LK+ CO2 (LCD) (Temp_rH) LON

Duct sensor for air quality, optional temperature and humidity

thermokon®
HOME OF SENSOR TECHNOLOGY

Datasheet

Subject to technical alteration
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The following illustrations show the version with LCD

» APPLICATION

Air quality sensor for recording the CO2 content, temperature and humidity. For direct connection to a DDC or a monitoring system, 2 analogue 0..10 V outputs are available for a maximum of 3 different values. The LCD models with RGB backlighting have a transparent cover.

» TYPES AVAILABLE

Duct sensor CO2 + temp + rH (opt.), optional with display – active LON

- LK+ CO2 (LCD) LON
- LK+ CO2 (LCD) Temp LON
- LK+ CO2 (LCD) Temp_rH LON

optionally with shorter sensor tube, type 100

- LK+ CO2 100 (LCD) LON
- LK+ CO2 100 (LCD) Temp LON
- LK+ CO2 100 (LCD) Temp_rH LON

» 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

» GENERAL REMARKS CONCERNING SENSORS

Especially with regard to passive sensors in 2-wire conductor versions, the wire resistance of the supply wire has to be considered. If necessary the wire resistance has to be compensated by the follow-up electronics. Due to self-heating, the wire current affects the measurement accuracy, so it should not exceed 1 mA.

When using lengthy connection wires (depending on the cross section used) the measuring result might be falsified due to a voltage drop at the common GND-wire (caused by the voltage current and the line resistance). In this case, 2 GND-wires must be wired to the sensor - one for supply voltage and one for the measuring current.

Sensing devices with a transducer should always be operated in the middle of the measuring range to avoid deviations at the measuring end points. The ambient temperature of the transducer electronics should be kept constant. The transducers must be operated at a constant supply voltage (±0,2 V). When switching the supply voltage on/off, onsite power surges must be avoided.

» 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).

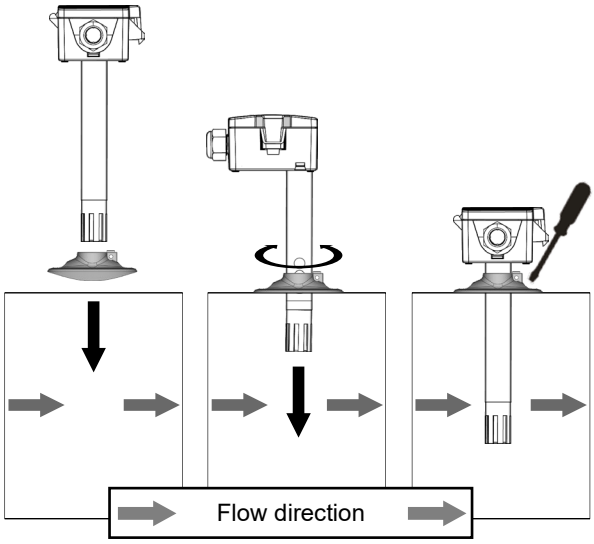
» TECHNICAL DATA

Measuring values *(type-dependent)*	CO2, temperature and humidity	
Output voltage	2x 0..10 V or 0..5 V, min. load 10 kΩ (live-zero configuration via Thermokon USEapp)	
Network technology	LON FT (free topology)	
Power supply	15..35 V = or 19..29 V ~ SELV	
Power consumption	max. 2,3 W (24 V =) | max. 4,3 VA (24 V ~) SELV	
Measuring range temp. *(type-dependent)*	**Temp | Temp_rH** +40..+140 °F (default setting) , optionally configured via Thermokon USEapp	
Measuring range humidity *(type-dependent)*	**Temp_rH** 0..100% rH non-condensing, optionally (enthalpy, absolute humidity, dew point)	
Measuring range CO2	0..2000 ppm (default), 0..5000 ppm (optionally configured via Thermokon USEapp)	
Accuracy temperature *(type-dependent)*	**Temp | Temp_rH** ±0,5 K (typ. at 70 °F)	
Accuracy humidity *(type-dependent)*	**Temp_rH** ±2% between 10..90% rH (typ. at 70 °F)	
Accuracy CO2	±50 ppm +3% of reading (typ. at 70 °F, 50% rH)	
Air speed	min. 1 ft/s, max. 40 ft/s	
Calibration	self-calibration, Dual Channel	
Sensor	NDIR (non-dispersiv, infrared)	
Display *(optional)*	**LCD** LCD 1.14x1.38 in. with RGB backlight	
Enclosure *(type-dependent)*	enclosure USE-M, PC, pure white, with removable cable entry	**LCD** cover PC, transparent
Protection	IP65 according to EN 60529	
Cable entry	M25, for wire max. Ø=0.28 in., seal insert for fourfold cable entry	
Connection electrical	**Mainboard** removable plug-in terminal, max. 14 AWG	**Plug-in card** removable plug-in terminal, max. 16 AWG
Pipe *(type-dependent)*	**CO2** PA6, black, Ø=0.77 in., length 6 in. **Type 100** Length 2.7 in.	**CO2 Temp | CO2 Temp_rH** PA6, black, Ø=0.77 in., length 7.1 in. **Type 100** Length 3.9 in.
Ambient condition	+32..+122 °F, max. 85% rH short term condensation	
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 ...)	

