

# INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

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Certificate No.:	IECEX ITA 13.0023X		Issue No: 2	Certificate history:
Status:	Current		Page 1 of 4	Issue No. 2 (2010-03-21) Issue No. 1 (2015-07-07) Issue No. 0 (2014-01-30)
Date of Issue:	2016-03-21			10000 110. 0 (2014 01 00)
Applicant:	Trolex Limited 10 Newby Road Hazel Grove Stockport Cheshire SK7 5DY United Kingdom			
Electrical Apparatus:	TX9165.01.i Sentro 8 Sensor Stati rModules	on with TX6350 eModul	es and TX9160	
Optional accessory:				
Type of Protection:	Intrinsic Safety			
Marking:	Ex ia I Ma			
Approved for issue on behalf of the Certification Body:	e IECEx	Ajay Maira		
Position:		Certification Authority		
Signature: (for printed version)		Ajay	Maire	
Date:		2016-03-21		
1 This certificate and schedule ma	ay only be reproduced in full			

2. This certificate is not transferable and remains the property of the issuing body.

3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

TUV Rheinland Australia Pty. Ltd 1/30 Kennington Drive Tomago NSW 2322 Australia





Certificate No:	IECEx ITA 13.0023X	Issue No: 2
Date of Issue:	2016-03-21	Page 2 of 4
Manufacturer:	Trolex Limited 10 Newby Road Hazel Grove Stockport Cheshire SK7 5DY United Kingdom	

Additional Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

### STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2011 Edition:6.0	Explosive atmospheres - Part 0: General requirements
<b>IEC 60079-11 : 2011</b> Edition:6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

This Certificate does not indicate compliance with electrical safety and performance requirements other than those expressly included in the

Standards listed above.

## **TEST & ASSESSMENT REPORTS:**

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

### Test Report:

AU/ITA/ExTR13.0029/00 GB/SIR/ExTR08.0123/00 GB/SIR/ExTR10.0223/00 GB/SIR/ExTR11.0250/00

AU/ITA/ExTR15.0026/00 GB/SIR/ExTR10.0062/01 GB/SIR/ExTR10.0321/00 GB/SIR/ExTR12.0094/00

AU/ITA/ExTR16.0009/00 GB/SIR/ExTR10.0180/00 GB/SIR/ExTR11.0057/00

Quality Assessment Report:

GB/SIR/QAR07.0017/05



Certificate No:	IECEx ITA 13.0023X		Issue No: 2
Date of Issue:	2016-03-21		Page 3 of 4
		Schedule	

### EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The TX9165.01.i Sentro 8 Sensor Station is designed to monitor up to eight sensors, these 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 Sentro 8 can be programmed to control a number of output relays and give various audio and visual alarms.

The TX9165.01i Sentro 8 Sensor Station comprises a sub-assembly of several printed circuit boards (PCB), 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 polycarbonate/ABS with anti-static 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. Cable access into the terminal chamber is through the eight gland entries at the bottom of the housing.

Refer to annex for additional information, including Input and Output Parameters & Conditions.

#### CONDITIONS OF CERTIFICATION: YES as shown below:

Refer to annex for additional information, including Input and Output Parameters & Conditions.



Certificate No:

IECEx ITA 13.0023X

Date of Issue:

2016-03-21

Issue No: 2

Page 4 of 4

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Please refer to Annex

Annex:

IECEx ITA 13.0023X-02 (Certificate Annex) - FINAL.pdf



# Additional Information concerning the Trolex Limited TX9165.01.i Sentro 8 Sensor Station and various Modules pertaining to Issue 0 of this certificate.

The TX9165.01.i Sentro 8 Sensor Station is designed to monitor up to eight sensors that may be fitted 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 Sentro 8 can be programmed to control a number of output relays and give various audio and visual alarms.

The TX9165.01.i Sentro 8 Sensor Station comprises a sub-assembly of several printed circuit boards (PCB), 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 polycarbonate/ABS with anti-static 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. Cable access into the terminal chamber is through the eight gland entries at the bottom of the housing.

