

# LK+ CO2 Temp\_rH BAT LRW

LoRaWAN® Duct sensor for air quality temperature and humidity

**thermokon**<sup>®</sup>  
HOME OF SENSOR TECHNOLOGY

## Datasheet

Subject to technical alteration  
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### » APPLICATION

Duct air quality sensor for measuring CO2 air quality, temperature and humidity in air ducts with LoRaWAN® interface.

### » TYPES AVAILABLE

#### Duct sensor – LRW

- LK+ CO2 Temp\_rH BAT LRW

### » 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 can be found on our website  
<https://www.thermokon.de/direct/en-gb/categories/lkplus>

### » NOTES ON DISPOSAL



The crossed-out wheeled 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](http://www.thermokon.com)

## » 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 term to loss of the specified accuracy:

- Mechanical stress
- Contamination (e.g. dust / fingerprints)
- Aggressive chemicals
- Ambient conditions (e.g. condensation on measuring element)



**Do not touch the sensor elements!**

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

## » INFORMATION ABOUT INDOOR AIR QUALITY CO<sub>2</sub>

EN 13779 defines several classes for indoor air quality:

Category	CO <sub>2</sub> 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<sub>2</sub>

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).

» **TECHNICAL DATA (TYPE-DEPENDENT)**

Measuring values	CO <sub>2</sub> , temperature and humidity
Power supply	(1-) 2x AA 3.6V lithium batteries LS14500 or ER14505 Temporary operation/ commissioning possible with 2x 1.5V AA (LR06) batteries (reduced battery life)
Measuring range temp.	-20..+70 °C
Measuring range humidity	0..100% rH non-condensing
Measuring range CO <sub>2</sub>	0..5000 ppm
Accuracy temperature	±0,4 K (typ. at 21 °C)
Accuracy humidity	±5% between 30..70% rH (typ. at 21 °C)
Accuracy CO <sub>2</sub>	±50 ppm +3% of reading (typ. at 21 °C, 50% rH)
Air Speed	Min. 0,3 m/s, max. 12 m/s
Calibration CO <sub>2</sub>	self-calibration, Dual Channel
Sensor	<b>CO<sub>2</sub></b> NDIR (non-dispersiv, infrared)
Enclosure	enclosure USE-M / cover, PC, pure white
Protection	IP65 according to EN 60529
Pipe	PA6, black, Ø=19,5 mm, length 150 mm
Ambient condition	0..+50 °C, max. 85% rH short term condensation
Configuration	Thermokon LRWapp, uConfig software, LoRaWAN® Downlink
Battery life	+/- 5 years (depending on device configuration, network setup, battery-type and environmental conditions)

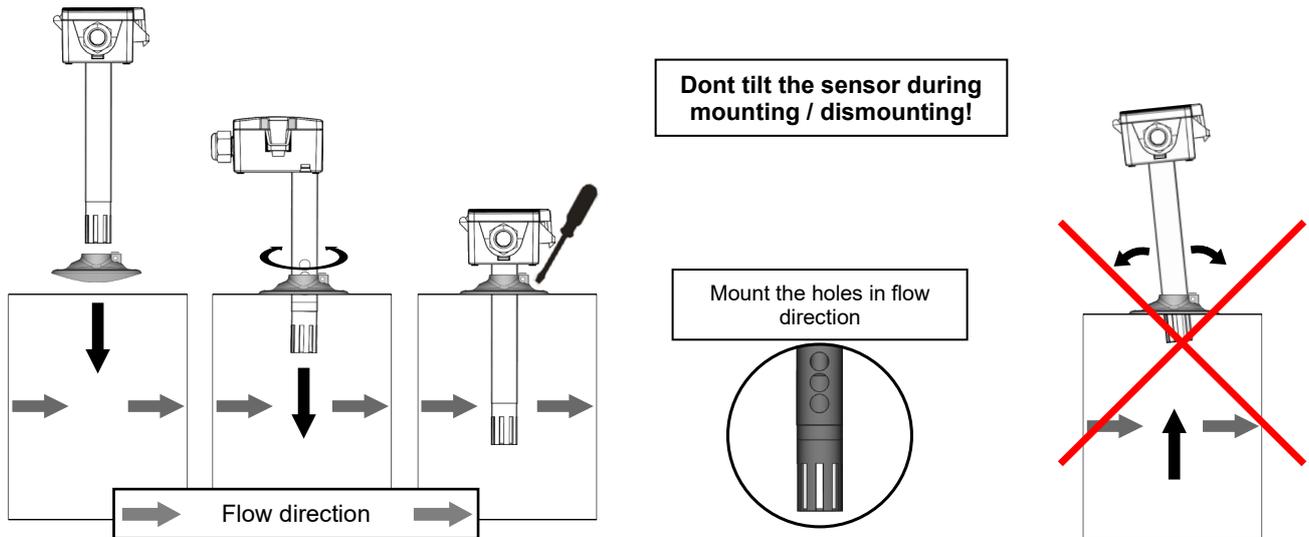
» **LoRaWAN®**

Radio technology	LoRaWAN®
LoRaWAN® version	1.0.4
Device class	Class A
Frequency	EU868 (863-870 MHz)
Max. transmission power	+14 dBm (25 mW)
Receiver sensitivity	-137 dBm
Antenna	Internal send- / receiver antenna, external antenna available on request
LoRaWAN® Features	Over the Air Activation (OTAA), Adaptive Data Rate (ADR)
Data transmission	Heartbeat interval (default: 1440 min), Measurement-interval (default: 1 min), hysteresis transmission behavior

