




Mining And Surface Certification (Pty) Ltd

2015/021934/07

THIS CERTIFICATE IS ISSUED AS AN I.A. CERTIFICATE IN TERMS OF THE MINE HEALTH AND SAFETY ACT, ACT NO 29 OF 1996 (AND REGULATIONS), THE OCCUPATIONAL HEALTH AND SAFETY ACT (ACT 85 OF 1993) AND REGULATION 17 OF THE ELECTRICAL MACHINERY REGULATIONS

IA CERTIFICATE	MASC S/23-8584X	Issue	1
Issue Date	07 May 2025	Expiry Date	29 September 2026
** Based on Certificate No	IECEx FMG 21.0019X	Issue / Variations / Amendment	5
Requested by	MSA – The Safety Company 1000 Cranberry Woods Township, PA 16066 United States of America		
Manufacturer	General Monitors Inc 16782 Von Karman Ave. Unit 14, Irvine, CA 92606 United States of America		
Description	The S5000 Gas Monitor fixed gas detection system is designed to measure specified percentage volumes of combustible gases or a variety of toxic gases or oxygen. The system comprises of an S5000 transmitter base unit and an optional S5000 Junction Box or JB5000 Junction Box fitted with an arrangement of up to a pair of two factory-configured combustible, toxic or oxygen gas sensors. The transmitter enclosure is fitted with associated circuitry, connection facilities and an LED display visible through the viewing window of the enclosure. See **Base certificate Annex for additional information.		
Equipment	Gas Monitor Gas Detection System	Type	S5000
MARKING: Original marking as per certificate ** remains applicable. IA number must be added.	Type: Ex Marking: IA Number: Warnings:	S5000 Gas Monitor Gas Detection System See Base Certificate ** MASC S/23-8584X (To be additionally marked on equipment) See Base Certificate ** (original marking must be applied)	
Quality Assurance report (QAR) / Notification (QAN):	GB/CML/QAR22.0009/01 US/UL/QAR10.0004/11 FR/INE/QAR08.0011/14		
Compliance: The equipment as described above has been allocated the rating <u>Explosion Protected 'as above'</u> utilizing the SANS/IEC Standards: <ul style="list-style-type: none"> • SANS (IEC) 60079-0: 2019 Equipment - General requirements • SANS (IEC) 60079-1: 2015 Equipment protection by flameproof enclosures "d" • SANS (IEC) 60079-15: 2010 Equipment protection by type of protection "n" • SANS (IEC) 60079-29-1: 2022 Gas detectors – Performance requirements of detectors for flammable gases • SANS (IEC) 60079-31: 2014 Equipment dust ignition protection by enclosure "t" <i>Note: This certificate covers only the listed standards and does not imply compliance to any other standard, related or inferred. It is up to the manufacturer to ensure that the product complies to all relevant standards for the application.</i>			
Specific conditions of use "X": <ul style="list-style-type: none"> • Refer to Annex A below for more details. 			
Conditions of manufacture: <ul style="list-style-type: none"> • Refer to Annex A below for more details. 			
 S. JORDAAN TECHNICAL SPECIALIST		 N. VILOJEN TECHNICAL OFFICER	
<p>This certificate covers all units sold as long as the QAR/QAN remains valid. According to the relevant requirements of the MHS Act and the OHS Act, production units of explosion protected equipment are required to comply with third party quality assurance (an approved mark scheme or batch testing by an accredited test laboratory).</p>			

Apparatus in hazardous locations is subject to the following provisions as applicable, which shall be adhered to:
SANS 10086 requirements;
Any conditions mentioned in the above certificate;
Any relevant requirements of the MHS Act;
Any restrictions and conditions enforced by the chief inspector of mines, principal inspector (Group I equipment) or chief inspector of factories (Group II equipment).

This certificate may only be reproduced in full
The certificate is not transferable and remains the property of the issuing body.

