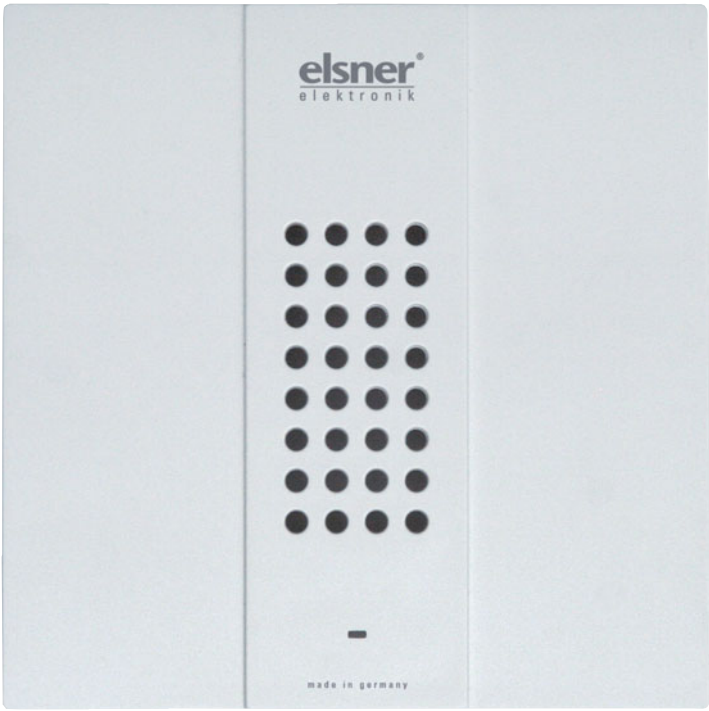
EN

KNX AQS

Air Quality Sensor



elsner elektronik

Installation and Adjustment

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 **Air Quality Sensor KNX AQS** measures the room CO_2 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 CO_2 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 alllows for control of a ventilation and thus helps to maintain the required CO_2 content value for room air.

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 (one or two step)
- **2 actuating variable comparators** for output of minimum, maximum or avarage 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 CO_2 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 CO_2 measurement, the device must be installed in a windproof socket.

The indiceted 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. 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 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. Delivery scope and assembly

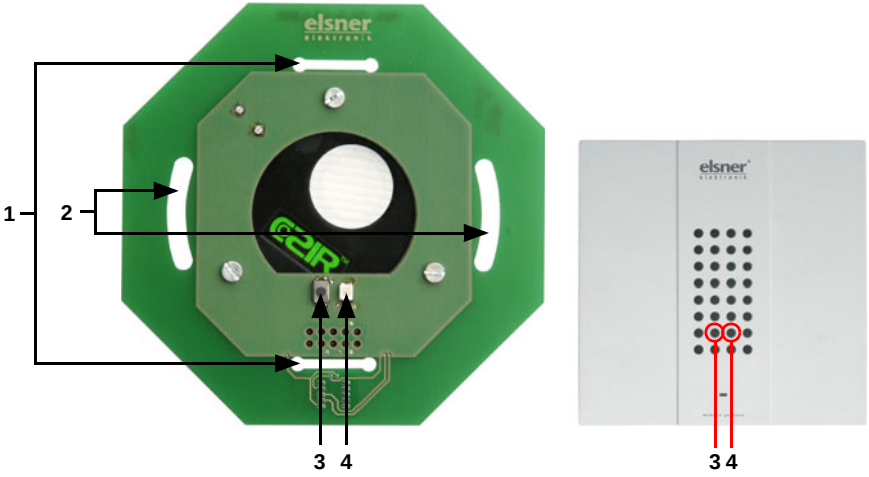
1x Cover with punches

2x Device screw Ø 3,2 mm × 15 mm

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

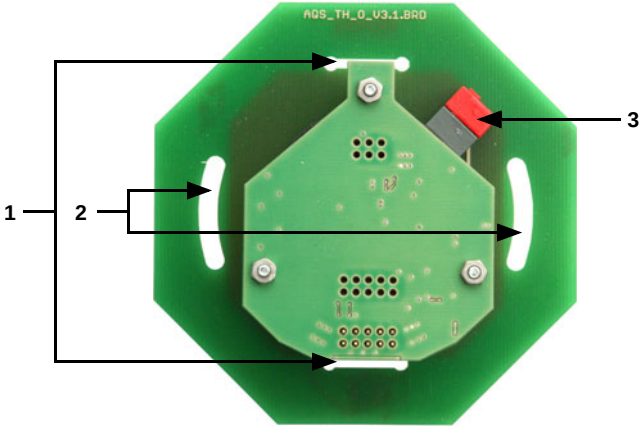
1x Distribution box Ø 70 mm, 36 mm deep

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

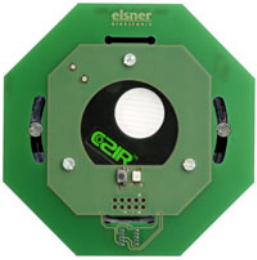


1 Grooves for attachment of cover
2 Oblong holes for fastening with distribution box
3 KNX terminal BUS +/-

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.

