Mining And Surface Certification (Pty) Ltd

2015/021934/07

THIS CERTIFICATE IS ISSUED AS AN I.A. CERTIFICATE IN TERMS OF THE MINE HEALTH AND SAFETY ACT, ACT NO 29 OF 1996 (AND REGULATIONS), THE OCCUPATIONAL HEALTH AND SAFETY ACT (ACT 85 OF 1993) AND REGULATION 17 OF THE ELECTRICAL MACHINERY REGULATIONS

IA CERTIFICATE	MASC S/23-8585X	**Issue**	1
Issue Date	11 November 2024	**Expiry Date**	11 November 2027
**** Based on Certificate No**	IECEx FMG 21.0033X	**Issue / Variations / Amendment**	1
Requested by	**MSA – The Safety Company** 1000 Cranberry Woods Township, PA 16066, United States of America		
Manufacturer	**MSA - The Safety Company / Mine Safety Appliance Company** 1000 Cranberry Woods Drive, Cranberry Township, PA 16066, United States of America		
Description	Infrared Gas Monitor type PrimaX IR The infrared gas monitor type PrimaX IR is a stationary gas detector for the measurement of hydrocarbon gases in ambient air under atmospheric conditions. Gas Detector Controller type PrimaX IR+ The gas detector controller type PrimaX IR+ is a stationary gas detector controller for the measurement of hydrocarbon gases in ambient air under atmospheric conditions. See **Base certificate for full description and specifications.		
Equipment	Infrared Gas Monitor type PrimaX IR; Gas Detector Controller type PrimaX IR+		
MARKING: **Original marking as per certificate ** remains applicable.** **IA number must be added.**	**Type:** **Ex Marking:**	Infrared Gas Monitor type PrimaX IR; Gas Detector Controller type PrimaX IR+ PrimaX IR Gas Monitor: Ex db IIC T4 Gb Ta = -50°C to +80°C Ex tb IIIC T130°C Db Ta = -50°C to +80°C PrimaX IR+ Gas Detector Controller: Ex db IIC T4 Gb Ta = -50°C to +80°C Ex tb IIIC T130°C Db Ta = -50°C to +80°C IP67	
	IA Number: **Warnings:**	MASC S/23-8585X (To be additionally marked on equipment) See Base Certificate ** (original marking must be applied)	
Quality Assurance report (QAR) / Notification (QAN):	FR/INE/QAR08.0011/13		

Compliance:

The equipment as described above has been allocated the rating Explosion Protected 'as above' utilizing the SANS/IEC Standards:

- SANS (IEC) 60079-0: 2019 Equipment - General requirements
- SANS (IEC) 60079-1: 2015 Equipment protection by flameproof enclosures "d"
- SANS (IEC) 60079-29-1: 2016 Gas detectors – Performance requirements of detectors for flammable gases
- SANS (IEC) 60079-31: 2014 Equipment dust ignition protection by enclosure "t"

Note: This certificate covers only the listed standards and does not imply compliance to any other standard, related or inferred. It is up to the manufacturer to ensure that the product complies to all relevant standards for the application.

Special conditions of safe use "X":

- Refer to Annex A below for more details.

Conditions of manufacture:

- Refer to Annex A below for more details.

S. JORDAAN
TECHNICAL SPECIALIST

N. VILOJEN
TECHNICAL OFFICER

This certificate covers all units sold as long as the QAR/QAN remains valid.
According to the relevant requirements of the MHS Act and the OHS Act, production units of explosion protected equipment are required to comply with third party quality assurance (an approved mark scheme or batch testing by an accredited test laboratory).

Apparatus in hazardous locations is subject to the following provisions as applicable, which shall be adhered to:
SANS 10086 requirements;
Any conditions mentioned in the above certificate;
Any relevant requirements of the MHS Act;
Any restrictions and conditions enforced by the chief inspector of mines, principal inspector (Group I equipment) or chief inspector of factories (Group II equipment).

