



1 **EU-TYPE EXAMINATION CERTIFICATE**

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

3 Certificate Number: **Sira 09ATEX2285X** Issue: **4**

4 Equipment: **TX9165.01.i Sentro 8 Sensor Station**

5 Applicant: **Trolex Limited**

6 Address: Hazel Grove
Stockport
Cheshire 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 60079-0:2012

EN 60079-11:2007

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
Ex ia I Ma

Project Number 80018030

Signed: J A May

Title: Director of Operations

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13 DESCRIPTION OF EQUIPMENT

The Sentro 8 Sensor Station TX9165.01.i is designed to monitor up to eight sensors (rModules and eModules), these are component approved items that are fully integrated into the Sensor Station to give direct monitoring of the toxic and flammable gas concentrations, ambient air temperature, atmospheric pressure and humidity, alternatively, the monitoring channels may be connected to remote sensors to measure airflow, pressure, vibration, etc. The Sensor 8 can be programmed to control a number of output relays and give various audio and visual alarms.

The eModules and rModules are already component approved under the following certification:

| Sensor Module | Certificate Numbers |
|---|--------------------------------------|
| TX6350 eModule – Flammable Gas Sensor (Group I) | Sira 10ATEX2046U, IECEx SIR 10.0018U |
| TX6350 eModule – Toxic Gas Sensor (Group I) | Sira 08ATEX2097U, IECEx SIR 08.0036U |
| TX6350 eModule – Flammable Gas Sensor | Sira 08ATEX2225U, IECEx SIR08.0046U |
| TX6350 eModule – Infrared Gas Sensing eModule (Group I) | Sira 10ATEX2356U, IECEx SIR 10.0185U |
| TX9160 Series rModule | Sira 10ATEX2032U, IECEx SIR 10.0013U |
| TX9160 Climate Sensing eModule | Sira 11ATEX2271U, IECEx SIR 11.0139U |

The eModule sensor modules are not connected to any other external IS modules. The rModule sensor modules are designed to interface to remotely connected sensors, provide power and signal where necessary. The following versions of the rModule were assessed under Sira 10ATEX2032U, IECEx SIR 10.0013U:

- TX9160.01i.301 4-20mA
- TX9160.01i.303 0.4-2V
- TX9160.01i.321 4-20mA Differential
- TX9160.01i.323 0.4-2V Differential
- TX9160.01i.306 PT100
- TX9160.01i.501 Namur
- TX9160.01i.502 Switch

The Sentro 8 Sensor Station TX9165.01.i comprises a sub-assembly of several printed circuit boards (PCB) fitted behind a terminal guard, within an inner plastic enclosure. The sub-assembly is made from the Main PCB, Power PCB, Control PCB, Upper Interface PCB and Lower Interface PCB. An LCD display is mounted on the Control PCB. The inner enclosure is housed inside an external enclosure that is made from either plastic filled with stainless steel or polycarbonate ABS with antistatic properties, and has a polycarbonate window for the LCD display. The enclosure provides a degree of ingress protection to at least IP54. External circuit connections are made in the terminal chamber. The terminals are fitted with a plastic cover to protect the live parts. Access into the terminal chamber is through the eight gland entries at the bottom of the housing.

Input Parameters:

Power Terminals 14 & 15

When no TX9160 rModules are fitted:

$U_i = 14.4 \text{ V}$

$C_i = 0$

$L_i = 0$

Output Parameters:

Relay Terminals 1, 2 & 3; 4, 5 & 6; 7, 8 & 9; 10, 11 & 12

$U_o = 0$

RS485 Terminal 17 & 18

$U_o = 5.88 \text{ V}$

$I_o = 66 \text{ mA}$

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When a number of TX9160 rModule are fitted:

$U_i = 14.4 \text{ V}$

$C_i = 0.38 \mu\text{F}$ multiplied by the number of TX9160 rModules, plus total C_i of all external sensors connected to TX9160 rModules.

$L_i =$ Total L_i of all external sensors connected to rModules.

