1. UNITED KINGDOM CONFORMITY ASSESSMENT
TYPE EXAMINATION CERTIFICATE

2. **Equipment or Protective systems intended for use in Potentially Explosive Atmospheres UKSI 2016:1107 (as amended) – Schedule 3A, Part 1**

3. **Type Examination Certificate No:** **FM21UKEX0219X**

4. **Equipment or protective system: (Type Reference and Name)** **S5000 Gas Monitor Gas Detection System**

5. **Name of Applicant:** **General Monitors Inc**

6. **Address of Applicant** **an MSA Company, 16782 Von Karman Ave., Unit 14, Irvine, California 92606, United States of America**

7. This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and documents therein referred to.

8. FM Approvals Ltd, certifies that this component has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Schedule 1 of the Regulations.

   The examination and test results are recorded in confidential report number:

   PR460784 dated 22nd July 2022

9. Compliance with the Essential Health and Safety Requirements, with the exception of those identified in item 15 of the schedule to this certificate, has been assessed by compliance with the following documents:

   EN 50104:2019, EN 50271:2018, EN IEC 60079-0:2018, EN 60079-1:2014, EN 60079-15:2010, EN 60079-29-1:2016+A1:2022+A11:2022, EN 60529:1991+A1:2000+A2:2013

10. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.

11. This Type Examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance with the Regulations. Further requirements of the Regulations apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12. The marking of the equipment or protective system shall include:

    See Annex

Certificate issued by:

3 December 2024

Victor Aluko-Oginni
Certification Manager, FM Approvals Ltd.

Date

FM Approvals Ltd. Voyager Place, Maidenhead, Berkshire, SL6 2PJ. United Kingdom
T: +44 (0) 1753 750 000 F: +44 (0) 1753 868 700 E-mail: atex@fmapprovals.com www.fmapprovals.com

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13. **Description of Equipment or Protective System:**

    See Annex

14. **Specific Conditions of Use:**

    See Annex

15. **Essential Health and Safety Requirements:**

    In addition to the Essential Health and Safety Requirements covered by the standards listed at item 8, all other requirements are demonstrated in the confidential report identified in item 8.

16. **Test and Assessment Procedure and Conditions:**

    This Type Examination Certificate is the result of testing of a sample of the product submitted, in accordance with the provisions of the relevant specific standard(s), and assessment of supporting documentation. It does not imply an assessment of the whole production.

    Whilst this certificate may be used in support of a manufacturer's claim for UKCA Marking, FM Approvals Ltd accepts no responsibility for the compliance of the equipment against all applicable Regulations in all applications.

    This Certificate has been issued in accordance with FM Approvals Ltd's UKCA Certification Scheme.

17. **Schedule Drawings**

    A list of the significant parts of the technical documentation is annexed to this certificate and a copy has been kept by the Approved Body.

18. **Certificate History**

    Details of the supplements to this certificate are described below:

Date	Description
25 July 2022	Original Issue.
19 August 2022	Supplement 1: Report Reference: PR462892 dated 17th August 2022. Description of the Change: Replaced microprocessor, as well as minor hardware changes and a firmware update. Corrected model code structure for S5000 transmitter.
3 December 2024	Supplement 2: Report Reference: PR467006 dated 19 November 2024. Description of the Change(s): The equipment received hardware and firmware updates resulting in additional performance and explosive atmosphere testing verification. The list of standards is updated to the latest edition as permitted in the Official Journal. The structure of the certificate is updated to list details in a table format. The leading paragraphs remain to detail information not in the specifications table. The equipment listings are moved into separate sections for the transmitter,

Date	Description
	the junction boxes, and the approved sensors. The listing for the transmitter shows a newly created table of Approved Sensors, detailing all FM Approved transmitter and sensor combinations. This includes FM Approved sensors maintained under separate approvals. This table indicates if performance testing has been performed. In cases where performance testing has not been performed, the transmitter/sensor combination still maintains the explosive atmosphere rating. The IR700 sensors and IR sensors with model codes R13 and R14 have been removed. The model code option for Aluminum housing for the transmitter has been removed. The humidity range for the Combustible Digital Sensors is increased to 95%RH, non-condensing. The term "FRIT" is replaced with "sintered flame arrestor".

