



# 1. EU-TYPE EXAMINATION CERTIFICATE

2. Equipment or Protective systems intended for use in Potentially Explosive Atmospheres - Directive 2014/34/EU

3. EU-Type Examination Certificate No: FM21ATEX0071X

4. Equipment or protective system:  
(Type Reference and Name) ULTIMA X5000 Gas Monitor Fixed Gas Detection System (ULTIMA X5000 Transmitter, ULTIMA X5000 or JB5000 Junction Box, and ULTIMA XIR Plus Sensor)

5. Name of Applicant: MSA Innovation LLC dba MSA - The Safety Company

6. Address of Applicant 1000 Cranberry Woods Drive, Cranberry Township, Pennsylvania 16066, 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 Europe Ltd, notified body number 2809 in accordance with Article 17 of Directive 2014/34/EU of 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 confidential report number:

PR460997 dated 9<sup>th</sup> August 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+A11:2024, EN 60079-1:2014, EN 60079-29-1:2016+A1:2022+A11:2022, EN 60079-31:2014, 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 EU-Type Examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

Certificate issued by:



11 April 2025

Certification Manager, FM Approvals Europe Ltd.

Date

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



See Annex

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

See Annex

14. **Specific Conditions of Use:**

See Annex

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

The relevant EHSRs that have not been addressed by the standards listed in this certificate have been identified and assessed in the confidential report identified in item 8.

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

This EU-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 CE Marking, FM Approvals Europe Ltd accepts no responsibility for the compliance of the equipment against all applicable Directives in all applications.

This Certificate has been issued in accordance with FM Approvals Europe Ltd's ATEX 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 Notified Body. The documents are maintained under file number PR449063

18. **Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
10 August 2022	Original Issue.
7 February 2023	<u>Supplement 1:</u> Report Reference: RR234893 dated 6 <sup>th</sup> February 2023. Description of the Change: Minor changes to replace an obsolete component. Various drawing updates to correlate with previously approved changes. No change to firmware. Minor edits to certificate format and text.

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Date	Description
29 July 2024	<p><u>Supplement 2:</u> Report Reference: PR467005 dated 15<sup>th</sup> July 2024. Description of the Change(s): Hardware and firmware updates required additional performance testing. The listing is updated to reduce paragraphs and provide information in a standardized table format, to provide clarity, and to create a table listing all approved sensors for the system. A new specific condition of use is added to the ULTIMA XIR Plus sensors. The critical document list has been updated. The company name has been updated from "MSA - The Safety Company" to "MSA Innovation LLC dba MSA - The Safety Company".</p>
22 November 2024	<p><u>Supplement 3:</u> Report Reference: RR243419 dated 15<sup>th</sup> November 2024. Description of the Change(s):</p> <ol style="list-style-type: none"><li>1. Qualification of alternate component for the IR touch proximity sensor (related to the user interface through the display).</li><li>2. Firmware update for the Ultima X5000 Gas Monitor from 4.01.0016 to 4.02.0018 due to the qualification of the alternate IR touch proximity sensor.</li></ol>
19 December 2024	<p><u>Supplement 4:</u> Report Reference: RR243867 dated 17<sup>th</sup> December 2024. Description of the Change(s): The humidity range for the ULTIMA XIR Plus Sensor has been extended to 5%RH to 95%RH, non-condensing. There are no firmware or hardware changes as a result of this revision.</p>
11 April 2025	<p><u>Supplement 5:</u> Report Reference: RR245442 dated 9 April 2025. Description of the Change(s): Updated communication board on X5000 Gas Monitor to permit local connection for modbus. Modbus remains for information gathering only, not for safety. The table of permitted sensors under X5000 Gas Monitor is updated to provide more detail. No new sensors added. The specific conditions of use have been updated.</p>

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# ANNEX

## ULTIMA X5000 Gas Monitor

### Equipment Ratings:

The ULTIMA X5000 Gas Monitor is Flameproof as Ex db IIC T6 Gb; Protection by Enclosure as Ex tb IIIC T85°C Db; Hazardous Locations, indoor and outdoor (IP66).

