

**Australian/New Zealand
Certification Scheme for
EXPLOSION-PROTECTED ELECTRICAL EQUIPMENT
ANZEx Scheme**

Certificate of Conformity

Certificate No.: ANZEx 09.3008X

Issue No.: 0

Date of Issue: 2009-08-06

Issue No.: 8

Date of Issue: 2015-09-10

Applicant: Mine Safety Appliances Company, LLC.
1000 Cranberry Woods Drive
Cranberry Township PA 16066-5207
United States of America

Electrical Apparatus: Altair 5 iR / 5X iR Multi-Gas Detector

Type of Protection: Intrinsic safety 'ia'

Marking Code: MSA Altair 5 iR
Ex ia s Zone 0 I IP54
Ex ia s Zone 0 IIC T4 IP54
MSA Altair 5X iR
Ex ia s Zone 0 I IP65
Ex ia s Zone 0 IIC T4 IP65
ANZEx 09.3008X
S/N: _____

Manufacturer: Mine Safety Appliances Company, LLC.
1000 Cranberry Woods Drive
Cranberry Township PA 16066-5207
United States of America

Manufacturing Location(s): As above

The EPEE certification database located at <http://www.anzex.com.au> shows the validity of this Certificate.

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	<p>Certificate issued by:</p> <p style="text-align: center;"><i>TestSafe Australia</i> 919 Londonderry Road, Londonderry NSW 2753 Australia Phone: +61 2 4724 4900 Fax: +61 2 4724 4999 http://www.testsafe.com.au</p>	 <p style="text-align: center;">www.jas-anz.org/register</p>
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This certificate is granted subject to the conditions as set out in Standards Australia/Standards New Zealand Miscellaneous Publication MP87.1:2008.

STANDARDS:

The electrical apparatus 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
- IEC 60079-1 : 2003** Electrical apparatus for explosive gas atmospheres - Part 1: Flameproof enclosure 'd'
- IEC 60079-11 : 2006** Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
- AS 1826-1983** Electrical Equipment for Explosive Atmospheres Special Protection – Type of Protection 's'

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standard(s) listed above.*

ASSESSMENT & TEST REPORTS:

The equipment listed has successfully met the assessment and test requirements as recorded in:

Test Report No. and Issuing Body:	35287, TestSafe
Quality Assessment Report No. and Issuing Body:	FR/INE/QAR08.0011/05
File Reference:	2015/004377



Debbie Wouters

Signed for and on behalf of issuing body

10 September 2015

Date of Issue

Acting Quality & Certification Manager

Position

**This certificate is not transferable and remains the property of the issuing body
and must be returned in the event of it being revoked or not renewed.**

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Schedule

EQUIPMENT:

The Altair 5 iR Multi-gas Detector is a 6 Gas instrument. It contains one dual toxic electrochemical cell, one single toxic electrochemical cell, one catalytic bead combustible cell, one oxygen electrochemical cell, and an infrared sensor.

The Altair 5X iR Multi-gas Detector is a 6 Gas instrument. It contains one dual XCell toxic electrochemical cell, one single XCell toxic electrochemical cell, one XCell combustible cell, one XCell oxygen electrochemical cell, and an infrared sensor. One electrochemical sensor bay can be fitted either with a XCell electrochemical cell or a 20 mm electrochemical cell.

It measures 170 mm by 90 mm by 47 mm. The body is made of polycarbonate and the overmoulding is conductive, of the same material as the Altair 4 gas detector. The display may be colour display or black and white. The apparatus uses rechargeable Lithium Ion battery.

CONDITIONS OF CERTIFICATION:

1. It is a condition of safe use that the rechargeable battery shall be charged in a safe area and charge voltage shall not exceed 6.7 V.

