



1 **EU-TYPE EXAMINATION CERTIFICATE**

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

3 Certificate Number: **Sira 09ATEX2008X** Issue: **5**

4 Equipment: **nVision™ Reference Pressure Recorder**

5 Applicant: **Crystal Engineering Corp.**

6 Address: 708 Fiero Lane, Suite 9
San Luis Obispo
California 93401
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 60079-11:2007 EN 60079-26:2007
IEC 60079-0:2007 (Used for guidance in respect of marking)

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 1G

Ex ia IIB T4 Ga, Ta = -20°C to +50°C, Approved battery type Rayovac Max Plus 815

Ex ia IIB T4 Ga, Ta = -20°C to +45°C, Approved battery type Duracell MN1500

Ex ia IIB T3 Ga, Ta = -20°C to +50°C, Approved battery type Energizer E91, EN91

Ex ia IIB T3 Ga, Ta = -20°C to +50°C, Approved battery type Duracell MN1500

Project Number 1528

Signed: 

Title: Director of Operations

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EU-TYPE EXAMINATION CERTIFICATE

Sira 09ATEX2008X
Issue 5

13 DESCRIPTION OF EQUIPMENT

The nVision™ Reference Pressure Recorder is a portable battery powered device that is used to log sensor data and calibrate process pressures and 4-20 mA transmitters. It contains an optional 2.4 GHz radio link that allows communication to the non-hazardous area. The equipment is fitted with primary batteries that are secured in place within a battery holder fixed with four corner screws to the underside of the unit.

The enclosure is made from a plastic material and can be fitted with a protective rubber boot. The equipment contains the following inputs, pressure, temperature (RTD) current (mA) voltage and switches. Externally the equipment comprises a membrane keypad and an LCD with a USB connector and sensor input connection facilities. The USB connection is used in the non-hazardous area for communication. It is also able to power the nVision™ Reference Pressure Recorder in the non-hazardous area. Internally the equipment contains a main PCB, a fully or partially encapsulated display/protection board and two factory fitted plug in modules. There is a choice of three types of modules, ma-V, pressure and temperature. The equipment only has space for two and so any combination of these two can occur, with the exception of the mA-V module which may only have one. The mA-V modules are marked with "MA20". The temperature modules are marked with "RTD100" the pressure modules are marked with "PM" and the maximum permitted pressure. These modules are removable by the use of a tool, however, they can be changed by the user, in accordance with the instructions.

Entity Parameters

RTD Module	MA20 Module	
Ui = 0	Ui = 28 V	
Ii = 0	Ii = 93.3 mA	
Pi = 0	Pi = 653.3 mW	
Uo = 9.73 V	Ci = 0.36 µF	
Io = 1.6642 A	Li = 39.1 µH	
Po = 1.1 W	Uo = 6.6 V	
Co = 0.5 µF	Io = 4.45 mA	
Lo = 12 µH *	Po = 7.34 mW	* Total cable inductance between all modules.
	Co = 0.5 µF **	** Dependant on the supply to the terminals but shall not be greater than 0.5 µF.
	Lo = 12 µH *	

Variation 1 - This variation introduced the following changes:

- i. The following modifications were endorsed; the product description being amended to recognise that the method of encapsulation of the display/protection board may differ depending on the build:
 - An alternative MA20 module design was introduced.
 - An alternative LCD assembly design was introduced.



SCHEDULE

EU-TYPE EXAMINATION CERTIFICATE

Sira 09ATEX2008X
Issue 5

Variation 2 - This variation introduced the following change:

- i. The recognition of the introduction of a barometric sensor.

Variation 3 - This variation introduced the following changes:

- i. The modification of the 4AA Power Module:
 - Option 1 - PCA PN: 4931:
 - Fuse F1 changed plus potting compound
 - Resistor R1 changed to 2 Ω , 0.75 W (was 2 Ω , 0.25 W)
 - Active current limiting circuit added.
 - Option 2 - PCA PN: 5052:
 - Fuse F1 changed to pre-encapsulated, certified fuse
 - Resistor R1 changed to 3.30 Ω , 0.75 W (was 2 Ω , 0.25 W)
 - Active current limiting circuit added.
- ii. The LCD Interface Adapter PN 4203-PCA is no longer manufactured and was replaced by PN 4933-PCA.
- iii. Additional Conditions of Manufacture were introduced.

Variation 4 - This variation introduced the following change:

- i. An alternate printed circuit board design for the DUAL ADC Sensor Interface was approved.