IA CERTIFICATE: MASC S/23-8584X
Equipment: S5000 Gas Monitor Gas Detection System
(Expiry date: 29 September 2026)

ANNEX A

This document is based on and must be read in conjunction with certificate IECEx FMG 21.0019X.	
Description (According to Base Certificate) **	
"Refer to description in Base Certificate ** (and any applicable schedules/issues/variations)."	
Issue	Issue 1: Supplemented for review as per ARP 0108 and NCoP 2398.
Standard compliance	See Base Certificate**
Specific conditions of use ("X")	<ul style="list-style-type: none"> • See Base Certificate** Annex
Conditions of manufacture	<ul style="list-style-type: none"> • None.
Conditions of Certification	<ul style="list-style-type: none"> • This IA Certificate covers all units sold from the date of this document to the expiry date of this certificate. • As per ARP 0108: 2018 / NCoP 2398: 2022 (as applicable) a maximum three yearly review is required on this IA Certificate (expiry is determined as per the QAR/QAN/QMS expiry date). • The apparatus must be additionally marked with the MASC marking details above. • This approval only covers the equipment as certified above and does not include any scheduled additions or variations / amendments / new issues to the certificate(s), made after the above date. • The equipment does not need to be re-tested when used on the conditions and with such restrictions as prescribed by the certificate on which this IA Certificate is based and any other conditions in this IA Certificate. • The certification on which this IA Certificate is based must remain valid. • The extent of the requirements in the ARP 0108:2018 / NCoP 2398: 2022 (as applicable), SANS 10108 and any other applicable regulations on the certification of the equipment must remain unchanged. • The Ex-quality assurance notification/report for the equipment must remain valid.
Conclusion:	<ul style="list-style-type: none"> • From the above and the selective examination of the documentation, nothing contrary to the requirements of the applicable standards was found, provided that the equipment / component is used as described in the above document / certificate and according to the MASC conditions below. A MASC IA certificate is issued based on the work done as per the Base Certificate **. • The routine tests for production units according to the Base Certificate ** must be complied with (if applicable).

This document is issued based on Mining And Surface Certification's Standard Contract terms and conditions available on request.

While every endeavour is made to ensure that a test / assessment / inspection is representative and accurately performed, and that a report / certificate is accurate in the quoted results and conclusions drawn from the test / assessment / inspection, MASC or its directors/employees shall in no way be liable for any error made in carrying out the test / assessment or for any erroneous statement, whether in fact or in opinion, contained in a report / certificate issued pursuant to a test / assessment / inspection.

MASC takes no responsibility for any non-conformances, exclusions, or any results / assessments / inspections not in compliance with the standards. By marking the equipment in accordance with the documentation / standard, the manufacturer / applicant attests on his own responsibility that the equipment / installation has been designed and constructed in accordance with the applicable requirements of the relevant standards and documentation, that the routine verifications / routine tests have been correctly completed and the equipment / installation complies with the documentation and standard(s).

This document is only for use and application in South Africa. It is issued based on National interpretations and accepted practices.

This document may only be reproduced in full.
This certificate is not transferable and remains the property of the issuing body.
This document will not be supported by MASC for certification purposes outside the borders of South Africa.

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IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	IECEX FMG 21.0019X	Page 1 of 5	<u>Certificate history:</u>
Status:	Current	Issue No: 5	Issue 4 (2024-12-26)
Date of Issue:	2025-03-27		Issue 3 (2024-11-19)
Applicant:	General Monitors Inc 16782 Von Karman Ave. Unit 14 Irvine, CA 92606 United States of America		Issue 2 (2024-04-04)
Equipment:	S5000 Gas Monitor Gas Detection System		Issue 1 (2022-08-17)
Optional accessory:			Issue 0 (2022-07-22)
Type of Protection:	Flameproof, Dust Protection by Enclosure, Nonsparking, and Gas Detector Performance		
Marking:	Refer to certificate annex for full marking.		

Approved for issue on behalf of the IECEx
Certification Body:

J. E. Marquedant

Position:

VP, Manager - Electrical Systems

Signature:
(for printed version)

Date:
(for printed version)

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.