DOCUMENTS:

Drawing/ Document No.:	Page/s:	Title:	Revision Level:	Date: (yyyy-mm-dd)
SK3098-1126	36	Altair5/Altair5 iR Test Safe, Global Release (<i>PCB Artworks and assembly drawings</i>)	0	2009-04-01
10102321	1	Printed Circuit Board, Global, Altair5 Main	1	2009-05-01
SK3073-1048	4	Wiring Schematic, Altair5 Main Board	4	2009-05-08
10083572	1	Box, Potting, PC Board Assembly, Altair5	1	2009-04-06
DG6214500	1	Microprocessor (<i>Schematic, sheet 2 of 2</i>)	0	2007-10-30
DG6214000	1	PCB/PCBA, Altair 5 WUSB	0	2007-10-30
DG6214800	2	Bill of Material, Altair 5 WUSB-Module	0	2007-08-03
10051985	1	<i>Screw, Hex, Button Head, SST, Battery Pack</i>	0	2003-10-28
7-7101-1	1	Battery Assembly, Potted, Rechargeable, Altair5	1	2008-09-19

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10088655	1	<i>D-Ring, SST</i>	0	2007-09-10
10088613	1	Clamp, D-Ring, Altair5iR	1	2009-02-09
10095899	3	Label, Rechargeable Battery Pack, Altair5	0	2008-07-09
10099649	1	Printed Circuit Board, Color Display, Global Altair5	0	2009-04-23
10099650	4	Color Display Assembly, Global, Altair5	3	2009-06-01
SK3014-1013	1	Wiring Schematic, P.C. Board Assembly, Color Display, Global Altair5	0	2009-04-23
10083510	1	Box, Potting, Display, Color, Lower, Altair5	0	2008-09-19
10083571	1	Box, Potting, Display, Color, Upper, Altair5	0	2008-09-19
10080500	1	Printed Circuit Board, Altair5 Mono Display	5	2008-08-15
10080501	1	Printed Circuit Board Assembly, Altair5 Mono Display	6	2008-08-15
SK3014-1007	1	Wiring Schematic, Printed Circuit Board Assembly, Altair5 Mono Display	3	2008-08-15
10081552	1	Display Monochrome Graphic, Altair5	4	2008-09-19
10083460	1	Mount, Display, Monochrome, Altair5	1	2008-09-19
10083573	1	Bracket, Display, Monochrome, Altair5	0	2008-09-19
7-7098-1	1	Case, Upper, Molded, Altair5	4	2008-09-30
10083574	1	Bracket, Sensor, Altair5	2	2008-09-19
10083593	1	Gasket, Sensor, Altair5	0	2008-09-19
10083459	1	Membrane Sensor, Altair5	1	2008-09-19
10090108	1	Membrane, Sensor, Reactive Gas, Altair5	1	2009-04-08
10083580	1	Cap, Pump, Altair5	2	2008-09-19
SK3073-1058	1	Wiring Schematic, P.C. Board Assembly, Rechargeable, Altair5iR	1	2009-05-01
SK3098-1130	3	Artwork, Australian Approvals, Altair 5iR	0	2009-07-24

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Certificate No.: ANZEx 09.3008X	Issue No.: 0	Date of Issue: 2009-08-06
	Issue No.: 8	Date of Issue: 2015-09-10

Drawing/ Document No.:	Page/s:	Title:	Revision Level:	Date: (yyyy-mm-dd)
10078704	2	Printed Circuit Board Assembly, Main, Altair5 iR	9	2009-05-01
10089398	1	Bracket, IR Sensor, Altair-iR	2	2009-04-08
10097335	1	Shield, IR Sensor, Altair iR	1	2009-05-20
10085923	1	Printed Circuit Board, Rechargeable, Altair5iR	3	2009-05-01
10078701	1	Printed Circuit Board Assembly, Rechargeable, Altair5iR	1	2009-05-01
7-7112-1	1	Battery Pack Assembly, Rechargeable, Altair5iR	1	2009-05-20
10088610	1	Bracket Assembly, Pump, Altair5iR	1	2009-04-24
10088611	1	Case, Lower, Molded, Altair5iR	2	2009-04-27
10088614	1	Door, Battery Pack, Rechargeable, Altair5iR	2	2009-04-27
DG 6207 583	3	Main, MCIR-Sensor (<i>Schematic</i>)	3	2006-02-01
DG 6207 983	7	MCIR-Sensor-Board (<i>PCB/PCBA</i>)	3	2006-02-01
DG 6207 483	8	Bill Of Material, MCIR-Sensor-Board	3	2006-02-01

Schedule of Variations

Variations Permitted by Issue 1:

- Remove Firmware page (page 4 of 4) from drawing 10099650 – Color Display Global Assembly Altair5. This change did not affect the intrinsic safety assessment of the product. No test report required.

