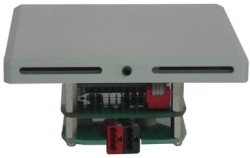




X-S8-CO2-TF		CO2 / Temperature / Humidity / Climate	Product Group 10
EIB/KNX, Indoor, IP20		Document: 3300_ex_X-S8-CO2-TF.pdf	Article No.
<p>KNX Sensor / controller for monitoring and control of CO2-concentration and room climate values as temperature, humidity and dewpoint temperature.</p> <p>Use case: Monitoring and control of CO2-concentration and air quality in offices, conference rooms, hotels, schools, workspaces etc. Monitoring and control of the climate in indoor applications.</p> <p>Auxiliary power necessary: 9 .. 30 VDC / 250 mW</p>			
	AE -S8-CO2-TF	<p>Metal housing: 82 x 82 x 8 mm with bevel Aluminium sandblasted, anodized</p> <p>Measured temperature range: -25 .. +55 °C Measured humidity range: 10 .. 90% r.H. CO2 measuring range: 0 .. 5000 ppm</p> <p>Magnetic fixture with metal frame (included) for (60 / 68 mm) in-wall pattress mounting IP20</p>	30803040
	AW -S8-CO2-TF	<p>Metal housing: 82 x 82 x 8 mm with bevel Aluminium sandblasted, white powder coated</p> <p>Measured temperature range: -25 .. +55 °C Measured humidity range: 10 .. 90% r.H. CO2 measuring range: 0 .. 5000 ppm</p> <p>Magnetic fixture with metal frame (included) for (60 / 68 mm) in-wall pattress mounting IP20</p>	30803041
	SK04 -S8-CO2-TF	<p>Plastic housing: 121 x 70 x 24 mm</p> <p>Measured temperature range: -10 .. +55 °C Measured humidity range: 10 .. 90% r.H. CO2 measuring range: 0 .. 5000 ppm</p> <p>On-wall mounting in dry indoor applications IP20</p>	30803050

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3.3 KNX Objects	12	3.7 Startup	20
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Imprint			

3.1 Application Description

Operating Principles and Areas of Application

The production series S8 uses sensors and controllers for a number of physical and chemical measurements for indoor and outdoor areas.

The measuring system **X-S8-CO2-TF** records the carbon dioxide rate measured by the CO2 sensor, as well as room temperature and humidity. With these measured values the dew point temperature and the absolute humidity are calculated.

A number of controller models with various functions are available.

KNX sensors are set up using the ETS (KNX Tool Software) with the associated application program.

The device is delivered unprogrammed.

All functions are parameterized and programmed by ETS.

The controller can be switched on or off by activation or locking via the KNX bus.

Functions

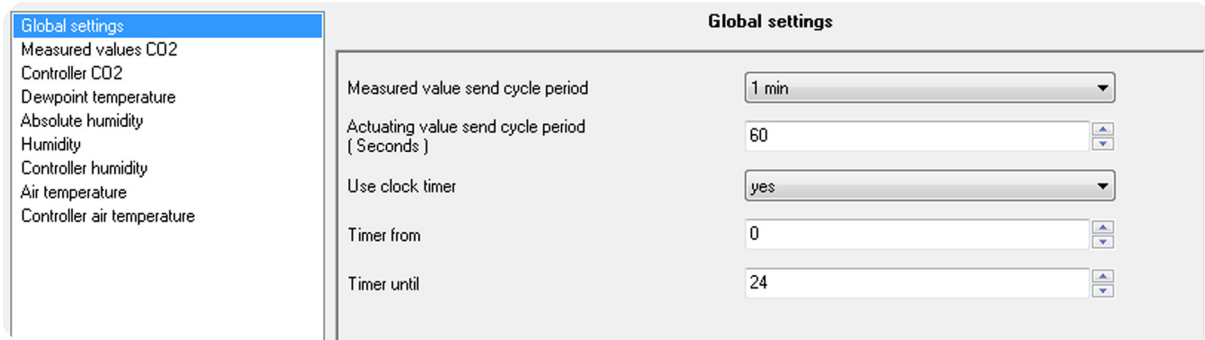
Measurement of CO2 with

- Two position controller with switch and pulse 1-bit output
or
- PI controller with continuous 8-bit or pulse-width modulated 1-bit output
- Measured Value can be periodically displayed or when value changes
- Adjustable periodic display of control variable (parameterized)
- Adjustable release and lock with all controllers (parameterized)
- Threshold alarm for upper and lower thresholds
- Auxiliary quantity of set value or threshold via the bus

3.2 KNX Parameter

3.2.1 General Settings	3		
3.2.2 Measured Values CO2	4	3.2.3 Controller CO2	5
3.2.4 Dewpoint Temperature	6	3.2.5 Absolute Humidity	7
3.2.6 Humidity	8	3.2.7 Controller Humidity	9
3.2.8 Air Temperature	10	3.2.9 Controller Air Temperature	11

3.2.1 General Settings



General Settings - X-S8-CO2-TF

Parameter	Setting	Description
Measured value send cycle period	1 .. 120 minutes	The transmission period of the measurement values that are to be sent cyclically. In the parameter set „Measured value x“ you can determine if the measurement values are sent periodically.
Actuating value send cycle period (Seconds)	10 .. 250	The transmission period of the correcting variables of the controller that are to be sent cyclically. In the parameter set „Controller x“ you can determine if the measurement values are sent periodically.
Use clock timer	<ul style="list-style-type: none"> • No • Yes 	When the timer is used, two additional parameters (timer from / to) and the objects 58 „device time“ and 59 „device date“ are available.
Timer from Timer until	0 .. 24 hour	The controller output can be locked depending on the time of day. The time in which the controller is unlocked must be entered here. In the parameter set „Controller x“ you can determine if the timer function is to be used for a specified controller.

