ALA5 2-Wire 4-20mA ATEX Load Cell Amplifier

ICA5ATEX Strain Gauge or Load Cell Analogue Amplifier Mounted Inside an In-Line Stainless Steel Enclosure (ILEATEX)

User Manual

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Chapter 1 The ALA5

The ALA5 is an ATEX certified (intrinsic safety) 2-wire 4-20mA amplifier providing a wide range of signal conditioning for Strain Gauges, Load Cells, Pressure and Torque Transducers.

Combining the ICA5ATEX miniature loadcell amplifier with the stainless steel ILEATEX enclosure produces a compact, robust and certified in-line amplifier suitable for use in zones 0, 1, and 2 in hazardous locations.

The ICA5ATEX is designed for a 1k bridge, however, 350R can be used at the expense of noise and drift performance.

Please note: the ICA5ATEX amplifier's output is uni-polar output i.e. zero strain input = 4mA and full range input = 20mA output.

Sensitivity adjustment, between 0.5 mV/V and 55 mV/V is achieved by a combination of the **SPAN** (gain) resistor R2 (see fig 4.1) and associated fine adjustment by potentiometer. Chapter 4 gives details of how to calculate a new value for R2 to suit loadcell outputs other than the factory set 2.5mV/V.

Similarly transducer **ZERO** can be compensated for in the module. This adjustment is to compensate for slight errors in the strain gauge and not to offset tare. The value of R1 (see fig 4.1) can be modified to increase the trim range of the zero point (see chapter 4).

Chapter 2: Installing the ALA5

Pre Installation

Carefully remove the ALA5 unit from its shipment box. Check that the unit is complete and undamaged.

The ALA5 can be installed in any industrial environment providing the following limits and ATEX conditions of use are met.

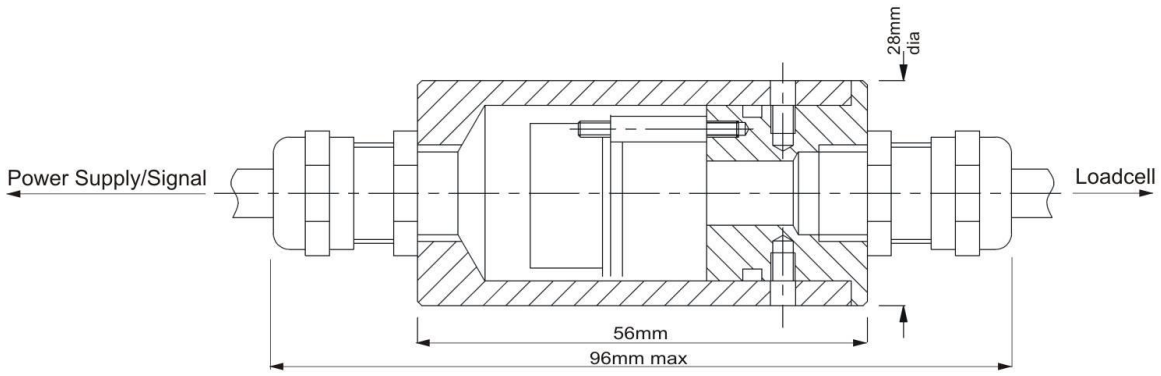
Please refer to Appendix A – 'Special conditions of safe use'

Operating Temperature	-40ºC to +85ºC
Humidity	95% non condensing
Storage temperature	-40ºC to +85ºC

Ex II 1 G Ex ia IIC T4
T_{amb} = -40˚C to +85˚C
CE_{2812} TRAC10ATEX11247X
Ui= 28V, Ii = 100mA, Pi = 0.7W
Co = 33nF, Lo = 3mH

For an explanation of the ATEX conditions of use see Appendix A

Figure 2.1 Dimensions



Connections:

The ALA5 is supplied pre-wired with 2-core screened cable for the supply/signal and 4-core screened cable for the loadcell connections.

If installing into a hazardous zone, the ALA5 must be connected via an approved ATEX Barrier with the following parameters:

Uo = 28V, Io = 100mA, Po = 0.7W, Barrier Impedance 300Ω.

These are maximum values, actual barrier parameters will vary. However, the barrier impedance is not permitted to change.

Please refer to Appendix A – 'Special conditions of safe use'

Two examples of suitable barriers are:
MTL7706+ (passive Zener diode type with active current limit) manufactured by MTL Instruments
KFD2-STC4-EX1/2 (3-way isolated type) manufactured by Pepperl and Fuchs

Standard cable:

IMPORTANT NOTE: The cables factory-fitted to the ALA5 (see table 1) limit the operating temperature range to -25°C to +70°C.

Table 1

Country	Supplier	Part No	Description
UK	Farnell	1218651	**Loadcell cable 1m:** Belden 8132 Twin twisted pair cable (28 AWG) 100% overall foil shield + 65% tinned copper braided outer shield O.D. 5.6mm Capacitance: core to core 33 pF/m & core to shield 61 pF/m Worst case capacitance: 224pF/m – see note 1 Temperature range: -30°C to +80°C
UK	Farnell	3855636 (per metre) 798-551 (100m reel)	**Output cable 5m:** Van Damme 268006C Single twisted pair cable (24 AWG) + 95% tinned copper braided shield O.D. 4.85mm Capacitance: core to core 100 pF/m & core to shield 165 pF/m Worst case capacitance: 197pF/m – see note 1 Temperature range: -25°C to +70°C

Note 1: The maximum capacitance, Cc, can be taken as the capacitance between all cores connected together and the screen (Annex C of the installations standard EN60079-14). A safety margin of +10% has been added.
The ground connection conductor should have sufficient cross-sectional area to ensure a low impedance path to attenuate RF interference.