## » 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.



## » BATTERY INSTALLATION

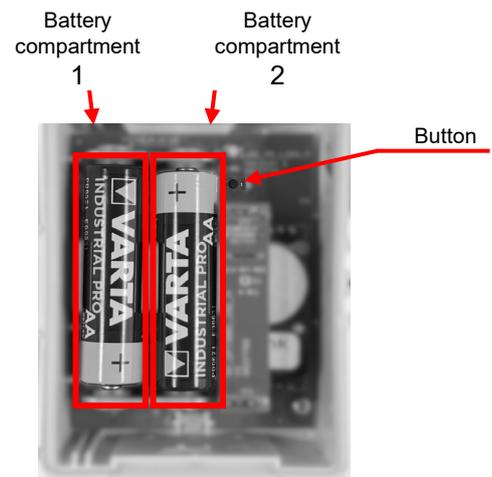
The LK+ BAT LRW is designed to be powered by 2x 3.6V lithium batteries (LS14500 or ER14505).

If using only 1 single battery, insert it into battery compartment 1. (Caution: 1 battery = reduction in battery life by more than half)

Insert the batteries as shown. Observe polarity/orientation.

For commissioning and as a temporary measure if lithium batteries are not available, the sensor can also be operated for several months with 2 alkaline manganese batteries (LR06).

(Lithium batteries are subject to dangerous goods regulations for shipping and are therefore not included in the scope of delivery.)



## » ADVICE FOR COMMISSIONING:



The LoRaWAN credentials required for commissioning can be read out via the uConfig software or the LRWapp. On request, the LoRaWAN credentials can also be provided in digital form. For this purpose, please contact your respective contact person.

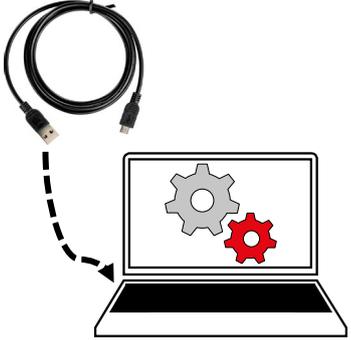
## » INFORMATION ABOUT LORAWAN SPECIFICATION



The Thermokon LoRaWAN specification can be downloaded from our website.

» **CONFIGURATION**

The configuration is performed in powered state. The following options are available for configuring the device:

Device connection	Micro-USB cable	Bluetooth radio	LoRaWAN® downlink
			
Configurations- software	PC/Notebook with uConfig software	Smartphone/Tablet with LRWApp	LoRaWAN Infrastructure

The configuration app with the corresponding instructions can be downloaded from the Google Play Store or the Apple App Store.

» **ADVICE FOR BLUETOOTH CONFIGURATION**

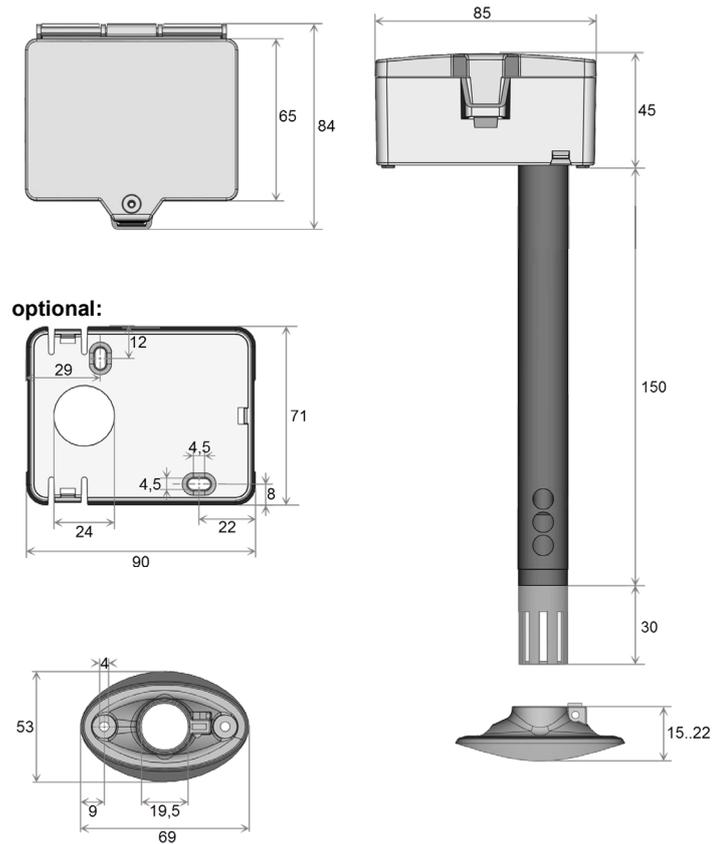


Press the button to start Bluetooth communication. After pressing the button, a connection can be established via the app within approx. 20 seconds. This is indicated by a flashing LED.

» **USER ADVICE**

After a certain time, dirt in the air can collect on the filter and then adversely affect the operation of the sensor. Under normal ambient condition an annual maintenance is recommended. Rinse the filter after cleaning with distilled water and dry it using clean oil-free air or nitrogen. Extremely contaminated filters should be replaced. At extreme ambient conditions, e.g. corrosive gases, the humidity sensor may have to be changed.

## » DIMENSIONS (MM)



## » ACCESSORIES (INCLUDED IN DELIVERY)

Mounting flange MF20  
 Mounting kit universal  
 • Cover screw + screw cover • 2 Rawlplugs • 2 Screws (countersunk head) • 2 Screws (rounded head)

Item No. 724296  
 Item No. 698511

## » ACCESSORIES (OPTIONAL)

Mounting base  
 Battery ER14505 (Lithium 3,6V AA)

Item No. 631228  
 Item No. 759182