ANZEx

Australian/New Zealand Certification Scheme
for Explosion Protected Equipment

Certificate of Conformity

Ex EQUIPMENT

Certificate No.: **ANZEx 09.4080X**	*Current Issue:* 2	*Date of Issue:* 2021-08-30

Applicant: **Nautitech Mining Systems Pty Ltd**
Unit 3, 9 Packard Avenue
Castle Hill, NSW 2154
Australia

Equipment: Intrinsically safe battery for use in Flameproof enclosures
[YY]V Battery: CT11164[XX] ([YY] and [XX] according to the voltage and type designation)

Type of Explosion Protection: Intrinsic safety 'i'

Explosion Protection Marking: Ex ia I or [Ex ia] I (-20°C ≤ Ta ≤ +60°C)

This certificate is granted subject to the requirements as set out in
Joint Accreditation System of Australia and New Zealand Publications
ANZEx System Rules 2020 & ANZEx Certified Equipment Scheme Rules 2021

Signed for and on behalf of issuing body Ajay Maira .....

Name & Position Ajay Maira - Certification Authority

This certificate is not transferable and remains the property of the issuing body.
The status of this certificate can be confirmed through the database located at www.anzex.com.au

Certificate issued by:

Ex Testing & Certification Pty Ltd
1/30 Kennington Drive, Tomago NSW 2322 Australia

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WWW.JAS-ANZ.ORG/REGISTER

Ex TESTING & CERTIFICATION

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Manufacturer : **Nautitech Mining Systems Pty Ltd**
Unit 3, 9 Packard Avenue
Castle Hill, NSW 2154
Australia

Additional Manufacturing Location(s): None

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:

AS/NZS 60079.0:2008 (Ed 5.0)	Explosive atmospheres Part 0: Equipment - General requirements
AS/NZS 60079.1:2007 (Ed 6.0), Annex E	Explosive atmospheres Part 1: Equipment protection by flameproof enclosures ‘d’
AS 2380.7 - 1987	Electrical equipment for explosive atmospheres - Explosion-protection techniques Part 7: Intrinsic safety ‘I’

This Certificate does not indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

(Certificate format based on template QMA-HAE-08-720 dated 2021-05-18)

Certificate of Conformity
Ex EQUIPMENT

Certificate No.: **ANZEx 09.4080X**	*Current Issue:* 2	*Date of Issue:* 2021-08-30

Schedule

Equipment Description:

The Intrinsically safe Battery apparatus is intended for installation where the outputs are only intrinsically safe when the external connected system power sources are de-energised, and either the isolation switch assembly contacts are open or the isolation switch assembly is disconnected or the shutdown inputs are not driven.

The apparatus consists of a nickel cadmium battery using six (6) or ten (10) cells and protective components limiting the maximum current and energy available at the connections to prevent spark ignition. The complete assembly is housed in a rectangular mild steel cup and fully encapsulated. Connections to external circuits are made with flying cables and wires from the enclosure, each connection is distinguished by colour coding of the emerging cables and wires.

The type of the battery is indicated by CT11164[XX].

XX	Designation	General rating and Interconnection Description
01	Standard	8.2V unit with flying leads.
02	Standard with interconnection PCB	8.2V unit with interface PCB incorporating terminals / plugs and sockets. Flying leads used with no internal connections to PCB.
03	12V for C7 application	12V unit with Interface PCB. All internal circuits connected via internal connections. No flying leads used.
04	12V with internal charger	12V unit with Interface PCB. All internal circuits connected via internal connections. No flying leads used.
05	Mini Loader interconnection	8.2V unit with Interface PCB. All internal circuits connected via internal connections. No flying leads used.

