



IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	IECEX ITA 13.0023X	Issue No: 2	<u>Certificate history:</u> Issue No. 2 (2016-03-21) Issue No. 1 (2015-07-07) Issue No. 0 (2014-01-30)
Status:	Current	Page 1 of 4	
Date of Issue:	2016-03-21		
Applicant:	Trox Limited 10 Newby Road Hazel Grove Stockport Cheshire SK7 5DY United Kingdom		
Electrical Apparatus:	TX9165.01.i Sentro 8 Sensor Station with TX6350 eModules and TX9160 rModules		
<i>Optional accessory:</i>			
Type of Protection:	Intrinsic Safety		
Marking:	Ex ia I Ma		

Approved for issue on behalf of the IECEx
Certification Body:

Ajay Maira

Position:

Certification Authority

Signature:
(for printed version)

Date:

2016-03-21

1. This certificate and schedule may 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](http://www.iecex.com).

Certificate issued by:

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





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Manufacturer: **Trox 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 Explosive atmospheres - Part 0: General requirements
Edition:6.0
IEC 60079-11 : 2011 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:6.0

*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	AU/ITA/ExTR15.0026/00	AU/ITA/ExTR16.0009/00
GB/SIR/ExTR08.0123/00	GB/SIR/ExTR10.0062/01	GB/SIR/ExTR10.0180/00
GB/SIR/ExTR10.0223/00	GB/SIR/ExTR10.0321/00	GB/SIR/ExTR11.0057/00
GB/SIR/ExTR11.0250/00	GB/SIR/ExTR12.0094/00	

Quality Assessment Report:

GB/SIR/QAR07.0017/05



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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.



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

Please refer to Annex

Annex:

[IECEX ITA 13.0023X-02 \(Certificate Annex\) - FINAL.pdf](#)

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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.

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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 sub-assembly 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



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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 – 4..20mA TX9160 rModule – 0.4..2V 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 ingress protection of at least IP54.
- The following parameters shall be taken into account during connection into a system:
TX9165.01.i Sentro 8 Sensor Station

Function	Terminals	Uo	Io	Po	Co	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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Function	Terminals	U _o	I _o	P _o	C _o	L _o	U _i	C _i	L _i
Module connectors A to H	Pin1 wrt 2	14.4 V	Io of supply connected 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				
			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.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	14.4V	5mA	17mW	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	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 and TX9160.01i.502	Namur/ Monitored Input	1m wrt 2m	14.4V	42mA	151mW	0.77uF	0
		3m not used					
Function: Incoming Power – Terminals 14&15 When a number of TX9160 rModule are fitted:			U _i = 14.4V	C _i = 0.38uF multiplied by the number of TX9160 rModule, plus total C _i of all external sensors connected to TX9160 rModules.		L _i = Total L _i of all external sensors connected to rModules.	

- 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).

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- 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. Level:	Date:
General Arrangement	P5550.02	B	2012-05-08
Circuit Diagram Control PCB	P5550.50 Sheet 1 & 2	B	2012-02-02
PCB, Control	P5550.51	C	2008-10-20
Circuit Diagram Interface PCBs	P5550.53 Sheet 1 & 2	A	2008-05-07
PCB, Lower Interface	P5550.54	C	2009-11-12
PCB, Upper Interface	P5550.55	C	2009-11-12
Circuit Diagram Gpl Power Supply PCB	P5550.58 Sheet 1 & 2	B	2011-08-23
PCB, Power Supply	P5550.59	C	2012-02-02
Circuit Diagram Main PCB (Gpl)	P5550.61 Sheet 1 & 2	A	2008-05-07
PCB, Main	P5550.62	B	2008-10-20
Main Unit Block Diagram	P5550.64	A	2008-02-07
Label Details Group I – AUS	P5550.132	A	2013-11-19
Screw/Washer Assembly	P5536.17	E	2008-11-28
Relay Certification Details	P5536.103	A	2008-05-02
Relay Encapsulation Details	P5536.104	A	2010-01-18
Certified Circuit Diagram LCD Module	P9000.165	B	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 Sensing Module – CPU Board	P5553.01 Sheet 1 & 2	A2	2007-04-24
PCB, Sensing Module CPU	P5553.02	B	2010-06-21
PCB, Connector Board	P5553.21	B	2010-06-14
Circuit Diagram Sensing Module 4 Series Flammable Baseboard	P5553.40 Sheet 1 & 2	C	2010-03-16
PCB, Base, Flammable, 4 Series	P5553.41	C	2010-06-14
4 Series Flammable Gas Sensor Block Diagram	P5553.64	A	2010-01-13
General Arrangement 4 Series Flammable Module	P5553-95	B	2010-06-23

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Title:	Drawing No.:	Rev. Level:	Date:
Flammable Gas Sensor	P5476.12	B	2012-05-01
Certification Markings	P5553-168	A	2013-11-21

TX6350 eModule – Infrared

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

TX6350 eModule – Toxic

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

TX9160 eModule – Climate

Title:	Drawing No.:	Rev. Level:	Date:
PCB, Connector Board	PP5553.21	B	2010-06-14
General Arrangement Climate Sensing Module	P5553-32	A	2011-07-18
Circuit Diagram Climate Sensing Module Baseboard	P5553.33	B	2011-04-18

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Annexe





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

TX9160 – Series rModule

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

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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 Sensor Block Diagram	P5553.22.IECANZ1 Sheet 1 of 1	A	2015-05-03
General Arrangement Electrochemical module	P5553.24.IECANZ1 Sheet 1 of 1	A	2015-05-29
PCB TOXIC BASEBOARD	P5553.184.IECANZ1 Sheets 1 to 2	A	2015-05-21
PCB TOXIC BASEBOARD	P5553.185.IECANZ1 Sheets 1 to 5	A	2015-05-21

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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 Baseboard	P5553.187.IECANZ1 Sheets 1 to 2	A	2015-08-11
PCB Infra Red Base Board (PCB Layers)	P5553.188.IECANZ1 Sheets 1 to 6	A	2016-03-07
General Arrangement Infrared Module	P5553-113.IECEX Sheet 1 of 1	A	2016-03-08