

	DS8231en	Data Sheet	
GRW9- Series (VOC)	Room Air Quality (VOC) Sensor		
	with Modbus RTU communication		

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

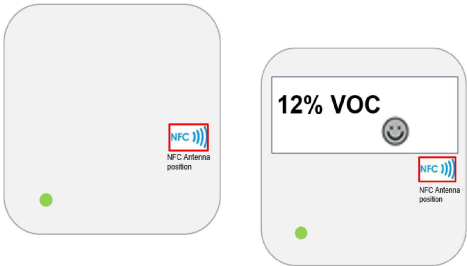
In accordance with RESET® and WELL Building Standard™.

Reading / Parameter settings via NFC technology

Sensor with Air Quality LED and optional with ePaper display

Product Designed in accordance to CE and UL standards

The sensor output is MODBUS RTU (RS485)



Use	Compatible to all common HVAC DDC and Analog Controls systems, with/without Building Automation System Air Quality (VOC) measuring in rooms and areas Used in all common HVAC applications Used in Commercial and Industrial Buildings
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Features	Sensor output via Modbus RTU communication Modern and practical product design Parameter settings via NFC technology Firmware updates via external USB-C Optional with ePaper display (31 x 60mm) Easy to use, install and maintain.
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Product Range

Order Codes	General Parameters					Air Quality (VOC)			
	Output	LED	Power Supply	Display	IP Rating	Parameters			
GRW9G.HG	Modbus RTU	AQ LED	AC/DC 24V (±10%)	n.a	IP 20	Device-to-Device variation ±15 Index Points (3.3%)	Measuring Range 0~500 Index Points (0~100%)	Repeatability ± 5 Index Points (1%)	Response time t63 10s
GRW9G.IG				ePaper display 31x60mm					

*Other passive elements are available. Contact your Sales Manager for more information

Sensor Specification	Sensor Specification	Measured	Air Quality (VOC)
		Sensor Characteristics	Active
		Sensor Output (s)	Modbus RTU communication, RS485
	Air Quality (VOC)	Device-to-Device variation	±15 Index Points (3.3%)
		Repeatability	± 5 Index Points (1%)
		Response Time	t63 10s
		Measuring Range	0~500 Index Points (0~100%)
Technical Information	Electrical Information	Power Supply	AC/DC 24V (±10%)
		Frequency	50 / 60 Hz at AC 24V
		Terminal Clamp	Screw terminal, max. 1.5mm ²
		Power Consumption	≤ 1W @ AC 24V / DC 24V
	Mechanical Information	Cable Entry	~50mm x 10mm on the backside
		USB-C	Bootloader for software updates
		Display	ePaper 31x60mm
	Color and Materials	Housing Cover	ABS, white
		Housing Bottom	ABS, white
		Flammability Standard	UL94class HB ; IEC 6070 ; ISO 9770
	Environmental Conditions	Operation Temperature	0°C~+50°C
		Operation Humidity	<85 % RH, no condensation
		Transport Temperature	-35°C~+70°C
		Transport Humidity	< 90% RH
		Storage Humidity	< 85% RH, no condensation
	Norms and Directives	IP- Rating	IP20 to IEC60529
		REACH Regulation	Regulation (EC) No. 1907/2006
		Safety Class	III to EN 60 730
		CE Conformities to	2004/108/EG EM Compatibility EMV
		CE EM Compatibility Emitted Interference	2000/EN60730-1 Emitted Interference
		CE EM 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
	Shipping & Handling	Minimum Order	1 box with 1 piece
		Packaging	Rigid Cardboards Packaging