Certificate issued by:

FM Approvals LLC
One Technology Way
Norwood MA 02062
United States of America

FM Approvals



IECEX Certificate of Conformity

Certificate No.: **IECEX FMG 21.0019X**

Page 2 of 5

Date of issue: 2025-03-27

Issue No: 5

Manufacturer: **General Monitors Inc**
16782 Von Karman Ave.
Unit 14
Irvine, CA 92606
United States of America

Manufacturing locations: **General Monitors (Ireland) Ltd**
Ballybrit Business Park
Galway
Ireland

MSA - THE SAFETY COMPANY
1000 Cranberry Woods Dr
Cranberry Township
Pennsylvania 16066-5296
United States of America

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :

The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

[IEC 60079-0:2017](#) Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

[IEC 60079-1:2014](#) Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
Edition:7.0

[IEC 60079-15:2010](#) Explosive atmospheres - Part 15: Equipment protection by type of protection "n"
Edition:4

[IEC 60079-29-1:2016](#) Explosive atmospheres – Part 29-1: Gas detectors – Performance requirements of detectors for flammable gases
Edition:2.0

[IEC 60079-31:2013](#) Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"
Edition:2

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Reports:

[US/FMG/ExTR21.0023/00](#)
[US/FMG/ExTR21.0023/03](#)

[US/FMG/ExTR21.0023/01](#)
[US/FMG/ExTR21.0023/04](#)

[US/FMG/ExTR21.0023/02](#)

Quality Assessment Reports:

[FR/INE/QAR08.0011/14](#)

[GB/CML/QAR22.0009/01](#)

[US/UL/QAR10.0004/11](#)



IECEX Certificate of Conformity

Certificate No.: **IECEX FMG 21.0019X**

Page 3 of 5

Date of issue: 2025-03-27

Issue No: 5

EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

The S5000 Gas Monitor fixed gas detection system is designed to measure specified percentage volumes of combustible gases or a variety of toxic gases or oxygen. The system comprises of an S5000 transmitter base unit and an optional S5000 Junction Box or JB5000 Junction Box. The S5000 Gas Monitor supports two Digital Sensors, one ULTIMA XIR Plus sensor and one Digital Sensor simultaneously, or one IR400 point IR detector and one Digital Sensor simultaneously. The device only supports one passive sensor, either a combustible catalytic bead sensor for combustible gases or a metal oxide semiconductor (MOS) sensor for H₂S.

Refer to the Annex for additional information.

SPECIFIC CONDITIONS OF USE: YES as shown below:

See Annex



IECEX Certificate of Conformity

Certificate No.: **IECEX FMG 21.0019X**

Page 4 of 5

Date of issue: 2025-03-27

Issue No: 5

Equipment (continued):

See Annex



IECEX Certificate of Conformity

Certificate No.: **IECEX FMG 21.0019X**

Page 5 of 5

Date of issue: 2025-03-27

Issue No: 5

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

The firmware version of the Toxic Digital Sensors with Diffusion Supervision is increased from 4.0.9 to 5.2.3. The IECEx certification is not affected, as the digital sensors are not currently performance tested to the IEC 62990-1 standard. In addition, the following changes were made to the product listing: the IR400 sensors are updated to reference an additional IECEx certificate, the description of the Universal Gas HC Sensors are updated to replace the text "general purpose flammable gas" with "methane and propane", and two model codes of the S5000 Junction Boxes have been corrected.

Annex:

[IECEX FMG 21.0019X 05 Annex.pdf](#)

Annex to: IECEx FMG 21.0019X Issue 5
Applicant: General Monitors Inc
Apparatus: S5000 Gas Monitor Gas Detection System

Marking:

1. S5000 Gas Monitor

Ex db IIC T5 Gb (WITH CEMENTED WINDOW JOINT)
Ex db IIB+H2 T5 Gb (WITH NON-CEMENTED, FLANGED WINDOW JOINT)
Ex nA nC IIC T4 Gc
Ex tb IIIC T85°C Db
Ta = -55°C to +75°C
60079-29-1
IP66

WHEN USING PASSIVE SINTERED SENSORS
Ex db IIC T4 Gb (WITH CEMENTED WINDOW JOINT)
Ex db IIB+H2 T4 Gb (WITH NON-CEMENTED, FLANGED WINDOW JOINT)
Ta = -40°C to +70°C

