LK+ CO2 (LCD) (Temp_rH)

Duct sensor for air quality, optional temperature and humidity

thermokon®
HOME OF SENSOR TECHNOLOGY

Datasheet

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The following illustrations show the version with LCD

»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. LCD models with RGB background light have a transparent cover. Display configuration and threshold values for color changes can be parameterized via Thermokon USEapp. 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 CO2 + temp, optional with LCD – active 2x 0..10 V | 2x 4..20 mA | Relay
- LK+ CO2 (LCD) Temp VV
- LK+ CO2 (LCD) Temp AA
- LK+ CO2 (LCD) Temp VV Relay

optionally with shorter sensor tube, type 100
- LK+ CO2 100 (LCD) Temp VV
- LK+ CO2 100 (LCD) Temp AA
- LK+ CO2 100 (LCD) Temp VV Relay

Duct sensor CO2 + temp +rH (opt.), optional with LCD – active 3x 0..10 V
- LK+ CO2 (LCD) Temp 3xV

optionally with shorter sensor tube, type 100
- LK+ CO2 100 (LCD) Temp 3xV

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

»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/lkplus

»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 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.

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 therm 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 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$_2$

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).

»TECHNICAL DATA

Measuring values	CO2, temperature + humidity (depending on the device)
Output voltage	2..4x 0..10 V or 0..5 V, min. load 10 kΩ (live-zero configuration via Thermokon USEapp)
Output Amp *(type-dependent)*	**AA** 2x 4..20 mA, max. load 500 Ω
Output passive *(optional)*	**passive** Options: additional passive temperature sensor eg: PT100/PT1000/NI1000/NI1000TK5000/NTC10K... and other sensors on request
Output switch contact *(type-dependent)*	**Relay** 2 floating contacts for 24 V ~ or 24 V = / 3 A
Power supply *(type-dependent)*	**VV | 3xV | Relay** 15..35 V = or 19..29 V ~ SELV	**AA** 15..35 V = SELV
Power consumption	max. 2,3 W (24 V =) | max. 4,3 VA (24 V ~)
Measuring range temp. *(type-dependent)*	**VV | 3xV** 0..+50 °C (default setting), optionally configured via Thermokon USEapp
Measuring range humidity *(type-dependent)*	**3xV** 0..100% rH non-condensing, optionally configured via Thermokon USEapp (enthalpy, absolute humidity, dew point)
Measuring range CO2	0..2000 ppm (default), 0..5000 ppm (optionally configured via Thermokon USEapp)
Accuracy temperature *(type-dependent)*	**VV | AA | 3xV | Relay** ±0,5 K (typ. at 21 °C)	**passive** depending on used sensor
Accuracy humidity *(type-dependent)*	**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	**CO2** NDIR (non-dispersiv, infrared)
Display *(optional)*	LCD 29x35 mm with RGB backlight
Enclosure	enclosure USE-M, PC, pure white, cover PC, transparent, with removable cable entry
Protection	IP65 according to EN 60529
Cable entry *(type-dependent)*	**VV | AA | 3xV** Flextherm M20, for wire Ø=4,5..9 mm, removable	**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, optional length 100 mm
Ambient condition	0..+50 °C, max. 85% rH short term condensation
Mounting	installation is also possible using mounting base

»APPLICATION NOTICE

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.

»CONFIGURATION

The Thermokon bluetooth dongle with micro-USB (Item No.: 668262) is required for communication between USEapp and USE-M / USE L products. 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.

