LK+ CO2+VOC (LCD) (Temp_rH)

Duct sensor for air quality, optional temperature and humidity



Datasheet

Subject to technical alteration Issue date: 11/18/2024 · A141





The following illustrations show the version with LCD

» APPLICATION

Sensor for outdoor CO2 measurement optional temperature and humidity: cold rooms, greenhouses, production plants and warehouses. With a mix output, a mixture of CO2 and VOC signals can be realized. The mixing ratio can be configured with the USE app. Designed for outdoor mounted applications with 0..10 V or 4..20 mA output. 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 + VOC or Mix, optional with LCD - active 2x 0..10 V | 2x 4..20 mA | Relay

- LK+ CO2+VOC (LCD) VV
- LK+ CO2+VOC (LCD) AA
- LK+ CO2+VOC (LCD) VV Relay

optionally with shorter sensor tube, Type 100

- LK+ CO2+VOC (LCD) 100 VV
- LK+ CO2+VOC (LCD) 100 AA
- LK+ CO2+VOC (LCD) 100 VV Relay

Duct sensor CO2 + VOC + temp +rH (opt.) or mix, optional with LCD - active 3x/4x 0..10 V

- LK+ CO2+VOC (LCD) Temp 3xV
- LK+ CO2+VOC (LCD) Temp_rH 4xV

optionally with shorter sensor tube, Type 100

- LK+ CO2+VOC (LCD) 100 Temp 3xV
- LK+ CO2+VOC (LCD) 100 Temp_rH 4xV

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 <u>https://www.thermokon.de/direct/en-gb/categories/lkplus</u>

»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 ($\pm 0, 2$ 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 $(\pm 0, 2 \text{ V})$ 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.

Do not touch the sensor

elements!

» 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)

Re-calibration or exchange of the sensor element are not subject of the general warranty.

»INFORMATION ABOUT INDOOR AIR QUALITY CO2

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	6001.000 ppm	800 ppm	Moderate indoor air quality
IDA4	>1.000 ppm	1.200 ppm	Poor indoor air quality

»INFORMATION ABOUT SELF-CALIBRATION FEATURE CO2

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).

» APPLICATION NOTICE FOR AIR QUALITY SENSORS VOC

Volatile organic compunds (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 odur | tobacco smoke | odur 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 USEapp subsequently, if needed.

» 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.

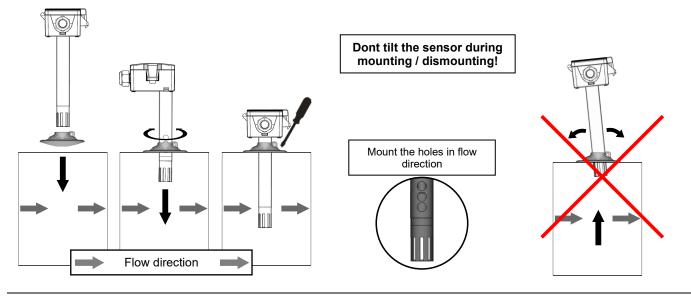
»TECHNICAL DATA

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Notes mixed gas sensors detect gases and vapours which can be oxidised (burnt): Body odours, tobacco smoke,	Ambient condition	mbient condition 0+50 °C, max. 85% rH short term condensation		
	Mounting	Mounting installation is also possible using mounting base		
	Notes			

» 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.

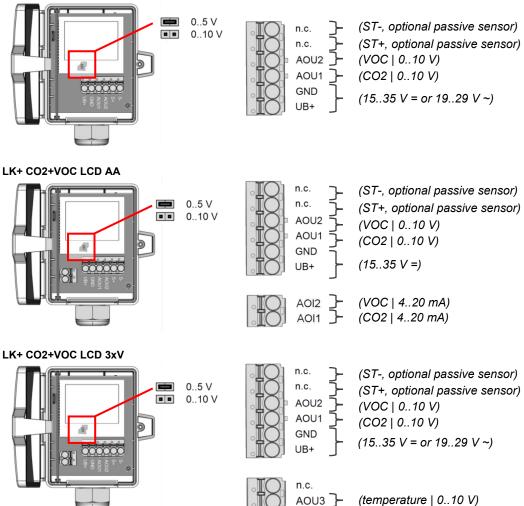
Remove the lower section of the sensor carefully and pulling straight out.

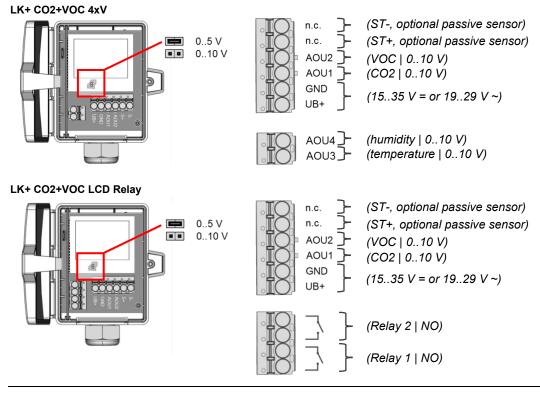


» CONNECTION PLAN

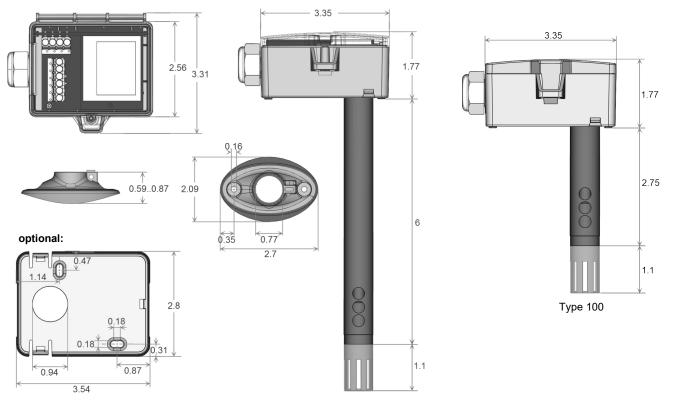
To change the output voltage range (default: 0..10 V to 0..5 V) via jumper, the display must be removed from the board.

LK+ CO2+VOC LCD VV





» DIMENSIONS (MM)



»ACCESSORIES (INCLUDED IN DELIVERY)

Mounting base

Mounting kit universal • 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)

Bluetooth dongle

Item No. 631228 Item No. 698511

Item No. 641333

Item No. 668262