SAirHR – Gas sensors with medium-high resolution (Rev.3 01022024)

Description and working principle

The SAirHR sensors allow the measurement of some toxic gases present in the air; they are equipped with a very sensitive element that uses an intelligent cpu with high reliability solid polymer electrochemical gas detection technology and intelligent algorithm calculation. This technology allows to obtain precise measurements in industrial environments and in outdoor environments where gas concentrations are relatively low.

The sensor simultaneously detects the single gas and the temperature and humidity of the air. Since the change in the gas state is closely related to temperature and humidity, the SAirHR sensor provides a measurement with good resolution and ensures a professional solution.

The intelligent gas sensor module also provides a self-test that evaluates sensor performance without a gas measurement.
It is therefore an excellent solution for smart home and IoT applications. Data is transmitted through the output signal, which makes it easy and convenient to identify the right time to perform maintenance and replacement.

The measurement detected by the cell is then linearized and amplified at the output as an analogue electrical signal 4… 20mA which can be interfaced with the most common dataloggers and plc available on the market. SAirHR sensors are made of stainless materials and are therefore suitable for working outdoors in critical environmental conditions. Thanks to the use of a filter and a protective screen, the negative effect of atmospheric agents and dust on the performance of the transmitter is minimized and at the same time natural air circulation is guaranteed. The assembly is very simple thanks to the supplied bracket which allows to fix the sensor on horizontal or vertical poles ø25… 43mm or on the wall.

Main applications

- ✓ Environmental analyzes
- ✓ Micro-climate
- ✓ Industrial
- ✓ Breeding farms

Benefits

- ✓ Versatility of use
- ✓ Good resolution
- ✓ Possibility of calibration on various measuring ranges

Technical data

Model	Measure	Range (other on request)	Resolution	Accuracy
SCO2- I	Carbon dioxide (CO2)	0…2.000 o 0…5.000ppm	0,5…1% f.s.	±1% fino al 25% del range di f.s. ±2% dal 26 al 50% del range di f.s. ±5% per range >50% del range di f.s.
SNO- I	Nitrogen monoxide (NO)	0…5.000ppm	0,5ppm	0,5…1% f.s.
SCH4HR-I	Methane (CH_4)	0…100ppm	50ppm	±3% f.s.
SCOHR- I	Carbon monoxide (CO)	0…10.000ppb	10ppb	±5% del fondo scala
SSO2HR-I	Sulphur dioxide (SO_2)	0…5.000ppb	10ppb	
SH2SHR-I	Sulphured hydrogen (H_2S)	0…5.000ppb	10ppb	
SNO2HR-I	Nitrogen dioxide (NO_2)	0…5.000ppb	10ppb	
SO3HR-I	Ozone (O_3)	0…5.000ppb	10ppb	
SCL2HR-I	Chlorides (Cl_2)	0…5.000ppb	10ppb	
SNH3HR-I	Ammonia (NH_3)	0…10.000ppb	10ppb	
SSMELL-I	Odorous substances *	0…5.000ppb	10ppb	

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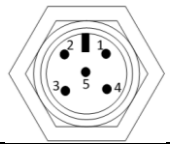
SHCHO-I	Formaldehyde (HCHO)	0…5.000ppb	10ppb	
SVOCHR-I	Volatile Organic Compounds (VOC)	0…10.000ppb	10ppb	
Output	4…20mA			
Power / consumption	9…24Vdc <0.6W			
Response time	depending on the model (tip. < 3s (T90 < 30-80s))			
Expected lifetime (maintenance)	>3 years (calibration check every 12 months)			
Time drift	<1% / month			
Working conditions	Temperature: -40…+55°C; Rel. Humidity: 15…95% (not condensing)			
Connector	IP68 plug			
Mounting	Universal bracket for fixing on horizontal or vertical pipes ø:25…42mm			
Materials	White painted and anodized aluminium, Polycarbonate			
Dimensions and weight	Sensor body: 140 x 120 x 120mm (support excluded), weight: 700g			

Accessories

Cable	Shielded for outdoor. Available lengths: 4, 12, 22m (others upon request)
Cod. CSxx (xx= meters of cable)	Sensor cable with IP68 connector (sensor side) and open wires (datalogger side)
Cod. CSDxx	Sensor- Geoves' datalogger cable with IP68 connector (sensor side) and terminal (datalogger side)

Electrical wiring

Connector IP68 on the sensor 	Pin1: Iout+ Pin2: Pin3: Pin4: Gnd Pin5: +Vdc (9…24Vdc)

Example of installation and mounting on a meteorological station

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** Smell sensor*

What kind of gas can the odor sensor (SSmell - Smell Sensor) detect?
Here are some of the main odorous gases where SSmell is used; there are various intensity levels from 1 to 5 but most detectable by the SSmell is below Lev3.

Intensity Level standard of main odor pollutants Gas

Gas			Odor intensity level(mg/m³/ppm)													
Gas	Gas Formula	Molecular weight	Lev1		Lev2		Lev2.5		Lev3		Lev3.5		Lev4		Lev5	
			mg/m³	ppm	mg/m³	ppm	mg/m³	ppm	mg/m³	ppm	mg/m³	ppm	mg/m³	ppm	mg/m³	ppm
Ammonia	NH3	17.0310	0.0697	0.1000	0.4179	0.6000	0.6965	1.0000	1.3931	2.0000	3.4826	5.0000	6.9653	10.0000	27.8611	40.0000
Hydrogen Sulfide	H2S	34.0800	0.0007	0.0005	0.0084	0.0060	0.0279	0.0200	0.0836	0.0600	0.2788	0.2000	0.9757	0.7000	4.1814	3.0000
Methyl Mercaptan	CH4S	48.1000	0.0002	0.0001	0.0014	0.0007	0.0039	0.0020	0.0079	0.0040	0.0197	0.0100	0.0590	0.0300	0.3934	0.2000
Methyl Sulfide	C2H6S	62.1300	0.0003	0.0001	0.0051	0.0020	0.0254	0.0100	0.1016	0.0400	0.5082	0.2000	2.0328	0.8000	5.0819	2.0000
Carbon disulfide	CS2	76.1400	0.0853	0.0274	1.0240	0.3288	1.0240	0.3288	2.0520	0.6590	5.1310	1.6477	10.2638	3.2961	5.1310	1.6477
Dimethyl Disulfide	C2H6S2	94.2000	0.0012	0.0003	0.0116	0.0030	0.0347	0.0090	0.1156	0.0300	0.3853	0.1000	1.1558	0.3000	11.5577	3.0000
Trimethylamine	C3H9N	59.1100	0.0002	0.0001	0.0024	0.0010	0.0121	0.0050	0.0484	0.0200	0.1692	0.0700	0.4835	0.2000	7.2524	3.0000
Styrene	C8H8	104.1500	0.1278	0.0300	1.7038	0.4000	1.7038	0.4000	3.4076	0.8000	8.5190	2.0000	17.0380	4.0000	8.5190	2.0000
Average odor value :			0.0357	0.0198	0.3968	0.1677	0.4410	0.2219	0.9012	0.4516	2.3117	1.1535	4.8717	2.4158	8.7472	6.8560

In applications for the detection of odorous gases, other gas sensors could be used such as sensors for the measurement of SO2, NO2, Cl2, TVOC, etc….
If you want to find the type of industry that smell is coming from when neighbors complain, only the SSmell can detect the total concentration of odorous gases, but it is not possible to identify the type of gas detected.
However, if you combine the SSmell measurement with a pair of anemometers it will be easy to pinpoint the source of odor pollution.

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