1 **EU-TYPE EXAMINATION CERTIFICATE**

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

3 Certificate Number: **Sira 17ATEX1049X** Issue: **2**

4 Equipment: **ULTIMA® X5000 Gas Monitor fixed gas detection system (ULTIMA® X5000 transmitter & ULTIMA® X5000 Junction Box) and ULTIMA® XIR Plus sensor**

5 Applicant: **MSA - The Safety Company**

6 Address: 1000 Cranberry Woods Drive, Cranberry Township, PA 16066, USA

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

8 Sira Certification Service, notified body number 0518 in accordance with Articles 17 and 21 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this equipment 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 Annex II to the Directive.

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 to this certificate, has been assured by compliance with the following documents:

EN 60079-0:2012/A11:2013	EN 60079-1:2014	EN 60079-31:2014
EN 60079-29-1:2007*	EN 50271:2010	

* Applies only to the ULTIMA® X5000 Gas Monitor fixed Combustible Gas Detection System.

*EN 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.

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 identified in the schedule to this certificate.

11 This EU-Type Examination Certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:

ULTIMA® X5000 transmitter:

II 2GD
Ex db IIC T5 Gb
Ex tb IIIC T85°C Db
-40°C ≤ Ta ≤ +60°C
EN 60079-29-1

ULTIMA® X5000 Junction Box:

II 2GD
Ex db IIC T6 Gb
Ex tb IIIC T85°C Db
-40°C ≤ Ta ≤ +60°C

ULTIMA® XIR Plus sensor :

II 2G
Ex db IIC T5 Gb
-40°C ≤ Ta ≤ +60°C

Project Number 70164032

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Deputy Certification Manager

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13 **DESCRIPTION OF EQUIPMENT**

The ULTIMA® X5000 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 ULTIMA® X5000 transmitter base unit and an optional ULTIMA® X5000 Junction Box fitted with an arrangement of up to a pair of two factory-configured combustible or toxic gas sensors. The transmitter enclosure is fitted with associated circuitry, connection facilities and an Organic LED (OLED) display visible through the viewing window of the enclosure.

The ULTIMA® X5000 transmitter is the control unit of the ULTIMA® X5000 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). The enclosure is provided with ¾" NPT or M25 threaded entries which can be fitted with the sensors described below or suitably certified sensors, cable entry devices or blanking plugs.

The ULTIMA® X5000 Junction Box is the remote mounting unit of the ULTIMA® X5000 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) The enclosure is provided with ¾" NPT or M25 threaded entries which can be fitted with the sensors described below or suitably certified sensors, cable entry devices or blanking plugs.

The ULTIMA® XIR Plus sensor is the infra-red sensor unit of the ULTIMA® X5000 Gas Monitor fixed gas detection system and the enclosure of the sensor is designed for Flameproof (Ex db) protection.

The ULTIMA® X5000 system makes use of two sensor types including a Digital Sensor for Combustible, toxic or oxygen gas detection and the ULTIMA® XIR Plus sensor (infra-red) for combustible or toxic gas detection, all mounted via conduit entries. The permitted sensor configurations follow:

- Two-Digital Sensors (combustible, toxic or oxygen) both installed either integral to the ULTIMA® X5000 transmitter, one integral and one remote via an ULTIMA® X5000 Junction Box or two remote via two separate ULTIMA® X5000 Junction Boxes.
- Two-ULTIMA® XIR Plus sensors both installed either integral to the ULTIMA® X5000 transmitter, one integral and one remote via an ULTIMA® X5000 Junction Box or two remote via two separate ULTIMA® X5000 Junction Boxes.
- One Digital Sensor (combustible, toxic or oxygen) and one ULTIMA® XIR Plus sensor installed either integral to the ULTIMA® X5000 transmitter, one integral and one remote via an ULTIMA® X5000 Junction Box or one sensor each remote via two separate ULTIMA® X5000 Junction Boxes.

