



sensitron

A Halma company



products

C A T A L O G

sensitron

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Sensitron is a global gas detection company.

The product range consists of gas detection systems, detectors and control panels, for all applications.





Founded in 1988 in the province of Milan, Sensitron became part of the Halma plc group in 2021. Always focused on innovation and technology, the in-house research and development department pursues product development with the goal of safety for people, environments and the ecosystem in which we live.





HOW CHOOSE A GAS DETECTOR

Identification of the gas to be detected

-  **FLAMMABLE**
-  **TOXIC**
-  **OXYGEN/INERT GASES**
-  **REFRIGERANT**



FLAMMABLE
Risk of fire and/or explosion

The thermal reaction occurs in the presence, in the right proportion and simultaneously, of:

- **Ignition energy**
- **Ignition source**
- **Fuel**
gas or dust
- **Comburant**
oxygen



TOXIC
Risk of poisoning

Toxic gases can have very dangerous physiological effects on humans.
It is the employer's responsibility to ensure that employees are not exposed to such levels of toxicity.

- **TLV**
Limit value of concentrations of toxic gases in the workplace to which workers can be exposed over time without suffering harmful effects.
- **TLV-TWA**
Time averaged concentration, 8 hours or 48 hours, to which workers can be repeatedly exposed over time, without suffering harmful effects.
- **TLV-STEL**
Maximum concentration to which workers may be exposed for a maximum period of 15 minutes without being affected.



OXYGEN/INERT GASES
Risk of choking
Lack of oxygen

Inert gases can reduce the concentration of oxygen in the environment causing asphyxiation.

- **Inert gases**
Some examples:
Cryopreservation of biological samples in liquid nitrogen
Use of helium, argon, nitrogen, etc. in laboratories
MRI rooms in which helium leaks may occur
Use of inert gases for extinguishing fires (EDC)
- **Oxygen**
Enrichment or decrease
The human organism does not encounter difficulty breathing up to a minimum oxygen level of 19.5 %. For this reason, the concentration level must be monitored so that it never falls below 18.19 %. This condition is referred to as oxygen deficiency.
Oxygen enrichment increases flammability in the atmosphere and toxicity to humans when it exceeds 24% concentration.







REFRIGERANT
Risk of fire, poisoning, lack of oxygen or environmental damage

Refrigerants are particular substances that, subjected to certain pressures, have the ability to absorb significant amounts of heat, passing from the liquid to the gaseous state and reaching remarkably low temperatures.
Given the restrictions dictated by the new protocols, the market has begun to move along two different paths: the research for a refrigerant with the lowest possible environmental impact and the "rediscovery" of natural refrigerants, in particular with the release of the new F-gas regulation.

- **Toxicity of refrigerant gases**
Group A: all refrigerants that are not toxic for concentrations of 400 ppm or less.
Group B: this group includes all refrigerants that are toxic for concentrations below 400 ppm.
- **Flammability of refrigerant gases**
Class 1: non flammable refrigerants
Class 2: moderately flammable refrigerants
Class 3: highly flammable refrigerants
A2L: mildly flammable refrigerants

Sensors Identification of the detection technology to be used

-  **INFRARED**
-  **CATALYTIC SENSOR**
-  **PID SENSOR**
-  **ELECTROCHEMICAL CELL**



INFRARED
Infrared optical principle

- Optical sensors detect the difference in attenuation, at a specific wavelength, between a reference signal and the signal produced by the passage of light through the substance to be detected.
- **Life expectancy over 5 years, selective detection, insensitive to poisoning substances.**



CATALYTIC SENSOR
Chemical principle

- The operating principle is based on the oxidation of flammable gas on the surface of an electrically heated catalytic element.
- It is sensitive to certain poisoning substances or inhibitors.
- Relative response: the output variation for the same %LFL concentration of different gases is called relative sensitivity.
- **Average life of 4-5 years, linear and suitable for detecting a wide range of flammable gases. It is sensitive to certain poisoning substances and inhibitors.**



PID SENSOR
Photoionization principle

- A sensor with a photonic ionisation detector, inside there is an ionisation chamber containing an ultraviolet light source which, when gases or VOCs enter, ionises the molecules, producing electrons and positive ions.
- They detect a wide range of VOCs, including benzene, toluene, ethanol, formaldehyde.
- Unsuitable for detecting inorganic gases, e.g. oxygen, hydrogen or carbon dioxide.
- **Photo ionisation sensor, detects low concentrations and technology enables the detection of volatile organic compounds (VOCs). Requires annual lamp replacement.**



EC SENSOR
Electrochemical cell

- **toxic gas and oxygen detection, with high resolution and response accuracy.**
Detection range from a few ppm to Vol (e.g. Oxygen).
Inert gases (e.g. Argon, Helium, Nitrogen...) are detected due to lack of oxygen.
- **Electrochemical cell sensor, has a detection range from ppm to %VOL.**
High response accuracy.
Operation is affected by low temperatures and humidity.

