LK+ CO2

Duct sensor for air quality, temperature and humidity (optional)

thermokon®
HOME OF SENSOR TECHNOLOGY

Datasheet

Subject to technical alteration
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Application

Duct air quality sensor for detection of CO2, optional with temperature and humidity. Designed for duct mounted applications with up to 3 0..10 V outputs or connection to a BUS system.

Types Available

Duct sensor CO2 + temp (opt.) + rH (opt.) – active 2x/3x 0..10 V | 2x 4..20 mA

LK+ CO2 VV
LK+ CO2 AA
LK+ CO2 3xV

Duct sensor CO2 + temp – active 2x 0..10 V + relay

LK+ CO2 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 (±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.

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

Information about Self-Calibration Feature CO_2

Virtually all gas sensors are subject to some sort of drift. The degree of drift is partially dependent on the use of quality components and good design. But even with good components and excellent design, a small amount of drift can still occur in the sensor that may ultimately result in the need for a sensor to be recalibrated.
The natural drift of the sensor is caused by:

• Dust/dirt • Aggressive chemicals absorbed inside chamber / optical elements • Corrosion inside chamber (high rh, condensation) • Temperature cycles causing mechanical stress • Electron/hole migration in the photo detector's semiconductor • Drift of photo amplifiers • External mechanical stress on chamber • Light source wear-off

Most of the effects listed above will be compensated by the automatic self-calibration of the sensor's dual channel technology. In contrast to commonly used ABC-Logic self-calibrating sensors with dual channel technology are suitable for all applications including those operating 24 hours, 7 days a week, for example hospitals.

However some effects cannot be compensated automatically and may result in a very gradual natural drift of a few ppm per month. This natural drift is not covered by Thermokon's 5-year warranty.

Technical Data

Measuring values	CO2, temperature + humidity (depending on the device)		
Output voltage	2x/3x 0..10 V or 0..5 V, min. load 10 kΩ (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)		
Measuring range CO2	0..2000 ppm (default), 0..5000 ppm , optionally configurable via Thermokon USEapp		
Accuracy temperature	**VV | AA | 3xV | Relay** ±0,5 K (typ. at 21 °C)	**passive** depending on used sensor	
Accuracy humidity	**3xV** ±2% between 10..90% rH (typ. at 21 °C)		
Accuracy CO2	±50 ppm +3% of reading (typ. at 21 °C, 50% rH)		
Air speed	min. 0,3 m/s, max. 12 m/s		
Calibration	self-calibration, Dual Channel		
Sensor	NDIR (non-dispersiv, infrared)		
Enclosure	enclosure USE-M, PC, pure white, with removable cable entry		
Protection	IP65 according to EN 60529		
Cable entry	**VV | AA** Flextherm M16, for wire Ø=3..7 mm, removable	**3xV** M20, for wire max. Ø=10 mm, seal insert for double cable entry for wire max Ø=6 mm	**Relay** M25 with fourfold cable entry for wire with max. Ø=7 mm, removable
Connection electrical	removable plug-in terminal, max. 2,5 mm²		
Pipe	PA6, black, Ø=19,5 mm, length 180 mm		
Ambient condition	0..+50 °C, max. 85% rH short term condensation		
Mounting	installation is also possible using mounting base		

Declaration of conformity

The declaration of conformity of the products can be found on our website https://www.thermokon.de/.

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.

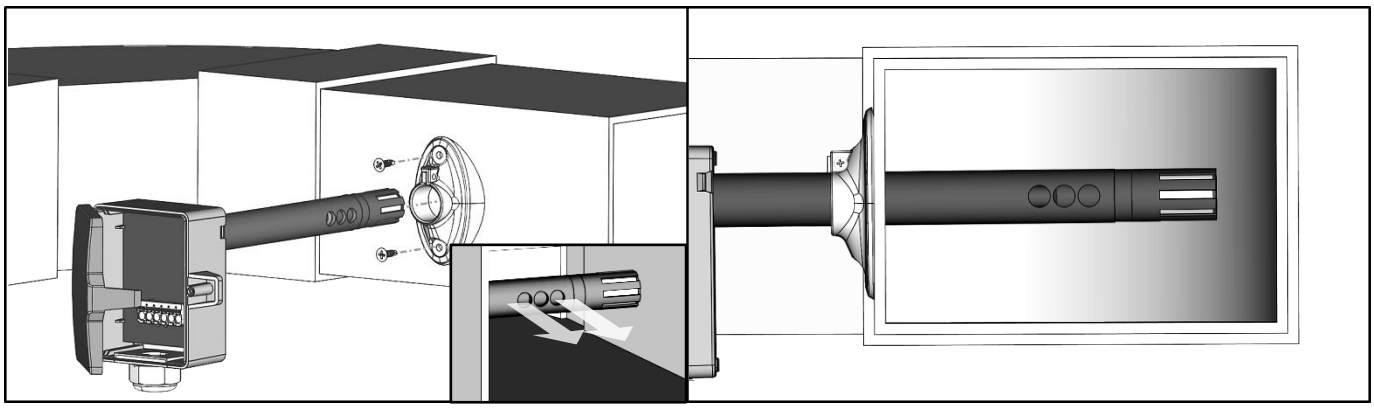
Application notice

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.

