



# 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](http://www.iecex.com)

Certificate No.:	IECEX ITA 14.0006X	Issue No: 3	<u>Certificate history:</u> Issue No. 3 (2016-03-21) Issue No. 2 (2015-07-07) Issue No. 1 (2014-12-18) Issue No. 0 (2014-06-05)
Status:	<b>Current</b>	Page 1 of 4	
Date of Issue:	<b>2016-03-21</b>		
Applicant:	<b>Trox Limited</b> 10 Newby Road, Hazel Grove Stockport Cheshire SK7 5DY <b>United Kingdom</b>		
Electrical Apparatus:	<b>Sentro 1 Sensor/Transmitter TX6351.01i, TX6352.01i &amp; Sentro Trip Amp/Transmitter TX9081.01i</b>		
<i>Optional accessory:</i>			
Type of Protection:	<b>Intrinsically Safe</b>		
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





# IECEx Certificate of Conformity

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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:

<a href="#">AU/ITA/ExTR13.0029/00</a>	<a href="#">AU/ITA/ExTR14.0011/00</a>	<a href="#">AU/ITA/ExTR14.0041/00</a>
<a href="#">AU/ITA/ExTR15.0026/00</a>	<a href="#">AU/ITA/ExTR16.0009/00</a>	<a href="#">GB/SIR/ExTR10.0035/01</a>
<a href="#">GB/SIR/ExTR12.0032/01</a>	<a href="#">GB/SIR/ExTR13.0003/00</a>	<a href="#">GB/SIR/ExTR14.0116/00</a>

#### 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 Sentro 1 Sensor (or Trip Amp)/Transmitter monitors an input from a fully integrated eModule (or rModule). It provides a reading on an LCD display and an output signal based on the monitored input signal. The TX6351/TX6352 are fitted with an approved eModule to directly monitor toxic gas concentration, flammable gas concentration, ambient air temperature, or atmospheric pressure and humidity. The TX9081 is fitted with an approved rModule to monitor the input from an external sensor such as a sensor to measure airflow, pressure, vibration, etc.

- **TX6351** - 4 wire sensor/transmitter (2x power, 2x signal)
  - Output options: 4-20mA, 0.4-2V, RS485, Relay, 5-15Hz
  - Module options: any TX6350 eModule or TX9160 Climate eModule
- **TX6352** - 2 wire sensor/transmitter (loop powered)
  - Output options: 4-20mA
  - Module options: TX6350 Toxic gas eModule.
- **TX9081** - 4 wire Trip Amp/transmitter (2x power, 2x signal)
  - Output options: 4-20mA, 0.4-2V, RS485, Relay, 5-15Hz
  - Modules options: TX9160 rModule

Refer to the annexe for additional information.

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

Refer to the annex for additional information.



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

Please refer to the annex

**Annex:**

[IECEX ITA 14.0006X-03 \(Certificate Annex\) - FINAL.pdf](#)

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## Annexe



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**IECEX ITA 14.0006X**

**Issue No.:**

**3**

### Additional Information:

The unit comprises a Display PCB, Control PCB and an Output PCB, assembled on a plastic carcass, which in turn is encased in an outer polycarbonate ABS enclosure with antistatic properties with a polycarbonate window for the LCD display. The enclosure provides a degree of ingress protection to at least IP54. External circuit connections are made through the two gland entries at the bottom of the housing.

### The Sentro has the option of the following output PCB's that give rise to the following products:

Model	Output PCB
TX6351.01i.11 and TX9081.01i.11	0.4-2 V Option Comms/Analogue Output
TX6351.01i.12 and TX9081.01i.12	4-20 mA 4 Wire Option Comms/ Analogue Output
TX6351.01i.15 and TX9081.01i.15	RS485 Option Comms/ Analogue Output
TX6351.01i.14 and TX9081.01i.14	Dual Relay Option Relay PCB
TX6351.01i.13 and TX9081.01i.13	5-15 Hz Option Relay PCB
TX6352.01i.12	4-20 mA 2 Wire (Loop Powered)

As part of this certification, the following modules can be used with any of the output PCB's above; the exception to this is that the loop powered version is only compatible with a Toxic eModule due to power consumption constraints.

- TX6350 eModule – Flammable, assessed in IECEx ITA 13.0023X
- TX6350 eModule – Infrared, assessed in IECEx ITA 13.0023X
- TX6350 eModule – Toxic, assessed in IECEx ITA 13.0023X
- TX9160 eModule – Climate, assessed in IECEx ITA 13.0023X
- TX9160 rModule – 4..20mA, assessed in IECEx ITA 13.0023X
- TX9160 rModule – 0.4..2V, assessed in IECEx ITA 13.0023X
- TX9160 rModule – PT100, assessed in IECEx ITA 13.0023X
- TX9160 rModule – Namur, assessed in IECEx ITA 13.0023X