14 DESCRIPTIVE DOCUMENTS

14.1 Drawings

Refer to Certificate Annexe.

14.2 Associated Sira Reports and Certificate History

Issue	Date	Report no.	Comment
0	30 April 2009	R52A19587A	The release of the prime certificate.
1	4 February 2010	R21259A/00	The introduction of Variation 1.
2	09 November 2010	R23012A/00	The introduction of Variation 2.
3	26 July 2013	R29000A/00	The introduction of Variation 3.
4	07 October 2015	R70046971A	The introduction of Variation 4
5	15th October 2019	1528	<ul style="list-style-type: none"> • Transfer of certificate Sira 09ATEX2008X 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. <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>

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

- 15.1 Parts of the enclosure may generate an ignition-capable level of electrostatic charge under certain extreme conditions. The user should ensure that the equipment is not installed or used in a location where it may

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SCHEDULE

EU-TYPE EXAMINATION CERTIFICATE

Sira 09ATEX2008X
Issue 5

be subjected to external conditions, which might cause a build-up of electrostatic charge on non-conducting surfaces. Additionally, cleaning of the equipment should be done only with a damp cloth.

- 15.2 The USB connector shall not be used within the hazardous atmosphere. It shall be used in the non-hazardous atmosphere with either "Safety Extra Low Voltage Circuits" (SELV) or "Protective Extra Low Voltage Circuits" (PELV). The USB connector has a Um of 6 V.

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 09ATEX2008X
Equipment: nVision™ Reference Pressure Recorder
Applicant: Crystal Engineering Corp.

Issue 0

Number	Sheet	Rev.	Date (Sira stamp)	Description
4055	1 to 2	A	15 Apr 09	GENERAL ARRANGEMENT
3824	1 to 2	A	15 Apr 09	LABEL, FRONT PANEL, NVISION
4057	1 of 1	A	15 Apr 09	SERIAL NUMBER LABELING DETAIL, CHASSIS, NVISION
3927	1 to 2	B	20 Apr 09	LABEL, REAR, 4AA MODULE
3921-PCA	1 of 1	A	15 Apr 09	PRINTED CIRCUIT ASSEMBLY 4AA BATTERY, NVISION
3921-BOM	1 of 1	A	15 Apr 09	NVISION 4AA BATTERY PRINTED CIRCUIT ASSEMBLY
3795-SCH	1 of 1	A	15 Apr 09	4AA POWER MODULE
3795-PCB	1 of 1	A	15 Apr 09	PRINTED CIRCUIT BOARD, 4AA POWER MODULE, NVISION, MECHANICAL SPECIFICATIONS
3795-ART	1 to 3	A	15 Apr 09	PRINTED CIRCUIT BOARD LAYER DEFINITIONS
3817-PCA	1 of 1	C	15 Apr 09	MAIN BOARD
3817-BOM	1 of 1	C	15 Apr 09	NVISION MAIN PRINTED CIRCUIT ASSEMBLY
3794-SCH	1 to 10	C	15 Apr 09	MAIN PCA, NVISION
3794-PCB	1 of 1	C	15 Apr 09	MAIN BOARD
3794-ART	1 to 6	C	15 Apr 09	PRINTED CIRCUIT BOARD LAYER DEFINITIONS
3957	1 of 1	A	15 Apr 09	LCD MODULE, POTTED, NVISION
3955-PCA	1 of 1	A	15 Apr 09	PRINTED CIRCUIT ASSEMBLY LCD INTERFACE ADAPTER, NVISION
3955-BOM	1 of 1	A	15 Apr 09	NVISION LCD INTERFACE ADAPTER PRINTED CIRCUIT ASSEMBLY
3950-SCH	1 of 1	C	15 Apr 09	LCD INTERFACE ADAPTER - ATEX
3950-PCB	1 of 1	C	15 Apr 09	PRINTED CIRCUIT BOARD, LCD ADAPTER, ATEX MECHANICAL SPECIFICATIONS
3950-ART	1 of 4	C	15 Apr 09	PRINTED CIRCUIT BOARD LAYER DEFINITIONS
3888-PCA	1 of 1	B	15 Apr 09	PRINTED CIRCUIT ASSEMBLY MODULE INTERFACE, NVISION
3888-BOM	1 of 1	B	15 Apr 09	NVISION MODULE INTERFACE PRINTED CIRCUIT ASSEMBLY
3793-SCH	1 of 1	B	15 Apr 09	COMMON SENSOR INTERFACE
3793-PCB	1 of 1	B	15 Apr 09	PRINTED CIRCUIT BOARD COM. MOD. INTERFACE, NVISION MECHANICAL SPECIFICATIONS
3793-ART	1 to 6	B	15 Apr 09	PRINTED CIRCUIT BOARD LAYER DEFINITIONS
3889-PCA	1 of 1	B	15 Apr 09	PRINTED CIRCUIT ASSEMBLY DUAL ADC PRESSURE, NVISION
3889-BOM	1 of 1	B	15 Apr 09	NVISION DUAL ADC PRESSURE PRINTED CIRCUIT ASSEMBLY
3792-SCH	1 of 1	B	15 Apr 09	DUAL ADC SENSOR INTERFACE
3792-PCB	1 of 1	B	15 Apr 09	PRINTED CIRCUIT BOARD, DUAL ADC INTERFACE, NVISION MECHANICAL SPECIFICATIONS
3792-ART	1 to 5	B	15 Apr 09	PRINTED CIRCUIT BOARD LAYER DEFINITIONS
3827-PCA	1 of 1	A	15 Apr 09	PRINTED CIRCUIT ASSEMBLY, RTD INTERFACE, NVISION
3827-BOM	1 of 1	A	15 Apr 09	NVISION RTD INTERFACE MODULE PRINTED CIRCUIT ASSEMBLY
3821-SCH	1 of 1	A	15 Apr 09	RTD INTERFACE
3821-PCB	1 of 1	A	15 Apr 09	PRINTED CIRCUIT BOARD RTD MODULE, NVISION MECHANICAL SPECIFICATIONS
3821-ART	1 to 3	A	15 Apr 09	PRINTED CIRCUIT BOARD LAYER DEFINITIONS
3993-1-PCA	1 of 1	A	15 Apr 09	PRINTED CIRCUIT BOARD ASSEMBLY, MA-VOLT INTERFACE 1