»MOUNTING ADVICE

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.** To prevent condensate permeation the pipe must be installed in an orientation that occurring condensate can run off.
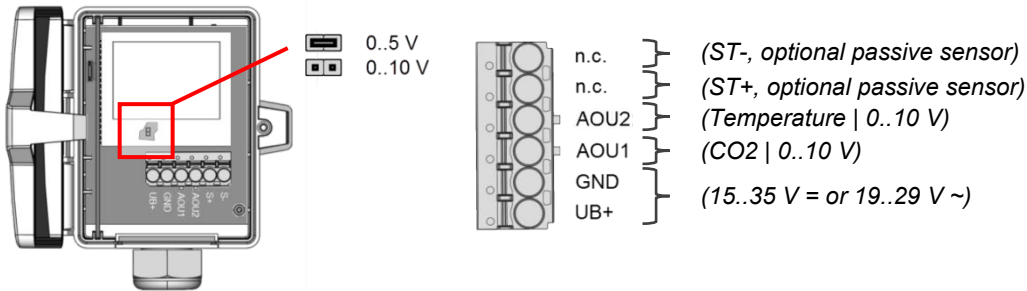
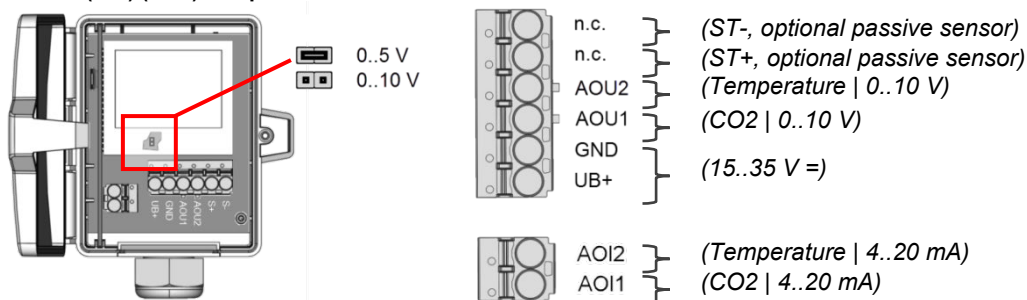Remove the lower section of the sensor carefully and pulling straight out.

Dont tilt the sensor during mounting / dismounting!