Order Notes

Order Code

e.g. GRW9G.HG

All Information and technical data are subject to alteration

Modbus Parameters	Register	Register_Name	Register_Description_1	Register_Description_2	Attributes	Range	Default
	0	MODBUS_SERIALNUMBER_0	Serial Number 0	actual version	R	---	---
	1	MODBUS_SERIALNUMBER_1	Serial Number 1	actual version	R	---	---
	2	MODBUS_SERIALNUMBER_2	Serial Number 2	actual version	R	---	---
	3	MODBUS_SERIALNUMBER_3	Serial Number 3	actual version	R	---	---
	4	MODBUS_VERSION_SOFTWARE	Software Version	actual version	R	---	---
	5	MODBUS_PRODUCT_MODEL	Hardware Version	actual version	R	---	---
	6	MODBUS_ADDRESS	Modbus Address	Default 120, selectable 1...254	R/W	1 - 254	120
	7	MODBUS_PORTOCOL_SELECTION	Protocol	0= MODBUS RTU ;	R/W	0	0
	9	MODBUS_BAUD_MANUAL	Baud Rate	0= 9600 ; 1= 19.200 ; 2= 38.400 ; 3= 57.600 ; 4= 115.200	R/W	0 - 4	1
	10	MODBUS_STOP_BITS	Modbus stop bits	0 = 1bit, 1 = 2bits	R/W	0 - 1	0
	11	MODBUS_PARITY_BITS	Parity bits	0 = none, 1= even, 2 = odd	R/W	0 - 2	1
	12	MODBUS_DEFAULT_RESET	Factory reset	0 = updated values , update to default values 1 =	R/W	0 - 1	0
	Temperature (50-99)	Register_Name	Register_Description_1	Register_Description_2	Attributes	Range	Default
	50	MODBUS_TEMPERATURE_CALIBRATION	Temperature sensor calibration 10k) (+/-	Calibration factor (10=1k)	R/W	-100 - +100	0
	51	MODBUS_TEMPERATURE_UNIT	Deg C = 0, Deg F = 1	Temperature unit	R/W	0 - 1	0
	52	MODBUS_TEMPERATURE_MIN_RANGE	Temprature Minimum Range	SENSIRION CHIP Temperature Range	R/W	-40°C~-+135°C	---
	53	MODBUS_TEMPERATURE_MAX_RANGE	Temprature Maximum Range	SENSIRION CHIP Temperature Range	R/W	-40°C~-+135°C	---
	55	MODBUS_TEMPERATURE_VALUE	Temperature actual value	Temperature value including calibration value	R	---	---
	Humidity (100-149)	Register_Name	Register_Description_1	Register_Description_2	Attributes	Range	Default
	100	MODBUS_Rel. Humidity	Rel. Humidity actual value	Rel. Humidity actual value including calibration value	R	0~100%	---
	101	MODBUS_Dew Point Value, actual	Dew Point actual value	Dew Point actual value including calibration value	R	0~50gr/m3	---
	102	MODBUS_Enthalpy Value, actual	Enthalpy actual value	Enthalpy actual value including calibration value	R	-20°C~-+80°C	---
	103	MODBUS_Absolute Humidity, actual	Absolute Humidity actual value	Absolute Humidit value including calibration value	R	0~85kJ/kg	---
	104	MODBUS_HUMIDITY_CALIBRATION	HUMIDITY sensor calibration 10%) (+/-	Calibration factor (10=1%)	R/W	0-1000	0
	Air Quality CO2 (150-199)	Register_Name	Register_Description_1	Register_Description_2	Attributes	Range	Default
	150	MODBUS_CO2_VALUE	CO2 value	CO2 value including calibration value	R	0~5000	---
	151	MODBUS_TEMPERATURE_CALIBRATION	Temperature sensor calibration (+/-10k)	Calibration factor (10=1k)	R/W	-100 to +100	0
	152	MODBUS_CO2_MIN_Range	CO2 Minimum Range	SENSIRION CHIP CO2 Range	R/W	0~5000	---
	153	MODBUS_CO2_MAX_Range	CO2 Maximum Range	SENSIRION CHIP CO2 Range	R/W	0~5000	---
	170	MODBUS_CO2_LED/DIS_RELEASE	0= enables ; 1= disabled	LED control	R/W	0 - 1	0
	171	MODBUS_CO2_LED/DIS_Status	0= good ; 1= fair ; 2=bad (red)	LED status	R/W	0 - 2	---
	172	MODBUS_CO2_LED/DIS_GREEN_SETPOINT	max value for good	CO2 Level "Fair" On - Yellow Color enlightened / EMOJI fair	R/W	0~40.000	800
	173	MODBUS_CO2_LED/DIS_Yellow_SETPOINT	max value for fair	CO2 Level "Bad" On - Red Color enlightened / EMOJI bad	R/W	0~40.000	1400
	Air Quality VOC (200...249)	Register_Name	Register_Description_1	Register_Description_2	Attributes	Range	Default
	200	MODBUS_VOC_VALUE	VOC value	VOC value including calibration value	R	---	---
	201	MODBUS_VOC_CALIBRATION	VOC sensor calibration	Calibration factor (1=1 VOC IP)	R/W	100	0
	202	MODBUS_VOC_MIN_OUTPUT	VOC Range	SENSIRION CHIP VOC Range (VOC Index Points IP)	R/W	0~500	
	203	MODBUS_VOC_MAX_OUTPUT	VOC Range	SENSIRION CHIP VOC Range (VOC Index Points IP)	R/W	0~500	
	220	MODBUS_VOC_LED/DIS_RELEASE	0= enables ; 1= disabled	LED control	R/W	0 - 1	0
	221	MODBUS_VOC_LED/DIS_Status	0= good ; 1= fair ; 2=bad (red)	LED status	R/W	0 - 2	---
	222	MODBUS_VOC_LED/DIS_GREEN_SETPOINT	max value for good	VOC Level "Fair" On - Yellow Color enlightened / EMOJI fair	R/W	0~500	200
	223	MODBUS_VOC_LED/DIS_Yellow_SETPOINT	max value for fair	VOC Level "Bad" On - Red Color enlightened / EMOJI bad	R/W	0~500	350

