IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	IECEx SIR 09.0053X issue No.:2	Certificate history: Issue No. 2 (2010-11-15) Issue No. 1 (2010-2-26) Issue No. 0 (2009-5-1)
Status:	**Current**	
Date of Issue:	**2010-11-15**	Page 1 of 5

Applicant: **Crystal Engineering Corp.**
708 Fiero Lane, Suite 9
San Luis Obispo
California 93401
United States of America

Electrical Apparatus: **nVision™ Reference Pressure Recorder**
Optional accessory:

Type of Protection: **Intrinsic Safety**

Marking: **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

Approved for issue on behalf of the IECEx Certification Body: D R Stubbings BA MIET

Position: Certification Manager

Signature:
(for printed version)

Date: 2010-11-15

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

SIRA Certification Service
Rake Lane
Eccleston
Chester
CH4 9JN
United Kingdom

sira CERTIFICATION

IECEx Certificate of Conformity

Certificate No.: IECEx SIR 09.0053X

Date of Issue: **2010-11-15** Issue No.: **2**

Manufacturer: **Crystal Engineering Corp.**
708 Fiero Lane, Suite 9
San Luis Obispo
California 93401
United States of America

Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2004 Edition: 4.0	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
IEC 60079-11 : 2006 Edition: 5	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-26 : 2006 Edition: 2	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

GB/SIR/ExTR09.0024/00
GB/SIR/ExTR10.0023/00
GB/SIR/ExTR10.0274/00

Quality Assessment Report:
CA/CSA/QAR07.0004/00
CA/CSA/QAR07.0004/01
CA/CSA/QAR07.0004/02

IECEx Certificate of Conformity

Certificate No.: IECEx SIR 09.0053X

Date of Issue: **2010-11-15** Issue No.: **2**

Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

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.

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
	Co = 0.5 µF **
	Lo = 12 µH *

* Total cable inductance between all modules
** Dependant on the supply to the terminals but shall not be greater than 0.5 µF

CONDITIONS OF CERTIFICATION: YES as shown below:

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 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.
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.

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Date of Issue: **2010-11-15** Issue No.: **2**

EQUIPMENT(continued):

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.

The Manufacturer shall note the following condition of manufacture:

1. Only one MA20 module may be used in any one nVision™ Reference Pressure Recorder.

IECEx Certificate of Conformity

Certificate No.: IECEx SIR 09.0053X

Date of Issue: **2010-11-15** Issue No.: **2**

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Issue 1 – this Issue introduced the following changes:	
1	The following changes 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.
Issue 2 – this Issue introduced the following change:	
1	The recognition of the introduction of a barometric sensor.

1 **EC TYPE-EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

3 Certificate Number: **Sira 09ATEX2008X** Issue: **2**

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

5 Applicant: **Crystal Engineering Corp.**

6 Address: 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 Sira Certification Service, notified body number 0518 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, 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 special conditions for safe use specified in the schedule to this certificate.

11 This EC 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 23012
C. Index 12

D R Stubbings BA MIET
Certification Manager

This certificate and its schedules may only be reproduced in its entirety and without change.

Sira Certification Service
Rake Lane, Eccleston, Chester, CH4 9JN, England
Tel: +44 (0) 1244 670900
Fax: +44 (0) 1244 681330
Email: info@siracertification.com
Web: www.siracertification.com

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
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Uo = 9.73 V	Ci = 0.36 µF
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Co = 0.5 µF	Io = 4.45 mA
Lo = 12 µH *	Po = 7.34 mW
	Co = 0.5 µF **
	Lo = 12 µH *

* Total cable inductance between all modules.

** Dependant on the supply to the terminals but shall not be greater than 0.5 µF.

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.

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Web: www.siracertification.com

Variation 2 - This variation introduced the following changes:

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

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.

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 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.

17 CONDITIONS OF CERTIFICATION

17.1 The use of this certificate is subject to the Regulations Applicable to Holders of Sira Certificates.

17.2 Holders of EC type-examination certificates are required to comply with the production control requirements defined in Article 8 of directive 94/9/EC.

17.3 Only one MA20 module may be used in any one nVision™ Reference Pressure Recorder.

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Email: info@siracertification.com
Web: www.siracertification.com

CRYSTAL
engineering corporation

EC Declaration of Conformity

Issued in accordance with the ATEX Directive 94/9/EC

Manufacturer:	Crystal Engineering Corporation 708 Fiero Lane, Suite 9 San Luis Obispo, CA, 93401 USA
Products:	nVision Reference Pressure Recorder *is in conformity with the provisions of the Directive 94/9/EC for use in potentially explosive atmospheres*
Marking:	II 1 G Ex ia IIB T4 Ga, Ta = -20C to 50C, Rayovac Max Plus 815 II 1 G Ex ia IIB T4 Ga, Ta = -20C to 45C, Duracell MN1500 II 1 G Ex ia IIB T3 Ga, Ta = -20C to 50C, Energizer E91, EN91 II 1 G Ex ia IIB T3 Ga, Ta = -20C to 50C, Duracell MN1500
Harmonized Standards:	EN 60079-0: 2006 EN 60079-11: 2007 EN 60079-26: 2007 IEC 60079-0: 2007 (Marking Guidance)
EC-Type Examination Certificate:	Sira 09ATEX2008X Sira Certification Service, Notified Body 0518 Rake Lane, Eccleston, Chester, CH4 9JN England
EC Directives:	94/9/EC ATEX Directive 2004/108/EC EMC Directive 97/23/EC PED Directive

