1 **EU-TYPE EXAMINATION CERTIFICATE**

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

3 Certificate Number: **Sira 09ATEX2338X** Issue: **6**

4 Equipment: **IB IL EX-IS AIO 4/EF-PAC Module and IB IL EX-IS DIO 4/NAM-PAC Module and IB IL EX-IS TEMP 4 RTD/TC-PAC Module**

5 Applicant: **Azonix Corporation**

6 Address: 101 Billerica Ave
Building #4
North Billerica
Massachusetts 01862
USA

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., 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.

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:

EN 60079-0:2006 EN 60079-0:2009 EN 60079-11:2007 IEC 60079-15:2010

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 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.

12 The marking of the equipment shall include the following:

II 3(1)GD
Ex nA [ia Ga Da] IIC T4 Gc
Ta = -25°C to +60°C
(All the marking associated with category 3 use is applied under the manufacturer's ATEX declaration of conformity and is shown here for clarity)

Project Number 1991

Signed:

Title: Director of Operations

CSA Group Netherlands B.V.
Utrechtseweg 310,
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Netherlands

SCHEDULE

EU-TYPE EXAMINATION CERTIFICATE **Sira 09ATEX2338X**
Issue 6

13 **DESCRIPTION OF EQUIPMENT**

AIO Module

The IB IL EX-IS AIO 4/EF-PAC Module is an Analog Input-Output (AIO) device. It is designed to be powered from a PWR Module, which has a voltage limited to 28 V in accordance with the requirements of intrinsic safety, but without current limiting. The AIO Module converts the supply into to four isolated intrinsically safe outputs that are individually resistively safe for IIC gases and vapours. Each of the four channels shall be treated as separate intrinsically safe circuits.

The safety description is as follows:

	Input from PWR Module		
Um	28 Vdc		
	Intrinsically safe output per channel		
Uo	28 Vdc		
Io	109 mA		
Po	757 mW		
	Cable parameters (see note)		
	IIC	IIB	IIA
Co	82 nF	649 nF	2149 nF
Lo	1.015 mH	3.045 mH	8.12 mH

Note: the quoted entity parameters of Co and Lo are applicable for the distributed capacitance and inductance in cable. Where there is lumped circuit capacitance or inductance in the connected equipment (represented by Ci and Li respectively), then lumped capacitance shall be limited to a maximum value of 1 µF for Group IIB and 600 nF for Group IIC and lumped inductance shall not exceed 50% of the quoted Lo.

DIO Module

The IB IL EX-IS DIO 4/NAM-PAC Module is a Digital Input-Output (DIO) device. It is designed to be powered from a PWR Module, which has a voltage limited to 28 V in accordance with the requirements of intrinsic safety, but without current limiting. The DIO Module converts the supply to four isolated intrinsically safe outputs and four inputs. Each of the eight channels shall be treated as separate intrinsically safe circuits.

The safety description is as follows:

	Input from PWR Module					
Um	28 Vdc					
	Intrinsically safe output at CN2 & CN3 (per channel)			Intrinsically safe input at CN2 & CN3 (per channel)		
Ui	0			0		
Uo	28 Vdc			11.76 Vdc		
Io	109 mA			137 mA		
Po	757 mW			401 mW		
	Cable parameters (see note)			Cable parameters (see note)		
	IIC	IIB	IIA	IIC	IIB	IIA
Co	0.083 µF	0.625 µF	2.15 µF	1.5 µF	9.9 µF	39 µF
Lo	1.015 mH	3.045 mH	8.12 mH	1.52 mH	4.56 mH	21.1 mH

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Note: the quoted entity parameters of Co and Lo are applicable for the distributed capacitance and inductance in cable. Where there is lumped circuit capacitance or inductance in the connected equipment (represented by Ci and Li respectively), then lumped capacitance shall be limited to a maximum value of 1 µF for Group IIB and 600 nF for Group IIC and lumped inductance shall not exceed 50% of the quoted Lo.