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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	AU/ITA/ExTR13.0029/00	TX9165.01.i
Sentro Sensor/Transmitter	GB/SIR/ExTR10.0035/01	TX635x.01i.xx
Sentro Sensor/Transmitter	GB/SIR/ExTR12.0032/01	TX635x.01i.xx and TX9081.01.xx
Variation to certificates Sira 09ATEX2352X and IECEx SIR 09.0147X	GB/SIR/ExTR13.0003/00	
(Variation to certificates Sira 09ATEX2352X and IECEx SIR 09.0147X)	GB/SIR/ExTR14.0116/00	

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

1. The following safety parameters are applicable to the Sentro 1 Sensors/Transmitters:

Model	Terminals	Input Parameters					Output Parameters				
		Ui	Ii	Ci	Li	Pi	Uo	Io	Po	Co	Lo *5
TX6351.01i.11 and TX9081.01i.11	5 wrt 6	14.4V	*1	*2	*3	-	-	-	-	-	-
	1 wrt (2 or 3)	-	-	-	-	-	14.4V	40mA	135mW	*4	292mH
TX6351.01i.12 and TX9081.01i.12	5 wrt 6	14.4V	*1	*2	*3	-	-	-	-	-	-
	1 wrt (2 or 3)	-	-	-	-	-	14.4V	477mA	1.72W	*4	2.1mH
TX6351.01i.15 and TX9081.01i.15	5 wrt 6	14.4V	*1	*2	*3	-	-	-	-	-	-
	1 wrt 2	6.88V	*1	0	0	-	5.88V	66mA	97mW	*4	26mH
	2 wrt 3										
TX6351.01i.14 and TX9081.01i.14	5 wrt 6	14.4V	*1	*2	*3	-	-	-	-	-	-
	1 wrt 2	30V	*1	0	0	-	0	0	0	0	0
	3 wrt 4	30V	*1	0	0	-	0	0	0	0	0
TX6351.01i.13 and TX9081.01i.13	5 wrt 6	14.4V	*1	*2	*3	-	-	-	-	-	-
	1 wrt 2	16.5V	-	0	0	2.5W	0	0	0	0	0
TX6352.01i.12	1 wrt 2	14.4V	*1	*2	*3	-	-	-	-	0	0

\*1 – Ii : Not critical.

\*2 – Ci : Ci = 0, unless a rModule is connected to the Sentro 1, then Ci=0.38uF plus the Ci of the external sensors connected to the rModule.

\*3 – Li : Total Li of all external sensors and equipment connected to the rModule.

\*4 – Co : 1uF, unless the conditions stated in 60079-11 2011, Clause 10.1.5.2 part b can be satisfied.

\*5 – Lo : Is calculated using the formula  $\frac{1}{2}Lo(Io*1.5)^2=525uJ$ .

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TÜVRheinland®

Precisely Right.



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2. 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:

1. No connection shall be made to rModule terminal 1m (power).
2. The 0V of the external sensor power supply shall be connected to the 0V input of the equipment.
3. The  $U_i$  presented by an externally powered sensor to the rModule shall not exceed 14.4V.



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### Drawings pertaining to Issue 0 of this Certificate.

#### Manufacturer's Documents

Title:	Drawing No.:	Sheets	Rev. Level:	Date:
General Arrangement	P5536-100	1	D	2014-01-27
Relay Certification Details	P5536-103	1	A	2008-05-02
Relay Encapsulation Details	P5536-104	5	A	2010-01-18
Circuit Diagram Master Analogue/Comms Output PCB (Alternative Build)	P5536.276	5	A	2014-04-11
PCB, Analogue/Comms Output (Alternative Build)	P5536.277	1	A	2014-04-11
Circuit Diagram Control PCB (Group I Build)	P5536.202	2	E	2014-03-20
PCB, Control	P5559.203	1	B	2009-10-14
Circuit Diagram Display PCB (Group I Build)	P5536.204	2	B	2009-10-07
PCB, Display	P5536.205	1	C	2012-05-01
PCB, Connector	P5559.212	1	B	2009-10-14
Circuit Diagram Master 5-15Hz/Relay Output PCB (Alternative Build)	P5536.278	4	A	2014-04-10
PCB, 5-15Hz/ Relay Output (Alternative Build)	P5536.279	1	A	2014-04-11
Sentro Block Diagram Group I Versions	P5536.224	1	C	2011-10-19
Circuit Diagram 4-20mA Loop Powered Output PCB (Group I Build)	P5536.225	2	D	2014-01-24
PCB, Loop Powered 4-20mA / 2-Wire	P5559.226	1	C	2011-05-10
Label Details Group I (AUS)	P5536.251	1	A	2014-02-27

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### Variations permitted by Issue 1 of this certificate:

The purpose of this issue is to add another sensor module to the existing range of sensors that may be fitted to the Sentro 1 Transmitter Stations.

When a Humidity Sensor Module is mounted to a Sentro 1 base unit, the combination is given the name TX6356 Humidity Sensor/Transmitter.

The Humidity Sensor Module comprises of two components; the Humidity rModule and the Humidity Sensor Head. These are joined with an interconnecting adapter cable.