## Associated Sub assemblies TX6350 eModule – Flammable TX6350 eModule – Infrared TX6350 eModule – Toxic TX9160 eModule – Climate TX9160 rModule – 4..20mA TX9160 rModule – 0.4..2V TX9160 rModule – PT100 TX9160 rModule – Namur

## TX6350 eModule – Flammable

The TX6350 eModule - Flammable is designed to measure concentration of flammable gas by means of a pellistor type sensing head and to electronically convert the measured value into an output signal that can be monitored by monitoring equipment, into which the sensor is plugged. The Flammable Gas Sensor contains a sub-assembly comprising a Sensing Board, Baseboard and a Connector Board. The sub-assembly fits inside a plastic enclosure with one face of the Connector Board exposed to connect with an external circuit.

## TX6350 eModule – Infrared

The TX6350 - Infrared Gas Sensing eModule is designed to measure gas concentration by means of a Dynament Type MSHia \*\*\* or Type MSHia-P \*\*\* Gas Sensor (code Ex d+ia I Ma). The microcontroller inside the module communicates digitally with the Gas Sensor to obtain the current gas reading. This reading is provided as an output signal which is monitored by the TX9165.01.i Sentro 8 Sensor Station into which the module is plugged.

Page 1 of 9

IECEX ITA 13.0023X-02 (CERTIFICATE ANNEX) - FINAL.DOCX



2

**IECEx ITA 13.0023X** 

Annexe

The Infrared Gas Sensing eModule contains a sub-assembly comprising a CPU board (alternatively CPU OSC Board), baseboard and a connector board. The CPU board makes use of a pressure sensor which is used to monitor normal atmospheric pressure. The subassembly fits inside a plastic enclosure with one face of the connector board exposed to connect with an external circuit.

# TX6350 eModule - Toxic

The TX6350 Toxic Gas Sensor is designed to measure toxic gas concentration by means of an electrochemical cell and to electronically convert the measured value into an output signal that can be monitored by the sensor station into which the sensor is plugged.

The TX6350 Toxic Gas Sensor contains a sub-assembly comprising a CPU Board, Connector Board and either a Toxic Baseboard or an Oxygen Baseboard. The sub-assembly fits inside a plastic enclosure with one face of the Connector Board exposed to connect to external circuit.

# TX9160 eModule - Climate

The TX 9160 Climate Sensing Module is designed to measure temperature humidity and pressure by means of two sensors with digital interfaces. The Information from the sensors is processed and sent electronically to monitoring equipment which the climate sensor is plugged into.

The sensing module contains a sub-assembly comprising a sensor board, baseboard and connector board. The sub-assembly fits inside a plastic enclosure with one face of the connector board exposed to connect with an external circuit.

# TX9160 – Series rModule

The TX9160 Series rModules Sensors are designed to interface to remotely connected sensors, provide power and where necessary provide signal conditioning, power limitation and digital interface to the base unit.

The sensor contains a sub-assembly comprising a Signal Conditioning CPU board and one of three Signal Conditioning Baseboards i.e. 0.4-2V/4-20mA Input Module Baseboard

PT100 Input Module Baseboard

Single Namur/Monitoring Switch Baseboard

The sub-assembly fits inside a plastic enclosure.

The products covered by this certificate incorporate devices covered by reports reviewed by TUV Rheinland Australia Pty. Ltd. Any modifications of the devices shall require re-certification.

Existing Report Name	Existing Report	Device Name
Sentro 8 Sensor Station TX9165.01.i	GB/SIR/ExTR10.0062/01	TX9165.01.i Sentro 8 Sensor Station

IECEX ITA 13.0023X-02 (CERTIFICATE ANNEX) - FINAL.DOCX



2

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Annexe

Annexe for Certificate No.:

**IECEx ITA 13.0023X** 

Issue No.:

Existing Report Name	Existing Report	Device Name
TX6350 eModule – Flammable Gas Sensor (Group I)	GB/SIR/ExTR10.0180/00	TX6350 eModule – Flammable
TX9160 Series rModule Group I	GB/SIR/ExTR10.0223/00	TX9160 rModule – 420mA
		TX9160 rModule – 0.42V
		TX9160 rModule – PT100
		TX9160 rModule – Namur
TX6350 Toxic Gas Sensor	GB/SIR/ExTR10.0321/00	TX6350 eModule – Toxic
TX6350 Infrared Gas Sensing eModule (Group I)	GB/SIR/ExTR11.0057/00	TX6350 eModule – Infrared
TX9160 Climate Sensing eModule	GB/SIR/ExTR11.0250/00	TX9160 eModule – Climate
Sentro 8 Sensor Station TX9165.01.i	GB/SIR/ExTR12.0094/	TX9165.01.i Sentro 8 Sensor Station