TEMP Module

The IB IL EX-IS TEMP 4 RTD/TC-PAC Module is a four channel temperature measurement device. It is designed to be powered from a PWR Module, which has a voltage limited to 28 V in accordance with the requirements of intrinsic safety, but without current limiting. The TEMP Module converts the supply into to four isolated intrinsically safe inputs that are individually resistively safe for IIC gases and vapours. Each of the four channels shall be treated as separate intrinsically safe circuits.

The safety description is as follows:

	Input from PWR Module		
Um	28 Vdc		
	Intrinsically safe output per channel		
Uo	5.88 Vdc		
Io	0.095 A		
Po	0.139 W		
	Cable parameters (see note)		
	IIC	IIB	IIA
Co	42 µF	999 µF	999 µF
Lo	0.984 mH	2.9 mH	7.8 mH

Note: the quoted entity parameters of Co and Lo are applicable for the distributed capacitance and inductance in cable. Where there is lumped circuit capacitance or inductance in the connected equipment (represented by Ci and Li respectively), then lumped capacitance shall be limited to a maximum value of 1 µF for Group IIB and 600 nF for Group IIC and lumped inductance shall not exceed 50% of the quoted Lo.

Variation 1 - This variation introduced the following change:

i. The recognition of minor drawing modifications; these amendments are administrative or involve changes to the design that do not affect the aspects of the product that are relevant to explosion safety.

Variation 2 - This variation introduced the following changes:

i. The introduction of a TEMP Module was recognised, the description is amended to include this and the notes are similarly modified.

Variation 3 - This variation introduced the following changes:

i. The recognition of the following changes to the TEMP Modules:
   - The introduction of a new CJC riser board.
   - Minor component and artwork changes to the main board were permitted.
   - Minor typographical changes to Special Conditions of Safe Use were recognised.

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Variation 4 - This variation introduced the following changes:

i. The correction of the Io value from 108 mA to 109 mA and the Po value from 750 mW to 757 mW was approved; these values are corrected in the relevant table above.
ii. A change of non-critical component values.
iii. The provision of additional insulation around safety resistors R106, R113, R120 & R127 was acknowledged.

Variation 5 - This variation introduced the following changes:

i. Drawing number P19-101874 was modified to:
   - Change the value of fuse F1 from 62 mA to 100 mA.
   - Add a not on the lead length of D26, D27, D811 and D812.
   - Introduce F2.
ii. The values of non-critical component FB2, R97 and R98 were changed.
iii. The Applicant's Manufacturing address was changed from 900 Middlesex Turnpike, Billerica, MA 01821 to 101 Billerica Ave, Building #4, North Billerica, Massachusetts 01862.

14 DESCRIPTIVE DOCUMENTS

14.1 Drawings

Refer to Certificate Annexe.

14.2 Associated Sira Reports and Certificate History

Issue	Date	Report number	Comment
0	04 June 2010	R20267B/00 R20267C/00	The release of the prime certificate.
1	26 August 2010	R23210B/00	The introduction of Variation 1.
2	23 December 2010	R23332A/00	The introduction of Variation 2.
3	11 January 2012	R24187A/00	The introduction of Variation 3.
4	18 April 2012	R26332B/00	The introduction of Variation 4.
5	11 December 2013	R32497A/00	The introduction of Variation 5.
6	31st October 2019	1991	• Transfer of certificate **Sira 09ATEX2338X** from Sira Certification Service to CSA Group Netherlands B.V.. • EC Type-Examination Certificate in accordance with 94/9/EC updated to EU Type-Examination Certificate in accordance with Directive 2014/34/EU. *(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.)*

15 SPECIAL CONDITIONS FOR SAFE USE (denoted by X after the certificate number)

15.1 The module shall only be supplied from the IB IL EX-IS PWR IN-PAC Module.

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If the module is installed in a zone 2 hazardous area, it shall be housed in an enclosure that is coded Ex nA, Ex e, Ex d or Ex p. If the module is installed in a zone 22 or 21 hazardous area, it shall be housed in an enclosure that is coded Ex tD or Ex t. The enclosure shall provide an ingress protection suitable for the environment, with a minimum of IP54. For some types of enclosure, additional certification will be required to permit the installation of the module within the enclosure. Reference should be made to the enclosure certificate. The installer shall ensure that the maximum ambient temperature of the module when installed is not exceeded.

