



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 MSC 21.0004X	Page 1 of 4	<u>Certificate history:</u>
Status:	Current	Issue No: 1	Issue 0 (2021-05-05)
Date of Issue:	2023-11-16		
Applicant:	Nautitech Mining Systems Pty Limited Unit 3/9 Packard Ave CASTLE HILL NSW 2154 Australia		
Equipment:	Remote CH4 Monitor		
Optional accessory:			
Type of Protection:	Intrinsic Safety & Flameproof		
Marking:	Ex d ia I Mb (U_m Energised / available) / Ex ia I Ma (U_m De-energised / withdrawn)		

Approved for issue on behalf of the IECEx
Certification Body:

Ujen Singh

Position:

Quality and Certification Manager

Signature:
(for printed version)

Date:
(for printed version)

16 November 2023

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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.



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TestSafe Australia
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A U S T R A L I A



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Issue No: 1

Manufacturer: **Nautitech Mining Systems Pty Limited**
Unit 3/9 Packard Ave
CASTLE HILL NSW 2154
Australia

Manufacturing locations: **Nautitech Mining Systems Pty Limited**
Unit 3/9 Packard Ave
CASTLE HILL NSW 2154
Australia

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 60079-0:2011](#) Explosive atmospheres - Part 0: General requirements
Edition:6.0

[IEC 60079-1:2007](#) Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
Edition:6

[IEC 60079-11:2011](#) Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:6.0

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 Report:

[AU/MSC/ExTR21.0005/00](#)

Quality Assessment Report:

[AU/MSC/QAR21.0001/01](#)



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EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

The 'Remote CH4 Monitor' is available in 2 models namely;

1. Model ME5070-2-99-139: Electronics including a CHR Display fitted in a NTMS (Nautitech) Flameproof enclosure (Ex d I/IIC T5 Mb Gb), as certified under IECEx ITA 12.0007X.

2. Model ME5070-2-99-140: Electronics including a LCD Display fitted in a NTMS (Nautitech) Flameproof enclosure (Ex d I/IIC T5 Mb Gb), as certified under IECEx ITA 12.0007X.

The equipment comprises of a previously certified flameproof enclosure containing electronic components mounted on printed circuit board, a display and a gas detector assembly externally mounted on one of the flameproof enclosure threaded entries.

The equipment can be powered by either a non intrinsically safe source having a **maximum U_m** not exceeding 24 Vdc **OR** from a suitably certified intrinsically safe power supply. Refer to Conditions of Safe Use and Annex for full details.

SPECIFIC CONDITIONS OF USE: YES as shown below:

The following Conditions apply;

1. Only suitably certified gland or blanking plug may be used in the threaded entry(s). all unused entries must be blanked.
2. The Input and Output parameters listed in the Annex to this Certificate are taken in to consideration in every installation:



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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

Variations permitted by Issue 1:

1. The auditing body was changed to TestSafe Australia.
2. Components were added to the equipment description for clarity.
3. Drawing No. ME5070-0-25-017-A Rev 2, was added to the drawings list for detailed information.
4. Correction to some typographic errors on the drawings list.

Annex:

[IECEx MSC 21.0004X-1_Annexe_1.pdf](#)



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Equipment: description continue.

The equipment has different Ex ratings based on the isolation of energised circuits at the different connection facilities:

Ex d ia I Mb (Um available / energised):

The non-intrinsically safe power source as well as the intrinsic safety power supply and comms are available to the flameproof enclosure and its internal intrinsic safety interface board. The non-i.s. power supply lines energise the non-i.s. display (graphics and LED) and non-i.s. associated data lines (CAN bus).

The interface board continues to provide [Ex ia I] to the NTMS RapidSense CH4 Sensor.

The CH4 sensor head electronics remain intrinsically safe at all times. **See safety parameters below.**

Ex ia I Ma (Um withdrawn / de-energised):

All power and data sources are from associated intrinsically safe sources only.

The internal powered circuits inside the flameproof enclosure comply with intrinsic safety. Two possible states exist, depending on whether the J6/J7 CAN Bus and J4/J5 non-i.s. power supply is not connected or connected See safety parameters below.

