1 **TYPE EXAMINATION CERTIFICATE**

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

3 Certificate Number: **Sira 15ATEX4138X** Issue: **4**

4 Equipment: **Thermocouple Scanner/ AXTC20, AXTC20-01, AXTC20-02, 234-1644, 741219, 741220, AXTC20CO, AXTC20CO-01, 63.03.002-20, AXTC20CO-02, AM171000, 1100357, AXTC20-04, AXTC20-06, AXTC20-07, and AXTC20-08 and Models AX188000, AX188001 and AX188000-xx (01, 02 or 03), AX185000, AX185000-01, AX185000-02, AX185000-03 741219B, AX185000-04 741358A, AX185000-XX, AX185001**

5 Applicant: **Axiomatic Technologies Corporation**

6 Address: 5915 Wallace St. Mississauga, Ontario, CANADA L4Z 1Z8

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

8 CSA Group Netherlands B.V., certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design of Category 3 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.

9 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:

AXTC20 Series
EN IEC 60079-0:2012+A11:2013 EN 60079-15:2010
Models AX188000, AX188000-xx, and AX188001
EN 60079-0:2012+A11:2013 EN 60079-15:2010 EN 60079-7:2015+A1:2018*
Models AX185000, AX185000-XX and AX185001
EN IEC 60079-0 :2018 EN IEC 60079-7 : 2015+A1 :2018
* Applied to Models AX188000, AX188000-xx, and AX188001 only

10 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.

11 This Type Examination Certificate relates only to the design of the specified equipment, and not to specific items of equipment subsequently manufactured. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:

AXTC20, AXTC20-01, AXTC20-02, 234-1644, 741219 and 741220	Models AX188000, AX188000-xx, AX188001	AX185000, AX185000-01, AX185000-02, AX185000-03 741219B, AX185000-04 741358A, AX185000-XX, AX185001.
II 3G Ex nA IIC T4 Gc Ta = -40°C to +70 °C	II 3G Ex ec IIC T4 Gc Ta = -40°C to +85°C	II 3G Ex ec IIC T4 Gc Ta = -40°C to +70°C

Signed: Michelle Halliwell

Title: Director of Operations

PRODUCTS RvA C 652

Project Number 80115733

13 **DESCRIPTION OF EQUIPMENT**

AXTC20 Series:

These devices monitor up to 20 channels of several types of thermocouples such as: B, E, J, K, N, R, S or T, each with two pins at the connectors for positive and negative connections. All 20 channels of temperature data are automatically sent over the CAN bus when power is applied with no additional programming or configuration required. Integral diagnostics determine thermocouple integrity and thermocouple inputs are isolated from each other.

All Thermocouple scanner models AXTC20, AXTC20-01, AXTC20-02, 234-1644, 741219, 741220, AXTC20CO, AXTC20CO-01, 63.03.002-20, AXTC20CO-02, AM171000, 1100357, AXTC20-04, AXTC20-06, AXTC20-07, and AXTC20-08 consist of a printed circuit board assembly for the power and CAN bus interface with an 8 pin Deutsch connector and a printed circuit board assembly for the 20 thermocouples interface including a microprocessor and a 40 pin Deutsch connector. The differences between all models are in the software. The enclosure is made of extruded aluminum with stainless steel endplates that are secured by four screws. Mounting can be either horizontal or vertical.

Series AX185000, AX185000-01, AX185000-02, AX185000-03 741219B, AX185000-04, AX185000-xx, AX185001:

These devices monitor up to 20 independently channels of Type J, K, B, E, N, R, S or T thermocouples. All 20 channels of temperature data are automatically sent over the SAE J1939 CAN bus when power is applied with no additional programming or configuration needed. The Temperature information includes winding temperature, Engine Main bearing Temperature, exhaust temperature etc. The 20 Channel Thermocouple Module models AX185000 uses J1939 communication protocol. Model AX185000-01, AX185000-02, AX185000-03 741219B, AX185000-034 741358A, AX185000 -xx, uses a custom setpoint in software where xx = software setpoint file location; values = 01, 02, 03 etc. Model AX185001 uses CANopen protocol and Model AX185001-xx uses a setpoint in software where xx = software setpoint file location; values = 01, 02, 03 etc.