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
2	CO2 sensor malfunction	Output	1.001	C R T
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
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

No	Name	Function	DPT	Flags
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
137	Actuating variable comparator 1: Input 5	Input	5.010	C W
138	Actuating variable comparator 1: Output	Output	1.001	C R T

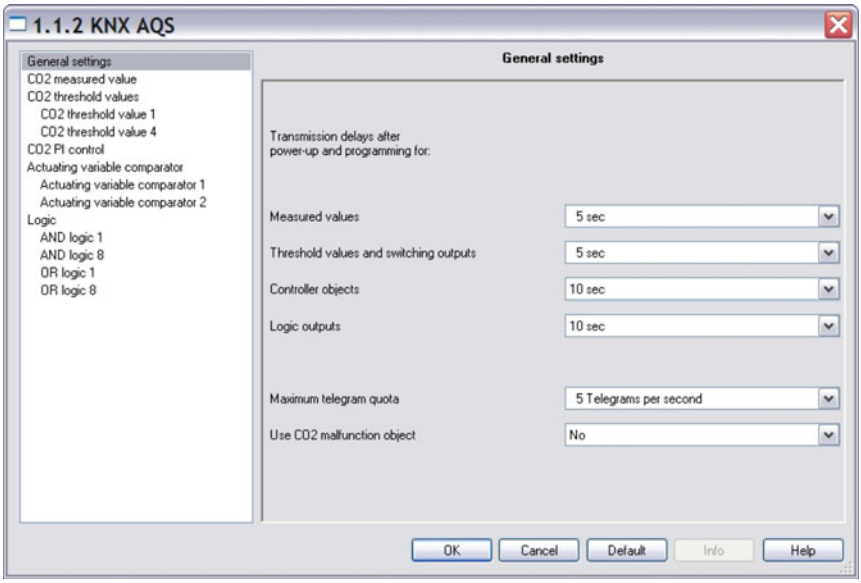
No	Name	Function	DPT	Flags
139	Actuating variable comparator 1: Block	Input	1.002	C W
140	Actuating variable comparator 2: Input 1	Input	5.010	C W
141	Actuating variable comparator 2: Input 2	Input	5.010	C W
142	Actuating variable comparator 2: Input 3	Input	5.010	C W
143	Actuating variable comparator 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
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

No	Name	Function	DPT	Flags
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
210	OR Logic 8: Blocking	Input	1.002	C W
211	Logic input 1	Input	1.002	C W

No	Name	Function	DPT	Flags
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



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 CO2 malfunction object	No • Yes

4.2. 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

4.3. CO2 treshold values

Use threshold value 1 / 2 / 3 / 4	No • Yes

4.3.1. CO2 threshold value 1 / 2 / 3 / 4

Threshold value

Threshold value setpoint per	Parameter • Communication object

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 *(only if the value communicated last is „not“ maintained or „after restoration of voltage“)*	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 *only if sending „Increment/decrement“)*	1 • 2 • 5 • 10 • 20 • 50 • 100 • 200
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 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 "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. CO2 PI control

Use control	No • Yes

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 cyle *(only if sending „periodically“)*	5 s • 10 s • 30 s • 1 min • ... • 2 h

Controler target value:

Target value setpoint per	Parameter • Communication object

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 *(only if the value communicated last is „not" maintained or „after restoration of voltage")*	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 *(only with „Increment/Decrement")*	1 • 2 • 5 • 10 • 20 • 50 • 100 • 200

Control of ventilation 1. 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 % *(only if a specific value is sent)*	0 ... 100
With release the actuating variable follows the control	

Control of ventilation 2. 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 % *(only if a specific value is sent)*	0 ... 100
With release, the actuating variable follows the control	

4.5. Actuating variable comparator

Use comparator 1 / 2	No • Yes

4.5.1. 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

4.6. 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

OR Logic:

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

4.6.1. AND Logik 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)

4.6.2. 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
CO2 sensor malfunction = ON
CO2 sensor malfunction = OFF
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

4.6.3. OR Logic 1 / 2 / 3 / 4 / 5 / 6 / 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)

4.6.4. 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

elsner®
elektronik

Elsner Elektronik GmbH Control and Automation Technology
Herdweg 7
D – 75391 Gechingen Phone +49 (0) 70 56 / 93 97-0 info@elsner-elektronik.de
Germany Fax +49 (0) 70 56 / 93 97-20 www.elsner-elektronik.de