ANNEX

S5000 Gas Monitor

Markings:

II 3G
Ex nA nC IIC T4 Gc
-55°C ≤ Ta ≤ +75°C
EN 60079-29-1
EN 50104
IP66

Description of Equipment:

The S5000 Gas Monitor fixed gas detection system consists of an S5000 Transmitter and an optional S5000 Junction Box or ULTIMA JB5000 Junction Box (see certificate FM21ATEX0073X for details) fitted with up to two factory-configured combustible, toxic or oxygen gas sensors. 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 ULTIMA JB5000 Junction Box. Refer to the Sensor Table below for the list of permitted sensors. Further details of the sensors can be found in the associated certificate (if applicable), under the specified product listing.

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.

Model Code Options:

S5000-a-b-c-d-e-fff-ggg-h, Gas Monitor S5000
a is for Enclosure Material:
- 2 = Stainless Steel – IIB+H2 (with non-cemented, flanged 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

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

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			FM21UKEX0220X
Digital Sensors	See Sensor Table in the associated product listing of the referenced certificate			FM21UKEX0219X
IR400	R00	No Sensor	N/A	N/A
IR400-1065	R43	Methane - CH_4	0-100% LFL	N/A
IR400-1067	R44	Propane - C_3H_8	0-100% LFL	N/A
IR400-2593	R45*	Hexane - C_6H_{14}	0-100% LFL	N/A
IR400-2611	R46*	Pentane - C_5H_{12}	0-100% LFL	N/A
IR400-1069	R47*	Butane - C_4H_{10}	0-100% LFL	N/A
IR400-1108	R48*	Ethane - C_2H_6	0-100% LFL	N/A
IR400-1533	R50*	Ethylene - C_2H_4	0-100% LFL	N/A
Passive Sintered Sensors				
Universal Gas HC Sensor (Combustible)	C00	No Sensor	N/A	N/A
11159-1L	C07	General Purpose	0-100% LFL	N/A
11159-2L	C08	General Purpose, High Temperature	0-100% LFL	N/A
11159-8L	C09	General Purpose	0-20% LFL	N/A
11159-8	C10	General Purpose	0-20% LFL	N/A

SCHEDULE

to Type Examination Certificate No. FM21UKEX0219X

Product / Listing Title	Model Code	Gas / Description	Range	Certificate Number
11159-1	C11	General Purpose	0-100% LFL	N/A
11159-2	C12	General Purpose, High Temperature	0-100% LFL	N/A
Universal Gas H_2S Sensor (Toxic)	M00*	No Sensor	N/A	N/A
51457-1L	M11*	Hydrogen Sulfide - H_2S	0-100 ppm	N/A
51457-5L	M12*	Hydrogen Sulfide - H_2S	0-50 ppm	N/A
51457-9L	M13*	Hydrogen Sulfide - H_2S	0-20 ppm	N/A
51457-1	M14*	Hydrogen Sulfide - H_2S	0-100 ppm	N/A
51457-5	M15*	Hydrogen Sulfide - H_2S	0-50 ppm	N/A
51457-9	M16*	Hydrogen Sulfide - H_2S	0-20 ppm	N/A

*Denotes sensors that do not have performance certification to EN 60079-29-1 or EN 50104. See Specific Condition of Use number 1 for additional information.

Accessories - The following accessories are included in the Approval:

CALKIT1	Calibration Kit for Digital Gas Sensors
1400270	Calibration Kit for IR400 Point IR Detector

Specific Conditions of Use:

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 all sensors. The equipment is subject to the installation and orientation requirements defined in the product manual.
4. 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.
5. 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.

Conditions relating to EN 50271

1. The user shall comply with the requirements given in the manufacturer's user documentation in regards 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.

2. 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.
3. The safety related device must be functioning and powered independently of any control devices required for operation.
4. The proof test interval for the S5000 safety function is 3 months.
5. 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 Boxes

Markings:

II 3G
Ex nA IIC T6 Gc
-55°C < Ta < +75°C
EN 60079-29-1
EN 50104
IP66

Description of Equipment:

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.

S5000 Junction Boxes

Model Reference	Description
324240-1, 324240-5, 324240-9, 324240-13, 324240-17	S5000 Junction Box; Stainless Steel, (with non-cemented, flanged window joint)
324240-2, 324240-6, 324240-10, 324240-14, 324240-18	S5000 Junction Box; Aluminium, (with non-cemented, flanged window joint)
324240-3, 324240-7, 324240-11, 324240-15, 324240-19	S5000 Junction Box; Stainless Steel, (with cemented window joint)
324240-4, 324240-8, 324240-12, 324240-16, 324240-20	S5000 Junction Box; Aluminium, (with cemented window joint)

For the ULTIMA JB5000 Junction Box marking and listing, refer to MSA certificate FM21UKEX0220X.