»MOUNTING ADVICE

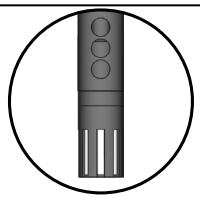
The sensor can be mounted on the ventilation duct by means of the mounting flange MF20 TPO (optional with mounting base). **Align the openings on the sensor tube according to the flow direction.** To prevent condensate permeation the pipe must be installed in an orientation that occurring condensate can run off.

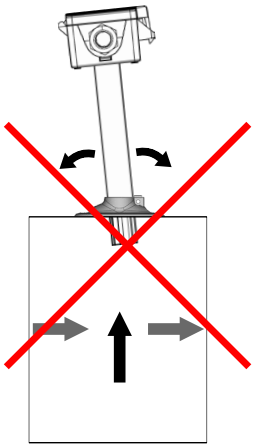
Remove the lower section of the sensor carefully and pulling straight out.



Dont tilt the sensor during mounting / dismounting!

Mount the holes in flow direction

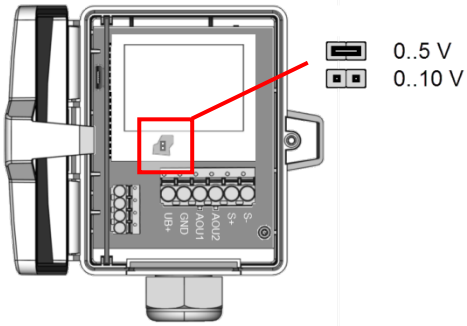


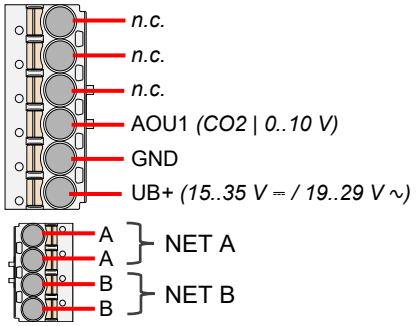


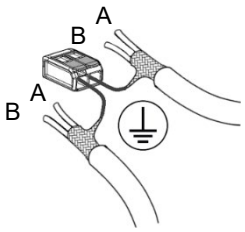
»CONNECTION PLAN

To change the output voltage range (default: 0..10 V to 0..5 V) via jumper, the display must be removed from the board first.

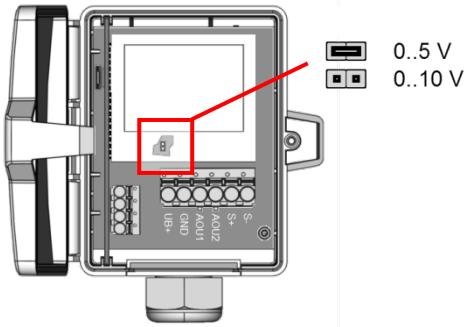
LK+ CO2 (LCD) LON

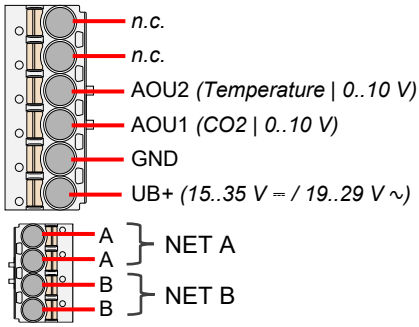


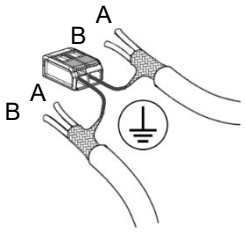




LK+ CO2 Temp (LCD) LON | LK+ CO2 Temp_rH (LCD) LON

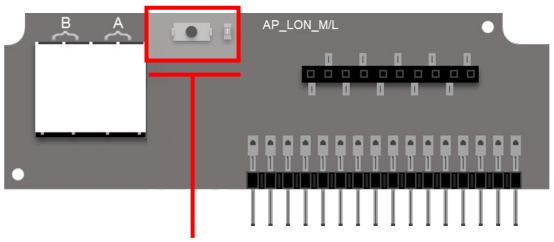






»PLUG-IN CARD

Service-Pin-Telegramm
When the service pin is activated, the service pin telegram is transmitted with the LON device identification - the Neuron Chip ID.



