

GAOS SENSON Smart Gas Analysis Systems















Ostec Instruments produces and offers hi-tech innovative scientific and analytical equipment.

Our mission is to be a company that finds, selects, protects and develops cutting-edge ideas to create new products and technologies and deliver technological progress. That is why the symbol of our company is a growing sprout.

We provide complete solutions for our clients: the best equipment to meet customer's requirements, deep knowledge of customer's applications, qualified and reliable maintenance support.



OUR other products:

				
IROS FTIR Spectroscopy	RAMOS Confocal Raman Microscopes	SEOS 02 optical emission spectrometer	NIOS Nanomechanical Testers	FIPOS ATR fiber probes
				
AVOS vibration control solutions	LIOS 500N laser elemental analyzer	Accessories for Scanning Probe Microscopy	IROS P series Industrial FTIR Spectrometers	OMOS M series Analytical Metallographic Systems

About Company

The main goal of the company is to meet the demand for modern, reliable industrial gas analysis equipment and systems. We offer a wide range of solutions - stationary, portable multi-gas and individual gas analysis systems, network equipment, auxiliary products and accessories for construction of gas analysis networks. Our solutions are designed for continuous monitoring of air in work and residential areas, as well as process media. Besides series products listed in the catalog, we are ready to develop and deliver system solutions and products tailored to the specific requirements of the customer.

While introducing a new line of gas analysis equipment to the market, we offer a fundamentally new concept of gas analysis systems based on replaceable modular gas analyzers GAOS SENSON-SM-9001. This is the main, but not the only innovation of the company. Our portfolio is constantly updated with new solutions, track the news!

GAOS SENSON Analysis Systems New concept of gas analysis equipment design

For a start - a small digression. All electric lighting devices consist of two main elements - the lamp and the luminaire itself. Modern electric lamps are very diverse devices. They are based on various physical principles (incandescent, gas-discharge, LED, etc.). They have different electrical parameters (power, voltage).

They can be implemented in various form factors, vary in size, color, etc. They are produced by many manufacturers. It is a lamp which provides the main function of lighting devices - to shine. But in order for the lamp to glow, it must be installed in an electric lighting device - a chandelier, a ceiling lamp, a lantern, etc. Lamps need to be changed periodically. However, it does not occur to anyone to change the lighting device entirely.

After all, a chandelier is much more expensive than a light bulb, and changing it requires certain qualifications and special technical measures (for example, de-energizing the connection point). But any housewife can replace a blown bulb. Why? The answer

is simple - all electric lamps and electric devices have a unified, standard connection interface (nominal supply voltage, type of base/cartridge, etc.). Not just standard, but also specially designed for easy lamp change. What is this lyrical digression for?

Stationary gas analyzers are somewhat reminiscent of lighting devices. They are represented by a variety of models from different manufacturers. Virtually any of these devices is built according to a general principle and consists of three main components:

- gas sensitive element (primary converter of gas concentration into electrical signal);
- secondary signal converter from a gas sensitive element to the unified electrical signal (digital or analog);
- module of indication, alarm, control of external devices, etc.

In many cases, third-party sensors are used as sensitive elements. The physical principle of operation of such elements can be very different - electrochemical, thermal catalytic, photoionization, optical, semiconductor, thermal conductometric and other types of detectors are produced. A number of foreign and domestic companies specialize in such sensors, producing them as mass electronic components.

The problem is that each of the gas analyzers on the market is a complete measurement tool. It is subject to periodic calibration, which means disassembly / assembly, availability of a replacement stock for the period of calibration, and highly qualified personnel for work on gas monitoring networks.

Often, such work involves de-energizing of facilities, which means even if temporary, but the termination of the main technological processes at the facility. As a result, maintenance costs can significantly exceed the cost of the gas analyzers themselves, especially at geographically remote and autonomous facilities.

And of course, having once purchased a device, for example, for methane analysis, it cannot be used to measure ammonia concentration. We changed the concept, creating a wide range of compact gas analyzers GAOS SENSON-SM-9001 and gas analysis systems based on them.

New concept

- simplifies the replacement of gas analyzers for calibration and in the event of a malfunction - in the case of GAOS SENSON it is as simple as changing a light bulb, no need to dismantle / change the entire device. That is, it is enough to change a light bulb, not a chandelier;
- it dramatically reduces the stock of replacement systems in volume and cost - only the GAOS SENSON-SM-9001 modules are needed (supply of light bulbs, not chandeliers);
- requirements for the qualification of staff (there is only one requirement - accuracy) are reduced.

GAOS SENSON-SM-9001 gas analyzer

The metrological characteristics of stationary gas analyzers are almost completely determined by the gas sensitive element with an electronic control module. Each type of gas sensitive elements requires its own control and processing algorithms; individual calibration is required for each individual sensor. By

combining the sensor with the secondary processing module into a single structural unit, we received an intelligent sensor module (ISM) (Fig. 1). It stores calibration and other factory constants, and also supports an open, unified digital interface for connecting to external devices.

Since all the metrological significant elements are concentrated in the ISM, and there are enough standard power supply and data transmission interfaces to work with it, this module is a complete gas analyzer - GAOS SENSON-SM-9001, to which the type of measuring tool is assigned.

Indeed, the operation of GAOS SENSON-SM-9001 requires only external power supply and any device supporting the serial port 11ABT, i.e. any personal computer or industrial controller (Fig. 2). No specialized software is required; any terminal program (for example, the one supplied with Windows) is enough. As a matter of principle, ONLY GAOS SENSON-SM-9001 is subject to periodic "checking and replacing".

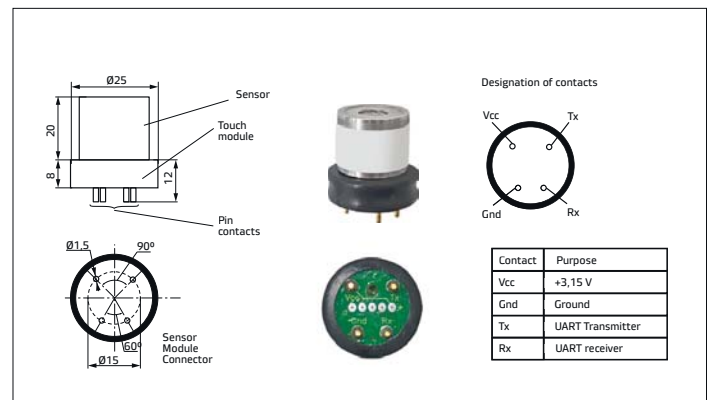


Fig.1. Gas analyzer GAOS SENSON-SM-9001

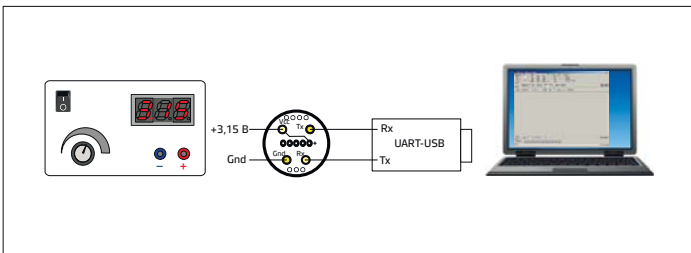


Fig.2. Connection diagram for the gas analyzer GAOS SENSON-SM-9001

Gas analysis systems based on gas analyzers GAOS SENSON-SM-9001

GAOS SENSON-SM-9001 fundamentally changes the approach to design and operation of gas analyzers, while maintaining outward similarity with traditional solutions. This is possible due to the functional separation of a small built-in measuring module (gas analyzer) and all other elements of the device (gas analysis system).

For ease of use of gas analyzers GAOS SENSON-SM-9001 a number of sets of auxiliary equipment has been developed (Table 1). Together with the gas analyzer GAOS SENSON-SM-9001 they form gas analysis systems. As part of these systems, the GAOS SENSON-SM-9001 gas analyzer is referred to as a smart sensor module. We emphasize that only the ISM is the measurement tool, it is this module that is subject to periodic calibration. That's why, during this procedure, it is not necessary to dismantle the rest of the gas analysis system equipment.

Auxiliary equipment of gas analysis systems is made in an explosion-proof version of the type "flameproof shell" or "intrinsically safe circuit" of the ia level. It has Ex-marking 1 Ex d IIC T6 (flameproof enclosure) or 1 Ex ia IIC T4 X (intrinsically safe circuit). The rated voltage of the power supply is 24 V DC, the allowable range is 18-27 V. The degree of protection of the enclosure against external influences is IP 66 according to GOST 14254-2015 (IEC 60529:2013). We offer a range of options for gas analysis systems, allowing you to choose the configuration that most closely matches the features and operating

conditions. All gas analysis systems are grouped into two series: SD and SV (GAOS SENSON-SD-xxxx-SM and GAOS SENSON-SV-xxxx-SM) (Table 1).

The SD series includes the basic models of systems ("sensors"). It includes modules providing ISM connection, power supply and data exchange with external devices via the Current Loop 4-20 mA and RS-485 channels (protocol MODBUS RTU). However, the gas analysis systems of this series do not have the means to display and control external devices. The SV series is a functional extension of the SD series. Each unit of the SD series corresponds to the gas analysis system of the SV series. SV systems have the capabilities to indicate the measured concentration, signaling that thresholds are exceeded, a built-in keyboard for adjustment, and controls for external equipment.

Each of the series contains three groups of devices, differing only in the design options, and, accordingly, restrictions on the operating conditions. The systems of group 1 - GAOS SENSON-SD-7031-SM and GAOS SENSON-SV-5021-SM, respectively are the most resistant to external influences. The modules of these systems are made in explosion-proof enclosures (stainless steel and aluminum alloy) of the type "flameproof enclosure" and with an allowable operating temperature range -60 to +50 °C.