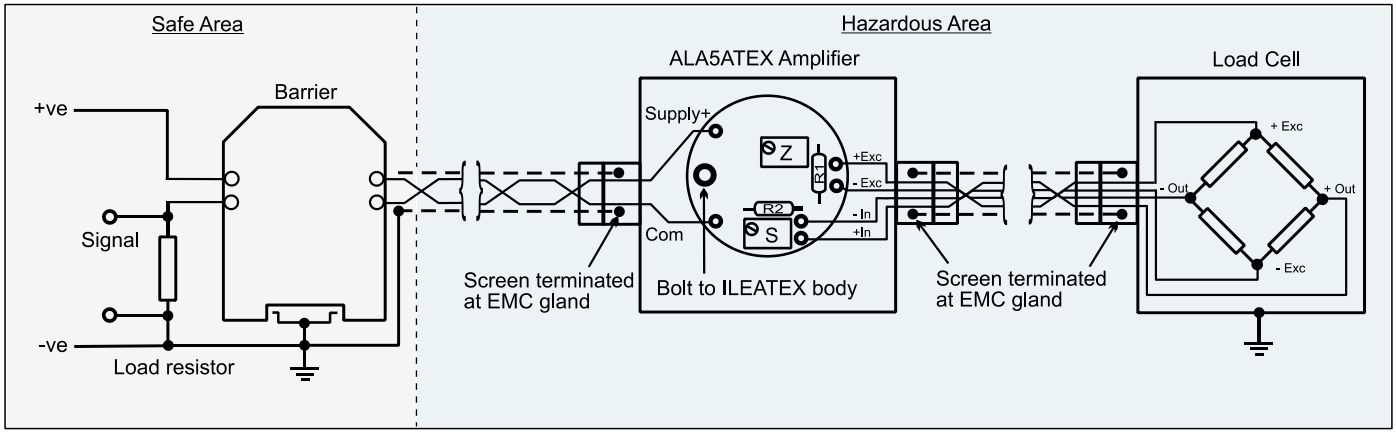
Cable colour code:

Power/signal	
Red	Supply +
Green	Com
Loadcell	
Orange/White	+Exc
White/Orange	-Exc
Blue/White	+In
White/Blue	-In

Alternative Cable types

The type of cable used should be suitable for use in the hazardous area with particular regard to the certified -40˚C to +85˚C temperature range of the ALA5.
The cable should comprise twin twisted pairs of cables – four-core for the loadcell and a single pair for the power/signal.
Each cable should have an overall braid to ensure a good EMC seal with the glands on the ALA5.

Figure 2.1 Connection Details for the ALA5



The barrier limits the amount of electrical energy that can be transferred into the hazardous area thereby preventing the ignition of a flammable atmosphere in the event of a fault condition occurring.

A simple passive barrier is shown above but this can be replaced by an isolated barrier to avoid ground loops that may affect measurement accuracy and stability. These devices provide three-way isolation between power, input and output.

The ALA5 is supplied with a 1m input cable and a 5m output cable. If the cables are too short for a particular installation, they can be replaced with longer lengths or joined provided that an ATEX approved junction box is used and the conditions set out below are satisfied. Excessively long leads, particularly the load cell cable may cause noise and stability problems.

IMPORTANT NOTE: In order to remain ATEX compliant, the total amount of capacitance that can be connected to the ALA5 enclosure (Co) must not exceed 33nF (0.033uF). This value must include the total cable capacitance and the Ci value of the barrier supplying the unit. If the installation includes any ATEX junction boxes their Ci values must also be included.

As an example, the maximum length for the output cable specified in table 1 will be:
(33nF – 224pF)/197pF = 166.4m (multiply the pF/m figure given in table 1 by the length in metres to obtain the total capacitance of each cable)
Please refer to Appendix A – 'Special conditions of safe use'

For special cable types e.g. high temperature, armoured etc. please contact Mantracourt Electronics.

Output Connections

The ICA5ATEX analogue output is 4 to 20mA. The power and signal are combined in a single pair cable, simplifying installation.

N.B. Neither connection to the output load is electrically common to the load cell.

The following formula gives the suitable range of shunt resistance for low supply voltage operation.

Output Shunt Resistance Formula

The shunt resistance must be less than: $((V_{supply} - 9) / 20mA) - R_{wiring}$

e.g. assuming 10 Ohms wiring resistance and 24V supply:

Max shunt resistance = ((24 - 9) / 0.02) –10 = 740 Ohms

Chapter 3: Calibration

In order to calibrate the ALA5 the cover of the enclosure must be removed as follows:

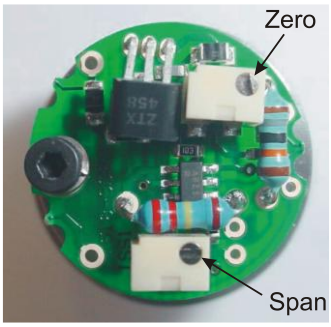
Mechanical tools required: 1.5mm hex key, 14mm AF spanner and flat-blade screwdriver, maximum width 1.5mm.

1. Remove the two grub screws using a 1.5mm hex key

2. Loosen the gland furthest away from the grub screw holes using a 14mm AF spanner.

3. Gently ease the base out of the cover ensuring that the cable slides through the loosened gland to avoid any strain on the internal connections.

4. The ICA5ATEX amplifier will now be exposed allowing access to the two trimming potentiometers.



Calibration:

1. Apply the **low** calibration conditions (weight, force or mV/V). Set the output to 4mA using the **Zero** potentiometer.

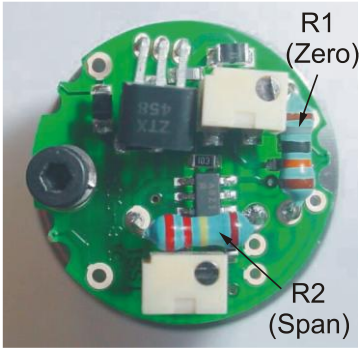
2. Apply the known **high** calibration conditions (ideally between 75% and full scale) and adjust the **Span** potentiometer to give the required output current for the known input.
   i.e. 16mA for 4-20mA final calibration with 75% input or 20mA if 100% input.

