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

Ex COMPONENT CERTIFICATE

Certificate No.:	**IECEx ITA 08.0012U**	Page 1 of 5	Certificate history:
Status:	**Current**	Issue No: 2	Issue 1 (2012-02-10) Issue 0 (2008-09-29)
Date of Issue:	2021-08-18		

Applicant: **Nautitech Mining Systems P/L**
Unit 3, 9 Packard Ave
Castle Hill, NSW 2154
Australia

Ex Component: NTMS Shunt Types 5006-01, 5006-02 & 5006-03

This component is NOT intended to be used alone and requires additional consideration when incorporated into other equipment or systems for use in explosive atmospheres (refer to IEC 60079-0).

Type of Protection: **Intrinsic Safety "ia"**

Marking: [Ex ia] I, IIC, IECEx ITA 08.0012U

Approved for issue on behalf of the IECEx Certification Body: **Ajay Maira**

Position: **Certification Authority**

Signature: (for printed version)

Date: 2021-08-18

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:

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

Ex TESTING & CERTIFICATION

IECEx Certificate of Conformity

Certificate No.: **IECEx ITA 08.0012U**

Date of issue: 2021-08-18

Issue No: 2

Manufacturer: **Nautitech Mining Systems P/L**
Unit 3, 9 Packard Ave
Castle Hill, NSW 2154
Australia

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 60079-0:2004 Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
Edition:4.0

IEC 60079-11:2006 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:5

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:

AU/ITA/ExTR08.0018/00 AU/ITA/ExTR08.0018/01

Quality Assessment Report:

AU/MSC/QAR21.0001/00

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Ex Component(s) covered by this certificate is described below:

The NTMS Shunt Type: 5006-01 is designed to restrict the transfer of energy from unspecified non-hazardous area equipment to the hazardous area circuits by limitation of voltage and current.

Rated at 12V - 50mA

The equipment comprises of electronic components mounted on a double sided printed wiring board all encapsulated within a plastic enclosure. External connections are made via solder pins located in the base of the equipment.

See Annex for further details.

SCHEDULE OF LIMITATIONS:

See Annexe for details

IECEx Certificate of Conformity

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)
See Annexe for details.

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Certificate No.: **IECEx ITA 08.0012U**

Date of issue: 2021-08-18

Issue No: 2

Additional information:
Job 21105

Annex:

IECEx ITA 08.0012U-2 Annexe final.pdf

IECEx Certificate of Conformity

Annexe

Annexe for Certificate No.:	IECEx ITA 08.0012U	Issue No.:	2

Description:

As provided in 'Equipment' section of the certificate.

Schedule of Limitations pertaining to Issue 0 of this Certificate:

These have been consolidated into the Schedule of Limitations in Issue 1 of this certificate.

Drawing list pertaining to Issue 0 of this Certificate:

Manufacturer's Documents

Title:	Drawing No.:	Pages	Rev. Level:	Date:
NTMS Shunt – Assembly	ExMD500602	1	1.0	2008-08-24
NTMS Shunt Device Markings	ExMK500601	1	1.0	2008-08-24
NTMS Shunt	ExPB500601-03	1	1.0	2008-08-24
NTMS Shunt	ExPS500601-03	1	1.0	2008-08-24
NTMS Shunt Wiring Diagram	ExWD500601	1	1.0	2008-08-24

Variations permitted by Issue 1 of this certificate:

1. Change of address, was Unit 55, 4 Hoyle Ave., Castle Hill

2. Two new types have been introduced: Types 5006-02 (Dual channel) and 5006-03 (Single channel) to form the complete set of barriers:

5006-01 Rated at 12V - 50mA (-20°C to + 40°C)

5006-02 Rated at 10V – 50mA (-20°C to + 60°C)

5006-03 Rated at 10V – 50mA (-20°C to + 60°C) (Single channel only)

3. The PCB remained the same, only component values changed.

4. Label details were updated for the relevant changes.

Schedule of Limitations pertaining to Issue 1 of this certificate:

NTMS Shunt Type: 5006-01

Non Hazardous Area Terminals
JP2 Pins 1 & 2 with respect to earth (pins JP3 pins 1, 2 & 3)
$U_m = 250V$

Hazardous Area Terminals
Single Channel with respect to earth
JP1 pin 1 with respect to earth (pins JP3 pins 1, 2 & 3)
JP1 pin 2 with respect to earth (pins JP3 pins 1, 2 & 3)

Uo	12.6V
Io	132.7mA
Po	418mW
Ci	Negligible
Li	Negligible

The capacitance and either the inductance or the inductance to resistance (L/R) ratio of the hazardous area load connected to either hazardous area JP1 pin 1 OR JP1 pin 2 with respect to earth (pins JP3 pins 1, 2 & 3) must not exceed the following values;

Group	Capacitance (uF)	Inductance (mH) OR L/R Ratio (uH / Ω)	
IIC	1.15	2.02	85
IIIB	7.40	8.08	340
IIA	27.00	16.16	680
I	29.00	26.52	1116

Both Channels in parallel with respect to earth
JP1 pins 1 & 2 with respect to earth (JP3 pins 1, 2 & 3)

