



1 **EU-TYPE EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU

3 Certificate Number: **Sira 06ATEX2036X** Issue: **4**

4 Equipment: **STX3261 Methane Sensor**

5 Applicant: **Trolex Ltd**

6 Address: Newby Road
Hazel Grove
Stockport
SK7 5DY
UK

7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 CSA Group Netherlands B.V., Notified Body Number 2813 in accordance with Articles 17 and 21 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential reports listed in Section 14.2.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

EN 50014:1997 (amendments A1 to A2) EN 50020:2002 EN 50303:2000

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to Specific Conditions of Use identified in the schedule to this certificate.

11 This EU-Type Examination Certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:



I M1

EEx ia I (T_{amb} = -20°C to +55°C)

Project Number 2985

Signed: 

Title: Director of Operations

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CSA Group Netherlands B.V.
Utrechtseweg 310,
6812 AR, Arnhem,
Netherlands



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13 DESCRIPTION OF EQUIPMENT

The Methane Sensor is designed to measure methane concentration by means of a pellistor type sensing head and to electronically convert the measured methane concentration into an output signal that can be configured either as a 0 V to 2.0 V output signal or as a 4 to 20 mA output signal.

The unit consists of a controller PCB, an output PCB containing an encapsulated DC to DC converter and an optional LCD, all 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 Methane concentration displayed on the optional LCD. A relay mounted on the controller PCB is programmed to disconnect the power to the catalytic sensor. The catalytic sensor is housed in a separate metallic enclosure that is externally attached to the main plastic enclosure. External electrical connections are made to screw type terminals mounted on the output PCB.

The STX3261 Methane Sensor has the following safety description:

| Connector pins 1 w.r.t. 2 (Power input) | Connector pins 4 w.r.t. 3 (0.4 to 2V signal output) | Connector pins 5 w.r.t. 3 (4-20mA signal output) |
|--|--|--|
| $U_i = 15.4 \text{ V}$ $I_i = 3.14 \text{ A}$ $L_i = 0$ $C_i = 0$ | $U_o = 6.51 \text{ V}$ $I_o = 31.2 \text{ mA}$ $P_o = 21.5 \text{ mW}$ $C_o = 1000 \mu\text{F}$ $C_i = 0$ $L_o = 0.5 \text{ H}$ $U_i = 15.4 \text{ V}$ | $U_o = 15.4 \text{ V}$ $I_o = 162.1 \text{ mA}$ $P_o = 62.5 \text{ mW}$ $C_o = 12.8 \mu\text{F}$ $C_i = 121\text{nF}/132.46 \mu\text{F} @ 6.51 \text{ V}$ $L_o = 17.7 \text{ mH}$ $U_i = 15.4 \text{ V}$ |

This certificate does not cover any accessories to the methane sensor or its incorporation into an intrinsically safe system.

Variation 1: This variation introduced the following changes:

- i. The name and address of the applicant was changed.
- ii. The input voltage (U_i) at connector T1 w.r.t T2 and T4 w.r.t. T3 is now 14.4 V (previously 15.4 V).
- iii. The input fuse F1 is now 0.125 mA (was 250 mA).
- iv. The 2 V Pellister power supply (DC to DC converter) is now part of the output printed circuit board (pcb) and is now un-encapsulated.
- v. The DC to DC converter has been re-designed. The clamped output voltage to the pellister has remained 3.47 V (maximum). The inductor value L1 in the modified DC to DC converter is 12 μH (previously 470 μH).
- vi. The 5 V power rail is now clamped by ZD1 & ZD2 to 7.14 V (previously D2, D3 & D4 clamped to 6.51 V).
- vii. The output board now has two build options. It is built to give either an output of 0.4 V - 2 V or 4 – 20 mA at terminal 4.
- viii. The circuit to the 4 – 20 mA output is now supplied from the 12 V rail ($14.4 \text{ V} = U_i$).
- ix. The relay, used to disconnect the power to the catalytic sensor, is no longer used.
- x. The output pcb is now made up using four layers.
- xi. Minor circuit modifications have also been made to the LCD board, these do not affect intrinsic safety assessment.



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xii. The recognition of the new safety parameters listed below, when incorporating the changes described in this variation:

| Connector pins T1 w.r.t. T2 (Power input) | Connector pins T4 w.r.t. T3 (0.4 - 2 V signal output) | Connector pins T4 w.r.t. T3 (4 - 20 mA signal output) |
|--|---|--|
| $U_i = 14.4 \text{ V}$ $I_i = 3.14 \text{ A}$ $L_i = 0$ $C_i = 0$ | $U_o = 7.14 \text{ V}$ $I_o = 12 \text{ mA}$ $P_o = 22 \text{ mW}$ $C_i = 0$ $L_i = 0$ $C_o = 1000 \mu\text{F}$ $L_o = 1 \text{ H}$ $U_i = 14.4 \text{ V}$ | $U_o = 14.4 \text{ V}$ $I_o = 276 \text{ mA}$ $P_o = 1 \text{ W}$ $C_i = 0$ $L_i = 0$ $C_o = 17.9 \mu\text{F}$ $L_o = 6.13 \text{ mH}$ $U_i = 14.4 \text{ V}$ |

Variation 1 - This variation introduced the following changes:

- i. The addition of interconnection details between the Head and the printed circuit board.
- ii. To permit the use of an alternative Head arrangement for the methane sensor.

