

LP+ CO2 (LCD) (Temp_rH) RS485 BACnet

Duct air quality sensor, optionally with temperature and humidity sensors

thermokon[®]
HOME OF SENSOR TECHNOLOGY

Data sheet

Subject to technical changes
Issue date: 15.09.2026 • A141



Similar to illustration

» APPLICATION

Air quality sensor for measuring CO2 concentration, temperature and humidity. For direct connection to a DDC or monitoring system, 2 analog 0..10 V outputs are available for up to 3 different values. The LCD models with RGB backlighting feature a transparent cover.

» TYPES AVAILABLE

Outdoor sensor CO2 + temp. (optional) + rH (optional), optionally with display – active RS485 BACnet MS/TP

- LP+ CO2 (LCD) Temp_rH RS485 BACnet

» SECURITY ADVICE – ATTENTION

The installation and mounting of electrical devices (modules) may only be carried out by an authorized and qualified electrician.



The device is intended exclusively for its specified use. Unauthorized modifications or alterations to the device are prohibited!

The modules must not be used in connection with devices that directly or indirectly serve purposes related to human safety, health protection, or life support, or whose operation may pose a risk to people, animals, or property.

Devices with a mains power connection may only be connected when the supply line has been disconnected and is voltage-free.

The following also apply:

- Local laws, health and safety regulations, technical standards, and applicable regulations
- The condition of the device at the time of installation to ensure safe installation
- This data sheet and the operating instructions of the device

» PRODUCT TESTING AND CERTIFICATION



Declaration of conformity

Declarations of conformity for our products can be found on our website:

» NOTES ON DISPOSAL



The symbol of the crossed-out wheeled bin indicates that the product or any removable batteries must not be disposed of with household or commercial waste.

Within the EU, you are legally obliged to ensure that the product is disposed of separately and appropriately in accordance with the applicable national regulations of your country.

Alternatively, please contact your supplier or Thermokon Sensortechnik GmbH.

Further information can be found at: www.thermokon.com

» GENERAL NOTES ON SENSORS

Especially for passive sensors in two-wire configuration, the resistance of the connecting cable must be taken into account. If necessary, this must be compensated for in the downstream electronics. Due to self-heating, the measuring current affects the accuracy of the measurement. It should therefore not exceed 1 mA.

When using long connecting cables (depending on the cross-section used), the voltage drop on the common GND line (caused by the supply current and cable resistance) can distort the measurement result. In this case, two GND lines must be connected to the sensor, one for the supply current and one for the measuring current.

For sensors with a transmitter, the transmitter should generally be operated in the middle of the measuring range, as increased deviations may occur at the measuring range end points. The ambient temperature of the transmitter electronics should be kept constant. The transmitters must be operated at a constant supply voltage (± 0.2 V). Current/voltage peaks when switching the supply voltage on or off must be avoided on site.

» HEAT GENERATION DUE TO ELECTRICAL POWER LOSS

The electrical power dissipation of sensors containing electronic components can affect temperature measurement and depends on the respective operating voltage. This power dissipation must be considered during temperature measurement. At a constant operating voltage (± 0.2 V), this is usually achieved by adding or subtracting a constant offset value.

Thermokon transmitters can be operated at variable supply voltages. The transmitters are factory-set to a reference supply voltage of 24 V. At this voltage, the expected measurement deviation of the output signal is at its lowest. Other supply voltages may result in a measurement deviation. Recalibration can be carried out on a device-specific basis either directly on the device or via a software variable (app or bus).

Please note: Draughts help to dissipate the power loss at the sensor more effectively. This may result in temporary deviations in the temperature measurement.

» NOTE ON HUMIDITY SENSORS

Under normal environmental conditions, we recommend a recalibration interval of 1 year to verify the accuracy required for the application.

The following environmental conditions can damage the sensor element and may, in the long term, lead to a loss of the specified accuracy:

- Mechanical stress
- Contamination (dust, fingerprints, etc.)
- Aggressive chemicals
- Environmental influences (e.g. condensation on the measuring element)



**Do not touch
the sensor element!**

Recalibrations or any required sensor replacement are not covered by the general warranty.

» INFORMATION ON INDOOR AIR QUALITY CO2

DIN EN 13779 defines various categories for indoor air quality:

Category	CO2 concentration above outdoor air level [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 ON CO2 SELF-CALIBRATION

Optical gas sensors are subject to drift. Therefore, the CO2 sensor must be protected from the following environmental conditions, as they can accelerate or promote aging, wear, and increased measurement deviations:

- Mechanical stress (including stress caused by temperature fluctuations)
- Contamination (dust, fingerprints, etc.)
- Aggressive chemicals
- Environmental influences (high humidity or condensation on the sensing element)

An internal self-calibration using dual-channel technology compensates for the resulting drift. Thermokon sensors are suitable for continuous operation (e.g. hospitals).