Electrical Ratings/Parameters

See above table

Certificate of Conformity
Ex EQUIPMENT

Certificate No.: **ANZEx 09.4080X**	*Current Issue:* 2	*Date of Issue:* 2021-08-30

Specific Conditions of Use:

A) Conditions applying to the safe use of the intrinsically safe battery

1. The following parameters are to be taken into account during installation:

When the external connected system power sources are de-energised, and either the isolate switch assembly contacts are open or the isolate switch assembly is disconnected or the shutdown inputs are open circuited or the shutdown inputs are not driven, the connecting flying cables and wires from the Intrinsically Safe Battery apparatus have the following intrinsic safety entity parameters:

For the type CT11164[01], CT11164[02] and CT11164[05] types:

	Uo	Io	Co	Lo	Ui	Ii	Ci	Li
Charging Connection	22mV	20µA	1F	20mH	9V	Internally Limited	0F	0H
Power Output	37mV	50µA	0.4F	10mH	9V	Internally Limited	0F	0H
Data Port	0V	0A	*	*	24V	Internally Limited	100nF	0H
Control Inputs	9V	25mA	113µF	500µH	9V	Internally Limited	0F	0H
Shutdown Inputs**	9V*	25mA	113µF	500µH	9V	Internally Limited	0F	0H

*No practical limit, no electrical output from internal optical isolation.

For the type CT11164[03] and CT11164[04] types:

	Uo	Io	Co	Lo	Ui	Ii	Ci	Li
Charging Connection	22mV	20µA	1F	20mH	15V	Internally Limited	0F	0H
Power Output	<1.1V	<200µA	40µF	10mH	15V	Internally Limited	0F	0H
Shutdown Inputs	15V	44mA	14µF	200mH	15V	Internally Limited	0F	0H

The isolate connection is specifically for connection to switch contacts, and cable parameters are specified for this connection.

	Max. Cable Capacitance	Max. Cable Inductance
Isolate Connection Cable	0.1 µF	200µH

The Intrinsically Safe Battery shall otherwise be treated as associated apparatus with no intrinsic safety outputs and installed using a separate means of explosion protection when in the hazardous area. All connections to the Intrinsically Safe Battery apparatus are limited by Um=24 V on all connections.

Certificate of Conformity
Ex EQUIPMENT

Certificate No.: **ANZEx 09.4080X**	*Current Issue:* 2	*Date of Issue:* 2021-08-30

2. It is a condition of safe use that the Intrinsically Safe Battery terminal blocks / plugs and sockets be located and installed in accordance with intrinsic safety wiring practice, especially considering clearance distances from other circuits / terminals blocks.
3. It is a condition of safe use that the Intrinsically Safe Battery Apparatus must be installed in accordance with drawing No 1116-001.
4. It is a condition of safe use that the isolate switch assembly and connecting wiring must be installed in accordance with drawing No. 1116-001.
5. It is a condition of safe use that the thickness of insulation between the isolation switch assembly wiring conductors and any other conductor must be at least 0.5mm.
6. It is a condition of safe use that the isolate switch cable connector must be protected from invasion of foreign material when not mated.
7. It is a condition of safe use that the Intrinsically Safe Battery apparatus including connecting cable to the isolation switch and the isolation switch assembly shall be installed in one enclosure that provides ingress protection to IP55 and mechanical protection against a 20 Joule impact.
8. It is a condition of safe use that the exposed surface of the encapsulation shall be inspected and the Intrinsically Safe battery apparatus rejected for service if signs of physical wear or damage are evident.

B) Conditions for the application of the intrinsically safe battery in a flameproof enclosure

1. Additional compliance with the safety requirements of relevant industrial standards must be investigated and achieved.
2. The battery is for use in Group I flameproof enclosures only.
3. The battery pack was estimated to dissipate a maximum of 11.5W of power under normal conditions, for temperature rise considerations of the flameproof enclosure.
4. Compliance with installation rules according to the relevant codes of practice and manufacturers recommendations shall be achieved.
5. Installation of the battery pack shall maintain sufficient segregation between intrinsically safe and non-intrinsically safe circuits.
6. The ambient temperature limitation of the certified battery shall not be exceeded considering the internal temperature rise and expected external ambient temperatures of the enclosure.
7. The flameproof enclosure should be marked (inside or outside) clearly indicating the manufacturer and the type of battery pack used. In addition, the information should appear in the instructions for the flameproof enclosure.
8. The warning label “WARNING – DO NOT OPEN WHEN AN EXPLOSIVE GAS ATMOSPHERE IS PRESENT” should be applied to the flameproof enclosure.
9. The battery pack must be securely mounted (e.g. held in place by a purpose designed clip or bracket).
10. During installation, the segregation around the battery pack and its associated connections and circuitry shall comply with the requirements of table 1 of AS/NZS 60079.7:2006 (Ed 4.0), according to the highest voltage applicable around the relevant parts.
11. Safety devices shall ensure that the charging rate of 1.25A maximum is not exceeded.