15.2 If the module is installed in a non-hazardous area, the enclosure or location shall provide suitable protection. This may either be by the use of an enclosure approved for use in zones 1, 2, 21 or 22 or otherwise meet the following requirements:

- Non-metallic enclosures must be capable of withstanding the thermal endurance requirements of IEC 60079-0, prior to impact and IP54 testing.
- Any enclosure must be capable of withstanding an impact of 7J or the module otherwise protected from impact
- The enclosure or location must provide an ingress protection of at least IP54.
- If exposed to sunlight, non-metallic enclosures must be capable of meeting the requirements of IEC 60079-0 clause 26.10 regarding resistance to light.

15.3 The installer is responsible for ensuring that the mounting of the module does not reduce the segregation distances between different modules. There shall be a minimum of 6 mm between any intrinsically safe terminals and other conductors or earthed metal, in accordance with IEC 60079-14:2007 clause 12.2.3. In addition, there shall be a minimum of 50 mm between the intrinsically safe terminals of the module and any non-intrinsically safe terminals.

15.4 When the module is installed in a hazardous area, 'live' connection and disconnection of the module from the rail is only permitted if the potentially explosive atmosphere is shown to be absent.

15.5 Each of the four channels, for the AIO or TEMP, or eight channels for the DIO, shall be treated as a separate intrinsically safe circuit.

15.6 Each channel shares a common zero volts with the other channels in the module but is isolated from the zero volts of other modules. If the field devices do not maintain 500 Vac isolation from plant earth, then all the devices from a single module shall be installed in a location (such as the same vessel) where a difference in plant earth potential is unlikely to occur. If the field devices maintain 500 Vac isolation from plant earth, there is no such limitation.

15.7 The quoted entity parameters of Co and Lo are applicable for the distributed capacitance and inductance in cable. Where there is lumped circuit capacitance or inductance in the connected equipment (represented by Ci and Li respectively), then lumped capacitance shall be limited to a maximum value of 1 µF for Group IIB and 600 nF for Group IIC and lumped inductance shall not exceed 50% of the quoted Lo.

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.

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Certificate Annexe

Certificate Number: **Sira 09ATEX2338X**

Equipment: **IB IL EX-IS AIO 4/EF-PAC Module,**
IB IL EX-IS DIO 4/NAM-PAC Module
& IB IL EX-IS TEMP 4 RTD/TC-PAC Module

Applicant: **Azonix Corporation**

Issue 0

AIO Module

Drawing No.	Sheets	Rev.	Date (Sira stamp)	Title
10-500425	1 to 17	3.0	07 May 10	AIO IS sector diagram & schematic
11-500425	1 to 9	A	07 May 10	AIO artwork
12-500425	1 of 1	A	07 May 10	AIO PCB silkscreen
P17-200331	1 to 2	A	07 May 10	Transformer, NXP, COMMS, unencapsulated
P17-200333	1 to 4	A	07 May 10	General assembly
P17-200334	1 to 2	A	07 May 10	Transformer, power
P17-200336	1 to 2	A	07 May 10	Transformer, NXP, COMMS, encapsulated
P19-101755	1 to 3	B	02 Jun 10	AIO critical parts list
P19-101772	1 of 1	A	07 May 10	AIO marking (Azonix)
19-101776	1 to 2	A	07 May 10	Re-work instruction for D19, D20

