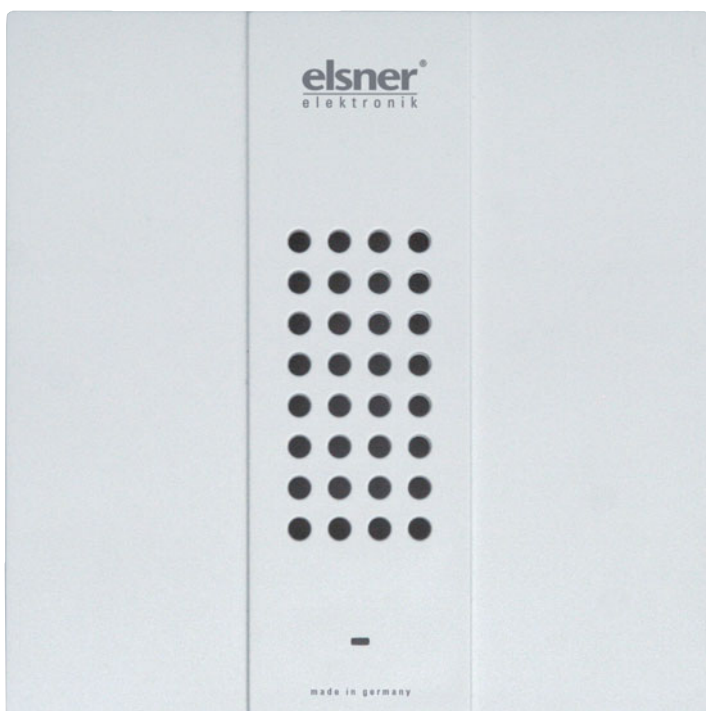




KNX AQS/TH

Indoor Sensor



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Explanation of the symbols used in this manual



Danger of death by electrocution!

Advice on dangers concerning work on electrical terminals, components etc.
Safety measures to protect the life and health of relevant personnel.



Safety instruction!

Instructions that must strictly be observed to ensure the safe operation.
Safety measures to protect against damage to persons or property.

1. Description

The **Indoor Sensor KNX AQS/TH** measures the room CO₂ concentration, the temperature and air humidity and calculates the dew point. The sensor can receive external values for temperature, humidity and CO₂ via the bus and process them with the own data to overall values (mixed values, e. g. room average).

The **KNX AQS/TH** provides eleven 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.

Integrated PI controllers allows for control of a ventilation (depending on CO₂ concentration and air humidity) and a heating/cooling system (depending on temperature). The sensor can emit a warning to the bus as soon as the area of optimum comfort (according to DIN 1946) is left.

Functions:

- Measurement of **CO₂ concentration** of the air, of **temperature** and **air humidity** (absolute, relative), calculation of the dew point
- **Mixed values** from own measured values and external values (proportions can be set in percentage)
- **PI controller for heating** (one or two step) and **cooling** (one or two step) depending on temperature
- **PI controller for ventilation** depending on humidity and CO₂ concentration: dehumidification/humidification (one step) or dehumidification (one or two step)
- **11 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 average values. Each with 5 inputs (for values received via communication objects)

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
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	approx. 95% rF, 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	227
Measurement range CO ₂	0...2000 ppm
Resolution (CO ₂)	1 ppm
Accuracy *(CO ₂)	± 50 ppm ± 3% of the measured value±
Measurement range temperature	-10...+50°C
Resolution (temperature)	0.1°C
Accuracy* (temperature)	± 0.4°C at 25°C
Measurement range humidity	0...95%
Resolution (humidity)	0.1%
Accuracy* (humidity)	± 5% R. H.

* Please consider the notes on Accuracy of the measurement, Seite 5

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 be 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 **KNX AQS/TH** is flush mounted in a distribution box (Ø 70 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:

- Direct sunlight
- 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
- 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 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).

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

2.3. Delivery scope and assembly



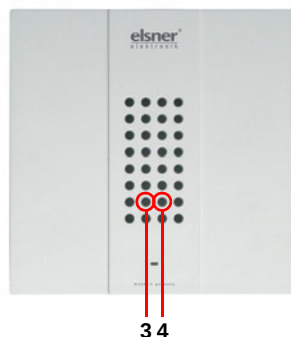
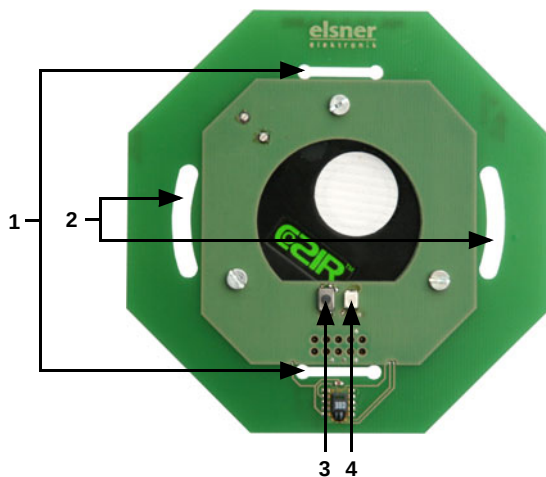
1x Cover with punches

2x Device screw Ø 3,2 mm × 15 mm

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

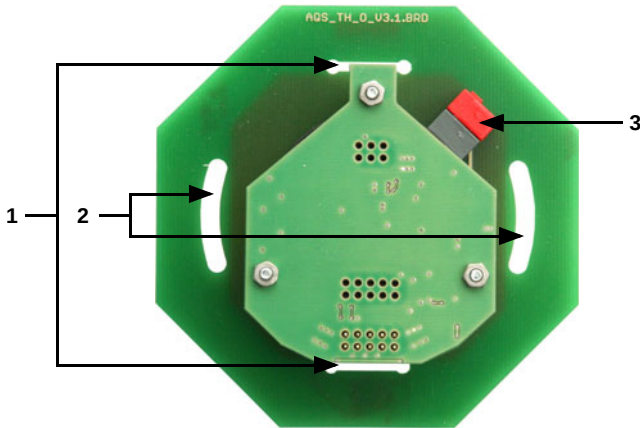
1x Distribution box Ø 70 mm, 36 mm deep

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



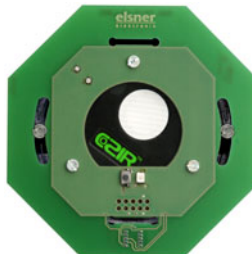
- 1 Grooves for attachment of cover
- 2 Oblong holes for fastening with distribution box
- 3 KNX terminal BUS +/-

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.

