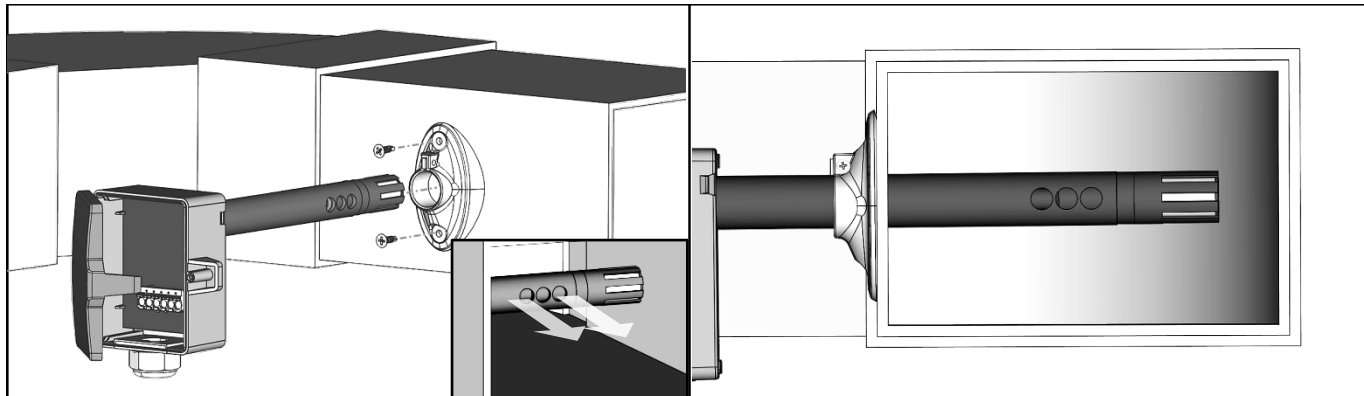


The housing cover must be completely closed in order to ensure the accuracy and reproducibility of the measured values during a test or service log via USEapp.

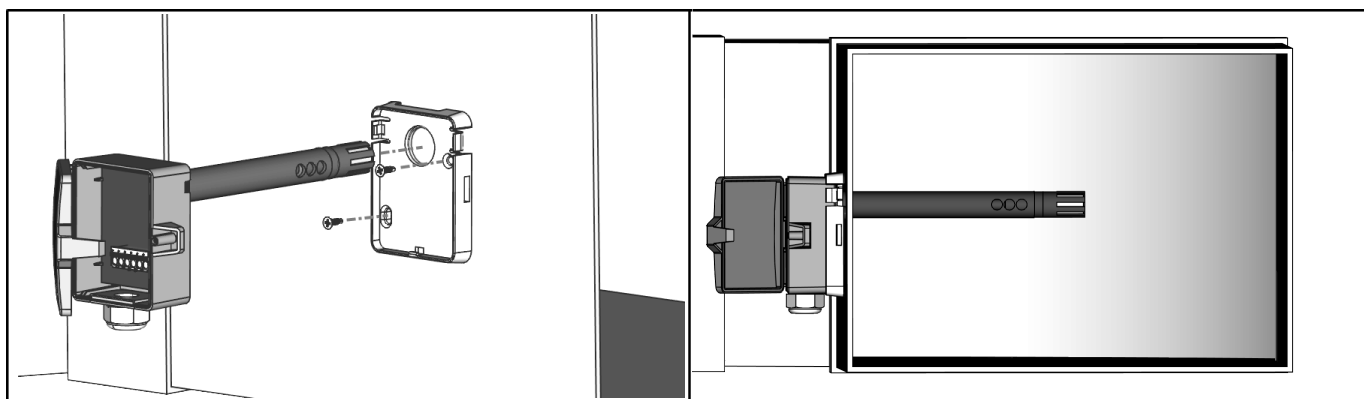
The Bluetooth dongle snaps into the socket easily. When removing, please fix the plug-in card (option PCB) so that it is not unintentionally pulled out.

Mounting Advices

The sensor can be mounted on the ventilation duct by means of the mounting flange MF20 TPO (optional with mounting base). Align the openings on the sensor tube according to the flow direction.