RS485 Terminal 17 & 18

$U_i = 6.88 \text{ V}$

$C_i = 0$

$L_i = 0$

Relay Terminals 1, 2 & 3; 4, 5 & 6; 7, 8 & 9; 10, 11 & 12

$U_i = 30 \text{ V}$

$P_o = 97 \text{ mW}$

$C_o = 1000 \mu\text{F}$

$L_o = 26 \text{ mH}$

When a TX9160 rModule is fitted, the external sensors connected to terminals 1m, 2m and 3m have the following parameters, dependant on the sensor type fitted

| Sensor Type | | rModule Terminals | Output Parameters | | | | |
|-----------------------------------|-----------------------------------|-------------------|--|-------|-------|--------|-------|
| | | | U_o | I_o | P_o | C_i | L_i |
| TX9160.01i.301 and TX9160.01i.303 | 0.4-2V /4-20 mA Input | 1m wrt 3m | $U_o = U_o$ of external power supply connected to base unit where maximum $U_o = 14.4\text{V}$ $I_o = I_o$ of external power supply connected to base unit. $P_o = P_o$ of external power supply connected to base unit. $C_i = C_i$ of external power supply connected to base unit. $L_i = L_i$ of external power supply connected to base unit. | | | | |
| | | 2m wrt 3m | 14.4 V | 5 mA | 17 mW | 0 | 0 |
| TX9160.01i.321 and TX9160.01i.323 | 0.4-2V/4-20 mA Differential Input | 1m | Not Connected | | | | |
| | | 2m to 3m | 14.4V | 5 mA | 17 mW | 0 | 0 |
| TX9160.01i.306 | PT100 Input | 1m wrt 3m | 14.4V | 28mA | 100mW | 120nF | 0 |
| | | 2m wrt 3m | 14.4V | 5 mA | 17 mW | 0 | 0 |
| TX9160.01i.501 and TX9160.01i.502 | Namur/ Monitored Input | 1m wrt 2m | 14.4V | 42mA | 151mW | 0.77uF | 0 |
| | | 3m not used | | | | | |

Variation 1 - This variation introduced the following changes:

- Addition of a pull down Resistor on Control PCB.
- Addition of Relay Diodes to Power Supply PCB
- Addition of further eModules/rModules
- Change to GA including enclosure material, conformal coating and connection facilities.
- The input and output parameters are amended, the table of approved Sensor Modules is added to the description and new Special Conditions/ Conditions of Manufacture and Certification are included and an 'X' is subsequently added to the certificate number.
- Following appropriate assessment to demonstrate compliance with the requirements of the latest EN 60079 series of standards, the documents previously listed in section 9 EN 60079-0:2006 was replaced by that currently listed.

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Variation 2 - This variation introduced the following changes:

- i. Power Supply PCB have been redesigned to replace switching converter circuits with linear regulator circuits.
- ii. Control PCB has been modified to remove power supply circuit from the Control PCB and moved to the Power Supply PCB and replaced with linear regulator circuit.

14 DESCRIPTIVE DOCUMENTS

14.1 Drawings

Refer to Certificate Annexe.

14.2 Associated Sira Reports and Certificate History

| Issue | Date | Report no. | Comment |
|-------|-----------------|------------|---|
| 0 | 26 March 2010 | R17261A/00 | The release of the prime certificate. |
| 1 | 28 July 2010 | R17261A/01 | This Issue covers the following changes: <ul style="list-style-type: none">• Report no. R17261A/01 replaced R17261A/00 to remove the special condition for safe use; consequently, the 'X' suffix was removed from the certificate number, and to introduce a new condition of certification.• Typographical errors were corrected. |
| 2 | 17 May 2013 | R26669A/00 | The introduction of Variation 1. |
| 3 | 31 October 2019 | 2116 | This Issue covers the following changes: <ul style="list-style-type: none">• Transfer of certificate Sira 09ATEX2285X 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> |
| 4 | 16 March 2020 | R80018030A | The introduction of Variation 2. |

15 SPECIFIC CONDITIONS OF USE (denoted by X after the certificate number)

- 15.1 Where an external sensor is used with either a type TX9160.01i.301 (4-20mA), TX9160.01i.303 (0.4-2V), TX9160.01i.321 (4-20mA Differential) or TX9160.01i.323 (0.4-2V Differential) rModule and it is powered from a separate intrinsically safe power supply, the following conditions shall be met:
- No connection shall be made to rModule terminal 1m (power).
 - The 0V of the external sensor power supply shall be connected to the 0V input of the equipment.
 - The Ui presented by an externally powered sensor to any rModule, terminals 2m or 3m, shall not exceed the 14.4 V.

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15.2 TX9160 Series rModule:

For the purpose of this certificate, a P+ F inductive sensor to PTB00 ATEX 2048X to Category II 1G Ex ia IIC T6 connected to terminals 1m and 2m of a TX9160.01i.501 Namur input module may be considered equivalent to Category I M1. The sensor shall be installed in such a manner as to meets the requirements of Group I e.g. the external; enclosure to meet IP54, impact protection etc.