3.2.2 Measured Values CO2

Measured Values CO2 - X-S8-CO2-TF

Parameter	Setting	Description
Measured value send cyclical	<ul style="list-style-type: none"> No Yes 	The transmission period can be parameterized in the parameter set „General Settings“.
Measured value send by change	<ul style="list-style-type: none"> No Yes 	The necessary change can be set in the parameter „Differential gab send / limits“.
Type datapoint	<ul style="list-style-type: none"> 2-Byte unsigned 2-Byte float 4-Byte float 	Measured Data Output and Auxiliary Data are defined concurrently.
Auxiliary object is	<ul style="list-style-type: none"> Setpoint Upper limit Lower limit 	Every controller has an auxiliary object which can control either the set point of the controller or the limit values.
Auxiliary value store by change	<ul style="list-style-type: none"> No Yes 	When the auxiliary data is changed the new value is carried over to EEPROM and saved in case of a bus voltage breakdown. This should be used only when the data is not frequently changed as EEPROM has only a limited memory cycle.
Lower limit ppm	0 .. 4999	If the measured value corresponds with the preset value, the object 5 „Output, Lower Limit CO2“ will be set.
Upper limit ppm	0 .. 4999	If the measured value corresponds with the preset value, the object 4 „Output, Upper Limit CO2“ will be set.
Schaltdifferenz Senden / Grenzwerte ppm	0 .. 4999	To reduce the bus load when a value is changed and to avoid multiple switching between measured data and thresholds, a hysteresis between 10ppm and 100ppm should be used.

3.2.3 Controller CO2

Controller CO2 - X-S8-CO2-TF

Parameter	Setting	Description
Locking object	<ul style="list-style-type: none"> locked if 1 locked if 0 	When using the Locking object 7 „Input, enable / lock controller“ the controller output is deactivated. The lock function can be set up for „release“ or „lock“.
Actuating value by ascending actual value	<ul style="list-style-type: none"> increasing decreasing 	The actuating direction of the controller can be adapted to the characteristics of the controlled system.
Controller	<ul style="list-style-type: none"> Steady PI Controller Switched PI Controller (PWM) Two-Position Controller Two-Position Controller Pulsed 	The different controller types and the corresponding parameters are described in chapter 3.4 Notes
Setpoint ppm	0 .. 4999	Setpoint setting
Proportional range ppm	0 .. 4999	see chapter 3.4 Notes - General Rules for Adjusting the PI Parameter
Reset time (in minutes)	0 .. 255	see chapter 3.4 Notes - General Rules for Adjusting the PI Parameter
Actuating value send cyclical	<ul style="list-style-type: none"> No Yes 	The cycle period is set in „General Settings“.

Controller CO2 - X-S8-CO2-TF (continue)

Parameter	Setting	Description
Actuating value distance to limit in %	0 .. 50	When the lower threshold is surpassed 0% is set, when the upper threshold is surpassed 100% will be set. This is important for actuators which do not operate reliably at threshold levels.
Cycle duration in seconds	0 .. 65535	Total time of On and Off state.
Differential gab Cotroller ppm	0 .. 4999	see chapter 3.4 Notes - Two-Positon Control
Duty cycle in %	0 .. 50	duty cycle = pulse duration / cycle duration x 100 see chapter 3.4 Notes - Two-Positon Control with Pulsed Output
Use clock timer	<ul style="list-style-type: none"> • No • Yes 	The use of the clock timer can be enable / disable for each channel separately.

3.2.4 Dewpoint Temperature

Dewpoint Temperature - X-S8-CO2-TF

Parameter	Setting	Description
Measured value send cyclical	<ul style="list-style-type: none"> • No • Yes 	The transmission period can be parameterized in the parameter set „General Settings“.
Measured value send by change	<ul style="list-style-type: none"> • No • Yes 	The necessary change can be set in the parameter „Differential gab send / limits“.
Type datapoint	<ul style="list-style-type: none"> • 1-Byte signed • 2-Byte signed • 2-Byte float • 4-Byte float 	Measured Data Output and Auxiliary Data are defined concurrently.
Auxiliary object is	<ul style="list-style-type: none"> • Upper limit • Lower limit 	Every controller has an auxiliary object which can control either the set point of the controller or the limit values.
Auxiliary value store by change	<ul style="list-style-type: none"> • No • Yes 	When the auxiliary data is changed the new value is carried over to EEPROM and saved in case of a bus voltage breakdown. This should be used only when the data is not frequently changed as EEPROM has only a limited memory cycle.
Lower limit (x 0,01 °C)	-9999 .. +19999	If the measured value corresponds with the preset value, the object 33 „Output, Lower Limit dewpoint temperature“ will be set. (Please mind the factor !)

Dewpoint Temperature - X-S8-CO2-TF (continue)

Parameter	Setting	Description
Upper limit (x 0,01 °C)	-9999 .. +19999	If the measured value corresponds with the preset value, the object 32 „Output, Upper Limit dewpoint temperature“ will be set. (Please mind the factor !)
Differential gab send / limits (x 0,01 °C)	-9999 .. +19999	To reduce the bus load when a value is changed and to avoid multiple switching between measured data and thresholds, a hysteresis between 0,1°C and 1°C should be used. (Please mind the factor !)