# Conditions of safe use pertaining to Issue 0 of this Certificate.

- Any replacement cable glands shall be suitable for the application and shall provide an 1. ingress protection of at least IP54.
- 2. The following parameters shall be taken into account during connection into a system: TX9165.01.i Sentro 8 Sensor Station

Function	Terminals	Uo	lo	Ро	Со	Lo	Ui	Ci	Li
Incoming Power	14 & 15						14.4V	0	0
RS485	Terminal A - 17 wrt 15/16 (0V)	5.88 V	66mA	97mW	1000uF	26mH	6.88V	0	0
	Terminal B - 18 wrt 15/16 (0V)	5.88 V	66mA	97mW	1000uF	26mH	6.88V	0	0
Output Relays	1,2,3; 4,5,6; 7,8,9; 10,11,12	0V					30V	0	0
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# Annexe



2

Annexe for Certificate No.:

**IECEx ITA 13.0023X** 

Issue No.:

Function	Terminals	Uo	lo	Ро	Со	Lo	Ui	Ci	Li
Module connectors A to H	Pin1 wrt 2	14.4 V	lo of supply connect ed at the power terminal 14 & 15						
	Pin 3 & 4 wrt 2	6.51 V	460mA	1.383 W	1000uF	2.06mH			
	Pin 5 wrt 2	5.88 V	27mA	40mW	1000uF	Lo/Ro = 565.5mH			
	Pin 6 wrt 2	5.88 V	27mA	40mW	1000uF	Lo/Ro = 565.5mH			

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

Sensor Type		rModule Terminals	Parameters				
			Uo	lo	Ро	Ci	Li
TX9160.01i.301 and TX9160.01i.303	0.4-2V / 4-20 mA Input	1m wrt 3m	Uo = Uo of ex maximum Uo Io = Io of exte Po = Po of ex Ci = Ci of exte Li = Li of exte	ternal power = 14.4.V rnal power su ternal power s rnal power s frnal power su	supply connecter supply connecter supply connect upply connecter upply connecter 17mW	ted to base unition of the	I nit where t. nit. it. t.
TX9160 01i 321	0.4-2V/4-20	2111 WIL 3111 1m	Not Connecte	d Anne	1711100	0	0
and TX9160.01i.323	mA Differential Input	2m to 3m	14.4V	5mA	17mW	0	0
TX9160.01i.306	PT100 Input	1m wrt 3m	14.4V	28mA	100mW	120nF	0
		2m wrt 3m	14.4V	5mA	17mW	0	0
TX9160.01i.501	Namur/	1m wrt 2m	14.4V	42mA	151mW	0.77uF	0
and TX9160.01i.502	Monitored Input	3m not used					
Function: Incoming Power – Terminals 14&15 When a number of TX9160 rModule are fitted:			<b>Ui</b> = 14.4V	Ci = 0.38uF by the num TX9160 rM total Ci of a sensors con TX9160 rM	<sup>-</sup> multiplied ber of odule, plus Il external nnected to odules.	Li = Total L external se connected	i of all nsors to rModules.

- 3. 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).

IECEX ITA 13.0023X-02 (CERTIFICATE ANNEX) - FINAL.DOCX

Annexe

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Annexe for Certificate No.:

IECEx ITA 13.0023X

Issue No.:

2

- 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.