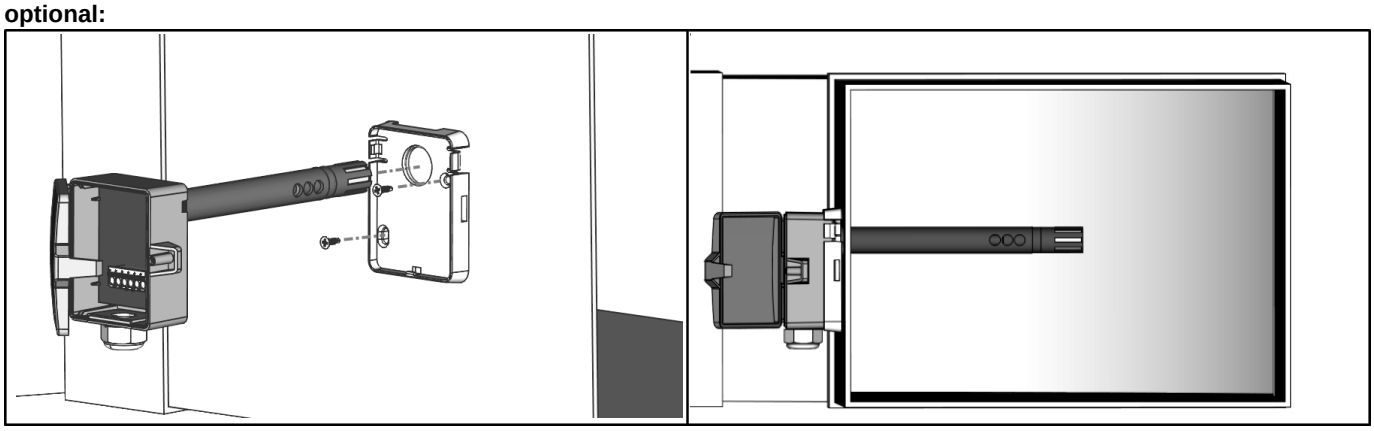
The Bluetooth dongle snaps into the socket easily. When removing, please fix the plug-in card (option PCB) so that it is not unintentionally pulled out.

Mounting Advices

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

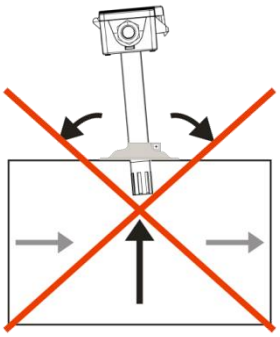


optional:



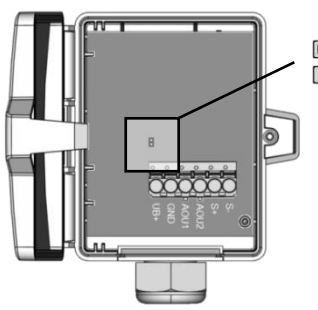
Dismounting Advices

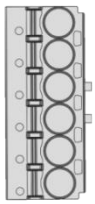
Remove the lower section of the sensor carefully and pulling straight out. **Pay close attention to the correct dismantling of the component!**



Connection Plan

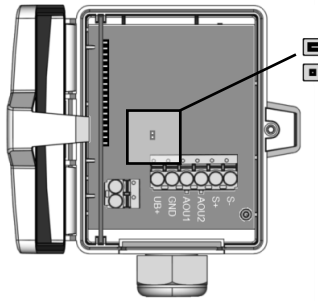
LK+ **CO2 VV**

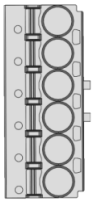




(ST-, optional passive sensor)
(ST+, optional passive sensor)
(temperature | 0..10 V)
(CO2 | 0..10 V)
(15..35 V = or 19..29 V ~)

LK+ **CO2 AA**

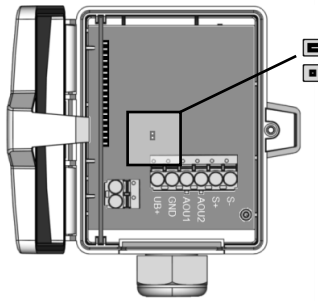


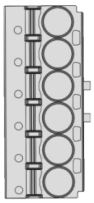


(ST-, optional passive sensor)
(ST+, optional passive sensor)
(temperature | 0..10 V)
(CO2 | 0..10 V)
(15..35 V =)

(temperature | 4..20 mA)
(CO2 | 4..20 mA)