2. S5000 Junction Box

Ex db IIC T6 Gb (WITH CEMENTED WINDOW JOINT)
Ex db IIB+H2 T6 Gb (WITH NON-CEMENTED, FLANGED WINDOW JOINT)
Ex nA IIC T6 Gc
Ex tb IIIC T85°C Db
Ta = -55°C to +75°C
60079-29-1
IP66

WHEN USING PASSIVE SINTERED SENSORS
Ex db IIC T4 Gb (WITH CEMENTED WINDOW JOINT)
Ex db IIB+H2 T4 Gb (WITH NON-CEMENTED, FLANGED WINDOW JOINT)
Ta = -40°C to +70°C

3. Digital Sensor (With Sintered Flame Arrestor)

Ex db IIC T5 Gb
Ex tb IIIC T85°C Db
Ex db nA IIC T5 Gc
Ta = -55°C to +60°C
60079-29-1
IP65

4. Digital Sensor (With Sintered Flame Arrestor)

Ex nA IIC T5 Gc
Ta = -55°C to +60°C
IP65

Annex to: IECEx FMG 21.0019X Issue 5

Applicant: General Monitors Inc

Apparatus: S5000 Gas Monitor Gas Detection System

Description of Equipment:

The S5000 Gas Monitor consists of an S5000 Transmitter and an optional S5000 Junction Box or JB5000 Junction Box. The S5000 Gas Monitor supports two Digital Sensors, one ULTIMA XIR Plus sensor and one Digital Sensor simultaneously, or one IR400 point IR detector and one Digital Sensor simultaneously. The device only supports one passive sintered sensor, either a combustible catalytic bead sensor for combustible gases or a metal oxide semiconductor (MOS) sensor for H₂S. The sensors may be connected integral to the transmitter or remote via the S5000 or JB5000 Junction Box.

The S5000 Gas Monitor enclosure consists of a single 316 stainless steel compartment enclosure and is provided with ¾" NPT threaded entries and a certified adapter is supplied for M25 entries which can be fitted with the sensors described below or suitably certified cable entry devices or blanking plugs.

The S5000 Junction Boxes are the remote mounting units of the S5000 Gas Monitor fixed gas detection system. The S5000 enclosures are provided with either ¾" NPT or M25 threaded entries, and a certified adapter can be supplied for M25 entries which can be fitted with sensors approved for use with the S5000 Gas Monitor fixed gas detection system, suitably certified cable entry devices, or blanking plugs. The equipment enclosure has been separately tested against the requirements of EN 60529 and meets IP66.

The S5000 Digital Sensor (with sintered flame arrestor) consists of a sensor body and a combustible gas, toxic gas, or oxygen sensing element. The sintered flame arrestor is located in the lower sensor element housing assembly, which has a fine thread pattern machined in to mate to the thread pattern of the upper sensor body assembly. The Digital Sensors are constructed of stainless steel and include a ¾" NPT thread for connection to the S5000 Transmitter. Remote connection requires the S5000 Junction Box or JB5000 Junction Box.

Model Code Options:

1. S5000 Gas Monitor

S5000-a-b-c-d-e-f-g-h, S5000 Gas Monitor

a is for Enclosure Material:

- 2 = Stainless Steel – IIB+H₂ (with flanged, non-cemented window joint)
- 3 = Stainless Steel – IIC (with cemented window joint)

b is for Outputs:

- 0 = Bluetooth/ Modbus/ HART 1.25 mA
- 1 = Bluetooth/ Modbus/ HART 3.5 mA
- 2 = Bluetooth/ Modbus/ HART 1.25 mA/ RELAYS
- 3 = Bluetooth/ Modbus/ HART 3.5 mA/ RELAYS
- 4 = No Bluetooth/ Modbus/ HART 1.25 mA
- 5 = No Bluetooth/ Modbus/ HART 3.5 mA
- 6 = No Bluetooth/ Modbus/ HART 1.25 mA/ RELAYS
- 7 = No Bluetooth/ Modbus/ HART 3.5 mA/ RELAYS

c is for Relay State:

- 0 = No Relays
- 1 = Latch Alarm / Non-Latch Warn De-Energized
- 2 = Latch Alarm / Non-Latch Warn Energized
- 3 = Latch Alarm / Latch Warn De-Energized
- 4 = Latch Alarm / Latch Warn Energized
- 5 = Non-Latch Alarm / Non-Latch Warn De-Energized
- 6 = Non-Latch Alarm / Non-Latch Warn Energized
- 7 = Non-Latch Alarm / Latch Warn De-Energized
- 8 = Non-Latch Alarm / Latch Warn Energized

d is for Agency Approval:

- 1 = ATEX/IECEx/UKEX

Annex to: IECEx FMG 21.0019X Issue 5

Applicant: General Monitors Inc

Apparatus: S5000 Gas Monitor Gas Detection System

e is for Custom Features:

- 00 = None (standard)
- 01 = Stainless Steel Tag
- 02 = HART Off (Factory Setting, customer can enable later)
- 03 = Stainless Steel Tag / Hart Off (Factory Setting, customer can enable later)
- 04 = UI Assy –1 with Bluetooth Disabled
- 05 = Stainless Steel Tag / UI Assy –1 with Bluetooth Disabled
- 06 = BCM Modbus (Isolated)
- 07 = SS Tag/BCM Modbus (Isolated)

fff is for Sensor 1 selection: See Approved Sensors table below

- Cxx = Passive Sintered Sensor (Combustible)
- Dxx = Digital Sensor
- Mxx = Passive Sintered Sensor (Toxic)
- Rxx = IR Series Combustible Sensor
- xx = Ultima XIR Plus Sensor

ggg is for Sensor 2 selection: See Approved Sensors table below

- 000 = No Sensor or Sensor Body
- Dxx = Digital Sensor

h is for Paint Options:

- 0 = no paint
- 1 = Gray
- 2 = Blue
- 3 = Yellow
- 4 = White

Specifications:

Sensor Type:	See Sensor Table for sensor type
Gases:	See Sensor Table for approved gases
Range:	See Sensor Table for ranges
Installation:	Fixed
Sampling Type:	See Sensor Table for sampling type
Accuracy:	See Sensor Table for sensor accuracy
Response Time:	See Sensor Table for response time
Supply Parameters:	12-30 Vdc, 13.7W maximum
Operating Temperature:	-55°C to +75°C -40°C to +70°C (when installed with passive sintered sensors as identified in the Sensor Table)
Storage Temperature:	-50°C to +85°C
Relative Humidity:	5 to 95% RH non-condensing
Measurement Signal:	Two 4-20mA, LED Display
Alarms:	LED Display, Relay (5A 30Vdc / 250Vac)
Ingress Protection:	IP66
Firmware:	NXP Microprocessor: 2.00.0065 ST Microprocessor: 4.01.0011

Annex to: IECEx FMG 21.0019X Issue 5

Applicant: General Monitors Inc

Apparatus: S5000 Gas Monitor Gas Detection System

Sensor Table - Sensors permitted for use with the S5000 Gas Monitor:

Product / Listing Title	Model Code	Gas / Description	Range	Certificate Number
Ultima XIR Plus Combustible Gas Sensors	See Sensor Table in the associated product listing of the referenced certificate			IECEX FMG 21.0021X
Digital Sensors	See Sensor Table in the associated product listing of the referenced certificate			IECEX FMG 21.0019X
IR400	R00	No Sensor	N/A	IECEX CML 23.0018X
IR400-1065	R43	Methane - CH ₄	0-100% LFL	IECEX CML 23.0018X
IR400-1067	R44	Propane - C ₃ H ₈	0-100% LFL	IECEX CML 23.0018X
IR400-2593	R45*	Hexane - C ₆ H ₁₄	0-100% LFL	IECEX CML 23.0018X
IR400-2611	R46*	Pentane - C ₅ H ₁₂	0-100% LFL	IECEX CML 23.0018X
IR400-1069	R47*	Butane - C ₄ H ₁₀	0-100% LFL	IECEX CML 23.0018X
IR400-1108	R48*	Ethane - C ₂ H ₆	0-100% LFL	IECEX CML 23.0018X
IR400-1533	R50*	Ethylene - C ₂ H ₄	0-100% LFL	IECEX CML 23.0018X
Passive Sintered Sensors				
Universal Gas HC Sensor (Combustible)	C00	No Sensor	N/A	N/A
11159-1L	C07	Methane - CH ₄ Propane - C ₃ H ₈	0-100% LFL	N/A
11159-2L	C08	Methane - CH ₄ , High Temperature Propane - C ₃ H ₈ , High Temperature	0-100% LFL	N/A
11159-8L	C09	Methane - CH ₄ Propane - C ₃ H ₈	0-20% LFL	N/A
11159-8	C10	Methane - CH ₄ Propane - C ₃ H ₈	0-20% LFL	N/A
11159-1	C11	Methane - CH ₄ Propane - C ₃ H ₈	0-100% LFL	N/A
11159-2	C12	Methane - CH ₄ , High Temperature Propane - C ₃ H ₈ , High Temperature	0-100% LFL	N/A
Universal Gas H ₂ S Sensor (Toxic)	M00*	No Sensor	N/A	N/A
51457-1L	M11*	Hydrogen Sulfide - H ₂ S	0-100 ppm	N/A
51457-5L	M12*	Hydrogen Sulfide - H ₂ S	0-50 ppm	N/A
51457-9L	M13*	Hydrogen Sulfide - H ₂ S	0-20 ppm	N/A

Annex to: IECEx FMG 21.0019X Issue 5

Applicant: General Monitors Inc

Apparatus: S5000 Gas Monitor Gas Detection System

Product / Listing Title	Model Code	Gas / Description	Range	Certificate Number
51457-1	M14*	Hydrogen Sulfide - H ₂ S	0-100 ppm	N/A
51457-5	M15*	Hydrogen Sulfide - H ₂ S	0-50 ppm	N/A
51457-9	M16*	Hydrogen Sulfide - H ₂ S	0-20 ppm	N/A

*Denotes sensors that do not have performance certification to IEC 60079-29-1.

Accessories - The following accessories are included in the Approval:

CALKIT1	Calibration Kit for Digital Gas Sensors & ULTIMA XIR Plus Sensors
1400270	Calibration Kit for IR400 Point IR Detector

2. S5000 Junction Boxes

Model Reference	Description
324240-5, 324240-9, 324240-13, 324240-17, 324240-21	S5000 Junction Box; Stainless Steel, (with non-cemented, flanged window joint)
324240-2, 324240-6, 324240-10, 324240-14, 324240-18	S5000 Junction Box; Aluminum, (with non-cemented, flanged window joint)
324240-7, 324240-11, 324240-15, 324240-19, 324240-22	S5000 Junction Box; Stainless Steel, (with cemented window joint)
324240-4, 324240-8, 324240-12, 324240-16, 324240-20	S5000 Junction Box; Aluminum, (with cemented window joint)

3. Digital Sensors (With Sintered Flame Arrestor)

A-5K-SENS-aa-b-c-d-e, Digital Sensor (With Sintered Flame Arrestor)

a is for Gas Type:

See Sensor Table below

b is for material type:

0 = Stainless Steel

1 = Aluminum

c is for listed Approval:

A = IECEx/ATEX/UKEX

d is for Sensor Body Thread Type:

0 = No Sensor Body

1 = 3/4 NPT

2 = M25

e is for Advanced Option:

0 = none

Annex to: IECEx FMG 21.0019X Issue 5

Applicant: General Monitors Inc

Apparatus: S5000 Gas Monitor Gas Detection System

Sensor Table:

Model Code	Approved Gas	Range
00	No Sensor or Sensor Body (transmitter only)	N/A
01	No Sensor (Sensor Body with blank element and sintered flame arrestor)	N/A
60	Methane - CH ₄	0-100% LFL – 5.0% vol
61	Propane - C ₃ H ₈	0-100% LFL – 2.1% vol
62	Heptane - C ₇ H ₁₆	0-100% LFL – 1.05% vol
63	Nonane - C ₉ H ₂₀	0-100% LFL – 0.8% vol
64	Hydrogen - H ₂	0-100% LFL – 4.0% vol
65	Methane - CH ₄	0-100% LFL – 4.4% vol
66	Propane - C ₃ H ₈	0-100% LFL – 1.7% vol
67	Heptane - C ₇ H ₁₆	0-100% LFL – 0.85% vol
68	Nonane - C ₉ H ₂₀	0-100% LFL – 0.7% vol
XX	Any two digit letter representing: - Combustible Type gas sensor with sintered flame arrestor, not verified by FM Approvals for the specific flammable gas for performance to IEC 60079-29-1, or - Oxygen or Toxic sensor with sintered flame arrestor, not verified by FM Approvals for performance.	N/A

Specifications:

Sensor Type:	Catalytic Bead
Sampling Type:	Diffusion
Accuracy:	±5% F.S.
Response Time:	t(90) ≤ 60 s
Operating Temperature:	-50°C to +60°C
Storage Temperature:	-40°C to +60°C
Relative Humidity:	5 to 95% RH, non-condensing
Firmware:	1.0.1

Annex to: IECEx FMG 21.0019X Issue 5
Applicant: General Monitors Inc
Apparatus: S5000 Gas Monitor Gas Detection System

4. Digital Sensors (Without Sintered Flame Arrestor)

A-5K-SENS-aa-b-c-d-e, Digital Sensor (Without Sintered Flame Arrestor)

a is for Gas Type:

See Sensor Table below

b is for material type:

0 = Stainless Steel

1 = Aluminum

c is for listed Approval:

A = IECEx/ATEX/UKEX

d is for Sensor Body Thread Type:

0 = No Sensor Body

1 = 3/4 NPT

2 = M25

e is for Advanced Option:

0 = none

Sensor Table:

Model Code	Approved Gas	Range
00	No Sensor or Sensor Body (transmitter only)	N/A
02	No Sensor (Sensor Body with blank element, without a sintered flame arrestor)	N/A
XX	Any two digit letter representing a gas sensor without a sintered flame arrestor, not verified for performance.	N/A

Specifications:

Sensor Type:	Electrochemical
Sampling Type:	Diffusion
Accuracy:	N/A
Response Time:	N/A
Operating Temperature:	-50°C to +60°C
Storage Temperature:	-40°C to +60°C
Relative Humidity:	5 to 95% RH, non-condensing
Firmware:	1.0.1

Annex to: IECEx FMG 21.0019X Issue 5

Applicant: General Monitors Inc

Apparatus: S5000 Gas Monitor Gas Detection System

Specific Conditions of Use:

1. S5000 Gas Monitor

1. For any sensors not specifically identified as having performance testing, the sensors shall require additional evaluation if used within a safety related system.
2. Under certain extreme circumstances, the non-metallic parts incorporated in the enclosure of this equipment may generate an ignition-capable level of electrostatic charge. Therefore, the equipment shall only be cleaned with a damp cloth.
3. This fixed equipment apparatus is exclusively designed for field mounting in the vertical orientation with restrictions placed around the conduit entry locations permitted for connection of the Digital Sensors, ULTIMA XIR Plus sensors, and passive sensors. The equipment is subject to the installation and orientation requirements defined in the product manual.
4. The flameproof joints shall not be repaired.
5. It is recommended to end users to seek guidance provided in EN 60079-29-2 for installation, use and maintenance of gas detectors for flammable gases and other applicable gases.
6. Guidance for functional safety of fixed gas detection systems are set out in EN 60079-29-3 which has not been covered in the scope of this assessment.
7. The user shall comply with the requirements given in the manufacturer's user documentation in regard to all relevant functional safety aspects such as application of use, installation out of hazardous areas, operation, maintenance, proof tests, maximum ratings, environmental conditions, and repair.
8. Selection of this equipment for use in safety functions, configuration, overall validation, maintenance and repair shall only be carried out by competent personnel, observing all the manufacturer's conditions and recommendations in the user documentation.
9. The safety related device must be functioning and powered independently of any control devices required for operation.
10. Further assessment shall be required when the safety device is combined with specific Equipment under Control and before the safety device is used to control risks of explosion.

