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**	0
Issue Date	04 December 2023	**Expiry Date**	17 June 2025
**** Based on Certificate No**	IECEx FMG 21.0019X	**Issue / Variations / Amendment**	1
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	S5000 Gas Monitor fixed gas detection system (Transmitter and Junction Boxes) and Digital Sensor (With FRIT and No FRIT).		
MARKING: **Original marking as per certificate ** remains applicable.** **IA number must be added.**	**Type:** **Ex Marking:** **IA Number:** **Warnings:**	S5000 Gas Monitor fixed gas detection system (Transmitter and Junction Boxes) and Digital Sensor (With FRIT and No FRIT). 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):	US/UL/QAR10.0004/10		

Compliance:

The equipment as described above has been allocated the rating Explosion Protected 'as above' utilizing the SANS/IEC Standards:

- 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: 2016 Gas detectors – Performance requirements of detectors for flammable gases
- SANS (IEC) 60079-31: 2014 Equipment dust ignition protection by enclosure "t"

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.

Special conditions of safe use "X":

- Refer to Annex A below for more details.

Conditions of manufacture:

- Refer to Annex A below for more details.

C. WELTHAGEN
TECHNICAL SPECIALIST

N. VILOJEN
TECHNICAL OFFICER

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).

ANNEX A

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).

Mining And Surface Certification (Pty) Ltd
Unit 5 Lelyta Park, 45 Jurg Avenue, Hennopspark, Ext 87
Centurion 0157

IA CERTIFICATE: MASC S/23-8584X

Equipment: S5000 Gas Monitor fixed gas detection system (Transmitter and Junction Boxes) and Digital Sensor (With FRIT and No FRIT).

(Expiry date: 04 December 2026)

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)."	
Standard compliance	See Base Certificate **
Special conditions of safe use ("X")	• See Base Certificate**.
Conditions of manufacture	S5000 transmitter: • Dielectric Voltage Withstand Test (per IEC 60079-15, clause 23.2.1) At the end of manufacture, each S5000 transmitter shall be subjected to an electric strength test using a test voltage of 1500 Vac or 2100 Vdc applied between the following test locations for a minimum of 60 seconds. Alternatively, a voltage of 1800 Vac or 2520 Vdc may be applied for 0.1 second. There shall be no evidence of breakdown. a. Between the input terminals and the relay terminals. b. Between the metallic enclosure and the relay terminals. Digital Sensor (With FRIT and No FRIT) models: • Dielectric Voltage Withstand Test (per IEC 60079-15, clause 23.2.1) This testing may be performed on the complete Digital Sensor assembly (upper housing and sensor) or separately on the upper housing and the sensor prior to final assembly. At the end of manufacture, each Digital Sensor shall be subjected to an electric strength test using a test voltage of 500 Vac or 850 Vdc applied between the following test locations for a minimum of 60 seconds. Alternatively, a voltage of 600 Vac or 1020 Vdc may be applied for 0.1 second. There shall be no evidence of breakdown. a. Between P1, P2, P3 and P4 terminal pins and the metallic enclosure.
Conditions of Certification	• This IA Certificate covers all units sold from the date of this document to the expiry date of this certificate. • As per ARP 0108 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 (or regulations), 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:	• 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).

Mining And Surface Certification (Pty) Ltd Reg No: 2015/021934/07
Directors: Roelof Viljoen & Francoius du Toit
Unit #5, Lelyta Park, 45 Jurg Avenue, Hennopspark Ext 87, Centurion, 0157
P.O. Box 14344, Clubview, 0014
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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**

Certificate history:
Issue 0 (2022-07-22)

Status: **Current**

Issue No: 1

Date of Issue: 2022-08-17

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

Equipment: **S5000 Gas Monitor fixed gas detection system (Transmitter and Junction Boxes) and Digital Sensor (With FRIT and No FRIT).**

Optional accessory:

Type of Protection: **Flameproof, Dust Protection by Enclosure and Ex n.**

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
1151 Boston-Providence Turnpike
Norwood, MA 02062
United States of America

IECEx Certificate of Conformity

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 Edition:7.0	Explosive atmospheres - Part 0: Equipment - General requirements
IEC 60079-1:2014-06 Edition:7.0	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
IEC 60079-15:2010 Edition:4	Explosive atmospheres - Part 15: Equipment protection by type of protection "n"
IEC 60079-29-1:2016-07 Edition:2.0	Explosive atmospheres – Part 29-1: Gas detectors – Performance requirements of detectors for flammable gases
IEC 60079-31:2013 Edition:2	Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"

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/ExTR21.0023/01

Quality Assessment Reports:

FR/INE/QAR08.0011/12 GB/SIR/QAR07.0014/10 US/UL/QAR10.0004/10

IECEx Certificate of Conformity

EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

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 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.

