




Mining And Surface Certification (Pty) Ltd

2015/021934/07

THIS CERTIFICATE IS ISSUED AS AN I.A. CERTIFICATE IN TERMS OF THE MINE HEALTH AND SAFETY ACT, ACT NO 29 OF 1996 (AND REGULATIONS), THE OCCUPATIONAL HEALTH AND SAFETY ACT (ACT 85 OF 1993) AND REGULATION 17 OF THE ELECTRICAL MACHINERY REGULATIONS

IA CERTIFICATE	MASC M/21-8496 X	Issue	1
Issue Date	11 November 2022	Expiry Date	27 August 2025
** Based on Certificate No	IECEX CML 20.0158X	Issue / Variations / Amendment	1
Requested by	Trolex Ltd Newby Rd, Hazel Grove, Stockport, Cheshire, SK7 5DY United Kingdom		
Manufacturer	Trolex Ltd Newby Rd, Hazel Grove, Stockport, Cheshire, SK7 5DY United Kingdom		
Description	The Sentro 1 Sensor/Transmitters TX635x.01i.xx.35(.xx) and TX9081.01i.xx.35(.xx) monitor an input from sensor modules. The sensor module is fully integrated into the base unit to give direct monitoring of oxygen, toxic or flammable gas concentrations (versions with eModules), or alternatively the monitoring channel may be connected to a remote sensor to measure airflow, pressure, vibration, etc (versions with rModules). See Annex of Base Certificate for full description.		
Equipment	Sentro 1 Sensor/Transmitters	Type	TX635x.01i.xx.35(.xx) and TX9081.01i.xx.35(.xx)
MARKING: Original marking as per certificate ** remains applicable. IA number must be added.	Type: Sentro 1 Sensor/Transmitters TX635x.01i.xx.35(.xx) and TX9081.01i.xx.35(.xx) Ex Marking: Ex ia I Ma Ta = -20°C to +40°C IA Number: MASC M/21-8496 X (To be additionally marked on equipment) Warnings: See Base Certificate ** (original marking must be applied)		
Quality Assurance report (QAR) / Notification (QAN):	GB/SIR/QAR07.0017/12		
Quality Assurance report (QAR) / Notification (QAN) Expiry date:	27 August 2025		
Compliance: The equipment as described above has been allocated the rating <u>Explosion Protected 'as above'</u> utilizing the SANS/IEC Standards: • SANS (IEC) 60079-0: 2019 Equipment - General requirements • SANS (IEC) 60079-11: 2012 Equipment protection by intrinsic safety "I" <i>Note: This certificate covers only the listed standards and does not imply compliance to any other standard, related or inferred. It is up to the manufacturer to ensure that the product complies to all relevant standards for the application.</i>			
Special conditions of safe use "X": • Refer to Annex A below for more details.			
Conditions of manufacture: • Refer to Annex A below for more details.			
 C. WELTHAGEN TECHNICAL SPECIALIST		N. VILJOEN TECHNICAL OFFICER	
This certificate covers all units sold as long as the QAR/QAN remains valid. According to the relevant requirements of the MHS Act and the OHS Act, production units of explosion protected equipment are required to comply with third party quality assurance (an approved mark scheme or batch testing by an accredited test laboratory).			

Apparatus in hazardous locations is subject to the following provisions as applicable, which shall be adhered to:
 SANS 10086 requirements;
 Any conditions mentioned in the above certificate;
 Any relevant requirements of the MHS Act;
 Any restrictions and conditions enforced by the chief inspector of mines, principal inspector (Group I equipment) or chief inspector of factories (Group II equipment).

This certificate may only be reproduced in full
 The certificate is not transferable and remains the property of the issuing body.

IA CERTIFICATE: MASC M/21-8496 X
Equipment: Sentro 1 Sensor/Transmitters
(Expiry date: 27 August 2025)