The product model code options of the ULTIMA® X5000 gas detection systems (combustible, toxic or oxygen) featuring the ULTIMA® X5000 transmitter, ULTIMA® X5000 Junction Box, ULTIMA® XIR Plus sensor and the Digital Sensor 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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EU-TYPE EXAMINATION CERTIFICATE **Sira 17ATEX1049X**
Issue 2

Model Code Options:

ULTIMA® X5000 Gas Monitor fixed gas detection system:
ULTIMA® X5000 Transmitter:
Model coding appearing on the transmitter enclosure are shown below:

ULTIMA® X5000 transmitter (equipment)		
Model reference	Description	Coding/System Limitations
A-X5000-***abcdeffggh***	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 the Junction Box enclosure – only one senor per Junction Box permitted; two Digital Sensors or/ one ULTIMA® XIR Plus sensor and one Digital Sensor or/ two ULTIMA® XIR Plus sensors are permitted for installation (the main transmitter enclosure and the Junction Box enclosure): ***a*** is for Enclosure Material: 0 = Stainless Steel – ¾" NPT 1 = Aluminum – ¾" NPT 2 = Stainless Steel – M25 ***b*** is A = IECEx (ATEX) ***c*** is for Bluetooth: 0 = Yes 1 = No ***d*** is for Output Communication: 0 = Analog/HART 1 = Analog/HART/Relays ***e*** is 0 = Default place holder, not relevant to certification ***ff*** is for Sensor 1 selection: ***gg*** is for Sensor 2 selection: **Sensors:** for Sensor Selection ***ff*** or **gg:** -ULTIMA® XIR Plus sensor selections include 00 = No Sensor AC = IR combustible 0-100% LEL – Methane AD = IR combustible 0-100% LEL – Propane AE = IR Carbon Dioxide – 0-5000 ppm AF = IR Carbon Dioxide – 0-2% AG = IR Carbon Dioxide – 0-5% -Digital Sensor selections include, 00 = No Sensor or Sensor Body (transmitter only) 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 65 = Combustible, 0-100% LEL – Methane 66 = Combustible, 0-100% LEL – Propane ***h*** is for Tag: 0 = None T# = (# = 1, 2, or 3) Stainless Steel affixed tags	*transmitter only, without sensors* Ex db IIC T5 Gb Ex tb IIIC T85°C Db Tamb: -40°C ≤ Ta ≤ +60°C *Gas Detection System: main transmitter + one or two Digital Sensors (one sensor maybe connected to one Junction Box)* Ex db IIC T5 Gb Ex tb IIIC T85°C Db Tamb: -40°C ≤ Ta ≤ +60°C *Gas Detection System: main transmitter + one or two ULTIMA® XIR Plus sensors (one sensor maybe connected to one Junction Box)* Ex db IIC T5 Gb Tamb : -40°C ≤ Ta ≤ +60°C *Gas Detection System: main transmitter + one Digital Sensor + one ULTIMA® XIR Plus sensors (one sensor maybe connected to one Junction Box)* Ex db IIC T5 Gb Tamb : -40°C ≤ Ta ≤ +60°C The coding of any attached sensor limits the coding of the transmitter/ system.

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EU-TYPE EXAMINATION CERTIFICATE

Sira 17ATEX1049X
Issue 2

ULTIMA® X5000 Junction Box:
Model coding appearing on the Junction Box are shown below:

ULTIMA® X5000 Junction Box (equipment)		
Model reference	Description	Coding/System Limitations
10179509	ULTIMA® X5000 Junction Box; Stainless Steel, ¾" NPT	*Junction Box only, without sensors* Ex db IIC T6 Gb Ex tb IIIC T85°C Db Tamb: -40°C ≤ Ta ≤ +60°C *With a Digital Sensor connected* Ex db IIC T5 Gb Ex tb IIIC T85°C Db Tamb: -40°C ≤ Ta ≤ +60°C *With an ULTIMA® XIR Plus connected* Ex db IIC T5 Gb Tamb: -40°C ≤ Ta ≤ +60°C The coding of any attached sensor limits the coding of the junction box.
10179511	ULTIMA® X5000 Junction Box; Stainless Steel, M25	
10179513	ULTIMA® X5000 Junction Box; Aluminum, ¾" NPT	