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

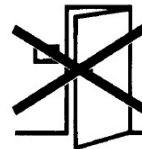
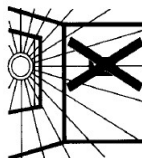
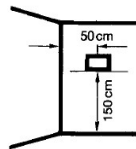
Local electrical supply authority regulations

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

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

Advices

Mounting 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.

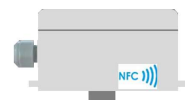
NFC Setting



All devices marked with the NFC Logo can be parameterized via the Gruner AP NFC APP.

The NFC APP is available on the Gruner AP WEBSITE.

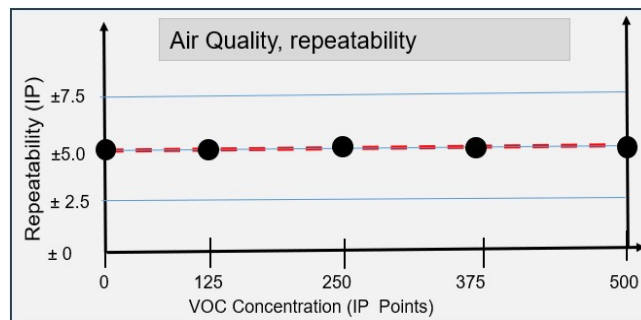
Hold your NFC capable Android phone to the NFC Logo. The installed APP will start automatically.



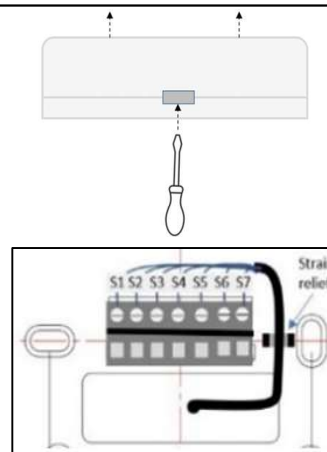
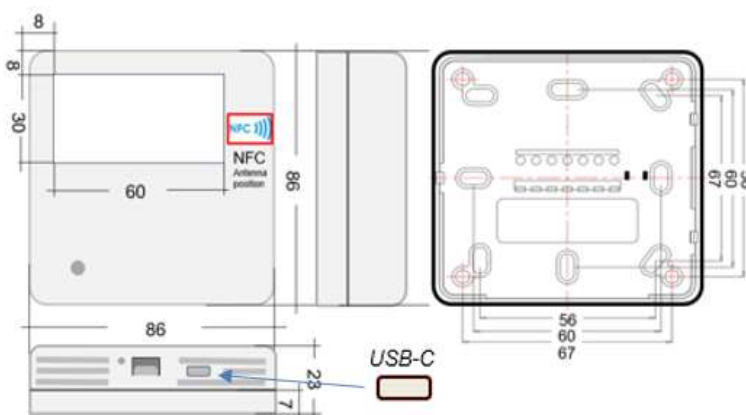
Commisioning Note

The sensor will reach its specified accuracy after 1h after powered up.

Accuracy Curves



Dimensional Drawing / Mounting



Connections & Settings

Terminal Connections						
S1	S2	S3	S4	S5	S6	S7
UB+	GND	n.a.	COM -	COM +	n.a.	n.a.