Mining And Surface Certification (Pty) Ltd
Unit 5 Lelyta Park, 45 Jurg Avenue, Hennopspark, Ext 87
Centurion 0157

ANNEX A

This document is based on and must be read in conjunction with certificate IECEx FMG 21.0033X.	
Description (According to Base Certificate) **	
"Refer to description in Base Certificate ** (and any applicable schedules/issues/variations)."	
Supplementary	Issue 1: Supplemented for review as per NCoP 2398
Standard compliance	See Base Certificate ******
Special conditions of safe use ("X")	PrimaX IR Infrared Gas Monitor: • The gas monitor PrimaX IR is equipped with a tapered NPT thread or a metric thread for mounting to a connection enclosure of protection type increased safety "e" or protection type flameproof enclosure "d". • When mounting the gas monitor to an enclosure of protection type flameproof enclosure "d", the reference pressure of the separate enclosure for the connection must not exceed 10.5 bar. The test of the mechanical strength of the separate enclosure for the connection and the test of the connecting thread with respect to explosion hazards must be ensured within the framework of the type test of the electrical apparatus, which is attached to the gas monitor PrimaX IR. The threaded hole to which the gas monitor is attached must meet the requirements of section 5.3 (Table 4/5) of IEC 60079-1. • Due to the limitations on the potting used for the wire bushing on the PrimaX IR, the service temperature within the separate enclosure (the enclosure the PrimaX IR is mounted to) must not exceed 120°C. • When mounting the gas monitor to enclosures in type of protection increased safety "e", the mechanical resistance, and the IP protection (IP6X) of the mounted enclosure has to be ensured by the type test of the electrical apparatus being mounted to the gas monitor. After mounting of the gas monitor onto an enclosure in type of protection increased safety "e", the clearances and creepage distances must meet the requirements of Table 2 of IEC 60079-7. The non-shielded cables of the gas monitor must be routed and connected so as to be mechanically protected and corresponding to the temperature resistance of the cables as per 4.6.2, 4.8.2 and 4.9 of IEC 60079-7. • For dust applications, any intensive electrostatic charging processes to the instrument label has to be prevented. • The ¾" NPT fixture has to be sealed with 2-layer PTFE sealing tape or according to the instructions of the manufacturer of the enclosure with NPT thread; when removed, new PTFE sealing has to be used after reinstalling. • The gas monitor PrimaX IR must be screwed into the housing wall such that it is secured against self-loosening. The specified minimum thread depth of the add-on housing has to be observed. • The gas monitor PrimaX IR must be included into the earthing and equipotential bonding of the complete system, including the enclosure it is connected to. • The screw heads are filled with potting to prevent self-loosening and unauthorized entry. The user may not open the enclosure. Opening of the device will invalidate the type approval. PrimaX IR+ Gas Detector Controller: • The PrimaX IR+ has not been evaluated to the performance requirements of IEC 60079-29-1 and shall not be used to execute safety critical functions. • The flameproof joints of the equipment are not intended to be repaired. For maintenance or repair, contact the manufacturer. • The ¾" NPT fixture has to be sealed with 2-layer PTFE sealing tape or according to the instructions of the manufacturer of the enclosure with NPT thread; when removed, new PTFE sealing has to be used after reinstalling

Mining And Surface Certification (Pty) Ltd Reg No: 2015/021934/07
Directors: Roelof Viljoen & Francoius du Toit
Unit #5, Lelyta Park, 45 Jurg Avenue, Hennopspark Ext 87, Centurion, 0157
P.O. Box 14344, Clubview, 0014
Tel: 012 653 2959 ◊ Fax: 086 605 8568
e-mail: **info@masc-ex.co.za**

Conditions of manufacture	• None.
Conditions of Certification	• This IA Certificate covers all units sold from the date of this document to the expiry date of this certificate. • As per ARP 0108: 2018 / NCoP 2398: 2022 (as applicable) a maximum three yearly review is required on this IA Certificate (expiry is determined as per the QAR/QAN/QMS expiry date). • The apparatus must be additionally marked with the MASC marking details above. • This approval only covers the equipment as certified above and does not include any scheduled additions or variations / amendments / new issues to the certificate(s), made after the above date. • The equipment does not need to be re-tested when used on the conditions and with such restrictions as prescribed by the certificate on which this IA Certificate is based and any other conditions in this IA Certificate. • The certification on which this IA Certificate is based must remain valid. • The extent of the requirements in the ARP 0108:2018 / NCoP 2398: 2022 (as applicable), SANS 10108 and any other applicable regulations on the certification of the equipment must remain unchanged. • The Ex-quality assurance notification/report for the equipment must remain valid.
Conclusion:	• From the above and the selective examination of the documentation, nothing contrary to the requirements of the applicable standards was found, provided that the equipment / component is used as described in the above document / certificate and according to the MASC conditions below. A MASC IA certificate is issued based on the work done as per the Base Certificate **. • The routine tests for production units according to the Base Certificate ** must be complied with (if applicable).

