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 M/11-376X**
Equipment:	TX6363 Infra Red Gas Sensor / Transmitter
Serial No:	(see "Conditions of Certification")
Applicant:	Trolex Limited.
Address:	Hazel Grove Stockport Cheshire SK7 5DY United Kingdom
Manufacturer:	Trolex Limited.
Address:	Hazel Grove Stockport Cheshire SK7 5DY United Kingdom

DESCRIPTION:

The TX6363 Infra Red Gas Sensor / Transmitter takes a signal from a component-certified gas sensing head that is mounted on the sensor board in the sensor enclosure, this signal is conditioned and an analogue signal is then transmitted to other monitoring equipment. The sensing head can detect both flammable and toxic gases. The signal requires compensation for pressure and temperature changes so a pressure sensor is fitted on the pressure sensor PCB and a temperature-measuring integrated circuit is located on the sensor head PCB.

The equipment comprises an output board connected to an optional display board plus a control board, which is connected to two sensor conditioning boards (pressure sensor and infra red sensor). The assembly is housed in a anti-static polycarbonate housing with a polycarbonate window. The sensor may be mounted on the main unit, or in a remote location connected by up to 10m of cable.

There are three versions of the equipment:

1. Group I, 5 to 15 Hz
2. Group I, 0.4 to 2 V
3. Group I, 4 to 20 mA

/. The TX6363…

This document may only be reproduced in full.
This certificate is not transferable and remains the property of the issuing body.
This document will not be supported by MASC for certification purposes outside the borders of South Africa.

The TX6363 has the following safety description at terminals 1 to 5:

	4-20mA			0.4-2V			5-15Hz		
	T1-T2 (signal) (Note 1)	T4-T3 (main circuit supply)	T5-T3 (lamp supply)	T1-T2 (signal) (Note 2)	T4-T3 (main circuit supply)	T5-T3 (lamp supply)	T1-T2 (signal) (Note 1)	T4-T3 (main circuit supply)	T5-T3 (lamp supply)
Ii	666mA	-	-	666mA	-	-	-	-	-
Pi	-	-	-	1.5W	-	-	1.5W	-	-
Ui	16.5V	16.5V	16.5V	16.5V	16.5V	16.5V	16.5V	16.5V	16.5V
Ci	1.2nF	1.2nF	1.2nF	1.2nF	1.2nF	1.2nF	0	0	0
Li	0	0	0	0	0	0	0	0	0

Note 1: **4-20mA Group I build only:** the power and signal terminals have been assessed as a single intrinsically safe circuit. However, if it is required to assess these as separate intrinsically safe circuits, then the signal circuit should be considered to have a resistance of 73Ω in series with its terminals.

Note 2: **0.4-2V Group I build only:** the power and signal terminals have been assessed as a single intrinsically safe circuit. However, if it is required to assess these as separate intrinsically safe circuits, then the signal circuit should be considered as a supply of 7.14V with a resistance of 218Ω in series with its terminals.

Variation 1 - This variation introduced the following changes:

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

Variation 2 - This variation introduced the following changes:

1. The addition of two Pull Up resistors (RM1 and RM2) to the Control PCB was endorsed.

Variation 3 - This variation introduced the following changes:

1. The introduction of the TX6363 Mk2 Infra Red Gas Sensor / Transmitter that incorporates the following modifications:

   - The Output Board has been redesigned and replaced the previous version.
   - A new LCD Display has been introduced to replace the previous version.
   - The use of an alternative pressure sensor on the head PCB.
   - AN alternative housing material with anti-static properties.
   - The use of Bedford opto-isolator Type OPI1264D approved under BAS 01ATEX1278U coded Ex ia IIC as an alternative to that approved under BAS Ex 89C2096U/2 coded EEx ia IIC.
   - The use of Littlefuse fuse 259 approved under Baseefa02ATEX0071U coded EEx ia as an alternative to that approved under BAS Ex 832303.

/. The new…

This document may only be reproduced in full.
This certificate is not transferable and remains the property of the issuing body.
This document will not be supported by MASC for certification purposes outside the borders of South Africa.