3.2.5 Absolute Humidity

Absolute Humidity - X-S8-CO2-TF

Parameter	Setting	Description
Measured value send cyclical	• No • Yes	The transmission period can be parameterized in the parameter set „General Settings“.
Measured value send by change	• No • Yes	The necessary change can be set in the parameter „Differential gab send / limits“.
Type datapoint	• 1-Byte unsigned • 2-Byte unsigned • 2-Byte float • 4-Byte float	Measured Data Output and Auxiliary Data are defined concurrently.
Auxiliary object is	• Upper limit • Lower limit	Every controller has an auxiliary object which can control either the set point of the controller or the limit values.
Auxiliary value store by change	• No • Yes	When the auxiliary data is changed the new value is carried over to EEPROM and saved in case of a bus voltage breakdown. This should be used only when the data is not frequently changed as EEPROM has only a limited memory cycle.
Lower limit (x 0,01 g/m ³)	-9999 .. +19999	If the measured value corresponds with the preset value, the object 40 „Output, Lower Limit absolute humidity“ will be set. (Please mind the factor !)
Upper limit (x 0,01 g/m ³)	-9999 .. +19999	If the measured value corresponds with the preset value, the object 39 „Output, Lower Limit absolute humidity“ will be set. (Please mind the factor !)

Absolute Humidity - X-S8-CO2-TF (continue)

Parameter	Setting	Description
Differential gab send / limits (x 0,01 g/m ³)	-9999 .. +19999	In order to limit the busload when the values change and to avoid multiple switching within the range of the limits, an appropriate hysteresis value should be applied. (Please mind the factor !)

3.2.6 Humidity
Humidity - X-S8-CO2-TF

Parameter	Setting	Description
Measured value send cyclical	<ul style="list-style-type: none"> • No • Yes 	The transmission period can be parameterized in the parameter set „General Settings“.
Measured value send by change	<ul style="list-style-type: none"> • No • Yes 	The necessary change can be set in the parameter „Differential gab send / limits“.
Auxiliary object is	<ul style="list-style-type: none"> • Setpoint • Upper limit • Lower limit 	Every controller has an auxiliary object which can control either the set point of the controller or the limit values.
Auxiliary value store by change	<ul style="list-style-type: none"> • No • Yes 	When the auxiliary data is changed the new value is carried over to EEPROM and saved in case of a bus voltage breakdown. This should be used only when the data is not frequently changed as EEPROM has only a limited memory cycle.
Lower limit (in %)	0 .. 100	If the measured value corresponds with the preset value, the object 47 „Output, Lower Limit humidity“ will be set.
Upper limit (in %)	0 .. 100	If the measured value corresponds with the preset value, the object 46 „Output, Upper Limit humidity“ will be set.
Differential gab send / limits (in %)	0 .. 100	In order to limit the busload when the values change and to avoid multiple switching within the range of the limits, an appropriate hysteresis value should be applied.

3.2.7 Controller Humidity

Controller Humidity - X-S8-CO2-TF

Parameter	Setting	Description
Locking object	<ul style="list-style-type: none"> • locked if 1 • locked if 0 	When using the Locking object 49 „Input, enable / lock relative humidity“ the controller output is deactivated. The lock function can be set up for „release“ or „lock“.
Actuating value by ascending actual value	<ul style="list-style-type: none"> • increasing • decreasing 	The actuating direction of the controller can be adapted to the characteristics of the controlled system.
Controller	<ul style="list-style-type: none"> • Steady PI Controller • Switched PI Controller (PWM) • Two-Position Controller • Two-Position Controller Pulsed 	The different controller types and the corresponding parameters are described in chapter 3.4 Notes .
Setpoint (in %)	0 .. 100	Setpoint setting
Proportional range (in %)	0 .. 100	see chapter 3.4 Notes - General Rules for Adjusting the PI Parameter
Reset time (in Minuten)	0 .. 255	see chapter 3.4 Notes - General Rules for Adjusting the PI Parameter
Actuating value send cyclical	<ul style="list-style-type: none"> • No • Yes 	The cycle period is set in „General Settings“.
Actuating value distance to limit in %	0 .. 50	When the lower threshold is surpassed 0% is set, when the upper threshold is surpassed 100% will be set. This is important for actuators which do not operate reliably at threshold levels.
Cycle duration in seconds	0 .. 65535	Total time of On and Off state.
Differential gap Controller (in %)	0 .. 100	see chapter 3.4 Notes - Two-Position Control
Duty cycle in %	0 .. 50	duty cycle = pulse duration / cycle duration x 100 see chapter 3.4 Notes - Two-Position Control with Pulsed Output
Use clock timer	<ul style="list-style-type: none"> • No • Yes 	The use of the clock timer can be enable / disable for each channel separately.