Systems of group 2 - GAOS SENSON-SD-7033-SM and GAOS SENSON-SV-5023-SM - are made in an aluminum alloy casing. They have an intrinsically safe "ia" type of explosion protection and can be operated at temperatures -40 to +50 °C.

Table 1. GAOS SENSON Gas Analysis Systems

Group	Special features	GAOS SENSON-SD series	GAOS SENSON-SV series
1	Housing: Stainless steel, aluminum alloy Ex marking: 1Ex d IIC T6 (option - PB Ex d I Mb X and 1Ex d IIC T6 Gb X) Temperature range: -60...50 °C	 SD-7031-SM SD-PBExd	 SV-5021-SM (6 versions)
2	Housing: aluminum alloy Ex marking: 1Ex ia IIC T4 X Temperature range: -40...50 °C	 SD-7033-SM	 SV-5023-SM
3	Housing: Polycarbonate Ex marking: 1Ex ia IIC T4 X Temperature range: -30...50 °C	 SD-7032-SM	 SV-5022-SM

Systems of group 3 - GAOS SENSON-SD-7032-SM and GAOS SENSON-SV-5022-SM - are produced in plastic cases. They also have an intrinsically safe "ia" type of explosion protection and can be operated at temperatures -30 to +50 °C.

Of course, gas analysis systems have other minor differences related to the peculiarities of their design and purpose (Table 2). More specialized gas analyzers

are created on the basis of Gas Analysis Systems. For example, the GAOS SENSON-SV-5024 gas analyzer for analyzing oxygen or carbon monoxide concentrations is intended for indoor use in explosion-proof areas.

On the contrary, the mine version of the gas analyzer GAOS SENSON-SV-PBExd is designed to work in underground mines, mines and land-based buildings, it has the Ex marking PB Ex d I Mb X and 1Ex d IIC T6 Gb X.

Table 2. Main features of GAOS SENSON Gas Analysis Systems

GAOS SENSON Model Name	Auxiliary equipment (modules)	Housing material	Type of explosion protection	Temperature range, °C	Indicator and keyboard	Interfaces		Relay	Sound alarm
						Current loop 4-20 mA	RS-485		
SENSON-SD-7031-SM	MKT-1m	Stainless steel	d-shell	-60...50	Absent	Present	Present	Absent	Absent
SENSON-SD-7032-SM	MKT-1p	Plastic	Intrinsically safe circuit 1a	-30...50	Absent	Present	Present	Absent	Absent
SENSON-SD-7033-SM	MKT-2m	Aluminium alloy	Intrinsically safe circuit 1a	-40...50	Absent	Present	Present	Absent	Absent
SENSON-SV-5021-SM	MKT-1m, MKIUS	Stainless steel, aluminum alloy	d-shell	-60...50	Present	Present	Present	Present	Possible connection
SENSON-SV-5022-SM	MKTI-1p	Plastic	Intrinsically safe circuit 1a	-30...50	Present	Present	Absent	Present	Present
SENSON-SV-5023-SM	MKTI-1m	Aluminium alloy	Intrinsically safe circuit 1a	-40...50	Present	Present	Present	Present	Present

* Not in all versions of GAOS SENSON-SV-5021-SM

GAOS SENSON-SD series

The system GAOS SENSON-SD-7031-SM is a switching and broadcasting module MKT-1m in a cylindrical stainless steel case with an easily removable cover (Fig. 3). The gas analyzer GAOS SENSON SM-9001 is installed under the cover.

The system GAOS SENSON-SD-7032-SM is made in a plastic case. ISM is connected to the MKT-1p module (Fig. 4). Connection of ISM is provided by a special connector, covered with a protective cover.

The GAOS SENSON-SD-7033 system has a metal case with two cable entries and the sound alarm system. ISM is connected similarly to model 7032.

GAOS SENSON-SV series

The systems of the GAOS SENSON-SV series have more capabilities than those of the GAOS SENSON-SD series in terms of autonomous use. As a rule, all models of this series have a digital indication system, a keyboard for adjustment, actuating relays, and sound alarm systems.

- Group of systems GAOS SENSON-SV-5021-SM Auxiliary equipment of this group is made in the form of two blocks;
- MKT-1m module with ISM installed in it;
- module of switching, indication, control and interfacing of MKIUS.

All systems of the GAOS SENSON-SV-5021-SM series have an interface "current loop 4-20 mA". Type of explosion protection - "flameproof enclosure".

The systems of the GAOS SENSON-SV-5021 series are divided into two main groups: relay systems and network systems. Network systems (versions 5021-03 and -13) support the RS-485 digital interface, but do not have actuating relays. Relay systems (5021, 5021-02, -10 and -12), on the contrary, are equipped with actuating relays, the connector for connection to the RS-485 channel is not provided.

The MKT-1m module can either be directly screwed into the MKIUS unit, or connected to it with a 1.8 m cable (can be changed upon special order). Versions without indication and the keyboard are also possible (for example, for decrease in energy consumption).

Gas analysis systems GAOS SENSON-SV-5022-SM and GAOS SENSON-SV-5023-SM are made in plastic and metal housings, respectively. Both systems have intrinsic safety type 1a explosion protection, a digital indicator and keyboard, three executive relays and a built-in sound alarm, as well as the Current loop 4-20 mA interface. The GAOS SENSON-SV-5023-SM system additionally supports the RS-485 digital interface, that is, it can operate both independently and as part of a network.

Process versions

Gas analysis systems can be produced in process versions. In this case, the protective cap with a grid for diffusion sampling is replaced by a cap with nozzles for the forced supply of samples. Such devices include GAOS SENSON-SD-7031-01-SM, SENSON-SD-7033-01-SM, SENSON-SV-5023-01-SM.

Replacement of gas analyzers GAOS SENSON-SM-9001 as part of the GAOS SENSON systems

To connect the ISM to the GAOS SENSON gas analysis system (for initial installation or for replacement), simply unscrew the protective cover and insert the GAOS SENSON-SM-9001 gas analyzer into the connector. Its design eliminates the possibility of improper installation. ISM is installed under the protective cover (Fig.3 and 4).

At the same time, an extremely simple change of ISM is provided, without need for any special tools. For modules with an intrinsic safety type of protection, it is possible to change the ISM without disconnecting the power supply ("hot swapping").

Network equipment for GAOS SENSON Gas Analysis Systems

GAOS SENSON Gas Analysis Systems are equipped with two data transmission channels - analog "current loop 4-20 mA" and digital RS-485 with MODBUS RTU protocol. Optionally, it is possible to support the data transmission protocol of the AVUS-SKZ system (Avangard). To connect devices via an analog channel, we offer a line of analog signal controllers as part of the GAOS SENSON-K-1M, SENSON-K-4M and SENSON-K-8M devices. They allow receiving the measured concentration values from 1, 4 and 8 gas analyzers, respectively. The

controllers are equipped with digital indicators, means of sound alarm of threshold values exceeding, as well as the ability to control external devices (relays).

All Senson gas analysis systems with an intrinsic safety circuit of protection must be connected through spark protection barriers. In particular, we recommend using the barriers BI-Exia-xxx-24 specially designed for these systems.

Gas Analyzer or Gas Analysis System?

Gas analyzing systems based on gas analyzers GAOS SENSON-SM-9001 have a number of indisputable advantages compared to traditional gas analyzers. However, if for some reason it is preferable to purchase not a modular system, but a single device, there is no problem.

The scope of all Senson certificates covers both gas analyzers GAOS SENSON-SM-9001 and complete gas analyzers GAOS SENSON, in which "SENSON-SM-9001" are considered as smart sensor modules.

Each product can be supplied both as a gas analyzer and as a gas analysis system - for example, the GAOS SENSON-SV-5021 gas analyzer or the GAOS SENSON-SV-5021-SM gas analysis system. Regarding the hardware, it will be the same device. The only difference is that in the first case, the entire device is subject to verification and replacement, and in the second case, only the GAOS SENSON-SM-9001 gas analyzer module is subject to verification and replacement.



Fig.3. Removing the ISM from the GAOS 5-SD-7031-SM housing

In terms of designations, the gas analysis system differs from a gas analyzer completely similar to it only by adding the SM suffix after the model name. By removing this suffix when ordering, you will receive

a gas analyzer with the appropriate accompanying documentation. However, before choosing a traditional device, once again analyze the advantages of the Senson gas analysis systems!

Advantages of gas analysis systems based on GAOS SENSON-SM-9001

1. Operating costs. Only GAOS SENSON-SM-9001 is subject to periodic verification. To replace it, simply unscrew the protective cover and simply remove the ISM from the connector. You can immediately insert another one in its place, tighten the cover (just by hand) - and the device is again ready for operation. The cost of the ISM replacement stock and the cost of replacing them are incomparable with similar costs in the case of traditional gas analyzers. Thus, the concept of ISM dramatically reduces the cost of ownership of the instrument stock of gas analyzers, due to:
 - radical reduction of time spent on dismantling equipment for calibration and repair;
 - reducing the cost of stock replacement equipment;
 - increasing the autonomous operational resource of remote objects, including onboard-based.
2. Optimization of the price and selection of gas sensitive elements. GAOS SENSON-SM-9001 opens up broad opportunities for the unification of equipment, and therefore - to reduce its price. The design of gas analysis systems based on GAOS SENSON-SM-9001 allows the use of sensors from virtually any manufacturer, domestic and foreign, subject to the execution in standard types of enclosures. The device (for example, the GAOS SENSON-SV-5021 gas analysis system) is in no way limited to a specific type of gas being analyzed. This allows to optimally choose the type of gas-sensitive item depending on the customer's task. For example, for analyzing the concentration of methane, depending on customer requirements, it is possible to propose optical, thermal catalytic, semiconductor gas sensitive elements of various manufacturers.