Refer to the Annex for additional information.

SPECIFIC CONDITIONS OF USE: YES as shown below:
See Annex

IECEx Certificate of Conformity

Equipment (continued):

See Annex

IECEx Certificate of Conformity

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)
A microprocessor has been replaced, along with other minor hardware changes to facilitate the IC replacement. The firmware has updated as well.

The model codes and specific conditions of use have been updated to correct missing certified models and text, as well as to align with the US, Canadian, ATEX, and UKEX listings.

Annex:

US FMG 21.0019X-1 Annex_1.pdf

Annex to: **IECEx FMG 21.0019X Issue 1**

Applicant: **General Monitors Inc**

Apparatus: **S5000 Gas Monitor fixed gas detection system(Transmitter and Junction Boxes) and Digital Sensor (With FRIT and No FRIT).**

Marking:

S5000 Transmitters:

Cemented Joint version:
Ex db IIC T5 Gb
Ex tb IIIC T85°C Db
Ex nA nC IIC T4 Gc
-55°C ≤ Ta ≤ +75°C
IEC 60079-29-1
When using passive sintered sensor:
Ex db IIB+H2 T4 Gb
-40°C ≤ Ta ≤ +70°C
IP66

Flanged Joint version:
Ex db IIB+H2 T5 Gb
Ex tb IIIC T85°C Db
Ex nA nC IIC T4 Gc
-55°C ≤ Ta ≤ +75°C
IEC 60079-29-1
When using passive sintered sensor:
Ex db IIB+H2 T4 Gb
-40°C ≤ Ta ≤ +70°C
IP66

S5000 Junction Boxes:

Cemented Joint versions:
Ex db IIC T6 Gb
Ex tb IIIC T85°C Db
Ex nA IIC T6 Gc
-55°C ≤ Ta ≤ +75°C
When using passive sintered sensor:
Ex db IIB+H2 T4 Gb
-40°C ≤ Ta ≤ +70°C
IP66

Flanged Joint versions:
Ex db IIB+H2 T6 Gb
Ex tb IIIC T85°C Db
Ex nA IIC T6 Gc
-55°C ≤ Ta ≤ +75°C
When using passive sintered sensor:
Ex db IIB+H2 T4 Gb
-40°C ≤ Ta ≤ +70°C
IP66

Digital Sensor:

With FRIT:
Ex db IIC T5 Gb
Ex tb IIIC T85°C Db
Ex db nA IIC T5 Gc
-55°C ≤ Ta ≤ +60°C
IP65

No FRIT:
Ex nA IIC T5 Gc
-55°C ≤ Ta ≤ +60°C
IP55

Equipment:

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.

The S5000 Transmitter is the control unit of the S5000 Gas Monitor fixed gas detection system and the enclosure of the transmitter is designed for Flameproof (Ex db) and Dust ignition protection by enclosure (Ex tb) and Non-Sparking/ Protected Sparking (Ex nA nC) protection. The enclosure 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 equipment enclosure has been separately tested against the requirements of IEC 60529 and meets IP66.

The S5000 Junction Boxes are the remote mounting units of S5000 Gas Monitor fixed gas detection system and the Junction Box enclosure is designed for Flameproof (Ex db) and Dust ignition protection by enclosure (Ex tb) and Non-Sparking (Ex nA) protection. The enclosure 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 equipment enclosure has been separately tested against the requirements of IEC 60529 and meets IP66.