ULTIMA® XIR Plus sensor:
Model coding appearing on ULTIMA® XIR Plus sensor are shown below:

ULTIMA® XIR Plus gas sensor (equipment)		
Model reference	Description	Coding
A-5K-SENS-***aa***-***b***-c-***d***-e	ULTIMA® XIR Plus infrared Combustible sensor; where the following applies: ***aa*** is for Gas Type: AC = IR combustible 0-100% LEL – Methane AD = IR combustible 0-100% LEL – Propane ***b*** is 0 = Stainless Steel ***c*** is A = IECEx (ATEX) ***d*** is for Sensor Body: 1 = ¾" NPT 2 = M25 ***e*** is 0 = Not relevant to certification	Ex db IIC T5 Gb Tamb: -40°C ≤ Ta ≤ +60°C
	ULTIMA® XIR Plus infrared Toxic sensor; where the following applies: ***aa*** is for Gas Type: AE = IR Carbon Dioxide – 0-5000 ppm AF = IR Carbon Dioxide – 0-2% AG = IR Carbon Dioxide – 0-5% ***b*** is 0 = Stainless Steel ***c*** is A = IECEx (ATEX) ***d*** is for Sensor Body: 1 = ¾" NPT 2 = M25 ***e*** is 0 = Not relevant to certification	

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EU-TYPE EXAMINATION CERTIFICATE **Sira 17ATEX1049X**
Issue 2

Digital Sensor:
Model coding appearing on the Digital Sensor 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	

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EU-TYPE EXAMINATION CERTIFICATE **Sira 17ATEX1049X**
Issue 2

Description relating to EN 50271:2010 Application:

Main Transmitter – The main transmitter unit consists of an explosion proof aluminum or stainless steel enclosure that houses the main unit electronics. Functionality includes the unit power supply, microprocessor and digital interface, 4-20mA drivers, user interface and (optional) relays. Up to two sensors in any combination can be used with a single Main Transmitter.

ULTIMA® XIR Plus Sensor – The UTIMA® XIR Plus sensor is an infrared sensor designed to measure many combustible and toxic gases. It consists of an optical bench, power board, and main board that digitizes the gas measurement for communication with the main transmitter.

Digital Sensors – The Digital Sensor modules include either an MSA XCell electrochemical sensor (currently CO, H2S and Oxygen) or an MSA XCell catalytic bead combustible sensor, a pre-amp board and a board that digitizes the gas measurement for communication with the main transmitter. The CO and H2S sensor modules also includes MSA's patented Life and Health algorithm that automatically compensates for sensor drift and sensitivity loss.

Table 1: FMEDA Analysis Results of the ULTIMA® X5000 Gas Detector (single mode)

Parameter name	Symbol	Equation/source	Result
Proof Test Interval	T1	IEC 61508-4 clause 3.8.5	**4380 hrs**
Mean Time Tod Repair	MTTR	IEC 61508-4 clause 3.6.21	**72 hrs**
Mean Repair Time (once revealed)	MRT	IEC 61508-4 clause 3.6.22	**72 hrs**
Type A/B	Type	IEC 61508-2 clause 7.4.4.1.2 & 7.4.4.1.3	**Type B**
Total failures:	λ	IEC 61508-4 clause 3.6.4	See Table 3 & Table 4.
Safe diagnosed failures:	λ_{SD}	IEC 61508-4 clause 3.6.8	
Safe undiagnosed failures:	λ_{SU}		
Dangerous diagnosed failures:	λ_{DD}	IEC 61508-4 clause 3.6.7	
Dangerous undiagnosed failures:	λ_{DU}		
Diagnostic coverage:	DC	$DC = \frac{\lambda_{DD}}{\lambda_{DU} + \lambda_{DD}}$	
Safe Failure Fraction:	SFF	$SFF = \frac{\lambda_{SD} + \lambda_{SU} + \lambda_{DD}}{\lambda}$	
Channel equivalent down time	t_{CE}	$t_{CE} = \frac{\lambda_{DU}}{\lambda_D}\left(\frac{T}{2} + MRT\right) + \frac{\lambda_{DD}}{\lambda_D} MTTR$	
PFD_{AVG} (using simplified equation)	PFD_{AVG}	$PFD_{AVG} = \lambda_{DU}\left(\frac{T}{2} + MTTR\right) + \lambda_{DD} MTTR$	

Element Safety Function

The element safety functions of the ULTIMA® X5000 Gas Detector is defined as follows:

'To provide the host system with a predefined 4-20mA alarm signal output and de-energise a relay (if included) in the event of a dangerous or explosive atmosphere depending on the sensor type configuration.'