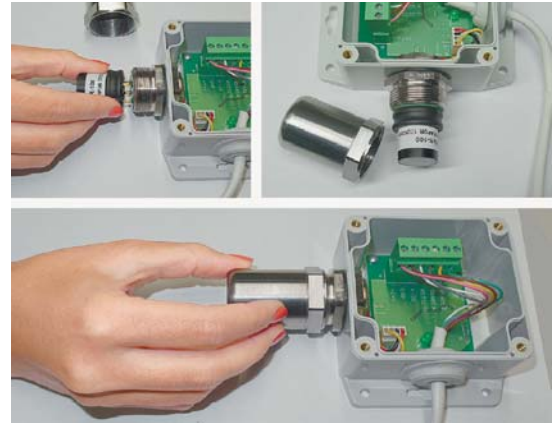


Fig.4. Installation of ISM

3. Flexibility. If you need to change the type of target gas, using the traditional approach, you must purchase and install a new device. In contrast, in GAOS SENSON gas analysis systems, the target gas is changed by simply changing the GAOS SENSON-SM-9001 module. For example, if for any reason, instead of CO_2 , it is necessary to control O_2 , it is enough to purchase only a new ISM GAOS SENSON-SM-9001 for oxygen, and a new data sheet will be attached to it. On the other hand, it is even possible to change the type of structural design of the gas analysis system (d-Shell or intrinsically safe circuit, plastic or metal housing), since the measurement tool is only GAOS SENSON-SM-9001.
4. Estimated delivery time. Since only the GAOS SENSON-SM-90011 module is subject to state calibration and verification,

taking into account the modular construction of the instruments, the order schedules are significantly reduced. While the GAOS SENSON-SM-9001 is being tested, the remaining elements of the gas analysis system are being prepared.

5. Fulfillment of special requirements. In case of special requirements of the customer (non-standard method of sampling, installation specifics, etc.), a new type of measuring instrument is not required to be approved for the new device (the latter can last a year or more). Since only the GAOS SENSON-SM-90011 detector is a measuring instrument in such system, no additional metrological certification is required.

Are you tired of changing chandeliers instead of light bulbs?

GAOS SENSON Gas Analysis Systems - stationary, portable and individual - allow you to determine the

concentration of a wide number of gases in different ranges (Table 3).

Table 3. Gases detected by Senson gas analysis systems

Measurable component	Range of measurements	Limits of the main relative error, %	Stationary	Portable	Individual	Order Code (C)
Nitrogen Dioxide (NO ₂)	0,1–30 mg/m ³	±15	Yes	Yes	Yes	NO2-2
Nitrogen oxide (NO)	0,1–30 mg/m ³	±15	Yes	Yes	Yes	NO-2
Ammonia (NH ₃)	0,1–200 mg/m ³	±15	Yes	Yes	Yes	NH3-2
Hydrogen (H ₂)	0,01–4 vol. %	±10	Yes	Yes	Yes	H2-2
	1–100 vol. %	±5	Yes*	Yes*	Yes*	H2-3
Hydrogen chloride (HCl)	0,1–30 mg/m ³	±25	Yes	Yes	Yes	HCl-1
Helium (He)	1–100 vol. %	±20	Yes	Yes	Absent	He-1
Oxygen (O ₂)	0,1–30 vol. %	±5	Yes	Yes	Yes	O2-2
	1–100 vol. %	±1	Yes	Yes*	Yes*	O2-3
Methane (CH ₄)	0,001–1 vol. %	±10	Yes	Absent	Absent	CH4-1
	0,01–5 vol. %	±10	Yes	Yes	Yes	CH4-2
Methanol (CH ₃ OH)	1–100 vol. %	±5	Yes	Yes*	Yes*	CH4-3
	0,1–30 mg/m ³	±20	Yes	Yes	Yes	CH3OH-1
Propane (C ₃ H ₈)	0,001–2 vol. %	±10	Yes	Yes	Yes	C3H8-1
Hydrogen Sulfide (H ₂ S)	0,1–30 mg/m ³	±10	Yes	Yes	Yes	H2S-2
Sulfur dioxide (SO ₂)	0,1–30 mg/m ³	±10	Yes	Yes	Yes	SO2-2
Hydrocarbons (C ₂ –C ₁₀)	50–3000 mg/m ³	±25	Yes	Absent	Yes	CH-1
	0,05–1 vol. %	±10	Yes	Yes	Yes	CH-2
Carbon dioxide (CO ₂)	100–2000 mg/m ³	±20	Yes	Absent	Absent	CO2-1
	0,01–5 vol. %	±15	Yes	Yes	Yes	CO2-2
Carbon oxide (CO)	1–100 vol. %	±10	Yes	Yes*	Yes*	CO2-3
	0,1–30 mg/m ³	±10	Yes	Yes	Yes	CO-2
Formaldehyde (H ₂ CO)	0,1–30 mg/m ³	±25	Yes	Yes	Yes	H2CO-1
Chlorine (Cl ₂)	0,1–30 mg/m ³	±10	Yes	Yes	Yes	Cl2-2
Ethanol (C ₂ H ₅ OH)	50–5000 mg/m ³	±25	Yes	Yes	Yes	C2H5OH-1
	0,01–3 vol. %	±15	Yes	Yes	Yes	C2H5OH-2

* - only in the process version

1. Pattern approval certificate RU.C.31.004.A no. 69448. Valid until March 28, 2023
2. Certificates of compliance with the requirements of the technical regulations of the Customs Union TR CU 012/2011 "On the safety of equipment for work in explosive atmospheres" for Senson gas analyzers. Valid until 09/21/2022.
3. Certificates of compliance with the requirements of the technical regulations of the Customs Union TR CU 012/2011 "On the safety of equipment for work in explosive atmospheres" for Senson-PBExd gas analyzers. Valid until December 18, 2022.
4. Certificate of compliance with the requirements of GOST 12.2.091-2012 (IEC 61010-1:2001 and GOST R IEC 61326-1-2014. GOST R certification system Valid until 9/12/2020.
5. Declaration of Conformity of the Technical Regulations of the Customs Union TR CU 020/2011 "Electromagnetic Compatibility of Technical Means". Valid until 9/12/2022.
6. Certificate of quality management system compliance with the requirements of GOST R ISO 9001-2015 (ISO 9001:2015). Valid until 6/14/2020.
7. Certificate of type approval by the Russian Maritime Register of Shipping.
8. Certificate of Recognition of type approval of measuring instruments in the Republic of Kazakhstan.
9. Certificate of type approval of measuring instruments in the Republic of Belarus.





GAOS SENSON-SD-7031

Gas Analysis System GAOS SENSON-SD-7031-SM is a stationary singlechannel device for continuous monitoring of gas concentration in the working area. It provides a high level of emergency protection in areas where it is possible to exceed the concentration of combustible and toxic substances, as well as the excess / decrease in oxygen concentration.

The system is designed for operation in particularly harsh conditions in terms of climatic, mechanical and corrosive effects. The design eliminates access to the control electronics, and at the same time provides the ease of changing the smart sensor module GAOS SENSON-SM-9001.

Special features

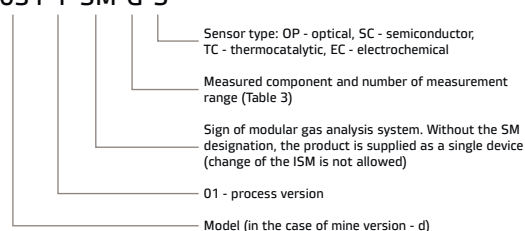
- stainless steel case, impact resistant, corrosion-resistant;
- internal volume (except for the GAOS SENSON-SM-9001 compartment) is filled with compound;
- possible mine explosion-proof design (PB Ex dI Mb X);
- temperature range - from -60 to + 50 °C;
- interfaces: analog - "Current loop 4-20 mA", digital - RS-485 (MODBUS RTU)
- the design eliminates the possibility of unintended effects on the measuring blocks during installation of the device and connection of electrical cables;
- integration with the module of indication and control of external devices MKIUS is possible;
- installation is possible both with the help of the bracket, and by means of screwing into the MKIUS-01 junction box;
- equipped with a cable with a working length of 1.8 m.

Versions

Model	Special features
GAOS SENSON-SD-7031-SM	with diffusion sampling (standard version)
GAOS SENSON-SD-7031-01-SM	with forced sampling (process version, supplied with unions for the filing and removal of the sample)
GAOS SENSON-SD-PBExd	mine version

Identification at order

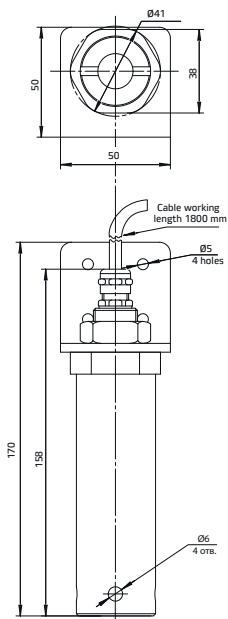
SENSON-SD-7031-Y-SM-G-S



Specifications

Type of measuring device	Gas Analyzer Sensor
Housing materials	Stainless steel
Explosion protection marking: <ul style="list-style-type: none"> • standard version • mine version 	1Ex d IIC T6 Gb X PB Ex d I Mb X / 1Ex d IIC T6 Gb X
The degree of protection of the housing against external influences according to GOST 14254-2015 (IEC 60529: 2013)	IP66
Ambient temperature	-60...+50°C
Relative humidity	Up to 95%, non-condensing
Pressure	84 to 120 kPa
Dimensions, max	50 x 50 x 170 mm
Weight, max	800 g
Power supply voltage: <ul style="list-style-type: none"> • nominal • range • electric power consumption, max 	24 V DC 18-27 V DC 1.3 W
Output signals: <ul style="list-style-type: none"> • analog • digital 	Current loop 4-20 mA RS-485, MODBUS RTU protocol
Types of sensors	Optical, semiconductor, thermocatalytic, electrochemical, thermoconductometric
Average sensor life	Up to 3 years
Average sensor life	10 years