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Certificate Annexe



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Number	Sheet	Rev.	Date (Sira stamp)	Description
3993-1-BOM	1 of 1	A	15 Apr 09	NVISION MA20 PRINTED CIRCUIT ASSEMBLY 1 of 2
3954-1-SCH	1 of 1	A	15 Apr 09	MA-VOLT INTERFACE
3954-1-PCB	1 of 1	A	15 Apr 09	PRINTED CIRCUIT BOARD, MV MODULE, NVISION, MECHANICAL SPECIFICATIONS
3954-1-ART	1 to 4	A	15 Apr 09	PRINTED CIRCUIT BOARD LAYER DEFINITIONS
3993-2-PCA	1 of 1	A	15 Apr 09	PRINTED CIRCUIT BOARD ASSEMBLY, MA20 INTERFACE, NVISION
3993-2-BOM	1 of 1	A	15 Apr 09	NVISION MA20 PRINTED CIRCUIT ASSEMBLY 2 of 2
3954-2-SCH	1 of 1	A	15 Apr 09	MA-VOLT INTERFACE
3954-2-PCB	1 of 1	A	15 Apr 09	PRINTED CIRCUIT BOARD, MV MODULE, NVISION, MECHANICAL SPECIFICATIONS
3954-2-ART	1 to 4	A	15 Apr 09	PRINTED CIRCUIT BOARD LAYER DEFINITIONS

Issue 1

The following drawings were revised as a result of the modification to introduce an alternative MA20 module design:

Drawing	Sheets	Rev.	Date (Sira stamp)	Title
3993-1-PCA	1 of 1	B	14 Jan 10	PRINTED CIRCUIT BOARD ASSEMBLY, MA-VOLT INTERFACE 1
3993-1-BOM	1 of 1	B	14 Jan 10	NVISION MA20 PRINTED CIRCUIT ASSEMBLY 1 of 2
3954-1-SCH	1 of 1	C	14 Jan 10	MA-VOLT INTERFACE
3954-1-PCB	1 of 1	C	14 Jan 10	PRINTED CIRCUIT BOARD, MV MODULE, NVISION, MECHANICAL SPECIFICATIONS
3954-1-ART	1 to 4	C	14 Jan 10	PRINTED CIRCUIT BOARD LAYER DEFINITIONS
3993-2-PCA	1 of 1	B	14 Jan 10	PRINTED CIRCUIT BOARD ASSEMBLY, MA20 INTERFACE, NVISION
3993-2-BOM	1 of 1	B	14 Jan 10	NVISION MA20 PRINTED CIRCUIT ASSEMBLY 2 of 2
3954-2-SCH	1 of 1	C	14 Jan 10	MA-VOLT INTERFACE
3954-2-PCB	1 of 1	C	14 Jan 10	PRINTED CIRCUIT BOARD, MV MODULE, NVISION, MECHANICAL SPECIFICATIONS
3954-2-ART	1 to 4	C	14 Jan 10	PRINTED CIRCUIT BOARD LAYER DEFINITIONS

