

SMART S-MS

PREMIUM LINE GAS DETECTORS



- Rivelazione di gas esplosivi, tossici e ossigeno
- SIL 2(3) (EN50402 EN61508 part 1-7 TUV-SUD certified)
- IP 65 (optional IP67)
- Versione in alluminio o acciaio inox
- EN 60079-29-1 performance (CESI02ATEX084)

APPLICAZIONI

- Impianti chimici e petrolchimici
- Stazioni di compressione e turbine a gas
- Impianti farmaceutici
- Depositi di gas GPL e Metano
- Settore navale

- *Detection of flammable gases, toxic gases and Oxygen*
- *SIL 2(3) (EN50402 EN61508 part 1-7 TUV-SUD certified)*
- *IP 65 (optional IP67)*
- *Alloy or stainless steel version*
- *EN 60079-29-1 performance (CESI02ATEX084)*

APPLICATIONS

- *Petrochemical Plants*
- *Compressor stations and gas turbines*
- *Pharmaceutical industry*
- *LNG/LPG storage facilities*
- *Marine application*



DESCRIZIONE

I rivelatori di gas serie **SMART S-MS** (Marine & SIL) vengono impiegati per rivelare la presenza di sostanze infiammabili o tossiche in aree pericolose.

Progettati per garantire un'elevata protezione in ambienti particolarmente corrosivi, questa linea di rivelatori è la scelta ideale per applicazioni nel settore navale.

I rivelatori **SMART S-MS** sono certificati SIL2 Hardware e SIL3 Software e consentono di monitorare gas infiammabili (%LIE), gas tossici in ppm, oppure ossigeno, sia per carenza che per eccesso.

Questa linea di prodotti offre una scelta di sensori idonea a tutte le applicazioni: le teste SMART S sono infatti state progettate per offrire un'ampia gamma di alternative per offrire all'utilizzatore la soluzione più idonea alle specifiche richieste.

Il sensore **Pellistor**, utilizzato nelle versioni per miscele esplosive, compresi idrocarburi, ammoniaca, idrogeno e vapori di benzina, conferisce una linearità eccellente fino al 100% LIE.

Nei luoghi in cui la funzionalità dei Pellistori possa essere compromessa dalla presenza di sostanze avvelenanti, Sensitron propone una serie di sensori **infrarossi**: i sensori IR permettono di aggiungere affidabilità e durata, evitando i problemi di avvelenamento a cui i Pellistori sono a volte soggetti.

Per la rivelazione dei gas tossici Sensitron ha operato una selezione tra le più affidabili **celle elettrochimiche** per realizzare strumenti che rappresentino lo stato dell'arte nella rivelazione dei gas tossici. I rivelatori sono disponibili con custodia in lega di alluminio o in acciaio inox.

PRESTAZIONI PRINCIPALI

- Uscita 4-20 mA su 3 fili e Modbus RS485
- Ampia gamma di sensori e di gas rilevabili
- Modem Hart con scheda 3 relè (opzionale)
- Uscita 3 relè (opzionale)
- Certificati IECEx, ATEX II2G & SIL 2(3)

DESCRIPTION

SMART S-MS (Marine & SIL) line allows monitoring toxic and flammable gases in harsh environments.

Designed to offer increased resistance to corrosive elements, this range of products is ideal for marine application.

SMART S-MS offer SIL2 Hardware, SIL3 software approved capability and can detect flammable compounds (%LEL), toxic compounds (ppm) and Oxygen contents for both its depletion and enrichment.

They offer a complete range of sensor heads for all applications: the SMART S-HEAD line has been designed to offer a wide range of alternatives that grant customers the best solution to their requirements.

Pellistor sensors employed for all flammable gas detection, included hydrocarbons, ammonia, hydrogen, fuel and petrol vapours, show an excellent output linearity up to 100% LEL.

For aggressive atmospheres, where the Pellistor functionality might be seriously compromised by the presence of inhibitors or poisons, Sensitron proposes a range of industrial grade **Infrared** sensors: IR sensors are immune from poisoning and this guarantees a higher accuracy and a longer lifetime.

For the toxic gas detection, Sensitron has operated a reliable selection among the most performing **electrochemical cells** to supply units representing the state of the art in toxic gas detection.

The detectors can be housed in alloy or stainless steel enclosures.

MAIN FEATURES

- Output 4-20 mA 3 wires & RS485 Modbus
- Wide range of sensors and detectable gases
- Hart modem with 3-relay card (optional)
- 3-relay output (optional)
- Certifications: IECEx, ATEX II2G & SIL 2(3)



SMARTS-S range are SIL2 Hardware, SIL3 Software certified by Tüv Süd, according to EN 50402 & IEC 61508 part 1-7.