3. Transmission protokoll

3.1. List of all Communication objects

Abbreviations Flags:

C Communication

R Read

W Write

T Transmit

U Update

No	Name	Function	DPT	Flags
0	Software version	readable	217.001	C R T
1	Malfunction temperature/humidity sensor	Output	1.001	C R T
2	CO2 sensor malfunction	Output	1.001	C R T
3	External measured value for temperature	Input	9.001	C W
4	Internal measured value for temperature	Output	9.001	C R T
5	Total measured value for temperature	Output	9.001	C R T
6	Request min./max. temperature measured value	Input	1.017	C W
7	Minimum measured value for temperature	Output	9.001	C R T
8	Maximum measured value for temperature	Output	9.001	C R T
9	Reset min./max. measured value for temperature	Input	1.017	C W
10	Temp. threshold value 1: Absolute value	Input / output	9.001	C R W T U
11	Temp. threshold value 1: (1:+ 0:-)	Input	1.002	C W
12	Temp. threshold value 1: Switching delay from 0 to 1	Input	7.005	C W
13	Temp. threshold value 1: Switching delay from 1 to 0	Input	7.005	C W
14	Temp. threshold value 1: Switching output	Output	1.001	C R T
15	Temp. threshold value 1: Switching output block	Input	1.002	C W
16	Temp. threshold value 2: Absolute value	Input / output	9.001	C R W T U

No	Name	Function	DPT	Flags
17	Temp. threshold value 2: (1:+ 0:-)	Input	1.002	C W
18	Temp. threshold value 2: Switching delay from 0 to 1	Input	7.005	C W
19	Temp. threshold value 2: Switching delay from 1 to 0	Input	7.005	C W
20	Temp. threshold value 2: Switching output	Output	1.001	C R T
21	Temp. threshold value 2: Switching output block	Input	1.002	C W
22	Temp. threshold value 3: Absolute value	Input / output	9.001	C R W T U
23	Temp. threshold value 3: (1:+ 0:-)	Input	1.002	C W
24	Temp. threshold value 3: Switching delay from 0 to 1	Input	7.005	C W
25	Temp. threshold value 3: Switching delay from 1 to 0	Input	7.005	C W
26	Temp. threshold value 3: Switching output	Output	1.001	C R T
27	Temp. threshold value 3: Switching output block	Input	1.002	C W
28	Temp. threshold value 4: Absolute value	Input / output	9.001	C R W T U
29	Temp. threshold value 4: (1:+ 0:-)	Input	1.002	C W
30	Temp. threshold value 4: Switching delay from 0 to 1	Input	7.005	C W
31	Temp. threshold value 4: Switching delay from 1 to 0	Input	7.005	C W
32	Temp. threshold value 4: Switching output	Output	1.001	C R T
33	Temp. threshold value 4: Switching output block	Input	1.002	C W
34	Temp. control: Switching object (0:Heating 1:Cooling)	Input	1.002	C W
35	Temp. control: Target value current	Output	9.001	C R T
36	Temp. control: Blocking object	Input	1.002	C W
37	Temp. control: Target value, Heating day	Input / output	9.001	C R W T U
38	Temp. control: Target value, Heating day (1:+ 0:-)	Input	1.002	C W
39	Temp. control: Target value, Cooling day	Input / output	9.001	C R W T U
40	Temp. control: Target value, Cooling day (1:+ 0:-)	Input	1.002	C W

No	Name	Function	DPT	Flags
41	Temp. control: Actuating variable heating (1.stage)	Output	5.001	C R T
42	Temp. control: Actuating variable heating 2.stage	Output	5.001	C R T
43	Temp. control: Actuating variable heating 2.stage	Output	1.001	C R T
44	Temp. control: Actuating variable Cooling (1. stage)	Output	5.001	C R T
45	Temp. control: Actuating variable Cooling 2.stage	Output	5.001	C R T
46	Temp. control: Actuating variable Cooling 2.stage	Output	1.001	C R T
47	Temp. control: Night reduction activation	Input	1.003	C W
48	Temp. control: Target value heating, night	Input / output	9.001	C R W T U
49	Temp. control: Target value heating, night (1:+ 0:-)	Input	1.002	C W
50	Temp. control: Target value Cooling, night	Input / output	9.001	C R W T U
51	Temp. control: Target value Cooling, night (1:+ 0:-)	Input	1.002	C W
52	Temp. control: Status heating 1 (1=ON 0=OFF)	Output	1.001	C R T
53	Temp. control: Status heating 2 (1=ON 0=OFF)	Output	1.001	C R T
54	Temp. control: Status Cooling 1 (1=ON 0=OFF)	Output	1.001	C R T
55	Temp. control: Status Cooling 2 (1=ON 0=OFF)	Output	1.001	C R T
56	Temp. control: Window status (0: CLOSED 1: OPEN)	Input	1.019	C W
57	External measured value for humidity	Input	9.007	C W
58	Internal measured value for humidity	Output	9.007	C R T
59	Total measured value for humidity	Output	9.007	C R T
60	Request min./max. humidity measured value	Input	1.017	C W
61	Minimum measured value for humidity	Output	9.007	C R T
62	Maximum measured value for humidity	Output	9.007	C R T
63	Reset min./max. measured value for humidity	Input	1.017	C W

No	Name	Function	DPT	Flags
64	Humidity threshold value 1: Absolute value	Input / output	9.007	C R W T U
65	Humidity threshold value 1: (1:+ 0:-)	Input	1.002	C W
66	Humidity threshold value 1: Switching delay from 0 to 1	Input	7.005	C W
67	Humidity threshold value 1: Switching delay from 1 to 0	Input	7.005	C W
68	Humidity threshold value 1: Switching output	Output	1.001	C R T
69	Humidity threshold value 1: Switching output block	Input	1.002	C W
70	Humidity threshold value 2: Absolute value	Input / output	9.007	C R W T U
71	Humidity threshold value 2: (1:+ 0:-)	Input	1.002	C W
72	Humidity threshold value 2: Switching delay from 0 to 1	Input	7.005	C W
73	Humidity threshold value 2: Switching delay from 1 to 0	Input	7.005	C W
74	Humidity threshold value 2: Switching output	Output	1.001	C R T
75	Humidity threshold value 2: Switching output block	Input	1.002	C W
76	Humidity control: Blocking object	Input	1.006	C W
77	Humidity control: Target value	Input / output	9.007	C R W T
78	Humidity control: Target value (1:+ 0:-)	Input	1.002	C W
79	Humidity control: Actuating variable Dehumidification (1.stage)	Output	5.001	C R T
80	Humidity control: Actuating variable Dehumidification 2.stage	Output	5.001	C R T
81	Humidity control: Actuating variable Humidification	Output	5.001	C R T
82	Humidity control: Status Dehumidification1(1=ON 0=OFF)	Output	1.001	C R T
83	Humidity control: Status Dehumidification2(1=ON 0=OFF)	Output	1.001	C R T
84	Humidity control: Status Humidification (1=ON 0=OFF)	Output	1.001	C R T
85	Dew point temperature	Output	9.001	C R T
86	Cooling medium temp.: Threshold value	Output	9.001	C R T

No	Name	Function	DPT	Flags
87	Cooling medium temp.: Actual value	Input	9.001	C W
88	Cooling medium temp.: Offset change (1:+ 0:-)	Input	1.002	C W
89	Cooling medium temp.: Switching delay from 0 to 1	Input	7.005	C W
90	Cooling medium temp.: Switching delay from 1 to 0	Input	7.005	C W
91	Cooling medium temp.: Switching output	Output	1.001	C R T
92	Cooling medium temp.: Switching output block	Input	1.002	C W
93	Absolute Humidity [g/kg]	Output	14.005	C R T
94	Absolute Humidity [g/m³]	Output	14.005	C R T
95	Ambient climate Status: 1 = comfortable 0 = uncomfortable	Output	1.002	C R T
96	External measured value for humidity	Input	9.001	C W
97	Internal measured value for CO2	Output	9.001	C R T
98	Total measured value for CO2	Output	9.001	C R T
99	Request min./max. CO2 value	Input	1.017	C W
100	Maximum measured value for CO2	Output	9.001	C R T
101	Reset min./max. measured value for CO2	Input	1.017	C W
102	CO2 threshold value 1: Absolute value	Input / output	9.001	C R W T U
103	CO2 threshold value 1: (1:+ 0:-)	Input	1.002	C W
104	CO2 threshold value 1: Switching delay from 0 to 1	Input	7.005	C W
105	CO2 threshold value 1: Switching delay from 1 to 0	Input	7.005	C W
106	CO2 threshold value 1: Switching output	Output	1.001	C R T
107	CO2 threshold value 1: Switching output block	Input	1.002	C W
108	CO2 threshold value 2: Absolute value	Input / output	9.001	C R W T U
109	CO2 threshold value 2: (1:+ 0:-)	Input	1.002	C W
110	CO2 threshold value 2: Switching delay from 0 to 1	Input	7.005	C W
111	CO2 threshold value 2: Switching delay from 1 to 0	Input	7.005	C W
112	CO2 threshold value 2: Switching output	Output	1.001	C R T