14 **DESCRIPTIVE DOCUMENTS**

14.1 **Drawings**

Refer to Certificate Annexe.

14.2 **Associated Sira Reports and Certificate History**

| Issue | Date | Report no. | Comment |
|-------|-------------------|------------|--|
| 0 | 17 February 2006 | R52F13818A | The release of prime certificate. |
| 1 | 6 June 2007 | R59A16388A | This Issue covers the following changes: <ul style="list-style-type: none"> • All previously issued certification was rationalised into a single certificate, Issue 1. Issue 0 referenced above is only intended to reflect the history of the previous certification and has not been issued as a document in this format. • The introduction of Variation 1. |
| 2 | 4 September 2007 | R59A16388B | This issue recognised that report number R59A16388B replaced R59A16388A. |
| 3 | 7 April 2009 | R59A19227A | The introduction of Variation 2. |
| 4 | 31st October 2019 | 2985 | <ul style="list-style-type: none"> • Transfer of certificate Sira 06ATEX2036X from Sira Certification Service to CSA Group Netherlands B.V.. • EC Type-Examination Certificate in accordance with 94/9/EC updated to EU Type-Examination Certificate in accordance with Directive 2014/34/EU. <i>(In accordance with Article 41 of Directive 2014/34/EU, EC Type-Examination Certificates referring to 94/9/EC that were in existence prior to the date of application of 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. Variations to such EC Type-Examination Certificates may continue to bear the original certificate number issued prior to 20 April 2016.)</i> |



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- 15 **SPECIAL CONDITIONS FOR SAFE USE** (denoted by X after the certificate number)
- 15.1 The IP54 rating of the unit shall be maintained at all times.
- 16 **ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II** (EHSRs)
- The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in the reports listed in Section 14.2.

Certificate Annexe



Certificate Number: Sira 06ATEX2036X

Equipment: STX3261 Methane Sensor

Applicant: Trolex SA (Pty) Ltd

Issue 0

| Drawing No. | Sheets | Rev. | Date | Description |
|-------------|--------|------|-----------|---|
| J5007.01.01 | 1 of 1 | A | 23 Feb 05 | Circuit Diagram DC to DC converter |
| J5007_01_02 | 1 of 1 | A | 31 Mar 05 | Circuit Diagram Output PCB |
| J5007.06.02 | 1 of 1 | A | 23 Feb 05 | Circuit Diagram Controller PCB |
| J5007_01_04 | 1 of 1 | A | 18 Nov 05 | LCD PCB / LCD for controller |
| J5007_03_02 | 1 of 1 | A | 18 Nov 05 | Component and track layout – Output PCB |
| J5007_03_03 | 1 of 1 | A | 16 Nov 05 | Component and track layout – Controller PCB |
| J5007_11_01 | 1 of 1 | A | 23 Feb 05 | Component and track layout – SXT3261_PSU |
| J5007_11_02 | 1 of 1 | A | 16 Nov 05 | Label details |
| J5007.12.01 | 1 of 1 | A | 16 Nov 05 | Assembly drawing – Full assembly of unit |
| J5007.12.02 | 1 of 1 | A | 16 Nov 05 | Assembly drawing – Internal assembly |
| P5156.59 | 1 of 1 | D | 23 May 97 | Arrangement of Sensor Head |

Issue 1

| Drawing No. | Sheets | Rev. | Date | Description |
|-------------|--------|------|-----------|-----------------------------------|
| P5555.15 | 1 of 1 | A | 09 Mar 07 | Block Diagram |
| P5555.01 | 1 of 3 | A | 30 Apr 07 | Circuit Diagram Output PCB |
| P5555.01 | 2 of 3 | A | 30 Apr 07 | Circuit Diagram Output PCB |
| P5555.01 | 3 of 3 | A | 08 Mar 07 | Circuit Diagram Output PCB |
| P5555.03 | 1 of 1 | A | 30 Apr 07 | Output PCB |
| P5555.05 | 1 of 2 | A | 08 Mar 07 | Circuit Diagram Control & Display |
| P5555.05 | 2 of 2 | A | 08 Mar 07 | Parts List Control & Display |
| P5555.04 | 1 of 1 | A | 17 Jan 07 | PCB Control & Display |
| P5555-02 | 1 of 1 | A | 15 Mar 07 | General Arrangement |
| P5555-17 | 1 of 1 | A | 24 May 07 | Certification Label |

Issue 2

No new drawings were introduced.

Issue 3

| Drawing No. | Sheets | Rev. | Date (Sira Stamp) | Description |
|-------------|--------|------|----------------------|---------------------------------|
| P5555-02 | 1 of 2 | A | 30 Mar 09 | General Arrangement |
| P5555-02 | 2 of 2 | A | 30 Mar 09 | GA Alternative Head Arrangement |

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