IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx TSA 08.0013X issue No.:4

Status: **Current**

Date of Issue: **2012-08-03** Page 1 of 4

Certificate history:
Issue No. 4 (2012-8-3)
Issue No. 3 (2010-9-16)
Issue No. 2 (2008-9-29)
Issue No. 1 (2008-7-8)
Issue No. 0 (2008-3-12)

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

Electrical Apparatus: **Altair 4 / 4X Diffusion Multi-gas Detector**
Optional accessory:

Type of Protection: **Intrinsic Safety**

Marking:
MSA
Altair 4 Multi-gas Detector
Ex ia d I IP54
Ex ia d IIC T4 IP54
Altair 4X Multi-gas Detector
Ex ia I IP67
Ex ia mb d IIC T4 IP67 - When Combustible XCell Sensor is installed
Ex ia IIC T4 IP67 - When Combustible XCell Sensor is not installed.
IECEx TSA 08.0013X
S/N: _____

Approved for issue on behalf of the IECEx Certification Body: Ujen Singh

Position: Quality and Certification Manager

Signature:
(for printed version)

Date: 02 AUGUST 2012.

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 the Official IECEx Website.

Certificate issued by:

TestSafe Australia
919 Londonderry Road
Londonderry NSW 2753
Australia

Test Safe AUSTRALIA

IECEx Certificate of Conformity

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Date of Issue: **2012-08-03** Issue No.: **4**

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

Manufacturing location(s):

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 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 Edition: 4.0	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
IEC 60079-1 : 2003 Edition: 5	Electrical apparatus for explosive gas atmospheres - Part 1: Flameproof enclosure 'd'
IEC 60079-11 : 2006 Edition: 5	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

*This Certificate **does not** indicate compliance with electrical 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 Report:
AU/TSA/ExTR07.0040/01 AU/TSA/ExTR10.0009/00 AU/TSA/ExTR12.0034/00

Quality Assessment Report:

FR/INE/QAR08.0011/03

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Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

The Altair 4 Multi-gas Detector is a 4 Gas instrument. It contains one dual toxic electrochemical cell, one combustible cell, and one oxygen electrochemical cell. It measures 75 mm by 120 mm by 35 mm. The body is made of Lexan 141-112 and is over-molded with conductive rubber RTP 2099E, the same material as the Altair single gas detector. The display is a mono-colour LCD (Philips PCF8533 series).

The rechargeable battery is Lithium polymer (Sony battery) – one cell. The battery is encapsulated in a plastic container with soft polyurethane based encapsulant.

CONDITIONS OF CERTIFICATION: YES as shown below:

Please refer to Annexe of the certificate.

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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Please refer to Annexe of the certificate.

Annexe: Annexe for IECEx TSA 08.0013X-4.pdf

IECEx Certificate of Conformity Annexe

Annexe for Certificate No.:	IECEx TSA 08.0013X	Issue No.:	4

Conditions of Certification pertaining to Issue 0 of this Certificate:

It is a condition of safe use that the input parameters for the battery charger, which may be connected only in a safe area, are shown below:

Maximum Charger Voltage U_m	6.7 V
Maximum Charger Current I_m	1.7 A

Drawing list pertaining to Issue 0 of this Certificate:

Document No.	Sheets	Document Title	Issue	Date (yyyy/mm/dd)
SK3098-1039	21	4-Gas Detector, 4GD, Altair4, IEC	0	2007/11/29
SK3098-1059	1	Label, AS/NZS and IEC Approvals, Altair4	0	2008/03/06

Changes relating to Issue 1:

- Adding an alternate case overmould material RTP 2099E X 118617 B (Black) to the apparatus.

This change has been assessed in Test Report AU/TSA/ExTR08.0026/00.

Conditions of Certification pertaining to Issue 1 of this Certificate:

The previous conditions are still applicable.

Drawing list pertaining to Issue 1 of this Certificate:

Document No.	Sheets	Document Title	Issue	Date (yyyy/mm/dd)
SK3098-1039	11 of 21	4-Gas Detector, 4GD, Altair4, IEC	0A	2008/05/05

Changes relating to Issue 2:

- The drawing SK3098-1039 Rev.0 is replaced by drawings SK3098-1039 Rev.1. The changes are:

1. Sheet 1, 2 & 5: Added illustration of missing non-protective resistor R94 (unmarked) in the combustible associated schematic. (Note: This information was accidentally left out on this schematic, but, the part was previously already on p.c. board artwork drawing sheet 19 which has remained unchanged, thus spacing analysis still remains unaffected).
2. Sheet 3: Added maximum capacitance and minimum voltage rating of C12 in the BATT SAFETY SCHEMATIC (Note: This information was previously already noted on sheet 12).
3. Sheet 4: Added R94, its specifications and its analysis of missing non-protective resistor R94 to the COMB CIRCUIT schematic.