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ANNEX A

This document is based on and must be read in conjunction with certificate IECEx CML 20.0158X.	
Description (According to Base Certificate) **	
"Refer to description in Base Certificate ** (and any applicable schedules/issues/variatioins)."	
Standard compliance	See Base Certificate **
Special conditions of safe use ("X")	<ul style="list-style-type: none">• Where an external sensor is used with either rModule type TX9160.01i.301.35 (4-20mA) or TX9160.01i.303.35 (0.4-2V) and it is powered from an external supply, the following shall apply<ul style="list-style-type: none">• No connection shall be made to the power terminal 1m• The 0V of the external sensor supply shall be connected to the 0V of the Sentro supply• rModule types TX9160.01i.306.35 (PT100), TX9160.01i.501.35 (NAMUR), and TX9160.01i.502.35 (switch) shall not be used with externally powered sensors.• The cable entries to the supply and output terminals shall be made via cable glands which provide a minimum degree of protection of IP54.• Under certain extreme circumstances, unearthed metal parts of the enclosure may store an ignition capable level of electrostatic charge. The equipment shall either be earthed via the integral earthing terminal or the user/installer shall implement precautions to prevent the build-up of electrostatic charge. When not earthed, the capacitance of the metallic label to earth is >10pF
Conditions of manufacture	<ul style="list-style-type: none">• Where the product incorporates certified parts or safety critical components, the manufacturer shall ensure that any changes to those parts or components do not affect the compliance of the certified product that is the subject of this certificate
Conditions of Certification	<ul style="list-style-type: none">• This IA Certificate covers all units sold from the date of this document to the expiry date of this certificate.• As per ARP 0108 a maximum three yearly review is required on this IA Certificate (expiry is determined as per the QAR/QAN/QMS expiry date).• The apparatus must be additionally marked with the MASC marking details above.• This approval only covers the equipment as certified above and does not include any scheduled additions or variations / amendments / new issues to the certificate(s), made after the above date.• The equipment does not need to be re-tested when used on the conditions and with such restrictions as prescribed by the certificate on which this IA Certificate is based and any other conditions in this IA Certificate.• The certification on which this IA Certificate is based must remain valid.• The extent of the requirements in the ARP 0108 (or regulations), SANS 10108 and any other applicable regulations on the certification of the equipment must remain unchanged.• The Ex-quality assurance notification/report for the equipment must remain valid.
Conclusion:	<ul style="list-style-type: none">• From the above and the selective examination of the documentation, nothing contrary to the requirements of the applicable standards was found, provided that the equipment / component is used as described in the above document / certificate and according to the MASC conditions below. A MASC IA certificate is issued based on the work done as per the Base Certificate **.• The routine tests for production units according to the Base Certificate ** must be complied with (if applicable).

This document is issued based on Mining And Surface Certification's Standard Contract terms and conditions available on request.

While every endeavour is made to ensure that a test / assessment / inspection is representative and accurately performed, and that a report / certificate is accurate in the quoted results and conclusions drawn from the test / assessment / inspection, MASC or its directors/employees shall in no way be liable for any error made in carrying out the test / assessment or for any erroneous statement, whether in fact or in opinion, contained in a report / certificate issued pursuant to a test / assessment / inspection.

MASC takes no responsibility for any non-conformances, exclusions or any results / assessments / inspections not in compliance with the standards. By marking the equipment in accordance with the documentation / standard, the manufacturer / applicant attests on his own responsibility that the equipment / installation has been designed and constructed in accordance with the applicable requirements of the relevant standards and documentation, that the routine verifications / routine tests have been correctly completed and the equipment / installation complies with the documentation and standard(s).

This document is only for use and application in South Africa. It is issued based on National interpretations and accepted practices.

This document may only be reproduced in full.
This certificate is not transferable and remains the property of the issuing body.
This document will not be supported by MASC for certification purposes outside the borders of South Africa.

Mining And Surface Certification (Pty) Ltd Reg No: 2015/021934/07
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IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

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

Certificate No.:	IECEx CML 20.0158X	Page 1 of 4	<u>Certificate history:</u>
Status:	Current	Issue No: 1	Issue 0 (2021-04-29)
Date of Issue:	2022-08-12		
Applicant:	Trolex Ltd Newby Rd Hazel Grove Stockport Cheshire, SK7 5DY United Kingdom		
Equipment:	Sentro 1 Sensor/Transmitters TX635x.01i.xx.35(.xx) and TX9081.01i.xx.35(.xx)		
Optional accessory:			
Type of Protection:	Intrinsic Safety Ex "i"		
Marking:	Ex ia I Ma Ta = -20°C to +40°C		

Approved for issue on behalf of the IECEx
Certification Body:

L A Brisk

Position:

Certification Officer

Signature:
(for printed version)

Date:
(for printed version)

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 www.iecex.com or use of this QR Code.