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 09ATEX2285X
Equipment: TX9165.01.i Sentro 8 Sensor Station
Applicant: Trolex Limited

Issue 0 and 1

| Drawing | Sheets | Rev. | Date (Sira stamp) | Title |
|-----------|--------|------|-------------------|-------------------------------|
| P5550-02 | 1 of 1 | A | 08 Feb 10 | General Arrangement |
| P5536-17 | 1 of 1 | E | 08 Feb 10 | Screw/Washer Assembly |
| P5550.70 | 1 of 1 | A | 08 Feb 10 | Label |
| P5536-103 | 1 of 1 | A | 08 Feb 10 | Relay Certification Details |
| P5536-104 | 1 of 5 | A | 08 Feb 10 | Relay Encapsulation |
| P5550.64 | 1 of 1 | A | 08 Feb 10 | Block Diagram |
| P5550.61 | 1 of 2 | A | 08 Feb 10 | Circuit Main PCB |
| P5550.61 | 2 of 2 | A | 08 Feb 10 | Circuit Main PCB |
| P5550.62 | 1 of 1 | B | 08 Feb 10 | PCB Main |
| P5550.58 | 1 of 2 | A | 08 Feb 10 | Circuit Gp I Power Supply PCB |
| P5550.58 | 2 of 2 | A | 08 Feb 10 | Circuit Gp I Power Supply PCB |
| P5550.59 | 1 of 1 | B | 08 Feb 10 | PCB Power Supply |
| P5550.50 | 1 of 2 | A | 08 Feb 10 | Circuit Control PCB |
| P5550.50 | 2 of 2 | A | 08 Feb 10 | Circuit Control PCB |
| P5550.51 | 1 of 1 | C | 08 Feb 10 | PCB Control |
| P9000.165 | 1 of 1 | A | 08 Feb 10 | LCD Module |
| P5550.53 | 1 of 2 | A | 08 Feb 10 | Circuit Interface PCB |
| P5550.53 | 2 of 2 | A | 08 Feb 10 | Circuit Interface PCB |
| P5550.54 | 1 of 1 | C | 08 Feb 10 | PCB Lower Interface |
| P5550.55 | 1 of 1 | C | 08 Feb 10 | PCB Upper Interface |

Issue 2

| Drawing | Sheets | Rev. | Date (Sira stamp) | Title |
|----------|--------|------|-------------------|-------------------------------|
| P5550.58 | 1 of 2 | B | 23 Aug 11 | Circuit Gp I Power Supply PCB |
| P5550.58 | 2 of 2 | B | 23 Aug 11 | Circuit Gp I Power Supply PCB |
| P5550.59 | 1 of 1 | C | 02 Feb 12 | PCB Power Supply |
| P5550.50 | 1 of 2 | B | 02 Feb 12 | Circuit Control PCB |
| P5550.50 | 2 of 2 | B | 02 Feb 12 | Circuit Control PCB |
| P5550.70 | 1 of 1 | B | 19 Apr 12 | Label Details Group I |
| P5550-02 | 1 of 1 | B | 05 May 12 | General Arrangement |

Issue 3 – No new drawings were issued.

Issue 4

| Drawing | Sheets | Rev. | Date (Sira stamp) | Title |
|-------------------------|--------|------|-------------------|---|
| P5550.217.01.ATEX.IECEX | 1 to 2 | A | 13 Mar 20 | Sentro 8 Power Supply PCB Schematic & BOM |
| P5550.219.01.ATEX.IECEX | 1 to 5 | A | 05 Mar 20 | Sentro 8 Power Supply PCB Layout |
| P5550.220.01.ATEX.IECEX | 1 to 2 | A | 05 Mar 20 | Sentro 8 Control PCB Schematic & BOM |
| P5550.221.01.ATEX.IECEX | 1 to 6 | A | 05 Mar 20 | Sentro 8 Control PCB Layout |
| P5550.02.02.ATEX.IECEX | 1 of 1 | A | 05 Mar 20 | General Arrangement Drawing |
| P5550.70 | 1 of 1 | C | 12 Mar 20 | Label Details Group I |

* Note: Drawings P5550.58, P5550.59, P5550.50, P5550.51 & P5550.02 are now obsolete and replaced by P5550.217.01.ATEX.IECEX, P5550.219.01.ATEX.IECEX, P5550.220.01.ATEX.IECEX, P5550.221.01.ATEX.IECEX & P5550.02.02.ATEX.IECEX drawings.

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