See Table 2 below for 4-20 mA alarm signal details in different operation modes.

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Table 2: Analog Output Default Values

Output Setting	Custom 1 (mA)	Custom 2 (mA)	3.5 mA with HART (mA)	1.25 mA with HART (mA)
Fault	2.0	2.0	3.5	1.25
Calibration (excl. O_2)	3.0	3.0	3.5	1.25
Calibration – O_2 only	3.0	21.7	3.5	1.25
Ready	4.0	4.0	4.0	4.0
WARN Signal	5.6	5.6	5.6	5.6
ALARM Signal	8.8	8.8	8.8	8.8
Over Range	21.7	21.7	21.7	21.7

Table 3: FMEA Summary for the ULTIMA® X5000 Gas Detector in Single Mode (1oo1) without Relay (Low Demand of Operation)

Safety Function: To provide the host system with a predefined 4-20 mA alarm signal output and de-energise a relay (if included) in the event of a dangerous or explosive atmosphere depending on the sensor type configuration. See Table2 for 4-20 mA alarm signal details in different operation modes.

Sensor 1	Sensor 2	Relay	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}	SFF	DC	t_{CE}	PFD
Xcell Toxic	No Sensor	No	2.99E-08	1.20E-06	1.54E-06	4.14E-08	98.53%	97.39%	1.29E+02	2.05E-04
Xcell Toxic	Xcell Toxic	No	3.05E-08	1.53E-06	2.03E-06	6.80E-08	98.14%	96.76%	1.43E+02	3.00E-04
Xcell Toxic	Xcell Oxygen	No	3.06E-08	1.60E-06	2.02E-06	4.30E-08	98.83%	97.91%	1.18E+02	2.42E-04
Xcell Toxic	Cat Bead Comb	No	3.00E-08	1.31E-06	1.61E-05	1.64E-06	91.40%	90.75%	2.75E+02	4.88E-03
Xcell Toxic	XIR Plus	No	2.99E-08	1.82E-06	2.54E-06	5.21E-08	98.83%	97.99%	1.16E+02	3.01E-04
Xcell Oxygen	No Sensor	No	3.00E-08	1.28E-06	1.53E-06	1.65E-08	99.42%	98.94%	9.53E+01	1.48E-04
Xcell Oxygen	Xcell Oxygen	No	3.07E-08	1.68E-06	2.00E-06	1.81E-08	99.52%	99.11%	9.16E+01	1.85E-04
Xcell Oxygen	Cat Bead Comb	No	3.01E-08	1.39E-06	1.61E-05	1.62E-06	91.55%	90.87%	2.72E+02	4.82E-03
Xcell Oxygen	XIR Plus	No	3.00E-08	1.89E-06	2.53E-06	2.71E-08	99.39%	98.94%	9.52E+01	2.43E-04
Cat Bead Comb	No Sensor	No	2.94E-08	9.83E-07	1.56E-05	1.62E-06	91.15%	90.63%	2.77E+02	4.78E-03
Cat Bead Comb	Cat Bead Comb	No	2.95E-08	1.09E-06	3.02E-05	3.22E-06	90.69%	90.38%	2.83E+02	9.46E-03
Cat Bead Comb	XIR Plus	No	2.94E-08	1.60E-06	1.66E-05	1.63E-06	91.82%	91.09%	2.67E+02	4.88E-03
XIR Plus	No Sensor	No	2.93E-08	1.49E-06	2.06E-06	2.55E-08	99.29%	98.78%	9.88E+01	2.06E-04
XIR Plus	XIR Plus	No	2.93E-08	2.11E-06	3.05E-06	3.61E-08	99.31%	98.83%	9.76E+01	3.02E-04