Dimensional drawing



Wiring diagram

GAOS SENSON-SD-7031
Electrical Connection Diagram

MKT-1m module		
Circuit	Wire color*	
+24V	Pink	Power cable 24 V
GND	Brown	
4-20	White	To 4-20 mA receiver
RS232TX	Gray	To MKIUS module (if required)
RS485 A	Yellow	Busbar RS-485
RS485 B	Green	

*Color may be different, it is listed in the data sheet and in the tag on the cable

Scope of delivery

1. Gas analyzer GAOS SENSON-SM-9001
2. MKT-1m module
3. Bracket, mounting nut, washer, grounding ring
4. Data Sheet
5. Manual
6. Packaging

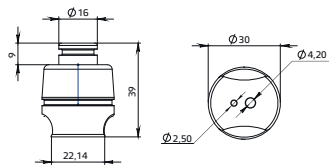
Auxiliary equipment

- Power supply 24 V 1.4 or 0.6 A, per DIN-rail
- Air filters (set, 5 pcs.)
- RS-485-USB interface converter for communication with a PC
- UART-USB interface converter for communication with a PC
- PC-01 programming console
- Protective visor
- Intrinsic safety barrier BI-Exia-130-24

Additional accessories

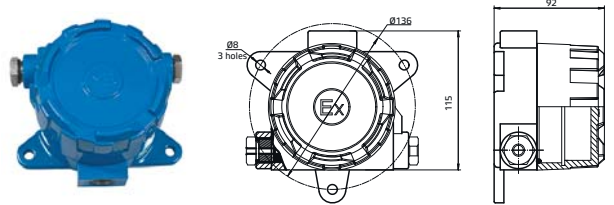
Calibration adapter

Serves for supplying calibration gas mixtures during calibration, verification and testing of gas analyzers.



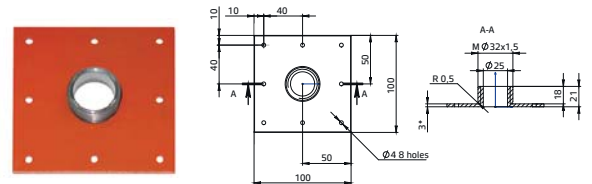
Switching box MKIUS-01

It is used to switch the device to external networks in a hazardous area. Allows you to both screw the GAOS SENSON-SD-7031 directly into the housing of the junction box, and connect it through the cable gland. Exmarking: 1E d IIC T6 Gb X.



Flange for mounting to ventilation ducts

Required to connect the GAOS SENSON-SD-7031 to the ventilation ducts and similar structures.



Air filter set

Air filters are designed to protect the device from the effects of fine particles when operating in dusty conditions. It is not necessary to remove the protective cover and turn off the device for installation/replacement.





GAOS SENSON-SV-5021

Gas Analytical System GAOS SENSON-SV-5021-SM is a stationary single-channel device for continuous monitoring of gas concentration in the working area. The system is designed for operation in particularly harsh conditions in terms of climatic, mechanical and corrosive effects.

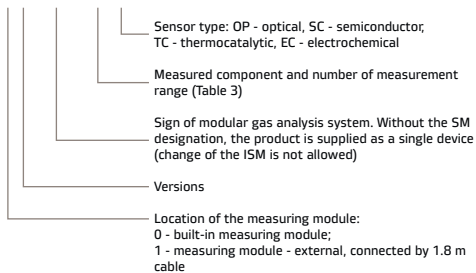
Depending on the task, several system configurations are possible - with and without an indicator, with a built-in or remote measurement module. The device is equipped with light indication, built-in system of control and setting the threshold values, controls for external devices.

Special features

- stainless steel and aluminum alloy housing, impact resistant, corrosion-resistant;
- explosion-proof type "flameproof enclosure";
- temperature range - from -60 to + 50 °C;
- interfaces: analog - "Current loop 4-20 mA", digital - RS-485 (MODBUS RTU)
- flexible system layout, the measurement module can be integrated and remote with a 1.8 m cable
- target gas concentration indicator;
- power and fault LEDs;
- LED indicators for exceeding gas thresholds;
- three electronic keys for controlling external devices that are triggered when the specified concentration thresholds are exceeded, as well as when the sensor fails and in the absence of power supply;
- possibility to connect a sound alarm device.

Identification at order

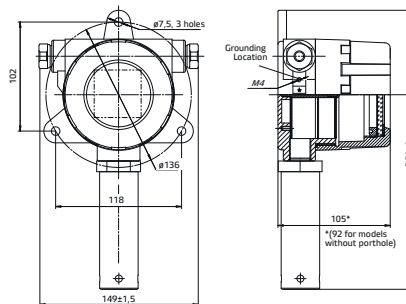
SENSON-SV-5021-XY-SM-G-S



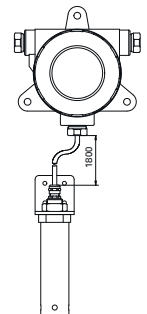
Versions

Model	Description	Order Code (Y)
SENSON-SV-5021 (relay)	Gas analyzer with indicator; electronic keys "dry contact". Transmission of information on the "Current loop 4-20 mA" interface. The measuring module is integrated in the device.	Absent
SENSON-SV-5021-02 (relay, without indicator)	Gas analyzer without indicator, with electronic keys "dry contact". Transmission of information on the "Current loop 4-20 mA" interface. The measuring module is integrated in the device.	2
SENSON-SV-5021-03 (network)	Gas analyzer with indicator. Transmission of information on the interface "Current loop 4-20 mA" and RS-485 (MODBUS RTU). The measuring module is integrated in the device.	3
SENSON-SV-5021-10 (relay)	Gas analyzer with indicator; electronic keys "dry contact". Transmission of information on the "Current loop 4-20 mA" interface. Measuring module - remote (cable, 1.8 m)	1
SENSON-SV-5021-12 (relay, without indicator)	Gas analyzer without indicator, with electronic keys "dry contact". Transmission of information on the "Current loop 4-20 mA" interface. Measuring module - remote (cable, 1.8 m)	2
SENSON-SV-5021-13 (network)	Gas analyzer with indicator. Transmission of information on the interface "Current loop 4-20 mA" and RS-485 (MODBUS RTU). Measuring module - remote (cable, 1.8 m)	3

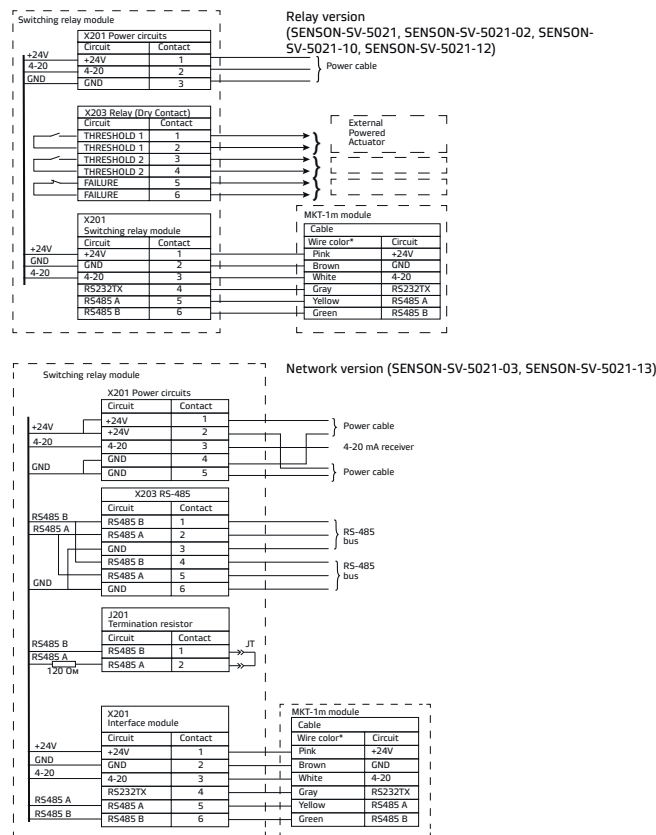
Dimensional drawing



Connection of the external measuring module



Wiring diagram



*Color may be different; it is listed in the data sheet and in the tag on the cable

Specifications

Weight, max	Stainless steel, aluminum alloy
Explosion protection marking	1Ex d IIC T6 Gb X
The degree of protection of the housing against external influences according to GOST 14254-2015 (IEC 60529: 2013)	IP66
Ambient temperature	-60...+50 °C
Relative humidity	Up to 95%, non-condensing
Pressure	84 to 120 kPa
Dimensions, max	160x261x105 mm
Weight, max	1800 g
Cable Glands	
Power Voltage	Two cable entries, connection thread M20x1.5
Nominal	24 V DC
Range	18-27 V DC
Electric power consumption, max	
Output signals:	2.5 W
• analog	Current loop 4-20 mA
• digital	RS-485, MODBUS RTU protocol
• electronic dry contact relay (direct or alternating current)	Threshold - normally open 150 mA, up to 27 V Malfunction - normally closed 150 mA, 27 V
Sound alarm control	3 V; 150 mW
Types of sensors	Optical, semiconductor, thermocatalytic, electrochemical, thermoconductometric
Average sensor life	Up to 3 years
Average service life of the device	10 years

Scope of delivery

1. Gas analyzer GAOS SENSON-SM-9001
2. MKT-1m module
3. MKIUS module
4. Data Sheet
5. Manual
6. Packaging

Auxiliary equipment

- Assembly kit (bracket for wall mounting, mounting nut, washer, grounding ring)
- Cable glands
- Power supply 24 V 1.4 or 0.6 A, per DIN-rail
- Air filters (set, 5 pcs.)
- Interface converter RS-485-USB
- Interface converter UART-USB
- PC-01 programming console
- Protective visor
- Intrinsic safety barrier BI-Exia-130-24



GAOS SENSON-SD-7032

Gas Analytical System GAOS SENSON-SD-7032-SM is a stationary single-channel device for continuous monitoring of gas concentration in the working area. It provides a high level of emergency protection in areas where it is possible to exceed the concentration of combustible and toxic substances, as well as the excess/decrease in oxygen concentration.

