

Datasheet

Subject to technical alteration
Issue date: 9/12/2019 • A003



The following illustrations show the version with LCD

Application

Air quality sensor for measuring VOC air quality, CO₂, temperature and humidity in outdoor areas with 2 0..10 V 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.

Types Available

Duct sensor CO₂ + VOC – active RS485 Modbus MS/TP | LCD

LA+ CO₂+VOC RS485 Modbus

LA+ CO₂+VOC LCD RS485 Modbus

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.

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	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 CO₂

All gas sensors are subject to drift caused by components. This fact results generally in the need to recalibrate the sensors regularly.

With dual channel technology Thermokon integrates automatic self-calibration for different fields of operation. In contrast to common used ABC-Logic sensors with self-calibration dual channel are suitable for applications operating 24 hours, 7 days a week as for example hospitals.

Manual calibration is not necessary!

Application Notice for Air Quality Sensors VOC

Unlike CO₂ sensors, which specifically measure CO₂, mixed gas sensors detect a wide range of gases. The sensor signal does not indicate the type of gas or its concentration in ppm. Mixed gas sensors detect gases and vapours consisting of carbohydrates, or more generally gases that can be oxidised (burnt): Odours, perfume, cleaning fluid scent, tobacco smoke, new materials fumigations (furniture, carpets, paint, glue ...).

Unlike CO₂, which humans cannot sense, the amount of odours (VOC) indicates the level of air quality. VOC sensors have proven their value in a multitude of applications for many years.

Measuring principle:

Similar to a catalyst converter the organic molecules are burnt (oxidized) when in contact with the sensor's heated -dioxide surface, adding a small amount of heat combustion. The increased temperature is measured providing a signal proportional to the number of molecules being burnt. CO₂ cannot be detected as it cannot be further oxidized.

Refrain from touching the sensor's element sensitive surface. Touching the sensitive surface element will void warranty.

Information about Calibration VOC

Similar to a catalyst converter the VOC sensor will deteriorate over time, which will affect the sensitivity. This VOC sensor automatically compensates the decrease in sensitivity by dynamic auto-calibration.

The reference level of air quality is derived from the ambient conditions over a 72h period. The lowest reading within this 72h time period will be used as reference level, representing the "clean and fresh air level".

Technical Data

Measuring values	CO2, VOC	
Output voltage	2x 0..10 V or 0..5 V, min. load 10 kΩ (live-zero configuration via Thermokon USEapp)	
Network technology	RS485 Modbus, RTU, half-duplex, baud rate 9.600, 19.200, 38.400 or 57600, parity: none (2 stopbits), even or odd (1 stopbit)	
Power supply	15..35 V = or 19..29 V ~	
Power consumption	max. 2,3 W (24 V =) max. 4,3 VA (24 V ~)	
Measuring range CO2	0..2000 ppm (default), 0..5000 ppm (optionally configured via Thermokon USEapp)	
Accuracy CO2	±50 ppm +3% of reading (typ. at 70 °F, 50% rH)	
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 removeable plug-in terminal, max. 14 AWG	Plug-in card removeable plug-in terminal, max. 16 AWG
Pipe	PC, pure white	
Filter	stainless steel wire mesh	
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 ...)	

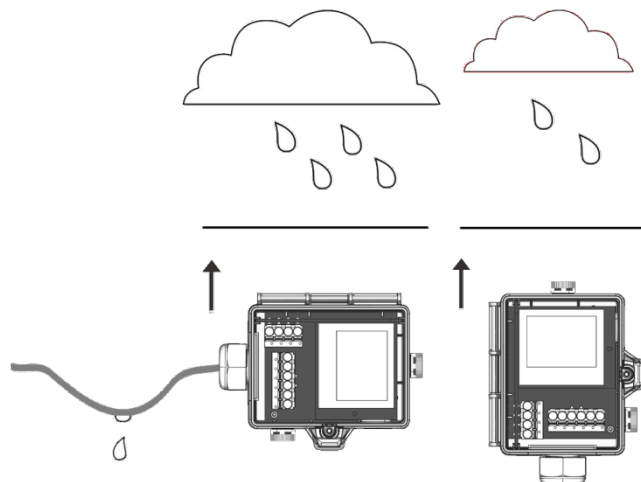


Declaration of conformity

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

Mounting Advices

In case of outdoor installation avoid direct rain and sun contact. Probably use sun respectively rain protection. Cable entry from bottom or side. For side cable routing set loop so that precipitation can drain defined. Observe permissible ambient condition.