For both Ex-ratings above the outputs to the Gas sensor (interface connection J2) and the LED indicators (Interface connection J3) are intrinsically safe Ex ia I Ma.

Three states are considered:

State 1: [Ex ia] I Ma ($-20^{\circ}\text{C} \leq T_{\text{amb}} \leq +75^{\circ}\text{C}$) (Associated apparatus) with the PCB's powered from non-intrinsically safe sources and the PCB's located in a "safe area" / inside a flameproof enclosure.

State 2: Ex ia I Ma ($-20^{\circ}\text{C} \leq T_{\text{amb}} \leq +75^{\circ}\text{C}$) (Energised circuit intrinsically safe) with the PCB's powered from intrinsically safe sources and the powered circuits complying with Ex ia I Ma. The PCB's are remaining in a flameproof enclosure / safe area.

State 3: Ex ia I Ma ($-20^{\circ}\text{C} \leq T_{\text{amb}} \leq +75^{\circ}\text{C}$) The PCB's are powered from an intrinsically safe power source only. Used in the i.s. mode (Ex ia I Ma ($-20^{\circ}\text{C} \leq T_{\text{amb}} \leq +75^{\circ}\text{C}$)) (Circuit intrinsically safe)

Outputs: For all states above the outputs to the Gas sensor (J2) and the LED indicators (J3) are intrinsically safe Ex ia I.

In state 1 and 2 the PCB's are used in a certified explosion protected enclosure (e.g. flameproof), with an ingress protection rating of at least IP54, or in the safe area inside an IP54 (minimum) enclosure. In state 3 the PCB's are used in an IP54 (minimum) enclosure.

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The safety parameters for the different terminals / connectors are considered as follows:

Connector / terminal block	State 1 [Ex ia] I Ma	State 2 Ex ia I Ma	State 3 Ex ia I Ma
J1 (Power supply and safe signal):	Um = 24 Vdc	Ui = 16 V Ii = 3.5 A Pi = 2.8 W Ci = 15.2 μF	Ui = 16 V Ii = 3.5 A Pi = 2.8 W Ci = 15.2 μF
J6/J7 (i.s power supply and signals / CAN bus)	No Connection		
J4/J5 (non-i.s. power supply and signals / CAN bus)	Um = 24 Vdc	No Connection (Power removed / De-energised)	
J2 (Power and signal lines / CAN bus to CH4 sensor)	Uo = 6.835 V Io = 3.3 A Po = 2 W Co = 1,000 μF Lo = 42.85 μH		
J3 (LED outputs)	Uo = 6.835 V Io = 3.28 A Po = 0.67 W Co = 1,000 μF Lo = 52.2 μH		

The above output load parameters apply where;

1. The external circuit contains no combined lumped inductance (L_i) or lumped capacitance (C_i) greater than 1% of the above values. OR
2. The external circuit contains either only lumped inductance (L_i) or lumped capacitance (C_i) in combination with a cable. OR
3. The inductance and capacitance are distributed as in a cable.

In all other situations e.g. the external circuit contains combined lumped inductance and capacitance, up to 50% of each of the inductance and capacitance values are allowed.

Notes:


1. The method of isolation / no connection / de-energisation is not part of this approval.
2. Determination and achievement of State 1 and State 2 is not part of this approval.
3. Where safety parameters are not assigned it was not required to be limited.
4. Where values are not calculated they were assigned by the client.
5. The equipment providing U_m is not part of this approval.
6. Allows the optional fitment of the heating element previously introduced and documented in Test Report AU/EXTC/ExTR18.0030/00.

Alternative Configuration.

To permit minor mechanical changes to the snout geometry which does not form part of the flameproof enclosure.