DETECTORS + CONTROL UNITS

CERTIFICATIONS



The Marine Equipment Directive (MED, Directive 2014/90/EU) ensures that safety requirements are applied and implemented in a harmonized manner throughout the European Union. The objectives of the directive are:

- Improve safety at sea
- Prevent marine pollution

SIL2 (3)

Safety Integrity Level (SIL) is the ability to reduce evaluated risk while ensuring the reliability of safety systems. There are 4 levels of SIL: SIL1, SIL2, SIL3, SIL4. Higher values of SIL correspond to a lower probability that the safety system will fail when called upon to operate.



EN 60079-29-1 describes the construction and test methods for verifying the performance of flammable gas detectors. The test sequence ensures the accuracy of the gas reading, its stability and response time.



HART (Highway Addressable Remote Transducer) is the global standard for sending and receiving digital information through the 4-20 mA analog current loops that connect most field instruments to distributed control systems.



Directive 2014/34/EU establishes the requirements and assessment of equipment intended for use in potentially explosive atmospheres. In fact, it defines health and safety requirements for the design, manufacture and commercialization of such equipment to ensure the safety of operators.



EN 50545-1 is dedicated to systems that enable the detection of toxic and combustible gases in garages. It describes the requirements for gas detectors and control units, the performance they must guarantee, and how to perform tests for evaluation.



The IECEx system is an international certification system. It was developed by the International Electrotechnical Commission to simplify global trade in equipment used in explosive atmospheres.

DETECTORS



	Analogue output Standard	Digital output Standard	Relay output	GAS						CERTIFICATIONS										
				Optional	Flammable	Toxic	CO2	VOC	Refrigerant	SIL		ATEX			Marine	IECEx		EN50545-1		
										2	3	Zone 1 explosion-proof	Zone 1 explosion-proof Performance	Group 1		Zone 1: IS	Zone 2: Increased safety		Zone 1 explosion-proof	Zone 1: IS
SMART 3G C2	4-20mA		3		x	x	x	x	x		Hw	Sw	x	x		x		x		
SMART 3G C2-LD	4-20mA		3		x	x	x	x	x		Hw	Sw	x	x		x		x		
SMART 3G D3	4-20mA		3		x	x	x	x	x		Hw	Sw	x			x		x		
SMART 3G C3	4-20mA		1 o 3		x	x	x	x	x		Hw	Sw	x			x		x		
SMART 3G D2	4-20mA		3		x	x	x	x	x		Hw	Sw	x	x		x		x		x
SMART 3G Gr.1	4-20mA		3		x	x					Hw	Sw	x		x		x			
SMART S SS	4-20mA	RS485 output	3	modem HART	x	x	x	x	x		Hw	Sw	x	x		x		x		x
SMART S MS MED	4-20mA	RS485 output	3		x				x		Hw	Sw	x	x			x			
SMART 3 NC	4-20mA		1 o 3		x	x	x													
SMART 3 R	4-20mA	RS485 output	3		x	x	x		x											
SMART 3H LITE		RS485 output	2				x		x											
SMART 3H FM-LITE		RS485 output	2				x		x											
SMART P		RS485 output			x	x														x