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



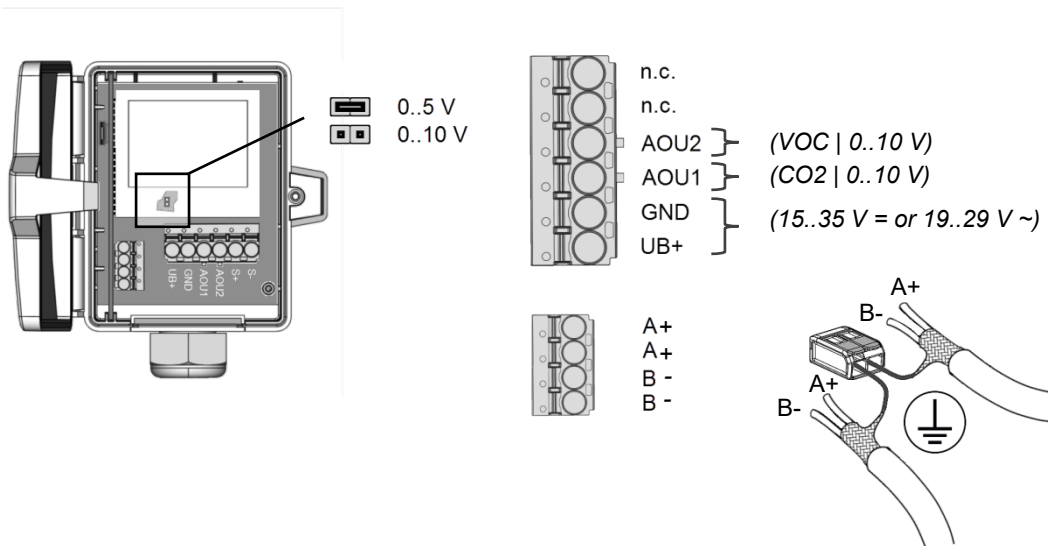
The housing cover must be completely closed in order to ensure the accuracy and reproducibility of the measured values during a test or service log via USEapp.

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.

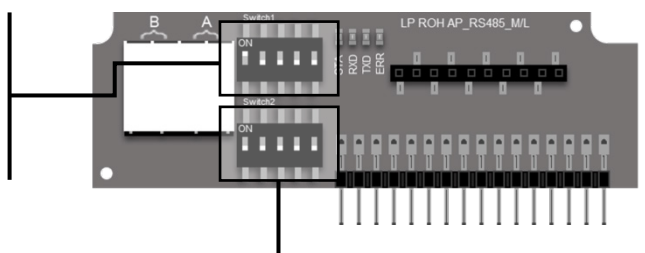
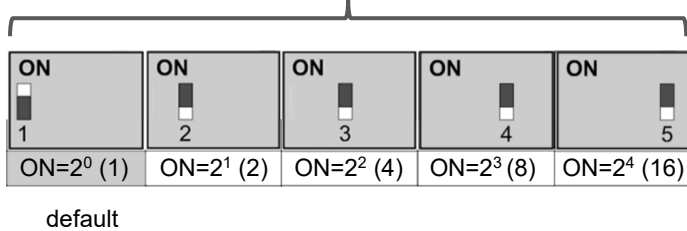
Connection Plan

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.