Certificate issued by:

Eurofins E&E CML Limited
Unit 1, Newport Business Park
New Port Road
Ellesmere Port, CH65 4LZ
United Kingdom





IECEx Certificate of Conformity

Certificate No.: **IECEx CML 20.0158X**

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Date of issue: 2022-08-12

Issue No: 1

Manufacturer: **Trolex Ltd**
Newby Rd
Hazel Grove
Stockport
Cheshire, SK7 5DY
United Kingdom

Manufacturing
locations:

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 equipment 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 60079-0:2017](#) Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

[IEC 60079-11:2011](#) Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:6.0

This Certificate **does not** indicate compliance with 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 Reports:

[GB/CML/ExTR20.0231/00](#)

[GB/CML/ExTR22.0187/00](#)

Quality Assessment Report:

[GB/SIR/QAR07.0017/11](#)



IECEx Certificate of Conformity

Certificate No.: **IECEx CML 20.0158X**

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Date of issue: 2022-08-12

Issue No: 1

EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

The Sentro 1 Sensor/Transmitters TX635x.01i.xx.35(.xx) and TX9081.01i.xx.35(.xx) monitor an input from sensor modules. The sensor module is fully integrated into the base unit to give direct monitoring of oxygen, toxic or flammable gas concentrations (versions with eModules), or alternatively the monitoring channel may be connected to a remote sensor to measure airflow, pressure, vibration, etc (versions with rModules).

See Annex for full description and conditions of manufacture.

SPECIFIC CONDITIONS OF USE: YES as shown below:

See Annex for Specific Conditions of Use.



IECEx Certificate of Conformity

Certificate No.: **IECEx CML 20.0158X**

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Date of issue: 2022-08-12

Issue No: 1

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

This issue introduces the following change:

1. Approval of an alternative DC-DC Converter

Annex:

[IECEx CML 20.0158X Annex Issue 1.pdf](#)

Annexe to: IECEx CML 20.0158X, Issue 1

Applicant: Trolex Ltd.

Apparatus: Sentro 1 Sensor/Transmitters
TX635x.01i.xx.35(.xx) and
TX9081.01i.xx.35(.xx)



Description

The Sentro 1 Sensor/Transmitters TX635x.01i.xx.35(.xx) and TX9081.01i.xx.35(.xx) monitor an input from sensor modules. The sensor module is fully integrated into the base unit to give direct monitoring of oxygen, toxic or flammable gas concentrations (versions with eModules), or alternatively the monitoring channel may be connected to a remote sensor to measure airflow, pressure, vibration, etc (versions with rModules).

The equipment may be fitted with various gas sensing modules (eModules) and various terminal modules (rModules) for remote connection of external sensors.

The unit comprises a Control PCB, Display PCB and an Output PCB housed in a non-metallic enclosure with polycarbonate LCD window which provides a degree of protection of at least IP54. External circuit connections are made through the two gland entries at the bottom of the housing, and via terminals on the front of the unit (rModules).

The Output PCB may be fitted in one of the following variants:

- Relay Output PCB
- Analogue/Comms Output PCB - 0.4V - 2V Output
- Analogue/Comms Output PCB - 4mA - 20mA Output
- Analogue/Comms Output PCB - RS485 Output
- 4-20mA Loop Powered Output PCB

The following table details the various build options of the base unit:

Base model no.	Output Type	Module type
TX6351.01i.11.35(.xx)	0.4V – 2V	eModule
TX6351.01i.12.35(.xx)	4mA – 20mA	
TX6351.01i.15.35(.xx)	RS485	
TX6351.01i.14.35(.xx)	Relays NC	
TX6351.01i.17.35(.xx)	Relays NO	
TX6352.01i.12.35(.xx)	4-20mA loop powered	eModule
TX9081.01i.11.35(.xx)	0.4V – 2V	rModule
TX9081.01i.12.35(.xx)	4mA – 20mA	
TX9081.01i.15.35(.xx)	RS485	
TX9081.01i.14.35(.xx)	Relays NC	
TX9081.01i.17.35(.xx)	Relays NO	

NOTE – only models with digits 35 after the output type option digits are covered by this certificate.

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The eModules and rModules may be any of the following types:

Type	Part no.	Description
eModule	TX6350.35(.XX...)	Infra red
	TX6350.35(.XX...)	Toxic gas and oxygen
	TX6350.35(.XX...)	Flammable gas
rModule	TX9160.01i.301.35(.XX..)	4-20mA input
	TX9160.01i.303.35(.XX..)	0.4V – 2V input
	TX9160.01i.306.35(.XX..)	PT100 input
	TX9160.01i.501.35(.XX..)	NAMUR input
	TX9160.01i.502.35(.XX..)	Switch input

NOTE – only models with digits 35 before the final option digits are covered by this certificate.

Intrinsic safety is achieved by limiting energy storage and discharge, and by connecting to the non-hazardous area via intrinsically safe interface devices.

