SABS

APPROVED INSPECTION AUTHORITY

IN TERMS OF REGULATION 10.1 OF THE MINERALS ACT(INCORPORATED IN THE MINE HEALTH AND SAFETY ACT) AND REGULATION 9(2) OFTHE ELECTRICAL MACHINERY REGULATIONS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT

IA CERTIFICATE: SABS MS/17-0830X

MSA AFRICA
PO Box 5717
MEYERSDALE
1447

Date: 06 September 2017

ALTAIR 4X MINING MULTIGAS DETECTOR
Expiry Date: September 2020

DESCRIPTION

The main change associated with the revised construction consist of changes to the IR circuit limited only to one protective resistor, one capacitor, one integrated circuit, and changes to related printed circuit board artwork.

a) The Infra-Red transceiver made by Sharp GP2W0110YP0F in the existing design has been made obsolete and is no longer available. This IR transceiver is being replaced by a part TFBS4650 manufactured by Vishay. The junction-to-ambient thermal resistance of the Vishay part is 300°C/W and that is less than the maximum limit for this Zone WOW located device, 973°C/W.

b) Associated capacitor C6 (not shown individually, but as part of a maximum lump capacitance on sheet 3 of the drawing <24µF) decreased in nominal capacitance from 1.0µF to 0.1µF, a less onerous change, with a voltage rating >10 Volts.

c) Protective resistor R7, referenced on sheets 3,6,7,8, & 12 and specified as a minimum (whereby the current R7 is 36.5 ohms nominal, +1% tolerance, 1 Watt rating, 2512SMD) has changed to 100 ohms nominal, +5% tolerance, 1 Watt rating, 2512SMD, a less onerous change. However, the original conditions/specifications of the drawing have remained unchanged, the new R7 (100 ohms) is still greater than or equal to 36.136 ohms.

d) The printed circuit board artwork and the drill legend, on all layers, have been revised to accommodate this circuit change, and, proper spacing and segregation have not been violated, as shown on the new sheets 14, 15, 16,17, 18, 19, 20[1].

e) Other minor changes not related to the IR circuit change:
e.1) A label with battery capacity and other information was added to the internal battery pack as shown on sheet 21[1].
e.2) Corrections (no design changes) were made in regards to infallible via designations (circle-I) and colors 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[1].

These changes don't have influence on the intrinsic safety of the apparatus.
No tests were necessary.

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MARKING

The marking of the apparatus may be replaced by the SABS marking (also see conditions of certification and certificate).

MSA ALTAIR 4X MINING MULTIGAS DETECTOR

I M1 Ex ia I Ma

II 1G Ex ia IIC T4 Ga

II 2G Ex d ia mb IIC T4 Gb

IA Number: SABS MS/17-0830X

Serial Number: .....

X - Special conditions of safe use

The input parameters for the battery charger, which may be connected only in a safe area, are shown below:

Maximum Charger Voltage Um	6.7 V
Maximum Charger Current Im	1.7 V

U – Ex Component

None

Compliance: The unit as described above and assessed in SABS Report No EPT-170831-00030 is hereby certified "Explosion Protected" and is suitable for use in hazardous locations as stated below, as determined during assessment conducted in accordance with the relevant requirements of SANS Standards:

- **SANS 60079-0: 2009 "Explosive atmospheres Part 0: Equipment - General requirements";and**
- **SANS 60079-11: 2007 "Explosive atmospheres Part 11: Equipment protection by intrinsic safety 'i'"**

Locations	Zone 0- When Combustible XCell Sensor is not installed or Zone 1- When Combustible XCell Sensor is installed	Underground and Surface industry
Hazardous Frequency		Continuous/Intermittent as could occur under normal operations
Environment	Group I/IIC	Methane and Hydrogen
Limiting Temperature	T 4	
Ambient Temperature	-40 °C≤Ta≤+60°C	

The use of the apparatus in hazardous locations is subject to the following provision, which shall be adhered to:

i) SANS 10086-1:2014, SANS 10086-2: 2013 and SANS 10012: 2004 requirements;
ii) Any relevant requirements of the MHS Act or the OHS Act;
iii) Codes of Practice enforced in terms of Regulations 10.1 of the Minerals Act, by the Chief Inspector of Mines;
iv) Any restrictions and conditions enforced by the Chief Inspector of Mines, Principal Inspector (Group I equipment) or Chief Inspector of Factories (Group II equipment); and
v) Any conditions mentioned in the above test report.

Conditions of certification:

1. This certificate covers all units sold / used / purchased from the date of this certificate to September 2020.
2. Specific conditions for the manufacture of the unit(s) are addressed in the confidential report of assessment to the manufacturer (SABS Report No EPT-170831-00030).

Evaluated by: **TA Ramolesane**
Test Officer

Reviewed by: **TM Matsobe**
Senior Test Officer

Authorised by: **DR Nene**
Management Signatory

SABS EXPLOSION PREVENTION TECHNOLOGY