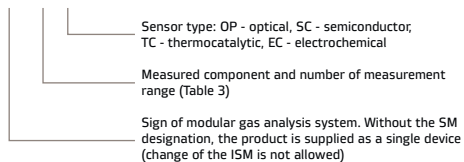
GAOS SENSON-SD-7032-SM is intended for general industrial applications. It can be used both indoors and outdoors. The design of the device eliminates access to the control electronics during operation, and at the same time provides the ease of changing the smart sensor module GAOS SENSON-SM-9001.

Special features

- budget version;
- housing - stainless steel and polycarbonate, corrosion-resistant;
- design of all electrical circuits provides the ia level of explosion protection;
- temperature range - from -30 to + 50 ° C;
- interfaces: analog - "Current loop 4-20 mA", digital - RS-485 (MODBUS RTU)
- the design eliminates the possibility of unintended effects on the measuring blocks during installation of the device and connection of electrical cables;
- integration with the module of indication and control of external devices MKIUS is possible.

Identification at order

SENSON-SD-7032-SM-G-S



Scope of delivery

1. Gas analyzer GAOS SENSON-SM-9001
2. MKT-1p module
3. Data Sheet
4. Manual
5. Packaging

Auxiliary equipment

- Power supply 24 V 0.25 A (from the socket ~ 220 V)
- Calibration adapter
- Interface converter RS-485-USB
- Interface converter UART-USB
- PC-01 programming console
- Protective visor
- Mounting cable
- Intrinsic safety barrier BI-Exia-130-24

Specifications

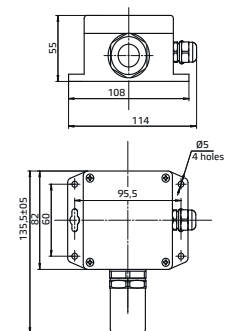
Housing materials	Polycarbonate, stainless steel
Explosion protection marking	1Ex ia d IIC T4 Gb X
The degree of protection of the housing against external influences according to GOST 14254-2015 (IEC 60529: 2013)	IP66
Ambient temperature	-30...+50°C
Relative humidity	Up to 95%, non-condensing
Pressure	84 to 120 kPa
Dimensions, max	115 x 136 x 55 mm
Weight, max	350 g
Power supply voltage:	
• Nominal	24 V DC
• Range	18-27 V DC
• Electric power consumption, max	1.3 W
Output signals:	
• analog	Current loop 4-20 mA
• digital	RS-485, MODBUS RTU protocol
Types of sensors	Optical, semiconductor, thermocatalytic, electrochemical, thermoconductometric
Average sensor life	Up to 3 years
Average service life of the device	10 years

Wiring diagram

GAOS SENSON-SD-7032

External circuits	Circuit	Contact
Power cable	+24V	1
	GND	2
	4-20	3
RS-485 cable		4
		5
		6

Dimensional drawing





GAOS SENSON-SV-5022

Gas Analysis System GAOS SENSON-SV-5022-SM is a stationary single-channel device for continuous monitoring of gas concentration in the working area. It is intended for general industrial applications, indoor and outdoor. The design of the device eliminates access to the control electronics during operation, and at the same time provides the ease of changing the smart sensor module GAOS SENSON-SM-9001.

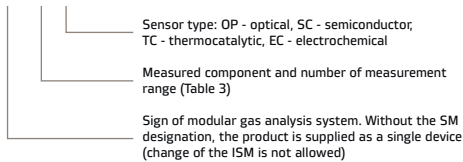
The device is equipped with sound and light indication, built-in system of control and setting the threshold values, controls for external devices.

Special features

- housing - stainless steel and polycarbonate, corrosion-resistant;
- design of all electrical circuits provides the ia level of explosion protection;
- temperature range - from -30 to + 50 ° C;
- interfaces: analog - "Current loop 4-20 mA"
- target gas concentration indicator;
- power and fault LEDs;
- LED indicators for exceeding gas thresholds;
- three electronic keys for controlling external devices
- sound warning device;
- ability to control in the field using the built-in keyboard.

Identification at order

SENSON-SV-5022-CM-G-S



Scope of delivery

1. Gas analyzer GAOS SENSON-SM-9001
2. MKT-1p module
3. Data Sheet
4. Manual
5. Packaging

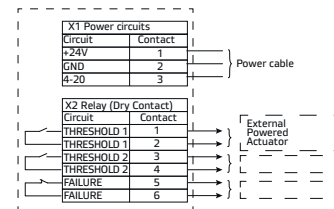
Auxiliary equipment

- Power supply 24 V 0.25 A (from the socket ~ 220 V)
- Calibration adapter
- Interface converter RS-485-USB
- Interface converter UART-USB
- PC-01 programming console
- Protective visor
- Mounting cable
- Intrinsic safety barrier BI-Exia-130-24

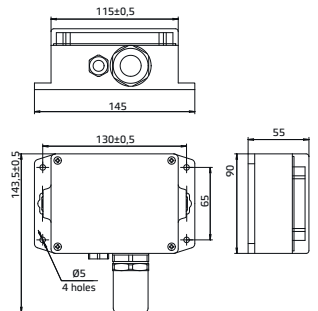
Specifications

Housing materials	Polycarbonate, stainless steel
Explosion protection marking	1Ex ia d IIC T4 Gb X
The degree of protection of the housing against external influences according to GOST 14254-2015 (IEC 60529: 2013)	IP66
Ambient temperature	-30...+50°C
Relative humidity	Up to 95%, non-condensing
Pressure	84 to 120 kPa
Dimensions, max	130 x 144 x 55 mm
Weight, max	750 g
Power supply voltage:	
• Nominal	24 V DC
• Range	18-27 V DC
• Electric power consumption, max	2.5 W
Output signals:	
• analog	Current loop 4-20 mA
• electronic dry contact relay (direct or alternating current)	Threshold - normally open 150 mA, up to 27 V Malfunction - normally closed 150 mA, 27 V
Types of sensors	Optical, semiconductor, thermocatalytic, electrochemical, thermoconductometric
Average sensor life	Up to 3 years
Average service life of the device	10 years

Wiring diagram



Dimensional drawing





GAOS SENSON-SD-7033

Gas Analysis System GAOS SENSON-SD-7033-SM is a stationary single-channel device for continuous monitoring of gas concentration in the working area. It provides a high level of emergency protection in areas where it is possible to exceed the concentration of combustible and toxic substances, as well as the excess / decrease in oxygen concentration.

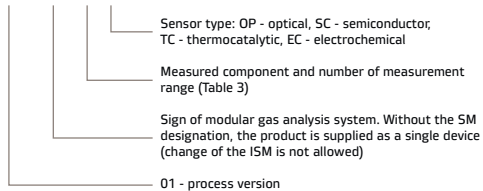
GAOS SENSON-SD-7032-SM is intended for general industrial applications when increased mechanical strength is required. Both diffusion sampling and forced sampling are possible.

Special features

- metal shockproof housing made of aluminum alloy and stainless steel;
- design of all electrical circuits provides the ia level of explosion protection;
- temperature range - from -40 to + 50 °C;
- interfaces: analog - "Current loop 4-20 mA", digital - RS-485 (MODBUS RTU)
- the design eliminates the possibility of unintended effects on the measuring blocks during installation of the device and connection of electrical cables.

Identification at order

SENSON-SD-7033-Y-CM-G-S



Process version



Process version of the system GAOS SENSON-SD-7033-01-SM is possible. In this case, the cover of the sensor module is supplied with two unions for forcing the supply and removal of the analyzed gas mixture through a tube with an internal diameter of 4 mm and an outer diameter of 6 mm.

Wiring diagram

External circuits		
Circuit	Contact	
RS485 A	1	Cable RS-485
RS485 B	2	
+24V	3	Power cable
4-20	4	
GND	5	

Specifications

Housing materials	Polycarbonate, stainless steel
Explosion protection marking	1Ex ia d IIC T4 Gb X
The degree of protection of the housing against external influences according to GOST 14254-2015 (IEC 60529: 2013)	IP66
Ambient temperature	-40...+50°C
Relative humidity	Up to 95%, non-condensing
Pressure	84 to 120 kPa
Dimensions, max	155 x 130 x 60 mm
Weight, max	750 g
Power supply voltage:	
• Nominal	24 V DC
• Range	18-27 V DC
• Electric power consumption, max	1.3 W
Output signals:	
• analog	Current loop 4-20 mA
• digital	RS-485, MODBUS RTU protocol
Types of sensors	Optical, semiconductor, thermocatalytic, electrochemical, thermoconductometric
Average sensor life	Up to 3 years
Average service life of the device	10 years

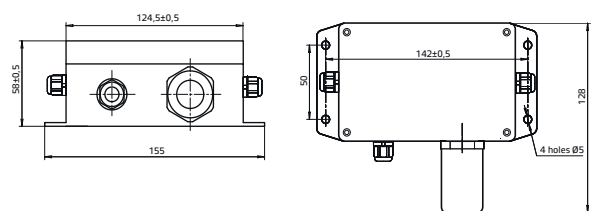
Scope of delivery

1. Gas analyzer GAOS SENSON-SM-9001
2. MKT-1p module
3. Data Sheet
4. Manual
5. Packaging

Auxiliary equipment

- Power supply 24 V 0.25 A (from the socket ~ 220 V)
- Calibration adapter
- Interface converter RS-485-USB
- Interface converter UART-USB
- PC-01 programming console
- Protective visor
- Mounting cable
- Intrinsic safety barrier BI-Exia-130-24

Dimensional drawing





GAOS SENSON-SV-5023

Gas Analysis System GAOS SENSON-SV-5023-SM is a stationary single-channel device for continuous monitoring of gas concentration in the working area. It is intended for general industrial applications when increased mechanical strength is required. Both diffusion sampling and forced sampling are possible.