### Markings:



II 2GD  
Ex db IIC T6 Gb  
Ex tb IIIC T85°C Db  
-40°C ≤ Ta ≤ +60°C  
EN 60079-29-1  
EN 50104  
IP66

### Description of Equipment:

The ULTIMA X5000 Gas Monitor consists of an ULTIMA X5000 Transmitter and an optional ULTIMA X5000 or JB5000 Junction Box. The ULTIMA X5000 Gas Monitor supports up to two ULTIMA XIR Plus point IR Detectors, up to two General Monitors Inc. Digital Sensors (Combustible w/ catalytic bead sensor, Toxic w/ electrochemical sensor, or Oxygen w/ electrochemical sensor), or one ULTIMA XIR Plus point IR detector and one Digital Sensor simultaneously.

The ULTIMA X5000 Gas Monitor enclosure consists of a single 316 stainless steel or aluminium compartment enclosure measuring approximately 5.9 inches in width, 5.7 inches in height with depths of 3.8 and 4.8 inches (depending on the windowed cover installed). The transmitter provides ¾ inch NPT threaded conduit entries, or optionally M25 straight threaded entries. Unused entries are fitted with suitably certified blanking plugs. M25 to ¾ inch NPT adapters are provided for connecting of sensors.

### Model Code Options:

#### A-X5000-abcdeffggh, Gas Monitor Model ULTIMA X5000

a is for Enclosure Material:

- 0 = Stainless Steel – ¾" NPT
- 1 = Aluminium - ¾" NPT
- 2 = Stainless Steel – M25

b is for listed Approval:

A = IECEx / ATEX / UKCA

c is for Bluetooth:

- 0 = Yes
- 1 = No

d is for Output Communication:

- 0 = Analog/HART
- 1 = Analog/HART/Relays

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- 3 = Analog/HART/Relays/Isolate Modbus
- e is for Advanced Option
- 0 = Default place holder, not relevant to certification
- ff is for Sensor 1 selection:  
See Model Code column of the Sensor Table
- gg is for Sensor 2 selection:  
See Model Code column of the Sensor Table
- h is for Tag:  
0 = None  
T# = (# = 1, 2, or 3) Stainless Steel affixed tags

### 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 the Sensors Table for response time
Supply Parameters:	11-30Vdc, 15W max
Operating Temperature:	-40°C to +60°C
Storage Temperature:	-40°C to +60°C
Relative Humidity:	5 to 95% RH non-condensing
Measurement Signal:	Two 4-20mA, LED Display
Alarms:	LED Display, Relay (5A 30Vdc / 250Vac)
Firmware:	NXP Microprocessor: 2.00.0065 ST Microprocessor: 4.02.0018

**Approved Sensors - The following sensors have been performance tested for use with the ULTIMA X5000 Gas Monitor, X5000 Junction Box, and JB5000 Junction Box:**

Product / Listing Title	Model Code	Gas/Description	Range	Certificate Number
ULTIMA XIR Plus Gas Sensors	See Sensor Table in the associated product listing of the referenced certificate			FM21ATEX0071X

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Product / Listing Title	Model Code	Gas/Description	Range	Certificate Number
Digital Sensor with Sintered Flame Arrestor	15	Oxygen - O <sub>2</sub>	0-25% O <sub>2</sub>	FM21ATEX0070X
	60	Methane - CH <sub>4</sub>	0-100% LFL – 5.0% vol	
	61	Propane - C <sub>3</sub> H <sub>8</sub>	0-100% LFL – 2.1% vol	
	62	Heptane - C <sub>7</sub> H <sub>16</sub>	0-100% LFL – 1.05% vol	
	63	Nonane - C <sub>9</sub> H <sub>20</sub>	0-100% LFL – 0.8% vol	
	64	Hydrogen - H <sub>2</sub>	0-100% LFL – 4.0% vol	
	65	Methane - CH <sub>4</sub>	0-100% LFL – 4.4% vol	
	66	Propane - C <sub>3</sub> H <sub>8</sub>	0-100% LFL – 1.7% vol	
	67	Heptane - C <sub>7</sub> H <sub>16</sub>	0-100% LFL – 0.85% vol	
	68	Nonane - C <sub>9</sub> H <sub>20</sub>	0-100% LFL – 0.7% vol	
	XX	Any other 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.		

