

Certificate of Conformity

Ex EQUIPMENT

Certificate No.:	ANZEx 09.3008X	Current Issue:	11	Date of Issue:	2022-04-19
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Applicant: **MSA – The Safety Company**
1000 Cranberry Woods Drive
Cranberry Township PA 16066-5207
United States of America

Equipment: Altair 5X iR Multi-Gas Detector

Type of Explosion Protection: Intrinsic safety “ia” & Flameproof enclosures “da”

Explosion Protection Marking: Ex ia I Ma
Ex ia IIC T4 Ga (with Ex sensor not installed)
Ex da ia IIC T4 Ga (with Ex sensor installed)
-40 °C ≤ Ta ≤ +50 °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



Name & Position

Debbie Wouters – Acting Quality & Certification Manager

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:

TestSafe Australia
919 Londonderry Road, Londonderry NSW 2753 Australia

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Manufacturer : **MSA – The Safety Company**
1000 Cranberry Woods Drive
Cranberry Township PA 16066-5207
United States of America

**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:

IEC 60079-0:2011 Ed 6	Explosive atmospheres - Part 0: General requirements
IEC 60079-1:2014 Ed 7	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures “d”
IEC 60079-11:2011 Ed 6	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety “i”

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

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Schedule

Equipment Description:

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 mono or colour. The apparatus uses rechargeable Lithium Ion battery.

The equipment has been separately tested against the requirements of IEC 60529 and it meets IP65.

The equipment contains already tested and certified devices/Ex component, summarized in Table 1.

Table 1- Item list

Item #	Designation	Type	Ex certificate number/ ExTR number	Standards with Editions	Ex marking code
1	SENS1	Combustible Gas Sensor XCell™ Ex	IECEX FTZU 09.0023U	IEC 60079-0:2017 Ed.7 IEC 60079-1:2014 Ed.7 IEC 60079-11:2011 Ed.6	Ex ia I Ma Ex da ia IIC Ga

Specific Conditions of Use:

1. The rechargeable battery shall be charged only in a safe area, the charge voltage (Um) and current (Im) shall not exceed 6.7 Vdc and 1.7 Adc.

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Register of Issues and Variations

includes the current issue

Issue 0 dated 2009-08-06

Test & Assessment Reports relevant for this issue:

TR No. & Issuing CBs: 31469, TestSafe Australia
 QAR No. & Issuing CB: CA/CSA/QAR06.0001/02, CSA Canada
 File Reference: 2009/001471

Standards relevant for this issue:

IEC 60079-0:2004 Ed 4 Explosive atmospheres Part 0: Equipment—General requirements
IEC 60079-1:2003 Ed 5 Electrical apparatus for explosive gas atmospheres - Part 1: Flameproof enclosure 'd'
IEC 60079-11:2006 Ed 5 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety 'i'
AS 1826-1983 Ed 2 Electrical Equipment for Explosive Atmospheres Special Protection – Type of Protection 's'

Manufacturer's Documents/Drawings associated with this issue:

Document/Drawing Number	Pages / Sheets	Document/Drawing Title	Revision	Date
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
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

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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
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

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Issue 1 dated 2009-12-14Variations Permitted by this Issue

- 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.

Test & Assessment Reports relevant for this issue:

TR No. & Issuing CBs: 31469, TestSafe Australia
QAR No. & Issuing CB: CA/CSA/QAR06.0001/02, CSA Canada
File Reference: 2009/032028

Manufacturer's Documents/Drawings associated with this issue:

Document/Drawing Number	Pages / Sheets	Document/Drawing Title	Revision	Date
10099650	3	Color Display Assembly, Global, Altair5	4	2009-09-29

Issue 2 dated 2010-08-17Variations Permitted by this Issue

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

Test & Assessment Reports relevant for this issue:

TR No. & Issuing CBs: 32542, TestSafe Australia
QAR No. & Issuing CB: CA/CSA/QAR06.0001/02, CSA Canada
File Reference: 2010/008725

Manufacturer's Documents/Drawings associated with this issue:

Document/Drawing Number	Pages / Sheets	Document/Drawing Title	Revision	Date
10088610	1	Bracket Assembly, Pump, Altair5iR	2	2010-05-27

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Issue 3 dated 2011-03-16Variations Permitted by this Issue

- Added new model of Altair 5X iR.

