

# Sewi KNX AQS and Sewi KNX AQS/TH-D Indoor Air Quality Sensors

## Technical specifications and installation instructions

Item numbers

Sewi KNX AQS: 70394 (white), 70694 (jet black)

Sewi KNX AQS/TH-D: 70397 (white), 70697 (jet black)



## 1. Description

The **Sensors Sewi KNX AQS and Sewi KNX AQS/TH-D** for the KNX bus system measures the CO<sub>2</sub> concentration in a room.

**Sewi KNX AQS/TH-D** additionally measures the temperature, the air humidity and the air pressure and calculates the dew-point. The sensor can output a warning to the bus as soon as the comfort field, as per DIN 1946, is left.

Via the bus, the indoor sensors can receive external values and process it further with its own data to a total value (mixed value, e.g. room average).

All measurement values can be used for the control of limit-dependent switching outputs. States can be linked via AND logic gates and OR logic gates. Multi-function modules change input data as required by means of calculations, querying a condition, or converting the data point type. In addition, an integrated manipulated variable comparator can compare and output variables that were received via communication objects.

Integrated PI-controllers control ventilation (according to humidity or CO<sub>2</sub> concentration) and heating/cooling (according to temperature).

### Functions:

- Measuring the **CO<sub>2</sub> concentration** of the air with **mixed value calculation**. The share of internal measurement value and external value can be set as a percentage
- **Threshold values** can be adjusted per parameter or via communication objects
- **PI controller for ventilation** according to CO<sub>2</sub> concentration: Ventilate/Air (one-stage) or Ventilate (one or two-stage)
- **8 AND and 8 OR logic gates**, each with 4 inputs. All switching events as well as 16 logic inputs in the form of communications objects can be used as inputs for the logic gates. The output of each gate can be configured optionally as 1-bit or 2 x 8-bit
- **8 multi-function modules** (computers) for changing the input data by calculations, by querying a condition or by converting the data point type
- **4 actuating variable comparators** to output minimum, maximum or average values. 5 inputs each for values received via communication objects

### Additional functions Sewi KNX AQS/TH-D:

- Measuring the **temperature** and **air humidity** (relative, absolute), each with **mixed value calculation**. The share of internal measurement value and external value can be set as a percentage
- Bus message, whether the values for temperature and air humidity are within the **comfort field** (DIN 1946). **Dew point** calculation
- **Air pressure measurement**. Output of the value as normal pressure and optionally as barometric pressure
- **PI-controller for heating** (one or two-stage) and **cooling** (one or two-stage) according to temperature. Regulation according to separate setpoints or basic setpoint temperature
- **PI controller for ventilation** according to humidity: Ventilate/Air (one-stage) or Ventilate (one or two-stage)
- **Summer compensation** for cooling systems. A characteristic curve matches the target temperature in the room to the external temperature and sets the minimum and maximum target temperature values

Configuration is made using the KNX software ETS. The **product file** can be downloaded from the Elsner Elektronik website on [www.elsner-elektronik.de](http://www.elsner-elektronik.de) in the "Service" menu.

### 1.0.1. Scope of delivery

- Sensor

### 1.1. Technical data

General:	
Housing	Plastic
Colours	<ul style="list-style-type: none"> <li>• White similar to signal white RAL 9003 (skirting)/ grey white RAL 9002 (cover)</li> <li>• Jet black RAL 9005</li> </ul>
Assembly	Surface, wall or ceiling installation

Dimensions Ø x height	approx. 105 mm x approx. 32 mm
Degree of protection	IP 30
Weight	approx. 50 g
Ambient temperature	0...+50°C
Ambient humidity	5...85% RH, non-condensing
Storage temperature	-30...+70°C
<b>KNX bus:</b>	
KNX medium	TP1-256
Configuration mode	S-Mode
Group addresses	max. 2000
Assignments	max. 2000
Communication objects	Sewi KNX AQS/TH-D: 363 Sewi KNX AQS: 210
Nominal voltage KNX	30 V $\overline{\text{---}}$ SELV
Power consumption KNX	max. 20 mA
Connection	KNX plug terminals
Duration after bus voltage restoration until data is received	approx. 5 seconds
<b>Sensors:</b>	
CO <sub>2</sub> sensor:	
Measurement range	400...10,000 ppm
Temperature sensor (only Sewi KNX AQS/TH-D):	
Measurement range	0°C...+50°C
Humidity sensor (only Sewi KNX AQS/TH-D):	
Measurement range	0% RH ... 85% RH
Pressure sensor (only Sewi KNX AQS/TH-D):	
Measurement range	300 mbar ... 1100 mbar

The product conforms with the provisions of EU directives.

### 1.1.1. Measuring accuracy

Deviations in measured values due to interfering sources (see chapter *installation site*) must be corrected in the ETS in order to achieve the specified accuracy of the sensor (offset).

After applying the operating voltage, it can take up to 15 minutes until the **CO<sub>2</sub> measured value** is output correctly.

During **Temperature measurement**, the self-heating of the device is taken into consideration by the electronics. The software compensates the self-heating by reducing the measured temperature by 1.0°C.

## 2. Safety and use instructions



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



### CAUTION! Live voltage!

There are unprotected live components inside the device.