When re-assembling the ALA5 it is imperative that the 'O' is fitted correctly and the cable gland re-tightened to maintain a gas-tight seal.

Chapter 4: Changing the Gain and Offset Ranges

The ICA5ATEX amplifier is supplied un-calibrated but optimized for a sensitivity of 2.5mV/V with a 1k bridge.
To accommodate other sensitivities the gain resistor, 'R2' (see below) can be changed to a value derived from the following formula.

Figure 4.1



N.B. a high quality resistor (e.g. 1% 25-50 ppm metal film) should be used for best performance. It may be necessary to use an E96 value for optimum trim range: -

Calculating the Gain Resistor (R2)

$$R2 = \left(\frac{1069.2}{(mV/V) \times Vexc} - 10 \right)$$ k Ohms

Where mV/V is the sensitivity of the load cell (in mV/V), Vexc is the excitation voltage (in volts).

The following table gives calculated values of Vexc for various standard load cell impedances:

Load Cell Impedance	Excitation voltage (Vexc)
350	0.53
700	0.87
1000	1.08
1400	1.29
2000	1.51
5000	1.97

e.g. For a 2.5mV/V 1000 Ohm load cell : R2 = 386k Ohms – use 390k (nearest preferred value)

Use the following formulae to calculate the excitation voltage for cell impedances not given in the table:

$$Rx = \left(\frac{1}{(1/Rcell) + 4.762 \times 10\exp{-6}} \right)$$ Ohms

$$Vexc = \left(\frac{2.5 \times Rx}{Rx + 1300} \right)$$ Volts

e.g. for a 500 Ohm load cell:

Rx = 498.8 Ohms
Excitation Voltage, Vexc = 0.693V

Offset Resistor (R1)

The value of R1 can be changed to offset the zero point, if outside the normal trimming range (±2% FS). Its value will also depend on the impedance of the load cell. The factory-fitted value, 120k is optimised for a 1000 Ohm cell.

Offset Resistor (R1) vs Load Cell Impedance

The following table gives the value of R1 for various load cell impedances and ±2% FS and 4% FS trim:

Load Cell Impedance	**±2%**	**±4%**
350 ohms	15k	n/a
7000 ohms	82k	22k
1000 ohms	120k	56k
5000 ohms	910k	510k

Chapter 5: OEM Customers

IMPORTANT: OEM customers must hold a notified body Quality Assurance Notification (QAN) if the ICA5ATEX is to be installed into a Mantracourt ATEX approved 'generic' enclosure.

If installed into a non-ATEX approved enclosure, the whole assembly must be submitted for ATEX certification by an appropriate body.

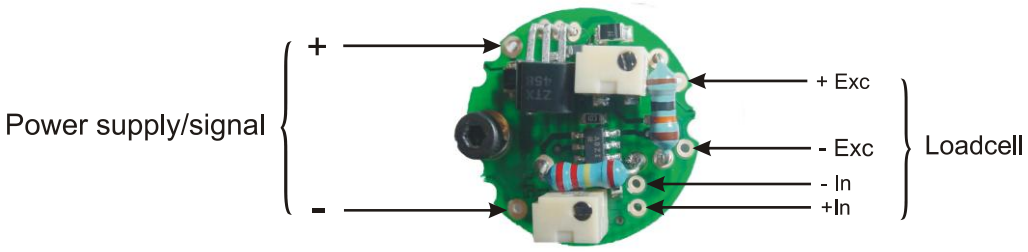
Please refer to Appendix A – 'Special conditions of safe use'

The ICA5ATEX amplifier is designed to fit into a pocket in a certified loadcell. Use the 2.1mm hole to secure the unit and to provide a good ground connection.
The mounting hole will accept an M2 screw or American equivalent #0-80.
Important Note: DO NOT USE #2 screw size.

Take care when soldering cables to the pads. Use a temperature controlled soldering iron set to a maximum 330 ºC, for no longer than 2 seconds per pad. Excessive heat or increased soldering time may result in damage to the PCB.

See fig 2.1 for recommended screen connections.

The ICA5ATEX Connections:

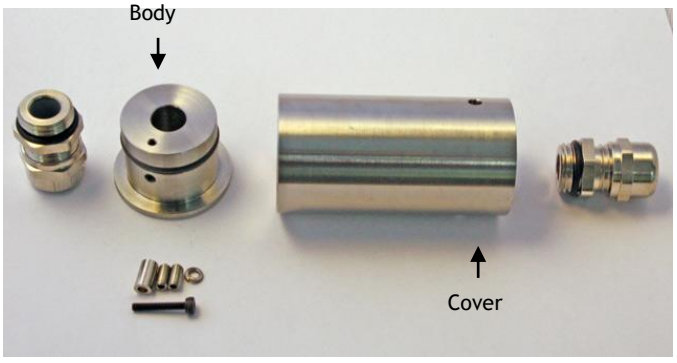


The power supply should be between 9 and 28V and must be connected through an ATEX approved barrier if installing into a hazardous area.

ILEATEX Enclosure

Package Contents

- EMC 'O' ring
- enclosure body
- enclosure Cover
- 2 x EMC cable glands PG7/20 TPI 14mm AF
- 2 x grub screws
- 1 x M2 spring washer
- 1 x M2 cylindrical spacer
- M2 x 12mm cap screw



Ensure that the 'O' ring is fitted to the body.