CONTROL UNITS



MULTISCAN ++S



PL4+



PL4+D



MULTISCAN 8+



MULTISCAN ++PK



MULTISCAN ++MED

	Max. inputs	Max. inputs = Onboard + modules		Max outputs	Max output = Onboard + modules		CERTIFICATIONS					Supervision interface	Rack		
		Onboard 4-20mA analogue	Max. inputs via modules, expansions and/or RS485		Onboard Relay	Max outputs via modules with Open Collector and/or relay	SIL			ATEX	Performance			Marine	EN50545-1
							1	2	3						
PL4+	8	4	4	21	5	16				X	X		NO		
PL4+D	12	4	8	21	5	16	X			X	X		USB-B		
MULTISCAN 8+	16	8	8	38	6	32	X			X	X		RS232 o USB-B		
MULTISCAN 8+16	24	8	16	54	6	48	X			X	X		RS232 o USB-B		
MULTISCAN ++ S1	40	8	32	72	8	64	X			X	X		RS232	19" 6U HE	
MULTISCAN ++ S1	72	8	64	136	8	128	X			X	X		RS232	19" 6U HE	
MULTISCAN ++ S1	136	8	128	264	8	256	X			X	X		RS232	19" 6U HE	
MULTISCAN ++ S1	264	8	256	520	8	512	X			X	X		RS232	19" 6U HE	
MULTISCAN++ S2	40	8	32	72	8	64		X		X	X		RS232	19" 6U HE	
MULTISCAN++ S2	72	8	64	136	8	128		X		X	X		RS232	19" 6U HE	
MULTISCAN++ S2	136	8	128	264	8	256		X		X	X		RS232	19" 6U HE	
MULTISCAN++ S2	264	8	256	520	8	512		X		X	X		RS232	19" 6U HE	
MULTISCAN++PK-8D	12	4	8	21	5	16						X	USB-B	19" 6U HE	
MULTISCAN++PK	40	8	32	72	8	64						X	RS232	19" 6U HE	
MULTISCAN++PK	72	8	64	136	8	128						X	RS232	19" 6U HE	
MULTISCAN++PK	136	8	128	264	8	256						X	RS232	19" 6U HE	
MULTISCAN++PK	264	8	256	520	8	512						X	RS232	19" 6U HE	
MULTISCAN++MED	72	8	64	136	8	128		X		X	X	X	RS232		

CONTROL UNITS



The control units are designed to work in small and large systems, in all application spectrums, classified and non classified areas.



PL4+

Max input: 8
Max output: 21
Certifications: Atex,
 Performance EN 60079-29-1



PL4+D

Max input: 12
Max output: 21
Certifications: Atex,
 Performance EN 60079-29-1, SIL1



MULTISCAN 8

Max input: 24
Max output: 54
Certifications: Atex,
 Performance EN 60079-29-1, SIL1



MULTISCAN++S1

Max input: 264
Max output: 520
Certifications: Atex,
 Performance EN 60079-29-1, SIL1



MULTISCAN++S2

Max input: 264
Max output: 520
Certifications: Atex,
 Performance EN 60079-29-1, SIL2



MULTISCAN++PK

Max input: 264
Max output: 520
Certifications: EN50545-1



MULTISCAN++MED

Max input: 72
Max output: 136
Certifications: ATEX,
 Performance EN 60079-29-1, SIL2,
 MED

SMART 3G

SMART



SMART 3G gas detectors are designed for all applications.



SMART 3G D2



SMART 3G C2



SMART 3G C3



SMART 3G C2 LD



SMART 3G D3

Gas detected: flammable, toxic, CO2, VOC and refrigerant

Sensors: catalytic, infrared, electrochemical cell and PID

Outputs: analogue 4-20mA, RS485, relay

Certifications: hardware SIL2 and software SIL3, ATEX, IECEx

SMART 3G-GR1:
SMART 3G-Gr1 gas detectors are designed for use in mines, tunnels or areas classified Group 1

Gas detected: flammable and toxic

Sensors: catalytic, infrared, electrochemical cell

Outputs: analogue 4-20mA, RS485, relay

Certifications: hardware SIL2 and software SIL3, ATEX Group 1

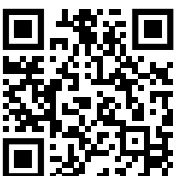
Also available with display



SMART 3G GR 1

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USE *AUGMENTED REALITY* TO DISCOVER MORE INFORMATION ABOUT OUR PRODUCTS



PHARMACEUTIC



Gas detection in the pharmaceutical industry is crucial in all processes: in laboratories, in production and in chemical processing to storage of materials and products.

Most detected gas:
OXYGEN (O₂), AMMONIA (NH₃), LPG, HYDROGEN (H₂), METHANE (CH₄), ACETONE (C₃H₆O), ETHYL ACETATE (C₄H₈O₂), HEXANE (C₆H₁₄), STYRENE (C₈H₈), PENTANE (C₅H₁₂), PROPANE (C₃H₈), BUTANE (C₄H₁₀), TOLUENE (C₆H₅CH₃)

POSSIBLE SOLUTION:
SMART 3G D3, C2-LD and MULTISCAN++S1 control unit

VISIT ON *SPATIAL*
A PHARMACEUTICAL
APPLICATION
IN VIRTUAL REALITY



WATER AND WASTEWATER



In wastewater plants, the most common hazards come from sources such as sewers, aeration tanks, sludge digestion tanks and deodorization plants.

