1 **TYPE EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres 2014/34/EU

3 Certificate Number: **Sira 17ATEX4052X** Issue: **1**

4 Equipment: **S5000 Transmitter, Junction Boxes and Digital Sensors (With FRIT and No FRIT)**

5 Applicant: **General Monitors Inc** **General Monitors (Ireland) Limited**

6 Address: 26776 Simpatica Circle
Lake Forest, CA 92630
USA

Ballybrit Business Park Galway
Galway
Republic of Ireland

7 This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

8 Sira Certification Service certifies that this equipment has been found to comply with the Essential Health and Safety Requirements that relate to the design of Category 3 equipment, which is intended for use in potentially explosive atmospheres. These Essential Health and Safety Requirements are given in Annex II to European Union Directive 2014/34/EU of the European Parliament and of the Council, 26 February 2014.

The examination and test results are recorded in the confidential reports listed in Section 14.2.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule of this certificate, has been assessed by reference to:

EN 60079-0:2012/A11:2013 EN 60079-15:2010 EN 60079-1:2014

The above list of documents may detail standards that do not appear on the UKAS Scope of Accreditation, but have been added through Sira's flexible scope of accreditation, which is available on request.

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 of the specified equipment, and not to specific items of equipment subsequently manufactured.

12 The marking of the equipment shall include the following:

S5000 Transmitter:
Cemented and Flanged Joint versions:

II 3G
Ex nA nC IIC T4 Gc
-55°C ≤ Ta ≤ +75°C

IP66

S5000 Junction Boxes:
Cemented and Flanged Joint versions:

II 3G
Ex nA IIC T6 Gc
-55°C ≤ Ta ≤ +75°C

IP66

Project Number 70172583

C Ellaby
Certification Manager

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SCHEDULE

TYPE EXAMINATION CERTIFICATE **Sira 17ATEX4052X**
Issue 1

Digital Sensor:

With FRIT:	**No FRIT**:
II 3G	II 3G
Ex db nA IIC T5 Gc	Ex nA IIC T5 Gc
-55°C ≤ Ta ≤ +60°C	-55°C ≤ Ta ≤ +60°C
IP65	IP55

13 **DESCRIPTION OF EQUIPMENT**

The S5000 Transmitter is the control unit of the S5000 Gas Monitor fixed gas detection system and is designed for 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 Box is the remote mounting unit of the S5000 Gas Monitor fixed gas detection system and is designed for 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 and Non-Sparking (Ex db nA). 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. The equipment enclosure has been separately tested against the requirements of IEC 60529 and meets IP55.

The product model code options of the S5000 Transmitter, S5000 Junction Boxes and Digital Sensors (With FRIT and No FRIT) are shown below.

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SCHEDULE

TYPE EXAMINATION CERTIFICATE **Sira 17ATEX4052X**
Issue 1

Model Code Options:

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

S5000 transmitter (equipment)		
Model reference	Description	Coding
S5000-0*bcdefffggg*	S5000 transmitter, Aluminum (flanged/non-cemented)	Ex nA nC IIC T4 Gc Tamb: -55°C ≤ Ta ≤ +75°C
S5000-1*bcdefffggg*	S5000 transmitter, Aluminum (cemented)	
S5000-2*bcdefffggg*	S5000 transmitter, Stainless Steel (flanged/non-cemented)	
S5000-3*bcdefffggg*	S5000 transmitter, Stainless Steel (cemented)	

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

S5000 Junction Boxes (equipment)		
Model reference	Description	Coding
324240-1	S5000 Junction Box; Stainless Steel, (flanged/non-cemented)	Ex nA IIC T6 Gc Tamb: -55°C ≤ Ta ≤ +75°C
324240-2	S5000 Junction Box; Aluminium, (flanged/non-cemented)	
324240-3	S5000 Junction Box; Stainless Steel, (cemented)	
324240-4	S5000 Junction Box; Aluminium, (cemented)	

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 (With FRIT) model (combustible); where the following applies ***aa*** is for Gas Type: 01 = No Sensor (sensor body (With FRIT) w/blank element) 60 = Combustible, 0-100% LEL – 5% Methane 61 = Combustible, 0-100% LEL – 2.1% Propane 65 = Combustible, 0-100% LEL – 4.4% Methane 66 = Combustible, 0-100% LEL – 1.7 % 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 nA IIC T5 Gc Tamb: -55°C ≤ Ta ≤ +60°C
	Digital Sensor (With FRIT) model (toxic); where the following applies ***aa*** is for Gas Type: 01 = No Sensor (sensor body (With FRIT) 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% 17 = Oxygen, 0-25% Solvent Tolerant	