No	Name	Function	DPT	Flags
113	CO2 threshold value 2: Switching output block	Input	1.002	C W
114	CO2 threshold value 3: Absolute value	Input / output	9.001	C R W T U
115	CO2 threshold value 3: (1:+ 0:-)	Input	1.002	C W
116	CO2 threshold value 3: Switching delay from 0 to 1	Input	7.005	C W
117	CO2 threshold value 3: Switching delay from 1 to 0	Input	7.005	C W
118	CO2 threshold value 3: Switching output	Output	1.001	C R T
119	CO2 threshold value 3: Switching output block	Input	1.002	C W
120	CO2 threshold value 4: Absolute value	Input / output	9.001	C R W T U
121	CO2 threshold value 4: (1:+ 0:-)	Input	1.002	C W
122	CO2 threshold value 4: Switching delay from 0 to 1	Input	7.005	C W
123	CO2 threshold value 4: Switching delay from 1 to 0	Input	7.005	C W
124	CO2 threshold value 4: Switching output	Output	1.001	C R T
125	CO2 threshold value 4: Switching output block	Input	1.002	C W
126	CO2 control: Blocking object	Input	1.006	C W
127	CO2 control: Target value	Input / output	9.007	C R W T
128	CO2 control: Target value (1:+ 0:-)	Input	1.002	C W
129	CO2 control: Actuating variable ventilation (1.stage)	Output	5.001	C R T
130	CO2 control: Actuating variable ventilation (2.stage)	Output	5.001	C R T
131	CO2 control: Status ventilation 1 (1=ON 0=OFF)	Output	1.001	C R T
132	CO2 control: Status ventilation 2 (1=ON 0=OFF)	Output	1.001	C R T
133	Actuating variable comparator 1: Input 1	Input	5.010	C W
134	Actuating variable comparator 1: Input 2	Input	5.010	C W
135	Actuating variable comparator 1: Input 3	Input	5.010	C W
136	Actuating variable comparator 1: Input 4	Input	5.010	C W

No	Name	Function	DPT	Flags
137	Actuating variable comparator 1: Input 5	Input	5.010	C W
138	Actuating variable comparator 1: Output	Output	1.001	C R T
139	Actuating variable comparator 1: Block	Input	1.002	C W
140	Actuating variable comparator 2: Input 1	Input	5.010	C W
141	Actuating variable comparator 2: Input 2	Input	5.010	C W
142	Actuating variable comparator 2: Input 3	Input	5.010	C W
143	Actuating variable comparator 2: Input 4	Input	5.010	C W
144	Actuating variable comparator 2: Input 5	Input	5.010	C W
145	Actuating variable comparator 2: Output	Output	1.001	C R T
146	Actuating variable comparator 2: Block	Input	1.002	C W
147	AND Logic 1: 1 Bit Switching output	Output	1.002	C R T
148	AND Logic 1: 8 Bit Output A	Output	5.010	C R T
149	AND Logic 1: 8 Bit Output B	Output	5.010	C R T
150	AND Logic 1: Blocking	Input	1.002	C W
151	AND Logic 2: 1 Bit Switching output	Output	1.002	C R T
152	AND Logic 2: 8 Bit Output A	Output	5.010	C R T
153	AND Logic 2: 8 Bit Output B	Output	5.010	C R T
154	AND Logic 2: Blocking	Input	1.002	C W
155	AND Logic 3: 1 Bit Switching output	Output	1.002	C R T
156	AND Logic 3: 8 Bit Output A	Output	5.010	C R T
157	AND Logic 3: 8 Bit Output B	Output	5.010	C R T
158	AND Logic 3: Blocking	Input	1.002	C W
159	AND Logic 4: 1 Bit Switching output	Output	1.002	C R T
160	AND Logic 4: 8 Bit Output A	Output	5.010	C R T
161	AND Logic 4: 8 Bit Output B	Output	5.010	C R T
162	AND Logic 4: Blocking	Input	1.002	C W
163	AND Logic 5: 1 Bit Switching output	Output	1.002	C R T
164	AND Logic 5: 8 Bit Output A	Output	5.010	C R T
165	AND Logic 5: 8 Bit Output B	Output	5.010	C R T
166	AND Logic 5: Blocking	Input	1.002	C W
167	AND Logic 6: 1 Bit Switching output	Output	1.002	C R T
168	AND Logic 6: 8 Bit Output A	Output	5.010	C R T
169	AND Logic 6: 8 Bit Output B	Output	5.010	C R T

No	Name	Function	DPT	Flags
170	AND Logic 6: Blocking	Input	1.002	C W
171	AND Logic 7: 1 Bit Switching output	Output	1.002	C R T
172	AND Logic 7: 8 Bit Output A	Output	5.010	C R T
173	AND Logic 7: 8 Bit Output B	Output	5.010	C R T
174	AND Logic 7: Blocking	Input	1.002	C W
175	AND Logic 8: 1 Bit Switching output	Output	1.002	C R T
176	AND Logic 8: 8 Bit Output A	Output	5.010	C R T
177	AND Logic 8: 8 Bit Output B	Output	5.010	C R T
178	AND Logic 8: Blocking	Input	1.002	C W
179	OR Logic 1: 1 Bit Switching output	Output	1.002	C R T
180	OR Logic 1: 8 Bit Output A	Output	5.010	C R T
181	OR Logic 1: 8 Bit Output B	Output	5.010	C R T
182	OR Logic 1: Blocking	Input	1.002	C W
183	OR Logic 2: 1 Bit Switching output	Output	1.002	C R T
184	OR Logic 2: 8 Bit Output A	Output	5.010	C R T
185	OR Logic 2: 8 Bit Output B	Output	5.010	C R T
186	OR Logic 2: Blocking	Input	1.002	C W
187	OR Logic 3: 1 Bit Switching output	Output	1.002	C R T
188	OR Logic 3: 8 Bit Output A	Output	5.010	C R T
189	OR Logic 3: 8 Bit Output B	Output	5.010	C R T
190	OR Logic 3: Blocking	Input	1.002	C W
191	OR Logic 4: 1 Bit Switching output	Output	1.002	C R T
192	OR Logic 4: 8 Bit Output A	Output	5.010	C R T
193	OR Logic 4: 8 Bit Output B	Output	5.010	C R T
194	OR Logic 4: Blocking	Input	1.002	C W
195	OR Logic 5: 1 Bit Switching output	Output	1.002	C R T
196	OR Logic 5: 8 Bit Output A	Output	5.010	C R T
197	OR Logic 5: 8 Bit Output B	Output	5.010	C R T
198	OR Logic 5: Blocking	Input	1.002	C W
199	OR Logic 6: 1 Bit Switching output	Output	1.002	C R T
200	OR Logic 6: 8 Bit Output A	Output	5.010	C R T
201	OR Logic 6: 8 Bit Output B	Output	5.010	C R T
202	OR Logic 6: Blocking	Input	1.002	C W
203	OR Logic 7: 1 Bit Switching output	Output	1.002	C R T
204	OR Logic 7: 8 Bit Output A	Output	5.010	C R T
205	OR Logic 7: 8 Bit Output B	Output	5.010	C R T
206	OR Logic 7: Blocking	Input	1.002	C W
207	OR Logic 8: 1 Bit Switching output	Output	1.002	C R T
208	OR Logic 8: 8 Bit Output A	Output	5.010	C R T
209	OR Logic 8: 8 Bit Output B	Output	5.010	C R T