3.2.8 Air Temperature

Air Temperature - X-S8-CO2-TF

Parameter	Setting	Description
Measured value send cyclical	<ul style="list-style-type: none"> • No • Yes 	The transmission period can be parameterized in the parameter set „General Settings“.
Measured value send by change	<ul style="list-style-type: none"> • No • Yes 	The necessary change can be set in the parameter „Differential gab send / limits“.
Type datapoint	<ul style="list-style-type: none"> • 1-Byte signed • 2-Byte signed • 2-Byte float • 4-Byte float 	Measured Data Output and Auxiliary Data are defined concurrently.
Auxiliary object is	<ul style="list-style-type: none"> • Setpoint • Upper limit • Lower limit 	Every controller has an auxiliary object which can control either the set point of the controller or the limit values.
Auxiliary value store by change	<ul style="list-style-type: none"> • No • Yes 	When the auxiliary data is changed the new value is carried over to EEPROM and saved in case of a bus voltage breakdown. This should be used only when the data is not frequently changed as EEPROM has only a limited memory cycle.
Lower limit (x 0,01 °C)	-9999 .. +19999	If the measured value corresponds with the preset value, the object 54 „Output, Lower Limit air temperature“ will be set. (Please mind the factor !)
Upper limit (x 0,01 °C)	-9999 .. +19999	If the measured value corresponds with the preset value, the object 53 „Output, Upper Limit air temperature“ will be set. (Please mind the factor !)
Measured value shift (x 0,01 °C)	-32768 .. +32767	A calibration / offset adjustment of the sensors can occur when the measured displacement is offset due to cable length or other known external influences. (Please mind the factor !)
Differential gab send / limits (x 0,01 °C)	-9999 .. +19999	To reduce the bus load when a value is changed and to avoid multiple switching between measured data and thresholds, a hysteresis between 0,1°C and 1°C should be used. (Please mind the factor !)

3.2.9 Controller Air Temperature

Controller Air Temperature - X-S8-CO2-TF

Parameter	Setting	Description
Locking object	<ul style="list-style-type: none"> • locked if 1 • locked if 0 	When using the Locking object 56 „Input, enable / lock air temperature“ the controller output is deactivated. The lock function can be set up for „release“ or „lock“.
Actuating value by ascending actual value	<ul style="list-style-type: none"> • increasing • decreasing 	The actuating direction of the controller can be adapted to the characteristics of the controlled system.
Controller	<ul style="list-style-type: none"> • Steady PI Controller • Switched PI Controller (PWM) • Two-Position Controller • Two-Position Controller Pulsed 	The different controller types and the corresponding parameters are described in chapter 3.4 Notes .
Setpoint (x 0,01 °C)	-9999 .. +19999	Setpoint setting (Please mind the factor !)
Proportional range (in °C)	-9999 .. +19999	see chapter 3.4 Notes - General Rules for Adjusting the PI Parameter
Reset time (in Minuten)	0 .. 255	see chapter 3.4 Notes - General Rules for Adjusting the PI Parameter
Actuating value send cyclical	<ul style="list-style-type: none"> • No • Yes 	The cycle period is set in „General Settings“.
Actuating value distance to limit in %	0 .. 50	When the lower threshold is surpassed 0% is set, when the upper threshold is surpassed 100% will be set. This is important for actuators which do not operate reliably at threshold levels.
Cycle duration in seconds	0 .. 65535	Total time of On and Off state.
Differential gab Cotroller (in °C)	-9999 .. +19999	see chapter 3.4 Notes - Two-Positon Control
Duty cycle in %	0 .. 50	$T_{duty\ cycle} = \text{pulse duration} / \text{cycle duration} \times 100$ see chapter 3.4 Notes - Two-Positon Control with Pulsed Output
Use clock timer	<ul style="list-style-type: none"> • No • Yes 	The use of the clock timer can be enable / disable for each channel separately.

3.3 KNX Objects

Objects - X-S8-CO2-TF

No.	Label	Data Point Type	Function
0	Output, error code	DPT 4 Byte	Error code
2	Output, measured value CO2	DPT adjustable	Measured value
3	Input, auxiliary object CO2	DPT adjustable	Auxiliary object
4	Output, Upper limit CO2	DPT 1.002 Bool 1 Bit	Exceeding limit
5	Output, Lower limit CO2	DPT 1.002 Bool 1 Bit	Undercut limit
6	Output, controller CO2	DPT adjustable	Actuating value
7	Input, enable/lock controller	DPT 1.001 Switch 1 Bit	Enable/lock
8	Output, object status CO2	DPT 1 Byte	Status
30	Output, measured value dewpoint temperature	DPT adjustable	Calculated value
31	Input, auxiliary object dewpoint temperature	DPT adjustable	Auxiliary object
32	Output, Upper limit dewpoint temperature	DPT 1.002 Bool 1 Bit	Limit
33	Output, Lower limit dewpoint temperature	DPT 1.002 Bool 1 Bit	Limit
37	Output, measured value absolute humidity	DPT adjustable	Calculated value
38	Input, auxiliary object absolute humidity	DPT adjustable	Auxiliary object
39	Output, Upper limit absolute humidity	DPT 1.002 Bool 1 Bit	Limit
40	Output, Lower limit absolute humidity	DPT 1.002 Bool 1 Bit	Limit
44	Output, measured value relative humidity	DPT adjustable	Measured value
45	Input, auxiliary object relative humidity	DPT adjustable	Auxiliary object
46	Output, Upper limit relative humidity	DPT 1.002 Bool 1 Bit	Limit
47	Output, Lower limit relative humidity	DPT 1.002 Bool 1 Bit	Limit
48	Output, controller relative humidity	DPT adjustable	Actuating value
49	Input, enable/lock relative humidity	DPT 1.001 Switch 1 Bit	Enable/lock
50	Output, object status relative humidity	DPT 1 Byte	Channel status
51	Output, measured value air temperature	DPT adjustable	Measured value
52	Input, auxiliary object air temperature	DPT adjustable	Auxiliary object
53	Output, Upper limit air temperature	DPT 1.002 Bool 1 Bit	Limit
54	Output, Lower limit air temperature	DPT 1.002 Bool 1 Bit	Limit
55	Output, controller air temperature	DPT adjustable	Actuating value
56	Input, enable/lock air temperature	DPT 1.001 Switch 1 Bit	Enable/lock
57	Output, object status air temperature	DPT 1 Byte	Channel status
58	Equipment time	DPT 10.001 Time of day 3 Byte	Time
59	Equipment date	DPT 11.001 day of month 3 Byte	Date