The following new drawings were included as a result of the modification to introduce an alternative LCD assembly design:

Drawing	Sheets	Rev.	Date (Sira stamp)	Title
4233	1 of 1	A	04 Feb 10	LCD MODULE ASSY, NVISION
4203-BOM	1 of 1	A	14 Jan 10	NVISION LCD INTERFACE ADAPTER PRINTED CIRCUIT ASSEMBLY
4203-PCA	1 of 1	A	14 Jan 10	PRINTED CIRCUIT ASSEMBLY LCD INTERFACE ADAPTER NVISION
4196-SCH	1 of 1	A	14 Jan 10	LCD INTERFACE - ATEX
4196-PCB	1 of 1	A	14 Jan 10	PRINTED CIRCUIT BOARD, LCD ADAPTER, ATEX MECHANICAL SPECIFICATIONS

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Drawing	Sheets	Rev.	Date (Sira stamp)	Title
4196-ART	1 to 3	A	14 Jan 10	PRINTED CIRCUIT BOARD LAYER DEFINITIONS

Issue 2

The following drawings were included as a result of the introduction of a barometric sensor.

Drawing	Sheets	Rev.	Date (Sira stamp)	Title
4386-SCH	1 of 1	B	01 Nov 10	Schematic, 24/16 bit barometric sensor
4386-PCB	1 of 1	B	01 Nov 10	Printed circuit board BARO sensor interface mechanical specifications
4396-BOM	1 of 1	B	01 Nov 10	BOM, barometric module printed circuit assembly
4396-PCA	1 of 1	B	01 Nov 10	Printed circuit assembly barometric module, NVision
4480	1 of 1	A	01 Nov 10	Pressure sensing element barometric
4055	1 to 2	B	01 Nov 10	General arrangement drawing NVision

Issue 3

Drawing	Sheets	Rev.	Date (Sira stamp)	Title
4930-PCB	1 of 1	B	19 Jul 13	PRINTED CIRCUIT BOARD 4AA POWER MODULE, MECHANICAL SPECIFICATION
4930-SCH	1 of 1	B	19 Jul 13	4AA POWER MODULE
4931-AML	1 of 1	E	19 Jul 13	4AA POWER MODULE, APPROVED MANUFACTURER LIST (AML)
4931-PCA	1 of 1	E	19 Jul 13	PRINTED CIRCUIT ASSEMBLY 4AA BATTERY
4872	1 of 1	B	19 Jul 13	SHELL, ENCAPSULATION
4932-PCB	1 of 1	B	19 Jul 13	PRINTED CIRCUIT BOARD LCD ADAPTER, MECHANICAL SPECIFICATION
4932-SCH	1 of 1	B	19 Jul 13	LCD INTERFACE
4933-AML	1 of 1	E	19 Jul 13	LCD ADAPTER, APPROVED MANUFACTURER LIST (AML)
4933-PCA	1 of 1	E	19 Jul 13	PRINTED CIRCUIT ASSEMBLY LCD INTERFACE ADAPTER
5178	1 of 1	B	19 Jul 13	CONTROL DRAWING SAFETY CRITICAL DISTANCES FOR PCA 4933
5051-PCB	1 of 1	C	19 Jul 13	PRINTED CIRCUIT BOARD 4AA POWER MODULE, MECHANICAL SPECIFICATION
5051-SCH	1 of 1	C	19 Jul 13	4AA POWER MODULE
5052-AML	1 of 1	C	19 Jul 13	4AA POWER MODULE, APPROVED MANUFACTURER LIST (AML)
5052-PCA	1 of 1	C	19 Jul 13	PRINTED CIRCUIT ASSEMBLY 4AA BATTERY

Issue 4

Drawing	Sheets	Rev.	Date (Sira stamp)	Description
5541-PCB	1 of 1	A	25-Sep-15	Printed circuit board, DUAL ADC Sensor Interface, Mechanical Specification
5541-SCH	1 of 1	A	25-Sep-15	DUAL ADC SENSOR Interface (Alternate PCB)
5542-AML	1 of 1	A	25-Sep-15	DUAL ADC SENSOR Interface, Approved Manufacturer List
5542-PCA	1 of 1	A	25-Sep-15	DUAL ADC SENSOR Interface, Printed Circuit Assembly

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