No	Name	Function	DPT	Flags
210	OR Logic 8: Blocking	Input	1.002	C W
211	Logic input 1	Input	1.002	C W
212	Logic input 2	Input	1.002	C W
213	Logic input 3	Input	1.002	C W
214	Logic input 4	Input	1.002	C W
215	Logic input 5	Input	1.002	C W
216	Logic input 6	Input	1.002	C W
217	Logic input 7	Input	1.002	C W
218	Logic input 8	Input	1.002	C W
219	Logic input 9	Input	1.002	C W
220	Logic input 10	Input	1.002	C W
221	Logic input 11	Input	1.002	C W
222	Logic input 12	Input	1.002	C W
223	Logic input 13	Input	1.002	C W
224	Logic input 14	Input	1.002	C W
225	Logic input 15	Input	1.002	C W
226	Logic input 16	Input	1.002	C W

4. Setting of parameters

4.1. General settings

1.1.3 KNX AQS/TH

General settings

Transmission delays after power-up and programming for:

Measured values	5 sec
Threshold values and switching outputs	5 sec
Controller objects	10 sec
Logic outputs	10 sec
Maximum telegram quota	5 Telegrams per second
Use temperature/humidity malfunction object	No
Use CO2 malfunction object	No

OK Cancel Default Info Help

Transmission delays after power-up and programming for:

Measured values	5 s • 10 s • 30 s • 1 min • ... • 2 h
Threshold values and switching outputs	5 s • 10 s • 30 s • 1 min • ... • 2 h
Controller objects	5 s • 10 s • 30 s • 1 min • ... • 2 h
Logic outputs	5 s • 10 s • 30 s • 1 min • ... • 2 h
Maximum telegram quota	1 • 2 • 3 • 5 • 10 • 20 Telegrams per second
Use temperature/humidity malfunction object	No • Yes
Use CO2 malfunction object	No • Yes

4.2. Temperature measured value

Offset in 0,1°C	-50 ... +50
Use external measured value	No • Yes

If no external measured value is used:

Use external measured value	No
Measured value	• not • periodically • on change • on change and periodically
From change of (in relation to last measured value) (only if sending „on change“)	0,1°C • 0,2°C • 0,5°C • 1,0°C • 2,0°C • 5,0°C
Transmission cycle (only if sending „periodically“)	5 s • 10 s • 30 s • 1 min • ... • 2 h
Use minimum and maximum value (Values are not maintained after reset)	No • Yes

If an external measured value is used:

Use external measured value	Yes
Ext. measured value proportion of the total measured value	5% ... 100% (in steps of 5%)
All following settings refer to the total measured value	

Internal and total measured value send	• not • periodically • on change • on change and periodically
From change of (in relation to last measured value) (only if sending „on change“)	0,1°C • 0,2°C • 0,5°C • 1,0°C • 2,0°C • 5,0°C
Transmission cycle (only if sending „periodically“)	5 s • 10 s • 30 s • 1 min • ... • 2 h
Use maximum value (Values are not maintained after reset)	No • Yes

4.3. Temperature threshold values

Use threshold value 1 / 2 / 3 / 4	No • Yes
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4.3.1. Threshold values 1 / 2 / 3 / 4

Threshold value

Threshold value setpoint per	Parameter • Communication object
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If the threshold value is set per Parameter:

Threshold value setpoint per	Parameter
Threshold value in 0,1°C	-300... 800
Hysteresis of the threshold value in %	0 ... 50

If the threshold value is set per Communication object:

Threshold value setpoint per	Communication object
The value communicated last shall be maintained	• not • after restoration of voltage • after restoration of voltage and programming (Values are not maintained after reset)
Start threshold value in 0,1°C valid until 1. communication (only if the value communicated last is „not“ maintained or „after restoration of voltage“)	-300 ... 800
Limitation of object value (min) in 0,1°C	-300 ... 800
Limitation of object value (max) in 0,1°C	-300 ... 800
Type of threshold change	• Absolute value • Increment/decrement
Step size (only if sending „Increment/decrement“)	0,1°C • 0,2°C • 0,3°C • 0,4°C • 0,5°C • 1,0°C • 2,0°C • 3,0°C • 4,0°C • 5,0°C
Hysteresis of the threshold value in %	0 ... 50

Switching output:

Output is at (TV = Threshold value)	• TV above = 1 TV – Hyst. below = 0 • TV above = 0 TV – Hyst. below = 1 • TV above = 1 TV – Hyst. above = 0 • TV above = 0 TV – Hyst. above = 1
Delays can be set via objects (in seconds)	No • Yes
Switching delay from 0 to 1 (only if delays are not set via objects)	none • 1 s • 2 s • 5 s • 10 s • ... • 2 h
Switching delay from 1 to 0 (only if delays are not set via objects)	none • 1 s • 2 s • 5 s • 10 s • ... • 2 h
Switching output sends	• on change • on change to 1 • on change to 0 • on change and periodically • on change to 1 and periodically • on change to 0 and periodically
Send switching output in a cycle of (only if sending „periodically“)	5 s • 10 s • 30 s • 1 min • ... • 2 h

Blocking:

Use block of the switching output	No • Yes
Evaluation of the blocking object	• if value 1: block if value 0: release • if value 0: block if value 1: release

Value of the blocking object before 1. communication	0 • 1
Behaviour of the switching output	
With blocking	• do not send telegram • send 0 • send 1

The behaviour with release of the switching output depends on the value of the parameter "Temperature switching output sends ..." (see "Temperature switching output")

Value of parameter „switching output sends“:	Setting options „Behaviour of switching output with release“:
on change	• do not send telegram • send status of the switching output
on change to 1	• do not send telegram • if switching output = 1 → send 1
on change to 0	• do not send telegram • if switching output = 0 → send 0
on change and periodically	send status of the switching output (no selection)
on change to 1 and periodically	if switching output = 1 → send 1 (no selection)
on change to 0 and periodically	if switching output = 0 → send 0 (no selection)

4.4. Temperature PI control

Use control	No • Yes
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Control general:

Type of control	• One-stage heating • Two-Stage heating • One-stage cooling • One-stage heating and One-stage cooling • Two-Stage heating and One-stage cooling • Two-Stage heating and Two-stage cooling
Behaviour of the blocking object with value	• 1 = block control 0 = release control • 0 = block control 1 = release control
Value of the blocking object before 1. communication	0 • 1
Transmission behaviour of actuating variables	• on change • on change and periodically
Transmission cycle (only if sending „periodically“)	5 s • 10 s • 30 s • 1 min • ... • 2 h

Transmission behaviour of status objects	• on change • on change to 1 • on change to 0 • on change and periodically • on change to 1 and periodically • on change to 0 and periodically
Transmission cycle (only if sending „periodically“)	5 s • 10 s • 30 s • 1 min • ... • 2 h
Switching between heating and cooling	• is carried out by ded zone • is carried out by switching object
Dead zone between heating and cooling in 1°C	1 ... 100
Cooling control starts with actual temperature $\geq$ target value + dead zone	

Controler target value

Target value setpoint per	Parameter • Communication object
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If the target value is set per Parameter:

Target value setpoint per	Parameter
Target value in 0,1°C	-300 ... 800

If the target value is set per communication object:

Target value setpoint per	Communication object
The value communicated last shall be maintained	• not • after restoration of voltage • after restoration of voltage and programming (Do not use for first commissioning)
Start target value in 0,1°C valid until 1. Kommunikation (only if the value communicated last is „not“ maintained or „after restoration of voltage“)	-300 ... 800
Limitation of object value (min) in ppm	-300 ... 800
Limitation of object value (max) in ppm	-300 ... 800
Type of the target value change	• Absolute value • Increment/decrement
Step size (only with „Increment/Decrement“)	0,1°C • 0,2°C • 0,3°C • 0,4°C • 0,5°C • 1,0°C • 2,0°C • 3,0°C • 4,0°C • 5,0°C

Control of heating 1st stage:

Setting of the controller by	• controler parameter • Preset applications
Application (nur wenn der Regler durch eine „vorgegebene Anwendung“ eingestellt wird)	• Hot water heating • Floor heating • Fan convector • Electrical heating

Maximum actuating variable is reached at target/actual difference of (only if the controller is set by „controler parameter“)	1,0°C • 2,0 °C • 3,0°C • 4,0°C • 5,0°C
Re-setting time in minutes (only if the controller is set by „controler parameter“)	1 ... 255
If blocked, the actuating variable shall	• not be sent • send a specific value
Value in % (only if sending a specific value)	0 ... 100
With release the actuating variable follows the control	

Settings for „Preset applications“:

Hot water heating	• Maximum actuating variable is reached at target/actual difference of 5°C • Re-setting time 150 min
Floor heating	• Maximum actuating variable is reached at target/actual difference of 5°C • Re-setting time 240 min
Fan convector	• Maximum actuating variable is reached at target/actual difference of 4°C • Re-setting time 90 min
Electrical heating	• Maximum actuating variable is reached at target/actual difference of 4°C • Re-setting time 100 min

Control of heating 2nd stage: (two-stage heating only):

Target value difference between 1. and 2. stage in 0,1°C	0 ... 100
Type of control of the 2. stage	• 2-point-control • PI control
Hysteresis in 0,1°C (only if 2-point control is used)	0 ... 100
Actuating variable is a (only if 2-point control is used)	• 1 bit object • 8 bit object
Value in % (only if 2-point control is used and if the actuating variable is a 8 bit object)	0 ... 100

For PI control see control heating 1st stage.

If blocked, the actuating variable shall	• not be sent • send a specific value
Value in % (only if sending a specific value)	0 ... 100
With release the actuating variable follows the control	

Control of cooling 1st stage:

Setting of the controller by	• controller parameter • Preset applications
Application (nur wenn der Regler durch eine „vor-gegebene Anwendung“ eingestellt wird)	• Cooling ceiling
Maximum actuating variable is reached at target/actual difference of (only if the controller is set by „controller parameter“)	1,0°C • 2,0°C • 3,0°C • 4,0°C • 5,0°C
Re-setting time in minutes (only if the controller is set by „controller parameter“)	1 ... 255
If blocked, the actuating variable shall	• not be sent • send a specific value
Value in % (only if sending a specific value)	0 ... 100
With release the actuating variable follows the control	

Settings for „Preset applications“:

Cooling ceiling	• Maximum actuating variable is reached at target/actual difference of 5°C • Re-setting time 240 min
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Control of cooling 2nd stage (two-stage cooling only):

Target value difference between 1. and 2. stage in 0,1°C	0 ... 100
Type of control of the 2. stage	• 2-point-control • PI control
Hysteresis in 0,1°C (only if 2-point control is used)	0 ... 100
Actuating variable is a (only if 2-point control is used)	• 1 bit object • 8 bit object
Value in % (only if 2-point control is used and if the actuating variable is a 8 bit object)	0 ... 100

For PI control see control of cooling 1st stage.

If blocked, the actuating variable shall	• not be sent • send a specific value
Value in % (only if sending a specific value)	0 ... 100
With release the actuating variable follows the control	

Night reduction:

Use night reduction	No • Yes
Night reduction for object value	• 1 = active 0 = not active • 0 = active 1 = not active

Value of the activation object before 1. communication	• 0 • 1
Target value setpoint per	• Parameter • Communication object

If the target value is set by Parameter:

Target value setpoint per	Parameter
Target value heating in 0,1°C	-300 ... 800
Target value cooling in 0,1°C	-300 ... 800

If the target value is set by Communication object:

Target value setpoint per	Communication object
The value communicated last shall be maintained	• not • After restoration of voltage • After restoration of voltage and programming (Do not use for first commissioning)
Start threshold value in 0,1°C valid until 1. communication (only if the value communicated last is „not“ maintained or „after restoration of voltage“)	-300 ... 800
Limitation of object value (min) in 0,1°C	-300 ... 800
Limitation of object value (max) in 0,1°C	-300 ... 800
Type of threshold change	• Absolute value • Increment/decrement
Step size (only if sending „Increment/decrement“)	0,1°C • 0,2°C • 0,3°C • 0,4°C • 0,5°C • 1,0°C • 2,0°C • 3,0°C • 4,0°C • 5,0°C

Frost/heat protection:

Use frost/heat protection	No • Yes
Target value heating in 0,1°C	-300 ... 800
Delay of activation (after opening window)	none • 1 s • 2 s • 5 s • 10 s • ... • 2 h
Target value cooling in 0,1°C	-300 ... 800
Delay of activation (after opening window)	none • 1 s • 2 s • 5 s • 10 s • ... • 2 h
Status of window before 1. communication	CLOSED • OPEN

4.5. Humidity measured value

Offset in %RH	-10 ... 10
Use external measured value	No • Yes

Use external measured value	No
Measured value	• not • periodically • on change • on change and periodically
From change of (only if sending „on change“)	0,10% • 0,20% • 0,50% • 1% • ... • 25,00%
Transmission cycle (only if sending „periodically“)	5 s • 10 s • 30 s • 1 min • ... • 2 h
Use minimum and maximum value (Values are not maintained after reset)	No • Yes

4.6. Humidity threshold values

Use humidity threshold values 1 / 2	No • Yes
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4.6.1. Humidity threshold values 1 / 2

Threshold value:

Threshold value setpoint per	Parameter • Communication object
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If the threshold value is set per Parameter:

Threshold value setpoint per	Parameter
Threshold value in %RH	0... 100
Hysteresis of the threshold value in % (in relation to threshold value)	0 ... 50

If the threshold value is set per Communication object

Threshold value setpoint per	Communication object
The value communicated last shall be maintained	• not • After restoration of voltage • After restoration of voltage and programming (Do not use for first commissioning)
Start threshold value in %rF valid until 1. communication (only if the value communicated last is „not“ maintained or „after restoration of voltage“)	0 ... 100
Type of threshold change	• Absolute value • Increment/decrement
Step size (only if sending „Increment/decrement“)	1,0% • 2,0% • 5,0% • 10,0%
Hysteresis of the threshold value in % (in relation to threshold value)	0 ... 50

Switching output:

Output is at (TV = Threshold value)	• TV above = 1 TV – Hyst. below = 0 • TV above= 0 TV – Hyst. below = 1 • TV above = 1 TV – Hyst. above = 0 • TV above = 0 TV – Hyst. above = 1
Delays can be set via objects (in seconds)	No • Yes
Switching delay from 0 auf 1 (only if delays are not set via objects)	none • 1 s • 2 s • 5 s • 10 s • ... • 2 h
Switching delay from 1 auf 0 (only if delays are not set via objects)	none • 1 s • 2 s • 5 s • 10 s • ... • 2 h
Switching output sends	• on change • on change to 1 • on change to 0 • on change and periodically • on change to 1 and periodically • on change to 0 and periodically
Send switching output in a cycle of (only if sending „periodically“)	5 s • 10 s • 30 s • 1 min • ... • 2 h