Object Description - X-S8-CO2-TF

No.	Label	Description																												
8	Output, object status CO2	The values of the individual bits are added and transmitted to the bus. The status functions monitor the controller status for purposes of reporting and troubleshooting.																												
50	Output, object status relative humidity																													
57	Output, object status air temperature																													
		<table border="1"> <thead> <tr> <th>Status:</th> <th>Bit-No.</th> <th>Hexadecimal</th> <th>Decimal</th> </tr> </thead> <tbody> <tr> <td>upper limit too large</td> <td>0</td> <td>0x01</td> <td>1</td> </tr> <tr> <td>lower limit underrun</td> <td>1</td> <td>0x02</td> <td>2</td> </tr> <tr> <td>setpoint not equal to zero</td> <td>2</td> <td>0x04</td> <td>4</td> </tr> <tr> <td>lock activ</td> <td>4</td> <td>0x10</td> <td>16</td> </tr> <tr> <td>auxiliary is stored</td> <td>5</td> <td>0x20</td> <td>32</td> </tr> <tr> <td>timer activ</td> <td>6</td> <td>0x40</td> <td>64</td> </tr> </tbody> </table>	Status:	Bit-No.	Hexadecimal	Decimal	upper limit too large	0	0x01	1	lower limit underrun	1	0x02	2	setpoint not equal to zero	2	0x04	4	lock activ	4	0x10	16	auxiliary is stored	5	0x20	32	timer activ	6	0x40	64
Status:	Bit-No.	Hexadecimal	Decimal																											
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setpoint not equal to zero	2	0x04	4																											
lock activ	4	0x10	16																											
auxiliary is stored	5	0x20	32																											
timer activ	6	0x40	64																											

3.4 Notes

Controller models available are the PI controller or a two-position controller. Both controllers are equipped with pulsed output. The pulsed two-position controller works with constant duty cycle, which like the cycle duration is parameterized. The duty cycle of the pulsed PI controller is variable and depends on the control variable (pulse-width modulation).

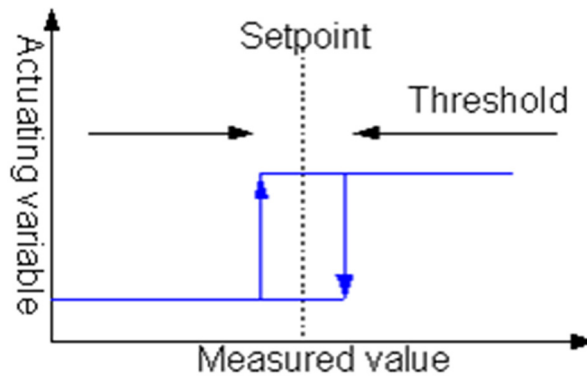
Two-Position Control

Two-position control is a very simple way of controlling.

Once the actual value (\pm half the switching difference) exceeds or falls below the set point a switch-on or switch-off command is sent to the bus.

Set the differential gap large enough to keep bus load to a minimum and configure the differential gap small enough to avoid extreme actual value fluctuations.

The two-position controller is parameterized using the set point and the switching threshold.

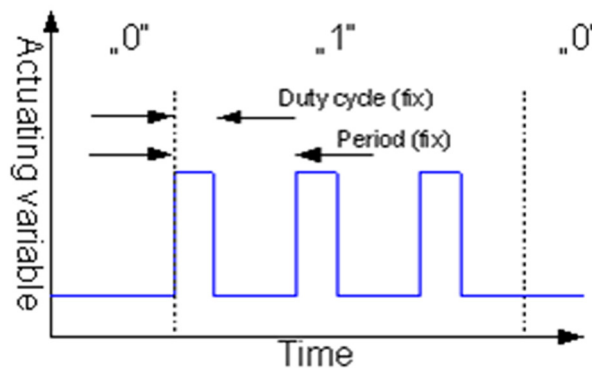


Two-Position Control with Pulsed Output

The controller works analogous to the two-position controller.

The actuating variable emits pulses with fixed duty cycle.

When the control variable reaches 40% in a cycle time of 10 minutes it will repeatedly turned on for 4 minutes and turned off for 6 minutes.



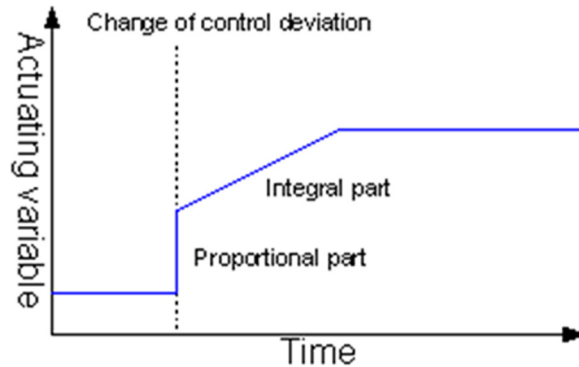
Continuous PI Control

To understand a PI controller one should think of an algorithm consisting of a proportional and integral part. By combining these two parts it is possible to get a quick and exact adjustment of the actuating variable.