Service PIN / Service LED

Specification LON:
A detailed description of the LON variables can be found in our downloadcenter:
https://www.thermokon.de/direct/files/use-lon-plugin.zip

»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.

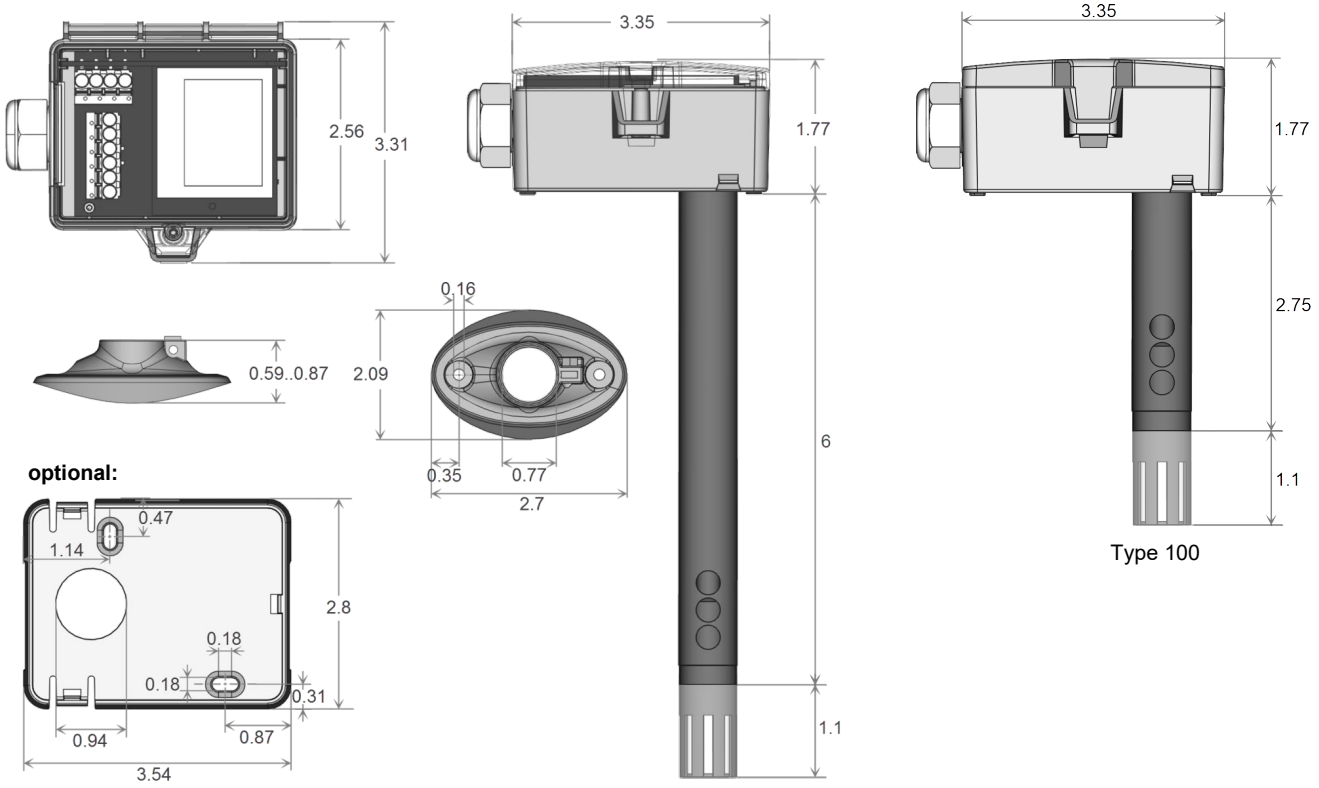
»CONFIGURATION

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.

»DIMENSIONS (IN.)



Type 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)

Filter stainless steel, wire mesh	Item No. 231169
Bluetooth dongle	Item No. 668262