**Accessories - The following accessories are included in the Approval:**

CALKIT1	Calibration Kit for Digital Gas Sensors & Ultima XIR Plus Sensors
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**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. To minimize the risk of electrostatic charge, provisions shall be made for adequate grounding and equipment shall be installed in such a manner so that accidental discharge shall not occur. Therefore, the equipment shall only be cleaned with a damp cloth.
3. This fixed equipment is designed for field mounting in the vertical orientation with restrictions placed around the conduit entry locations permitted for connection of both the Digital Sensor and ULTIMA XIR Plus infrared (IR)

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

4. The flameproof joints shall not be repaired.
5. The High Alarm relay can be programmed for a latching or non-latching operation with a deliberate manual action to reset. When the High Alarm relay is set to non-latching the output must be connected to an integrated or auxiliary system with the means of latching and resetting incorporated into these systems.
6. Guidance for Installation of fixed gas detection systems are set out in EN 60079-29-2 which has not been covered in the scope of this assessment.
7. 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.

## ULTIMA X5000 Junction Boxes

### Markings:



II 2GD  
Ex db IIC T6 Gb  
Ex tb IIIC T85°C Db  
-40°C ≤ Ta ≤ +60°C  
EN 60079-29-1  
EN 50104  
IP66

### Description of Equipment:

The ULTIMA X5000 Junction Boxes are the remote mounting units of ULTIMA X5000 Gas Monitor fixed gas detection system. The X5000 enclosures are provided with either 3/4" 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 X5000 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.

### ULTIMA X5000 Junction Boxes

Model Reference	Description
10179509	ULTIMA X5000 Junction Box; Stainless Steel, 3/4" NPT
10179511	ULTIMA X5000 Junction Box; Stainless Steel, M25
10179513	ULTIMA X5000 Junction Box; Aluminium, 3/4" NPT

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### 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. To minimize the risk of electrostatic charge, provisions shall be made for adequate grounding and equipment shall be installed in such a manner so that accidental discharge shall not occur. Therefore, the equipment shall only be cleaned with a damp cloth.
2. This fixed equipment is designed for field mounting in the vertical orientation with restrictions placed around the conduit entry locations permitted for connection of the Digital Sensor or the ULTIMA XIR Plus infrared (IR) sensor. The equipment is subject to the installation and orientation requirements defined in the product manual.
3. The flameproof joints shall not be repaired.

## ULTIMA JB5000 Junction Boxes

### Markings:



II 2GD  
Ex db IIC T6 Gb  
Ex tb IIIC T85°C Db  
-55°C ≤ Ta ≤ +75°C  
EN 60079-29-1  
EN 50104  
IP66

### Description of Equipment:

The ULTIMA JB5000 Junction Boxes are the remote mounting units of ULTIMA X5000 Gas Monitor fixed gas detection system. The JB5000 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 X5000 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.

### ULTIMA JB5000 Junction Boxes

Model Reference	Description
10213892	JB5000 Junction Box; Stainless Steel, ¾" NPT
10213896	JB5000 Junction Box; Stainless Steel, M25

### 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. To minimize the risk of electrostatic charge, provisions shall be made for adequate grounding and equipment shall be installed in such a manner so that accidental discharge shall not occur. Therefore, the equipment shall only be cleaned with a damp cloth.
2. This fixed equipment is designed for field mounting in the vertical orientation with restrictions placed around the conduit entry locations permitted for connection of the Digital Sensor or the ULTIMA XIR Plus infrared (IR) sensor. The equipment is subject to the installation and orientation requirements defined in the product manual.
3. The flameproof joints shall not be repaired.

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### ULTIMA XIR Plus Sensor

#### Markings:



II 2G  
Ex db IIC T6 Gb  
-40°C ≤ Ta ≤ +60°C  
EN 60079-29-1  
IP66

#### Description of Equipment:

The ULTIMA XIR Plus Combustible Gas Sensor consists of a two-piece stainless steel enclosure with lens assembly and includes a 3/4" NPT thread or M25 thread for connection to the X5000 Transmitter. Remote connection requires the X5000 Junction Box or JB5000 Junction Box.