Mount the holes in flow direction

Flow direction
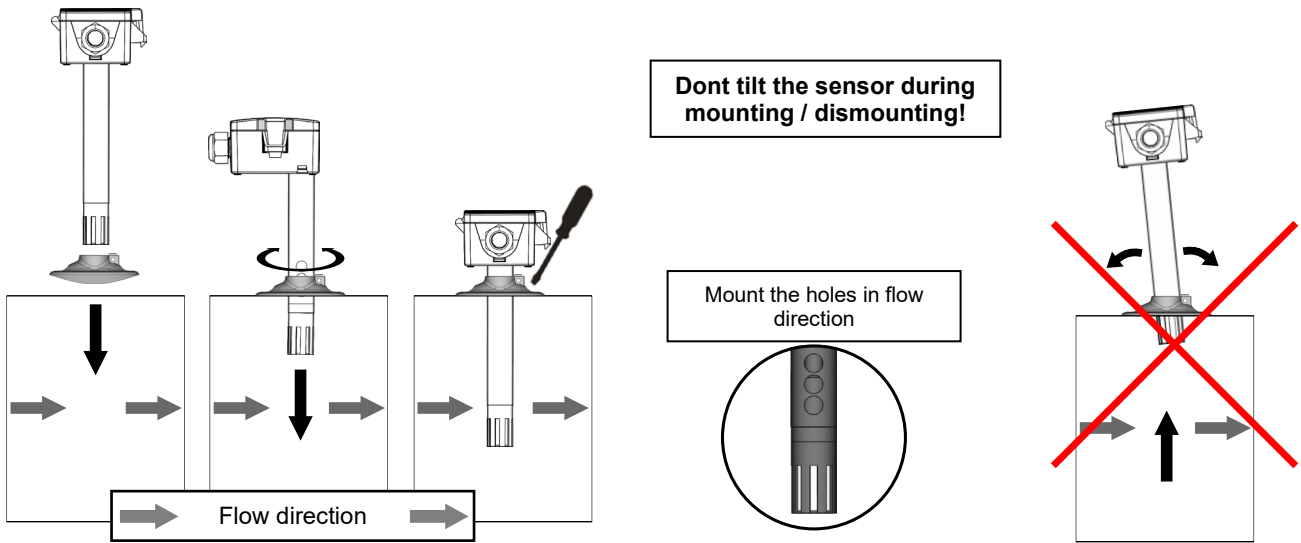
»CONNECTION PLAN

To change the output voltage range (default: 0..10 V to 0..5 V) via jumper, the display must be removed from the board.
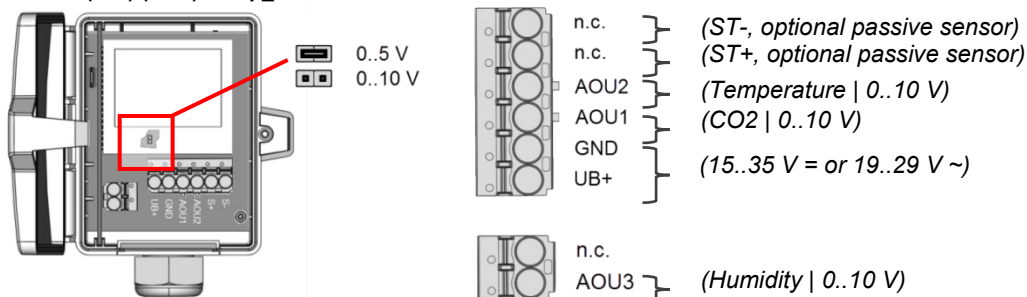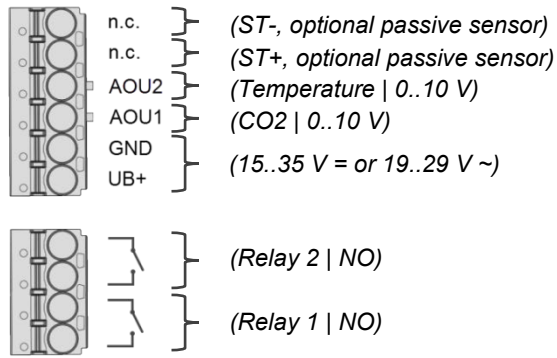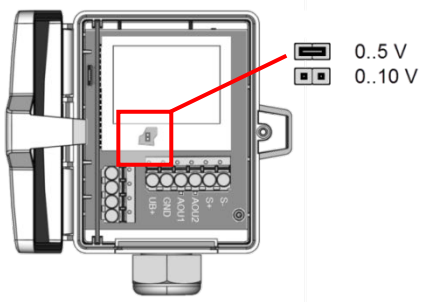
LK+ CO2 (100) (LCD) Temp VV

0..5 V
0..10 V

n.c.   *(ST-, optional passive sensor)*
n.c.   *(ST+, optional passive sensor)*
AOU2   *(Temperature | 0..10 V)*
AOU1   *(CO2 | 0..10 V)*
GND
UB+   *(15..35 V = or 19..29 V ~)*

LK+ CO2 (100) (LCD) Temp 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   *(CO2 | 0..10 V)*
GND
UB+   *(15..35 V =)*

AOI2   *(Temperature | 4..20 mA)*
AOI1   *(CO2 | 4..20 mA)*

LK+ CO2 (100) (LCD) Temp_rH 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   *(CO2 | 0..10 V)*
GND
UB+   *(15..35 V = or 19..29 V ~)*

n.c.
AOU3   *(Humidity | 0..10 V)*

LK+ CO2 (100) (LCD) Temp 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 — *(CO2 | 0..10 V)*
GND
UB+ — *(15..35 V = or 19..29 V ~)*

(Relay 2 | NO)

(Relay 1 | NO)

» DIMENSIONS (MM)

65   84

15..22   53

Optional:

12
29
71
4,5
4,5   8
24   22
90

4
9   19,5
69

85
45
180

85
45
100

Typ 100

» ACCESSORIES (INCLUDED IN DELIVERY)

Mounting base	Item No. 631228
Mounting kit universal	Item No. 698511
• Cover screw + screw cover• 2 Rawlplugs • 2 Screws (countersunk head) • 2 Screws (rounded head)	

» ACCESSORIES (OPTIONAL)

Sealing insert M20 USE white, 2x Ø=7 mm (for 2 wire; PU 10 pieces)	Item No. 641333
Bluetooth dongle	Item No. 668262