1 **EC TYPE-EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

3 Certificate Number: **Sira 09ATEX2285X** Issue: **2**

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 Sira Certification Service, notified body number 0518 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, 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 special conditions for safe use specified in the schedule to this certificate.

11 This EC 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 26669

A C Smith
Certification Manager

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13 **DESCRIPTION OF EQUIPMENT**

The Sentro 8 Sensor Station TX9165.01i is designed to monitor up to eight sensors, 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 Sentro 8 Sensor Station TX9165.01i 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:
Ui = 14.4 V
Ci = 0
Li = 0

When a number of TX9160 rModule are fitted:
Ui = 14.4 V
Ci = 0.38 µF multiplied by the number of TX9160 rModules, plus total Ci of all external sensors connected to TX9160 rModules.
Li = Total Li of all external sensors connected to rModules.

RS485 Terminals 17 & 18
Ui = 6.88 V
Ci = 0
Li = 0

Relay Terminals 1, 2 & 3; 4, 5 & 6; 7, 8 & 9; 10, 11 & 12
Ui = 30 V

Output Parameters:

Relay Terminals 1, 2 & 3; 4, 5 & 6; 7, 8 & 9; 10, 11 & 12
Uo = 0

RS485 Terminal 17 & 18
Uo = 5.88 V
Io = 66 mA
Po = 97 mW
Co= 1000 µF
Lo = 26 mH

MODULE_A to H

Pin 1 wrt 2
Uo = 14.4 V
Io = Io of the supply connected at the Power Terminal 14

Pin 3 & 4	**Pin 5 wrt 2**	**Pin 6**
Uo = 6.51 V	Uo = 5.88 V	Uo = 5.88 V
Io = 460 mA	Io = 27 mA	Io = 27 mA
Po = 1.38 W	Po = 40 mW	Po = 40 mW
Co = 1000 µF	Co = 1000 µF	Co = 1000 µF
Lo = 2.06 mH	Lo/Ro = 565.5mH	Lo/Ro = 565.5 mH

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SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE **Sira 09ATEX2285X**
Issue 2

When a TX9160 rModule if 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**				
			Uo	**Io**	**Po**	**Ci**	**Li**
TX9160.01i.301 and TX9160.01i.303	0.4-2V /4-20 mA Input	1m wrt 3m	Uo = Uo of external power supply connected to base unit where maximum Uo = 14.4.V Io = Io of external power supply connected to base unit. Po = Po of external power supply connected to base unit. Ci = Ci of external power supply connected to base unit. Li = Li 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:

i. Addition of a pull down Resistor on Control PCB.
ii. Addition of Relay Diodes to Power Supply PCB
iii. Addition of further eModules/rModules
iv. Change to GA including enclosure material, conformal coating and connection facilities.
v. 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.
vi. 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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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: • 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.

15 SPECIAL CONDITIONS FOR SAFE 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.

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.

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17 **CONDITIONS OF CERTIFICATION**

17.1 The use of this certificate is subject to the Regulations Applicable to Holders of Sira Certificates.

17.2 Holders of EC type-examination certificates are required to comply with the production control requirements defined in Article 8 of directive 94/9/EC.

17.3 The printed circuit boards applied with conformal coating shall be inspected to ensure that no conductive parts protrude through the coating.

17.4 The cable glands shall be suitable to provide an ingress protection to at least IP54.

17.5 The products covered by this certificate incorporate previously certified devices, it is therefore the responsibility of the manufacturer to continually monitor the status of the certification associated with these devices, and the manufacturer shall inform Sira of any modifications of the devices that may impinge upon the explosion safety design of their products.

Sensor Module	Certificate Numbers	Markings
TX6350 eModule – Flammable Gas Sensor (Group I)	Sira 10ATEX2046U	I M1 Ex ia I Ma ($-20^{o}C \leq T_a \leq +40^{o}C$)
TX6350 eModule – Toxic Gas Sensor (Group I)	Sira 08ATEX2097U	
TX6350 eModule – Flammable Gas Sensor	Sira 08ATEX2225U	
TX6350 eModule – Infrared Gas Sensing eModule (Group I)	Sira 10ATEX2356U	
TX9160 Series rModule	Sira 10ATEX2032U	
TX9160 Climate Sensing eModule	Sira 11ATEX2271U	

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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

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