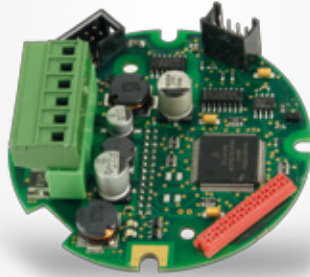
Sensing element	SIL Capability	Output	λ_{DU}	PFD _{avg}		Test Period
				Single detector	Redundant detectors	
Catalytic	SIL 2 (3)	4-20 mA	1.17×10^{-7} h	5.28×10^{-4}	5.31×10^{-5}	12 months
		Digital RS485	1.11×10^{-7} h	4.95×10^{-4}	4.97×10^{-5}	
Electrochemical	SIL 2 (3)	4-20 mA	1.34×10^{-7} h	6.05×10^{-4}	6.09×10^{-5}	12 months
		Digital RS485	1.27×10^{-7} h	5.71×10^{-4}	5.75×10^{-5}	
Infrared	SIL 2 (3)	4-20 mA	4.65×10^{-8} h	2.23×10^{-4}	1.12×10^{-5}	12 months
		Digital RS485	3.92×10^{-8} h	1.89×10^{-4}	9.50×10^{-6}	



ENCLOSURES & TRANSMITTERS



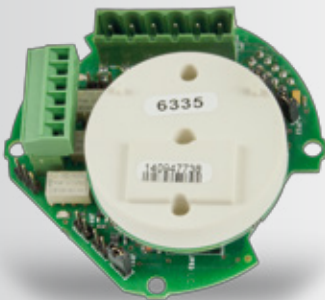
**S-MS 4AC enclosure
for S6 HEADS**



**Transmitter SMART S
4-20 mA RS 485**

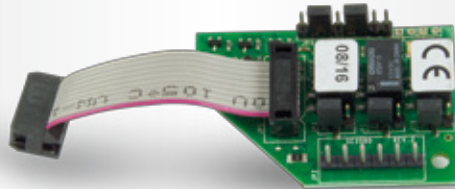


**S-MS 3AC enclosure
for S4 HEADS**

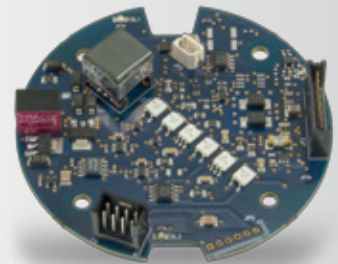


**Hart modem with
3-relay card**

OPTIONALS



3-relay card



**Intrinsically safe PCB
& galvanic isolation**

HEADS

S4[XXXGAS]



PEL - Industrial grade Pellistor
IRS - Infrared Technology
ECS - Premium Electrochemical Cell
CT-MOS - Sensor for H2S

S6[XXXGAS]



IRM - Innovative fast t90, POP-IR single point open path with mesh & dust cover

ACCESSORIES



**CALIBRATION
KEYPAD**



**CALIBRATION
ADAPTER**



RAIN SHIELD



GD - ADAPTER



**WEATHER
PROTECTION CONE**



**MESH & MEMBRANE
DUST COVER**

Technical specifications

Sensing element	Pellistor for flammable gas, Premium line EC cells for toxic gas, IR source or Pyro elements for NDIR sensors for flammable, refrigerants and CO2
Measuring range	100% LEL for flammable, ppm for toxic, % Vol. for O2 and CO2
Power supply	12-24Vdc -20% +15%
Consumption at 24 Vdc	Pellistor: 100 mA (medium); 160 mA (max) E.C. 70 mA (medium); 130 mA (max) IR: 110 mA (medium); 160 mA (max)
Proportional analog output	1 x 4-20 mA (300 Ω max; 200 Ω typical)
Proportional Serial Output	1 x RS485 and proprietary protocol for addressable gas control panel
Relay outputs	Optional 3-relay board with tension free changeover contact 24V-1A (non latching relay)
Resolution	0,5% Full scale
Warm-up time	2 minutes
Stabilization time	60 minutes for calibration
Storage temperature	-25°C ÷ +60°C (or limits of the sensor)
Operating temperature	-40°C ÷ +60°C (+65°C or 75°C on request) typically -30°C ÷ +50°C for EC cells
Relative humidity	20-90 % Rh / 40° C (5-95% RH non condensing, on request)
IP rating	IP 65 (IP67 with: STGD/AD3 adapter and IP67 cable gland)
Enclosure material	Aluminum (Stainless Steel AISI316 on request)
Input cable	2 or 3 x 3/4" NPT (depending on enclosure type)
Operative pressure	80-110 KPa
Max. air velocity	6 m/s
Weight	1500 g (2500 g with stainless steel enclosure)
Dimension (approx)	L 145 x H 190 x D 130 mm (L290 x H 145 x D 130 with POP-IR sensor)
Orientation	Detector shall be mounted sensor head downwards (horizontal for POP-IR)
ATEX certificates	CESI 17ATEX003X (ESR) CESI 02ATEX084 (EN 60079-29-1 performance)
EMC Reference Standards	EN 50270 EN 61000-6-4
Safety Integrity Level	SIL 2 (SIL 3 SW) C-IS-245120-01 by TÜV Sud

Detector performance, according to sensor head type

	CAT S4XXX series		IR S4XXX series		E-CELL S4XXX series		POP-IR (***) S6XXX series	
	CH4	Other flamm. gases	CH4	Other flamm. gases	CO	H2S	CH4	Other flamm. gases
Accuracy	±2% FS	±2,5%FS	±2% FS	±2% FS	±1% FS	±2% FS	±2% FS	±2% FS
Repeatability	±2% FS	±5% FS	±5% FS	±5% FS	±3% FS	±5% FS	±2% FS	±5% FS
Response time (t90)*	< 9sec	< 30sec	< 25sec	< 60sec	< 60sec	< 60sec	< 9sec (**)	< 20sec (**)
Sensor head material	Stainless Steel AISI316L							

(* According to IEC 60079-29-1 Paragraphs 5.3.3 & 5.4.16

(**) POP-IR sensor head without rain and dust protection

(***) Standard for CH4 and Propane; other flammable gases on request



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Due to Sensitron commitment to research, design and product improvement, specifications are subject to change without notice.