



EU-TYPE EXAMINATION CERTIFICATE

Equipment intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU

Certificate Number: **Sira 00ATEX2001X** Issue: **4**

Equipment: **TX6141 and TX6143 Pressure Sensor/Transmitter**

Applicant: **Trolex Limited**

Address: Newby Road
Hazel Grove
Stockport ST7 5DY
UK

This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

CSA Group Netherlands B.V., Notified Body Number 2813 in accordance with Articles 17 and 21 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, 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.

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 50014:1997 including Amendments A1 to A2 EN 50020:1994 EN 50020:1994

If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to Specific Conditions of Use identified in the schedule to this certificate.

This EU-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.

The marking of the equipment shall include the following:



I M1

EEx ia I ($T_a = -20^{\circ}\text{C}$ to $+60^{\circ}\text{C}$) *or*



II 1G

EEx ia IIC T4 ($T_a = -20^{\circ}\text{C}$ to $+60^{\circ}\text{C}$)

Project Number 3882

Signed: 
Title: Director of Operations

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CSA Group Netherlands B.V.
Utrechtseweg 310,
6812 AR, Arnhem,
Netherlands



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13 DESCRIPTION OF EQUIPMENT

The Trolex TX614x-Series Pressure Sensors/Transmitters are designed to measure differential, gauge and absolute pressure in process pipeline, atmosphere and tank monitoring applications. The sensor element comprises a ceramic or stainless steel diaphragm in contact with strain gauge resistive elements in a Wheatstone Bridge configuration; in the case of the differential pressure sensor, there is a second diaphragm. Any deflection of the diaphragm due to changes in pressure difference across it will unbalance the bridge and result in a voltage signal proportional to the pressure difference. The bridge excitation is either voltage or current depending on the type of sensor. The signal voltage is converted to a digital value using an analog-to-digital converter and is read by the micro-controller. The micro-controller software calculates the true scaled pressure reading and performs other functions such as linearisation and temperature compensation as well as conversion of the displayed pressure reading in units other than bar.

The scaled pressure reading is displayed on an LCD module, which also allows users to re-calibrate the apparatus as well as change the default settings affecting operation. The scaled reading is also converted into a standard process signal such as 0.4 - 2 V, 5 - 15 Hz and 4 - 20 mA for use in monitoring and control processes.

The two types of TX614x-Series covered by the certificate are:

- 1 TX6141: gauge or absolute pressure
- 2 TX6143: differential pressure

The apparatus is housed in a polycarbonate enclosure with a polycarbonate window glued into a recess to allow viewing of an LCD.

Each of the two types of TX614x can be manufactured in one of five versions:

- A Group I: 4 to 20 mA version (4-wire)
- B Group I: 0.4 to 2 V version (4-wire)
- C Group I: 5 to 15 Hz version (4-wire)
- D Group I: 4 to 20 mA version (2-wire)
- E Group II: 4 to 20 mA version (2-wire)

The equipment has not been assessed as a 'safety device' as referenced in Directive 94/9/EC, Annex II, clause 1.5.



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The TX614x has the following safety descriptions:

Version	T3/T4 (supply)	T1/T2 (signal out) [See notes 1-3]
Group I: 4 - 20 mA version	$U_i = 16.5 \text{ V}$, $C_i = 4 \text{ nF}$ $L_i = 0$	$U_i = 16.5 \text{ V}$, $P_i = 1.72 \text{ W}$ $C_i = 15 \text{ nF}$, $L_i = 0$. $U_o = 16.5 \text{ V}$, $I_o = 220 \text{ mA}$ $P_o = 0.91 \text{ W}$, $C_o = 11.9 \text{ }\mu\text{F}$, $L_o = 2.6 \text{ mH}$.
Group I: 0.4 - 2 V version	$U_i = 16.5 \text{ V}$; $C_i = 4 \text{ nF}$ $L_i = 0$	$U_i = 16.5 \text{ V}$, $P_i = 1.72 \text{ W}$ $C_i = 15 \text{ nF}$, $L_i = 0$ $U_o = 16.5 \text{ V}$, $I_o = 41 \text{ mA}$ $P_o = 0.17 \text{ W}$, $C_o = 11.9 \text{ }\mu\text{F}$ $L_o = 2.6 \text{ mH}$
Group I: 5-15 Hz version	$U_i = 16.5 \text{ V}$ $C_i = 4 \text{ nF}$ $L_i = 0$	$U_i = 16.5 \text{ V}$ $P_i = 1.72 \text{ W}$ $C_i = 0$, $L_i = 0$, $U_o = 0$
T1 & T4 (supply/signal out) [T2 & T3 are not connected]		
Group I: 4-20 mA version (2-wire)	$U_i = 16.5 \text{ V}$ $C_i = 18.3 \text{ nF}$ $L_i = 0$	
Group II: 4 - 20 mA version (2-wire) – HART and non-HART	$U_i = 28 \text{ V}$ $I_i = 100 \text{ mA}$ $P_i = 0.7 \text{ W}$ $C_i = 18.3 \text{ nF}$ $L_i = 0$	