Please refer to Appendix A – 'Special conditions of safe use'

Chapter 6: Specifications

Table 6.1 ICA5ATEX – 4-20mA 2 wire Specifications

Environmental

Parameter	Minimum	Typical	Maximum	Units	Notes
Supply voltage Range	9.0	24	28	Volts	
Operating Temperature Range	-40	-	85	Deg C	
Storage Temperature Range	-40	-	85	Deg C	
Reverse polarity Protection	-30	-	-	Volts	

Measurement

Parameter	Minimum	Typical	Maximum	Units	Notes
Bridge Excitation	1.05	1.11	1.16	Volts	Note 1
Bridge Impedance	350	1000	5000	Ohms	
Bridge Sensitivity	0.5	2.5	55	mV/V	Note 2
Output load	-	-	300	Ohms	Note 3
Bandwidth	DC	-	1000	Hz	
'Zero' adjustment	-	±2	-	%FR	Note 4
'Span' adjustment	-	±8	-	%FR	
Linearity	-	0.02	-	%FR	
Temperature stability					
'Zero' Temperature Stability	-	0.001	0.005	+/-%FR/Deg C	At 2.5mV/V
'Span' Temperature Stability	-	0.007	0.014	+/-%FR/Deg C	At 2.5mV/V

FR=Full Range (16mA)

Note 1: 1000 Ohm load cell – Typically 0.53V for 350 Ohm cell
Note 2: Set by calibration resistor
Note 3: Limited by the 300Ω barrier impedance
Note 4: 1000 Ohms load cell – change R1 to suit other load cell impedances.

Note: Recommended bridge impedance is 1,000 Ohms

Note: The voltage between either of the power supply connections and the load cell shield should not exceed 50V. Any leakage will be greater than 10M Ohms.

Table 6.2 ILEATEX Enclosure Specifications

Parameter	Minimum
Cover material	Stainless steel type 304
Body material	Stainless steel type 316 or 17-4
Threaded entries	PG7 / 20 TPI
Cable entries	PG7 EMC glands (e.g. Jacob 50.007/EMV 14mm AF)
Environmental rating	IP67

Environmental Approvals

Output shall not exceed the sum of uncertainties when subjected to an electric field of 10V/m over the frequency range 80 to 600MHz

CE Approvals

European EMC Directive	2004/108/EC BS EN 61326-1:2006 BS EN 61326-2-3:2006

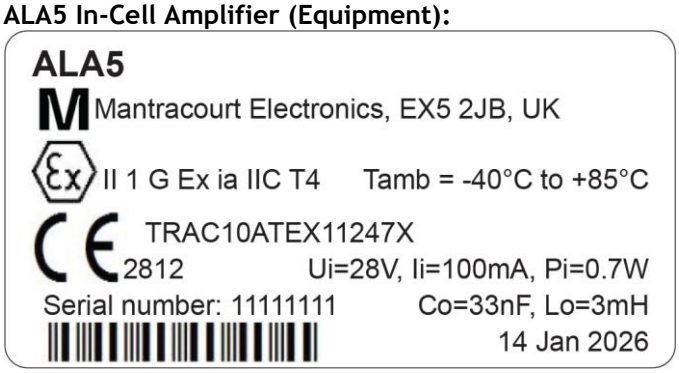
Appendix A: Special Conditions of Safe Use

Special conditions of safe use:

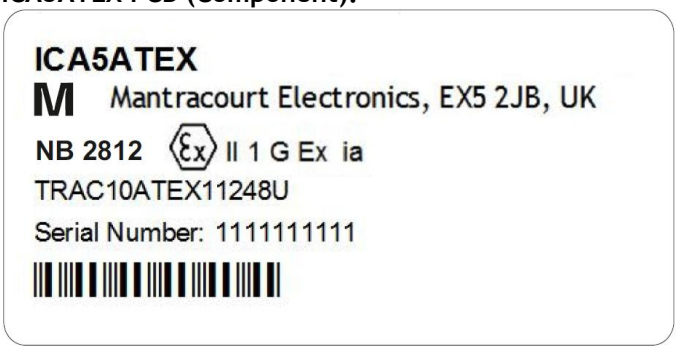
ALA5 Equipment:	
1	The apparatus must be supplied by an approved ATEX Barrier with the following parameters: Uo = 28V, Io = 100mA, Po = 0.7W, Barrier Impedance 300Ω. These are maximum values, actual barrier parameters will vary. However, the barrier impedance is not permitted to change.
2	External inductance connected shall take into account the electrical parameters of the cable, Lc, and the combined amount shall be less than or equal to 3mH.
3	External capacitance connected shall take into account the electrical parameters of the cable, Cc, and the combined amount shall be less than or equal to 33nF.
Schedule of limitations:	
ICA5ATEX Component:	
4	The enclosure used to house the ICA5ATEX must be metallic and not contain, by mass, more than 10% in total of aluminium, magnesium, titanium and zirconium OR 7.5% in total of aluminium, magnesium or zirconium.
5	The ICA5ATEX PCB must be mounted completely within an ATEX approved metallic apparatus enclosure as per the manufacturer's instructions.
6	Cable glands used for entry to an enclosure must be metallic and rated to maintain a minimum IP54 level of protection. Alternatively ATEX approved glands in both metallic and non-metallic material are permitted.
7	The apparatus must be supplied by an approved ATEX Barrier with the following parameters: Uo = 28V, Io = 100mA, Po = 0.7W, Barrier Impedance 300Ω. These are maximum values, actual barrier parameters will vary. However, the barrier impedance is not permitted to change.
8	External inductance connected shall take into account the electrical parameters of the cable, Lc, and the combined amount shall be less than or equal to 3mH.
9	External capacitance connected shall take into account the electrical parameters of the cable, Cc, and the combined amount shall be less than or equal to 33nF.
10	Each ICA5ATEX PCB must be subjected to and pass a 500Vrms or 700Vdc dielectric strength test from live parts to earth when disconnected from the earth stud.
11	PCB tracks must maintain a minimum 0.2mm separation distance to the enclosure wall.
Schedule of limitations:	
ILEATEX Component:	
12	PCB tracks must maintain a minimum separation distance to the enclosure wall as required by the amplifier ATEX approval.