2. S5000 Junction Box

1. Under certain extreme circumstances, the non-metallic parts incorporated in the enclosure of this equipment may generate an ignition-capable level of electrostatic charge. Therefore, the equipment shall only be cleaned with a damp cloth.
2. The flameproof joints shall not be repaired.

3. Digital Sensors

1. For any sensors not specifically identified as having performance testing, the sensors shall require additional evaluation if used within a safety related system.
2. Under certain extreme circumstances, the non-metallic parts incorporated in the enclosure of this equipment may generate an ignition-capable level of electrostatic charge. Therefore, the equipment shall only be cleaned with a damp cloth.
3. The flameproof joints shall not be repaired.
4. If the sensor is uninstalled, the equipment instruction manual shall be referenced prior to reinstalling.
5. The Digital Sensor is provided with a 3/4" NPT thread and shall only be connected to a suitably certified enclosure. The installation to the certified enclosure shall be with five fully engaged threads, tightened wrench-tight.
6. The Digital Sensor shall be connected directly to a suitably certified junction box or instrument for the hazardous area of installation and thereby provide Ex protection for the flying lead connections.
7. For combustible gas detection performance applications, the appropriate Digital Sensor model number shall only be used to construct the S5000 Gas Monitor fixed gas detection system; mounted onto either the S5000 transmitter, S5000 Junction Box enclosure, or JB5000 Junction Box enclosure and receive power and control from the transmitter.

Annex to: IECEx FMG 21.0019X Issue 5

Applicant: General Monitors Inc

Apparatus: S5000 Gas Monitor Gas Detection System

8. The Ingress Protection rating is exclusively based upon the installation instruction for orientation specified in the operating manual.
9. The Digital Sensor shall only be installed for external connection to suitably certified equipment (transmitters) providing transient protection set at a maximum transient overvoltage of 119 V (140% of 85 V_{peak}).
10. The Digital Sensor shall only be fitted to enclosures having a maximum reference pressure of 34.4 bars or lower. It is recommended to end users to seek guidance provided in EN 60079-29-2 for installation, use and maintenance of gas detectors for flammable gases and other applicable gases.
11. Guidance for functional safety of fixed gas detection systems are set out in EN 60079-29-3 which has not been covered in the scope of this assessment.

Full Certificate change history

Issue 0

Issue 1 – This issue introduced the following changes:

1. Deleted the Coding/System Limitations column, as this information is redundant from the markings.
2. Updated specific conditions of use to align with US/CA/ATEX/UKEX text.

Issue 2 – Updated General Monitors Ireland QAR.

Issue 3 – The equipment was updated to replace microprocessors for the S5000 Gas Monitor, the Toxic Digital Sensor, and the XIR Plus Sensor (for MSA Innovation LLC). In addition, firmware was updated to the equipment. The description of equipment and the structure of the equipment listing were updated to better detail the equipment approved, the specifications of the equipment, and which sensors are permitted for use in the system. The listing for the Digital Sensors was separated from the S5000 Gas Monitor listing. The humidity range for the Combustible Digital Sensors was increased to 95 %RH.

Issue 4 – The humidity range for the Combustible Digital Sensors has been extended to a range of 5% RH to 95% RH, non-condensing. There are no firmware or hardware changes as a result of this revision. The term "General Purpose" is updated to "General Purpose Flammable Gas" to provide clarity. The specific conditions of use for the Digital Sensors have been updated to align with other certification schemes.

Issue 5 – The firmware version of the Toxic Digital Sensors with Diffusion Supervision is increased from 4.0.9 to 5.2.3. The equipment listing is updated as follows: The IR400 sensors are updated to reference an additional IECEx certificate, the description of the Universal Gas HC Sensors are updated to replace the text “general purpose flammable gas” with “methane and propane”, and two model codes of the S5000 Junction Boxes have been corrected.