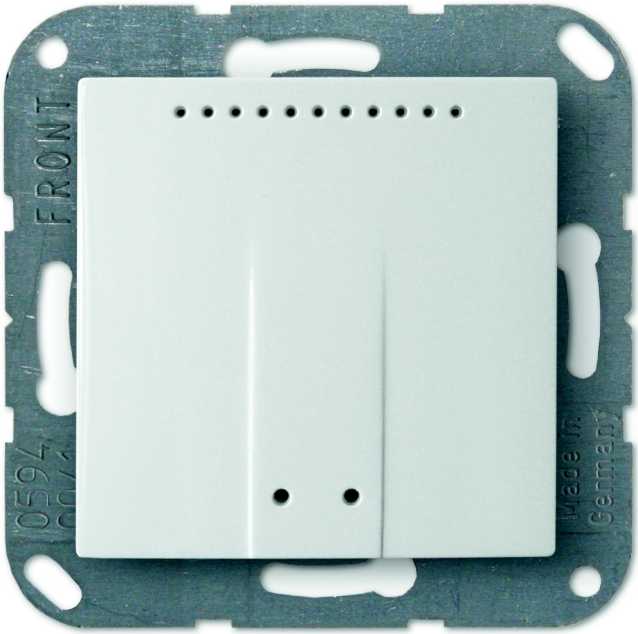
KNX AQS-UP basic

Air Quality Sensor

Technical specifications and installation instructions

Article numbers 70224 (white), 70225 (aluminium), 70226 (anthracite), 70227 (stainless steel)



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1. Description

The **Air Quality Sensor KNX AQS-UP basic** measures the CO_2 concentration in the room. The sensor can receive an external CO_2 value via the bus and process it with the own data to an overall value (mixed value, e. g. room average).

The **KNX AQS-UP basic** provides four switching outputs with adjustable threshold values. The switching outputs and further communication objects can be linked by AND and OR logic gates. Additionally, an integrated actuating variable comparator can compare and output values that are received via communication objects.
An integrated PI controllers allows for control of ventilation depending on CO_2 concentration.

The housing is completed with a frame of the switching series installed in the building and thus merges with the interior.

Functions:

- Measurement of **CO_2 concentration** of the air
- **Mixed value** from own measured value and external value (proportions can be set in percentage)
- **PI controller for ventilation** depending on CO_2 concentration: dehumidification/humidification (one step) or dehumidification (one or two step)
- **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
- **2 actuating variable comparators** for output of minimum, maximum or avarage values. Each with 5 inputs (for values received via communication objects)

Configuration is made using the KNX software ETS. The **product file** can be downloaded from the Elsner Elektronik homepage on **www.elsner-elektronik.de** in the "Service" menu.

1.0.1. Scope of delivery

- Housing with display, buttons and sensor board
- CO_2 sensor unit
- Base plate

You will need *in addition* (not supplied):

- Socket Ø 60 mm, 42 mm deep
- Frame (for element 55 x 55 mm), suitable for the switching programme used in the building

1.1. Technical specifications

Housing	Plastic material (partly lacquered)
Colours	• White glossy (similar to RAL 9016 Traffic White) • Aluminium matt • Anthracite matt • Stainless steel • Special colours on request
Mounting	In-wall (in socket Ø 60 mm, 42 mm deep)
Protection category	IP 20
Dimensions	Housing approx. 55 x 55 (W x H, mm), mounting depth approx. 15 mm, base plate approx. 71 x 71 (W x H, mm)
Total weight	approx. 72 g
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
CO_2 measurement range	0...2000 ppm
CO_2 resolution	1 ppm
CO_2 accuracy*	± 50 ppm ± 3% of the measuered value

* Mind the notes on *Accuracy of the measurement*, page 3

The product conforms with the provisions of EU guidelines.

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 CO_2 measurement, the device must be installed in a windproof socket.

The indicated **accuracy of the CO_2 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 CO_2 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.

The 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. Installation notes

Installation, testing, operational start-up and troubleshooting should only be performed by an electrician.