LK+ **CO2 3xV**

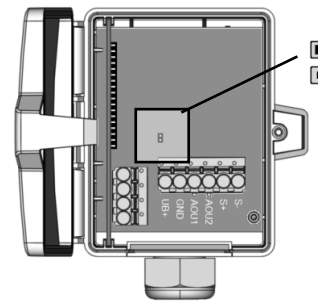


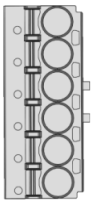


(ST-, optional passive sensor)
(ST+, optional passive sensor)
(temperature | 0..10 V)
(CO2 | 0..10 V)
(15..35 V = or 19..29 V ~)

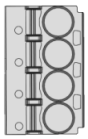
(humidity | 0..10 V)

LK+ **CO2 Relay**



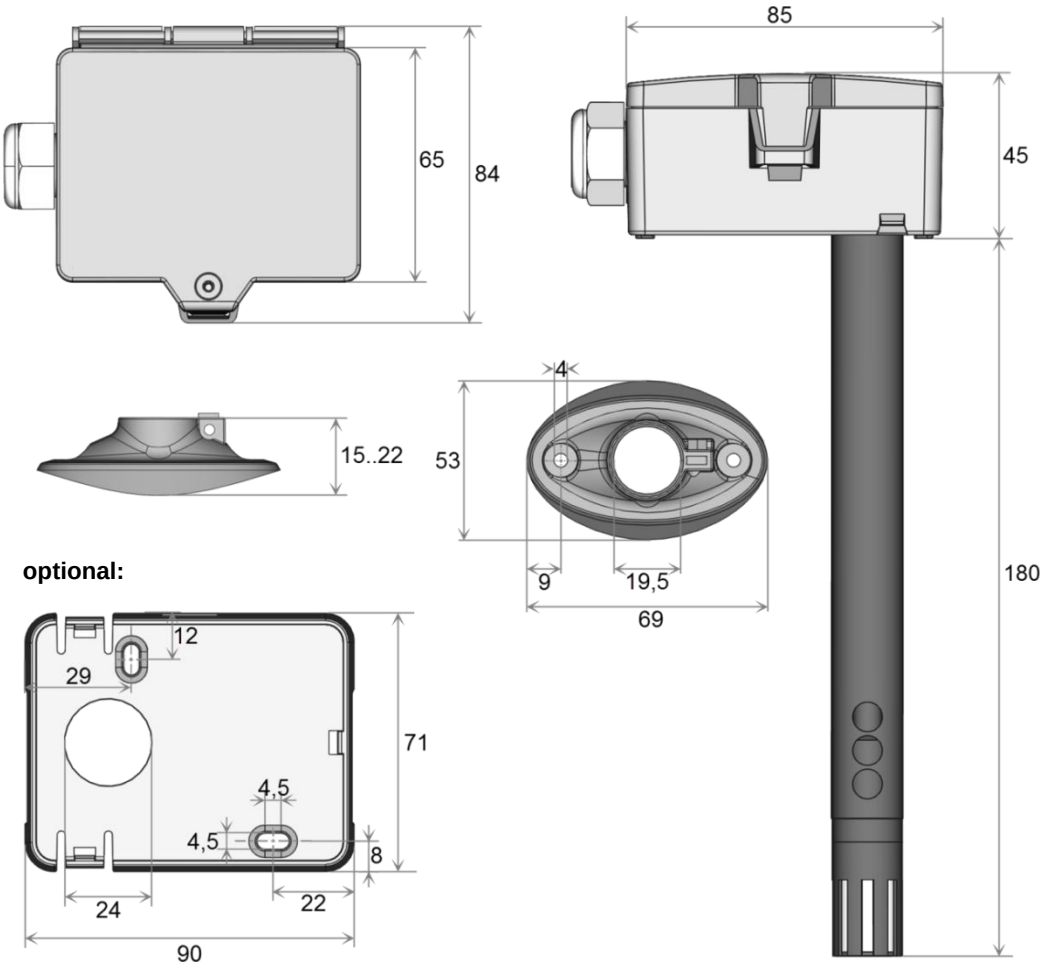


(ST-, optional passive sensor)
(ST+, optional passive sensor)
(temperature| 0..10 V)
(CO2 | 0..10 V)
(15..35 V = or 19..29 V ~)



(Relay 2 | NO)
(Relay 1 | NO)

Dimensions (mm)



Accessories (included in delivery)

Mounting flange MF20	Item No. 612562
Mounting kit universal	Item No. 698511

• Cover screw + screw cover• 2 Rawlplugs • 2 Screws (countersunk head) • 2 Screws (rounded head)

Accessories (optional)

Bluetooth dongle	Item No. 668262
Cable entry M25 USE white, sealing insert 4x Ø=7 mm (4 pcs)	Item No. 641364
Mounting base	Item No. 631228
Filter stainless steel, wire mesh	Item No. 231169
M16 Sealing inserts cable entry (packaging unit 10 pcs.) for wire with Ø 8 mm	Item No. 641340

M20 Sealing inserts cable entry (packaging unit 10 pcs.)

for wire with Ø	2x6 mm	2x7 mm	6 mm	8 mm
Item No	641319	641333	641074	641081