The new version conforms to the requirements of the specific EN 60079 series of standards detailed in section 9 and bears the marking shown below:

I M1
Ex ia I Ma (Ta = -20ºC to +60ºC)

The following safety description is applicable to this version:

Input parameters

	Group I 4-20mA			Group I 0.4-2V			Group I 5-15Hz		
	T1-T2 (Signal)	T4-T3 (main circuit supply)	T5-T3 (lamp supply)	T1-T2 (Signal)	T4-T3 (main circuit supply)	T5-T3 (lamp supply)	T1-T2 (Signal)	T4-T3 (main circuit supply)	T5-T3 (lamp supply)
Ui	16.5V	16.5V	16.5V	16.5V	16.5V	16.5V	16.5V	16.5V	16.5V
Pi	-	-	-	-	-	-	1.5W	-	-
Ci	0	1.1nF	1.1nF	0	1.1nF	1.1nF	0	1.1nF	1.1nF
Li	0	0	0	0	0	0	0	0	0

Output parameters

	Group I 4-20mA			Group I 0.4-2V			Group I 5-15Hz		
	T1-T2 (Signal)	T4-T3 (main circuit supply)	T5-T3 (lamp supply)	T1-T2 (Signal)	T4-T3 (main circuit supply)	T5-T3 (lamp supply)	T1-T2 (Signal)	T4-T3 (main circuit supply)	T5-T3 (lamp supply)
Uo	16.5V	7.14V	7.14V	16.5V	7.14V	7.14V	-	7.14V	7.14V
Io	540mA	15mA	15mA	29mA	15mA	15mA	-	15mA	15mA
Po	1.765W	24mW	24mW	120mW	24mW	24mW	-	24mW	24mW
Co	11.7µF	-	-	11µF	-	-	-	-	-
Lo	1.5mH	-	-	493mH	-	-	-	-	-

MARKING:

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

IA No: MASC M/11-376X

COMPLIANCE:

The unit as described above and in MASC letter **11-376 R4** is hereby certified "Explosion Protected" Ex ia I Ma (Ta = -20ºC to +60ºC) 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...

This document may only be reproduced in full.
This certificate is not transferable and remains the property of the issuing body.
This document will not be supported by MASC for certification purposes outside the borders of South Africa.

The evaluation was conducted according to the requirements of:

- **SANS (IEC) 60079-0: 2000 "Explosive atmospheres – Part 0: Equipment — General requirements"**
- **SANS (IEC) 60079-11: 1999 "Explosive atmospheres – Part 11: Equipment protection by intrinsic safety 'i'"**
- **EN50303: 2005 "Category M1"**

Location	Zone 0 & 1	Gas / coal dust: Underground.
Hazard Frequency	---	Continuous as could occur under normal operating conditions in hazardous area
Environment	Group I	Methane and coal dust
Limiting Temperature		450ºC (methane gas) / 150ºC (coal dust)
Ambient Temperature	-20ºC to +60ºC	

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.

SPECIAL CONDITIONS OF SAFE USE (X)

1. The user should note that internal components may exceed 150ºC under fault conditions and care should be taken to prevent the ingress of coal dust when opening the enclosure.

CONDITIONS OF CERTIFICATION:

1. This Certificate remains valid based on a three yearly review covered by an official MASC letter.
2. The apparatus must be additionally marked in a clear, legible, visible and indelible manner with the MASC marking details above.
3. 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.
4. 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.

/. 5. The Sira...

This document may only be reproduced in full.
This certificate is not transferable and remains the property of the issuing body.
This document will not be supported by MASC for certification purposes outside the borders of South Africa.

5. The Sira certification must remain valid.

6. The bearing of the requirements in the ARP 0108 (or regulations) and SANS 10108 on the certification of the equipment must remain unchanged.

7. All production units must be covered by a QAN, Mark Scheme or Batch Evaluation.

Approved on behalf of MASC

F du Toit
TECHNICAL SPECIALIST

Mining And Surface Certification

This document is issued based on Mining And Surface Certification's Standard Contract terms and conditions available on request.

While every endeavour is made to ensure that a test / assessment is representative and accurately performed, and that a report is accurate in the quoted results and conclusions drawn from the test / assessment, MASC or its members/employees shall in no way be liable for any error made in carrying out the test / assessment or for any erroneous statement, whether in fact or in opinion, contained in a report issued pursuant to a test / assessment.
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).

This document is only for use and application in South Africa. It is issued based on National interpretations and accepted practises.

This document may only be reproduced in full.
This certificate is not transferable and remains the property of the issuing body.
This document will not be supported by MASC for certification purposes outside the borders of South Africa.