CAUTION!
Live voltage!
There are unprotected live components inside the device.

- National legal regulations are to be followed.
- Ensure that all lines to be assembled are free of voltage and take precautions against accidental switching on.
- Do not use the device if it is damaged.
- Take the device or system out of service and secure it against unintentional use, if it can be assumed, that risk-free operation is no longer guaranteed.

The device is only to be used for its intended purpose. Any improper modification or failure to follow the operating instructions voids any and all warranty and guarantee claims.

After unpacking the device, check it immediately for possible mechanical damage. If it has been damaged in transport, inform the supplier immediately.

The device may only be used as a fixed-site installation; that means only when assembled and after conclusion of all installation and operational start-up tasks and only in the surroundings designated for it.

Elsner Elektronik is not liable for any changes in norms and standards which may occur after publication of these operating instructions.

2.2. Installation position

The **Air Quality Sensor KNX AQS-UP basic** will be installed concealed within a socket (Ø 60 mm, 42 mm deep).

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

For monitoring of the CO_2 content of the room air choose an installation position in height of head (standing or sitting, according to utilization of room). The CO_2 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 CO_2 measurement, the device must be installed in a windproof socket.

2.3. Composition

2.3.1. Housing

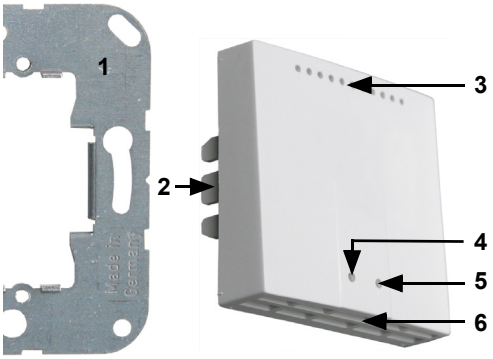

Fig. 1
1 Base plate
2 Notches
3 Air circulation holes
4 Programming LED (recessed)
5 Programming button (recessed) for teaching instrument
6 Air circulation holes (BOTTOM)

2.3.2. Rear view of sensor board with connections

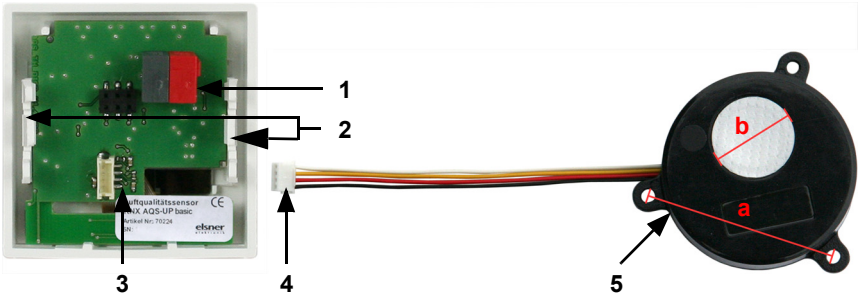

Fig. 2

1 KNX terminal BUS +/-
2 Notches
3 Slot for CO_2 sensor unit
4 Plug of CO_2 sensor unit
5 CO_2 sensor unit

Lenght of cable approx. 110 mm
a Hole centre distance approx. 43 mm
b Diameter of diaphragm approx. 18 mm

2.4. Assembly of the sensor

First of all fit the windproof socket with connection. Also seal inlet pipes to avoid infiltration.

Place the CO_2 sensor unit in the socket. The side with the sensor membrane must face to front.

Fig. 3

Screw the base plate onto the socket and position the frame of the switching programme. Connect the CO_2 sensor unit and the bus line +/- (black-red plug) to the terminals provided on the board.

Pin the sensor with the notches on to the metal frame, so that sensor and frame are fixed.

2.5. Notes on mounting and commissioning

Never expose the device to water (e.g. rain) or dust. This can damage the electronics. You must not exceed a relative humidity of 95%. Avoid condensation.

After the bus voltage has been applied, the device will enter an initialisation phase lasting a few seconds. During this phase no information can be received or sent via the bus.