» **TECHNICAL DATA**

Measured values <i>(type dependant)</i>	CO2, temperature and humidity	
Ambient conditions	0..+50 °C, max. 85 %rH, non-condensing	
Network technology	RS485 BACnet MS/TP, Fail-safe Biasing required	
Output voltage	2x 0..10 V or 0..5 V (adjustable via jumper)	
Supply voltage*	15..35 V = or 19..29 V ~ SELV <i>For AC voltage, ensure correct polarity</i>	
Power consumption	max. 2,3 W (24 V =) 4,3 VA (24 V ~)	
Sensor	NDIR (non-dispersive infrared), sensor cable black 5 m 10 m, other lengths on request	
Calibration	Self-calibration, dual channel, offset calibration via Thermokon USEapp	
Protection	IP65 according to DIN EN 60529	
Mounting	Mounting can optionally be carried out using the mounting base	
Housing <i>(type dependant)</i>	USE-M housing with hinged cover, PC, pure white, with removable cable entry	LCD <i>(optional)</i> Cover PC, transparent
Display <i>(optional)</i>	LCD LCD 29 x 35 mm with RGB backlighting	
Cable length	5000 mm (RJ45 on one side)	
Cable entry	M25 for cables with max. Ø = 7 mm, sealing insert for fourfold cable entry, removable	
Electrical connection	Base board Removable plug-in terminal, max. 2.5 mm²	Plug-in board Removable plug-in terminal, max. 1.5 mm²

* If several bus devices are supplied by a 24 V AC voltage, ensure that all "positive" supply voltage inputs (+) of the field devices are connected to each other, and that all "negative" supply voltage inputs (-) = reference potential are connected to each other (in-phase connection of the field devices). If the supply voltage is reversed on one of the field devices, this will cause a short circuit of the supply voltage through the device.

The resulting short-circuit current flowing through this field device will damage the device. Therefore, ensure correct wiring.

» **Temperature**

Temperature measuring range	0..+50 °C
Temperature accuracy	±0,5 K (typ. at 21 °C)

» **Humidity**

Humidity measuring range (non-condensing)	Rel. humidity* 0..100 %rH	Abs. humidity * 0..50 0..80 g/m ³	Enthalpy* 0..85 KJ/kg	Dew point * 0..+50 -20..+80 °C
	* adjustable via Thermokon USEapp			
Humidity accuracy	±2 % between 10..90 %rH (typ. at 21 °C)			

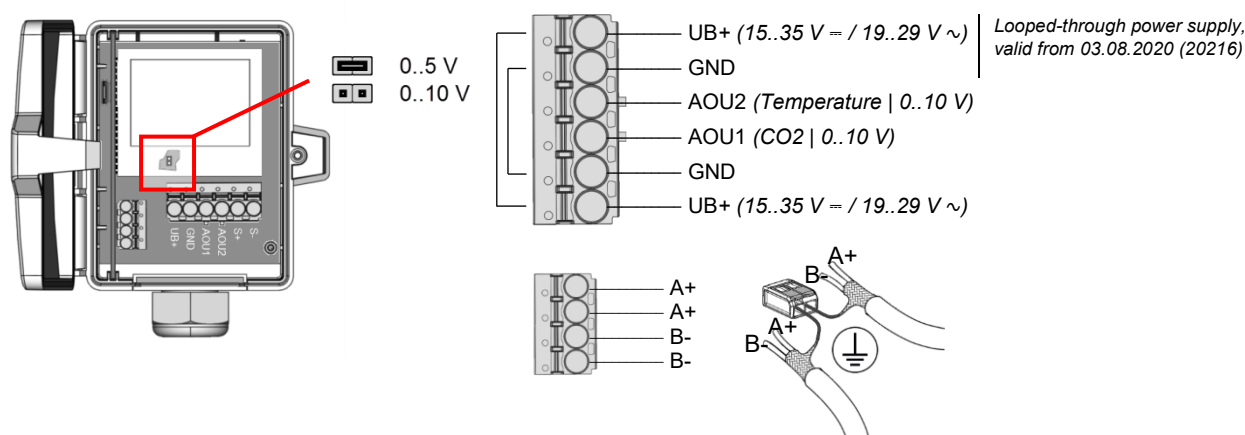
» **CO2**

CO2 measuring range	0..2000 ppm, 0..5000 ppm (optionally configurable via Thermokon USEapp)
CO2 accuracy	±50 ppm +3 % of measured value (typ. at 21 °C, 50 %rH, 1015 hPa)

» WIRING DIAGRAM

To change the output voltage (0..10 V to 0..5 V) via jumper, the display must be disconnected from the circuit board.