Specific Conditions of Use:

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

FM Approvals Ltd. Voyager Place, Maidenhead, Berkshire, SL6 2PJ. United Kingdom
T: +44 (0) 1753 750 000 F: +44 (0) 1753 868 700 E-mail: atex@fmapprovals.com www.fmapprovals.com

with a damp cloth.

Digital Sensors (With Sintered Flame Arrestor)

Markings:

II 3G
Ex db nA IIC T5 Gc
-55°C < Ta < +60°C
EN 60079-29-1
EN 50104
IP65

Description of Equipment:

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 ULTIMA JB5000 Junction Box.

Model Code Options:

A-5K-SENS-a-b-c-d-e Digital Sensor (With Sintered Flame Arrestor)
a is for Gas Type:
See Sensor Table below
b is for Material:
0 = Stainless Steel
1 = Aluminium
c is for Listed Approval:
A = ATEX/IECEx/UKEX
d is for Sensor Body Thread Type:
0 = No Sensor Body
1 = ¾ NPT
2 = M25
e is for Advanced Option:
0 = none

Sensor Table:

Model Code	Gas / Description	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
15	Oxygen - O_2	0-25% vol
60	Methane - CH_4	0-100% LFL – 5.0% vol

Model Code	Gas / Description	Range
61	Propane - C_3H_8	0-100% LFL – 2.1% vol
62	Heptane - C_7H_{16}	0-100% LFL – 1.05% vol
63	Nonane - C_9H_{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_3H_8	0-100% LFL – 1.7% vol
67	Heptane - C_7H_{16}	0-100% LFL – 0.85% vol
68	Nonane - C_9H_{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 EN 60079-29-1, or - Oxygen sensor with sintered flame arrestor, not verified by FM Approvals for performance to EN 50104, or - Toxic Type gas sensor with sintered flame arrestor.	N/A

Specifications:

Sensor Type:	Combustible Sensors: Catalytic Bead O_2 Sensor: Electrochemical
Sampling Type:	Diffusion
Accuracy:	Combustible Sensors: ±5% F.S. O_2 Sensor: ±0.5% O_2
Time of Response:	Combustible Sensors: t(90) ≤ 60 s O_2 Sensor: 5 seconds
Operating Temperature:	Combustible Sensors: -50°C to +60°C O_2 Sensor: -40°C to +60°C
Storage Temperature:	-40°C to +60°C
Relative Humidity:	Combustible Sensors: 10 to 95% RH, non-condensing O_2 Sensor: 10 to 95% RH, non-condensing
Firmware:	1.0.1

Specific Conditions of Use:

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. If the sensor is uninstalled, the equipment instruction manual shall be referenced prior to reinstalling.
4. The Digital Sensor is provided with a ¾" 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.
5. 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.
6. 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.
7. The Ingress Protection rating is exclusively based upon the installation instruction for orientation specified in the operating manual.
8. 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).
9. 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.
10. 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.

Digital Sensor (Without Sintered Flame Arrestor)

Markings:

II 3G
Ex nA IIC T5 Gc
-55°C ≤ Ta ≤ +60°C
IP55

Description of Equipment:

The S5000 Digital Sensor consists of a sensor body and a combustible gas, toxic gas, or oxygen sensing element. The Digital Sensor is designed with coarser threads to prevent installation with the S5000 intended for use in a Zone 1 explosive atmosphere. 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 ULTIMA JB5000 Junction Box. The Digital Sensors without sintered flame arrestor are not verified by FM Approvals for performance to EN 60079-29-1 or EN 50104.

Model Code Options:

A-5K-SENS-a-b-c-d-e Digital Sensor (Without Sintered Flame Arrestor)
a is for Gas Type:

See Sensor Table below

b is for Material:
- 0 = Stainless Steel
- 1 = Aluminium

c is for Listed Approval:
- A = ATEX/IECEx/UKEX

d is for Sensor Body Thread Type:
- 0 = No Sensor Body
- 1 = ¾ NPT
- 2 = M25

e is for Advanced Option:
- 0 = none

Sensor Table:

Model Code	Gas / Description	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
Time of Response:	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

Specific Conditions of Use:

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. If the sensor is uninstalled, the equipment instruction manual shall be referenced prior to reinstalling.

4. The Digital Sensor is provided with a ¾" 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.
5. 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.
6. 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.
7. The Ingress Protection rating is exclusively based upon the installation instruction for orientation specified in the operating manual.
8. 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).
9. 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.
10. 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.