LA+ CO2+VOC LCD RS485 Modbus



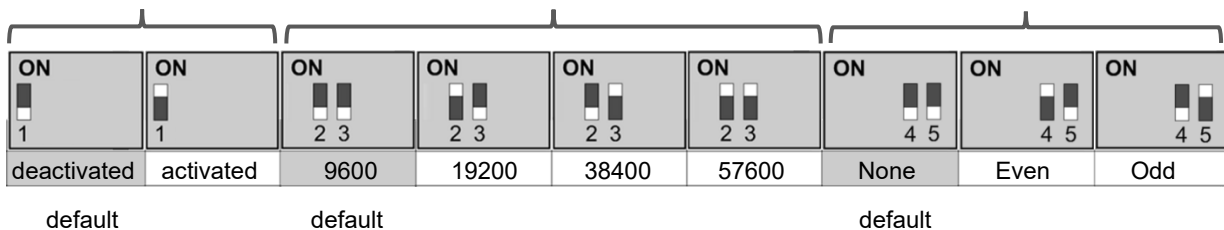
Address



Termination 120Ω

Baud rate

Parity



Address	Access	Description	Resolution / Unit	
5	R	CO2	1.0	ppm
6	R	VOC	1.0	%
7	R	CO2 VOC MIX	1.0	

The modbus address of the device is set in the range of 1 ... 31 (binary encoded) using a 5-pole DIP switch. With address 0 via DIP, an extended address range (32..247) is available via USEapp.



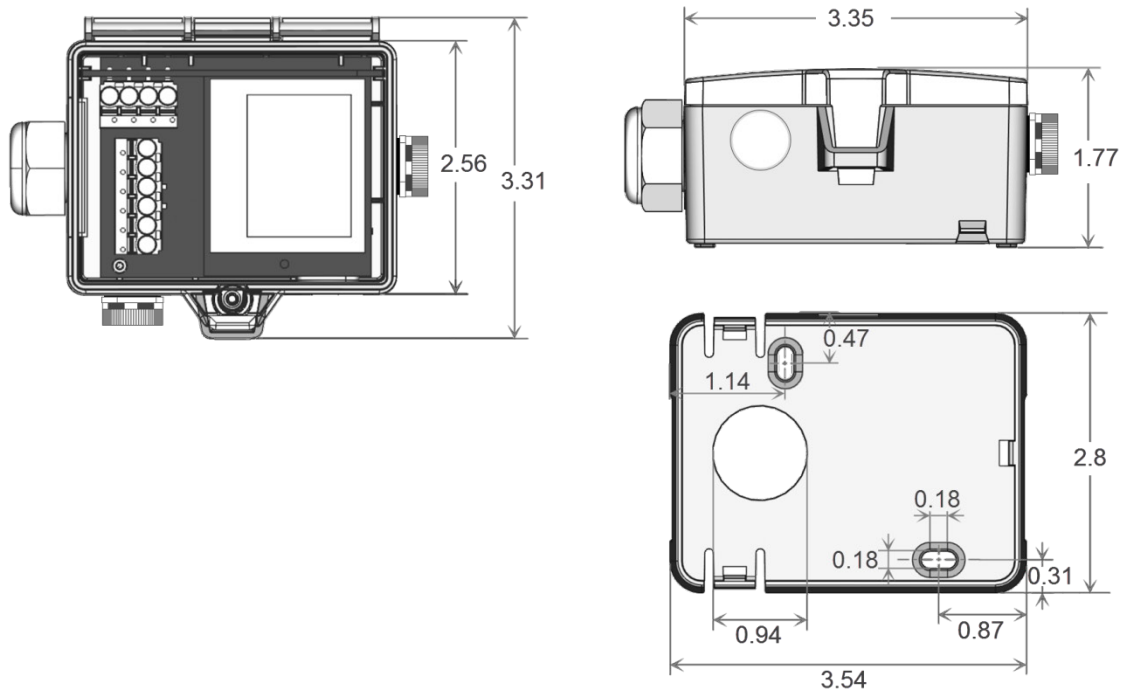
Modbus addresses:

USE-RS485 Modbus Interface

A detailed description of the Modbus addresses can be found in our downloadcenter:

→ [Download](#)

Dimensions (in.)



Accessories (included in delivery)

Mounting base

Item No. 631228

Mounting kit universal

Item No. 698511

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

Accessories (optional)

Bluetooth dongle

Item No. 668262

Filter stainless steel, wire mesh

Item No. 231169