



Mining And Surface Certification (Pty) Ltd

2015/021934/07



Certificate Number: MASC MS/11-358X
Issued: 22 September 2015
Expire: 22 September 2018
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IA – CERTIFICATE

(Revision 4 – Revised as per ARP 0108)

IN TERMS OF REGULATION 21.17.2 OF THE MINERALS ACT (INCORPORATION THE MINE HEALTH AND SAFETY ACT) AND REGULATION 9 (1) OF THE ELECTRICAL MACHINERY REGULATIONS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT

Ex – Type Examination

Certificate number:

MASC MS/11-358X

Equipment:

TX6373 Toxic Gas Sensor / Transmitter

Serial No:

(See Conditions of Certification)

Applicant:

Troxex Limited.

Address:

Hazel Grove
Stockport
Cheshire
SK7 5DY
United Kingdom

Manufacturer:

Troxex Limited.

Address:

Hazel Grove
Stockport
Cheshire
SK7 5DY
United Kingdom

DESCRIPTION:

The TX6373 Toxic Gas Sensor / Transmitters take a signal from an electrochemical gas sensing head mounted on the sensor board; this signal is conditioned and an analogue signal is then transmitted to other monitoring equipment. This apparatus comprises an output board connected to sensor head boards and an optional display board. The assembly is housed in an anti-static plastic enclosure and a polycarbonate window is fitted to allow viewing of the liquid crystal display.

There are the following versions of the TX6373:

- TX6373.01.11: Group I, 0.4 to 2V output
- TX6373.01.12: Group I, 4 to 20mA output (2 wire)
- TX6373.01.13: Group I, 5 to 15Hz output
- TX6373.02.12: Group II, 4 to 20mA output (2 wire)

The TX6373 has the safety descriptions listed in the table below.

Group I and II 4-20mA 2-wire			
Group I T4 / T1 (Power / signal)		Group II T4 / T1 (Power / Signal)	
Ui	16.5V	Ui	28V
Ii	-	Ii	100mA
Pi	-	Pi	0.7W
Ci	50nF *1	Ci	50nF *1
Li	0	Li	0

/ . Note 1...

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Note 1: In addition to the terminal capacitance at the supply voltage, for system assessment purposes, the installer should note that there is a terminal capacitance of 7.0µf at 7.08V.

Group I 0.4 - 2V and 5 - 15Hz					
T4 / T3 (Power)		T1 / T2 (sensor output signal)			
		0.4 – 2V (*2)		5 – 15 Hz (*2)	
Ui	16.5V	Ui	16.5V	Ui	16.5V
Ci	0 (*1)	Uo	5.88V	Uo	0
Li	0	Io	24mA		
		Po	35mW		
		Co	9.7µF		
		Lo / Ro	≤ 40 µH/Ω		

Note 1: For system assessment purposes, the installer should note that there is a terminal capacitance of 7.0µF at 7.08V.

Note 2: The 0.4 – 2V and 5 -15 Hz output may be connected to supplies derived from a single power source or form two separate power sources. Where two separate power sources are used, the power and signal circuits should be regarded as separate intrinsically safe circuits.

Variation 1 (One):

To permit:

- The modification of the output board circuit.

Variation 2 (Two):

To permit:

- The addition of zener diodes D8 ad D9 to the output board of the 4-20mA 2-wire Group I and II builds.
- The reduction of the capacitance value of C203 from 120nF maximum to 12nF maximum.

Variation 3 (Three):

- The use of a TO-92 package for voltage regulator U2 on the output board as an alternative to the current TO-220 package was permitted.
- The addition of C17 to the output board of the 4-20mA Group I and Group IIC builds only.
- The re-tabulation and introduction of a new safety parameters, in the Description of Equipment in the Issue 6, this list replaced that quoted in the prime certificate, therefore, the reader should refer to this document to review the previous values.

Variation 4 (Four):

- The use of 'Faradex' stainless steel filled nylon 6 as an alternative anti-static enclosure material was recognised.

Variation 5 (Five):

- The Lo/Ro value at the terminals T1/T2 was increased from 20µH/Ω to 40µH/Ω, the new value being recognised in the list of safety parameters quoted in Issue 6.

