IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

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

Certificate No.: IECEx SIR 17.0016X

Issue No: 0

Certificate history:
Issue No. 0 (2018-01-08)

Status: **Current**

Date of Issue: **2018-01-08**

Applicant: **General Monitors Inc**
26776 Simpatica Circle
Lake Forest, CA 92630
United States of America

Equipment: **S5000 Gas Monitor fixed gas detection system (Transmitter and Junction Box) and Digital Sensor.**

Optional accessory:

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

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

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

S5000 Junction Box
Cemented Joint versions:
Ex db IIC T6 Gb
Ex tb IIIC T85°C Db
Ex nA IIC T6 Gc
-55°C ≤ Ta ≤ +75°C

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

Digital Sensor:
Ex db IIC T5 Gb
Ex tb IIIC T85°C Db
-55°C ≤ Ta ≤ +60°C

Notes to Standard IEC 60079-29-1:
1. Applies only to the S5000 Gas Monitor fixed Combustible Gas Detection System.
2. IEC 60079-31 compliance does not imply that the equipment will detect gas during and after exposure to dust and fibers in suspension in air conditions.

Approved for issue on behalf of the IECEx Certification Body:

N Jones

Position:

pp R. A. CRAIG
Certification Manager

Signature:
(for printed version)

Date:

2018-01-08

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 the Official IECEx Website.

Certificate issued by:

SIRA Certification Service
CSA Group
Unit 6, Hawarden Industrial Park
Hawarden, Deeside, CH5 3US
United Kingdom

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Certificate No: IECEx SIR 17.0016X Issue No: 0

Date of Issue: **2018-01-08** Page 2 of 3

Manufacturer: **General Monitors**
26776 Simpatica Circle
Lake Forest, CA 92630
United States of America

Additional Manufacturing location(s):

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 electrical apparatus 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 : 2011 Edition:6.0	Explosive atmospheres - Part 0: 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 : 2007 Edition:1	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 electrical 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 Report:

GB/SIR/ExTR17.0204/00 GB/SIR/ExTR17.0252/00

Quality Assessment Report:

US/UL/QAR10.0004/05

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Certificate No: IECEx SIR 17.0016X Issue No: 0

Date of Issue: **2018-01-08**

Schedule

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 methane and propane gases or a variety of toxic gases or oxygen. The system comprises an S5000 transmitter base unit and an optional S5000 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 Annexe for additional information.

SPECIFIC CONDITIONS OF USE: YES as shown below:

Refer to the Annexe

Annex:

IECEx SIR 17.0016X issue 0 Annexe.pdf

Annexe to:	**IEC Ex SIR 17.0016X Issue 0**
Applicant:	General Monitors Inc
Apparatus:	S5000 Gas Monitor fixed gas detection system (Transmitter and Junction box) and Digital Sensor.

Equipment:

The S5000 Gas Monitor fixed gas detection system is designed to measure specified percentage volumes of methane and propane gases or a variety of toxic gases or oxygen. The system comprises an S5000 transmitter base unit and an optional S5000 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 protection by enclosure (Ex tb) with Non-Sparking/ Protected Sparking (Ex nA nC) protection. The enclosure is provided with ¾" NPT or M25 threaded entries which can be fitted with the sensors described below or suitably certified cable entry devices or blanking plugs.

The S5000 Junction Box is the remote mounting unit of S5000 Gas Monitor fixed gas detection system and the enclosure of the Junction Box is designed for Flameproof (Ex db) and Dust protection by enclosure (Ex tb) with Non-Sparking (Ex nA) protection. The enclosure is provided with ¾" NPT or M25 threaded entries which can be fitted with the sensors described below or suitably certified cable entry devices or blanking plugs.

The Digital Sensor is a catalytic sensing element construction type for the S5000 Gas Monitor fixed combustible gas detection configurations. For toxic and oxygen sensing, the Digital Sensor uses different sensing element types of construction. The enclosure of the sensor is designed for Flameproof (Ex db) and Dust protection by enclosure (Ex tb). See report R70141952B, IEC ExTR number GB/SIR/ExTR17.0204/00 for complete descriptive details.

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 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 Junction Box or two remote via two separate S5000 Junction Boxes.
- One IR400 sensor (combustible) and one Digital Sensor (combustible, toxic or oxygen) installed either integral to the S5000 transmitter or remotely via the S5000 Junction Box
- One Universal Gas (passive sintered) Sensor (combustible or toxic) installed either integral to the S5000 transmitter or one remote via the S5000 Junction Box

The product model code options of the S5000 gas detection systems (Combustible, toxic or oxygen) featuring the S5000 transmitter, S5000 Junction Box, IR400 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.

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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 the both the Digital Sensor and IR400 infrared (IR) sensors and Universal Gas Sensors. The equipment is subject to the installation and orientation requirements defined in the product manual.
3. The flameproof joints shall not be repaired.