Condition of Certification Relating to Issue 1:

The conditions of certification are unchanged from the issue 0 of the certificate.

Drawings Relating to Issue 1:

Drawing/ Document No.:	Page/s:	Title:	Revision Level:	Date: (yyyy-mm-dd)
10099650	3	Color Display Assembly, Global, Altair5	4	2009-09-29

This certificate and schedule shall not be reproduced except in full

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Certification Scheme for
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ANZEx Scheme**

Certificate of Conformity

Certificate No.: ANZEx 09.3008X	Issue No.: 0	Date of Issue: 2009-08-06
	Issue No.: 8	Date of Issue: 2015-09-10

Variations Permitted by Issue 2:

- The pump filtering structure has some changes – removal of the filter, shorten length of the tube. These changes are shown on the drawing 10088610.

These changes are assessed in Test Report 32542.

Condition of Certification Relating to Issue 2:

The conditions of certification are unchanged from the issue 0 of the certificate.

Drawings Relating to Issue 2:

Drawing/ Document No.:	Page/s:	Title:	Revision Level:	Date: (yyyy-mm-dd)
10088610	1	Bracket Assembly, Pump, Altair5iR	2	2010-05-27

Variations Permitted by Issue 3:

- Added new model of Altair 5X iR.

These changes are assessed in Test Report 32854.

Condition of Certification Relating to Issue 3:

The conditions of certification are unchanged from the issue 0 of the certificate.

Drawings Relating to Issue 3:

Drawing/ Document No.:	Page/s:	Title:	Revision Level:	Date: (yyyy-mm-dd)
SK3098-1187	66	TestSafe Approvals, Altair5X /Altair5X iR	0	2011-03-07

Variations Permitted by Issue 4:

The following are changes in regards to adding alternate battery pack part numbers of identical construction and materials with differences on colour of the overmold only.

On Sheet 2 of Drawing SK3098-1187 revision 0 to revision 1:

- Changed from "NUMBER 10093415" to "NUMBERS 10093415 OR 10114838"
- Changed from "NUMBER 10083507" to "NUMBERS 10083507 OR 10114837"
- Changed from "NUMBER 10083508" to "NUMBERS 10083508 OR 10114836"
- Changed from "NUMBER 10090521" to "NUMBERS 10090521 OR 10114835"

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EXPLOSION-PROTECTED ELECTRICAL EQUIPMENT
ANZEx Scheme**

Certificate of Conformity

Certificate No.: ANZEx 09.3008X	Issue No.: 0	Date of Issue: 2009-08-06
	Issue No.: 8	Date of Issue: 2015-09-10

- Changed from "NUMBER 10093416" to "NUMBERS 10093416 OR 10114851 OR 10114852"
- Changed from "NUMBER 10088522" to "NUMBERS 10088522 OR 10114839 OR 10114840"

On Sheet 62, added "OR ALTAIR5X" next to "ALTAIR5" for item 2 (battery pack door)

On Sheet 63, added "OR ALTAIR5X" next to "ALTAIR5" for item 1 (battery pack door)

On Sheet 64, added "OR ALTAIR5X" next to "ALTAIR5" for item 10 (battery pack door)

These changes were assessed in Test Report 32973.

Conditions of Certification pertaining to Issue 4 of this Certificate:

The conditions of certification are unchanged from the issue 0 of the certificate.

Drawing list pertaining to Issue 4 of this Certificate:

Drawing/ Document No.:	Page/s:	Title:	Revision Level:	Date: (yyyy-mm-dd)
SK3098-1187	66	TestSafe Approvals, Altair5X /Altair5X iR	1	2011-03-25

Variations Permitted by Issue 5:

The changes are described in their Agency Change Request 490298 and 490316.

In the Main Board, resistor R94 changed from 10 Ω 0.5 W to 110 Ω 0.75 W.

The following are changes made to the design documentation. These relate to deleting a via, minor change to layout of tracks, increasing track width, and designator changes.

Drawing SK3098-1187 revision 1 to revision 2:

1.) Sheet 14:

- a.) Previous R88 designator changed to R114, and, previous R114 designator changed to R88
- b.) Previous R85 designator changed to R112, and, previous R112 designator changed to R85.
- c.) Trace was thickened between D26 to D24.
- d.) Previous D18 designator changed to D20, previous D19 designator changed to D18, and previous D20 designator changed to D19.