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Issue 1

Digital Sensor, gas sensor (equipment)		
Model reference	Description	Coding
	20 = Hydrogen Sulfide, 0-10 ppm 21 = Hydrogen Sulfide, 0-50 ppm 22 = Hydrogen Sulfide, 0-100 ppm 23 = Hydrogen Sulfide, 0-500 ppm 72 = Nitrogen oxide, 0-100 ppm 75 = Hydrogen Cyanide, 0-50 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	
	Digital Sensor (No FRIT) model (toxic); where the following applies ***aa*** is for Gas Type: 02 = No Sensor (sensor body (No FRIT) w/blank element) 30 = Chlorine, 0-5 ppm (Zone 2 only) 31 = Chlorine, 0-10 ppm (Zone 2 only) 32 = Chlorine, 0-20 ppm (Zone 2 only) 35 = Chlorine Dioxide, 0-3 ppm (Zone 2 only) 40 = Ammonia, 0-100 ppm (Zone 2 only) 41 = Ammonia, 0-1000 ppm (Zone 2 only) 50 = Sulfur Dioxide, 0-25 ppm (Zone 2 only) 51 = Sulfur Dioxide, 0-100 ppm (Zone 2 only) 70 = Hydrogen, 0-1000 ppm (Zone 2 only) 71 = Ethylene Oxide, 0-10 ppm (Zone 2 only) 73 = Nitrogen Dioxide, 0-10 ppm (Zone 2 only) 74 = Hydrogen Chloride, 0-50 ppm (Zone 2 only) 76 = Hydrogen Fluoride, 0-10 ppm (Zone 2 only) ***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 nA IIC T5 Gc Tamb: -55°C ≤ Ta ≤ +60°C

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Variation 1 – This variation introduced the following changes:

i. Introduction of applicable assessment, checklist and label drawing revisions to apply IEC 60079-15:2010 Zone 2 approval Digital Sensor (With FRIT) assembly having the FRIT (stainless steel sintered element) and utilizes an electrochemical sensing element (Toxic and Oxygen) construction type and the Digital Sensor (No FRIT) assembly without the FRIT and utilizes an electrochemical sensing element (Toxic and Oxygen) construction type; for toxic or oxygen detection.
ii. Introduction of Standard EN 60079-1:2014 per the applicable assessment and checklist for Ex db protection of the thermocatalytic element in the Zone 2 (Gc) location for the Digital Sensor (With FRIT) model.
iii. The Marking, the Product Description and the Model Code Tables were amended to include the applicable Zone 2 approval coding for the Digital Sensor (With FRIT) and the Digital Sensor (No FRIT) models.
iv. Introduction of Specific Conditions of Use for the Digital Sensor (With FRIT) and the Digital Sensor (No FRIT) models.
v. Introduction of Conditions of Manufacturer for the Digital Sensor (With FRIT) and the Digital Sensor (No FRIT) models.
vi. Inclusion of the IP rating for each equipment enclosure as part of both the marking.
vii. Added the General Monitors (Ireland) Limited factory/ subcontractor to the Manufacturer's Name and Address section.
viii. A typographical error in a Condition of Manufacture was corrected.

14 DESCRIPTIVE DOCUMENTS

14.1 Drawings

Refer to Certificate Annexe.

14.2 Associated Sira Reports and Certificate History

Issue	Date	Report number	Comment
0	08 January 2018	R70141952A	The release of the prime certificate.
1	20 September 2018	R70172583A	The introduction of Variation 1.

15 SPECIFIC CONDITIONS OF USE

15.1 S5000 Transmitter:

15.1.1 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.

15.2 S5000 Junction Boxes:

15.2.1 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.

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15.3 **Digital Sensor (With FRIT) model:**

15.3.1 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.

15.3.2 The flameproof joints shall not be repaired..

15.3.3 If the sensor is uninstalled, the equipment manufacturer shall be contacted prior to reinstalling.

15.3.4 The Digital Sensor is provided with a ¾“ NPT thread and shall only be connected to a suitably certified junction box or instrument for the hazardous area of installation and thereby provide Ex protection for the flying lead connections. The installation to the certified enclosure shall be with five fully engaged threads, tightened wrench-tight.

