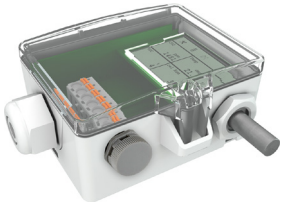
» LA+ CO2 (LCD) (Temp_rH)

Outdoor sensor for air quality

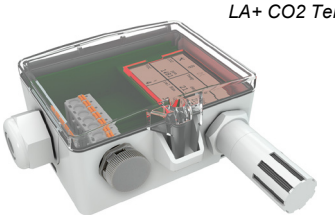
thermokon®
HOME OF SENSOR TECHNOLOGY

Datasheet

Subject to technical alteration
Issue date: 8/17/2020 · A110



LA+ CO2 Temp



LA+ CO2 Temp_rH

Illustration similar, depending on the type

» APPLICATION

Sensor for outdoor CO2 measurement optional temperature and humidity: cold rooms, greenhouses, production plants and warehouses. Designed for outdoor mounted applications with 0..10 V or 4..20 mA output. 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

Outdoor sensor CO2 + temp optional with LCD – active 2x 0..10 V | 2x 4..20 mA | Relay

LA+ CO2 (LCD) Temp VV
LA+ CO2 (LCD) Temp AA
LA+ CO2 (LCD) Temp VV Relay

Outdoor sensor CO2 + temp +rH (opt.) optional with LCD – active 3x 0..10 V

LA+ CO2 (LCD) Temp_rH 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

» 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.

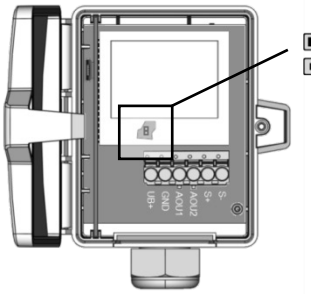
» TECHNICAL DATA

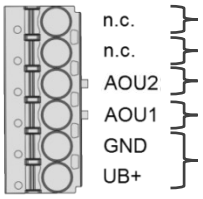
Measuring values	CO2, temperature + humidity (depending on the device)	
Output voltage	2..4x 0..10 V or 0..5 V, min. load 10 kΩ (live-zero configuration via Thermokon USEapp)	
Output Amp *(type-dependent)*	**AA** 2x 4..20 mA, max. load 500 Ω	
Output passive *(type-dependent)*	**passive** Options: additional 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** +40..+140 °F (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 70 °F)	**passive** depending on used sensor
Accuracy humidity *(type-dependent)*	**3xV** ±2% between 10..90% rH (typ. at 70 °F)	
Accuracy CO2	±50 ppm +3% of reading (typ. at 70 °F, 50% rH)	
Calibration	self-calibration, Dual Channel	
Sensor	**CO2** NDIR (non-dispersiv, infrared)	
Display (optional)	LCD 1.14x1.38 in. 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 max. Ø=0.18..0.35 in., removable	**Relay** M25 with fourfold cable entry for wire with max. Ø=0.28 in., removable
Connection electrical	removable plug-in terminal, max. 14 AWG	
Ambient condition	+32..+122 °F, max. 85% rH short term condensation	
Mounting	installation is also possible using mounting base	

» 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.

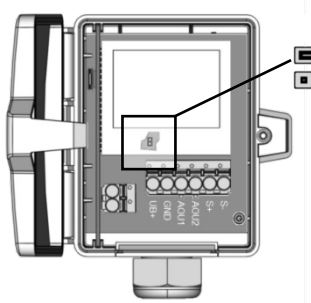
LA+ **CO2 (LCD) Temp VV**

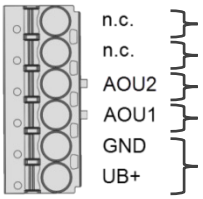




(ST-, optional passive sensor)
(ST+, optional passive sensor)
(Temperature | 0..10 V)
(CO2 | 0..10 V)
(15..35 V = or 19..29 V ~)

LA+ **CO2 (LCD) Temp AA**



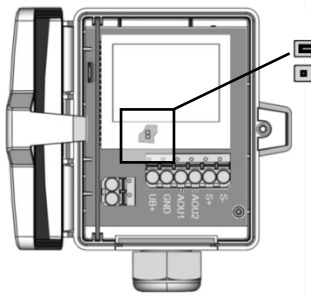


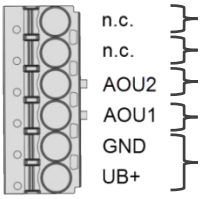
(ST-, optional passive sensor)
(ST+, optional passive sensor)
(Temperature | 0..10 V)
(CO2 | 0..10 V)
(15..35 V =)



