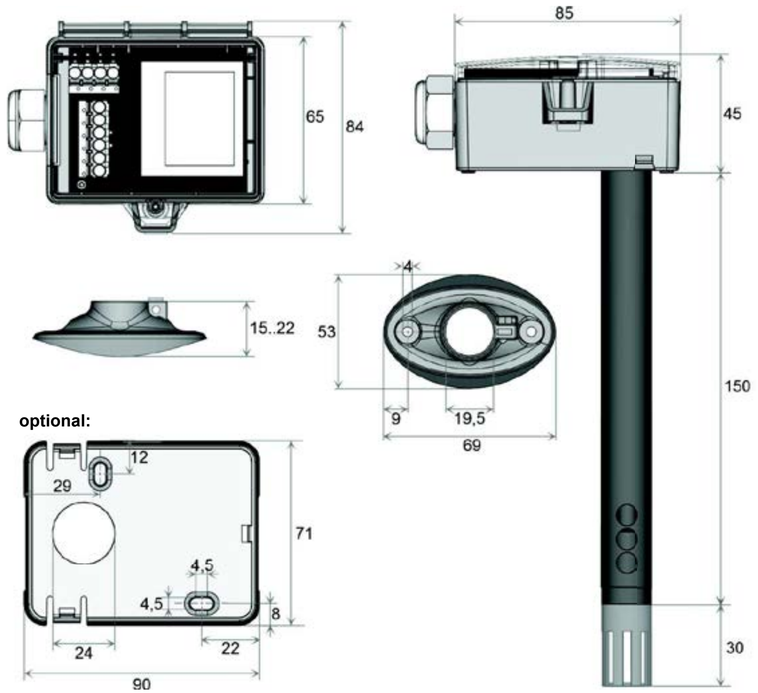
Sensor E-01

Duct sensor for air quality, temperature and humidity (optional)

Duct air quality sensor for detection of CO2, VOC, optional temperature and humidity. With a mix output, a mixture of CO2 and VOC signals can be realized. The mixing ratio can be configured with the USE app or via modbus. Designed for duct mounted applications with up to 2 configurable 0..10 V

Types Available

Duct sensor with display CO2 + VOC or mix – active BUS
LK+ CO2+VOC LCD RS485 Modbus
Duct sensor with display CO2 + VOC + temp – active BUS
LK+ CO2+VOC LCD Temp RS485 Modbus
Duct sensor with display CO2 + VOC + temp +rH – active BUS
LK+ CO2+VOC LCD Temp_rH RS485 Modbus



Technical Data	
Measuring values	VOC, CO2, temperature + humidity, each output can be set to get a variable mix of CO2 and VOC by configuration
Output voltage	2x 0..10 V or 0..5 V, min. load 10 kΩ (live-zero configuration via Thermokon USEapp)
Output passive	passive
	Options: additional passive temperature sensor, eg: PT100/PT1000/NI1000/NI1000TK5000/NTC10K... and other sensors on request
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 temp.	0..+50 °C (default setting), optionally configurable via Thermokon USEapp
Measuring range humidity	Temp_rH
	0..100% rH non-condensing, optionally configurable via Thermokon USEapp (enthalpy, absolute humidity, dew point)
Measuring range CO2	0..2000 ppm (default), 0..5000 ppm optionally configurable via Thermokon USEapp
Accuracy temperature	Temp | Temp_rH: ±0,5 K (typ. at 21 °C)
	passive: depending on used sensor
Accuracy humidity	Temp_rH ±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)
	VOC
	VOC sensor (heated metal oxide semiconductor)

