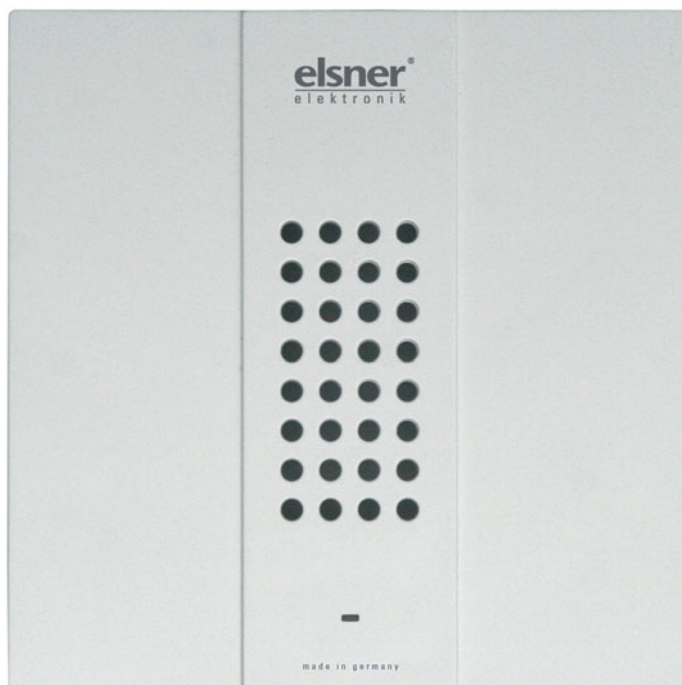




KNX AQS

Air Quality Sensor

Technical Specifications and Installation Instructions



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1. Description

The **Air Quality Sensor KNX AQS** measures the room CO₂ concentration and so provides a reliable information if the air is really “fresh”. From 1000 ppm on (equals 0.1%), the air is perceived as „stale“ – In this case the **KNX AQS** can send aeration commands to automatically controlled windows or ventilation units in the KNX bus system.

The air quality sensor can receive an external CO₂ value via the bus and process it with the own data to an overall value (mixed value, e. g. average pollution of room).

The **KNX AQS** provides four switching outputs with adjustable threshold values as well as AND and OR logic gates. Additionally, an integrated actuating variable comparator can compare and output values that are received via communication objects. The integrated PI controller allows for control of a ventilation and thus helps to maintain the required CO₂ content value for room air.

Functions:

- Measurement of **CO₂ concentration** of the air
- **Mixed value** from own measured value and external value (proportions can be set in percentage)
- **PI controller** for ventilation (one or two step)
- **2 actuating variable comparators** for output of minimum, maximum or average values. Each with 5 inputs (for values received via communication objects)
- **4 switching outputs** with adjustable threshold values (Threshold values can be set by parameter or via communication objects)
- **8 AND and 8 OR logic gates** with each 4 inputs. Every switching incident as well as 8 logic inputs (in the form of communication objects) may be used as inputs for the logic gates. The output of each gate may optionally be configured as 1 bit or 2 x 8 bits

Configuration is made using the KNX software ETS. The **programme file** (format VD), the data sheet and the manual can be downloaded from the Elsner Elektronik homepage on www.elsner-elektronik.de in the “Service” menu.

1.0.1. Measurement of carbon dioxide in the air

The CO₂ concentration in the air is indicated in parts per million (ppm). 1000ppm correspond to 0.1%. From this value on humans perceive the room air as „used“.

CO ₂ concentration (ppm)	
200.000	Humans are not capable to survive (fatal concentration)
100.000	Candle will go out
40.000 bis 50.000	Exhaled air
5.000	Maximum admissible value at work place (MAC value)
4.000	Insufficiently ventilated room

CO ₂ concentration (ppm)	
1.000	"Bad air" is perceived
330 bis 350	Outside air

1.1. Technical specifications

Housing	Plastic material
Colour	White matt
Mounting	In-wall (in junction box Ø 70 mm, 36 mm deep, box is included in scope of delivery)
Protection category	IP 50
Dimensions	Cover approx. 94 × 94 (W × H, mm), mounting depth approx. 8 mm
Weight	approx. 105 g (including box and cover)
Ambient temperature	Operation -10...+50°C, Storage -20...+60°C
Ambient air humidity	max. 95% R.H., avoid bedewing
Operating voltage	KNX bus voltage
Bus current	max. 10 mA
Data Output	KNX +/- bus terminal plug
BCU type	Own micro controller
PEI type	0
Group addresses	max. 254
Allocations	max. 254
Communication objects	133
Measurement range	0...2000 ppm
Resolution	1 ppm
Accuracy*	± 50 ppm ±3% of the measured value

* Please consider the notes on *Accuracy of the measurement*, page 4

The following standards have been considered for the evaluation of the product in terms of electro magnetic compatibility:

- EN 50090-2-2: 1996/A2:2007
- EN 61000-6-1: 2007
- EN 61000-6-3: 2007

The product has been tested for the above mentioned standards by an accredited EMV laboratory.

1.1.1. Accuracy of the measurement

Measurement variations from sources of interference (see chapter *Installation position*) must be corrected in the ETS in order to ensure the specified accuracy of the sensor (offset). To ensure a correct CO₂ measurement, the device must be installed in a wind-proof socket.

The indicated accuracy of the CO₂ measurement will be achieved after a run-in period of 24 hours (without interruption of the bus voltage) if the sensor has been in contact with fresh air (350...450 ppm) at least once in this period.

After this, the CO₂ sensor will recalibrate every two weeks by defining the lowest measured value captured during that period (without interruption of the bus voltage) as a reference for fresh air.