The controller calculates the control variable every second.

It can constantly be updated and is displayed periodically (value parameterized) by the PI controller.

Through the integral part an offset is adjusted to 0 over a certain period of time.



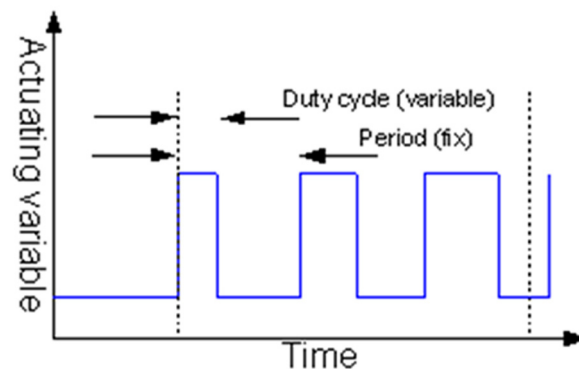
Continuous PI Control with Pulsed Output (PWM)

The controller works analogous to the PI controller, but the actuating variable emits pulses with a variable duty cycle.

PWM control sets the cycle duration of the transmission interval.

This allows a permanent on and off within the cycle time, which reaches an average valve position.

The duty cycle is determined indirectly via the integration time.



General Rules for Adjusting the PI Parameter

The reset time must be significantly larger than the delay time of the control system.

The proportional area corresponds to the reinforcement of the control circuit.

The smaller the proportional area, the larger the reinforcement is.

Parameters	Effect
Low Proportional Area	Quick adjustment to the setpoint. Strong overshoot when setpoint is compensated (continuous oscillation possible).
High Proportional Area	Slow correction of control deviations. No or few overshoots.
Short Integration Time	Rapid correction of control deviations. Danger of continuous oscillation.
Long Integration Time	Slow correction of control deviations. Little danger of overshoots or continuous oscillation.

3.5 Product Page

The KNX Sensor **X-S8-CO2-TF** is a sensor / controller from the S8 device series. It measures the CO2 value and the room climate with the values „temperature“ and „air humidity“. The measured values serve as a basis to calculate the values of the dew point temperature and the absolute air humidity.

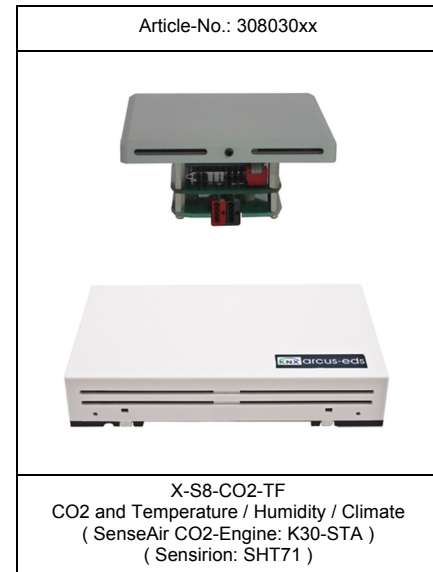
The device has an integrated KNX bus coupler and needs additional voltage (9 .. 30 VDC / 250mW).

The transducer with the bus coupler is enclosed in a durable, sealed, glass ball-reinforced plastic casing which fulfills protection degree IP65.

In the application software a separate controller (2-position or PI controller with continuous or pulsed output) is available for every channel.

Other functions include maximum and minimum thresholds and a help key where the set point and thresholds can be switched.

The sensor is configured with ETS (KNX Tool Software) and the application program. Controlling functions such as signal threshold and diverse adjustments are set using ETS (KNX Tool Software).



Areas of Application

- Testing of air quality and CO2 content in conference rooms, hotel rooms and working areas
- Recording temperature and relative humidity in interior / exterior areas and damp location areas
- Decentralized heating control for continuous KNX valve or electrothermal valve
- Decentralized ventilation control
- Dew Point Alarm for cooling ceilings/floors or conservatories
- Dew Point Alarm for identifying possible mold build-up in cellars
- Calculation of maximum and minimum temperatures

<p>Applicable Sensor: SenseAir CO2-Engine: K30-STA Sensirion: SHT71</p> <p>Measuring Range: K30-STA: 0 - 5000 ppm SHT71: -20 .. +80 °C 0 .. 95 % rH</p> <p>Accuracy of Sensor: K30-STA: ± 20 ppm ± 1 % meas. error SHT71: ± 0,5 °C ± 3 % rH</p> <p>Operating Voltage: 21 .. 32 VDC Power Consumption: approx. 240mW (at 24VDC) Auxiliary Supply: 9 .. 30 VDC / 250mW</p> <p>Operating Temperature: -20 .. +55 °C Storage Temperature: -20 .. +70 °C</p> <p>Protection Class: IP20</p>	
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3.6 Technical Data