From a hardware perspective, these are the same. These devices consist of a two PCB assembly.

20 Thermocouple Connector Board and Power Board that are placed horizontally on top of each other inside the enclosure. Power board PCB includes power supply, CAN bus interface with a custom 40 pin connector and a printed circuit board assembly for the 20 thermocouples interface including a microprocessor and an 8-pin connector. Second PCB – Connector Board and includes 8 pin connectors.

The differences between all models are in the software. The enclosure is made of polymeric material. The mounting can be either horizontal or vertical.

Model AX188000 series:

These devices monitor up to 2 channels of Type J, K, B, E, N, R, S or T thermocouples. The temperature information is provided to the engine control system over SAE J1939 CAN bus. Temperature information can include exhaust temperature, winding temperature, and fluid temperature monitoring. The channels are isolated and measure temperatures concurrently.

The 2 Channel Thermocouple Module models AX188000 uses J1939 communication protocol.

Model AX188000-xx uses a setpoint in software where xx = setpoint file location; values = 01, 02, 03 et. Model AX188001 uses CANopen protocol.

From a hardware perspective, these are the same. These devices consist of a single PCB assembly for the power and CAN bus interface with a custom 8 pin connector and a printed circuit board assembly for the 2 thermocouples interface including a microprocessor and a 8 pin connector. The differences between all models are in the software. The enclosure is made of polymeric material. The mounting can be either horizontal or vertical.

Variation 1 - This variation introduced the following changes:

i. Enclosure testing was conducted against the standards EN60079-0 and EN60079-15 in order to confirm the IP54 rating.
ii. Upper ambient limit was lowered from 85ºC to 70ºC.
iii. As a result of the above testing the specific conditions of use were revised.

Variation 2 - This variation introduced the following change:

i. A typographical error in the Certificate history was corrected.

Variation 3 - This variation introduced the following change:

i. Addition of Model AX188000 to the Certificate.

Variation 4 - This variation introduced the following change:

i. Addition of series Model AX185000, AX185000-01, AX185000-02, AX185000-03 741219B, AX185000-04 741358A, AX185000-XX, AX185001.

14 DESCRIPTIVE DOCUMENTS

14.1 Drawings

Refer to Certificate Annexe.

14.2 Associated Reports and Certificate History

Issue	Date	Report number	Comment
0	06 August 2015	R70017526A	The release of the prime certificate.
1	08 June 2017	R70111367A	This Issue covers the following changes: • Type Examination Certificate in accordance with 94/9/EC updated to Type Examination Certificate in accordance with Directive 2014/34/EU. *(In accordance with Article 41 of Directive 2014/34/EU, 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 Type Examination Certificates may continue to bear the original certificate number issued prior to 20 April 2016.)* • The introduction of Variation 1.
2	31 October 2019	0890	• Transfer of certificate Sira 15ATEX4138X from Sira Certification Service to CSA Group Netherlands B.V. • The introduction of Variation 2.
3	24 January 2022	80095044A	The introduction of Variation 3.

SCHEDULE

TYPE EXAMINATION CERTIFICATE **Sira 15ATEX4138X**
Issue 4

Issue	Date	Report number	Comment
4	22 November 2022	R80115733A	The introduction of Variation 4.

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

15.1 All connections to the **AXTC20 series, Model AX188000, AX188001, and AX188000-xx and AX185000, AX185001 and AX185000-XX,** shall be derived from SELV sources not exceeding 24Vdc and shall provide the transient protection at a level not exceeding 140% of the peak rated voltage.