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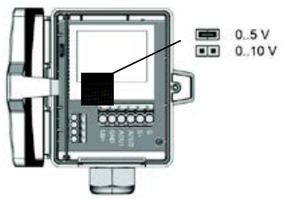
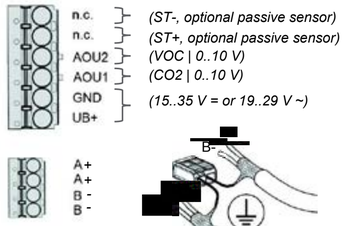
Display	LCD 29x35 mm with RGB backlight
Enclosure	enclosure USE-M, PC, pure white, cover PC, transparent, with removable cable entry
Protection	IP65 according to EN 60529
Cable entry	M25, for wire max. Ø=7 mm, seal insert for fourfold cable entry
Connection electrical	Mainboard
	removable plug-in terminal, max. 2,5 mm²
	Plug-in card
	removable plug-in terminal, max. 1,5 mm²
Pipe	CO2+VOC
	PA6, black, Ø=19,5 mm, length 150 mm
	Temp | Temp_rH
	PA6, black, Ø=19,5 mm, length 180 mm
Ambient condition	0..+50 °C, max. 85% rH short term condensation
Mounting	installation is also possible using mounting base
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 ...)

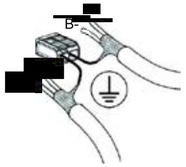
Connection Plan

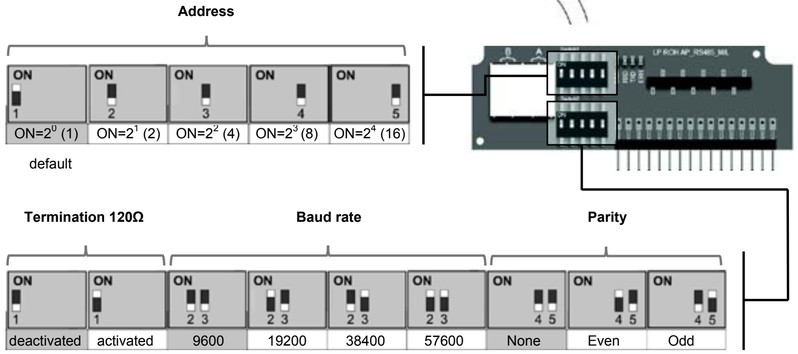
To change the output voltage range (default 0..10 V to 0..5 V) via jumper, the display must be removed from the board first. If the RS485 cable is looped through, connect both cable shields using the enclosed 2-pol. Connect terminal as shown.

LK+ CO2+VOC RS485 Modbus









Address	Access	Description	Resolution / Unit	
1	R	relative humidity	0.1	%rF
5	R	CO2	1.0	ppm
6	R	VOC	0.1	%

Register 400 = 1 (Unit SI)

Address	Access	Description	Resolution / Unit		
0	R	Temperature	SI	0.1	°C
2	R	Absolute humidity	SI	0.01	g/m³
3	R	Enthalpy	SI	0.1	kJ/kg
4	R	Dew point	SI	0.1	°C

Register 400 = 2 (Unit Imperial)

Address	Access	Description	Resolution / Unit		
0	R	Temperature	Imperial	0.1	°F
2	R	Absolute humidity	Imperial	0.01	gr/ft³
3	R	Enthalpy	Imperial	0.1	BTU/lb
4	R	Dew point	Imperial	0.1	°F

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 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!

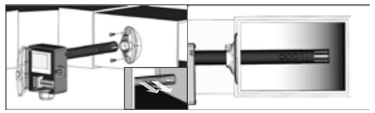
Application notice

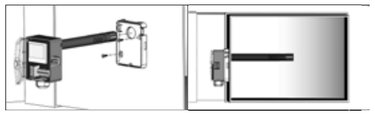
The housing cover must be completely closed in order to ensure the accuracy and reproducibility of the measured values during a test or service log via USEapp.
The Bluetooth dongle snaps into the socket easily. When removing, please fix the plug-in card (option PCB) so that it is not unintentionally pulled out.

Mounting Advices

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.

Optional mounting with mounting base (Item No. 631228), please note the installation depth of the sensor pipe.





Dismounting Advices

Remove the lower section of the sensor carefully and pulling straight out. Pay close attention to the correct dismantling of the component!

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