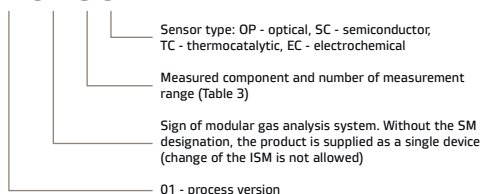
The device is equipped with sound and light indication, built-in system of control and setting the threshold values, controls for external devices.

Special features

- metal shockproof housing made of aluminum alloy and stainless steel;
- design of all electrical circuits provides the ia level of explosion protection;
- temperature range - from -40 to + 50 ° C;
- interfaces: analog - "Current loop 4-20 mA", digital - RS-485 (MODBUS RTU)
- target gas concentration indicator;
- power and fault LEDs;
- LED indicators for exceeding gas thresholds;
- three electronic keys for controlling external devices that are triggered when the specified concentration thresholds are exceeded, as well as when the sensor fails and in the absence of power supply;
- sound warning device;
- ability to control in the field using the built-in keyboard.

Identification at order

SENSON-SV-5023-Y-CM-G-S



Scope of delivery

1. Gas analyzer GAOS SENSON-SM-9001
2. MKT-1p module
3. Data Sheet
4. Manual
5. Packaging

Auxiliary equipment

- Power supply 24 V 0.25 A (from the socket ~ 220 V)
- Calibration adapter
- Interface converter RS-485-USB
- Interface converter UART-USB
- PC-01 programming console
- Protective visor
- Mounting cable
- Intrinsic safety barrier BI-Exia-130-24

Specifications

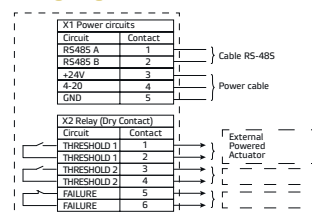
Housing materials	Polycarbonate, stainless steel
Explosion protection marking	1Ex ia d IIC T4 Gb X
The degree of protection of the housing against external influences according to GOST 14254-2015 (IEC 60529: 2013)	IP66
Ambient temperature	-40...+50°C
Relative humidity	Up to 95%, non-condensing
Pressure	84 to 120 kPa
Dimensions, max	155 x 130 x 60 mm
Weight, max	750 g
Power supply voltage:	
• Nominal	24 V DC
• Range	18-27 V DC
• Electric power consumption, max	2.5 W
Output signals:	
• analog	Current loop 4-20 mA
• digital	RS-485, MODBUS RTU protocol
• electronic dry contact relay (direct or alternating current)	Threshold - normally open 150 mA, up to 27 V Malfunction - normally closed 150 mA, 27 V
Types of sensors	Optical, semiconductor, thermocatalytic, electrochemical, thermoconductometric
Average sensor life	Up to 3 years
Average service life of the device	10 years

Process version

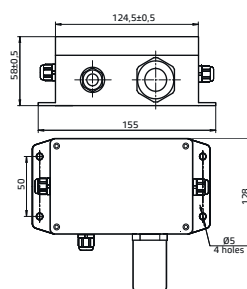


Process version of the system GAOS SENSON-SD-5023-01-SM is possible. In this case, the cover of the sensor module is supplied with two unions for forcing the supply and removal of the analyzed gas mixture through a tube with an internal diameter of 4 mm and an outer diameter of 6 mm.

Wiring diagram



Dimensional drawing





GAOS SENSON-SV-5024

Gas analyzer GAOS SENSON-SV-5024 is a stationary single-channel device for continuous monitoring of oxygen (O₂) or carbon monoxide (CO) concentrations in the working area.

The device is equipped with sound and light indication, built-in system of control and setting the threshold values, controls for external devices. GAOS SENSON-SV-5024 is a budget solution for controlling gas pollution in explosion-proof zones.

Special features

- budget version;
- housing - polycarbonate, corrosion-resistant;
- temperature range - from -30 to + 50 °C;
- interface - "Current loop 4-20 mA";
- target gas concentration indicator;
- power and fault LEDs;
- LED indicators for exceeding gas thresholds;
- three electronic keys for controlling external devices
- sound warning device;
- ability to control using the built-in keyboard.

Identification at order

For carbon monoxide (CO) - GAOS SENSON-SV-5024-CO; for oxygen (O₂) - GAOS SENSON-SV-5024-O2

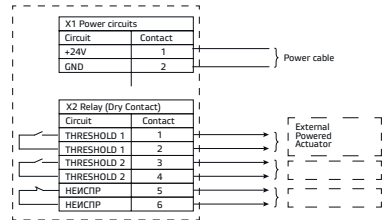
Scope of delivery

1. Gas analyzer GAOS SENSON-SV-5024
2. Data Sheet
3. Manual
4. Packaging

Auxiliary equipment

- Power supply 24 V 0.25 A (from the socket ~ 220 V)
- Calibration adapter
- Protective visor
- Mounting cable

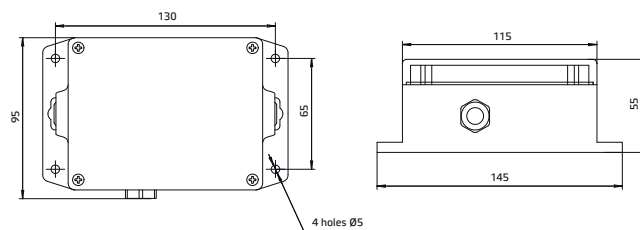
Wiring diagram



Specifications

Housing materials	Polycarbonate
Degree of protection of the housing against external influences	IP54
Ambient temperature	-20...+50°C
Relative humidity	Up to 95%, non-condensing
Pressure	84 to 120 kPa
Dimensions, max	96 x 145 x 55 mm
Weight, max	450 g
Power supply voltage:	
• Nominal	24 V DC
• Range	18-27 V DC
• Electric power consumption, max	2.5 W
Output signals:	
• analog	Current loop 4-20 mA
• electronic dry contact relay (direct or alternating current)	Threshold - normally open 150 mA, up to 27 V Malfunction - normally closed 150 mA, 27 V
Types of sensors	Electrochemical
Average sensor life	Up to 3 years
Average service life of the device	10 years

Dimensional drawing





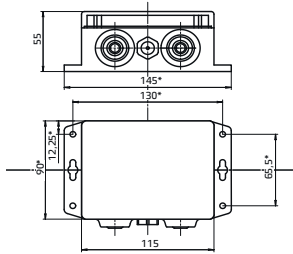
GAOS SENSON-K-1M

Analog signals controller GAOS SENSON-K-1M is a stationary device designed to receive data from external gas analyzers (for example, GAOS SENSON-SD) via the 4-20 mA Current loop. It provides indication of the numerical value of the gas concentration, sound alarm signaling when the predetermined threshold concentrations are exceeded, and the control of external devices. Values of the monitored parameters can be set using the built-in keyboard.

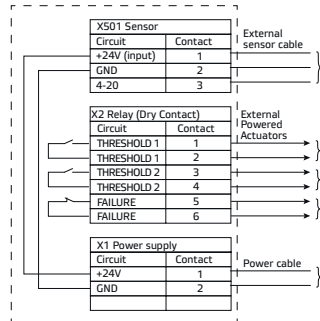
Special features

- target gas concentration indicator;
- power and fault LEDs;
- LED indicators for exceeding gas thresholds;
- three electronic keys for controlling external devices
- sound warning device;
- ability to control using the built-in keyboard.

Dimensional drawing



Wiring diagram



Specifications

Housing materials	Polycarbonate
Degree of protection of the housing against external influences	IP54
Ambient temperature	-30...+50°C
Relative humidity	Up to 95%, non-condensing
Pressure	84 to 120 kPa
Dimensions, max	130 x 144 x 55 mm
Weight, max	450 g
Power supply voltage:	
• Nominal	24 V DC
• Range	18-27 V DC
• Electric power consumption, max	1.2 W
Input signals	Current loop 4-20 mA
Electronic dry contact relay (direct or alternating current)	Threshold - normally open 150 mA, up to 27 V Fault - normally-closed 150 mA, 27 V
Average service life of the device	10 years

Scope of delivery

1. Analog Signal Controller GAOS SENSON-K-1M
2. Data Sheet
3. Manual
4. Packaging

Auxiliary equipment

- External relay block for DIN-rail "dry contacts" switching current up to 8 A
- Power supply from the network ~ 220 V, output voltage +24 V
- Power supply 24 V 0.6 A to DIN rail
- Protective visor
- Mounting cable
- Intrinsic safety barrier BI-Exia-130-24



GAOS SENSON-K-4M | S-K-8M

Controllers of analog signals GAOS SENSON-K-4M and GAOS SENSON-K-8M are designed for continuous simultaneous multichannel (up to 4 and 8 channels, respectively) collecting and displaying information from stationary gas analyzers or other measuring devices. The system provides light and sound alarms about exceeding specified threshold levels of concentrations with the ability to automatically turn on external devices (two external relays per channel).

The controller is interfaced with gas analyzers or other devices on the analog channel "Current loop 4-20 mA". The measured values are displayed on a two-line liquid crystal display (LCD) for each channel in series with a refresh rate of 2 s. It is possible to change the system parameters and channel calibration. To implement these modes, an on-screen menu and a 5-button keyboard on the front panel are provided. Memory of over 200 concentration measurements and output to an external PC are provided.