ATEX Marking:

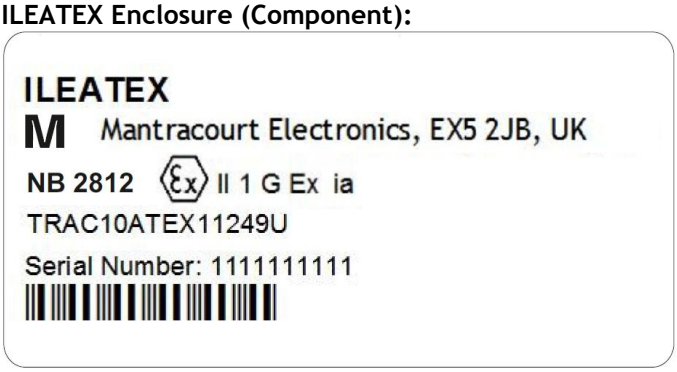
ALA5 In-Cell Amplifier (Equipment):



ICA5ATEX PCB (Component):



ILEATEX Enclosure (Component):



ATEX Marking details

Ex	Explosion protection
II	Equipment group: industrial
1	Equipment category: very high protection
G	Hazard: gas atmosphere - zones 0,1 and 2

Certification Code details

Ex	Explosion protection
ia	Intrinsic safety according to EN60079-11 (previously EN 50020)
IIC	Hydrogen/Acetylene gas group
T4	Temperature Classification – surface temperature <135°C

EU DECLARATION OF CONFORMITY-ALA5

EU DECLARATION OF CONFORMITY

Declaration No. ALA5-ATEX-DOC

We, the undersigned:

Name of Manufacturer:	**Mantracourt Electronics Ltd**
Address:	**The Drive, Farrington, Exeter, Devon, EX5 2JB**
Country:	**United Kingdom**

Declare under our sole responsibility that the following apparatus:

Product description:	**In-Cell Amplifier compromising ICA5ATEX and ILEATEX components.**
Model or Type No.:	**ALA5**
Brand name:	**N/A**
Is in conformity with the following relevant Union harmonisation legislation:	Based on the following harmonised standards:
EMC directive 2014/30/EU	**BS EN 61326-1:2013** **BS EN 61326-2-3:2013**
	And on the following non harmonised standards:
ATEX directive 2014/34/EU	**EN60079-0:2006** **EN60079-11:2007** An assessment of the differences between the quoted and harmonised standards has been made. There are deemed to be no discernible differences affecting this product. Full justification is available on request.

The following Notified Body has been involved in the conformity assessment process:

Notified Body:	**Element Rotterdam BV**
Notified Body No.:	**2812**
Role:	**Issue of ATEX EU Type Examination certificate**
Certificate No.:	**TRaC10ATEX11247X**
Additional information:	

ATEX coding:

II 1 G **Ex ia IIC T4**

Name and position of person binding the manufacturer or authorised representative:

Signature: James Slader

Name:	**Dr James Slader**
Function:	**Engineering Manager**
Location:	**Mantracourt Electronics Ltd**
Date of issue:	**19th January 2026**

Mantracourt® Electronics

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EU ATTESTATION OF CONFORMITY-ICA5ATEX

EU ATTESTATION OF CONFORMITY

Declaration No. ICA5ATEX-ATEX-AOC

We, the undersigned:

Name of Manufacturer:	**Mantracourt Electronics Ltd**
Address:	**The Drive, Farrington, Exeter, Devon, EX5 2JB**
Country:	**United Kingdom**

Declare under our sole responsibility that the following apparatus:

Product description:	**PCB – Component In-Cell Amplifier**
Model or Type No.:	**ICA5ATEX**
Brand name:	**N/A**
Is in conformity with the following relevant Union harmonisation legislation:	Based on the following harmonised standards:
EMC directive 2014/30/EU	**BS EN 61326-1:2013** **BS EN 61326-2-3:2013**
	And on the following non harmonised standards:
ATEX directive 2014/34/EU	**EN60079-0:2006** **EN60079-11:2007** An assessment of the differences between the quoted and harmonised standards has been made. There are deemed to be no discernible differences affecting this product. Full justification is available on request.

The following Notified Body has been involved in the conformity assessment process:

Notified Body:	**Element Rotterdam BV**
Notified Body No.:	**2812**
Role:	**Issue of ATEX EU Type Examination certificate**
Certificate No.:	**TRaC10ATEX11248U**
Additional information:	

ATEX coding:

II 1 G **Ex ia**

CE

Name and position of person binding the manufacturer or authorised representative:

Signature: James Slader

Name:	**Dr James Slader**
Function:	**Engineering Manager**
Location:	**Mantracourt Electronics Ltd**
Date of issue:	**19th January 2026**

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EU ATTESTATION OF CONFORMITY-ILEATEX

EU ATTESTATION OF CONFORMITY

Declaration No. ILEATEX-ATEX-AOC

We, the undersigned:

Name of Manufacturer:	**Mantracourt Electronics Ltd**
Address:	**The Drive, Farrington, Exeter, Devon, EX5 2JB**
Country:	**United Kingdom**

Declare under our sole responsibility that the following apparatus:

Product description:	**Metallic Enclosure**
Model or Type No.:	**ILEATEX**
Brand name:	**N/A**
Is in conformity with the following relevant Union harmonisation legislation:	Based on the following harmonised standards:
EMC directive 2014/30/EU	**BS EN 61326-1:2013** **BS EN 61326-2-3:2013**
	And on the following non harmonised standards:
ATEX directive 2014/34/EU	**EN60079-0:2006** **EN60079-11:2007** An assessment of the differences between the quoted and harmonised standards has been made. There are deemed to be no discernible differences affecting this product. Full justification is available on request.