15.2 **For AXTC20 Series:** End user shall use Deutsch mating plugs for connection with the receptacles of the models as shown below:

Supply Receptacle	Mating Plug
DT13-08PA	DT06-8S
Thermo couple Receptacle	Mating Receptacle
DRC13-40PA	DRC16-40S, DRC18-40S, DRC16-40SA, DRC18-40SA

For Model AX185000, AX185001, AX185000-XX
End user shall use Deutsch mating plugs for connection with the receptacles of the models as shown below:

Supply Receptacle	Mating Plug
DT13-08PA or AT13-08PA	DT06-8S
Thermo couple Receptacle	Mating Receptacle
DRC13-40PA	DRC16-40S, DRC18-40S, DRC16-40SA, DRC18-40SA

For Model AX188000, AX188000-xx, and AX188001 series:
End user shall use Deutsch mating plugs for connection with the receptacles of the models as shown below:

Receptacle (custom part to dimensions of)	Mating Plug
DT04-08PA	DT06-08SA

15.3 The equipment shall be protected from ultraviolet light sources within the final installation.

15.4 The AX188000, AX188000-xx, and AX188001 series shall be housed in a certified end-use enclosure that provides at least IP54 as per EN 60079-0.

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.

17 **CONDITIONS OF MANUFACTURE**

17.1 The use of this certificate is subject to the Regulations Applicable to Holders of CSA Group Netherlands B.V. certificates.

17.2 Holders of Type Examination Certificates are required to comply with the conformity to type requirements defined in Article 13 of Directive 2014/34/EU.

Certificate Annexe

Certificate Number: **Sira 15ATEX4138X**

Equipment: **Thermocouple Scanner/ AXTC20, AXTC20-01, AXTC20-02, 234-1644, 741219, 741220, AXTC20CO, AXTC20CO-01, 63.03.002-20, AXTC20CO-02, AM171000, 1100357, AXTC20-04, AXTC20-06, AXTC20-07, and AXTC20-08 and Models AX188000, AX188001 and AX188000-xx (01, 02 or 03) AX185000, AX185000-01, AX185000-02, AX185000-03 741219B, AX185000-04 741358A, AX185000-XX, AX185001**

Applicant: **Axiomatic Technologies Corporation**

Issue 0

Drawing no.	Sheets	Rev.	Date (Sira stamp)	Title
AXTC20-MD	1 to 1	A	22 Jun 15	AXTC20, SAEJ1939
FG-AXTC20	1 to 1	A	22 Jun 15	AXTC20, SAEJ1939
PCB-10006-01-ES-R61	1 to 14	61	22 Jun 15	20 Channel Thermocouple
PCB-10007-02-ES-R54	1 of 5	54	22 Jun 15	RTD Power Board
LBM-AXTC20-01	1 of 1	2	22 Jun 15	AXTC20 Label Drawing

Issue 1

Drawing	Sheets	Rev.	Date (Sira stamp)	Title
LBM-AXTC20-01-R3-D1-ATEX.pdf	1 of 1	R3-D1	02 May 17	AXTC20 Label Drawing

Issue 2. No new drawings were introduced

Issue 3

Drawing	Sheets	Rev.	Date (Stamp)	Title
MG-19028-01	1 to 5	A-D2	17 Dec 21	Dual Thermocouple Input Module, J1939
AX188000-MD-CSA-A	1 of 1	A-D2	17 Dec 21	Dual Thermocouple Input Module, J1939
SCM-19028-01-R2	1 to 10	2	17 Dec 21	2 TC Schematic
PCB-19028-01-R2	1 to 11	1	17 Dec 21	J1939 PCB layers
IJT-15004-02-R2	1 to 3	R2-D1	17 Dec 21	8-pin Deutsch face plate, Torays Amilan blue CM3004G-30 PA66
IJT-15004-03-R3	1 to 2	R3-D1	17 Dec 21	8-pin housing, Torays Amilan blue CM3004G-30 PA66
11242021-AXIO	1 of 1	A	17 Dec 21	Control drawing
LBM-AX188000-02-R1-ATEX	1 of 1	R1-D3	17 Dec 21	Label drawing

Issue 4

Drawing	Sheets	Rev.	Date (Stamp)	Title
AX185000 / AX185001 series				
AX185000-MD-D	1 of 1	D3	18 Oct 22	20 Channel Thermocouple, J1939
AX185001-MD-A	1 of 1	D3	18 Oct 22	20 Channel Thermocouple, CANopen
PCB-16005-02-R3 Schematic of Connector Board	1 of 1	3	18 Oct 22	Schematic - Connector Board
PCB-16029-01-R7-Schematic Main	1 to 16	7	18 Oct 22	Schematic - TC Board
FG-AX185000	1 to 6	D	18 Oct 22	BOM summary