



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 3 [Certificate history:](#)
Status: **Current** Issue No: 0
Date of Issue: 2021-05-05
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Marking: Ex d ia I Mb (U_m Energised / available) / Ex ia I Ma (U_m De-energised / withdrawn)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:

Geoff Slater

Position:

MSTC Manager

Signature:
(for printed version)

Date:

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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.



Certificate issued by:

MSTC Mine Safety Technology Centre
8 Hartley Drive
Thornton NSW 2322
PO Box 343
Australia



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

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 60079-1:2007-04 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/MS/ExTR21.0005/00](#)

Quality Assessment Report:

[AU/ITA/QAR08.0004/12](#)



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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:

Annex:

[Annex of IECEx MSC 21.0004X-00.pdf](#)



IECEX Certificate of Conformity Annex

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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 are 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):	$U_m = 24 \text{ Vdc}$	$U_i = 16 \text{ V}$ $I_i = 3.5 \text{ A}$ $P_i = 2.8 \text{ W}$ $C_i = 15.2 \text{ } \mu\text{F}$	$U_i = 16 \text{ V}$ $I_i = 3.5 \text{ A}$ $P_i = 2.8 \text{ W}$ $C_i = 15.2 \text{ } \mu\text{F}$
J6/J7 (i.s power supply and signals / CAN bus)	No Connection		μF
J4/J5 (non-i.s. power supply and signals / CAN bus)	$U_m = 24 \text{ Vdc}$	No Connection (Power removed / De-energised)	
J2 (Power and signal lines / CAN bus to CH4 sensor)	$U_o = 6.835 \text{ V}$ $I_o = 3.3 \text{ A}$ $P_o = 2 \text{ W}$ $C_o = 1,000 \text{ } \mu\text{F}$ $L_o = 42.85 \text{ } \mu\text{H}$		
J3 (LED outputs)	$U_o = 6.835 \text{ V}$ $I_o = 3.28 \text{ A}$ $P_o = 0.67 \text{ W}$ $C_o = 1,000 \text{ } \mu\text{F}$ $L_o = 52.2 \text{ } \mu\text{H}$		

The above output load parameters apply where;

1. The external circuit contains no combined lumped inductance (Li) or lumped capacitance (Ci) greater than 1% of the above values. OR
2. The external circuit contains either only lumped inductance (Li) or lumped capacitance (Ci) 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.

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Technical Documents			
Title:	Drawing No.:	Rev. Level:	Date:
LABEL - CH4 SENSOR - OUTER HOUSING - EX INFO	ME5070-0-25-048-A	4	2021-03-10
LABEL - GAS SENSOR ELEMENT	ME5070-0-25-017-A	4	2121-03-10
SENSOR ASSEMBLY – RAPIDSSENSE – IS CH4	ME5070-2-99-112-A	5	2018-08-10
IS GAS SENSOR AND CHR DISPLAY ASSY	ME5070-2-99-139-A	3	2014/05/02
LCD DISPLAY FLP ENCLOSURE WITH IS CH4 SENSOR ASSEMBLY	ME5070-2-99-140-A	3	2014/05/05
GRAPHICAL DISPLAY – SENSORS AND INDICATORS	ME5040-0-12-010-A Sheets 1 & 2	1	2014-05-14
GRAPHICAL DISPLAY - SENSORS AND INDICATORS	ME5040-2-12-010-A	06	2014-05-01
IS LED BOARD – BASIC DISPLAY	ME5070-2-12-045-A Sheets 1 to 5	01	2013-04-18
IS LED BOARD - BASIC DISPLAY	ME5070-2-12-045-A	01	2013-04-19
WIRING - IS CH4 SENSOR AND DISPLAY	WD507001	06	2014-05-05
IS CH4 SSENSOR – INTERFACE BOARD	ME5070-0-12-005-A Sheets 1 to 8	5	2014-04-11
IS CH4 SENSOR - INTERFACE BOARD	ME5070-2-12-005-A Sheet 1 to 3	04	2014/02/04
IS CH4 SENSOR – RECEPTACAL BOARD	ME5070-0-12-019-A Sheets 1 to 5	1	2013-04-09
IS CH4 SENSOR – RECEPTACAL BOARD	ME5070-2-12-019-A	01	2014-01-30
LABEL-CH4 SENSOR – OUTER HOUSING	ME5070-0-25-030-A	3	2014-05-02
FITTING & CONNECTOR ASSEMBLY – Exd IS CH4 SENSOR	ME5070-2-04-009-A	6	2014-01-21
FITTING & CONNECTOR ASSEMBLY – Ex d ia IS CH4 SENSOR	ME5070-2-04-009-A	8	2021-03-10
RapidSense CH4 Sensor - Power/Comms	D507005 - 4	1	2018-09-26
IS CH4 SENSOR – SIGNAL COND. BOARD	ME5070-0-12-003-A Sheets 1 to 5	4	2013-03-22
IS CH4 SENSO – MICRO BOARD	ME5070-0-12-004-A Sheets 1 to 5	4	2013-03-20
IS CH4 SENSOR - SIGNAL COND. BOARD	ME5070-2-12-003- A	2	2014-05-14
IS CH4 SENSOR - MICRO BOARD	ME5070-2-12-004 - A	4	2014-03-25
SENSOR ELEMENT ASSEMBLY – CH4	ME5070-2-19-009-A	7	2014-05-02

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Note: Drawings listed above that are in BOLD and ITALIZED text are new or revised.

A change in Certifying Body and resulting Certificate number

1. The addition of note 7 to drawing ME5070-2-04-009A which 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.

Technical Documents			
Title:	Drawing No.:	Rev. Level:	Date:
<i>SENSOR ASSEMBLY – RAPIDSENSE – IS CH4</i>	<i>ME5070-2-99-112-A</i>	<i>6</i>	<i>2021-03-10</i>
<i>IS GAS SENSOR AND CHR DISPLAY ASSY</i>	<i>ME5070-2-99-139-A</i>	<i>4</i>	<i>2021/03/10</i>
<i>LCD DISPLAY FLP ENCLOSURE WITH IS CH4 SENSOR ASSEMBLY</i>	<i>ME5070-2-99-140-A</i>	<i>4</i>	<i>2021-03-10</i>

Note: Drawings listed above that are in BOLD and ITALIZED text are new or revised.

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