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:

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. If the sensor is uninstalled, the equipment manufacturer shall be contacted 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 only be fitted to enclosures having a maximum reference pressure of 7.7 bars.
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 or S5000 Junction Box enclosures and receive power and control from the transmitter.

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Conditions of Manufacture:

S5000 transmitter, S5000 Junction Box and Digital Sensor:

1. The manufacturer is responsible for and shall include in the instruction manual the minimum particulars of all applicable instructional information required for the equipment by clause 30 of EN/ IEC 60079-0 — i.e., the certificates.

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 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.

S5000 transmitter and S5000 Junction Box enclosure with integral mounted Digital Sensor:

1. Before assembling the Digital Sensor onto the S5000 enclosure creating a combined assembly, the manufacturer is required to conduct batch hydrostatic pressure testing which shall be performed on the Digital Sensor per the requirements of IEC/EN 60079-1 Clause 16.6 on the wire feedthrough from the conduit side with no leakage for the duration of 10 seconds when 15 bars (10 bars times 1.5 factor; 218 psi or 15 bars) of pressure is applied.
   Example of batch testing:
   - For a production batch of up to 100 units, a sampling of 8 needs to be tested with no failures.
   - For a production batch from 101 to 1000 units, a sampling of 32 needs to be tested with no failure.
   - For a production batch from 1001 up to 10000 units, a sampling of 80 needs to be tested with no failures.

   For any noncompliant test results, 100% of all remaining samples in the batch shall be tested. Future batches should be routine tested (100%) until confidence is established to reconsider batch testing.

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Model Code Options:

The ULTIMA® X5000 Gas Monitor fixed gas detection system:

The S5000 Transmitter:

Model coding appearing on the transmitter enclosure are shown below:

S5000 transmitter (equipment)		
Model reference	Description	Coding/System Limitations
S5000-***abcdeefffggg***	Transmitter control unit of the Fixed Gas Detection System for use in explosive gas atmospheres: where up to two sensor may be connected either coupled to the transmitter enclosure or one coupled to the transmitter and the other coupled to the Junction Box enclosure – only one senor per Junction Box permitted; two Digital Sensors or/ one IR400 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 ***fff*** is for Sensor 1 selection: ***ggg*** is for Sensor 2 selection: **Sensors:** for Sensor Selection ***fff*** or ***ggg*** : (Independently certified Ex Equipment Sensors or Ex Component Sensors forming the Combustible Gas Detection System, per 60079-29-1, are denoted by [^]) - Digital Sensor selections include, D00 = No Sensor or Sensor Body (transmitter only) D01 = No Sensor (sensor body w/blank element) D10 = Carbon Monoxide, 0-100 ppm D11 = Carbon Monoxide, 0-500 ppm D12 = Carbon Monoxide, 0-1000 ppm D14 = Carbon Monoxide, Hydrogen Resistant 0-100 ppm D16 = Oxygen, 0-25%	*transmitter only, without sensors* - cemented joint window assembly Ex db IIC T5 Gb Ex tb IIIC T85°C Db Ex nA nC IIC T4 Gc Tamb: -55°C ≤ Ta ≤ +75°C - flanged joint window assembly Ex db IIB+H2 T5 Gb Ex tb IIIC T85°C Db Ex nA nC IIC T4 Gc Tamb: -55°C ≤ Ta ≤ +75°C *Gas Detection System: main transmitter + two Digital Sensors (one sensor maybe connected to one Junction Box)* (cemented) Ex db IIC T5 Gb Ex tb IIIC T85°C Db Tamb: -55°C ≤ Ta ≤ +60°C (flanged) Ex db IIB+H2 T5 Gb Ex tb IIIC T85°C Db Tamb: -55°C ≤ Ta ≤ +60°C *Gas Detection System: main transmitter + one IR400 + one Digital Sensor (one sensor maybe connected to one Junction Box)* (cemented and flanged) Ex db IIB+H2 T5 Gb Ex tb IIIC 100°C Db Tamb: -55°C ≤ Ta ≤ +75°C

