IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres

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

Certificate No.: **IECEx FMG 21.0021X**

Certificate history:
Issue 0 (2022-08-09)

Status: **Current**

Issue No: 1

Date of Issue: 2023-02-06

Applicant: **MSA - THE SAFETY COMPANY**
1000 Cranberry Woods Dr
Cranberry Township
Pennsylvania 16066-5296
United States of America

Equipment: **ULTIMA® X5000 Gas Monitor fixed gas detection system (ULTIMA® X5000 transmitter & ULTIMA® X5000 or JB5000 Junction Box) and ULTIMA® XIR Plus sensor**

Optional accessory:

Type of Protection: **Flameproof db, Type nA and Dust Protection by Enclosure tb**

Marking:

Refer to certificate annex for full marking.

Approved for issue on behalf of the IECEx Certification Body: **J. E. Marquedant**

Position: **VP, Manager - Electrical Systems**

Signature:
(for printed version)

Date:
(for printed version)

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 www.iecex.com or use of this QR Code.

Certificate issued by:

FM Approvals LLC
1151 Boston-Providence Turnpike
Norwood, MA 02062
United States of America

FM Approvals
Member of the FM Global Group

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Manufacturer: **MSA - THE SAFETY COMPANY**
1000 Cranberry Woods Dr
Cranberry Township
Pennsylvania 16066-5296
United States of America

Manufacturing locations: **General Monitors Ireland Ltd,Ballybrit Business Park,Galway**

Ireland

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 equipment 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 60079-0:2017 Edition:7.0	Explosive atmospheres - Part 0: Equipment - 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 60079-29-1:2016-07 Edition:2.0	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 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 Reports:

US/FMG/ExTR22.0014/00 US/FMG/ExTR22.0014/01

Quality Assessment Reports:

FR/INE/QAR08.0011/12 GB/SIR/QAR07.0014/10 US/UL/QAR10.0004/10

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EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

See appendix for details

SPECIFIC CONDITIONS OF USE: YES as shown below:
See appendix for details

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Equipment (continued):

See Appendix for details

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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)
Updated to replace obsolete components. No firmware change. Update model code to include missing variables for X5000

Annex:

US FMG EXTR22.0014 Annex.pdf

Annex to: **US FMG EXTR22.0014 Issue 1**

Applicant: **MSA - The Safety Company**

Apparatus: **Ultima X5000 Gas Monitor fixed gas detection system (Transmitter and Junction Boxes) and Ultima XIR Plus Sensor**

Marking:

ULTIMA® X5000 Transmitter:
Ex db IIC T6 Gb
Ex tb IIIC T85°C Db
Ex nA IIC T4 Gc
40°C ≤ Ta ≤ +60°C
60079-29-1
IP66

ULTIMA® X5000 Junction Boxes:
Ex db IIC T6 Gb
Ex tb IIIC T85°C Db
Ex nA IIC T6 Gc
-40°C ≤ Ta ≤ +60°C
60079-29-1
IP66

Ultima XIR Plus Sensor
Ex db IIC T6 Gb
Ex nA IIC T6 Gc
-40°C ≤ Ta ≤ +60°C
60079-29-1
IP66

ULTIMA® JB5000 Junction Boxes:

Ex db IIC T6 Gb
Ex tb IIIC T85°C Db
Ex nA IIC T6 Gc
-55°C ≤ Ta ≤ +75°C
60079-29-1
IP66

Notes to Standard IEC 60079-29-1:

1. Applies only to the X5000 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.

Equipment:

The ULTIMA® X5000 Transmitter is the control unit of the ULTIMA® X5000 Gas Monitor fixed gas detection system and is designed for Non-Sparking (Ex nA) protection, which excludes Output Alarm Relays and the relay board. The enclosure is provided with either ¾" NPT or M25 threaded entries and a certified adapter can be 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 ULTIMA® X5000 Transmitter provides an Organic LED (OLED) display, power, alarm and fault indicators, Bluetooth indication, two 4-20 mA measurement signal outputs, Bluetooth, Modbus (via a Bus Communication Module), wireless HART as well as wired HART communication capabilities.

The ULTIMA® X5000 and JB5000 Junction Boxes are the remote mounting units of ULTIMA® X5000 Gas Monitor fixed gas detection system and is designed for Non-Sparking (Ex nA) protection. The enclosures is 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 the sensors described below or suitably certified cable entry devices or blanking plugs. The equipment enclosures have been separately tested against the requirements of IEC 60529 and meets IP66.

The ULTIMA® XIR Plus Sensor assembly is the infra-red sensor unit of the ULTIMA® X5000 Gas Monitor fixed gas detection system and is designed for Non-Sparking (Ex nA) protection. The equipment enclosure has been separately tested against the requirements of IEC 60529 and meets IP66.

The product model code options for the ULTIMA® X5000 transmitter, ULTIMA® X5000 and JB5000 Junction Boxes, ULTIMA® X5000 XIR Plus Sensor are shown in the Model Code Options section below.