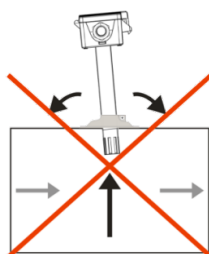


optional:



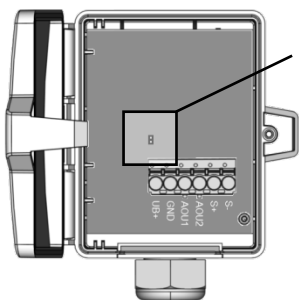
Dismounting Advices

Remove the lower section of the sensor carefully and pulling straight out. **Pay close attention to the correct dismantling of the component!**



Connection Plan

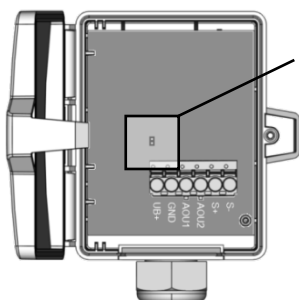
LK+ VOC V



0..5 V
0..10 V

n.c.	(ST-, optional passive sensor)
n.c.	(ST+, optional passive sensor)
n.c.	
AOU1	(VOC 0..10 V)
GND	
UB+	(15..35 V = or 19..29 V ~)

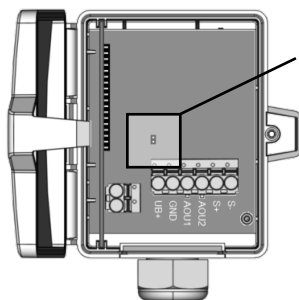
LK+ VOC WV



0..5 V
0..10 V

n.c.	(ST-, optional passive sensor)
n.c.	(ST+, optional passive sensor)
AOU2	(temperature 0..10 V)
AOU1	(VOC 0..10 V)
GND	
UB+	(15..35 V = or 19..29 V ~)

LK+ VOC AA

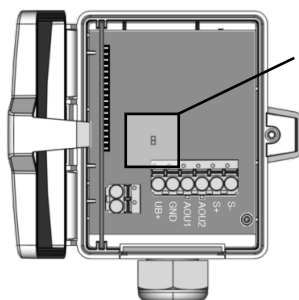


0..5 V
0..10 V

n.c.	(ST-, optional passive sensor)
n.c.	(ST+, optional passive sensor)
AOU2	(temperature 0..10 V)
AOU1	(VOC 0..10 V)
GND	
UB+	(15..35 V =)

AOI2	(temperature 4..20 mA)
AOI1	(VOC 4..20 mA)

LK+ VOC 3xV

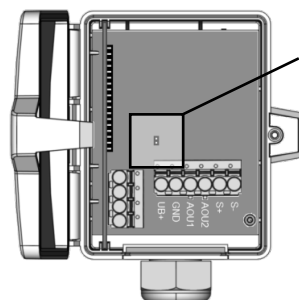


0..5 V
0..10 V

n.c.	(ST-, optional passive sensor)
n.c.	(ST+, optional passive sensor)
AOU2	(temperature 0..10 V)
AOU1	(VOC 0..10 V)
GND	
UB+	(15..35 V = or 19..29 V ~)

n.c.	
AOU3	(humidity 0..10 V)