Most detected gas:
METHANE (CH₄) HYDROGEN (H₂) CHLORINE (CL₂)
SULPHUR DIOXIDE (SO₂)
AMMONIA (NH₃) CARBON DIOXIDE (CO₂) ETHYLENE OXIDE (ETO) OZONE (O₃)

POSSIBLE SOLUTION:
SMART 3G C2
and PL4+ control unit

ENERGY STORAGE



Inside a Battery Energy Storage System (BESS) is essential to detect the presence of hydrogen, a highly flammable gas that can accumulate in battery charging and storage areas.

Detected gas:
HYDROGEN (H₂)

POSSIBLE SOLUTION:
SMART 3G C2 and
MULTISCAN++S1 control unit

PAPER INDUSTRY



In paper industry, gas detection is crucial during printing processes, coating and during paper bleaching or ink use.

Most detected gas:
METHANE (CH₄), HYDROGEN (H₂)
SULPHUR DIOXIDE (SO₂)
CHLORINE (CL₂)
AMMONIA (NH₃)
ETHYLENE OXIDE (ETO)

POSSIBLE SOLUTION:
SMART 3G D2 and
MULTISCAN++S2 control unit

SMART S

SMART



Due to their high customization, SMART-S gas detectors are designed for harsher and more aggressive environments.

Depending on the application, the detector can be customized by choosing sensor head, basic board and junction box.



SMART S-SS

Gas detected: flammable, toxic, CO₂, VOC and refrigerant

Sensors: catalytic, infrared, electrochemical cell and PID

Outputs: analogue 4-20mA, RS485, relay, HART modem

Certifications: hardware SIL 2 and Software SIL3, ATEX cat. 2 explosion-proof and IS, IECEx

Available with LED display



SMART S-MS

SMART S-MS MED: SMART S MS gas detectors are designed to withstand the harsh conditions of the marine environment and are MED certified for marine applications.

Gas detected: flammable and refrigerant

Sensors: catalytic, infrared

Outputs: analogue 4-20mA, RS485, relay

Certification: SIL, ATEX zone 1 cat. 2, IECEx, CCS, MED

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OIL & GAS



Gas detection is crucial during extraction, processing, and refining processes in the petrochemical industry.

Most detected gas:
METHANE (CH₄), ETHANE (C₂H₆), PROPANE (C₃H₈), HYDROGEN (H₂), HYDROGEN SULPHIDE (H₂S), SULPHUR DIOXIDE (SO₂), CARBON MONOXIDE (CO), CARBON DIOXIDE (CO₂), HYDROCHLORIC ACID (HCL), NITROGEN, VOLATILE ORGANIC COMPOUNDS (VOC)

POSSIBLE SOLUTION:
SMART S SS and MULTISCAN++S2 control unit

MARINE



In the marine industry, gas detection is critical to prevent hazards from ship exhaust, in addition the transportation of dangerous goods by sea may require monitoring for toxic and/or polluting gases.

Most detected gas:
METHANE (CH₄), PROPANE (C₃H₈), HYDROGEN (H₂), SULPHUR DIOXIDE (SO₂), AMMONIA (NH₃), CARBON MONOXIDE (CO), CHLORINE (CL₂), SULFURIC ACID (H₂SO₄), CARBON DIOXIDE (CO₂), VOLATILE ORGANIC COMPOUNDS (VOC), METHANOL (CH₃OH)

POSSIBLE SOLUTION:
SMART S-MS MED and MULTISCAN++MED control unit

SMART 3 and 3 NC

SMART



SMART 3 gas detectors are designed for use in non classified areas.



SMART 3H LITE

Gas detected: CO2 and refrigerant
Sensor: infrared
Output: RS485, relay



SMART 3H FM-LITE

Gas detected: CO2 and refrigerant
Sensor: infrared
Output: RS485, relay
Non-intrusive calibration via magnet
12-24 Vcc or 90-240 Vca power supply



SMART 3 R

Gas detected: flammable, toxic, CO2 and refrigerant

Sensors: infrared, catalytic, electrochemical cell

Output: analogue 4-20mA, RS485, relay
12-24 Vcc power supply. On request 90-240 Vac but without 4-20mA output



SMART 3 NC

Gas detected: flammable, toxic, CO2

Sensors: infrared, catalytic, electrochemical cell

Output: analogue 4-20mA, RS485, relay

Needs a control unit

MACHINERY ROOM



Engine rooms are confined spaces that often house complex engines and machinery that may run on diesel, gas or electric power.