Test & Assessment Reports relevant for this issue:

TR No. & Issuing CBs: 32854, TestSafe Australia
 QAR No. & Issuing CB: FR/INE/QAR08.0011/01, Ineris France
 File Reference: 2010/021953

Manufacturer's Documents/Drawings associated with this issue:

Document/Drawing Number	Pages / Sheets	Document/Drawing Title	Revision	Date
SK3098-1187	66	TestSafe Approvals, Altair5X /Altair5X iR	0	2011-03-07

Issue 4 dated 2011-05-18Variations Permitted by this Issue

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)

Test & Assessment Reports relevant for this issue:

TR No. & Issuing CBs: 32973, TestSafe Australia
 QAR No. & Issuing CB: FR/INE/QAR08.0011/01, Ineris France
 File Reference: 2011/008570

Manufacturer's Documents/Drawings associated with this issue:

Document/Drawing Number	Pages / Sheets	Document/Drawing Title	Revision	Date
SK3098-1187	66	TestSafe Approvals, Altair5X /Altair5X iR	1	2011-03-25

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Issue 5 dated 2011-08-24Variations Permitted by this Issue

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.
- 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.Test & Assessment Reports relevant for this issue:

TR No. & Issuing CBs: 33164, TestSafe Australia
 QAR No. & Issuing CB: FR/INE/QAR08.0011/02, Ineris France
 File Reference: 2011/012417

Manufacturer's Documents/Drawings associated with this issue:

Document/Drawing Number	Pages / Sheets	Document/Drawing Title	Revision	Date
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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Issue 6 dated 2013-08-19Variations Permitted by this Issue

- The alternative battery cells Panasonic / Sanyo UR18650A now added in the battery cell list.

Test & Assessment Reports relevant for this issue:

TR No. & Issuing CBs: 34359, TestSafe Australia
 QAR No. & Issuing CB: FR/INE/QAR08.0011/03, Ineris France
 File Reference: 2013/012137

Manufacturer's Documents/Drawings associated with this issue:

Document/Drawing Number	Pages / Sheets	Document/Drawing Title	Revision	Date
SK3098-1187	66	TestSafe Approvals, Altair5X / Altair5XiR	3	2013-04-19

Issue 7 dated 2014-06-13Variations Permitted by this Issue

- 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.

Test & Assessment Reports relevant for this issue:

TR No. & Issuing CBs: 34426, TestSafe Australia
 QAR No. & Issuing CB: FR/INE/QAR08.0011/04, Ineris France
 File Reference: 2013/012137

Manufacturer's Documents/Drawings associated with this issue:

Document/Drawing Number	Pages / Sheets	Document/Drawing Title	Revision	Date
3098-1187	85	TestSafe Approvals, Altair5X / Altair5XIR	4	2014-04-21

Issue 8 dated 2015-09-10Variations Permitted by this Issue

- 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.

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Test & Assessment Reports relevant for this issue:

TR No. & Issuing CBs: 35287, TestSafe Australia
 QAR No. & Issuing CB: FR/INE/QAR08.0011/05, Ineris France
 File Reference: 2015/004377

Manufacturer's Documents/Drawings associated with this issue:

Document/Drawing Number	Pages / Sheets	Document/Drawing Title	Revision	Date
3098-1187	96	TestSafe Approvals, Altair5X / Altair5XIR	5	2015-03-20

Issue 9 dated 2017-08-17

Variations Permitted by this Issue

1. Update the standards to IEC 60079-0:2011, IEC 60079-1:2014 and IEC 60079-11:2011.
2. Removal of Altair 5 model.
3. Create new drawing to describe an alternative construction of the display.
4. Company name changed to MSA – The Safety Company.