Technical Data - X-S8-CO2-TF

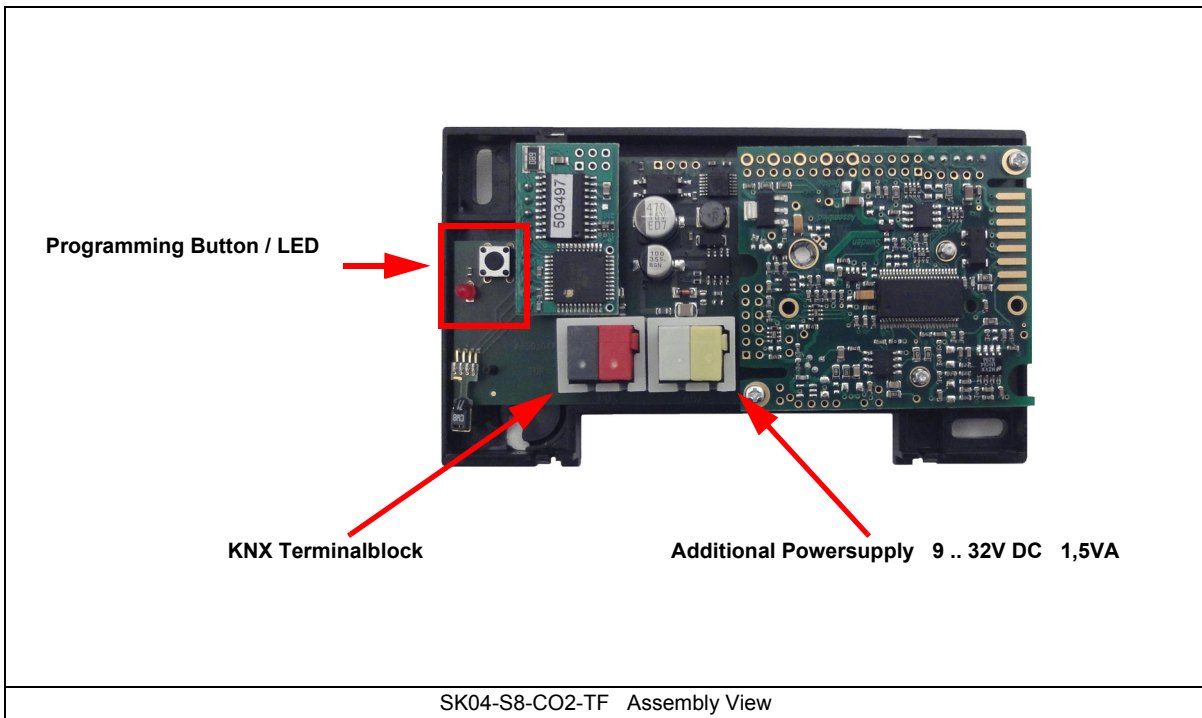
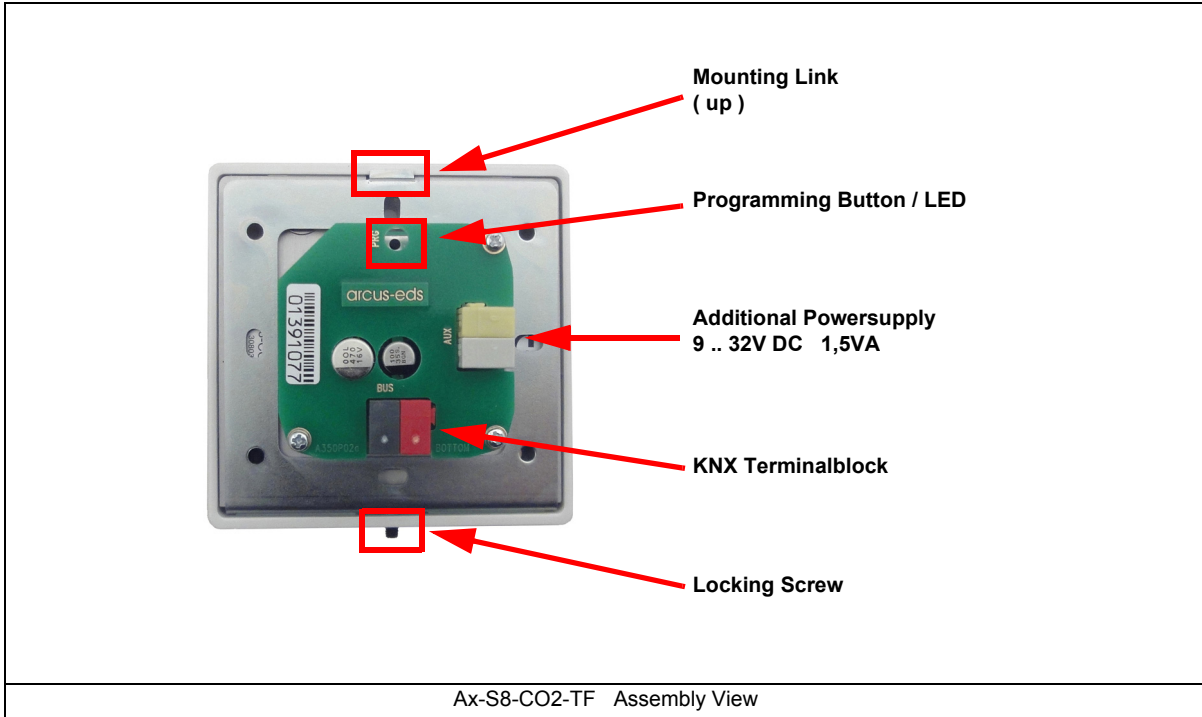
Measured Data	CO2 Concentration, Air Temperature, Relative Humidity, Dewpoint Temperature, Absolute Humidity
Sending Options	no sending, cyclical sending when change occurs
Parameter	Cyclical sending with variable periods, sending when change occurs with hysteresis
Objektyp CO2	2-Byte unsigned, 2-Byte float, 4-Byte float
Objektyp Dewpoint Temperature	1-Byte signed, 2-Byte signed, 2-Byte float, 4-Byte float
Objektyp Absolute Humidity	1-Byte unsigned, 2-Byte unsigned, 2-Byte float, 4-Byte float
Objektyp Air Temperature	1-Byte signed, 2-Byte signed, 2-Byte float, 4-Byte float
Controller Modi	Steady PI controller Switched PI controller (PWM) Two-Position controller Two-Position controller Pulsed
Parameter Steady PI controller	Setpoint, reset time, proportional factor, controller mode
Parameter Switched PI controller (PWM)	Setpoint, reset time, proportional factor, controller, cycle duration, threshold pitch
Parameter Two-Position controller	Setpoint, differential gap, controller mode
Parameter Two-Position controller Pulsed	Setpoint, differential gap, controller mode, cycle duration, duty cycle
Lock Function	All controller parameterizable as enable or lock
Controller Variables Output	depends on Controller Modi 1-Byte unsigned, 1-Bit Switch
Setpoint value send cyclical	None or 10-250 seconds, parameterizable
Limits: CO2, Dewpoint Temperature, Absolute Humidity, Relative Humidity, Air Temperature	Upper limit, Lower limit
Auxiliary value: CO2, Relative Humidity, Air Temperature	Setpoint, Lower limit or Upper limit
Auxiliary value: Dewpoint Temperature, Absolute Humidity	Lower limit or Upper limit
Bus power failure	Saving changed auxiliary quantities, parameterizable
Measured value shift	Air Temperature

