ADOS®
est. 1900

Instrumentation and Control

GASTRANSMITTER

GTR 210

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GASTRANSMITTER GTR 210

Application

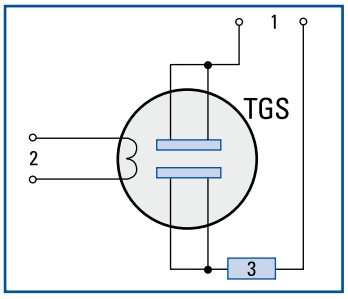
The gas transmitter ADOS GTR 210 is suitable for continuous measurement of gases in normal areas and areas where there are risks of explosion.
By employing 6 different types of sensor, noxious, explosive and non-combustible gases and vapours can be measured.
Display of the measured gas concentration and the adjustable alarm thresholds, are shown on a multi-colour graphic display. The keyboard input is by way of a touchpad.
A current signal is generated that is proportional to the measured concentration of gas, which is transmitted to an evaluation unit placed in a safe area, away from any dangers of explosion.

The type test of the explosion-protected gas transmitter, is completed by the KEMA.

KEMA test certificate: No.: KEMA
Type of protection: Ex d e ia mb IIC T4 Gb

Fields of Application

- Chemical industry
- Manufacture of paints and varnishes
- Plastic processing plants
- Sewage works
- Gas-fired boiler systems
- Liquid gas storage houses
- Laboratories
- Oxygen concentration measurement
- Refineries
- Cold-storage houses (Ammonia monitoring)
- Paint spraying booths
- and many more

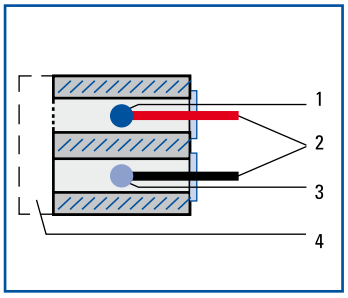


1 = Circuit voltage
2 = Heating voltage
3 = Load resistor

The TGS sensor

The TGS sensor contains a semiconductor sensor, which is constructed on SnO_2-sintered N-substrate.

When combustible or reducing gases are absorbed by the surface of the sensor, the concentration of the test gas is determined by the change in conductivity.



1 = Catalyzer pellistor
2 = Electric connections
3 = Inert pellistor
4 = Diffusion filter

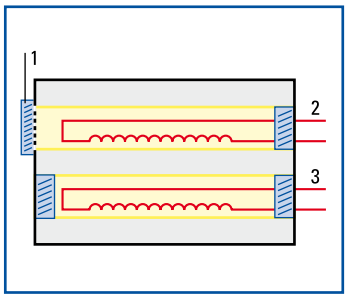
The VQ sensor

The head of the VQ sensor functions on the principle of heat reaction. When combustible or reducing gases or vapours come in contact with the measuring element, they are subjected to catalytic combustion, which causes a rise in temperature; this rise causes a change in the resistance of the measuring element which is used as a measure of the component of gas being tested.

The inert element is for compensating the temperature and conductivity of the test gas.

GASTRANSMITTER GTR 210

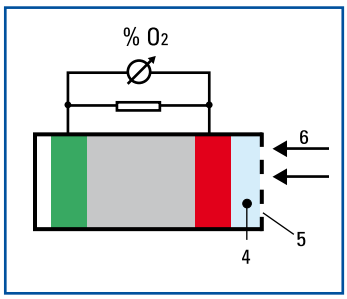
The GOW sensor



1 = Diffusion filter
2 = Test resistor
3 = Comparsion resistor

The GOW sensor functions on the principle of thermal conductivity. Two rhenium-tungsten resistors are used as a measuring element, where the comparison element is subjected to normal ambient air and the measuring element is subjected to the test gas. Any change in the concentration of gas at the measurement element, causes a change in temperature, which is due to the variation of conductivity.
The resultant change in resistance is a direct measure of the gas concentration.

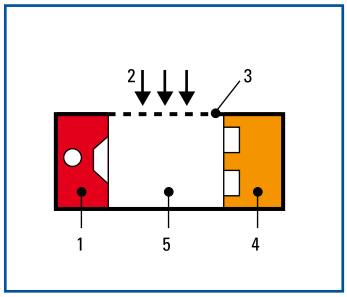
The TOX sensor



1 = Anode
2 = Electrolyte
3 = Cathode
4 = Diffusion path
5 = Diffusion filter
6 = Test gas

The TOX sensor is a measurement system with electro-chemical cell, where the sampled gas is measured by diffusion. In the case of oxygen measurement the oxygen content is in an electrolyte, thus producing a small flow of current (electro-chemical process).
At a constant air pressure, this current is directly proportional to the oxygen concentration in the sampled air.