Uo	12.6V
Io	265.4mA
Po	835.6mW
Ci	Negligible
Li	Negligible

The capacitance and either the inductance or the inductance to resistance (L/R) ratio of the hazardous area load connected to the hazardous area JP1 pins 1 & 2 with respect to earth (pins JP3 pins 1, 2 & 3) must not exceed the following values;

Group	Capacitance (uF)	Inductance (mH) OR L/R Ratio (uH / Ω)	
IIC	1.15	0.5	42
IIIB	7.40	2.0	170
IIA	27.00	4.0	340
I	29.00	6.6	558

Both Channels in series no earth connection
JP1 pin 1 with respect to JP1 pin 2

Uo	14.1V
Io	74.3mA
Po	262mW
Ci	Negligible
Li	Negligible

The capacitance and either the inductance or the inductance to resistance (L/R) ratio of the hazardous area load connected to the hazardous area JP1 pin 1 with respect to JP1 pin 2 must not exceed the following values;

Group	Capacitance (uF)	Inductance (mH) OR L/R Ratio (uH / Ω)	
IIC	0.71	6.44	135
IIIB	4.49	25.76	543
IIA	16.70	51.52	1087
I	19.70	84.53	1783

The above 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.

The equipment must be installed within a suitable enclosure offering a degree of protection not less than IP20.

JP3 pins 1, 2 & 3 must be infallibly connected to the main system earth in an earth reference system or infallibly connected to the secondary circuit 0V node in a galvanically isolated power supply system.

NTMS Shunt Type: 5006-02 & 5006-03

Non Hazardous Area Terminals

JP2 Pins 1 & 2 with respect to earth (pins JP3 pins 1, 2 & 3)
$U_m = 250V$

Hazardous Area Terminals

Single Channel with respect to earth (5006-02 and 5006-03)

5006-02: JP1 pin 1 OR pin 2 with respect to earth (pins JP3 pins 1, 2 & 3)

5006-03: JP1 pin 2 with respect to JP1 pin 1 AND earth (pins JP3 pins 1, 2 & 3)

Uo	10.5V
Io	111mA
Po	290mW
Ci	Negligible
Li	Negligible

The capacitance and either the inductance or the inductance to resistance (L/R) ratio of the hazardous area load connected to

- **5006-02:** either hazardous area JP1 pin 1 OR pin 2 with respect to earth (pins JP3 pins 1, 2 & 3)
- **5006-03:** JP1 pin 2 with respect to JP1 pin 1 AND earth (pins JP3 pins 1, 2 & 3) must not exceed the following values:

Group	Capacitance (uF)	Inductance (mH) OR L/R Ratio (uH / Ω)	
IIC	2.41	2.88	123
IIIB	16.8	11.5	490
IIA	75.0	23.0	980
I	66.0	37.8	1608

Both Channels in parallel with respect to earth (5006-02)

JP1 pins 1 & 2 with respect to earth (JP3 pins 1, 2 & 3)

Uo	10.5V
Io	222mA
Po	580mW
Ci	Negligible
Li	Negligible

The capacitance and either the inductance or the inductance to resistance (L/R) ratio of the hazardous area load connected to hazardous area JP1 pin 1 & 2 with respect to earth (pins JP3 pins 1, 2 & 3) must not exceed the following values:

Group	Capacitance (uF)	Inductance (mH) OR L/R Ratio (uH / Ω)	
IIC	2.41	0.72	61.2
IIIB	16.8	2.88	245
IIA	75.0	5.77	490
I	66.0	9.46	804

Both Channels in series no earth connection (5006-02)

JP1 pin 1 with respect to JP1 pin 2

Uo	12V
Io	63.2mA
Po	190mW
Ci	Negligible
Li	Negligible

The capacitance and either the inductance or the inductance to resistance (L/R) ratio of the hazardous area load connected to hazardous area JP1 pin 1 with respect to JP1 pin 2 must not exceed the following values:

Group	Capacitance (uF)	Inductance (mH) OR L/R Ratio (uH / Ω)	
IIC	1.41	8.9	187
IIIB	9.0	35.6	750
IIA	36.0	71.2	1501
I	35.0	116.8	2462

The above 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.

The equipment must be installed within a suitable enclosure offering a degree of protection not less than IP20.

In earth reference systems the JP3 pins 1, 2 & 3 must be infallibly connected to the main system earth in an earth reference system or infallibly connected to the secondary circuit 0 V node in a galvanically isolated power supply system.

Drawings Associated with the Issue 1 of this Certificate:

Manufacturer's Documents

Title:	Drawing No.:	Pages	Rev. Level:	Date:
NTMS Shunt - Assembly	ExMD500602	1	3.0	2012-01-12
Device Markings	ExMK500601	1	5	2012-01-10
NTMS Shunt	ExPB500601-03	1	2.0	2012-01-12
NTMS Shunt Wiring Diagram	ExWD500601	1	2	2011-12-09**
IS Barrier – dual channel – 60 Deg.C	ExSH500602-A	1	1	2011-12-09
IS Barrier – single channel – 60 Deg.C	ExSH500603-A	1	2	2011-12-09

** The drawing date listed was incorrect. Corrected during Issue 2 of this certificate.

Variations permitted by Issue 2 of this certificate:

- 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.

Schedule of Limitations pertaining to Issue 2 of this certificate:

There are no changes to the Schedule of Limitations.

Drawings Associated with the Issue 2 of this Certificate:

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