

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

***Certificate of Conformity***

Certificate No.: ANZEx 09.3009X	Issue No.: 0	Date of Issue: 2009-07-01
	Issue No.: 7	Date of Issue: 2014-06-13

**Applicant:** Mine Safety Appliances Co.  
1000 Cranberry Woods Drive  
Cranberry Township PA 16066-5207  
United States of America

**Electrical Apparatus:** Altair 5 / 5X Diffusion / Pumped Multi-Gas Detector

**Type of Protection:** Intrinsic safety 'ia'

**Marking Code:** MSA Altair 5  
Ex ia s Zone 0 I IP54  
Ex ia s Zone 0 IIC T4 IP54  
Altair 5X (with XCell Ex sensor not installed)  
Ex ia I IP65 (Zone 0)  
Ex ia IIC T4 IP65 (Zone 0), T<sub>amb</sub> = -40°C to +50°C  
Altair 5X (with XCell Ex sensor installed)  
Ex ia I IP65 (Zone 0)  
Ex ia s Zone 0 IIC T4 IP65, T<sub>amb</sub> = -40°C to +50°C  
ANZEx 09.3009X  
S/N: \_\_\_\_\_

**Manufacturer:** Mine Safety Appliances Co.  
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.*

**This certificate and schedule shall not be reproduced except in full**

 <b>Test Safe</b> AUSTRALIA	<p><b>Certificate issued by:</b></p> <p><i><b>TestSafe Australia</b></i></p> <p>919 Londonderry Road, Londonderry NSW 2753 Australia</p> <p><b>Phone: +61 2 4724 4900    Fax: +61 2 4724 4999</b></p> <p><a href="http://www.testsafe.com.au">http://www.testsafe.com.au</a></p>	 <b>JAS-ANZ</b> www.jas-anz.org/register
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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:            **34359, 34426, TestSafe**  
Quality Assessment Report No. and Issuing Body:    **FR/INE/QAR08.0011/04**

File Reference:    **2013/012137**



**Debbie Wouters**

*Signed for and on behalf of issuing body*

**13 June 2014**

*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 Multi-gas Detector is a 5 Gas instrument. It contains one dual toxic electrochemical cell, one single toxic electrochemical cell, one combustible cell, and one oxygen electrochemical cell.

The Altair 5X Multi-gas Detector is a 5 Gas instrument. It contains one dual XCell toxic electrochemical cell, one single XCell toxic electrochemical cell, one XCell combustible cell, and one XCell oxygen electrochemical cell.

It measures 170 mm by 90 mm by 45 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 mono or colour. The apparatus has options of gas sensing by diffusion or pump. The internal battery has available options of rechargeable or replaceable cells.

The rechargeable battery is Lithium Ion – one cell.

The alkaline battery is AA size alkaline cells – 3 cells (Duracell MN1500, Energizer E91).

**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.
2. It is a condition of safe use that for alkaline models, the Duracell MN1500 and Energizer E91 AA size alkaline cells can be used in the apparatus.

**DOCUMENTS:**

Drawing/ Document No.:	Page/s:	Title:	Revision Level:	Date: (yyyy-mm-dd)
SK3098-1126	36	(PCB Artworks and assembly drawings)	0	-
SK3098-1116	3	Artwork, Australia Approvals, Altair 5	0	2009-06-24
10102321	1	Printed Circuit Board, Global, Altair5 Main	1	2009-05-01
10102322	2	Printed Circuit Board Assembly, Main, Global Altair5	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 (Schematic, sheet 2 of 2)	0	2007-10-30

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<b>Drawing/ Document No.:</b>	<b>Page/s:</b>	<b>Title:</b>	<b>Revision Level:</b>	<b>Date: (yyyy-mm-dd)</b>
DG6214000	1	PCB/PCBA, Altair 5 WUSB	0	2007-10-30
DG6214800	2	Bill of Material, Altair 5 WUSB-Module	0	2007-08-03
7-7111-1	1	Battery Pack Assembly, Alkaline, Altair5	1	2008-08-08
10025664	1	Clip, Belt, Molded, Conductive, Orion	0	2000-11-07
10085926	1	Door, Alkaline Battery Pack, Altair5	4	2008-09-19
10085927	1	Holder, Battery, Alkaline, Altair5	0	2008-09-19
10078705	1	Printed Circuit Board, Alkaline, Altair 5	1	2008-08-08
10078706	1	Printed Circuit Board Assembly, Alkaline, Altair 5	1	2008-08-08
10095900	3	Label, Alkaline Battery Pack, Altair5	0	2008-07-09
7-7100-1	1	Battery Pack Assembly, Rechargeable, Altair5	3	2008-08-18
10083585	1	Clip, Belt, Altair5	3	2008-09-19
10083590	1	Door, Rechargeable Battery Pack, Altair5	4	2008-09-19
10051985	1	Screw, Hex Socket, Button Head	0	2003-10-28
7-7101-1	1	Battery Assembly, Potted, Rechargeable, Altair5	1	2008-09-19
10078689	1	Printed Circuit Board, Lithium, Altair5	6	2008-08-08
10078690	1	Printed Circuit Board Assembly, Lithium, Altair5	6	2008-08-08
SK3073-1047	1	Wiring Schematic, P.C. Board Assembly, Altair5, Lithium	7	2008-08-08
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

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Drawing/ Document No.:	Page/s:	Title:	Revision Level:	Date: (yyyy-mm-dd)
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
10083582	1	Case, Lower Molded, Diffusion, Altair5	4	2008-09-19
10083583	1	Case, Lower Molded, Pumped, Altair5	5	2008-09-19
10088609	1	Bracket Assembly, Pump, Altair5	2	2009-05-12
10088523	1	Bracket Assembly, Diffusion, Altair5	0	2008-08-01
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

**Schedule of Variations**

**Variations Permitted by Issue 1:**

- Removed 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.

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**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

**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 10088609.

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)
10088609	1	Bracket Assembly, Pump, Altair5	3	2010-05-27

**Variations Permitted by Issue 3:**

- Added new model of Altair 5X.

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.

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**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"
- 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  $\Omega$  0.5 W to 110  $\Omega$  0.75 W.

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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.
- 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

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Drawing/ Document No.:	Page/s:	Title:	Revision Level:	Date: (yyyy-mm-dd)
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

**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:**

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**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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