Variation 6 (Six):

- Following appropriate re-assessment to demonstrate compliance with the requirements of the latest standards, the documents previously listed in section 9, EN 50014:1997 plus amendments A1 & A2, EN 50020:1994, EN 50284:1999 and EN50303:2000, were replaced by those currently listed, the markings in section 12 were updated accordingly.

/. The addition...

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- The addition of an alternative plastic enclosure material with anti-static properties.
- The marking details were allowed to be laser-etched on a stainless steel label that is attached to the front face of the apparatus.
- The status of the following devices was clarified, the Condition of Certification being amended accordingly:

Device	Status	Product	Certificate no.
Opto-isolater	Removed	Bedford opto-isolator, type OPI1264D	BAS Ex 89C2096U
	Recognised*	Bedford opto-isolator, type OPI1264D	BAS 01ATEX1278U/4
Fuse	Removed	Littlefuse 259-series fuse	BAS Ex 832302U
	Recognised	Littlefuse 259-series fuse	BAS 02ATEX0071U – Issue 3

* This particular device has always been an option on the drawings and is now formally recognised in the certificate.

- The Description of Equipment was amended in line with the changes of safety parameters introduced in Variation 3 and 5.

MARKING:

Sira marking remains applicable. The following MASC Certificate number (IA number) must be additionally applied to the equipment.

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SPECIAL CONDITIONS OF USE (X):

Under certain extreme circumstances, the polycarbonate window may store an ignition-capable level of electrostatic charge. Therefore, when it is used for applications that specifically require group II, category 1 equipment, the TX6373 shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge. Additionally, the equipment shall only be cleaned with a damp cloth.

COMPLIANCE:

The unit as described above and in MASC Letter **11-358 R4** is hereby certified **“Explosion Protected”** Ex ia I/IIC T4 (Ta = -20°C to +60°C) and is suitable for use in hazardous locations as stated below and as tested, assessed and inspected in accordance with the relevant requirements of SANS Standards:

The evaluation was conducted according to the requirements of:

- **SANS (IEC) 60079-0: 2012 “Explosive atmospheres – Part 0: Equipment — General requirements”**
- **SANS (IEC) 60079-11: 2012 “Explosive atmospheres – Part 11: Equipment protection by intrinsic safety ‘i’”**
- **SANS (IEC) 60079-26: 2007 “Explosive atmospheres – Part 26: Equipment with equipment protection level (EPL) Ga”**
- **EN 50303: 2000 “Group I Category M1”**

Location	Zone 0 & 1	Gas/ Coal dust: Underground / Surface
Hazard Frequency		Continuous as could occur under normal operating conditions in hazardous area
Environment	Group I/IIC	Methane / Propane to Hydrogen
Limiting Temperature	T4	(Methane gas) / (Coal dust)
Ambient Temperature	-20°C to +60°C	

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

- i) SANS 10086 requirements;
- ii) Any conditions mentioned in the above report;
- iii) Codes of Practice enforced in terms of Regulations 21.17.2 of Minerals Act, by Chief Inspector of Mines;
- iv) Any restrictions and conditions enforced by Chief Inspectors of Mines, Principal Inspector (Group I equipment) of Chief Inspector of Factories (Group II equipment);
- v) Any relevant requirements of the MHS Act or the OHS Act.

CONDITIONS OF CERTIFICATION:

- This Certificate remains valid based on a three yearly review covered by an official MASC letter.
- The apparatus must be additionally marked in a clear, legible, visible and indelible manner with the MASC marking details above.
- This certificate of approval only covers the equipment as certified above and does not include any scheduled additions or variations/amendments/new issues to the certificate(s), made after the above date.
- The equipment does not need to be re-tested when used on the conditions and with such restrictions as prescribed by Sira and in this approval.
- The Sira certification must remain valid.
- The bearing of the requirements in the ARP 0108 (or regulations) and SANS 10108 on the certification of the equipment must remain unchanged.
- The Ex quality assurance notification for the equipment must remain valid.



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TECHNICAL SPECIALIST

Mining And Surface Certification

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MASC takes no responsibility for any non-conformances, exclusions or any results / assessments not in compliance with the standards. By marking the equipment in accordance with the documentation / standard, the manufacturer attests on his own responsibility that the equipment has been constructed in accordance with the applicable requirements of the relevant standards and that the routine verifications and routine tests have been successfully completed and the product complies with the documentation and standard(s).

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