Components:

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Component Part Number	Description
ME5070-2-04-009	Fitting and Connector Assembly, Rapidsense, IS CH4
ME5070-2-19-009	Sensor Element Assembly, Rapidsense, IS CH4
ME5070-2-24-005	Sintered Filter for Hybrid Snout
ME5070-2-12-005	PCB, CH4 Interface Board
ME5070-2-04-009	Fitting and Connector Assembly, Rapidsense, IS CH4
ME5070-2-19-009	Sensor Element Assembly, Rapidsense, IS CH4
ME5070-2-24-004	IS CH4 Sensor Sintered Filter Kit
ME5070-0-01-021	Housing, CH4 Sensor Assembly
ME5070-2-12-005	PCB, CH4 Interface Board

The above components certified under IECEx ITA 13.0021X can be used in any of the 2 models of Remote CH4 Monitor shown below, when the system has at least one label showing the IECEx MSC 21.0004X certificate number:

1. Model ME5070-2-99-139
2. Model ME5070-2-99-140

Drawing list pertaining to Issue 1 of this Certificate:

Document / Drawing No.:	Page/s:	Title:	Revision Level:	Date: (yyyy-mm-dd)
ME5070-0-25-048-A	1 of 1	LABEL - CH4 SENSOR - OUTER HOUSING - EX INFO	4	2021-03-10
ME5070-0-25-017-A	1 of 1	LABEL - GAS SENSOR ELEMENT	4	2021-03-10
ME5040-0-12-010-A	1 & 2	GRAPHICAL DISPLAY – SENSORS AND INDICATORS	1	2014-05-14
ME5040-2-12-010-A	1 of 1	GRAPHICAL DISPLAY - SENSORS AND INDICATORS	06	2014-05-01
ME5070-2-12-045-A	1 to 5	IS LED BOARD – BASIC DISPLAY	01	2013-04-18
ME5070-2-12-045-A	1 of 1	IS LED BOARD - BASIC DISPLAY	01	2013-04-19
WD507001-A	1 of 1	WIRING - IS CH4 SENSOR AND DISPLAY	06	2014-05-05
ME5070-0-12-005-A	1 to 8	IS CH4 SENSOR – INTERFACE BOARD (PCB)	5	2014-04-11

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Document / Drawing No.:	Page/s:	Title:	Revision Level:	Date: (yyyy-mm-dd)
ME5070-2-12-005-A	1 to 3	IS CH4 SENSOR - INTERFACE BOARD (SCH)	04	2014-02-04
ME5070-0-12-019-A	1 to 5	IS CH4 SENSOR – RECEPTACAL BOARD	1	2013-04-09
ME5070-2-12-019-A	1 of 1	IS CH4 SENSOR – RECEPTACAL BOARD	01	2014-01-30
ME5070-0-25-030-A	1 of 1	LABEL-CH4 SENSOR – OUTER HOUSING	3	2014-05-02
ME5070-2-04-009-A	1 of 1	FITTING & CONNECTOR ASSEMBLY – Exd IS CH4 SENSOR	6	2014-01-21
ME5070-2-04-009-A	1 of 1	FITTING & CONNECTOR ASSEMBLY – Exd ia IS CH4 SENSOR	8	2021-03-10
D507005-4	1 of 1	RapidSense CH4 Sensor - Power/Comms	1	2018-09-26
ME5070-0-12-003-A	1 to 5	IS CH4 SENSOR – SIGNAL COND. BOARD	4	2013-03-22
ME5070-0-12-004-A	1 to 5	IS CH4 SENSOR – MICRO BOARD	4	2013-03-20
ME5070-2-12-003-A	1 of 1	IS CH4 SENSOR - SIGNAL COND. BOARD	2	2014-05-14
ME5070-2-12-004-A	1 of 1	IS CH4 SENSOR - MICRO BOARD	4	2014-03-25
ME5070-2-19-009-A	1 of 1	SENSOR ELEMENT ASSEMBLY – CH4	7	2014-05-02
ME5070-2-99-112-A	1 of 1	SENSOR ASSEMBLY – RAPIDSENSE – IS CH4	6	2021-03-10
ME5070-2-99-139-A	1 of 1	IS GAS SENSOR AND CHR DISPLAY ASSY	4	2021-03-10
ME5070-2-99-140-A	1 of 1	LCD DISPLAY FLP ENCLOSURE WITH IS CH4 SENSOR ASSEMBLY	4	2021-03-10
ME5070-0-25-017-A	1 of 1	*LABEL - GAS SENSOR ELEMENT	2	2014-04-08

Note: An “*” is added before the title of documents that are new or revised.

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