The following Notified Body has been involved in the conformity assessment process:

Notified Body:	**Element Rotterdam BV**
Notified Body No.:	**2812**
Role:	**Issue of ATEX EU Type Examination certificate**
Certificate No.:	**TRaC10ATEX11249U**
Additional information:	

ATEX coding:

II 1 G **Ex ia**

Name and position of person binding the manufacturer or authorised representative:

Signature: James Slader

Name:	**Dr James Slader**
Function:	**Engineering Manager**
Location:	**Mantracourt Electronics Ltd**
Date of issue:	**19th January 2026**

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ALA5 Examination Certificate:

element

1 **CONFORMITÉ EUROPÉENE**

EU - TYPE EXAMINATION CERTIFICATE

2 **Product or Protective System Intended for use in Potentially Explosive Atmospheres**
Directive 2014/34/EU – Annex III

3	EU - Type Examination Certificate No.:	**TRAC10ATEX11247X (incorporating variations V1 and V2)**
4	Product:	**ALA5 In-Cell Amplifier**
5	Manufacturer:	**Mantracourt Electronics Ltd.,**
6	Address:	**The Drive, Farringdon, Exeter, Devon, EX5 2JB, United Kingdom**

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

8 Element Materials Technology, Notified Body number 2812, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential report **16-0104-006355 and TRA-064883-32-00A**.

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN60079-0:2006 **EN60079-11:2007** **EN60079-26:2007**

Except in respect of those requirements listed at section 18 of the schedule.

10 If the sign "X" is placed after the certificate number, it indicates that the product is subject to specific conditions of use specified in the schedule to this certificate.

11 This EU - TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12 The marking of this product shall include the following:

Ex **II 1 G Ex ia IIC T4 Tamb = -40°C to +85°C**

This certificate and its schedules may only be reproduced in its entirety and without change. This certificate is issued in accordance with the Element Materials Technology Ex Certification Scheme.

S P Winsor, Certification Manager

Issue date: 2026-05-11

Element Materials Technology Rotterdam BV
Zekeringstraat 33, 1014 BV, Amsterdam, Netherlands
Registered in the Netherlands. Registered Office: PO Box 6854, 4802 HW, Breda, Netherlands
Company Reg. No. 24170257

13 SCHEDULE TO EU - TYPE EXAMINATION CERTIFICATE

14 CERTIFICATE NUMBER TRAC10ATEX11247X (incorporating variations V1 and V2)

15 Description of Product

The ALA5 In-Cell Amplifier is a device which is intended to be connected to separately approved load cells. The ALA5 is made up of two component pieces:

a) the ICA5ATEX PCB
b) ILEATEX metallic enclosure.

The ICA5ATEX is an assembly of components on a PCB which acts as a strain gauge amplifier, converting a strain gauge input to a 4-20mA output; in effect it is a signal conditioner.
The ILEATEX is a metallic enclosure which provides mechanical and environmental protection as well as an earth connection. There are two cable entries on the ILEATEX enclosure via minimum IP54 rated cable glands, one for the supply from the barrier and one to the load cell.

The ALA5 equipment and ICA5ATEX component must be supplied by a suitably ATEX approved barrier.

16 Test Report No. (as added for this issue of the certificate): TRA-064883-32-00A

17 Specific Conditions of Use

1. The apparatus must be supplied by an approved ATEX Barrier with the following parameters: Uo = 28V, Io = 100mA, Po = 0.7W, Barrier Impedance 300Ω. These are maximum values, actual barrier parameters will vary. However, the barrier impedance is not permitted to change.
2. External inductance connected shall take into account the electrical parameters of the cable, Lc, and the combined amount shall be less than or equal to 3mH.
3. External capacitance connected shall take into account the electrical parameters of the cable, Cc, and the combined amount shall be less than or equal to 33nF.

Attention is drawn to the operating and installation instructions which may contain useful information in relation to conditions of use.

18 Essential Health and Safety Requirements (Directive Annex II)

In addition to the Essential Health and Safety Requirements covered by the standards listed at item 9, all other requirements are demonstrated in the relevant reports.

19 Drawings and Documents

The list of controlled technical documentation is given in TRA-064883-00-SDL, dated 2026-04-16.

20 Routine Tests

None.

21 Specific Conditions for Manufacture

1. Each ICA5ATEX PCB must be subjected to and pass a 500Vrms or 700Vdc dielectric strength test from live parts to earth when disconnected from the earth stud.

22 Photographs

23 Details of Markings

24 Certificate History

Original certificate	2010-07-20	First issue.
Variation V1	2021-11-04	This certificate was originally issued by Notified Body number 0891 under Directive 2014/34/EU. The technical file has been transferred to Element Notified Body number 2812 without further assessment or evaluation
Variation V2	2026-05-11	Administrative change to change manufacturer logo on markings.

This certificate is a consolidated certificate and reflects the latest status of the certification, including all variations and amendments.

25 Notes to CE marking

In respect of CE Marking, Element Materials Technology accepts no responsibility for the compliance of the product against all applicable Directives in all applications.

26 Notes to this certificate

Element Materials Technology certification reference: ERO050735P69 (GU-MANQ-0005).

Throughout this certificate, the date format yyyy-mm-dd (year-month-day) is used.

Notified Body number 2812 is the designation for Element Materials Technology Rotterdam BV.

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. Variation certificates to such EC-Type Examination Certificates, and new issues of such certificates, may continue to bear the original certificate number issued prior to 20 April 2016.

27 Conditions for the validity of this certificate

This certificate remains valid for so long as:

(i) The equipment listed in section 4 is manufactured in accordance with the documents listed in TRA-064883-00-SDL, dated 2026-04-16.