15.3.5 The Digital Sensor shall only be fitted to enclosures having a maximum reference pressure of 34.4 bars or lower.

15.3.6 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). The operating manual shall reinforce this installation requirement.

15.3.7 The Ingress Protection rating is exclusively based upon the installation instruction for orientation specified in the operating manual.

15.4 **Digital Sensor (No FRIT) model:**

15.4.1 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.

15.4.2 The Digital Sensor is provided with a ¾“ NPT thread and shall only be connected to a suitably certified junction box or instrument for the hazardous area of installation and thereby provide Ex protection for the flying lead connections.

15.4.3 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). The operating manual shall reinforce this installation requirement.

15.4.4 The Ingress Protection rating is exclusively based upon the installation instruction for orientation specified in the operating manual.

16 **ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II** (EHSRs)

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed reports listed in Section 14.2.

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SCHEDULE

TYPE EXAMINATION CERTIFICATE **Sira 17ATEX4052X**
Issue 1

17 **CONDITIONS OF MANUFACTURE**

17.1 The use of this certificate is subject to the Regulations Applicable to Holders of Sira Certificates.

17.2 Holders of Type Examination Certificates are required to comply with the conformity to type requirements defined in Article 13 of Directive 2014/34/EU.

17.3 **S5000 Transmitter:**

17.3.1 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.

17.4 **Digital Sensor (With FRIT and No FRIT) models:**

17.4.1 Dielectric Voltage Withstand Test (per EN 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..

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Certificate Annexe

Certificate Number: **Sira 17ATEX4052X**

Equipment: **S5000 Transmitter, Junction Boxes and Digital Sensors (With FRIT and No FRIT)**

Applicant: **General Monitors Inc**

Issue 0

Drawing no.	Sheets	Rev.	Date(Sira stamp	Description	Model
324140	1 of 1	0	23 Nov 17	S5000 Relay Board, Schematic	transmitter only
324141	1 of 1	0	23 Nov 17	S5000 Relay Board, Circuit Card Assembly	transmitter only
324141-1	1 of 1	1	23 Nov 17	S5000 Relay Board, BOM	transmitter only
324130	1 to 9	2	23 Nov 17	S5000 Control Board, Schematic	transmitter only
324131	1 of 1	1	23 Nov 17	S5000 Control Board, Circuit Card Assembly	transmitter only
324131-1	1 to 2	0	23 Nov 17	S5000 Control Board, BOM	transmitter only
324120	1 of 1	2	23 Nov 17	S5000 User Interface Board, Schematic	transmitter only
324121	1 of 1	0	23 Nov 17	S5000 User Interface Board, Circuit Card Assembly	transmitter only
324121-1	1 of 1	3	23 Nov 17	S5000 User Interface Board BOM	transmitter only
324101	1 to 3	1	12 Dec 17	S5000 Explosion-Proof Enclosure Design	Transmitter & Junction Box
324200	1 of 1	1	23 Nov 17	S5000 Junction Box Board, Schematic	Junction Box only
324201	1 of 1	1	23 Nov 17	S5000 Junction Box Board, Circuit Card Assembly	Junction Box only
324201-1	1 of 1	1	23 Nov 17	S5000 Junction Box Board, BOM	Junction Box only
324240	1 of 1	0	23 Nov 17	Junction Box Assembly	Junction Box only
324114	1 of 1	0	23 Nov 17	S5000 Transmitter and Junction Box electronics assembly	transmitter & Junction Box
MANS5000	1 of 63	01	23 Nov 17	Operating Manual General Monitors S5000 Gas Monitor	Transmitter & Junction Box
324247-1	1 of 1	1	23 Nov 17	Label Artwork S5000 Junction Box IIB+H2	Junction Box only
324247-2	1 of 1	1	23 Nov 17	Label Artwork S5000 Junction Box IIC	Junction Box only
932-002	1 of 1	C	12 Dec 17	Conformal coating specification list	transmitter & Junction Box

Issue 1:

Drawing no.	Sheets	Rev.	Date(Sira stamp	Description	Model
324131	1 of 1	2	16 Aug 18	S5000 Control Board, Circuit Card Assembly	transmitter only
MANS5000	1 to 66	02	16 Aug 18	Operating Manual General Monitors S5000 Gas Monitor	All
SK3098-1444	1 of 6	0	16 Aug 18	Nameplate Approval Drawing, S5000 equipment	All

Note: Drawing SK309-1444 replaces Drawings: 324110-1, 324110-3, 324247-1, 324247-2, and 10179426.

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