Specifications

Number of external devices	1 to 4 (K-4M) or 1 to 8 (K-8M)
Input signal	Current loop 4-20 mA
Maximum length of connecting cables from controller to external device with cable resistance not more than 50 Ohm	500 m
Supply voltage:	
• controller	24 V
• external device (via controller)	24 V
Power consumption of the controller, no more	1.5 W
Switched current and voltage on the built-in output electronic keys	24 V, 100 mA
Switched current and voltage on remote relays	220 V, 5 A (8 A)
Current consumption of the external relay (in the activated state)	25 mA
Maximum number of external relays connected to the controller	up to 8 (K-4M) or up to 16 (K-8M)
Digital interface for connecting to PC	RS-485
Dimensions:	
• controller	156 x 90 x 60 mm
• Power Supply	80 x 95 x 75 mm
• relay block	80 x 70 x 20 mm
Weight, max:	
• controller	300 g
• relay block	100 g
• 24V power supply	400 g
DIN rail width	35 mm

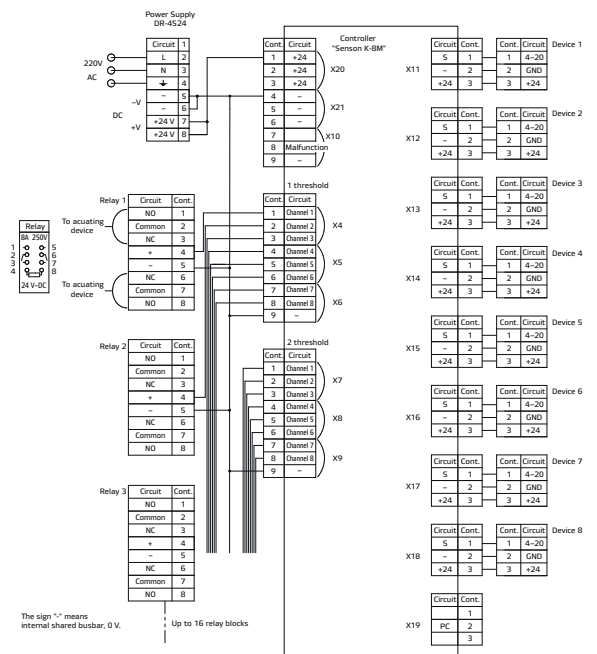
Scope of delivery

1. Controller GAOS SENSON-K-8(4)M
2. Remote power relay unit (1 pc.)
3. Data Sheet
4. Manual
5. Packaging

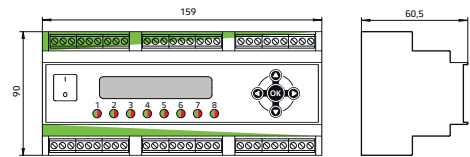
Auxiliary equipment

- External relay block for DIN-rail "dry contacts" switching current up to 8 A
- Power supply from the network ~ 220 V, output voltage +24 V
- Power supply 24 V 0.6 A to DIN rail
- Protective visor
- Mounting cable
- Intrinsic safety barrier BI-Exia-130-24

Wiring diagram



Dimensional drawing



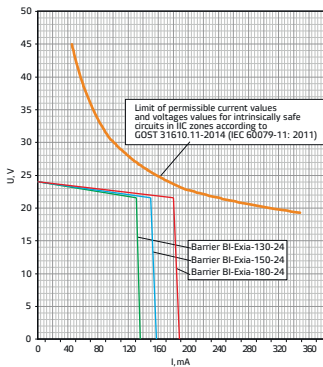


Intrinsic Safety Barriers BI-Exia-xxx-24

The BI-Exia-xxx-24 Intrinsic Safety Barriers are designed to provide the ia protection level of the intrinsically safe circuit when powered by explosion-proof equipment of category IIC and lower. The barrier protects the 24 V power supply channel through an intrinsically safe circuit, as well as the 4-20 mA Current Loop interface channel.

A distinctive feature of the BI-Exia-xxx-24 barriers is the active cutting of power in the power supply channel. The transfer characteristic of the BI-Exia-xxx-24 barriers is determined by two segments corresponding to the working area and the area of cutting (see figure).

The working area lies in the range from the no-load voltage to the point of cutting. In the cutting area, the voltage drops sharply to 0 V as the current increases. The output current-voltage characteristic of the Barrier is in the permissible range of currents and voltages for hazardous areas of category IIC, according to GOST 31610.11-2014 (IEC 60079-11: 2011).



Special features

- active power control;
- minimum power consumption, low flow resistance;
- high reliability - any two damages to internal components do not lead to the failure of the Barrier, in accordance with the requirements
- for the ia level of the explosionproof circuit;
- after overload, no power switching is required to return to the operating mode (no "trigger effect");
- additional thermal protection.

Scope of delivery

1. Intrinsic Safety Barriers
2. Data Sheet
3. Packaging

Information for order

Intrinsic Safety Barriers BI-Exia-xxx-24 are available in various model versions, differing in maximum output current.
IDENTIFICATION AT ORDER
 Senon-BI-xxx-24,
 xxx - maximum output current I_o (130, 150 or 180 mA)

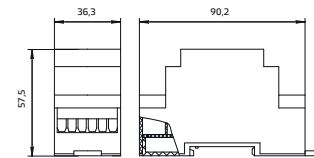
Specifications

Explosion protection marking	[Ex ia] IIC
Ambient temperature	-0...+50 °C
Relative humidity	Up to 95%, non-condensing
Pressure	84 to 120 kPa
Dimensions, max	37 x 58 x 91 mm
Weight, max	100 g

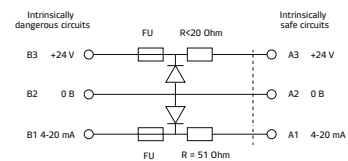
Intrinsically safe electrical parameters

Model	BM-Exia-130-24	BM-Exia-150-24	BM-Exia-180-24
Maximum output voltage, U_o , V	24	24	24
Maximum output current, I_o , mA	130	150	180
Maximum output power, P_o , W	2.8	3.3	3.9
Maximum external capacity, C_o , nF	62	62	62
Maximum external inductance, L_o , mH	1.05	0.79	0.54
Maximum input voltage U_m , V	27	27	27

Dimensional drawing



Connection diagram (equivalent)



Additional equipment and accessories



PC-01 programming console

Designed for calibration and verification of ISM GAOS SENSON-SM-9001. Equipped with a gas nozzle, RS-485-USB adapter, 220 V power supply.



Power sources

Designed for power supply from 220 V 50 Hz networks for devices with a supply voltage of 24 V. They differ in their design and rated current:

- a) 24 V; 0.6 A, for DIN rail mounting (35 mm);
- b) 24 V; 1.5 A, for DIN rail mounting (35 mm);
- c) 24 V; 0.25 A, for plugging in a standard outlet ~ 220 V.



Patch cables

Cable MKSH 3x0.35. With copper tinned multi-wire conductors (3x0.35 mm²) with PVC plastic insulation, in PVC plastic sheath. The outer diameter of the shell is 5.9 mm, the specific weight is 41 g/m. Designed for fixed interinstrument mounting, for connecting electrical and electronic equipment and instruments. Rated voltage up to 500 V with frequency up to 400 Hz. Rated DC voltage: up to 750 V.

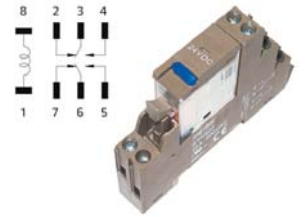
Cable KUV 6x0.35. With copper tinned multi-wire conductors (6x0.35 mm²) with PVC plastic insulation, in PVC plastic sheath.

Remote Power Relay Unit

Designed to control external devices. It is completed with electromechanical relays installed in a STN 607 type chassis for mounting on a DIN rail (35 mm). Dual On/Off Relay. The control voltage is 24 V (minimum - 5 V 10 mA). Rated load:

- resistive - 250 V AC / 30 V RS, 10 A;
- inductive - 250 V AC 7.5 A / 30 V RS, 6 A (cos φ = 0.3; L / R = 7 ms)

Maximum switching voltage is 277 V AC, the current is up to 12A (depending on type), up to 3000 VA.



Interface Converters



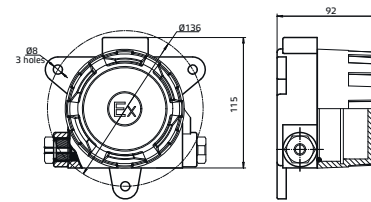
Air filter set

For protection of GAOS SENSON-SD-7031 from exposure of the dust.



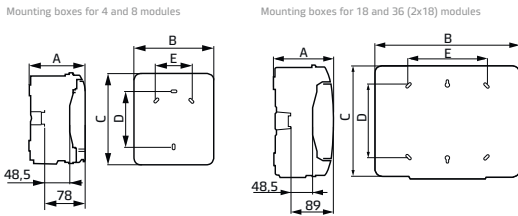
Switching box MKIUS-01

It is intended for switching electrical cables, as well as for connecting the MKT-1m module or the GAOS SENSON-SD-7031 gas analyzer in hazardous areas of the category up to IIC. Ex marking: 1Ex d IIC T6 Gb X.



Mounting boxes

Boxes are designed to accommodate network and additional equipment with mounting on a DIN-rail. Available in 4, 8, 18 and 36 modules options.