(ii) The standards listed in section 9 of this certificate continue to satisfy the Essential Health and Safety Requirements of Annex II of Directive 2014/34/EU and the generally acknowledged state of the art (e.g. as determined by the publishers of those standards).

ICA5ATEX Examination Certificate:

element

1 **CONFORMITÉ EUROPÉENE**

EU - TYPE EXAMINATION CERTIFICATE

2 **Product or Protective System Intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU – Annex III**

3 EU - Type Examination Certificate No.: **TRAC10ATEX11248U (incorporating variations V1 and V2)**

4 Product: **ICA5ATEX PCB**

5 Manufacturer: **Mantracourt Electronics Ltd.,**

6 Address: **The Drive, Farringdon, Exeter, Devon, EX5 2JB, United Kingdom**

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

8 Element Materials Technology, Notified Body number 2812, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential report **16-0104-006355 and TRA-064883-32-00A.**

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN60079-0:2006 **EN60079-11:2007** **EN60079-26:2007**

Except in respect of those requirements listed at section 18 of the schedule.

10 If the sign "X" is placed after the certificate number, it indicates that the product is subject to specific conditions of use specified in the schedule to this certificate.

11 This EU - TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12 The marking of this product shall include the following:

Ex II 1 G Ex ia

This certificate and its schedules may only be reproduced in its entirety and without change. This certificate is issued in accordance with the Element Materials Technology Ex Certification Scheme.

S P Winsor, Certification Manager

Issue date: 2026-05-11 Page 1 of 4 CSF355-NL 5.0

Element Materials Technology Rotterdam BV
Zekeringstraat 33, 1014 BV, Amsterdam, Netherlands
Registered in the Netherlands. Registered Office: PO Box 6854, 4802 HW, Breda, Netherlands
Company Reg. No. 24170257

13 SCHEDULE TO EU - TYPE EXAMINATION CERTIFICATE

14 CERTIFICATE NUMBER TRAC10ATEX11248U (incorporating variations V1 and V2)

15 Description of Product

The ICA5ATEX is an assembly of components on a PCB which acts as a strain gauge amplifier, converting a strain gauge input to a 4-20mA output; in effect it is a signal conditioner.
The ICA5ATEX is intended to be provided with a metallic enclosure which provides mechanical and environmental protection as well as an earth connection. The cable entries on the enclosure should only allow connections via minimum IP54 rated cable glands, one for the supply from the barrier and one to the load cell.

The ICA5ATEX component must be supplied by a suitably ATEX approved barrier.

16 Test Report No. (as added for this issue of the certificate): TRA-064883-32-00A

17 Schedule of limitations

1. The enclosure used to house the ICA5ATEX PCB must be metallic and not contain ,by mass, more than 10% in total of aluminium, magnesium, titanium and zirconium OR 7.5% in total of aluminium, magnesium or zirconium..
2. The ICA5ATEX PCB must be mounted completely within an ATEX approved metallic apparatus enclosure as per the manufacturer's instructions.
3. Cable glands used for entry to an enclosure must be metallic and rated to maintain a minimum IP54 level of protection. Alternatively ATEX approved glands in both metallic and non-metallic material are permitted.
4. External inductance connected shall take into account the electrical parameters of the cable, Lc, and the combined amount shall be less than or equal to 3mH.
5. External capacitance connected shall take into account the electrical parameters of the cable, Cc, and the combined amount shall be less than or equal to 33nF.
6. The apparatus must be supplied by an approved ATEX Barrier with the following parameters: Uo = 28V, Io = 100mA, Po = 0.7W, Barrier Impedance 300Ω. These are maximum values, actual barrier parameters will vary. However, the barrier impedance is not permitted to change.
7. Each ICA5ATEX PCB must be subjected to and pass a 500Vrms or 700Vdc dielectric strength test from live parts to earth when disconnected from the earth stud.
8. PCB tracks must maintain a minimum 0.2mm separation distance to the enclosure wall.

Attention is drawn to the operating and installation instructions which may contain useful information in relation to conditions of use.

18 Essential Health and Safety Requirements (Directive Annex II)

In addition to the Essential Health and Safety Requirements covered by the standards listed at item 9, all other requirements are demonstrated in the relevant reports.

19 Drawings and Documents

The list of controlled technical documentation is given in TRA-064883-00-SDL, dated 2026-04-16.

SCHEDULE TO EU - TYPE EXAMINATION CERTIFICATE

CERTIFICATE NUMBER TRAC10ATEX11248U (incorporating variations V1 and V2)

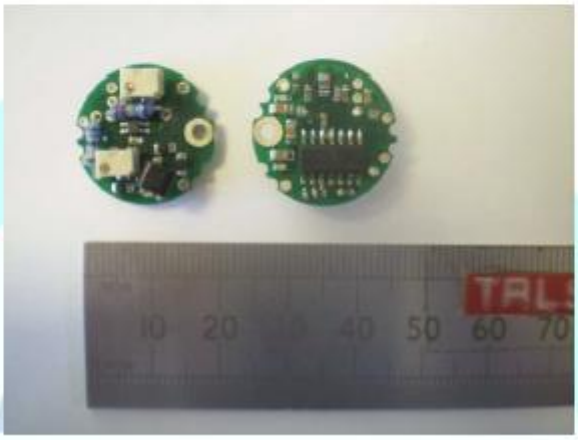
20 Routine Tests

None.

21 Specific Conditions for Manufacture

1. A coloured dot is to be marked on the PCB and Label to act as an identifier.

22 Photographs



23 Details of Markings

24 Certificate History

Original certificate	2010-07-20	First issue.
Variation V1	2021-11-04	This certificate was originally issued by Notified Body number 0891 under Directive 2014/34/EU. The technical file has been transferred to Element Notified Body number 2812 without further assessment or evaluation
Variation V2	2026-05-11	Administrative change to change manufacturer logo on markings and instructions.