# Drawing list pertaining to Issue 0 of this Certificate:

# TX9165.01.i Sentro 8 Sensor Station

Title:	Drawing No.:	Rev.	Date:
		Level.	0010.05.00
General Arrangement	P5550.02	В	2012-05-08
Circuit Diagram Control PCB	P5550.50	В	2012-02-02
	Sheet 1 & 2		
PCB, Control	P5550.51	С	2008-10-20
Circuit Diagram Interface PCBs	P5550.53	A	2008-05-07
	Sheet 1 & 2		
PCB, Lower Interface	P5550.54	С	2009-11-12
PCB, Upper Interface	P5550.55	С	2009-11-12
Circuit Diagram Gpl Power Supply PCB	P5550.58	В	2011-08-23
	Sheet 1 & 2		
PCB, Power Supply	P5550.59	С	2012-02-02
Circuit Diagram Main PCB (Gpl)	P5550.61	А	2008-05-07
	Sheet 1 & 2		
PCB, Main	P5550.62	В	2008-10-20
Main Unit Block Diagram	P5550.64	А	2008-02-07
Label Details Group I – AUS	P5550.132	А	2013-11-19
Screw/Washer Assembly	P5536.17	E	2008-11-28
Relay Certification Details	P5536.103	А	2008-05-02
Relay Encapsulation Details	P5536.104	А	2010-01-18
Certified Circuit Diagram LCD Module	P9000.165	В	2013-07-10
S/A of Display	P5550-69-AUS	A	2010-03-03

# TX6350 eModule – Flammable

Title:	Drawing No.:	Rev. Level:	Date:
Circuit Diagram Sensoing Module – CPU Board	P5553.01 Sheet 1 & 2	A2	2007-04-24
PCB, Sensing Module CPU	P5553.02	В	2010-06-21
PCB, Connector Board	P5553.21	В	2010-06-14
Circuit Diagram Sensing Module 4 Series Flammable	P5553.40	С	2010-03-16
Baseboard	Sheet 1 & 2		
PCB, Base, Flammable, 4 Series	P5553.41	С	2010-06-14
4 Series Flammable Gas Sensor Block Diagram	P5553.64	А	2010-01-13
General Arrangement 4 Series Flammable Module	P5553-95	В	2010-06-23

IECEX ITA 13.0023X-02 (CERTIFICATE ANNEX) - FINAL.DOCX

Page 5 of 9



2

Annexe for Certificate No.:

IECEx ITA 13.0023X

Annexe

Issue No.:

Title:	Drawing No.:	Rev. Level:	Date:
Flammable Gas Sensor	P5476.12	В	2012-05-01
Certification Markings	P5553-168	Α	2013-11-21
Flammable Gas Sensor Certification Markings	P5476.12 P5553-168	B A	20 <sup>-</sup> 20 <sup>-</sup>

## TX6350 eModule - Infrared

Title:	Drawing No.:	Rev.	Date:
		Level:	
Circuit Diagram Infraded CPU Board	P5553.11	А	2010-11-02
	Sheet 1 & 2		
PCB, Infra Red CPU	P5553.12	А	2010-11-03
Circuit Diagram Infraded Baseboard	P5553.13	А	2010-10-26
	Sheet 1 & 2		
PCB, Infra Red Baseboard	P5553.14	А	2010-10-27
PCB, Connector Board	P5553.21	В	2010-06-14
General Arrangment Infrared Module	P5553-113	А	2010-10-27
Infrared Sensor Gas Sensor Block Diagram	P5553.116	А	2010-10-27
Circuit Diagram Infrared CPU OSC Board	P5553.118	А	2011-01-04
	Sheet 1 & 2		
PCB, Infra Red CPU OSC	P5553.119	А	2011-01-05
Certification Markings	P5553-168	А	2013-11-21

## TX6350 eModule – Toxic

Title:	Drawing No.:	Rev. Level:	Date:
Circuit Diagram Sensoing Module – CPU Board	P5553.01 Sheet 1 & 2	A2	2007-02-24
PCB, Sensing Module CPU	P5553.02	В	2010-06-21
Circuit Diagram Sensing Module – Toxic Baseboard	P5553.03 Sheet 1 & 2	В	2014-01-09
PCB, Toxic Baseboard	P5553.04	В	2010-06-21
Circuit Diagram Sensing Module – Oxygen Baseboard	P5553.05 Sheet 1 & 2	A2	2008-05-30
PCB, Base, O2	P5553.06	В	2010-06-21
PCB, Connector Board	P5553.21	В	2010-06-14
Electrochemical Gas Sensor Block Diagram	P5553.22	A1	2008-08-13
General Arrangement Toxic Module	P5553-24	С	2010-06-23
Certification Markings	P5553-168	А	2013-11-21

## TX9160 eModule – Climate

Title:	Drawing No.:	Rev.	Date:
		Level:	
PCB, Connector Board	PP5553.21	В	2010-06-14
General Arrangement Climate Sensing Module	P5553-32	А	2011-07-18
Circuit Diagram Climate Sensing Module Baseboard	P5553.33	В	2011-04-18
IECEX ITA 13.0023X-02 (CERTIFICATE ANNEX) - FINAL.	DOCX Page	e 6 of 9	