Annex to: **US FMG EXTR22.0014 Issue 1**

Applicant: **MSA - The Safety Company**

Apparatus: **Ultima X5000 Gas Monitor fixed gas detection system (Transmitter and Junction Boxes) and Ultima XIR Plus Sensor**

Model Code Options:

ULTIMA® X5000 Transmitter:
Model coding appearing on the transmitter enclosure are shown below:

ULTIMA® X5000 transmitter (equipment) Software Revision: 2.00.0065	
Model reference	Description
*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 = ATEX/UKCA/IEC ***c*** is for Bluetooth: 0 = Yes 1 = No ***d*** is for Output Communication: 0 = Analog/HART 1 = Analog/HART/Relays 2 = Analog/HART/Relays/Isolate Modbus ***e*** is 0 = Default place holder, not relevant to certification ***ff*** is for Sensor 1 selection: ***gg*** is for Sensor 2 selection: ***h*** is for Tag: 0 = None T# = (# = 1, 2, or 3) Stainless Steel affixed tags **Sensors**: for Sensor Selection ***ff*** or ***gg***: (Sensors tested to EN 60079-29-1 or EN 50104 are denoted by [^]) - ULTIMA® XIR Plus sensor selections include: 00 = No Sensor AA = IR Combustible 0 – 100% LEL – 5% Methane [^] AB = IR Combustible 0 – 100% LEL – 2.1 % Propane [^] AC = IR Combustible 0-100% LEL – 4.4 % Methane [^] AD = IR Combustible 0-100% LEL – 1.7% Propane [^] AK = IR Combustible 0 – 100% LEL – 2.5% Acetone [^] AS = IR Combustible 0 – 100% LEL – 1.2% Benzene [^] BY = IR Combustible 0 – 100% LEL – 3.3% Ethanol [^] CD = IR Combustible 0 – 100% LEL – 2.7% Ethylene [^] CF = IR Combustible 0 – 100% LEL – 3% Ethylene Oxide [^] CJ = IR Combustible 0 – 100% LEL – 1.1% Hexane [^] CP = IR Combustible 0 – 100% LEL – 2% Isopropanol [^] DJ = IR Combustible 0 – 100% LEL – 1.7% Methyl Methacrylate [^] FJ = IR Combustible 0 - 100% LEL – 3.1% Ethanol [^] FL = IR Combustible 0 - 100% LEL – 2.3% Ethylene [^] FM = IR Combustible 0 - 100% LEL – 2.6% Ethylene Oxide [^]

	FP = IR Combustible 0 - 100% LEL – 1% Hexane [^] xx = Any 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 xx = Any two digit letter representing Toxic Type ULTIMA® XIR Plus infrared Toxic sensor - Digital Sensor selections include: 00 = No Sensor or Sensor Body (transmitter only) 01 = No Sensor fine thread w/blank element) 02 = No Sensor (sensor body coarse thread w/blank element) 15 = Oxygen, 0-25% [^] 60 = Combustible, 0-100% LEL – 5% Methane [^] 61 = Combustible, 0-100% LEL – 2.1%Propane [^] 62 = Combustible, 0-100% LEL – 1.05% Heptane [^] 63 = Combustible, 0-100% LEL – 0.8% Nonane [^] 64 = Combustible, 0-100% LEL – 4.0% Hydrogen [^] 65 = Combustible, 0-100% LEL – 4.4 % Methane [^] 66 = Combustible, 0-100% LEL – 1.7% Propane [^] 67 = Combustible, 0-100% LEL – 0.85% Heptane [^] 68 = Combustible, 0-100% LEL – 0.7% Nonane [^] xx = Any two digit number representing Gas Type Digital Sensor (With FRIT), not verified by FM Approvals for the specific flammable gas for performance to EN 60079-29-1 or EN 50104. xx = Any two digit number representing Toxic Type Digital Sensor (With FRIT).

The X5000 Junction Boxes:
Model coding appearing on the junction box enclosures are shown below:

ULTIMA® X5000 Junction Boxes (equipment)	
Model reference	Description
10179509	ULTIMA® X5000 Junction Box; Stainless Steel, ¾" NPT
10179511	ULTIMA® X5000 Junction Box; Stainless Steel, M25
10179513	ULTIMA® X5000 Junction Box; Aluminum, ¾" NPT

The X5000 Junction Boxes:
Model coding appearing on the junction box enclosures are shown below:

ULTIMA® X5000 Junction Boxes (equipment)	
Model reference	Description
10179509	ULTIMA® X5000 Junction Box; Stainless Steel, ¾" NPT
10179511	ULTIMA® X5000 Junction Box; Stainless Steel, M25
10179513	ULTIMA® X5000 Junction Box; Aluminum, ¾" NPT

Annex to: **US FMG EXTR22.0014 Issue 1**

Applicant: **MSA - The Safety Company**

Apparatus: **Ultima X5000 Gas Monitor fixed gas detection system (Transmitter and Junction Boxes) and Ultima XIR Plus Sensor**

ULTIMA® XIR Plus sensor:

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

ULTIMA® XIR Plus sensor (equipment)	
Model reference	Description
*A-5K-SENS-**aa**-**b**-c-**d**-e*	ULTIMA® XIR Plus infrared Combustible sensor; Gas Type verified for Performance per "EN 60079-29-1" where the following applies:. ***aa*** is for Gas Type (verified for Performance): AA = IR Combustible 0 – 100% LEL – 5% Methane AB = IR Combustible 0 – 100% LEL – 2.1 % Propane AC = IR combustible 0-100% LEL – 4.4% Methane AD = IR combustible 0-100% LEL – 1.7% Propane AK = IR Combustible 0 – 100% LEL – 2.5% Acetone AS = IR Combustible 0 – 100% LEL – 1.2% Benzene BY = IR Combustible 0 – 100% LEL – 3.3% Ethanol CD = IR Combustible 0 – 100% LEL – 2.7% Ethylene CF = IR Combustible 0 – 100% LEL – 3% Ethylene Oxide CJ = IR Combustible 0 – 100% LEL – 1.1% Hexane CP = IR Combustible 0 – 100% LEL – 2% Isopropanol DJ = IR Combustible 0 – 100% LEL – 1.7% Methyl Methacrylate FJ = IR Combustible 0 - 100% LEL – 3.1% Ethanol FL = IR Combustible 0 - 100% LEL – 2.3% Ethylene FM = IR Combustible 0 - 100% LEL – 2.6% Ethylene Oxide FP = IR Combustible 0 - 100% LEL – 1% Hexane ***b*** is 0 = Stainless Steel ***c*** is A = ATEX/UKCA/IEC ***d*** is for Sensor Body: 1 = ¾" NPT 2 = M25 ***e*** is 0 = Not relevant to certification ULTIMA® XIR Plus infrared Combustible sensor; Gas Type not verified for Performance per "EN 60079-29-1" where the following applies *aa* is for Gas Type (not verified for Performance): **xx** = Any two digit number representing a Gas Type not verified by FM Approvals for the specific flammable gas for performance to EN 60079-29-1. ***b*** is 0 = Stainless Steel ***c*** is A = ATEX/UKCA/IEC ***d*** is for Sensor Body: 1 = ¾" NPT 2 = M25 ***e*** is 0 = Not relevant to certification ULTIMA® XIR Plus infrared Toxic sensor; where the following applies: **aa** is for Gas Type Toxic Type: **xx** = Any two digit letter representing Toxic Type ULTIMA® XIR Plus infrared Toxic sensor: b is 0 = Stainless Steel c is A = ATEX/UKCA/IEC d is for Sensor Body: 1 = ¾" NPT 2 = M25 e is 0 = Not relevant to certification

Annex to: **US FMG EXTR22.0014 Issue 1**

Applicant: **MSA - The Safety Company**

Apparatus: **Ultima X5000 Gas Monitor fixed gas detection system (Transmitter and Junction Boxes) and Ultima XIR Plus Sensor**

The JB5000 Junction Boxes:
Model coding appearing on the junction box enclosures are shown below:

ULTIMA® X5000 Junction Boxes (equipment)	
Model reference	Description
10213879	JB5000 Junction Box; Stainless Steel, ½" NPT
10213893	JB5000 Junction Box; Stainless Steel, M25

Specific Conditions of Use:

ULTIMA® X5000 transmitter:

1. The following options shall have a seal installed within 2 in (50 mm) of the enclosure: - aluminum x5000 transmitter with and without relay contacts
2. the following options shall have a seal installed within 18 in (450 mm) of the enclosure: - stainless steel x5000 transmitter with relays
3. 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.
4. 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 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.
5. The flameproof joints shall not be repaired.
6. 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.
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.

ULTIMA® X5000 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. 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.
3. The flameproof joints shall not be repaired.

ULTIMA® XIR Plus Sensor:

1. Under certain extreme circumstances, the non-metallic parts incorporated in the enclosure of this equipmentmay generate an ignition-capable level of electrostatic charge. Therefore, the equipment shall only be cleanedwith a damp cloth.
2. The flameproof joints shall not be repaired.
3. 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.
4. The ULTIMA® XIR Plus infrared (IR) sensor shall only be fitted to enclosures having a maximum reference pressure of 13.5 bars.
5. 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.

6. The Ingress Protection rating is exclusively based upon the installation instruction for orientation specified in the operating manual.
7. 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.
8. 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.
9. The ULTIMA ® X5000 Gas Monitor fixed gas detection system complies with EN 50271 (Clause 4.8, safety integrity assessment excluded from the assessment). For the ULTIMA® XIR Plus sensor the new software version 3.0 and the checksum is 0xF33C with hardware part number 10172003.
10. 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:
11. An enclosure for which protection regarding ingress of an explosive dust atmosphere is provided, such as dust protection "t" enclosures" (IEC 60079-31), or
12. 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.
13. 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.

JB5000 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. 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.
3. The flameproof joints shall not be repaired.

Full Certificate change history

Issue 0

Issue 1 – Replace component. Update to drawing list. Correxit X5000 model code structure to show all variables.