



T18240en

Technical Information

thermokon[®]
asia pacific

GRW9-Series (CO2)

**Room Air Quality (CO2) Sensor
with Active Output**

The GRW1- Series (CO2) is designed to measure the air quality in rooms or areas

The air quality is measured based on CO2 levels (CO2= Carbon dioxide).

The sensor operates with low power supply

The sensor output is via BACnet MSTP or Modbus RTU communication / 0...10V or 4...20mA



Use

Compatible to all common HVAC DDC and Analog Controls systems, with/without Building Automation System

Air quality (CO2) measurements in rooms or areas

Used in all common HVAC applications

Used in Commercial and Industrial Buildings

Features

The sensor output is via BACnet MSTP or Modbus RTU communication / 0...10V or 4...20mA

Professional and practical product design, withstands rough environmental conditions

Easy to use, install and maintain

Product Range

Order Code	BUS-system	Power Supply	Accuracy	Analog Output	Measuring Range	Protection
GRW9.FA	BACnet MSTP	AC/DC 24V (±10%)	CO2+ max. ±40ppm and ±5% of measured value	0 ... 10V (default) / 4...20mA	Air Quality (CO2) = 0 ... 2.000PPM	IP20 according to EN 60529
GRW9.FG	Modbus RTU					

Sensor Specification	Sensor Specification	Measured	CO2	
		Sensor Characteristics	Active	
		Sensor Output (s)	BACnet MSTP or Modbus RTU communication, RS485	
		Sensor Type	Photoacoustic Sensing Principle	
		Output Load	Min. load 5kΩ @ AC/DC 24V	
		Accuracy	n/a	
		Measuring Range (s)	0...2000 ppm	
Technical Information	Electrical Information	Power Supply	AC/DC 24V (±10%)	
		Frequency	50 / 60 Hz at AC 24V	
		Terminal Clarr	Screw terminal, max. 1.5mm ²	
		Power Consumption	≤ 1.2W / AC 24V; ≤ 2.2 VA / DC 24V	
	User Interface	n/a	n/a	
	Mechanical Information	Cable Entry	~30mm x 10mm on the backside	
	Color and Materials	Housing Cover	ABS, White	
		Housing Bottom	ABS, White	
	Environmental Conditions	Operation Temperature	0°C...+50°C	
		Operation Humidity	<85 % r.h., no condensation	
		Transport Temperature	-35°C...+70°C	
		Transport Humidity	< 90% r.h.	
	Norms and Directives		Storage Humidity	< 85% r.h., no condensation
			IP- Rating	IP20 to IEC60529
			Safety Class	III to EN 60 730
			CE Conformities to	2004/108/EG Electromagnetic Compatibility EMV
			CE Electromagnetic Compatibility Emitted Interference	2000/EN60730-1 Emitted Interference
		CE Electromagnetic Compatibility Interference resistance	2000/EN60730-1 Interference Resistance	
		RoHS Compatibility	RoHS 3, Directive 2015/863	
		Operation Climatic Condition	IEC 60 721-3-3	
		Operation Mechanical Condition	IEC 60 721-3-2 to class2M2	
		Transport to Climatic Condition	IEC 60 721-3-2	
		Transport Mechanical Condition	IEC 60 721-3-2 to class2M2	
		Storage Climatic Condition	IEC 60 721-3-1	
		Storage Mechanical Condition	IEC 60 721-3-1 to class2M2	
Miscellaneous	Accessories	Accessory not included in delivery	URA0.B (106mmx106mm backplate)	
	Shipping & Handling	Minimum Order	1 box with 1 piece	
		Packaging	Rigid Cardboards Packaging	
	Order Notes	Order Code	GRW9.FA	

Modbus Parameters	Address Number	Register Description	
	0...3	Serial Number	actual version
	4	Software Version	actual version
	6	Modbus Address	Default 254, selectable 1...254
	8	Hardware Version	actual version
	11	Baud Rate autodetection	0= OFF ; 1= On
	15	Baud Rate, (if autodetection is OFF)	0= 9600 ; 1= 19.200 ; 2= 38.400 ; 3= 57.600 ; 4= 115.200
	34	Air Quality, CO2	actual value (0...2000PPM)