Standards relevant for this issue:

IEC 60079-0:2011 Ed 6	Explosive atmospheres Part 0: Equipment—General requirements
IEC 60079-1:2014 Ed 7	Electrical apparatus for explosive gas atmospheres - Part 1: Flameproof enclosure 'd'
IEC 60079-11:2011 Ed 6	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-18:2009 Ed 3	Explosive atmospheres - Part 18: Equipment protection by encapsulation "m"
AS 1826-1983 Ed 2	Electrical Equipment for Explosive Atmospheres Special Protection – Type of Protection 's'

Test & Assessment Reports relevant for this issue:

TR No. & Issuing CBs: 35611, 36021 TestSafe Australia
 QAR No. & Issuing CB: FR/INE/QAR08.0011/06, Ineris France
 File Reference: 2017/005807

Manufacturer's Documents/Drawings associated with this issue:

Document/Drawing Number	Pages / Sheets	Document/Drawing Title	Revision	Date
3098-1187	98	TestSafe Approvals, Altair5X / Altair5XiR	6	2016-05-23
SK3098-1394	1	ATT DWG, ALT ASSY, A5X, CLR DSPLY, IECEx	0	2017-02-16

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Issue 10 dated 2020-03-04Variations Permitted by this Issue

- Amended the equipment marking code to match the XCell combustible cell marking code for protection "da" with EPL Ga.
- Replace type protection "s" with "da".
- Amended the assessment for the infrared sensor.
- Add optional Mosfet for Q2 & Q3
- Correct the ingress protection IP67 to IP65 given in previous Test Report 35611 & 36021.

Standards relevant for this issue:

IEC 60079-0:2011 Ed 6	Explosive atmospheres Part 0: Equipment—General requirements
IEC 60079-1:2014 Ed 7	Electrical apparatus for explosive gas atmospheres - Part 1: Flameproof enclosure 'd'
IEC 60079-11:2011 Ed 6	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

Test & Assessment Reports relevant for this issue:

TR No. & Issuing CBs:	36925, TestSafe Australia
QAR No. & Issuing CB:	FR/INE/QAR08.0011/09, Ineris France
File Reference:	2019/016733

Manufacturer's Documents/Drawings associated with this issue:

Document/Drawing Number	Pages / Sheets	Document/Drawing Title	Revision	Date
3098-1187	98	TestSafe Approvals, Altair5X/Altair5XIR	7	2019-11-19
SK3025-1080	3	Artwork, Australian Approvals, Altair 5XIR (Marking Label)	2	2020-02-11
SK3098-1394	1	ATT DWG, ALT ASSY, A5X, CLR DSPLY, IECEx	0	2017-02-16

Issue 11 current issueVariations Permitted by this Issue

- Add alternative IC components for U5 & U6 on the Bluetooth board (different footprint).
- Add alternative PCB layout for the Bluetooth board.
- The XCell Combustible Gas Sensor certificate had been updated.

Test & Assessment Reports relevant for this issue:

TR No. & Issuing CBs:	37656, TestSafe Australia
QAR No. & Issuing CB:	FR/INE/QAR08.0011/11, Ineris France
File Reference:	2022/002048

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Manufacturer's Documents/Drawings associated with this issue:

Document/Drawing Number	Pages / Sheets	Document/Drawing Title	Revision	Date
3098-1187	97	*TestSafe Approvals, Altair5X/Altair5XIR	8	2022-01-27
SK3025-1080	3	Artwork, Australian Approvals, Altair 5XIR (Marking Label)	2	2020-02-11
SK3098-1394	1	ATT DWG, ALT ASSY, A5X, CLR DSPLY, IECEX	0	2017-02-16

Note: An * is included before the title of documents that are new or revised.