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Annexe

Annexe for Certificate No.:

**IECEx ITA 13.0023X** 

Issue No.:

Page 7 of 9

2

	Sheet 1 & 2		
PCB, Climate Sensing Module Baseboard	P5553.34	В	2011-08-31
Circuit Diagram Climate Sensing Module Sensor Board	P5553.35	В	2011-04-18
	Sheet 1 & 2		
PCB, Climate Sensing Module Sensor Board	P5553.36	В	2011-08-31
Climate Sensing Module Block Diagram	P5553.123	А	2011-05-12
Certification Markings	P5553-168	Α	2013-11-21

## TX9160 – Series rModule

Title:	Drawing No.:	Rev.	Date:
PCB, Connector Board	P5553.21	B	2010-06-14
General Arrangement Analogue / PT100	P5553-26	В	2010-07-29
PCB, 0.4-2V/4-20mA I/P Module Baseboard	P5553.27	D	2010-07-29
Circuit Diagram 0.4-2V/4-20mA Input Module Baseboard	P5553.28	С	2010-01-29
(Group I)	Sheet 1 & 2		
Circuit Diagram Signal Conditioning CPU Board (Group I)	P5553.29	В	2010-01-29
	Sheet 1 & 2		
PCB, Signal Conditioning CPU Board	P5553.30	В	2010-02-10
Circuit Diagram PT100 Input Module Baseboard (Group I)	P5553.42	E	2010-08-17
	Sheet 1& 2		
PCB,PT100 Baseboard	P5553.43	Е	2010-08-18
Circuit Diagram Single Namur/Monitored Switch	P5553.45	С	2010-01-29
Baseboard (Group I)	Sheet 1& 2		
PCB, Single Namur/Monitored Switch	P5553.46	D	2010-07-29
Signal Conditioning Module Block Diagram (Group I)	P5553.47	С	2010-02-02
Certification Markings	P5553-168	A	2013-11-13

# IECEx Certificate of Conformity Image: Conformity Image: Conformity Image: Conformity Annexe Annexe Annexe for Certificate No.: IECEx ITA 13.0023X

# Variations permitted by Issue 1 of this certificate:

This variation addresses the PCB and component changes to the TX6350 Toxic eModule Sensor covered in report AU/ITA/ExTR15.0026/00.

# Conditions of safe use pertaining to Issue 1 of this Certificate.

The conditions of safe use have not changed from Issue 0.

## Drawings pertaining to Issue 1 of this Certificate.

# Manufacturer's Controlled Documents

Title:	Drawing No.:	Rev. Level:	Date:
Electrochemical Gas	P5553.22.IECANZ1	A	2015-05-03
Sensor Block Diagram	Sheet 1 of 1		
General Arrangment	P5553.24.IECANZ1	А	2015-05-29
Electrochemical module	Sheet 1 of 1		
PCB TOXIC BASEBOARD	P5553.184.IECANZ1	А	2015-05-21
	Sheets 1 to 2		
PCB TOXIC BASEBOARD	P5553.185.IECANZ1	A	2015-05-21
	Sheets 1 to 5		

# IECEx Certificate of Conformity Image: Conformity Image: Conformity Image: Conformity Annexe Annexe Annexe for Certificate No.: IECEx ITA 13.0023X Issue No.: 2

# Variations permitted by Issue 2 of this certificate:

This variation addresses the PCB and component changes to the TX6350 Infrared Gas Sensing eModule covered in report AU/ITA/ExTR16.0009/00.

# Conditions of safe use pertaining to Issue 2 of this Certificate.

The conditions of safe use have not changed from Issue 0.

# Drawings pertaining to Issue 2 of this Certificate.

# Manufacturer's Controlled Documents

Title:	Drawing No.:	Rev. Level:	Date:
Circuit Diagram Infrared	P5553.187.IECANZ1	A	2015-08-11
Baseboard	Sheets 1 to 2		
PCB Infra Red Base Board	P5553.188.IECANZ1	A	2016-03-07
(PCB Layers)	Sheets 1 to 6		
General Arrangment	P5553-113.IECEx	A	2016-03-08
Infrared Module	Sheet 1 of 1		