- Inspect the device for damage before installation. Only put undamaged devices into operation.
- Comply with the locally applicable directives, regulations and provisions for electrical installation.
- Immediately take the device or system out of service and secure it against unintentional switch-on if risk-free operation is no longer guaranteed.

Use the device exclusively for building automation and observe the operating instructions. Improper use, modifications to the device or failure to observe the operating instructions will invalidate any warranty or guarantee claims.

Operate the device only as a fixed-site installation, i.e. only in assembled condition 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.

## 3. Installation

### 3.1. Installation location and preparation



**Install and use only in dry interior rooms!** Avoid condensation.

The sensor is installed surface mounted on walls or ceilings.

When selecting an installation location, please ensure that the measurement results of **temperature, humidity and CO<sub>2</sub>** are affected as little as possible by external influences. Possible sources of interference include:

- Direct sunlight
- Drafts from windows and doors
- Draughts from ducts coming from other rooms or the outdoors
- Warming or cooling of the building structure on which the sensor is mounted, e.g. due to sunlight, heating or cold water pipes
- Connection lines and empty ducts which lead from warmer or colder areas to the sensor

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

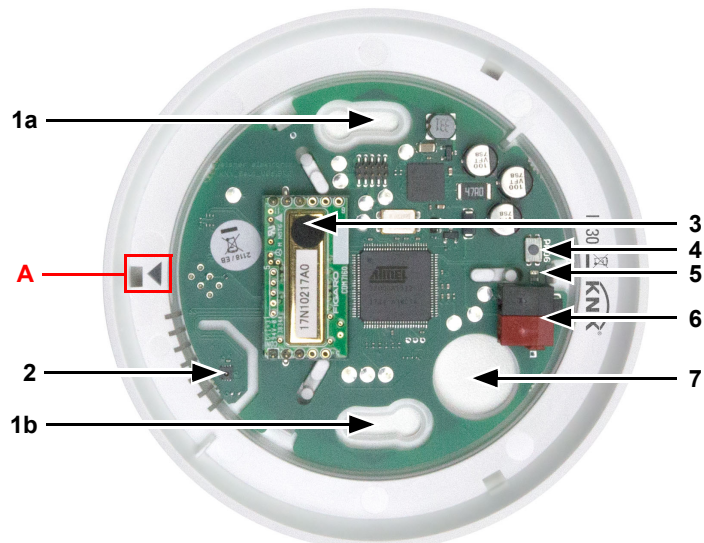
### 3.2. Connection

**⚠ For installation and wiring at the KNX connection, the provisions and standards applicable to SELV circuits must be complied with!**

The **Sensors Sewi KNX AQS and Sewi KNX AQS/TH-D** are surface-mounted but at the same time can also be screwed to a flush-mounted socket.

If the **Sensors Sewi KNX AQS and Sewi KNX AQS/TH-D** are installed on a flush-mounted socket, it must not contain any wiring with 230 V.

#### 3.2.1. Layout of the circuit board



**Fig. 1**  
 1 a+b Long holes for mounting (hole distance 60 mm)  
 2 Sensors for temperature, humidity, pressure (only Sewi KNX AQS/TH-D)  
 3 CO<sub>2</sub>-Sensor  
 4 Programming button  
 5 Programming LED  
 6 KNX-terminal BUS +/-  
 7 Cable bushing  
 A Mark for aligning the cover

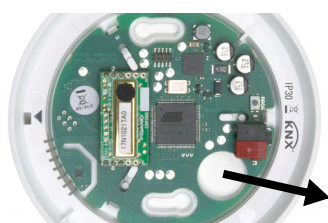
#### 3.2.2. Assembly



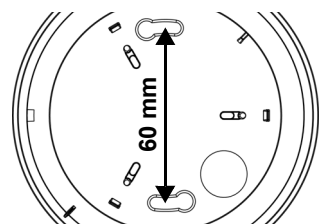
**Fig. 2** Housing from the outside  
 A Recess to open the housing



**Fig. 3**  
 Open the housing. To do this, carefully lift the cover from the skirting. Start at the recess, e.g. with a flat-head screwdriver.



**Fig. 4**  
 Lead the bus cable through the cable bushing in the skirting.



**Fig. 5**  
 Screw the skirting to the wall or the ceiling.  
 Hole distance 60 mm.



**Fig. 6**  
 Connect the KNX bus to the KNX terminal.



**Fig. 7**  
 Close the housing by positioning the cover and snapping it into place. To do this, align the recess on the cover to the marking on the skirting (the presence sensor must protrude through the opening in the cover).

### 4. Commissioning

The ventilation slots on the side must not be dirty, painted over or covered.

After the bus voltage has been applied, the device will enter an initialisation phase lasting approx. 5 seconds. During this phase no information can be received or sent via the bus.

#### 4.1. Addressing the equipment

The individual address is assigned via the ETS. For this purpose there is a button with a control LED on the unit (Fig. 1, No. 4+5).

The equipment is delivered with the bus address 15.15.255. Another address can be programmed using the ETS.

### 5. Maintenance

As a rule, it is sufficient to wipe the device with a soft, dry cloth twice a year.

### 6. Disposal

After use, the device must be disposed of in accordance with the legal regulations. Do not dispose of it with the household waste!