Certificate of Conformity
Ex EQUIPMENT

Certificate No.: **ANZEx 09.4080X**	*Current Issue:* 2	*Date of Issue:* 2021-08-30

12. The flameproof enclosure internal free volume is limited to a minimum of 25 litres. For smaller enclosures the charge current shall be cut off when the battery / cells are overcharged (voltage) according to the battery / cell manufacturer's ratings.
13. All safety devices must form safety related parts of a control system. It is the responsibility of the installer / Flameproof enclosure designer to assess that the safety integrity of the control system is consistent with the level of safety required by AS/NZS 60079.1:2007 (Ed 6.0).

Conditions of Certification of the intrinsically safe battery:

It is a condition of manufacture that each apparatus is to be capable of withstanding a test voltage of not less than 500 Volts 50 Hz applied between all connections and case for a period not less than 1 minute.

Certificate of Conformity
Ex EQUIPMENT

Certificate No.: **ANZEx 09.4080X**	*Current Issue:* 2	*Date of Issue:* 2021-08-30

Register of Issues and Variations
includes the current issue

Issue 0 dated 14 July 2009

Test & Assessment Reports relevant for this issue:

TR No. & Issuing CBs: TR 4474 + TR 4913 by ITACS
QAR No. & Issuing CB: AU/ITA/QAR08.0004/01 by ITACS
File Reference: 09.4080 of ITACS

Manufacturer's Documents/Drawings associated with this issue:

Document Number	Pages / Sheets	Document Title	Revision	Date
1116-001	1	IS Battery Interface Block Diagram	B	2009-03-31
ExPS11164-04	2	IS Battery – 12V	1.0	2009-05-20
PB11164	1	IS Battery – 12V	4	2009-04-30
1116-012	4[1]	IS Battery Assembly	B	2009-04-08
1116403-01	1	IS Battery - Connectors	A	2009-04-13
1116-018	1	IS Battery – Label details	C	2009-05-27

[1] The number of pages listed was incorrect. This has been corrected in issue 2

Issue 1 dated 5 June 2019

Variations Permitted by this Issue

1. Change to applicant and manufacturer's address details.
2. Change of ANZEx certificate to the latest format
3. Added Pages/Sheets numbers and amended dates to the latest format for the documents listed in the Manufacturer's Document Table in Issue 0 of this certificate.

Test & Assessment Reports relevant for this issue:

TR No. & Issuing CBs: N/A
QAR No. & Issuing CB: AU/ITA/QAR08.0004/10 by Ex Testing and Certification
File Reference: 19028

Manufacturer's Documents/Drawings associated with this issue:

There are no drawings applicable to this issue of the certificate.

Certificate of Conformity
Ex EQUIPMENT

Certificate No.: **ANZEx 09.4080X**	*Current Issue:* 2	*Date of Issue:* 2021-08-30

Issue 2 dated 30 August 2021

Variations Permitted by this Issue

1. The manufacturer's Quality Assessment was changed from Ex Testing and Certification to another IECEx Certification Body, Mine Safety Technology Centre. QAR reference has been changed accordingly.

Test & Assessment Reports relevant for this issue:

TR No. & Issuing CBs:	N/A
QAR No. & Issuing CB:	AU/MSC/QAR21.0001/00 by Mine Safety Technology Centre
File Reference:	21105

Manufacturer's Documents/Drawings associated with this issue:

There are no drawings applicable to this issue of the certificate.