



# Mining And Surface Certification CC

CC 2008/202081/23



Certificate Number: MASC M/11-360X  
Issued: 22 September 2014  
Expire: 22 September 2015  
Page: 1 of 4

## IA – CERTIFICATE (Revision 3 – Revised for Annual review)

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:

Equipment:

Serial No:

Applicant:

Address:

**MASC M/11-360X**

**STX3241 Toxic Gas Sensor**

(See Conditions of Certification)

Trox Limited.

10a Newby Road

Hazel Grove

Stockport

Cheshire

SK14 6NG

United Kingdom

Manufacturer:

Address:

Trox Limited.

10a Newby Road

Hazel Grove

Stockport

Cheshire

SK14 6NG

United Kingdom

### DESCRIPTION OF EQUIPMENT OR PROTECTIVE SYSTEM

The STX3241 Toxic Gas Sensor is designed to measure toxic gas concentration by means of an electrochemical type sensing cell and to electronically convert the measured value into an output signal that can be configured either as a 0.4 to 2.0V output signal or as a 4 to 20mA output signal.

The apparatus consists of an Output PCB and an LCD, both located in a plastic enclosure having an ingress protection rating of at least IP54. A window in the outer enclosure permits local viewing of the gas concentration displayed on the optional LCD. The electrochemical cell is located in the adjoining metallic enclosure.

External electrical connections are made inside the enclosure, via a cable gland entry, to screw type terminals mounted on the output PCB.

/ . Input...

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**IA CERTIFICATE NUMBER: MASC M/11-360**  
**STX3241 Toxic Gas Sensor**  
(Intrinsic Safety)  
(Revision 3)

Page 2 of 4

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**INPUT and OUTPUT PARAMETERS**

**Connector T1 w.r.t. T2  
(Power input)**

U<sub>i</sub> = 14.4V  
I<sub>i</sub> = 3.14A  
L<sub>i</sub> = 0  
C<sub>i</sub> = 0

**Connector T4 w.r.t. T3  
(0.4 to 2V output signal)**

U<sub>o</sub> = 8.34V    C<sub>o</sub> = 802μF  
I<sub>o</sub> = 14mA    L<sub>o</sub> = 1H  
P<sub>o</sub> = 30mW    U<sub>i</sub> = 14.4V  
C<sub>i</sub> = 0        C<sub>i</sub> = 0  
L<sub>i</sub> = 0        L<sub>i</sub> = 0

**Connector T4 w.r.t. T3  
(4-20mA output signal)**

U<sub>o</sub> = 14.4V    L<sub>o</sub> = 1mH  
I<sub>o</sub> = 696mA    C<sub>o</sub> = 17.9μF  
P<sub>o</sub> = 2.5W    U<sub>i</sub> = 14.4V

**Variation 1** – This variation introduced the following change:

- i. The amplifier and voltage reference circuitry was removed from the Output PCB and put onto a separate Cell Amplifier PCB that is mounted directly on the back of the gas cell.

**Variation 2** – This variation introduced the following change:

1. The recognition of an alternative head arrangement for the STX3241 Toxic gas sensor.
2. A change to the voltage rating of capacitors (C3 and C5) from 25V to 16V.
3. The recognition of minor drawing modifications, these amendments are administrative and do not affect the aspects of the product that are relevant to explosion safety.

**Variation 3** – This variation introduced the following change:

1. The recognition of an alternative enclosure material and a laser etched label.
2. The recognition of minor circuit modifications that allow an alternative '4-series' toxic sensor to be used.
3. The marking was amended to add the Equipment Protection Level (EPL) this change uses EN60079-0: 2009 for guidance.
4. EN60079-26 was previously referenced in error and has been removed.

**MARKING:**

The marking of the units are as follows:

**Trex Limited**  
**STX3241 Toxic Gas Sensor**



I M1  
Ex ia I Ma  
(T<sub>a</sub> = -20°C to +55°C)

**/.** Additional...

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**IA CERTIFICATE NUMBER: MASC M/11-360**  
**STX3241 Toxic Gas Sensor**  
(Intrinsic Safety)  
(Revision 3)

Page 3 of 4

**Additional MASC Marking:**

**Ex Rating:** Ex ia I (Ta = -20°C to +55°C)  
**IA No:** MASC M/11-360  
**Serial No:** (See Conditions of Certification)

**COMPLIANCE:**

The unit as described above and in MASC Letter **11-360** is hereby certified "Explosion Protected" Ex ia I (Ta = -20°C to +55°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:

SANS / IEC 60079: "Electrical apparatus for explosive gas atmospheres",

- **SANS/(IEC) 60079-0 : 2005 "General Requirements";**
- **SANS/(IEC) 60079-0 : 2009 (Used for guidance in respect of marking);**
- **SANS/(IEC) 60079-11 : 2007 "Equipment protection by intrinsic safety "i"**
- **ARP0108 (Edition 1.1) "Regulatory requirements for explosion protected apparatus".**

Location	Zone 0, 1 and 2	Mining
Hazard Frequency		Continuous as could occur under normal operating conditions
Environment	Group I	Methane / Coal Dust
Limiting Temperature		450°C (Methane gas) 150°C (Coal dust)
Ambient Temperature	-20°C to 55°C	

***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 USE ("X") (According to the SIRA Certificate):**

None

**/ . Conditions...**

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**IA CERTIFICATE NUMBER: MASC M/11-360**  
**STX3241 Toxic Gas Sensor**  
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Page 4 of 4

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**CONDITIONS OF CERTIFICATION:**

- This certificate remains valid based on the annual review indicated in 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.



**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.*

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