#### Model Code Options:

##### A-5K-SENS-a-b-c-d-e ULTIMA XIR Plus Infrared Combustible Sensor

a is for Gas Type:

See Model Code column of Sensor Table

b is for material type:

0 = Stainless Steel

c is for listed Approval:

A = IECEx / ATEX / UKCA

d is for Sensor Body Thread Type:

1 = 3/4" NPT

2 = M25

e is for Advanced Option:

0 = none

#### Sensor Table:

Model Code	Gas	Range
AA	Methane - CH <sub>4</sub>	0-100% LFL – 5% vol
AB	Propane - C <sub>3</sub> H <sub>8</sub>	0-100% LFL – 2.1% vol
AC	Methane - CH <sub>4</sub>	0-100% LFL – 4.4% vol
AD	Propane - C <sub>3</sub> H <sub>8</sub>	0-100% LFL – 1.7% vol
AK	Acetone - C <sub>3</sub> H <sub>6</sub> O	0-100% LFL – 2.5% vol
AS	Benzene - C <sub>6</sub> H <sub>6</sub>	0-100% LFL – 1.2% vol
BY	Ethanol - C <sub>2</sub> H <sub>6</sub> O	0-100% LFL – 3.3% vol
CD	Ethylene - C <sub>2</sub> H <sub>4</sub>	0-100% LFL – 2.7% vol

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Model Code	Gas	Range
CF	Ethylene Oxide - C <sub>2</sub> H <sub>4</sub> O	0-100% LFL – 3.0% vol
CJ	Hexane - C <sub>6</sub> H <sub>14</sub>	0-100% LFL – 1.1% vol
CP	Isopropanol - C <sub>3</sub> H <sub>8</sub> O	0-100% LFL – 2.0% vol
DJ	Methyl Methacrylate - C <sub>5</sub> H <sub>8</sub> O <sub>2</sub>	0-100% LFL – 1.7% vol
FJ	Ethanol - C <sub>2</sub> H <sub>6</sub> O	0-100% LFL – 3.1% vol
FL	Ethylene - C <sub>2</sub> H <sub>4</sub>	0-100% LFL – 2.3% vol
FM	Ethylene Oxide - C <sub>2</sub> H <sub>4</sub> O	0-100% LFL – 2.6% vol
FP	Hexane - C <sub>6</sub> H <sub>14</sub>	0-100% LFL – 1.0% vol
XX	Any other two digit letter representing: - Gas Type ULTIMA XIR Plus infrared Combustible sensor, not verified by FM Approvals for the specific flammable gas for performance to EN 60079-29-1 or - Toxic Type ULTIMA XIR Plus infrared Toxic sensor	N/A

### Specifications:

Sensor Type:	IR
Sampling Type:	Diffusion
Accuracy:	±5% F.S.
Response Time:	t(90) ≤ 60 s
Operating Temperature:	-40°C to +60°C
Storage Temperature:	-40°C to +60°C
Relative Humidity:	5 to 95% RH, non-condensing
Firmware:	NXP Microprocessor: 3.52 ST Microprocessor: 4.0.8

### 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.

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3. The flameproof joints shall not be repaired.
4. The ULTIMA XIR Plus infrared (IR) 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.
5. The ULTIMA XIR Plus 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.
6. The ULTIMA XIR Plus infrared (IR) sensor shall only be fitted to enclosures having a maximum reference pressure of 13.5 bars.
7. In combustible gas detection performance applications, the appropriate ULTIMA XIR Plus model number shall only be used to construct the ULTIMA X5000 Gas Monitor fixed gas detection system; mounted onto either the ULTIMA X5000 transmitter or ULTIMA X5000 Junction Box enclosures and receive power and control from the transmitter.
8. The Ingress Protection rating is exclusively based upon the installation instruction for orientation specified in the operating manual.
9. Guidance for Installation of fixed gas detection systems are set out in EN 60079-29-2 which has not been covered in the scope of this assessment.
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.
11. When the manufacturer of the equipment has not identified the type of protection on the label, the user shall, on installation, mark the label adjacent to the type of protection used. Once the type of protection has been marked it shall not be changed.
12. The XIR Plus Sensor enclosure with Sensor Guard (opaque cover) or enclosure must fully contain the optical radiation and comply with a suitable type of protection as required by the involved EPL, complying with one of the following conditions:
  - An enclosure for which protection regarding ingress of an explosive dust atmosphere is provided, such as dust protection "t" enclosures" (IEC 60079-31), or
  - An enclosure that provides a minimum ingress protection of IP 6X and where no internal absorbers are to be expected and complying with "Tests of enclosures" in IEC 60079-0.

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