Note 1: In some applications, T1 and T2 are inputs, in which case these output parameters are not relevant.

Note 2: For Group I builds, the connections to terminals T1/T2 and T3/T4 shall be from the same power supply. The user should note that the power to terminals T1/T2 must be limited to 1.72 W via a supply with a minimum source resistance of 40 Ω . There is no specific power limitation to terminals T3/T4, so terminals T1/T2 and T3/T4 should be regarded as separate intrinsically safe circuits.

Note 3: The installer should refer to the parameters of the equipment connected to terminals T1/T2 and compare these to the parameters listed in the table. The more onerous set of parameters should be used.

Note 4: terminals 5-8 are not used

Variation 1 - This variation introduced the following changes:

- The use of pad printing as an alternative method of marking.



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Variation 2 - This variation introduced the following changes:

- The output PCB circuit was modified.
- The safety description was changed as detailed below:

Version	T3/T4 (supply)	T1/T2 (signal out) [See notes 1 & 3]		
Group I: (4-wire) 4 - 20 mA version	U _i = 16.5 V C _i = 4 nF L _i = 0 [See note 2]	U _i = 16.5 V C _i = 4 nF L _i = 0.	U _o = 16.5 V I _o = 223 mA P _o = 0.921 W	C _o = 7 µF L _o = 0.6 mH
Group I: 0.4 – 2 V version	U _i = 16.5 V C _i = 4 nF L _i = 0 [See note 2]	U _i = 16.5 V C _i = 4 nF L _i = 0	U _o = 16.5 V I _o = 41 mA P _o = 0.17 W	C _o = 7 µF L _o = 0.6 mH
Group I: 5-15 Hz version	U _i = 16.5 V C _i = 4 nF L _i = 0	U _i = 16.5 V C _i = 0 L _i = 0	U _o = 0	
	T1 & T4 (supply/signal out) [T2 & T3 are not connected]			
Group I: (2-wire) 4 - 20 mA version	U _i = 16.5 V	C _i = 8 nF	L _i = 0	
Group II: (2-wire) 4 – 20 mA version	U _i = 28 V P _i = 0.84 W	C _i = 8 nF I _i = 120 mA	R _{min} ≥ 233 Ω L _i = 0	

Note 1: The signal terminals T1/T2 may be connected to a powered or non-powered load

Note 2: For all builds, the connections to terminals T1/T2 and T3/T4 are assumed to be from the same power supply. The signal terminals of 4-wire builds may be supplied from a different power supply, in which case, for system assessment purposes, the supply terminals T3/T4 shall be regarded as a 16.5 V source with one countable fault via a series resistance as below:

Group I 4-20 mA 4-wire: 73.9 Ω

Group I 0.4-2 V: 404 Ω

Group I 5-15 Hz: No galvanic connection between the supply and signal terminals

Note 3: The installer should refer to the parameters of the equipment connected to terminals T1/T2 and compare these to the parameters listed in the table. The more onerous set of parameters should be used.

Note 4: Terminals 5-8 are not used in any build.

- The addition of a special condition for safe use and a condition of certification.

- The removal of the option of a die cast enclosure.

Variation 3 - This variation introduced the following changes:

- The use of 'Faradex' stainless steel filled nylon 6 as an alternative anti-static enclosure material.

14 DESCRIPTIVE DOCUMENTS

14.1 Drawings

Refer to Certificate Annexe.