DIO Module

Drawing No.	Sheets	Rev.	Date (Sira stamp)	Title
10-500423	1 to 13	3.0	07 May 10	DIO schematic & IS block diagram
11-500423	1 to 9	03	02 Jun 10	DIO PCB artwork
12-500423	1 of 1	03	02 Jun 10	DIO PCB silkscreen
P17-200331	1 to 2	A	07 May 10	Transformer, NXP, COMMS, unencapsulated
P17-200332	1 to 4	A	07 May 10	DIO general assembly
P17-200336	1 to 2	A	07 May 10	Transformer, NXP, COMMS, encapsulated
P19-101756	1 to 2	A	07 May 10	DIO critical parts list
P19-101773	1 of 1	A	07 May 10	DIO marking – Azonix

Issue 1

AIO Module

Drawing No.	Sheets	Rev.	Date (Sira stamp)	Title
10-500425	1 to 17	B	23 Aug 10	AIO IS sector diagram & schematic
11-500425	1 to 9	B	23 Aug 10	AIO artwork
12-500425	1 of 1	B	23 Aug 10	AIO PCB silkscreen
P19-101755	1 to 3	C	23 Aug 10	AIO critical component list

DIO Module

Drawing No.	Sheets	Rev.	Date (Sira stamp)	Title
10-500423	1 to 13	C	23 Aug 10	DIO IS sector diagram & schematic
11-500423	1 to 9	C	23 Aug 10	DIO PCB artwork
12-500423	1 of 1	C	23 Aug 10	DIO PCB silkscreen
P19-101756	1 to 3	B	23 Aug 10	DIO critical component list

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Certificate Annexe

Certificate Number: **Sira 09ATEX2338X**

Equipment: **IB IL EX-IS AIO 4/EF-PAC Module,**
IB IL EX-IS DIO 4/NAM-PAC Module
& IB IL EX-IS TEMP 4 RTD/TC-PAC Module

Applicant: **Azonix Corporation**

Issue 2

TEMP Module

Drawing No.	Sheets	Rev.	Date (Sira stamp)	Title
10-500427	1 to 11	P2R1	21 Dec 10	TEMP IS sector diagram & schematic
11-500427	1 to 13	P2R1	21 Dec 10	TEMP artwork & silkscreen
P17-200331	1 to 2	A	07 May 10	Transformer, COMMS, P26-100118, unpotted
P17-200334	1 to 2	A	07 May 10	Transformer, power, P26-100119, unpotted
P17-200336	1 to 2	A	07 May 10	Transformer, COMMS, P26-100123, potted
P17-200348	1 to 4	A	21 Dec 10	General assembly
P19-101874	1 to 2	A	21 Dec 10	TEMP critical parts list
P19-101775	1 of 1	A	21 Dec 10	TEMP marking (Azonix)

Issue 3

TEMP Module

Drawing No.	Sheets	Rev.	Date (Sira stamp)	Title
10-500427	1 to 11	B	02 Aug 11	TEMP IS sector diagram & schematic
11-500427	1 to 8	A	02 Aug 11	TEMP artwork & silkscreen
19-101874	1 to 2	B	02 Aug 11	TEMP critical parts list

Issue 4

DIO Module

Drawing no.	Sheets	Rev.	Date (Sira stamp)	Title
10-500423	1 to 12	D	27 Mar 12	DIO schematic & IS block diagram
11-500423	1 to 13	D	27 Mar 12	DIO PCB artwork
12-500423	1 of 1	D	27 Mar 12	DIO PCB silkscreen
19-102025	1 to 3	A	27 Mar 12	DIO work instruction
P19-101756	1 to 2	D	27 Mar 12	DIO critical parts list

Issue 5

TEMP Module

Drawing	Sheets	Rev.	Date (Sira stamp)	Title
10-500427	1 to 11	C	10 Dec 13	TEMP, schematic
P19-101775	1 of 1	B	10 Dec 13	TEMP, marking
P19-101874	1 to 3	D	10 Dec 13	TEMP critical parts list

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