To guarantee the accuracy on a sustained basis, the sensor should be provided with fresh air at least once in two weeks. This occurs normally during room ventilation.

2. Installation and commissioning

2.1. Notes on installation



Installation, inspection, commissioning and troubleshooting of the device must only be carried out by a competent electrician.

Disconnect all lines to be assembled, and take safety precautions against accidental switch-on.

The device is exclusively intended for appropriate use. With each inappropriate change or non-observance of the instructions for use, any warranty or guarantee claim will be void.

After unpacking the device, check immediately for any mechanical damages. In case of transport damage, this must immediately notified to the supplier.



If damaged, the device must not be put into operation.

If an operation without risk may supposedly not be guaranteed, the device must be put out of operation and be secured against accidental operation.

The device must only be operated as stationary system, i.e. only in a fitted state and after completion of all installation and start-up works, and only in the environment intended for this purpose.

Elsner Elektronik does not assume any liability for changes in standards after publication of this instruction manual.

2.2. Installation position

The **Air Quality Sensor KNX AQS** is flush mounted in a distribution box (Ø70 mm, 36 mm deep) and covered. Box and cover are supplied.



**May be installed and operated in dry interior rooms only.
Avoid condensation.**

For monitoring of the CO₂ content of the room air choose an installation position in height of head (standing or sitting, according to utilization of room). The CO₂ concentration in indoor rooms is highest near the floor and decreases towards the ceiling.

When selecting an installation location, please ensure that the measurement results are affected as little as possible by external influences. Possible sources of interference include:

- Drafts from windows and doors
- Draft from ducts which lead from other rooms or from the outside to the junction box in which the sensor is mounted

Measurement variations from such sources of interference must be corrected in the ETS in order to ensure the specified accuracy of the sensor (offset).

To ensure a correct CO₂ measurement, the device must be installed in a windproof socket.

2.3. Delivery scope and assembly



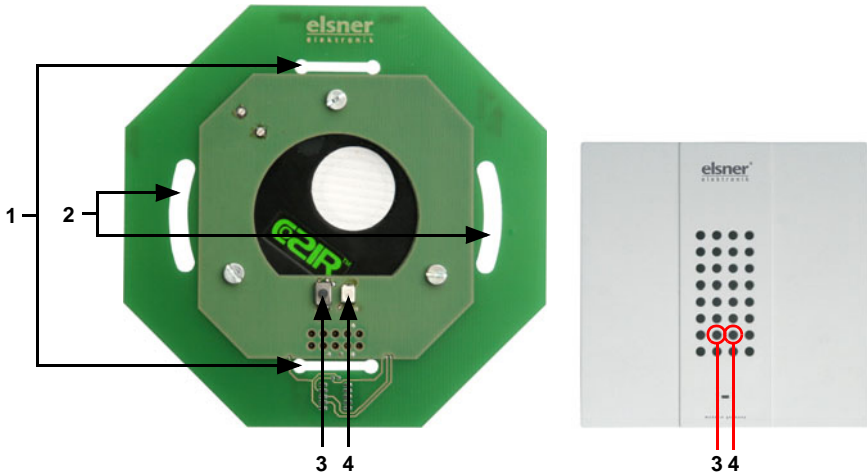
1x Cover with punches

2x Device screw Ø 3,2 mm × 15 mm

1x Board with sensor electronic and connection plugs (bus black-red, auxiliary voltage white-yellow)

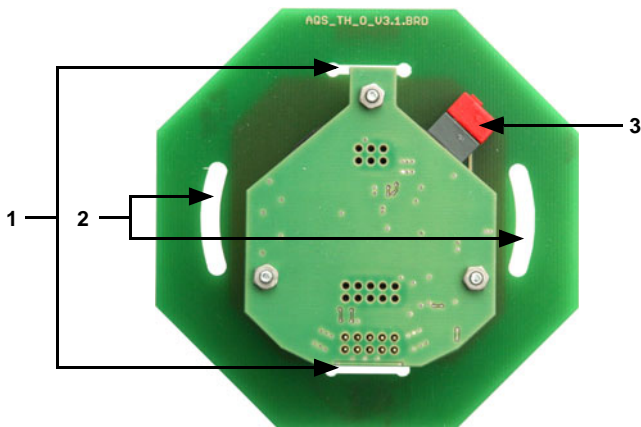
1x Distribution box Ø 70 mm, 36 mm deep

2.3.1. Front view sensor board



- 1 Grooves for attachment of cover
- 2 Oblong holes for fastening with distribution box
- 3 Programming button for teaching the device, can also be operated when cover is clamped on (see right)
- 4 Programming LED

2.3.2. Rear view sensor board with connections



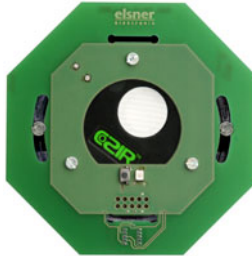
- 1 Grooves for attachment of cover
- 2 Oblong holes for fastening with distribution box
- 3 KNX terminal BUS +/-

2.4. Installation

The future orientation is determined by fitting the box:



Screw holes on left and right



→ Logo on top of board



→ Logo on top of cover

First, mount the box and connection lead

Subsequently, connect the bus +/- (connector black-red) to the intended terminal of the sensor board.

Screw the sensor board in the box. Now clamp the cover with the snap taps in the grooves of the board.

2.5. Notes on assembly and operation

Sensor must not be exposed to water (rain) or dust. This could result in the electronic being damaged. A relative air humidity of 95% must not be exceeded. Avoid bedewing.