2.) Sheets 16 through 23: Describes the revised alternate main printed circuit board artwork and component placement, for p/n 10105252 Revision 3, and the changes made are as follows:

- a.) Sheets 16 to 23: Typographical error references to part number 10105250 were changed to 10105252.

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ANZEx Scheme**

Certificate of Conformity

Certificate No.: ANZEx 09.3008X	Issue No.: 0	Date of Issue: 2009-08-06
	Issue No.: 8	Date of Issue: 2015-09-10

- b.) Sheet 21: corrected the typographical error in the naming of the PCB layer description from INNER 4 to BOTTOM.
 - c.) Sheet 20: The tracks on inner layer 4 were shifted to provide greater segregation around one ground ‘via’.
 - d.) Sheet 21: One portion of the ‘ground’ track on the bottom layer was removed, and the corresponding ‘via’ to this deleted track was deleted throughout the other layers (on sheets 16 to 20).
 - e.) All references to revision of the artwork were changed from Revision 2 to Revision 3.
- 3.) **All sheets:** the revision date in the title block was revised to, 24-June-2011, and the revision number changed from Revision 1 to Revision 2.

These changes were assessed in Test Report 33164.

Conditions of Certification pertaining to Issue 5 of this Certificate:

The conditions of certification are unchanged from the issue 0 of the certificate.

Drawing list pertaining to Issue 5 of this Certificate:

Drawing/ Document No.:	Page/s:	Title:	Revision Level:	Date: (yyyy-mm-dd)
SK3098-1187	66	TestSafe Approvals, Altair5X / Altair5XiR	2	2011-06-24
SK3073-1048	4	Wiring Schematic, Altair5 Main Board	5	2011-06-21
10102322	2	Printed Circuit Board Assembly, Main, Global Altair5	2	2011-06-21
10078704	2	Printed Circuit Board Assembly, Main, Global Altair5IR	10	2011-06-21

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Variations Permitted by Issue 6:

The alternative battery cells Panasonic / Sanyo UR18650A now added in the battery cell list.
These changes were assessed in Test Report 34359.

Conditions of Certification pertaining to Issue 6 of this Certificate:

The conditions of certification are unchanged from the issue 0 of the certificate.

Drawing list pertaining to Issue 6 of this Certificate:

Drawing/ Document No.:	Page/s :	Title:	Revision Level:	Date: (yyyy-mm-dd)
SK3098-1187	66	TestSafe Approvals, Altair5X / Altair5XiR	3	2013-04-19

Variations Permitted by Issue 7:

Replaced LCD display from Sharp LQ022B8UD05 to All Shore Industries ASI-T-2201-DA0EN/D. Drawing 3098-1187 was updated accordingly. The new LCD drawings were added from 75 – 85. Others kept the same as previous revision 3.
These changes were assessed in Test Report 34426.

Conditions of Certification pertaining to Issue 7 of this Certificate:

The conditions of certification are unchanged from the issue 0 of the certificate.

Drawing list pertaining to Issue 7 of this Certificate:

Drawing/ Document No.:	Page/s:	Title:	Revision Level:	Date: (yyyy-mm-dd)
3098-1187	85	TestSafe Approvals, Altair5X / Altair5XIR	4	2014-04-21

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Certification Scheme for
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ANZEx Scheme**

Certificate of Conformity

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	Issue No.: 8	Date of Issue: 2015-09-10

Variations Permitted by Issue 8:

The company name changed from Mine Safety Appliances Company to Mine Safety Appliances Company, LLC.
 Adding a Bluetooth wireless board, RFID tag (self-contained, separately certified), and pads tracks change on the main board. The outer enclosure has not been changed.
 These changes were assessed in Test Report 35287.

Conditions of Certification pertaining to Issue 8 of this Certificate:

The conditions of certification are unchanged from the issue 0 of the certificate.

Drawing list pertaining to Issue 8 of this Certificate:

Drawing/ Document No.:	Page/s:	Title:	Revision Level:	Date: (yyyy-mm-dd)
3098-1187	96	TestSafe Approvals, Altair5X / Altair5XIR	5	2015-03-20

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