Vendor code	Number of modules	Sizes, mm				
		A	B	C	D	E
6019 74	4	115,6	128	200	120	-
6019 78	8	115,6	200	200	120	106
6019 85	18	141	448	282	180	288
6019 86	36	161	448	432	330	290

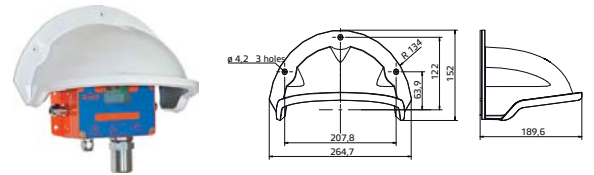
- Boxes are made of high impact resistant polystyrene.
- Dust and moisture protection class - IP65.
- The material does not support combustion. Resistant to hot wire up to 650 °C.
- Housings are completely symmetrical, the doors can be placed on either side.
- Equipped with plugged switching holes on the top, bottom and side walls.
- The handle is recessed, with a double latch. It can be supplied with a lock.



Protective visor

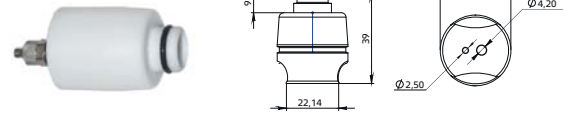
Designed to protect devices from precipitation. Housing material - plastic.

Mass - 200 g
Dimensions 265x152x190 mm.

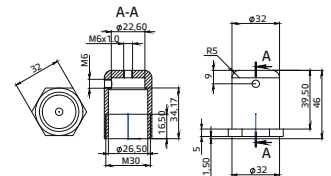


Verification chambers (adapters)

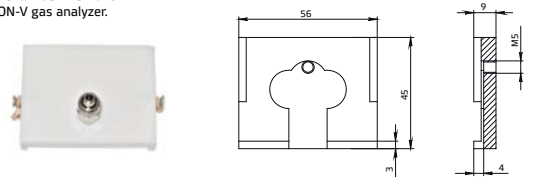
Verification chamber NG-5
For GA05 7031 and 5021 series.



Verification chamber NG-6
For GA05 7032, 7033 and 5022 series.



Verification chamber NG-2. For GA05 SENSON-V gas analyzer.





GAOS SENSON-V

GAOS SENSON-V individual gas analyzers are designed to ensure the personal safety of employees of enterprises whose production processes are related to the possibility of the release into the atmosphere of combustible, toxic and other dangerous gases, as well as the lack or excess of oxygen.

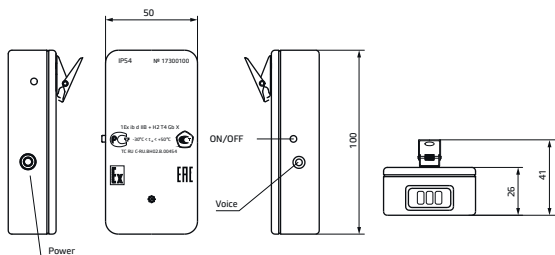
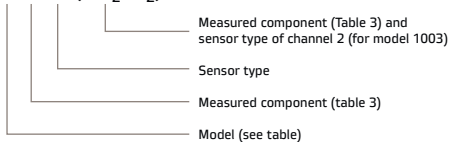
The device displays the measured concentration of gases on a digital indicator, and also gives sound and light signals when the concentration exceeds the established thresholds (for oxygen, it is higher or lower than the threshold). In gas analyzers of oxygen and low concentrations of hydrocarbons, auto-calibration is provided. Available in single and dual channel versions.

Versions

Model	Description
1001	Single gas device, basic design
1002	One-gas device, process version (a through passage gas chamber with a sensor for forced gas supply)
1003	Two gas device

Identification at order

SENSON-V-100x-G-S (/G₂-S₂)



Scope of delivery

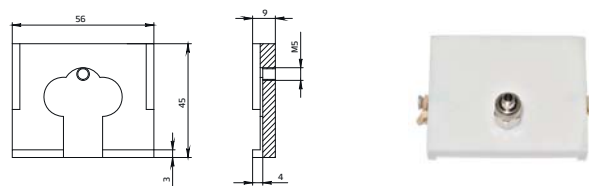
1. Gas analyzer GAOS SENSON-V
2. Charger (12 V power supply)
3. Data Sheet
4. Operation Manual (per batch)
5. Packaging

Specifications

Alarm time under normal conditions, max:	
• for thermal and semiconductor sensors	15 s
• for optical sensors	60 s
• for electrochemical sensors	45 s
• for oxygen	30 s
Alarm:	
• light	digital indicator
• sound	75 dB
Digital display indication period	5 s
Electric power from internal battery	3.6 V
Power consumption in duty / signal mode (1 channel):	
• for flammable gases	70/100 mW
• for toxic gases	20/50 mW
• with optical sensor for CO ₂ or CH ₄ or CH	300/330 mW
Charging voltage	12 V
Charging time	no more than 3 hours
Operating time without recharging (1 channel):	
• for flammable gases	20 h
• for toxic gases	70 h
• with optical sensor for CO ₂ or CH ₄ or CH	6 h
Dimensions, max	100 × 50 × 25 mm
Mass of the gas analyzer with the charger	no more than 150 g
Terms of Use:	
• relative humidity	30...95 %
• atmosphere pressure	84...120 kPa
• air temperature	-30...+50 °C
Calibration frequency	at least 1 time every 12 months
Explosion protection marking	1Ex ib d IIB + H, T4 Gb X
Enclosure protection level	IP54

Auxiliary equipment

Gas nozzle - calibrator





GAOS SENSON-M

Portable multi-gas detector GAOS SENSON-M is intended for monitoring of atmospheric air and process media (from 1 to 6 measurement channels).

Measured values are displayed on a digital display. When the concentration threshold is reached, the light and sound signals are turned on. The device can record the measurement results in a removable non-volatile memory card and then transfer them to a computer for storage and processing.

Versions

Model	Description
3005	Basic model with forced gas supply by means of a pump through sampling probes. It is used to control wells, tanks, holds, to search for leaks from pipelines.
3006	Ecological model. Using sampling probes is not possible. Used for the analysis of unstable or aggressive gases (HCl, Cl ₂ , NO ₂ , etc.)
3007	Process model. In contrast to the base model, there is not only an inlet but also an outlet unions for discharge of gas after analysis into the drainage or for its return to the equipment environment.
3008	Hybrid model. For a part of the sensors, the diffuse sampling mode is implemented, for others - the forced mode, using the pump.
3012	Stationary model. Differences from portable models: <ul style="list-style-type: none"> housing design allows you to attach the device to the equipment of the facility; power supply is possible both from an external DC network and from an internal battery, which serves as a backup power source; the plug-in battery charging connector is replaced with a screw-type power connector; outlet union is provided, similar to the technological model

Identification at order

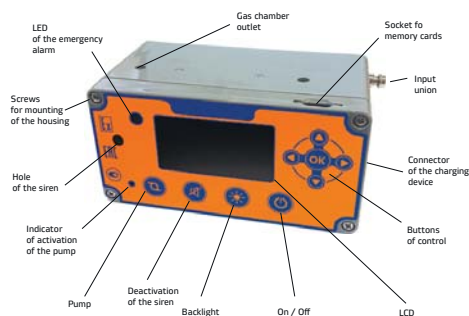
SENSON-M-30xx-N, 30xx - model number, N - number of measurement channels

Scope of delivery

1. Gas analyzer GAOS SENSON-M
2. Charger (power supply 220/12V)
3. Cover bag
4. Data Sheet
5. Manual

Specifications

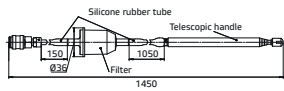
Alarm time under normal conditions, max: <ul style="list-style-type: none"> • for combustible gases • for toxic gases • for oxygen 	no more than 15 s no more than 45 s no more than 30 s
Number of gas sensitive sensors	1 to 6
Adjustable micropump flow rate	300-900 cm ³ /min
Terms of Use: <ul style="list-style-type: none"> • Relative humidity • Atmosphere pressure 	30...95% 84...120 kPa
Charging from the power supply	12 V
Full charge time, max	4 hours
Supply voltage from the internal battery	3.7 V
Continuous operation time without recharging	at least 20 hours
Dimensions (with a case)	no more than 170 x 80 x 85 mm
Weight	not more than 700 g
Operating temperature range	-30...+50 °C
Calibration frequency	at least 1 time in 12 months
Ex marking	1Ex ib d IIB + H ₂ T4 Gb X
Enclosure protection level	IP54



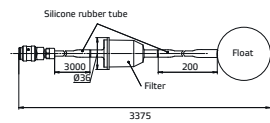
Auxiliary equipment

- Flexible hose
- Float probe
- Sampling probe
- Probe
- Telescopic probe
- Memory card of SD or SDHS type (4 GB)
- Wall mount brackets
- Charger from the car battery 12 V

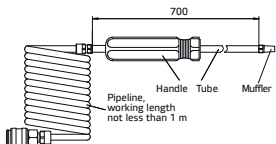
Telescopic probe



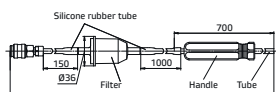
Float probe



Sampling probe



Probe

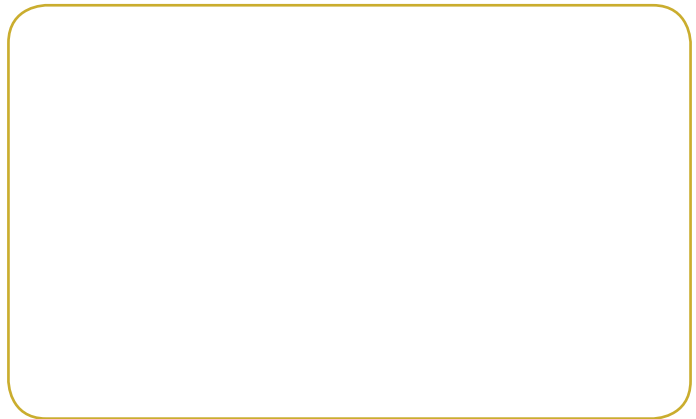




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