This certificate is a consolidated certificate and reflects the latest status of the certification, including all variations and amendments.

25 Notes to CE marking

In respect of CE Marking, Element Materials Technology accepts no responsibility for the compliance of the product against all applicable Directives in all applications.

26 Notes to this certificate

Element Materials Technology certification reference: ERO050735P69 (GU-MANQ-0005).

Throughout this certificate, the date format yyyy-mm-dd (year-month-day) is used.

Notified Body number 2812 is the designation for Element Materials Technology Rotterdam BV.

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. Variation certificates to such EC-Type Examination Certificates, and new issues of such certificates, may continue to bear the original certificate number issued prior to 20 April 2016.

27 Conditions for the validity of this certificate

This certificate remains valid for so long as:

(i) The equipment listed in section 4 is manufactured in accordance with the documents listed in TRA-064883-00-SDL, dated 2026-04-16.

(ii) The standards listed in section 9 of this certificate continue to satisfy the Essential Health and Safety Requirements of Annex II of Directive 2014/34/EU and the generally acknowledged state of the art (e.g. as determined by the publishers of those standards).

ILEATEX Examination Certificate:

element

1 **CONFORMITÉ EUROPÉENE**

EU - TYPE EXAMINATION CERTIFICATE

2 **Product or Protective System Intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU – Annex III**

3 EU - Type Examination Certificate No.: **TRAC10ATEX11249U (incorporating variations V1 and V2)**

4 Product: **ILEATEX Enclosure**

5 Manufacturer: **Mantracourt Electronics Ltd.,**

6 Address: **The Drive, Farringdon, Exeter, Devon, EX5 2JB, United Kingdom**

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

8 Element Materials Technology, Notified Body number 2812, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential report **16-0104-006355 and TRA-064883-32-00A.**

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN60079-0:2006 **EN60079-11:2007** **EN60079-26:2007**

Except in respect of those requirements listed at section 18 of the schedule.

10 If the sign "X" is placed after the certificate number, it indicates that the product is subject to specific conditions of use specified in the schedule to this certificate.

11 This EU - TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12 The marking of this product shall include the following:

Ex II 1 G Ex ia

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S P Winsor, Certification Manager

Issue date: 2026-05-11 Page 1 of 4 CSF355-NL 5.0

Element Materials Technology Rotterdam BV
Zekeringstraat 33, 1014 BV, Amsterdam, Netherlands
Registered in the Netherlands. Registered Office: PO Box 6854, 4802 HW, Breda, Netherlands
Company Reg. No. 24170257

13 SCHEDULE TO EU - TYPE EXAMINATION CERTIFICATE

14 CERTIFICATE NUMBER TRAC10ATEX11249U (incorporating variations V1 and V2)

15 Description of Product

The ILEATEX is a metallic enclosure which provides mechanical and environmental protection as well as an earth connection. There are two cable entries on the ILEATEX enclosure via minimum IP54 rated cable glands, one for the supply from the barrier and one to the load cell.

The ILEATEX enclosure is intended for use with the separately certified ICA5ATEX PCB Component or similarly ATEX approved amplifier PCBs to form load cell amplifier equipment.

16 Test Report No. (as added for this issue of the certificate): TRA-064883-32-00A

17 Schedule of limitations

1. PCB tracks must maintain a minimum separation distance to the enclosure wall as required by the amplifier ATEX approval.

Attention is drawn to the operating and installation instructions which may contain useful information in relation to conditions of use.

18 Essential Health and Safety Requirements (Directive Annex II)

In addition to the Essential Health and Safety Requirements covered by the standards listed at item 9, all other requirements are demonstrated in the relevant reports.

19 Drawings and Documents

The list of controlled technical documentation is given in TRA-064883-00-SDL, dated 2026-04-16.

20 Routine Tests

None.

21 Specific Conditions for Manufacture

None.

22 Photographs

23 Details of Markings

ILEATEX
M Mantracourt Electronics, EX5 2JB, UK
NB 2812 ⟨Ex⟩ II 1 G Ex ia
TRAC10ATEX11249U
Serial Number: 1111111111

24 Certificate History

Original certificate	2010-07-20	First issue.
Variation V1	2021-11-04	This certificate was originally issued by Notified Body number 0891 under Directive 2014/34/EU. The technical file has been transferred to Element Notified Body number 2812 without further assessment or evaluation
Variation V2	2026-05-11	Administrative change to change manufacturer logo on markings and instructions.

This certificate is a consolidated certificate and reflects the latest status of the certification, including all variations and amendments.

25 Notes to CE marking

In respect of CE Marking, Element Materials Technology accepts no responsibility for the compliance of the product against all applicable Directives in all applications.

26 Notes to this certificate

Element Materials Technology certification reference: ERO050735P69 (GU-MANQ-0005)

Throughout this certificate, the date format yyyy-mm-dd (year-month-day) is used.

Notified Body number 2812 is the designation for Element Materials Technology Rotterdam BV.

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. Variation certificates to such EC-Type Examination Certificates, and new issues of such certificates, may continue to bear the original certificate number issued prior to 20 April 2016.

27 Conditions for the validity of this certificate

This certificate remains valid for so long as:

(i) The equipment listed in section 4 is manufactured in accordance with the documents listed in TRA-064883-00-SDL, dated 2026-04-16.

(ii) The standards listed in section 9 of this certificate continue to satisfy the Essential Health and Safety Requirements of Annex II of Directive 2014/34/EU and the generally acknowledged state of the art (e.g. as determined by the publishers of those standards).

In the interests of continued product development, Mantracourt Electronics Limited reserves the right to alter product specifications without prior notice.