The above results are based on the following:
Proof Test Interval (PTI) = 4380 hours (6 months), Mean Time to Restoration (MTTR) = 72 hours, Mean Repair Time (MRT) = 72 hours

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Table 4: FMEA Summary for the ULTIMA® X5000 Gas Detector in Single Mode (1oo1) with Relay (Low Demand of Operation)

Safety Function: To provide the host system with a predefined 4-20 mA alarm signal output and de-energise a relay (if included) in the event of a dangerous or explosive atmosphere depending on the sensor type configuration. See Table2 for 4-20 mA alarm signal details in different operation modes.										
Sensor 1	Sensor 2	Relay	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}	SFF	DC	t_{CE}	PFD
Xcell Toxic	No Sensor	Yes	2.99E-08	1.34E-06	1.68E-06	5.25E-08	98.31%	96.96%	1.39E+02	2.39E-04
Xcell Toxic	Xcell Toxic	Yes	3.05E-08	1.67E-06	2.16E-06	7.91E-08	97.99%	96.47%	1.49E+02	3.34E-04
Xcell Toxic	Xcell Oxygen	Yes	3.06E-08	1.75E-06	2.15E-06	5.41E-08	98.64%	97.54%	1.26E+02	2.77E-04
Xcell Toxic	Cat Bead Comb	Yes	3.00E-08	1.45E-06	1.63E-05	1.65E-06	91.47%	90.76%	2.74E+02	4.91E-03
Xcell Toxic	XIR Plus	Yes	2.99E-08	1.96E-06	2.67E-06	6.31E-08	98.66%	97.69%	1.23E+02	3.35E-04
Xcell Oxygen	No Sensor	Yes	3.00E-08	1.42E-06	1.66E-06	2.75E-08	99.12%	98.37%	1.08E+02	1.82E-04
Xcell Oxygen	Xcell Oxygen	Yes	3.07E-08	1.82E-06	2.13E-06	2.91E-08	99.28%	98.65%	1.01E+02	2.20E-04
Xcell Oxygen	Cat Bead Comb	Yes	3.01E-08	1.53E-06	1.62E-05	1.63E-06	91.62%	90.89%	2.72E+02	4.85E-03
Xcell Oxygen	XIR Plus	Yes	3.00E-08	2.04E-06	2.66E-06	3.82E-08	99.20%	98.59%	1.03E+02	2.78E-04
Cat Bead Comb	No Sensor	Yes	2.94E-08	1.13E-06	1.58E-05	1.63E-06	91.23%	90.65%	2.77E+02	4.82E-03
Cat Bead Comb	Cat Bead Comb	Yes	2.95E-08	1.24E-06	3.04E-05	3.23E-06	90.73%	90.38%	2.83E+02	9.49E-03
Cat Bead Comb	XIR Plus	Yes	2.94E-08	1.74E-06	1.68E-05	1.64E-06	91.88%	91.10%	2.67E+02	4.91E-03
XIR Plus	No Sensor	Yes	2.93E-08	1.63E-06	2.19E-06	3.66E-08	99.06%	98.36%	1.08E+02	2.40E-04
XIR Plus	XIR Plus	Yes	2.93E-08	2.25E-06	3.19E-06	4.72E-08	99.14%	98.54%	1.04E+02	3.36E-04

The above results are based on the following:
Proof Test Interval (PTI) = 4380 hours (6 months), Mean Time to Restoration (MTTR) = 72 hours, Mean Repair Time (MRT) = 72 hours