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4. Sheet 11: Corrected ratings of 5 resistors to 0.125W for a typographical error. (Note: The correct values were previously already noted in the analysis contained within preceding sheets).
5. Sheet 11: Corrected dimension of minimum wall (non-floor) thickness of the battery tray/carrier from 0.86 mm to 0.50 mm. (Note: The correct dimension was previously already noted on sheet 20).
6. Sheet 11: Corrected revision of printed circuit board artwork from revision 2 to revision 4. (Note: The correct artwork revision was previously already noted on sheets 14 through 19).
7. Sheet 11: Added the calibration cap anti-static material type.
8. Sheet 12: Corrected quantities of components from 3 to 5 in two places for typographical errors. (Note: There were previously already noted 5 parts for Q1, Q3, Q4, Q12, Q13 and D2, D6, D7, D12, D13).
9. Sheet 12: Added missing non-protective resistor R94. (Note: As in 1. above, this information was accidentally left out on this schematic, but, the part was previously already on p.c. board artwork drawing which has remained unchanged, thus spacing analysis still remains unaffected).
10. Sheet 21: Added optional double-sided adhesive tape between optional clip and instrument.
11. Sheet 21: Added illustration for optional calibration cup.
12. Sheet 11: Added RoHS compliant Littelfuse 0466.200 0.2A SMT alternate fuse having the same UL and CSA approval file numbers as the previous 0433.200 fuse.
13. Sheet 11: Added alternate static dissipative overmold material RTP2099 EX 118617 B BLK/BLK in two places and removed "IP 64 Minimum" in five places.

These changes have been assessed in Test Report AU/TSA/ExTR08.0054/00.

Conditions of Certification pertaining to Issue 2 of this Certificate:

The previous conditions are still applicable.

Drawing list pertaining to Issue 2 of this Certificate:

Document Number	Document Title	Revision	Date
SK3098-1039 21 sheets	4-Gas Detector, 4GD, Altair4, IEC	1	2008/07/18

Changes relating to Issue 3:

1. Added new model Altair 4X to the certificate. Altair 4X is identical to Altair 4 only Altair 4X uses XCell sensors and has a different sensor circuit.

Altair 4X has been assessed in Test Report AU/TSA/ExTR10.0009/00.

2. Correction of the enclosure material in the equipment description from ABS to Lexan 141-122 in Test Report AU/TSA/ExTR07.0040/00. The Equipment description of the certificate is changed accordingly.
3. Quality Assessment Report has been updated

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IECEx Certificate of Conformity Annexe

Annexe for Certificate No.:	IECEx TSA 08.0013X	Issue No.:	4

Conditions of Certification pertaining to Issue 3 of this Certificate:

The previous conditions are still applicable.

Drawing list pertaining to Issue 3 of this Certificate:

Document Number	Document Title	Revision	Date
SK3098-1135 22 sheets	Altair4X, TestSafe, IECEx	0	2010/07/21
SK3098-1157	Label, AS/NZS and IEC Approvals, Altair4X	0	2010/09/01
SK3098-1085 24 sheets	Approval, XCell Ex Combustible Sensor, FTZU	-	2010-03-30

Changes relating to Issue 4:

The drawing SK3098-1135 Rev.0 is replaced by drawing SK3098-1135 Rev.1. The changes are:

1. The IR Transceiver (component designator U1) Sharp GP2W0110YP0F is being replaced by a similar device Vishay TFBS4650.
2. Associated capacitor C6 decreased in nominal capacitance from 1.0 µF to 0.1µF.
3. Protective resistor R7 36.5 Ω nominal, ±1% tolerance, 1 W rating, 2512 SMD has changed to 100 Ω nominal, ±5% tolerance, 1 W rating, 2512SMD. However, in the design requirement drawing, it is still described as ≥ 36.135 Ω with no change.
4. A label with battery capacity and other information was added to the internal battery pack.
5. Corrections (no design changes) were made in regards to infallible via designations (circle-I) and colours used to describe the plated through holes for connecting to the gas sensors' sockets as shown on new sheets 15, 16, 17, 18, 19, & 20.

This change has been assessed in Test Report AU/TSA/ExTR12.0034/00.

Conditions of Certification pertaining to Issue 4 of this Certificate:

The previous conditions are still applicable.

Drawing list pertaining to Issue 4 of this Certificate:

Document No.	Sheets	Document Title	Issue	Date (yyyy/mm/dd)
SK3098-1135	22	Altair4X, TestSafe, IECEx	1	2012/06/06

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