

Certificate of Conformity

Ex EQUIPMENT

Certificate No.: ANZEx 09.3008X	Current Issue: 10	Date of Issue: 2020-03-04
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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 conditions as set out in
Standards Australia/Standards New Zealand Miscellaneous Publication **MP87.1***

Signed for and on behalf of issuing body

Name & Position

Ujen Singh – 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.

TEST & ASSESSMENT REPORTS:

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

Test Report Nos. & Issuing Bodies associated with all issues of the certificate: 31469, 32542, 32854, 32973, 33164, 34359, 34426, 35287, 35611, 36021, 36925 TestSafe

Quality Assessment Report No. & Issuing Body: FR/INE/QAR08.0011/09

File Reference: 2019/016733

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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 60079-0:2011 Ed.6 IEC 60079-1:2014 Ed.7 IEC 60079-11:2011 Ed.6	Ex ia I Ma Ex da ia IIC Ga

Variations 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.

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.

Additional Information:

None.

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Manufacturer's Documents associated with this Issue:

Document Number	Pages / Sheets	Document 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

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

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History of Issues and Variations

Issue 0 dated 2009-08-06

Manufacturer's Documents associated with Issue 0:

Document Number	Pages / Sheets	Document 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
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

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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		

Issue 1 dated 2009-12-14

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.

Manufacturer's Documents associated with the Issue 1:

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

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Issue 2 dated 2010-08-17

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.

Manufacturer's Documents associated with the Issue 2:

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

Issue 3 dated 2011-03-16

Variations Permitted by Issue 3

- Added new model of Altair 5X iR.

These changes are assessed in Test Report 32854.

Manufacturer's Documents associated with the Issue 3:

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

Issue 4 dated 2011-05-18

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)

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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.

Manufacturer's Documents associated with the Issue 4:

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

Issue 5 dated 2011-08-24

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.
- 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.

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Manufacturer's Documents associated with the Issue 5:

Document Number	Pages / Sheets	Document 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

Issue 6 dated 2013-08-19

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.

Manufacturer's Documents associated with the Issue 6:

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

Issue 7 dated 2014-06-13

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.

Manufacturer's Documents associated with the Issue 7:

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

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Issue 8 dated 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.

Manufacturer's Documents associated with the Issue 8:

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

Issue 9 dated 2017-08-17

Variations Permitted by Issue 9

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.

These changes were assessed in Test Reports 35611 and 36021.

Manufacturer's Documents associated with the Issue 9:

Document Number	Pages / Sheets	Document 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