Variation 1 – This variation introduced the following changes:

i. Introduction of Certified Digital Sensor: Previously the Digital Sensor was evaluated as suitable to use with the ULTIMA® X5000 Gas Monitor fixed gas detection system requiring a special Digital Sensor nameplate referencing its suitability for use. The Digital Sensor Certification was confirmed and the requirement for the special Digital Sensor nameplate was removed.
ii. Introduction of two remote sensor configurations: two Dual Sensors, two ULTIMA® XIR Plus sensors and One Dual Sensor/One ULTIMA® XIR Plus sensor. The Product Description and The ULTIMA® X5000 Transmitter model code table was amended to reference the two remote sensor configurations.
iii. The Product Description and Model Code Tables were amended to correct typographical errors missed in the Prime report. Errors including, but not limited to: in Description section: Referencing Transmitter instead of Gas Detection System, calling out certified sensor along with cable entry devices & plugs, confirmation of gas types included in gas detection systems & Digital/XIR Plus Sensor and in Model Code Tables: Transmitter called out in title of each table, missing ambient temperature range and correction to Coding column title where appropriate.
iv. Introduction of an additional note to Standard EN 60079-29-1.
v. Transmitters, Junction Boxes and XIR Plus gas sensor Specific Condition of Use referencing "tightened to a minimum torque of 90 Nm (800 in-lbs.)" was removed.
vi. Transmitters and Junction Boxes Specific Condition of Use referencing "IEC 60664-1" was removed.
vii. Transmitters, Junction Boxes and XIR Plus gas sensor Specific Condition of Use referencing "non-metallic parts" was revised.

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viii. Specific Condition of Use was introduced to the Junction Box referencing "field mounting in the vertical orientation" inadvertently omitted from the prime Certificates, same as the present Transmitters Specific Condition of Use.

ix. Three Specific Conditions of Use were introduced to the XIR Plus gas sensor referencing: "sensor is provided with a ¾" NPT thread", "sensor shall only be fitted to enclosures having a maximum pressure" and "sensor shall be connected directly to a suitably certified junction box"; inadvertently omitted from the prime Certificates.

x. Introduction of a Condition of Manufacture referencing EN 60079-0, clause 30, requiring the manufacture responsible to provide relevant information not presently included in the Instruction Manual.

Variation 2 – This variation introduced the following changes:

i. Following appropriate assessment to demonstrate compliance, EN 50271:2010 was added to the list of standards and the description was amended to recognise the application of the product in a safety related loop. Specific Conditions of Use and Conditions of Manufacture were introduced as a result of this change.

14 DESCRIPTIVE DOCUMENTS

14.1 Drawings

Refer to Certificate Annexe.

14.2 Associated Sira Reports and Certificate History

Issue	Date	Report no.	Comment
0	02 October 2017	R70116274A	The release of the prime certificate.
1	20 March 2018	R70164032A	The introduction of Variation 1
2	03 May 2018	R70164637D	The introduction of Variation 2

15 SPECIFIC CONDITIONS OF USE (denoted by X after the certificate number)

15.1 ULTIMA® X5000 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.

15.1.2 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 ULTIMA® XIR Plus infrared (IR) sensors. The equipment is subject to the installation and orientation requirements defined in the product manual.

15.1.3 The flameproof joints shall not be repaired.

15.1.4 The ULTIMA® X5000 Gas Monitor fixed gas detection system complies with EN 50271 (clause 4.8, safety integrity assessment excluded from the assessment)

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15.2 **ULTIMA® X5000 Junction Box:**

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.

15.2.2 This fixed equipment is exclusively designed for field mounting in the vertical orientation with restrictions placed around the conduit entry locations permitted for connection of the Digital Sensor and the ULTIMA® XIR Plus infrared (IR) sensor. The equipment is subject to the installation and orientation requirements defined in the product manual.

15.2.3 The flameproof joints shall not be repaired.

15.2.4 The ULTIMA® X5000 Gas Monitor fixed gas detection system complies with EN 50271 (clause 4.8, safety integrity assessment excluded from the assessment)

15.3 **ULTIMA® XIR Plus gas sensor**:

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 The ULTIMA® XIR Plus infrared (IR) 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.

15.3.4 The ULTIMA® XIR Plus infrared (IR) sensor shall only be fitted to enclosures having a maximum reference pressure of 13.5 bars.

15.3.5 The ULTIMA® XIR Plus infrared (IR) 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..

15.4 **Conditions relating to EN 50271:2010**

15.4.1 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.

15.4.2 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.

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

15.4.4 The proof test interval for the ULTIMA® X5000 safety function is 6 months.

15.4.5 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.