The Digital Sensor (With FRIT) assembly utilizes either a catalytic sensing element (Combustible) construction type for the S5000 Gas Monitor fixed combustible gas detection configurations or an electrochemical sensing element (Toxic and Oxygen) construction type for toxic or oxygen detection. The FRIT (sinter element) is located in the lower sensor element housing assembly, which has a fine thread pattern machined to mate to

the thread pattern of the upper sensor body assembly. The Digital Sensor (With FRIT) is designed for Flameproof (Ex db), Dust ignition protection by enclosure (Ex tb) and Non-Sparking (Ex db nA). Digital Sensor (With FRIT) Toxic versions include a Diffusion Supervision feature that allows the sensor to output a fault if it determines the sensor inlet is blocked and include a Life and Health algorithm that automatically compensates for sensor drift and sensitivity loss. The equipment enclosure has been separately tested against the requirements of IEC 60529 and meets IP65.

The Digital Sensor (No FRIT) assembly, without the FRIT element, is excluded from combustible gas detection and is an Ex nA only electrochemical sensing element (Toxic and Oxygen) construction type for toxic and oxygen detection. The Digital Sensor (No-FRIT) model is limited to Zone 2 and therefore limits the Junction Box or Main Transmitter to which it is integrally installed to Zone 2. Digital Sensor (No FRIT) Toxic versions include a Life and Health algorithm that automatically compensates for sensor drift and sensitivity loss. The equipment enclosure has been separately tested against the requirements of IEC 60529 and meetsIP55.

The S5000 system makes use of three sensor types including a Digital Sensor for combustible, toxic or oxygen gas detection, Universal Gas (passive sintered) Sensors for combustible or toxic gas detection and an IR (infrared) sensor for combustible gas detection, all mounted via conduit entries. The IR400/700 (infrared) sensor and Universal Gas (passive sintered) Sensors cannot be mounted to the JB5000 Junction Boxes. The permitted sensor configurations follow:

- Two-Digital Sensors (combustible, toxic or oxygen) installed either integral to the S5000 transmitter, one integral and one remote via a S5000 or JB5000 Junction Box or two remote via two separate S5000 or JB5000 Junction Boxes.
- One IR400 sensor (combustible) or one IR700 sensor (toxic) and one Digital Sensor (combustible,toxic or oxygen) installed either integral to the S5000 transmitter or remotely via a S5000 JunctionBox. Alternatively, a Digital Sensor may be installed remotely via a JB5000 Junction Box.
- One Universal Gas (passive sintered) Sensor (combustible or toxic) installed either integral to the S5000 transmitter or one remote via a S5000 Junction Box.

The product model code options of the S5000 gas detection systems (Combustible, Toxic or Oxygen) featuring the S5000 transmitter, S5000 Junction Boxes, JB5000 Junction Boxes, IR400/IR700 sensor, Universal Gas (passive sintered) sensors and the Digital Sensors component are shown in the Model Code Options section below. The applicable configuration limitations resulting from the hazardous area classifications can be derived in the model codes. The equipment enclosures have been separately tested against the requirementsof IEC 60529 for Ingress Protection levels.

Annex to: **IECEx FMG 21.0019X Issue 1**

Applicant: **General Monitors Inc**

Apparatus: **S5000 Gas Monitor fixed gas detection system(Transmitter and Junction Boxes) and Digital Sensor (With FRIT and No FRIT).**

Model Code Options:

The S5000 Transmitter:
Model coding appearing on the transmitter enclosure are shown below:

S5000 transmitter (equipment) Software revision: 2.00.0045	
Model reference	Description
S5000-*abcdeefffgggh*	Transmitter control unit of the Fixed Gas Detection System for use in explosive gas atmospheres: where up to two sensors may be connected either coupled to the transmitter enclosure or one coupled to the transmitter and the other coupled to a Junction Box enclosure – only one sensor per Junction Box permitted (the JB5000 excludes connection to IR400/700and Universal Gas (passive sintered sensors); two Digital Sensors or one IR400 (combustible) / IR700 (toxic) sensor and one Digital Sensor or one Universal Gas H2S sensor (Toxic – Passive Sintered) or one Universal Gas HC sensor (Combustible – Passive Sintered) – *a* is for Enclosure Material: 0 = Aluminum – IIB+H2 (flanged/non-cemented) 1 = Aluminum – IIC (cemented) 2 = Stainless Steel – IIB+H2 (flanged/non-cemented) 3 = Stainless Steel – IIC (cemented) *b* is for Output Communications 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 1 for ATEX/IECEx *ee* is for an Additional Feature selection: 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:

ggg is for Sensor 2 selection:

Sensors: for Sensor Selection *fff* or *ggg* :
(Sensors tested to IEC 60079-29-1 are denoted by [^])
(Sensors additionally performance tested for Ethylene, Nonane, and Butanol are denoted by [*])

- Digital Sensor selections include):
D00 = No Sensor or Sensor Body (transmitter only)
D01 = No Sensor (sensor body (With FRIT) w/blank element)
D02 = No Sensor (sensor body (No FRIT) w/blank element)
D15 = Oxygen, 0-25% [^]
D60 = Combustible, 0-100% LEL – 5% Methane [^]
D61 = Combustible, 0-100% LEL – 2.1%Propane [^]
D62 = Combustible, 0-100% LEL – 1.05% Heptane [^]
D63 = Combustible, 0-100% LEL – 0.8% Nonane [^]
D64 = Combustible, 0-100% LEL – 4.0% Hydrogen [^]
D65 = Combustible, 0-100% LEL – 4.4 % Methane [^]
D66 = Combustible, 0-100% LEL – 1.7% Propane [^]
D67 = Combustible, 0-100% LEL – 0.85% Heptane [^]
D68 = Combustible, 0-100% LEL – 0.7% Nonane [^]
Dxx = Any two digit number representing Gas Type Digital Sensor (With FRIT), not verified by FM Approvals for the specific flammable gas for performance to IEC 60079-29-1.
Dxx = Any two digit number representing Toxic Type Digital Sensor (With FRIT).

-IR400/IR700 gas detector/ sensor selections include,
R00 = No Sensor
R13 = Methane, AL [^]
R14 = Propane, AL [^]
R43 = Methane, SS [^]
R44 = Propane, SS [^]
R45 = Hexane, SS
R46 = Pentane, SS
R47 = Butane, SS
R48 = Ethane , SS
R50 = Ethylene, SS
R52 = CO2, SS

-Universal Gas HC head sensor (combustible) selections include,
C00 = No Sensor
C07 = 11159-1L, Stainless Steel [^]
C08 = 11159-2L, Stainless Steel, High Temp. [^]
C11 = 11159-1, Stainless Steel [^]
C12 = 11159-2, Stainless Steel, High Temp. [^]
C09 = 11159-8L (0-20%LEL), Stainless Steel [^][*]
C10 = 11159-8 (0-20%LEL), Stainless Steel [^][*]

-Universal Gas H2S head sensor (toxic) selections include,
M00 = No Sensor
M11 = 51457-1L, Stainless Steel, 0-100 ppm
M12 = 51457-5L, Stainless Steel, 0-50 ppm
M13 = 51457-9L, Stainless Steel, 0-20 ppm
M14 = 51457-1, Stainless Steel, 0-100 ppm

	M15 = 51457-5, Stainless Steel, 0-50 ppm M16 = 51457-9, Stainless Steel, 0-20 ppm *h* is for paint options: 0 = no paint 1 = Gray 2 = Blue 3 = Yellow 4 = White

The S5000 Junction Boxes:
Model coding appearing on the Junction Box enclosures are shown below:

S5000 Junction Box (equipment)	
Model reference	Description
324240-1 324240-5 324240-9 324240-13 324240-17	S5000 Junction Box; Stainless Steel, (flanged/non-cemented). The -5, -9, -13 and -17 pertain to painted versions of the enclosure (gray, blue, yellow, white).
324240-2 324240-6 324240-10 324240-14 324240-18	S5000 Junction Box; Aluminium, (flanged/non-cemented). The -6, -10, -14 and -18 pertain to painted versions of the enclosure (gray, blue, yellow, white).
324240-3 324240-7 324240-11 324240-15 324240-19	S5000 Junction Box; Stainless Steel, (cemented). The -7, -11, -15 and -19 pertain to painted versions of the enclosure (gray, blue, yellow, white).
324240-4 324240-8 324240-12 324240-16 324240-20	S5000 Junction Box; Aluminium, (cemented). The -8, -12, -16 and -20 pertain to painted versions of the enclosure (gray, blue, yellow, white)

The JB5000 Junction Box:
Model coding appearing on the Junction Box enclosure is shown below:

JB5000 Junction Boxes (equipment)	
Model reference	Description
10213879	JB5000 Junction Box; Stainless Steel, ½" NPT
10213893	JB5000 Junction Box; Stainless Steel, M25