The Humidity rModule plugs into the main module receptacle housing inside the Sentro 1 Base Unit, whereas the Humidity Sensor Head is external to the Sentro 1 Base station and mounted in a M20 gland entry of the Sentro 1 Base Unit.

A signal from a digital humidity sensor mounted on the sensor board is conditioned and an analogue signal is then transmitted to other monitoring equipment.

### **The Sentro has the option of the following output PCB's that give rise to the following products:**

<b>Model</b>	<b>Output PCB</b>
TX6356.06.01	4-20 mA 4 Wire Option Comms/ Analogue Output
TX6356.06.02	0.4-2 V Option Comms/Analogue Output
TX6356.06.03	5-15 Hz Option Relay PCB
TX6356.06.04	RS485 Option Comms/ Analogue Output
TX6356.06.05	Dual Relay Normally closed
TX6356.06.06	Dual Relay Normally open

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

The following safety parameters are applicable to the Sentro 1 TX6356 Humidity Sensor/Transmitter:

Model	Field Screw Terminals	Input Parameters					Output Parameters				
		Ui	Ii	Ci	Li	Pi	Uo	Io	Po	Co	Lo *2
TX6356.06.01 (4..20mA)	5 wrt 6	14.4V	*1	0	0	-	-	-	-	-	-
	1 wrt (2 or 3)	-	-	-	-	-	14.4V	477mA	1.72W	*3	2.1mH
TX6356.06.02 (0.4..2V)	5 wrt 6	14.4V	*1	0	0	-	-	-	-	-	-
	1 wrt (2 or 3)	-	-	-	-	-	14.4V	40mA	135mW	*3	292mH
TX6356.06.03 (5-15Hz)	5 wrt 6	14.4V	*1	0	0	-	-	-	-	-	-
	1 wrt 2	16.5V	-	0	0	2.5W	0	0	0	0	0
TX6356.06.04 (RS485)	5 wrt 6	14.4V	*1	0	0	-	-	-	-	-	-
	1 wrt 2	6.88V	*1	0	0	-	5.88V	66mA	97mW	*3	26mH
	2 wrt 3										
TX6356.06.05 (Dual Relay Normally closed)	5 wrt 6	14.4V	*1	0	0	-	-	-	-	-	-
	1 wrt 2	30V	*1	0	0	-	0	0	0	0	0
	3 wrt 4	30V	*1	0	0	-	0	0	0	0	0
TX6356.06.06 (Dual Relay Normally open)	5 wrt 6	14.4V	*1	0	0	-	-	-	-	-	-
	1 wrt 2	30V	*1	0	0	-	0	0	0	0	0
	3 wrt 4	30V	*1	0	0	-	0	0	0	0	0

\*1 – Ii : Not critical.

\*2 – Lo : Is calculated using the formula  $\frac{1}{2}Lo(Io*1.5)^2=525uJ$ .

\*3 – Co : 1uF, unless the conditions stated in 60079-11 2011, Clause 10.1.5.2 part b can be satisfied.

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### Drawings pertaining to Issue 1 of this Certificate.

#### Manufacturer's Documents

<b>Title:</b>	<b>Drawing No.:</b>	<b>Sheets</b>	<b>Rev. Level:</b>	<b>Date:</b>
PCB, Connector Board	P5553.21	1	B	2010-06-14
Circuit Diagram Signal Conditioning CPU Board (Group I)	P5553.29	2	C	2014-12-16
PCB, Signal Conditioning CPU Board	P5553.30	1	B	2010-02-10
Circuit Diagram 0.4-2V Humidity Input Module Base PCB (Group I)	P5553.174	2	A	2014-04-24
PCB, Humidity I/P Module Baseboard	P5553.175	1	A	2014-04-24
0.4-2V Humidity Input rModule Block Diagram	P5553.176	1	A	2014-04-24
General Arrangement	P5553-177	1	B	2014-12-02
Certified Circuit Diagram Humidity Sensor Module	P5597.01	2	B	2014-02-06
rModule Interconnections Humidity Sensor Head	P5597.02	1	A	2014-07-30
PCB, Humidity Sensor Module	P5597.03	1	B	2014-04-09
Certification Markings	P5597.20	1	A	2014-12-03

#### Variations permitted by Issue 2 of this certificate:

This variation covers the change to the TX6350 Toxic eModule Sensor covered in IECEx ITA 13.0023X-01 and assessed in AU/ITA/ExTR15.0026/00.

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

The conditions of safe use have not changed from Issue 1.

#### **Drawings pertaining to Issue 2 of this Certificate.**

Nil.

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**Variations permitted by Issue 3 of this certificate:**

This variation covers the change to the TX6350 Infrared Gas Sensing eModule covered in IECEx ITA 13.0023X-02 and assessed in AU/ITA/ExTR16.0009/00.

**Conditions of safe use pertaining to Issue 3 of this Certificate.**

The conditions of safe use have not changed from Issue 1.

**Drawings pertaining to Issue 3 of this Certificate.**

Nil