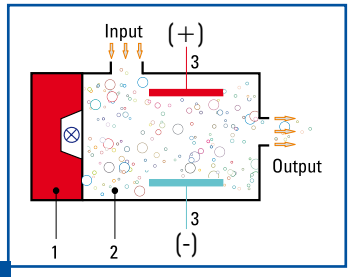
The IR sensor



1 = Infrared-radiation source
2 = Test gas
3 = Diffusion filter
4 = Infrared-detector
5 = Measurement chamber

The test gas flows through a measurement chamber that incorporates an IR radiating source and a two-channel infrared detector. The intensitiy of the infrared radiation is reduced as it passes through the gas molecules.The concentration of the gas can then be calculated by the magnitude of the reduction in intensity.
Since only absorption of the wavelength specific to the gas under test in relation to the wavelength not absorbed by a test gas is considered, interference due to dust, ageing etc., is almost compensated.

The PID sensor



1 = UV radiating source
2 = Test gas
3 = Capacitive charge measurement

The sampled gas flows through a measurement chamber, that incorporates a UV radiating source and a pair of electrodes with opposing polarity. The gas molecules to be detected are ionized by the UV radiation.
The resulting positively charged molecules and the electrons are attracted to the relevant electrode. The current generated is a measure of the gas concentration.
Using the PID measuring head, volatile organic compounds (VOC) can be measured, the ionisation potential of which is less than the energy in the UV radiating source (10,6 eV), e.g. aromatic hydrocarbons like toluol (C_7H_8) and xylene (C_8H_{10}) as well as chlorinated hydrocarbons like trichloroethylene ($CHCl_3$). The detection of toxic gases like phosphine (PH_3) is also possible.

The output signal of each sensor is connected to the central unit via a multicore cable for further processing. All sensors are plug-in types and thus are easily replaceable.

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ADOS est. 1900

Technical Data – gas sensors

Type	TGS	VQ	GOW	TOX	IR	PID
Measurement method	Semiconductor	Heat reduction	Thermal conductivity	Electro-chemical reaction	Infrared	Photo-Ionisation
Measurement range	ppm ranges to 100 % LEL	ppm ranges to 100 % LEL	from 0–5 Vol % to 0–100 Vol %	ppm ranges to 0–100 Vol %	0-100 % LEL CH_4, C_3H_8, C_2H_2 0-100 Vol % CH_4 0–1, 2, 3, 4, 5 Vol % CO_2	0 – 200 ppm to 0 – 2.000 ppm
Percentage error of f.s.d.	± 5 %	± 5 %	± 5 %	± 3 %	± 3 %	± 5 %
Temperature range	-13 °F to +131 °F	-13 °F to +131 °F	-13 °F to +131 °F	-13 °F to +131 °F	-13 °F to +131 °F	-13 °F to +131 °F
Temperature effect	5 %	2 %	2 %	2 %	2 %	2 %
Response time (t_{90})	approx. 20 s	approx. 20 s	approx. 40 s	< 60 s	< 30 s	approx. 60 s
Pressure effect	1 %	1 %	1 %	1 %	1 %	1 %
Mounting position	optional	optional	optional	optional	optional	optional
Application	Poisonous, combustible and explosive gases in the LEL region	Poisonous, combustible and explosive gases in the LEL region	gases exhibiting substantial differences in thermal conductivity, compared to air	O_2, CO, NH_3, NO_2, SO_2, H_2S and others	CH_4 (Vol %; LEL) Propan (LEL) CO_2 (Vol %)	e.g. C_7H_8, C_8H_{10} $CHCl_3$, PH_3
Versions available	industrial (Al), industrial (VA)- and Ex-version	industrial (Al), industrial (VA)- and Ex-version	industrial (Al), industrial (VA)- and Ex-version	industrial (Al), industrial (VA)- and Ex-version	industrial (Al), industrial (VA)- and Ex-version	industrial (Al), industrial (VA)- and Ex-version
Expected lifetime of the sensor	unlimited, when used for gases not causing catalytic poisoning	unlimited, when used for gases not causing catalytic poisoning	unlimited, when used with gases that do not attack aluminium, rhenium-tungsten or gold	12 months to 5 years depending on the measuring cell	approx. 5 years	12 months
Dimensions (W x H x D)	5.9 x 6.89 x 4.13 inch	5.9 x 6.89 x 4.13 inch	5.9 x 6.89 x 4.13 inch	5.9 x 6.89 x 4.13 inch 5.9 x 7.87 x 4.13 inch (O_2)	5.9 x 6.89 x 4.13 inch	5.9 x 6.89 x 4.13 inch

Technical data – gas transmitter

Type	GTR 210 Ex-Version	GTR 210 Standard	GTR 210 Comfort
Supply voltage	24 V DC +10 % / -25 %	24 V DC +10 % / -25 %	115 V AC, 60 Hz 230 V AC, 50 Hz (optional)
Power consumption:	4 W	4 W	10 VA
Interface	3-wire techniques 4 – 20 mA	3-wire techniques 4 – 20 mA	1 current output 4 – 20 mA 4 potential-free changeover contact for alarm/failure 1 digital input for cancelling alarms
Type of protection	II 2G Ex d e ia mb IIC T4 Gb KEMA	none	none
Protection class	IP 54	IP 54	IP 54
Weight	5.95 lbs	5.95 lbs	5.95 lbs

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