Blocking:

Use block of the switching output	No • Yes
Evaluation of the blocking object	• if value 1: block if value 0: release • if value 0: block if value 1: release
Value of the blocking object before 1. communication	0 • 1
Behaviour of the switching output	
With blocking	• do not send telegram • send 0 • send 1

The behaviour with release of the switching output depends on the value of the parameter “Switching output sends”

Value of parameter „switching output sends“:	Setting options „Behaviour of switching output with release“:
on change	• do not send telegram • send status of the switching output
on change to 1	• do not send telegram • if switching output = 1 → send 1
on change to 0	• do not send telegram • if switching output = 0 → send 0
on change and periodically	send status of the switching output (no selection)

on change to 1 and periodically	if switching output = 1 → send 1 (no selection)
on change to 0 and periodically	if switching output = 0 → send 0 (no selection)

4.7. Humidity PI control

Use humidity PI control	No • Yes
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Control general:

Type of control	• one-stage dehumidification • two-stage dehumidification • Humidification and dehumidification
Behaviour of the blocking object with value	• 1 = block control 0 = release control • 0 = block control 1 = release control
Value of the blocking object before 1. communication	0 • 1
Transmission behaviour of actuating variables	• on change • on change and periodically
Transmission cycle (only if sending „periodically“)	5 s • 10 s • 30 s • 1 min • ... • 2 h
Status objects send	• on change • on change to 1 • on change to 0 • on change and periodically • on change to 1 and periodically • on change to 0 and periodically
Transmission cycle (only if sending „periodically“)	5 s • 10 s • 30 s • 1 min • ... • 2 h

Controller target value:

Target value setpoint per	Parameter • Communication object
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If the target value is set per Parameter:

Target value setpoint per	Parameter
Target value in %	0 ... 100
Deadzone between humidification and dehumidification in %	0 ... 50

If the target value is set per Communication object::

Target value setpoint per	Communication object
The value communicated last shall be maintained	• not • After restoration of voltage • After restoration of voltage and programming (Do not use for first commissioning)

Start threshold value in % valid until 1. communication (only if the value communicated last is „not“ maintained or „after restoration of voltage“)	0 ... 100
Limitation of object value (min) in %RH	0 ... 100
Limitation of object value (max) in %RH	0 ... 100
Type of threshold change	• Absolute value • Increment/decrement
Step size (only if sending „Increment/decrement“)	1,0% • 2,0% • 5,0% • 10,0%

Dehumidification 1st stage

Maximum actuating variable is reached at target/actual difference of	1 ... 50
Re-setting time in mins	1 ... 255
If blocked, the actuating variable shall	• not be send • send a specific value
Value in % (only if sending a specific value)	0 ... 100
With release the actuating variable follows the control	

Dehumidification 2nd stage (two-stage dehumidification only):

Target value difference between 1. and 2. stage in %	0 ... 50
Maximum actuating variable is reached at target/actual difference of	1 ... 50
Hysteresis in 0,1°C	0 ... 100
Re-setting time in mins	1 ... 255
If blocked, the actuating variable shall	• not be send • send a specific value
Value in % (only if sending a specific value)	0 ... 100
With release the actuating variable follows the control	

4.8. Dewpoint temperature

Use dewpoint temperature	No • Yes
Dewpoint temperature sends	• not • periodically • on change • on change and periodically
From change of (only if sending „on change“)	0,1°C • 0,2°C • 0,5°C • 1,0°C • 2,0°C • 5,0°C

Transmission cycle (only if sending „periodically“)	5 s • 10 s • 30 s • 1 min • ... • 2 h
Use monitoring of the cooling medium temperature	No • Yes

4.8.1. Monitoring of the cooling medium temperature

Minimum Cooling medium temperature threshold value:

Threshold value = dew point temperature + offset

The offset communicated last shall be maintained	• not • After restoration of voltage • After restoration of voltage and programming (Do not use for first commissioning)
Offset in °C (only if offset is maintained „not“ or „after restoration of voltage“)	0 ... 20
Step size for offset change per communication object	0.1°C • 0.2°C • 0.3°C • 0.4°C • 0.5°C • 1°C • 2°C • 3°C • 4°C • 5°C
Hysteresis of the threshold value in %	0 ... 50
Threshold value sends	• not • periodically • on change • on change and periodically
From change of (only if sending „on change“)	0.1°C • 0.2°C • 0.5°C • 1.0°C • 2.0°C • 5.0°C
Transmission cycle (only if sending „periodically“)	5 s • 10 s • 30 s • 1 min • ... • 2 h

Switching output:

Output is at (TV = Threshold value)	• TV above = 1 TV – Hyst. below = 0 • TV above = 0 TV – Hyst. below = 1 • TV above = 1 TV – Hyst. above = 0 • TV above = 0 TV – Hyst. above = 1
Delays can be set via objects (in seconds)	No • Yes
Switching delay from 0 auf 1 (only if delays are not set via objects)	none • 1 s • 2 s • 5 s • 10 s • ... • 2 h
Switching delay from 1 auf 0 (only if delays are not set via objects)	none • 1 s • 2 s • 5 s • 10 s • ... • 2 h

Switching output sends	• on change • on change to 1 • on change to 0 • on change and periodically • on change to 1 and periodically • on change to 0 and periodically
Send switching output in a cycle of (only if sending „periodically“)	5 s • 10 s • 30 s • 1 min • ... • 2 h

Blocking:

Use block of the switching output	No • Yes
Evaluation of the blocking object	• if value 1: block if value 0: release • if value 0: block if value 1: release
Value of the blocking object before 1. communication	0 • 1
Behaviour of the switching output	
With blocking	• do not send telegram • send 0 • send 1

The behaviour with release of the switching output depends on the value of the parameter “Switching output sends”

Value of parameter „switching output sends“:	Setting options „Behaviour of switching output with release“:
on change	• do not send telegram • send status of the switching output
on change to 1	• do not send telegram • if switching output = 1 → send 1
on change to 0	• do not send telegram • if switching output = 0 → send 0
on change and periodically	send status of the switching output (no selection)
on change to 1 and periodically	if switching output = 1 → send 1 (no selection)
on change to 0 and periodically	if switching output = 0 → send 0 (no selection)

4.9. Absolute humidity

Use absolute humidity	No • Yes
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Unit object 65: water/ kg air

Unit object 66: water / m³ air

Transmission behaviour	• not • periodically • on change • on change and periodically
From change of (only if sending „on change“)	0,1 g • 0,2 g • 0,5 g • 1,0 g • 2,0 g • 5,0 g
Transmission cycle (only if sending „periodically“)	5 s • 10 s • 30 s... • 2 h

4.10. Comfort field

Use comfort field	No • Yes
Transmission behaviour	• not • periodically • on change • on change and periodically
Transmission cycle (only if sending „periodically“)	5 s • 10 s • 30 s... • 2 h
Maximum temperature in °C (Standard 26°C)	25 ... 40
Minimum temperature in °C (Standard 20°C)	10 ... 21
Maximum relative humidity in % (Standard 65%)	52 ... 90
Minimum relative humidity in % (Standard 30%)	10 ... 43
Maximum absolute humidity in 0,1g/kg (Standard 115 g/kg)	50 ... 200

Standard values comply with DIN 1946

Hysteresis of the temperature: 1°C

Hysteresis of the relative humidity: 2% RH

Hysteresis of the absolute humidity: 2 g/kg

4.11. CO2 measured value

Offset in ppm	-100 ... +100
Use external measured value	No • Yes

If no external measured value is used:

Use external measured value	No
Measured value	• not • periodically • on change • on change and periodically

From change of (in relation to last measured value) (only if sending „on change“)	2% • 5% • 10% • 25% • 50%
Transmission cycle (only if sending „periodically“)	5 s • 10 s • 30 s • 1 min • ... • 2 h
Use maximum value (Values are not maintained after reset)	No • Yes

If an external measured value is used:

Use external measured value	Yes
Ext. measured value proportion of the total measured value	5% ... 100% (in steps of 5%)
All following settings refer to the total measured value	
Internal and total measured value send	• not • periodically • on change • on change and periodically
From change of (in relation to last measured value) (only if sending „on change“)	2% • 5% • 10% • 25% • 50%
Transmission cycle (only if sending „periodically“)	5 s • 10 s • 30 s • 1 min • ... • 2 h
Use maximum value (Values are not maintained after reset)	No • Yes

4.12. CO2 threshold values

Use threshold value 1 / 2 / 3 / 4	No • Yes
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4.12.1. Threshold value 1 / 2 / 3 / 4

Threshold value:

Threshold value setpoint per	Parameter • Communication object
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If the threshold value is set per Parameter:

Threshold value setpoint per	Parameter
Threshold value in ppm	0 ... 5000
Hysteresis of the threshold value in %	0 ... 50

If the threshold value is set per Communication object:

Threshold value setpoint per	Communication object
The value communicated last shall be maintained	• not • after restoration of voltage • after restoration of voltage and programming (Values are not maintained after reset)

Start threshold value in ppm valid until 1. communication <i>(only if the value communicated last is „not“ maintained or „after restoration of voltage“)</i>	0 ... 5000
Limitation of object value (min) in ppm	0 ... 5000
Limitation of object value (max) in ppm	0 ... 5000
Type of threshold change	• Absolute value • Increment/decrement
Step size in ppm <i>only if sending „Increment/decrement“)</i>	1 • 2 • 5 • 10 • 20 • 50 • 100 • 200
Hysteresis of the threshold value in %	0 ... 50

Switching output:

Output is at <i>(TV = Threshold value)</i>	• TV above = 1 TV – Hyst. below = 0 • TV above = 0 TV – Hyst. below = 1 • TV above = 1 TV – Hyst. above = 0 • TV above = 0 TV – Hyst. above = 1
Delays can be set via objects (in seconds)	No • Yes
Switching delay from 0 auf 1 <i>(only if delays are not set via objects)</i>	none • 1 s • 2 s • 5 s • 10 s • ... • 2 h
Switching delay from 1 auf 0 <i>(only if delays are not set via objects)</i>	none • 1 s • 2 s • 5 s • 10 s • ... • 2 h
Switching output sends	• on change • on change to 1 • on change to 0 • on change and periodically • on change to 1 and periodically • on change to 0 and periodically
Send switching output in a cycle of <i>(only if sending „periodically“)</i>	5 s • 10 s • 30 s • 1 min • ... • 2 h

Blocking:

Use block of the switching output	No • Yes
Evaluation of the blocking object	• if value 1: block if value 0: release • if value 0: block if value 1: release
Value of the blocking object before 1. communication	0 • 1
Behaviour of the switching output	
With blocking	• do not send telegram • send 0 • send 1

The behaviour with release of the switching output depends on the value of the parameter "Temperature switching output sends ..." (see "Temperature switching output")

Value of parameter „switching output sends“:	Setting options „Behaviour of switching output with release“:
on change	• do not send telegram • send status of the switching output
on change to 1	• do not send telegram • if switching output = 1 → send 1
on change to 0	• do not send telegram • if switching output = 0 → send 0
on change and periodically	send status of the switching output (no selection)
on change to 1 and periodically	if switching output = 1 → send 1 (no selection)
on change to 0 and periodically	if switching output = 0 → send 0 (no selection)

4.13. CO2 PI control

Use control	No • Yes
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Control general:

Type of control	• One-stage ventilation • Two-stage ventilation
Behaviour of the blocking object with value	• 1 = block control 0 = release control • 0 = block control 1 = release control
Value of the blocking object before 1. communication	0 • 1
Transmission behaviour of actuating variables	• on change • on change and periodically
Transmission cycle (only if sending „periodically“)	5 s • 10 s • 30 s • 1 min • ... • 2 h
Transmission behaviour of status objects	• on change • on change to 1 • on change to 0 • on change and periodically • on change to 1 and periodically • on change to 0 and periodically
Transmission cycle (only if sending „periodically“)	5 s • 10 s • 30 s • 1 min • ... • 2 h

Controller target value:

Target value setpoint per	Parameter • Communication object
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If the target value is set per Parameter:

Target value setpoint per	Parameter
Target value in ppm	400 ... 5000

If the target value is set per communication object:

Target value setpoint per	Communication object
The value communicated last shall be maintained	• not • after restoration of voltage • after restoration of voltage and programming (Do not use for first commissioning)
Start target value in ppm valid until 1. Kommunikation (<i>only if the value communicated last is „not“ maintained or „after restoration of voltage“</i>)	400 ... 5000
Limitation of object value (min) in ppm	0 ... 5000
Limitation of object value (max) in ppm	0 ... 5000
Type of the target value change	• Absolute value • Increment/decrement
Step size in ppm (<i>only with „Increment/Decrement“</i>)	1 • 2 • 5 • 10 • 20 • 50 • 100 • 200

Control of ventilation 1st stage:

Maximum actuating variable is reached at target/actual difference of (in ppm)	100 ... 4000
Re-setting time in mins	1 ... 255
Type of the target value change	• not be sent • send a specific value
Value in % (<i>only if a specific value is sent</i>)	0 ... 100
With release the actuating variable follows the control	

Control of ventilation 2nd stage (only if two-stage control of ventilation is used):

Target value difference between 1. and 2. stage in ppm	100 ... 4000
Maximum actuating variable is reached at target/actual difference of (in ppm)	100 ... 4000
Re-setting time in mins	1 ... 255
If blocked, the actuating variable shall	• not be sent • send a specific value
Value in % (<i>only if a specific value is sent</i>)	0 ... 100
With release, the actuating variable follows the control	

4.14. Actuating variable comparator

Use comparator 1 / 2	No • Yes
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4.14.1. Actuating variable comparator 1 / 2

Output delivers	• Maximum value • Minimum value • Average value
Use input 1 / 2 / 3 / 4 / 5	No • Yes
Output sends	• on change of output • on change of output and periodically • when receiving an input object • when receiving an input object and periodically
Transmission cycle (only if sending „periodically“)	5 s • 10 s • 30 s • 1 min • ... • 2 h
From change of (only if sending „on change of output“)	1% • 2% • 5% • 10% • 20% • 25%
Evaluation of the blocking object	• if value 1: block bei Wert 0: release • if value 0: block bei Wert 1: release
Value of the blocking object before 1. communication	0 • 1
Behaviour of the output	
With blocking	• do not send telegramm • send value
Value in %	0 ... 100
With release the output sends (incl. 2 seconds release delay)	• the current value • the current value after reception of an object

4.15. Logic

Use logic inputs	No • Yes
Object value before 1. communication for	
Logic input 1 ... 16	0 • 1

AND Logic:

Logik 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8	not active • active
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OR Logic:

Logik 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8	not active • active
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4.15.1. AND Logic 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8

1. / 2. / 3. / 4. input	• do not use • all switching events which the sensor provides (see “Linkage inputs of the AND logic”)
Logic output sends	one 1 bit-object • two 8 bit-objects