Mining And Surface Certification (Pty) Ltd Reg No: 2015/021934/07
Directors: Roelof Viljoen & Francoius du Toit
Unit #5, Lelyta Park, 45 Jurg Avenue, Hennopspark Ext 87, Centurion, 0157
P.O. Box 14344, Clubview, 0014
Tel: 012 653 2959 ◊ Fax: 086 605 8568
e-mail: **info@masc-ex.co.za**

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 21.0033X**	Page 1 of 6	Certificate history:
Status:	**Current**	Issue No: 1	Issue 0 (2022-02-28)
Date of Issue:	2023-05-17		

Applicant: **MSA - The Safety Company / Mine Safety Appliance Company**
1000 Cranberry Woods Drive
Cranberry Township, PA 16066
United States of America

Equipment: **Infrared Gas Monitor type PrimaX IR; Gas Detector Controller type PrimaX IR+**

Optional accessory:

Type of Protection: **Equipment protection by flameproof enclosures "d"; Equipment dust ignition protection by enclosure 't'**

Marking: IECEx FMG 21.0033X

PrimaX IR Gas Monitor:

Ex db IIC T4 Gb Ta = -50°C to +80°C

Ex tb IIIC T130°C Db Ta = -50°C to +80°C

IEC 60079-29-1

PrimaX IR+ Gas Detector Controller:

Ex db IIC T4 Gb Ta = -50°C to +80°C

Ex tb IIIC T130°C Db Ta = -50°C to +80°C

IP67

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

IECEx Certificate of Conformity

Certificate No.: **IECEx FMG 21.0033X** Page 2 of 6

Date of issue: 2023-05-17 Issue No: 1

Manufacturer: **MSA - The Safety Company / Mine Safety Appliance Company**
1000 Cranberry Woods Drive
Cranberry Township, PA 16066
United States of America

Manufacturing locations: **MSA - The Safety Company / Mine Safety Appliance Company**
1000 Cranberry Woods Drive
Cranberry Township, PA 16066
United States of America

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 Edition:7.0	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
IEC 60079-29-1:2016 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/ExTR21.0037/00 US/FMG/ExTR21.0037/01 US/FMG/ExTR22.0017/00

Quality Assessment Report:

FR/INE/QAR08.0011/12

IECEx Certificate of Conformity

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

Infrared Gas Monitor type PrimaX IR

Gas Detector Controller type PrimaX IR+

SPECIFIC CONDITIONS OF USE: YES as shown below:
See Annex

IECEx Certificate of Conformity

Equipment (continued):

Subject and Type

Infrared Gas Monitor type PrimaX IR

Description

The infrared gas monitor type PrimaX IR is a stationary gas detector for the measurement of hydrocarbon gases in ambient air under atmospheric conditions.

The infrared gas monitor type PrimaX IR contains an infrared sensor for gas measurement and electronic boards; it uses a cartridge type heater located near the window and mirror.

The infrared gas monitor type PrimaX IR is designed in type of protection Flameproof Enclosure “db” and Equipment dust ignition protection by enclosure "tb”.

The connection of the gas monitor to other flameproof enclosures could be done via a M25 or a 3/4 NPT thread.

Specifications - The manufacturer’s specifications are as follows:

Operating Temperature: -50°C to +80°C

Storage Temperature: -50°C to +80°C

Relative Humidity: 15 to 95% RH

Supply Parameters: 18-32 Vdc, 24 Vdc (Nominal), 6 watts maximum

Measurement Signal: 4-20mA

Calibration: Calibration Cap or HART

Firmware Version: 3.6

Use of the following outputs for Safety Relevant Purposes:

4-20 mA output for measured values

Use of the following accessories:

Calibration Cap, part number 1011874 (IECEx LCI 10.0038X)

HART Calibration cover part number 10122228

Flow cap part number 10113100

Environmental Guard part number 10113663

Insect screen part number 10116419

Aluminum junction box kit part number 10117607 (NPT) and 10117606 (M25) (IECEx BVS 12.0057X)

316 Stainless steel junction box kit part number 10117608 (NPT) and 10117609 (M25) (IECEx FMG 07.0003U)

PrimaX IR link version 1.06

Measurement of the following gases

Methane, Propane, Ethylene, Propylene oxide, Acetone, Cyclopentane,Ethyl acetate 0-100% LEL

i-butane 0-70% LEL

propylene, Ethane, 0-50% LEL

n-butane, n-pentane, toluene 0-30% LEL

n-Hexane 0-10% LEL

A-PRIMAXIR-a-b-c. Gas Monitor.

a = Target Gas: 11, 12, 14, 15, 17, 19, 20, 27, 30, 31, 32, 33, 34, 37, 39, 41, 42, 43, 62 or 63.

b = Approval Agency: A.

c = Thread Type: M or N.