Technical Data - X-S8-CO2-TF (continue)

Ambient Temperature Electronic Measuring Equipment Casing	Operation: -20 .. +55 °C Storage: -20 .. +70 °C
Ambient Humidity	0 .. 95% rH not condensating
Ambient Temperature CO2-Sensor	Operation: -20 .. +50 °C Storage: -20 .. +70 °C
Ambient Humidity CO2-Sensor	0 .. 95 % rH
Measuring Range CO2	0 - 5000 ppm
Accuracy CO2	± 20 ppm, ± 1% Meas. Error
Resolution CO2	± 30 ppm ± 5% Meas. Error
Measuring Range Temperature	-20 .. +80 °C
Accuracy Temperature	± 0,5 °C
Resolution Temperature	± 0,01 °C
Measuring Range Humidity	0 .. 100 % rH
Accuracy Humidity	± 3 % rH
Operating Voltage	EIB/KNX Busspannung 21 .. 32VDC
Power Consumption	approx. 240mW (at 24VDC)
Auxiliary Supply	9 .. 32VDC 250mW
Bus Coupler	integrated
Start-up with ETS	ARC_S8.VD2 Product: S8-CO2
Curcuit Points	EIB-2-pole clamps (red / black)
Protection Class	IP20
Assembly Type Transducer Ax-S8-CO2-TF	standard in-wall pattress (60/68 mm)
Casing Dimensions Ax-S8-CO2-TF	Aluminium 82 x 82 x 8 mm with bevel anodized or white powder-coated
Article number Ax-S8-CO2-TF	3080304x
Assembly Type Transducer SK04-S8-CO2-TF	On-wall mounting in dry indoor
Casing Dimensions SK04-S8-CO2-TF	Plastic case 121 x 70 x 24 mm
Article number SK04-S8-CO2-TF	30803050
Probes	SenseAir CO2Engine K30-STA Sensirion SHT71

3.7 Startup

The KNX Sensor is set up using the ETS (KNX Tool Software) and the applicable application program.
The sensor is delivered unprogrammed.
All functions are programmed and parameterized with ETS.
Please read the ETS instructions.



3.8 Assembly

The Sensor **Ax-S8-CO2-TF** is for indoor areas.
Magnetic fixture with metal frame (included) for 60/68mm in-wall pattress mounting.

The Sensor **SK04-S8-CO2-TF** is for on-wall mounting in dry indoor applications.
Mounted with 2 screws onto the wall.

Both devices fulfill the protection class IP20.

Be careful not to damage the electronics with tools and cable heads.

In Case of Bus Voltage Recurrence

All changes made using the help key for the KNX/EIB bus are saved if the device has been correctly parameterized.
The controller and outputs start with their current values and the ETS parameter settings are saved.

Discharge Program and Reset Sensor

In order to delete the programming (projecting) and to reset the module back to delivery status, it must be switched to zero potential (disconnect the EIB bus coupler).

Press and hold the programming button while reconnecting the EIB bus coupler and wait until the programming LED lights up (approx. 5-10 seconds).

Now you can release the programming button.

The module is ready for renewed projecting.

If you release the programming button too early, repeat the aforementioned procedure.

Imprint

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Attention! Installation and mounting must be carried out by a qualified electrician.

The buyer/operator of the facility has to make sure that all relevant safety regulations, issued by VDE, TÜV and the responsible energy suppliers are respected. There is no warranty for defects and damages caused by improper use of the devices or by non-compliance with the operating manuals.

Warranty

We take over guarantees as required by law.

Please contact us if malfunctions occur. In this case, please send the device including a description of the error to the company's address named below.

Manufacturer



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