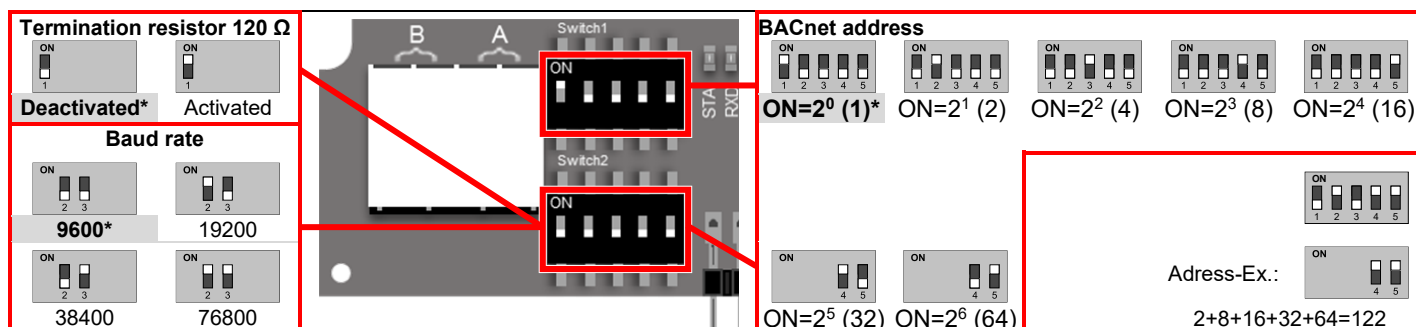
LP+ CO2 (Temp_rH) (LCD) RS485



» DIP SWITCH SETTINGS (PLUG-IN BOARD)

The BACnet address of the device is set via DIP switches using binary coding in the range of 1..127. (Address 0 is reserved and cannot be set).

***Default settings**



Object	Access	Description	COV increment	Unit
AI-1	R	Relative humidity	0..100 %	%rF
AI-5	R	CO2		ppm

Object	Access	Description	Object AV-38 = 1 (Unit SI)		Object AV-38 = 2 (Unit Imperial)	
			COV increment	Unit	COV increment	Unit
AI-0	R	Temperature	0..250	°C	0..480	°F
AI-2	R	Absolute humidity	0..80	g/m³	0..35	gr/ft³
AI-3	R	Relative humidity	0..85	KJ/kg	0..40	BTU/lb
AI-4	R	Dew point	0..80	°C	0..200	°F



BACnet objects, PICS and BIBBs:

USE-RS485 BACnet interface

A detailed description of the BACnet interface can be found at the following link: [Download](#)

» USER INFORMATION



The Bluetooth dongle easily locks into the socket. When disconnecting, hold the plug-in board (option board) in place to prevent it from being unintentionally pulled out.

» CONFIGURATION



Communication between the USEapp and products of the USE-M/USE-L series requires the Thermokon Bluetooth dongle with Micro-USB (item no.: 668262). Standard commercially available Bluetooth dongles are not compatible.

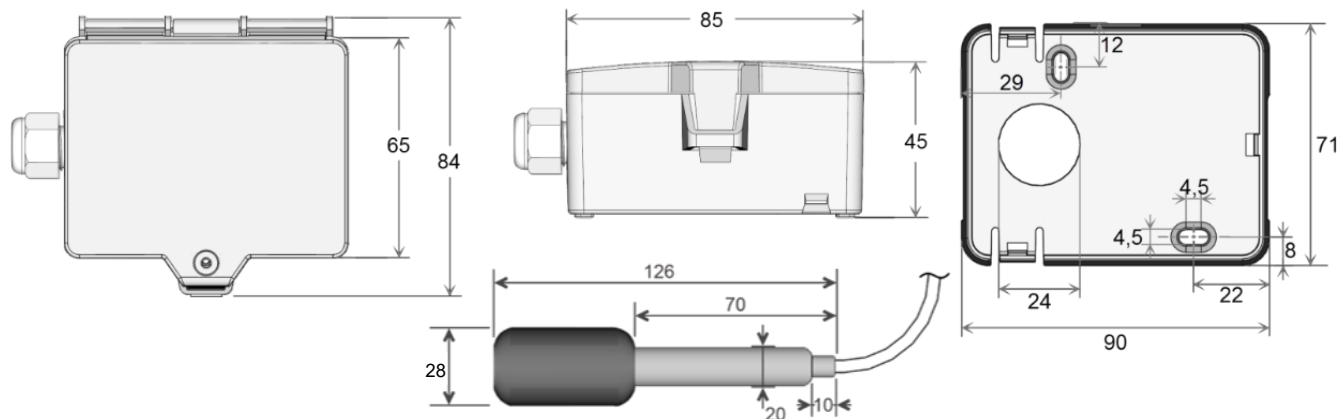


Device-specific reconfiguration can be carried out using the Thermokon USEapp. Configuration is performed while the device is powered.



The configuration app and the corresponding instructions are available for download from the Google Play Store or the Apple App Store.

» DIMENSIONS (MM)



» ACCESSORIES (INCLUDED IN DELIVERY)

Mounting base

Item no: 631228

Universal mounting set

Item no: 698511

• Cover screw + screw cover • 2 wall plugs • 2 countersunk self-tapping screws • 2 pan-head self-tapping screws

» ACCESSORIES (OPTIONAL)

Bluetooth dongle

Item no: 668262

RS485 Biasing Adapter

Item no: 811378

USB Interface RS485

Item no: 668293