If the logic output sends one 1 bit-object:

Logic output sends	one 1 bit-object
if logic = 1 → object value	1 • 0
if logic = 0 → object value	0 • 1

If the logic output sends two 8 bit-objects:

Logic output sends	two 8 bit-objects
Type of objects	• Value (0 ... 255) • Percent (0% ... 100%) • Angle (0°... 360°) • Scene recall (0 ... 127)
if logic = 1 → Object A Value	settings depend on „Type of objects“
if logic = 0 → Object A Value	settings depend on „Type of objects“
if logic = 1 → Object B Value	settings depend on „Type of objects“
if logic = 0 → Object B Value	settings depend on „Type of objects“
Transmission behaviour	• on change of logic • on change of logic to 1 • on change of logic to 0 • on change of logic and periodically • on change of logic to 1 and periodically • on change of logic to 0 and periodically • on change of logic + receipt of object • on change of logic + receipt of object and periodically
Transmission cycle (only if sending „periodically“)	5 s • 10 s • 30 s • 1 min • ... • 2 h

Blocking:

Evaluation of the blocking object	• if value 1: block if value 0: release • if value 0: block if value 1: release
Blocking object value before 1. communication	0 • 1
Behaviour of the switching output	
With blocking	• do not send telegram • send value for logic = 0 • send value for logic = 1

The behaviour with release of the switching output depends on the transmission behaviour

Value of parameter „Transmission behaviour“:	Setting options „Behaviour of switching output with release“:
on change of logic	• do not send telegram • send value for current logic status
on change of logic to 1	• do not send telegram • if logic = 1 → send value for 1

on change of logic to 0	• do not send telegram • if slogic = 0 → send value for 0
on change of logic and periodically	send value for current logic status (no selection)
on change of logic to 1 and periodically	if logic = 1 → send value for 1 (no selection)
on change of logic to 0 and periodically	if slogic = 0 → send value for 0 (no selection)
on change of logic and receipt of object	• do not send telegram • send status of the switching output
on change of logic and receipt of object and periodically	send value for current logic status (no selection)

4.15.2. Linkage inputs for AND Logik

do not use

Logic input 1

Logic input 1 inverted

Logic input 2

Logic input 2 inverted

Logic input 3

Logic input 3 inverted

Logic input 4

Logic input 4 inverted

Logic input 5

Logic input 5 inverted

Logic input 6

Logic input 6 inverted

Logic input 7

Logic input 7 inverted

Logic input 8

Logic input 8 inverted

Logic input 9

Logic input 9 inverted

Logic input 10

Logic input 10 inverted

Logic input 11

Logic input 11 inverted

Logic input 12

Logic input 12 inverted

Logic input 13

Logic input 13 inverted

Logic input 14

Logic input 14 inverted

Logic input 15

Logic input 15 inverted

Logic input 16

Logic input 16 inverted

Temperature/humidity sensor malfunction = ON
 Temperature/humidity sensor malfunction = OFF
 CO2 sensor malfunction = ON
 CO2 sensor malfunction = OFF
 Switching output temperature 1
 Switching output temperature 1 inverted
 Switching output temperature 2
 Switching output temperature 2inverted
 Switching output temperature 3
 Switching output temperature 3 inverted
 Switching output temperature 4
 Switching output temperature 4 inverted
 Temp. control Status switching object
 Temp. control Status switching object inverted
 Temp. control Status heating 1
 Temp. control Status heating 1 inverted
 Temp. control Status heating 2
 Temp. control Status heating 2 inverted
 Temp. control Status cooling 1
 Temp. control Status cooling 1inverted
 Temp. control Status cooling 2
 Temp. control Status cooling 2 inverted
 Temp. control Status night reduction
 Temp. control Status night reduction inverted
 Temp. control Status window
 Temp. control Status window inverted
 Switching output humidity 1
 Switching output humidity 1 inverted
 Switching output humidity 2
 Switching output humidity 2 inverted
 Humidity control status dehumidification 1
 Humidity control statusdehumidification 1 inverted
 Humidity control status dehumidification 2
 Humidity control status dehumidification 2 inverted
 Humidity control status humidification
 Humidity control status humidification inverted
 Switching output CO2 1
 Switching output CO2 1 inverted
 Switching output CO2 2
 Switching output CO2 2 inverted
 Switching output CO2 3
 Switching output CO2 3 inverted
 Switching output CO2 4
 Switching output CO2 4 inverted
 CO2 control status ventilation 1
 CO2 control status ventilation 1 inverted
 CO2 control status ventilation 2
 CO2 control status ventilation 2 inverted

4.15.3. OR Logic 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8

Input 1. / 2. / 3. / 4.	• do not use • all switching events which the sensor provides (see "Linkage inputs of the OR logic")
Logic output sends	one 1 bit-object • two 8 bit-objects

If logic output sends one 1 bit-object:

Logic output sends	one 1 bit-object
if logic = 1 → object value	1 • 0
if logic = 0 → object value	0 • 1

If logic output sends two 8 bit-objects:

Logic output sends	two 8 bit-objects
Type of objects	• Value (0 ... 255) • Percent (0% ... 100%) • Angle (0° ... 360°) • Scene recall (0 ... 127)
if logic = 1 → Object A Value	settings depend on „Type of objects“
if logic = 0 → Object A Value	settings depend on „Type of objects“
if logic = 1 → Object B Value	settings depend on „Type of objects“
if logic = 0 → Object B Value	settings depend on „Type of objects“

Transmission behaviour	• on change of logic • on change of logic to 1 • on change of logic to 0 • on change of logic and periodically • on change of logic to 1 and periodically • on change of logic to 0 and periodically • on change of logic + receipt of object • on change of logic + receipt of object and periodically
Transmission cycle (if sending „periodically“)	5 s • 10 s • 30 s • 1 min • ... • 2 h

Blocking:

Evaluation of the blocking object	• if value 1: block if value 0: release • if value 0: block if value 1: release
Blocking object value before 1. communication	0 • 1
Behaviour of the switching output	
With blocking	• do not send telegram • send value for logic = 0 • send value for logic = 1

The behaviour with release of the switching output depends on the transmission behaviour:

Value of parameter „Transmission behaviour“:	Setting options „Behaviour of switching output with release“:
on change of logic	• do not send telegram • send value for current logic status
on change of logic to 1	• do not send telegram • if logic = 1 → send value for 1
on change of logic to 0	• do not send telegram • if slogic = 0 → send value for 0
on change of logic and periodically	send value for current logic status (no selection)
on change of logic to 1 and periodically	if logic = 1 → send value for 1 (no selection)
on change of logic to 0 and periodically	if slogic = 0 → send value for 0 (no selection)
on change of logic and receipt of object	• do not send telegram • send status of the switching output
on change of logic and receipt of object and periodically	send value for current logic status (no selection)

4.15.4. Linkage inputs of OR Logik

The linkage inputs of the OR logic correspond with the parameters of the AND logic. The OR logic is additionally provided with the following inputs:

Switching output AND logic 1
 Switching output AND logic 1 inverted
 Switching output AND logic 2
 Switching output AND logic 2 inverted
 Switching output AND logic 3
 Switching output AND logic 3 inverted
 Switching output AND logic 4
 Switching output AND logic 4 inverted
 Switching output AND logic 5
 Switching output AND logic 5 inverted
 Switching output AND logic 6
 Switching output AND logic 6 inverted
 Switching output AND logic 7
 Switching output AND logic 7 inverted
 Switching output AND logic 8
 Switching output AND logic 8 inverted