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S5000 transmitter (equipment)		
Model reference	Description	Coding/System Limitations
	D20 = Hydrogen Sulfide, 0-10 ppm D21 = Hydrogen Sulfide, 0-50 ppm D22 = Hydrogen Sulfide, 0-100 ppm D65 = Combustible, 0-100% LEL – Methane [^] D66 = Combustible, 0-100% LEL – Propane [^] -IR400 gas detector/ sensor selections include, R00 = No Sensor R13 = Methane, AL [^] R14 = Propane, AL [^] R43 = Methane, SS [^] R44 = Propane, SS [^] R16 = Pentane, AL R17 = Butane, AL R20 = Ethylene, AL R47 = Butane, SS R48 = Ethane , SS R50 = Ethylene, SS -Universal Gas HC head sensor 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, Stainless Steel C10 = 11159-8, Stainless Steel -Universal Gas H2S head sensor 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 000 = No Sensor selection if Sensor 1 is not equal to C00 (Universal Gas HC head sensor or Universal Gas H2S head sensor), D## = Digital Sensor selection only if Sensor 1 = R## or D## (IR400 or Digital Sensor)	*Gas Detection System: main transmitter + one Universal Gas HC (Combustible – Passive Sintered) sensor head **or** one Universal Gas H2S (Toxic – Passive Sintered) sensor head (one sensor maybe connected to one Junction Box)* (cemented) Ex db IIC T4 Gb Tamb: -40°C ≤ Ta ≤ +70°C (flanged) Ex db IIB+H2 T4 Gb Tamb: -40°C ≤ Ta ≤ +70°C The coding of any attached sensor limits the coding of the transmitter/ system.

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The S5000 Junction Box:

Model coding appearing on the Junction Box enclosure are shown below:

S5000 Junction Box (equipment)		
Model reference	Description	Coding/System Limitations
324240-1	S5000 Junction Box; Stainless Steel, IIB + H2 (flanged/non-cemented)	*Junction Box only, without a sensor* Ex db IIB+H2 T6 Gb Ex tb IIIC T85°C Db Ex nA IIC T6 Gc Tamb: -55°C ≤ Ta ≤ +75°C *With one Digital Sensor connected* Ex db IIB+H2 T5 Gb Ex tb IIIC T85°C Db Tamb: -55°C ≤ Ta ≤ +60°C *With one IR400 connected* Ex db IIB+H2 T5 Gb Ex tb IIIC 100°C Db Tamb: -55°C ≤ Ta ≤ +75°C *With one Universal Gas HC (Combustible – Passive Sintered) **or** one Universal Gas H2S (Toxic – Passive Sintered) connected* Ex db IIB+H2 T4 Gb Tamb: -40°C ≤ Ta ≤ +70°C The coding of any attached sensor limits the coding of the junction box.
324240-2	S5000 Junction Box; Aluminium, IIB+H2 (flanged/non-cemented)	
324240-3	S5000 Junction Box; Stainless Steel, IIC (cemented)	*Junction Box only, without a sensor* Ex db IIC T6 Gb Ex tb IIIC T85°C Db Ex nA IIC T6 Gc Tamb: -55°C ≤ Ta ≤ +75°C *With one Digital Sensor connected* Ex db IIC T5 Gb Ex tb IIIC T85°C Db Tamb: -55°C ≤ Ta ≤ +60°C *With one IR400 connected* Ex db IIB+H2 T5 Gb Ex tb IIIC 100°C Db Tamb: -55°C ≤ Ta ≤ +75°C *With one Universal Gas HC (Combustible – Passive Sintered) **or** one Universal Gas H2S (Toxic – Passive Sintered) connected* Ex db IIC T4 Gb Tamb: -40°C ≤ Ta ≤ +70°C The coding of any attached sensor limits the coding of the junction box.
324240-4	S5000 Junction Box; Aluminium, IIC (cemented)	

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

Digital Sensor, gas sensor (equipment)		
Model reference	Description	Coding
A-5K-SENS-***aa-b-c-d-e***	Digital Sensor (combustible); where the following applies ***aa*** is for Gas Type: 01 = No Sensor (sensor body w/blank element) 65 = Combustible, 0-100% LEL – Methane 66 = Combustible, 0-100% LEL – Propane ***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	Ex db IIC T5 Gb Ex tb IIIC T85°C Db Tamb: -55°C ≤ Ta ≤ +60°C
	Digital Sensor (toxic); where the following applies ***aa*** is for Gas Type: 01 = No Sensor (sensor body w/blank element) 10 = Carbon Monoxide, 0-100 ppm 11 = Carbon Monoxide, 0-500 ppm 12 = Carbon Monoxide, 0-1000 ppm 14 = Carbon Monoxide, Hydrogen Resistant 0-100 ppm 16 = Oxygen, 0-25% 20 = Hydrogen Sulfide, 0-10 ppm 21 = Hydrogen Sulfide, 0-50 ppm 22 = Hydrogen Sulfide, 0-100 ppm ***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	

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

IR400 Sensor, gas sensor (equipment)		
Model reference	Description	Coding
IR400	Detector/ Sensor (combustible); provides a 4-20mA output with Modbus or optional Hart output	Ex db IIB+H_2 T5 Gb Ex tb IIIC T100°C Db Tamb: -60°C ≤ Ta ≤ +75°C

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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	Coding
11159-1 11159-2 11159-8* 11159-1L 11159-2L 11159-8L* *Excluded from the combustible gas detection performance approval (60079-29-1))	HC sensor head; Passive Sintered (combustible); provides a 4-20mA output with Modbus or optional Hart output.	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); provides a 4-20mA output with Modbus or optional Hart output.	

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