Subject and Type

Gas Detector Controller type PrimaX IR+

Description

The gas detector controller type PrimaX IR+ is a stationary gas detector controller for the measurement of hydrocarbon gases in ambient air under atmospheric conditions.

The gas detector controller type PrimaX IR+ contains electronic boards used to display gas concentrations from a 4-20mA gas detector.

The gas detector controller type PrimaX IR+ is designed in type of protection Flameproof Enclosure “db” and Equipment dust ignition protection by enclosure "tb”.

The connection of the gas detector controller to other flameproof enclosures or detectors could be done via a M25 or a 3/4 NPT thread.

Specifications - The manufacturer’s specifications are as follows:

Operating Temperature: -50°C to +80°C

Storage Temperature: -50°C to +80°C

Relative Humidity: 15 to 95% RH

Supply Parameters: 18-32 Vdc, 24 Vdc (Nominal), 6 watts maximum

Optional Relay Contacts: 30VDC 2 AMPS MAX

Measurement Signal: 4-20mA

IECEx Certificate of Conformity

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)
Addition of PrimaX IR+ Gas Detector Controller. Addition of ExTR for alternate cement materials for PrimaX IR Gas Monitor. Other minor documentation changes not affecting the equipment safety.

Annex:

Annex to Certificate IECEx FMG 21.0033X Issue 1.pdf

Annex to Certificate IECEx FMG 21.0033X – Issue 1

PrimaX IR Infrared Gas Monitor

Specific Conditions of Use:

1. The gas monitor PrimaX IR is equipped with a tapered NPT thread or a metric thread for mounting to a connection enclosure of protection type increased safety “e” or protection type flameproof enclosure “d”.
2. When mounting the gas monitor to an enclosure of protection type flameproof enclosure “d”, the reference pressure of the separate enclosure for the connection must not exceed 10.5 bar. The test of the mechanical strength of the separate enclosure for the connection and the test of the connecting thread with respect to explosion hazards must be ensured within the framework of the type test of the electrical apparatus, which is attached to the gas monitor PrimaX IR. The threaded hole to which the gas monitor is attached must meet the requirements of section 5.3 (Table 4/5) of IEC 60079-1.
3. Due to the limitations on the potting used for the wire bushing on the PrimaX IR, the service temperature within the separate enclosure (the enclosure the PrimaX IR is mounted to) must not exceed 120°C.
4. When mounting the gas monitor to enclosures in type of protection increased safety “e”, the mechanical resistance and the IP protection (IP6X) of the mounted enclosure has to be ensured by the type test of the electrical apparatus being mounted to the gas monitor. After mounting of the gas monitor onto an enclosure in type of protection increased safety “e”, the clearances and creepage distances must meet the requirements of Table 2 of IEC 60079-7. The non-shielded cables of the gas monitor must be routed and connected so as to be mechanically protected and corresponding to the temperature resistance of the cables as per 4.6.2, 4.8.2 and 4.9 of IEC 60079-7.
5. For dust applications, any intensive electrostatic charging processes to the instrument label has to be prevented.
6. The ¾” NPT fixture has to be sealed with 2 layer PTFE sealing tape or according to the instructions of the manufacturer of the enclosure with NPT thread; when removed, new PTFE sealing has to be used after reinstalling.
7. The gas monitor PrimaX IR must be screwed into the housing wall such that it is secured against self-loosening. The specified minimum thread depth of the add-on housing has to be observed.
8. The gas monitor PrimaX IR must be included into the earthing and equipotential bonding of the complete system, including the enclosure it is connected to.
9. The screw heads are filled with potting to prevent self-loosening and unauthorized entry. The user may not open the enclosure. Opening of the device will invalidate the type approval.

PrimaX IR+ Gas Detector Controller

Specific Conditions of Use:

1. The PrimaX IR+ has not been evaluated to the performance requirements of IEC 60079-29-1 and shall not be used to execute safety critical functions.
2. The flameproof joints of the equipment are not intended to be repaired. For maintenance or repair, contact the manufacturer.
3. The ¾” NPT fixture has to be sealed with 2 layer PTFE sealing tape or according to the instructions of the manufacturer of the enclosure with NPT thread; when removed, new PTFE sealing has to be used after reinstalling.