The equipment has the following safety description:

Model No.	Power Input	Output type	Output
TX6351.01i.11.35(.xx) TX9081.01i.11.35(.xx)	Terminal 5 w.r.t. 6 U _i = 14.4V C _i = 0 L _i = 0	0.4V – 2V	Terminal 1 w.r.t. 2 or 3 U _i = 14.4V U _o = 14.4V I _o = 40mA P _o = 0.135W C _i = 0 L _i = 0
TX6351.01i.12.35(.xx) TX9081.01i.12.35(.xx)		4mA – 20mA	Terminal 1 w.r.t. 2 or 3 U _i = 14.4V U _o = 14.4V I _o = 0.477A P _o = 1.72W C _i = 0 L _i = 0

Model No.	Power Input	Output type	Output
TX6351.01i.15.35(.xx) TX9081.01i.15.35(.xx)		RS485	Terminal 1 w.r.t. 3 (RS485 A) Terminal 2 w.r.t. 3 (RS485 B) Parameters for each output: U _i = 6.88V U _o = 5.88V C _i = 0 I _o = 66mA L _i = 0 P _o = 97mW
TX6351.01i.14.35(.xx) TX9081.01i.14.35(.xx)		Relays NC	Terminal 1 w.r.t. 2 (Relay 1) Terminal 3 w.r.t. 4 (Relay 2) U _i = 30V U _o = 0 C _i = 0 I _o = 0 L _i = 0 P _o = 0
TX6351.01i.17.35(.xx) TX9081.01i.17.35(.xx)		Relays NO	Terminal 1 w.r.t. 2 (Relay 1) Terminal 3 w.r.t. 4 (Relay 2) U _i = 30V U _o = 0 C _i = 0 I _o = 0 L _i = 0 P _o = 0
TX6352.01i.12.35(.xx)	Terminal 1 w.r.t. 2 U _i = 14.4V C _i = 0 L _i = 0	Loop powered	N/A

rModules have the following output parameters:

Model No.	Output type	Output terminals
TX9160.01i.301.35(.XX..)	4-20mA input	Terminal 1m w.r.t 3m Output parameters same as external supply Terminal 2m w.r.t 3m $U_o = 14.4V$ $I_o = 3.5mA$ $P_o = 12mW$ $C_i = 0$ $L_i = 0$
TX9160.01i.303.35(.XX..)	0.4V – 2V input	Terminal 1m w.r.t 3m Output parameters same as external supply Terminal 2m w.r.t 3m $U_o = 14.4V$ $I_o = 3.5mA$ $P_o = 12mW$ $C_i = 0$ $L_i = 0$
TX9160.01i.306.35(.XX..)	PT100 input	Terminals 1m and 2m (combined) w.r.t. 3m $U_o = 14.4V$ $I_o = 55mA$ $P_o = 0.20W$ $C_i = 0$ $L_i = 0$
TX9160.01i.501.35(.XX..)	NAMUR input	Terminal 1m w.r.t. terminal 2m $U_o = 14.4V$ $I_o = 46mA$ $P_o = 0.16W$ $C_i = 7.08\mu F$ $L_i = 0$
TX9160.01i.502.35(.XX..)	Switch input	Terminal 1m w.r.t. terminal 2m $U_o = 14.4V$ $I_o = 46mA$ $P_o = 0.16W$ $C_i = 7.08\mu F$ $L_i = 0$

Conditions of Manufacture

The following conditions are required of the manufacturing process for compliance with the certification.

- i. Where the product incorporates certified parts or safety critical components, the manufacturer shall ensure that any changes to those parts or components do not affect the compliance of the certified product that is the subject of this certificate.

Specific Conditions of Use

The following conditions relate to safe installation and/or use of the equipment.

- i. Where an external sensor is used with either rModule type TX9160.01i.301.35 (4-20mA) or TX9160.01i.303.35 (0.4-2V) and it is powered from an external supply, the following shall apply
 - No connection shall be made to the power terminal 1m
 - The 0V of the external sensor supply shall be connected to the 0V of the Sentro supply
- ii. rModule types TX9160.01i.306.35 (PT100), TX9160.01i.501.35 (NAMUR), and TX9160.01i.502.35 (switch) shall not be used with externally powered sensors.
- iii. The cable entries to the supply and output terminals shall be made via cable glands which provide a minimum degree of protection of IP54.
- iv. Under certain extreme circumstances, unearthed metal parts of the enclosure may store an ignition-capable level of electrostatic charge. The equipment shall either be earthed via the integral earthing terminal or the user/installer shall implement precautions to prevent the build-up of electrostatic charge. When not earthed, the capacitance of the metallic label to earth is >10pF.

Components covered by Ex Certificates issued to older editions of Standards

Certificate number	Standards (incl Ed)	Assessment result
IECEX SIR 07.0050U	IEC 60079-0 Ed 6	Technical differences evaluated and found satisfactory. For detail see ExTR
IECEX SIR 05.0030U	IEC 60079-0 Ed 6	
IECEX SIR 12.0139U	IEC 60079-0 Ed 6	