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14.2 Associated Sira Reports and Certificate History

Issue	Date	Report no.	Comment
0	28 April 2000	R52A6575A	The release of the prime certificate.
1	14 June 2000	52V6965	The introduction of Variation 1.
2	18 December 2001	R52A8420A	The introduction of Variation 2.
3	24 March 2003	R52A9400A	The introduction of Variation 3.
4	31st October 2019	3882	<p>This Issue covers the following changes:</p> <ul style="list-style-type: none">• All previously issued certification was rationalised into a single certificate, Issue 4, Issues 0 to 3 referenced above are only intended to reflect the history of the previous certification and have not been issued as documents in this format.• EC Type-Examination Certificate in accordance with 94/9/EC updated to EU Type-Examination Certificate in accordance with Directive 2014/34/EU. <i>(In accordance with Article 41 of Directive 2014/34/EU, EC Type-Examination Certificates referring to 94/9/EC that were in existence prior to the date of application of 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. Variations to such EC Type-Examination Certificates may continue to bear the original certificate number issued prior to 20 April 2016.)</i>• The transfer of certificate Sira 00ATEX2001X from Sira Certification Service to CSA Group Netherlands B.V..

15 **SPECIFIC CONDITIONS OF USE** (denoted by X after the certificate number)

- 15.1 Some parts of the enclosure are non-conducting and may generate an ignition capable level of static charge under certain extreme conditions. The user should ensure that the equipment is not installed in a location where it may be subjected to external conditions (such as high-pressure steam) that might cause a build up of static charge on non-conducting surfaces. Additionally, cleaning of the equipment should only be done with a damp cloth.
- 15.2 The safety description of the TX614x Pressure Sensor/Transmitter has changed as a result of variation 2. Consequently, the products that incorporate these modifications may not be suitable as a direct replacement for those that are manufactured to the previous design, therefore, the user/installer shall ensure that the TX614x Pressure Sensor/Transmitter is compatible with the equipment to which it is intended to be connected.

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.

Certificate Annexe



Certificate Number: Sira 00ATEX2001X

Equipment: TX6141 and TX6143 Pressure Sensor/Transmitter

Applicant: Trolex Limited

Issue 0

Drawing	Sheets	Rev.	Date	Title
P5430.01	1 of 1	A	03 Nov 97	Control PCB Certified Circuit Diagram
P5430.04	1 of 1	A	22 Jan 98	Output PCB
P5436.01	1 of 1	B	10 Apr 00	Output PCB Certified Circuit Diagram
P5436.02	1 of 1	C	06 Apr 00	General Arrangement
P5436.08	1 of 1	A	17 Mar 98	Certified Block Diagram
P5436.16	1 of 1	A	21 Apr 98	Interface PCB – Gauge/Absolute Pressure Certified Circuit Diagram
P5436.17	1 of 1	A	21 Apr 98	Interface PCB – Differential Pressure Certified Circuit Diagram
P5436.19	1 of 1	A	17 Mar 98	Certified Block Diagram
P5436.21	1 of 1	A	21 Apr 98	Interface PCB – Differential Pressure Certified Circuit Diagram
P5436.22	1 of 1	A	17 Mar 98	Certified Block Diagram
P5436.60	1 of 1	A	06 Apr 00	Certification Labels
P9000.100	1 of 1	B	06 Apr 00	Alternative Housing Arrangement

Issue 1

Drawing	Sheets	Rev.	Date	Title
P9000.100	1 of 1	C	7 Jun 00	Alternative Housing Arrangement

Issue 2

Drawing	Sheets	Rev.	Date	Title
P5430.04	1 of 1	C	22 Oct 01	Output PCB
P5436.01	1 of 6	C	12 Nov 01	Output PCB Overall Circuit Diagram
P5436.01	2 of 6	C	12 Nov 01	Output PCB GpI 0.4 to 2V Output Version
P5436.01	3 of 6	C	12 Nov 01	Output PCB GpI 4 to 20mA Output (2 wire)
P5436.01	4 of 6	C	12 Nov 01	Output PCB GpI 4 to 20mA Output (4 wire)
P5436.01	5 of 6	C	12 Nov 01	Output PCB GpI 5 to 15Hz Output Version
P5436.01	6 of 6	C	12 Nov 01	Output PCB GpII 4 to 20mA Output (2 wire)
P5436.02	1 of 1	d	25 Jun 01	General Arrangement

Issue 3

Drawing	Sheets	Rev.	Date	Title
P5436.02	1 of 1	E	04 Feb 03	General arrangement

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