LK+ VOC Relay

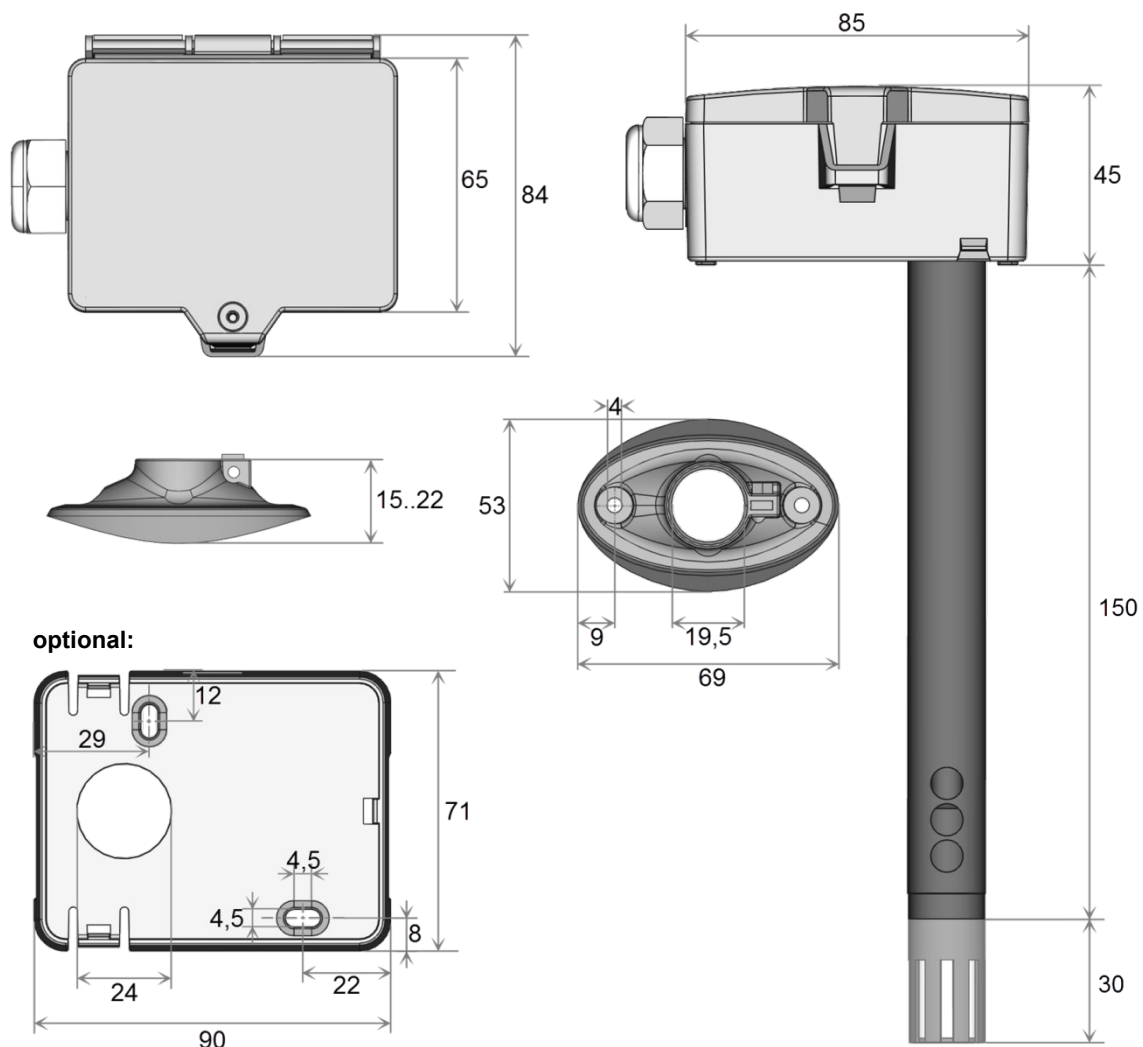


0..5 V
0..10 V

n.c.	(ST-, optional passive sensor)
n.c.	(ST+, optional passive sensor)
AOU2	(temperature 0..10 V)
AOU1	(VOC 0..10 V)
GND	
UB+	(15..35 V = or 19..29 V ~)

	(Relay 2 NO)
	(Relay1 NO)

Dimensions (mm)



Accessories (included in delivery)

Mounting flange MF20
 Mounting kit universal
 • Cover screw + screw cover • 2 Rawlplugs • 2 Screws (countersunk head) • 2 Screws (rounded head)

Item No. 612562
 Item No. 698511

Accessories (optional)

Bluetooth dongle
 Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)
 Mounting base
 Filter stainless steel, wire mesh
 Sealing insert M20 USE white, 2x Ø=7 mm (for 2 wire; PU 10 pieces)

Item No. 668262
 Item No. 641364
 Item No. 631228
 Item No. 231169
 Item No. 641333