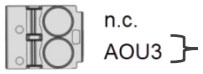
(Temperature | 4..20 mA)
(CO2 | 4..20 mA)

LA+ **CO2 (LCD) Temp_rH 3xV**



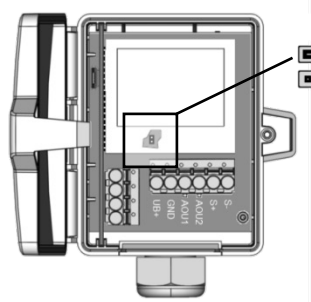


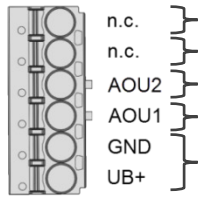
(ST-, optional passive sensor)
(ST+, optional passive sensor)
(Temperature | 0..10 V)
(CO2 | 0..10 V)
(15..35 V = or 19..29 V ~)



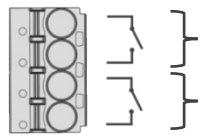
(Humidity | 0..10 V)

LA+ **CO2 (LCD) Temp Relay**





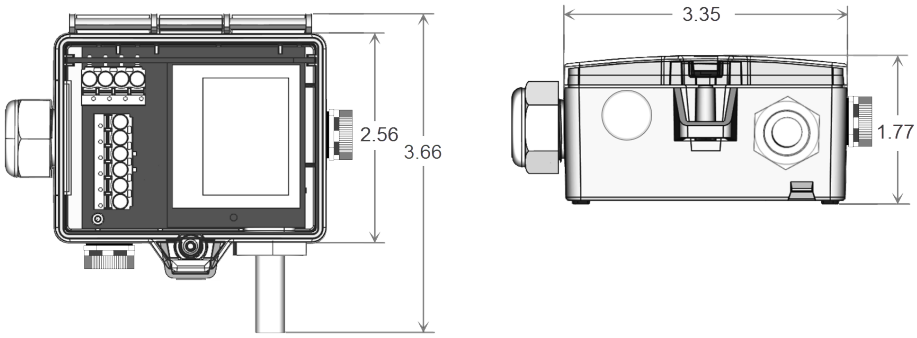
(ST-, optional passive sensor)
(ST+, optional passive sensor)
(Temperature | 0..10 V)
(CO2 | 0..10 V)
(15..35 V = or 19..29 V ~)



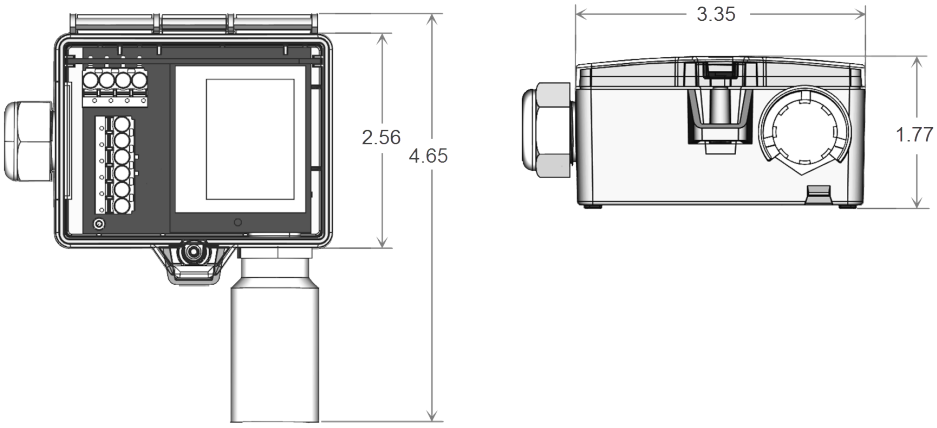
(Relay 2 | NO)
(Relay 1 | NO)

» DIMENSIONS (IN.)

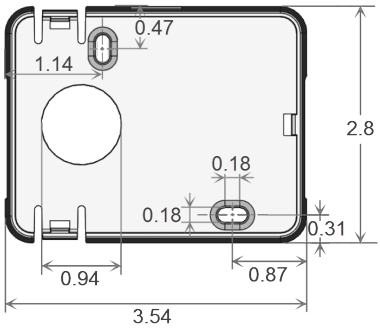
LA+ CO2 (LCD) Temp (Relay)



LA+ CO2 (LCD) Temp_rH



Montagesockel



»PRODUCT TESTING AND CERTIFICATION

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.

»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=0.28 in. (for 2 wire; PU 10 pieces)	Item No. 641333