Most detected gas:
METHANE (CH₄), PROPANE (C₃H₈), HYDROGEN (H₂), SULPHUR DIOXIDE (SO₂), AMMONIA (NH₃), CARBON MONOXIDE (CO), CHLORINE (CL₂), CARBON DIOXIDE (CO₂), VOLATILE ORGANIC COMPOUNDS (VOC)

POSSIBLE SOLUTION:
SMART 3-R

OXYGEN DETECTION IN MRI



A Magnetic Resonance Imaging machine requires the use of refrigerant gases that make it necessary to carefully detect the oxygen level.

Gas detected:
OXYGEN

POSSIBLE SOLUTION:
SMART 3 NC and PL4+ control unit

HOSPITAL



In the hospital sector, particularly within critical areas such as operating rooms or intensive therapy units, gas detectors are used to ensure the safety of environments.

Most detected gas:
OXYGEN (O₂), CARBON DIOXIDE (CO₂), METHANE (CH₄)

POSSIBLE SOLUTION:
SMART3 NC and PL4+ control unit



BUILDING AND HOTEL



Inside of buildings such as hospitals and hotels, it is necessary to detect possible leaks in air conditioning and refrigeration systems, as well as monitor environments such as kitchens, canteens, or laundries.

Most detected gas:
REFRIGERANT GAS A1 AND A2L, CO₂

POSSIBLE SOLUTION:
SMART 3H-lite and SMART 3H FM-lite



PK SYSTEM



SYSTEM

The **PK gas detection system** is designed to meet the European standard **EN 50545-1**. To operate, **SMART P** detectors need to be connected to a control unit, such as the **MULTISCAN++PK**.



SMART P

Gas detected:
flammable and toxic

Sensors:
catalytic, electrochemical cell

Output: RS485
EN 50545-1:2011+A1:2016
Compliance



MULTISCAN ++PK

Max input: 264

Max output: 520

Rack: 19"6U HE

Compliance: EN 50545-1:2011+A1:2016



Inside underground garages, air circulation can be complex and dangerous gas concentrations could increase the risk of explosion and poisoning.

Most detected gas:
LPG, METHANE (CH₄),
CARBON MONOXIDE (CO), VOLATILE ORGANIC
COMPOUNDS (VOC)

POSSIBLE SOLUTION:
SMART P AND
MULTISCAN++PK
CONTROL UNIT

VISIT ON *SPATIAL*
AN UNDERGROUND
PARK IN VIRTUAL
REALITY



MAINTENANCE

WHAT ARE THE BENEFITS OF PERFORMING PERIODIC MAINTENANCE?

- Reduce running costs
- Reduce environmental impact
- Ensure safety standards
- Extend the life cycle of instruments
- Prevent downtime
- Ensure system efficiency

ENTRUSTING PERIODIC MAINTENANCE TO SENSITRON MEAN:

- Start-up and testing of our products
- We also perform tests on systems that are already started and installed
- We ensure the highest security standards
- We configure the system to ensure the best performance



BIM + AR/VR

BIM (Building Information Modeling) is a digital approach to project delivery that allows the use of 3-D models instead of design drawings, fostering collaboration and ensuring access to up-to-date information while reducing error rates. This technology enables the creation of an information model containing useful information at every stage of design. All BIM files of our products are available on our website.

Benefits of using BIM files:

Digitization of processes, shared work environment, better management of work, implementation of new technologies such as AR and VR, reduction in errors, timeframes and management costs, sustainable policies.

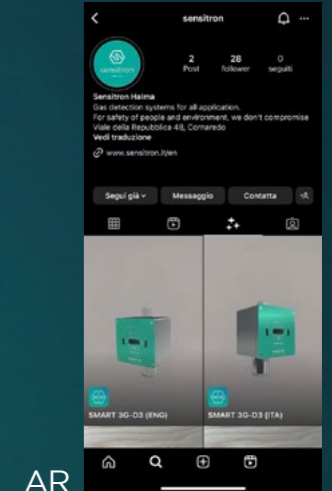


BIM

The use of Augmented Reality and the metaverse allows us to offer an immersive and interactive experience, enhancing engagement.

Augmented Reality aims to offer a three-dimensional view of our products, allowing everyone to explore them in detail from every angle. Within it, it is also possible to find information and technical data about the product itself.

With virtual reality, the intent is to immerse oneself in a digital future through the exploration of virtual spaces. In the "Sensitron HUB" space, it is possible to discover information regarding who Sensitron is and what it does, see our products in 3D, and learn more about the world of gas detection. Through the metaverse, real-world contexts have also been recreated, including a parking lot and a pharmaceutical chemical environment, to provide as much information as possible about how our products are useful.



VR



AR



sensitron

A Halma company

**Italian company
a world leader
in gas detection,
for all applications.**

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