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SCHEDULE

EU-TYPE EXAMINATION CERTIFICATE **Sira 17ATEX1049X**
Issue 2

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 in the reports listed in Section 14.2.

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

17.3 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 60079-0 — i.e., the certificates:

17.4 **Conditions relating to EN 50271:2010**

17.4.1 The manufacturer shall include the safety instructions in the relevant product manual.

17.4.2 Modification to the hardware or software shall be in accordance with IEC 61508-2, clause 7.8 and EN 50271. The certification body shall be notified of any changes.

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Certificate Annexe

Certificate Number: **Sira 17ATEX1049X**

Equipment: **ULTIMA® X5000 Gas Monitor fixed gas detection system (ULTIMA® X5000 transmitter & ULTIMA® X5000 Junction Box) and ULTIMA® XIR Plus sensor**

Applicant: **MSA - The Safety Company**

Issue 0:

Drawing no.	Sheets	Rev.	Date(Sira stamp)	Description
10162584	1 to 3	0	22 Sep 17	X5000 Option Board PCB Fabrication
10162585	1 to 2	0	22 Sep 17	X5000 Option Board Artwork
10163332	1 to 3	1	22 Sep 17	X5000 Main Board PCB Fabrication
10163333	1 to 2	0	22 Sep 17	X5000 Main Board PCB Assembly
10164799	1 of 2	0	22 Sep 17	X5000 User Interface Board PCB Fabrication
SK3098-1397	1 to 7	0	22 Sep 17	-X5000 transmitter and Junction Box Flame-Proof Enclosure Design (pages 1, 2 & 5) -XIR Plus sensor Flame-Proof Enclosure Design (page 4) -Label placement detail (page 6) -Cementing procedures (page 7)
SK3073-1134	1 of 1	0	22 Sep 17	Wiring Schematic, P.C. Board Assembly, Ultima X5000 Option
SK3073-1145	1 of 1	0	22 Sep 17	Wiring Schematic, P.C. Board Assembly, Ultima X5000, User Interface
SK3073-1146	1 to 2	1	22 Sep 17	Wiring Schematic, P.C. Board Assembly, Ultima X5000, Main
SK3073-1149	1 of 1	0	22 Sep 17	Wiring Schematic, PCBA, Ultima X5000, Remote Interface (Junction Box)
7-7206-1	1 of 1	1	22 Sep 17	X5000 Smart transmitter and Junction Box electronics assembly
10177361	1 to 67	1	22 Sep 17	Operating Manual, ULTIMA® X5000 Gas Monitor
10182779	1 to 4	1	22 Sep 17	ULTIMA® X5000 Gas Monitor Operating Manual Addendum
7-7207-1	1 of 1	0	22 Sep 17	XIR Plus assembly
SK3073-1144	1 of 1	0	22 Sep 17	Wiring Schematic, XIR Plus Board
10164157	1 to 1	0	22 Sep 17	XIR Plus Board Artwork
10177161	1 of 1	0	22 Sep 17	SMTA XIR Plus Board Artwork (BOM included in drawing)
10176109	1 of 1	0	22 Sep 17	X5000 Remote Interface (Junction Board) PCB Fabrication
10179429	1 of 1	0	22 Sep 17	ULTIMA® X5000 transmitter label
10179526	1 of 1	1	22 Sep 17	ULTIMA® XIR Plus sensor label
10182719	1 of 1	1	22 Sep 17	ULTIMA® X5000 Junction Box label

Issue 1: - No new drawings were introduced.

Issue 2: - The following new drawings were introduced to support the EN 50271 certification.

Drawing	Sheets	Rev.	Date (Sira stamp)	Title
SK3073-1122	1 of 1	4	29 Nov 17	Toxic & Oxygen ASIC Schematic
SK3073-1143	1 of 1	0	29 Nov 17	Wiring schematic, P.C. Board Assembly, ULTIMA XIR Plus, Main
324170	1 of 1	0	29 Nov 17	GM Catalytic Cell Pre-Amp
324180	1 of 1	0	29 Nov 17	Schematic Diagram, XCELL_PUCK
324230	1 of 1	2	29 Nov 17	XCELL Life & Health Puck Board

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