BACnet Parameters	Supported BACnet Objects Types	
	analog-value	
	device	
	Supported BACnet Services	
	who-is	
i-am		

object-identifier, object-name, object-type, present-value, units, object-list, vendor-id, vendor-name, system-status, confirmed-service, unconfirmed-services

BACnet Parameters	MSTP Objects		
	analog-value		
		BACnet Address	Default 127, selectable 0...127
	AV0	Baud rate autodetection	default 0, 0= OFF ; 1= ON
	AV1	Baud Rate, (if autodetection is OFF)	0= 9600 ; 1= 19.200 ; 2= 38.400 ; 3= 57.600 ; 4= 115.200
	AV2	Humidity Mode	0= Dew Point ; 1= Enthalpy ; 2= Absolute Humidity ; 3= relative humidity
	AV3	Protocol	0= Modbus ; 1= BACnet
	AV4	Air Quality, CO2	actual value (0...2000PPM)
	Device		
		device-identifier	
		device-name	

The function "Baud Rate autodetection" can only be used during the product is been setup. When the product is working with the BAS, the "Baud Rate autodetection" has to be set to 0= OFF and the actual Baud Rate has to be set.

Installation Notes

Observe the following general regulation for engineering and implementation:



All relevant national and heavy power regulations

Other country specific regulations

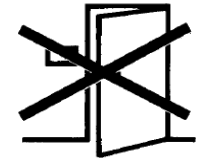
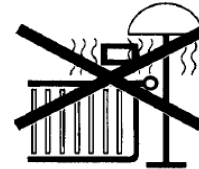
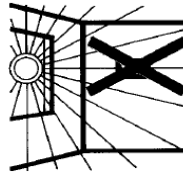
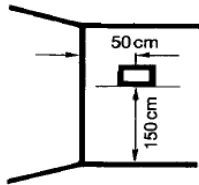
Country-specific regulations

Local electrical supply authority regulations

Schematics, cable listings, dispositions, specification and arrangements from the customer or engineering office in charge

Third party specifications, e.g. general contractors or constructors.

Mounting Advices



Advices

Disposal Notes

The device is considered an electronic device for disposal in terms of the EUROPEAN DIRECTIVE 2012/19/EU.



The device may not be disposed as domestic garbage.

The device must be disposed through channels provided for this purpose.

It is mandatory to comply with local currently applying laws and regulations.

Calibration Notes

The devices must be at the first use calibrated



Calibrate the sensor after the sensor was 30 minutes powered up

The air must be free of any taste of bad odor

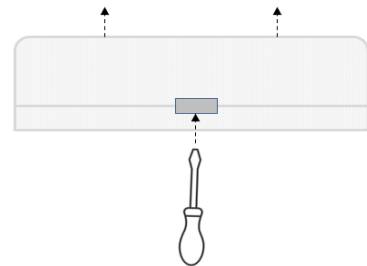
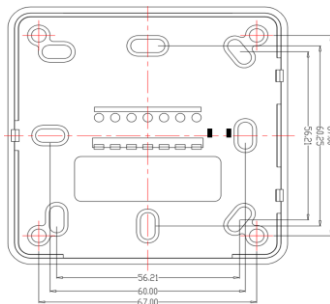
If the LED is green illuminated, the sensor is calibrated and setup

If the LED red is illuminated, turn the calibration potentiometer until the LED changes to green.

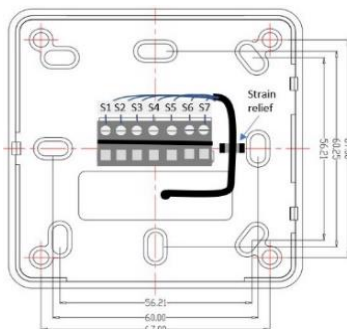
Then the sensor is calibrated and setup

This calibration can be repeated at any time during operation

Dimensional Drawing



Connections & Settings



Terminal Connections	
S1	UB+
S2	GND
S3	Analog out
S4	RS485 - C -
S5	RS485 - C+
S6	n.a.
S7	n.a.