Annex to: **IECEx FMG 21.0019X Issue 1**

Applicant: **General Monitors Inc**

Apparatus: **S5000 Gas Monitor fixed gas detection system(Transmitter and Junction Boxes) and Digital Sensor (With FRIT and No FRIT).**

The Digital Sensor:
Model coding appearing on the sensor enclosure are shown below:

Digital Sensor, gas sensor (equipment) Software Revision: (H2S and CO) – 1.1.2 (H2S and CO with Life and Health) – 1.3.0 (Combustible, 500 ppm H2S and O2) – 1.0.1 (Life and Health with Diffusion Supervision) – 4.0.9	
Model reference	Description
A-5K-SENS-*aa*-*b*-c-*d*-e	Digital Sensor (With FRIT) verified for Performance per IEC 60079-29-1 *aa* is for Gas Type (verified for Performance): 01 = No Sensor (sensor body w/blank element) 15 = Oxygen, 0-25% 60 = Combustible, 0-100% LEL – 5% Methane 61 = Combustible, 0-100% LEL – 2.1% Propane 62 = Combustible, 0-100% LEL – 1.05% Heptane 63 = Combustible, 0-100% LEL – 0.8% Nonane 64 = Combustible, 0-100% LEL – 4.0% Hydrogen 65 = Combustible, 0-100% LEL – 4.4% Methane 66 = Combustible, 0-100% LEL – 1.7% Propane 67 = Combustible, 0-100% LEL – 0.85% Heptane 68 = Combustible, 0-100% LEL – 0.7% Nonane *b* is for Material type 0 = Stainless Steel 1 = Aluminium *c* is for the listed Approval: A = ATEX/IECEx *d* is for Sensor Body: 0 = No Sensor Body 1 = ¾" NPT 2 = M25 *e* is for future use (Not relevant to certification) 0 = None Digital Sensor (With FRIT) not verified for Performance per IEC 60079-29-1 *aa* is for Gas Type (not verified for Performance): 01 = No Sensor (sensor body w/blank element) xx = Any two digit number representing Gas Type Digital Sensor (With FRIT), not verified by FM Approvals to IEC 60079-29-1 *b* is for Material type 0 = Stainless Steel 1 = Aluminium *c* is for the listed Approval: A = ATEX/IECEx

	d is for Sensor Body: 0 = No Sensor Body 1 = ¾" NPT 2 = M25 *e* is for future use (Not relevant to certification) 0 = None Digital Sensor (With FRIT) model (toxic); where the following applies Note: Digital Sensors "With FRIT" utilize Fine Threads for Flamepaths appropriate for Ex db applications. *aa* is for Toxic Type: 01 = No Sensor fine thread w/blank element xx = Any two digit number representing Toxic Type Digital Sensor (With FRIT) *b* is for Material type: 0 = Stainless Steel 1 = Aluminum *c* is for the listed Approval: A = ATEX/IECEx *d* is for Sensor Body: 0 = No Sensor Body 1 = ¾" NPT 2 = M25 *e* is 0 = Not relevant to certification 0 = None Digital Sensor (No FRIT) model (toxic); where the following applies Note: Digital Sensors "Without FRIT" utilize Course Threads for Ex nA applications. *aa* is for Toxic Type: 02 = No Sensor (sensor body (No FRIT) w/ blank element) xx = Any two digit number representing Toxic Type Digital Sensor (No FRIT) *b* is for Material type: 0 = Stainless Steel 1 = Aluminum *c* is for the listed Approval: A = ATEX/IECEx *d* is for Sensor Body: 0 = No Sensor Body 1 = ¾" NPT 2 = M25 *e* is 0 = Not relevant to certification 0 = None

Annex to: **IECEx FMG 21.0019X Issue 1**

Applicant: **General Monitors Inc**

Apparatus: **S5000 Gas Monitor fixed gas detection system(Transmitter and Junction Boxes) and Digital Sensor (With FRIT and No FRIT).**

The IR400/IR700 Sensor:
Model coding appearing on the sensor enclosure are shown below:

IR400/IR700 Sensor, gas sensor (equipment)	
Model reference	Description
IR400	Detector/ Sensor (combustible); provides a 4-20mA output with Modbus or optional Hart output. Ex db IIB+H2 T5 Gb Ex tb IIIC T100°C Db Tamb: -60°C ≤ Ta ≤ +75°C
IR700	Detector/ Sensor (toxic); provides a 4-20mA output with Modbus or optional Hart output. Ex db IIB+H2 T5 Gb Ex tb IIIC T100°C Db Tamb: -60°C ≤ Ta ≤ +75°C

The Universal Gas (passive sintered) Sensors HC & H2S Sensor Heads, models no. 11159 (HC) and 51457 (H2S):
Model coding appearing on the sensor enclosure are shown below:

Universal Gas (passive sintered) Sensor, two types (equipment)	
Model reference	Description
11159-1 11159-2 11159-8 (0-20%LEL) 11159-1L 11159-2L 11159-8L (0-20%LEL)	HC sensor head; Passive Sintered (Combustible) Ex db IIC T4 Gb Tamb: -40°C ≤ Ta ≤ +70°C
51457-1 51457-5 51457-9 51457-1L 51457-5L 51457-9L	H2S sensor head; Passive Sintered (Toxic) Ex db IIC T4 Gb Tamb: -40°C ≤ Ta ≤ +70°C

Specific Conditions of Use:

S5000 transmitter:

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. 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 both the Digital Sensor and IR Sensor. The equipment is subject to the installation and orientation requirements defined in the product manual.
3. The flameproof joints shall not be repaired.
4. It is recommended to end users to seek guidance provided in IEC 60079-29-2 for installation, use and maintenance of gas detectors for flammable gases and other applicable gases.
5. Guidance for functional safety of fixed gas detection systems are set out in IEC 60079-29-3 which has not been covered in the scope of this assessment.
6. 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.

7. 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.
8. The safety related device must be functioning and powered independently of any control devices required for operation.
9. 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.

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.

Digital Sensor (With FRIT) model:

1. Under certain extreme circumstances, the non-metallic parts incorporated in the enclosure 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. 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.
4. 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 or S5000 Junction Box enclosures and receive power and control from the transmitter.
5. The Ingress Protection rating is exclusively based upon the installation instruction for orientation specified in the operating manual.
6. 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 IEC 60079-29-2 for installation, use and maintenance of gas detectors for flammable gases and other applicable gases.
7. Guidance for functional safety of fixed gas detection systems are set out in IEC 60079-29-3 which has not been covered in the scope of this assessment.
8. 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.
9. 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.
10. The safety related device must be functioning and powered independently of any control devices required for operation.
11. 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.

Digital Sensor (No FRIT) model:

1. Under certain extreme circumstances, the non-metallic parts incorporated in the enclosure 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. 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.
4. 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 or S5000 Junction Box enclosures and receive power and control from the transmitter.
5. The Ingress Protection rating is exclusively based upon the installation instruction for orientation specified in the operating manual.

6. 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 Vpeak).
7. Guidance for functional safety of fixed gas detection systems are set out in IEC 60079-29-3 which has not been covered in the scope of this assessment.
8. 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.
9. 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.
10. The safety related device must be functioning and powered independently of any control devices required for operation.
11. 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.

Conditions of Manufacture:

S5000 transmitter:

1. Dielectric Voltage Withstand Test (per IEC 60079-15, clause 23.2.1)
   At the end of manufacture, each S5000 transmitter shall be subjected to an electric strength testusing a test voltage of 1500 Vac or 2100 Vdc applied between the following test locations for a minimum of 60 seconds. Alternatively, a voltage of 1800 Vac or 2520 Vdc may be applied for 0.1second. There shall be no evidence of breakdown.
   a. Between the input terminals and the relay terminals.
   b. Between the metallic enclosure and the relay terminals.

Digital Sensor (With FRIT and No FRIT) models:

1. Dielectric Voltage Withstand Test (per IEC 60079-15, clause 23.2.1)
   This testing may be performed on the complete Digital Sensor assembly (upper housing and sensor) orseparately on the upper housing and the sensor prior to final assembly.
   At the end of manufacture, each Digital Sensor shall be subjected to an electric strength test using a test voltage of 500 Vac or 850 Vdc applied between the following test locations for a minimum of 60 seconds. Alternatively, a voltage of 600 Vac or 1020 Vdc may be applied for 0.1 second. There shall beno evidence of breakdown.
   a. Between P1, P2, P3 and P4 terminal pins and the metallic enclosure.

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.