Name: David K. Porter, P.E.
Title: Director of Engineering
Date: 23 Feb 2012

EC Declaration of Conformity

CE

I/We

Crystal Engineering Corporation

of

708 Fiero Lane, Suite 9
San Luis Obispo, CA, 93401
USA

declare that

nVision Series Reference Pressure Recorder

In accordance with the following directives

2004/108/EC **The Electromagnetic Compatibility Directive per:**
CISPR 11:2003
EN 61326:2006

has been designed and manufactured to the following specifications

Pressure Modules (PM)

CISPR 11:2003	Radiated Emissions	Class B	Pass
EN 61326-1:2006 / EN 61000-4-2:2009	Electrostatic Discharge	Criteria C	Pass (1)
EN 61326-1:2006 / EN 61000-4-3:2006	RF Radiated Immunity		Pass

(1) Pressure changed value and/or unit reset when ESD was applied to the PM module

Current & Voltage Module (MA20)

CISPR 11:2003	Radiated Emissions	Class B	Pass
EN 61326-1:2006 / EN 61000-4-2:2009	Electrostatic Discharge	Criteria A	Pass
EN 61326-1:2006 / EN 61000-4-3:2006	RF Radiated Immunity		Pass

Temperature Module (RTD100)

CISPR 11:2003	Radiated Emissions	Class B	Pass
EN 61326-1:2006 / EN 61000-4-2:2009	Electrostatic Discharge	Criteria B	Pass (2)
EN 61326-1:2006 / EN 61000-4-3:2006	RF Radiated Immunity		Pass

(2) Temperature changed value when ESD was applied to RTD100 module

Barometric Reference Module (BARO)

CISPR 11:2003	Radiated Emissions	Class B	Pass
EN 61000-4-2:2009	Electrostatic Discharge	Criteria A	Pass
EN 61000-4-3:2006	RF Radiated Immunity		Pass

I hereby declare that the equipment named above has been designed to comply with the relevant sections of the above referenced specifications. The unit complies with all essential requirements of the Directives

David K. Porter, P.E.
(NAME OF AUTHORIZED PERSON)

Director of Engineering
(TITLE OF AUTHORIZED PERSON)

(SIGNATURE OF THE AUTHORIZED PERSON)

24 January 2012
(DATE OF ISSUE)

UKAS TESTING
0327

sira
CERTIFICATION
Rake Lane, Eccleston,
Chester, CH4 9JN, England

Tel: +44 (0) 1244 670900
Fax: +44 (0) 1244 681330
Email: info@siracertification.com
Web: www.siracertification.com

TEST CERTIFICATE

ISSUED BY SIRA TEST & CERTIFICATION LIMITED

TEST FOR THE INGRESS PROTECTION OF AN nVISION HAND HELD CALIBRATOR

Supplier:	Crystal Engineering Corporation 708 Fiero Lane Suite 9 San Luis Obispo California 93401 USA
Model or Type Identification:	nVision hand held calibrator
Standard:	BS EN 60529:1992 Incorporating Amendments Nos 1 and 2
Deviations from Standard:	None
ST&C Test Procedure:	LOP 220
ST&C Test Reports:	09/0179 and N52A19587A
Samples Delivery Date:	9 March 2009
Tests Conducted Between:	23 to 26 March 2009

IP67

This certificate refers to the performance of the test samples when tested against the agreed programme. It does not imply that any other samples or products necessarily comply with the requirements of the test programme.

Sira Test & Certification Limited being a UKAS accredited Test House in accordance with ISO/IEC 17025 has tested the above nVision hand held calibrator, and has found it to comply with the requirements of the Ingress Protection Code: IP 67.

S P Cork
Laboratory Manager

Dated 14 April 2009

This certificate may only be reproduced in its entirety and without change

Certificate No: Sira 52A19587ALab
Form 6240, Issue 8

a Volvere plc group company

Sira Test & Certification Ltd
Accredited certification and EU Notified Body activities are undertaken by Sira Certification Service

Registered in England: No 05569145

Registered Office:
Europa House, 310 Europa Boulevard,
Gemini Business Park, Warrington, WA5 7YQ

EC Declaration of Conformity

CE

I/We

Crystal Engineering Corporation

of

708 Fiero Lane, Suite 9
San Luis Obispo, CA, 93401
USA

declare that

nVision Laboratory Reference
NL-LAB

In accordance with the following directives

2004/108/EC — **The Electromagnetic Compatibility Directive per:**
CISPR 11: 2003
EN 61326: 2006

has been designed and manufactured to the following specifications

CISPR 11: 2003	Conducted Emissions	Class A	Pass
CISPR 11: 2003	Radiated Emissions	Class A	Pass
EN 61000-3-2: 2005	Harmonics		Pass
EN 61000-3-3: 2006	Voltage Fluctuations & Flicker		Pass
EN 61000-4-2: 2001	Electrostatic Discharge		Pass
EN 61000-4-3: 2006	Radiated Immunity		Pass
EN 61000-4-4: 2004	Electrical Fast Transient / Burst		Pass
EN 61000-4-5: 2005	Surge Immunity		Pass
EN 61000-4-6: 2006	Conducted Immunity		Pass
EN 61000-4-8: 2001	Magnetic Field Immunity		Pass
EN 61000-4-11: 2004	Voltage Dips and Interrupts		Pass

I hereby declare that the equipment named above has been designed to comply with the relevant sections of the above referenced specifications. The unit complies with all essential requirements of the Directives

David K. Porter, P.E.
(NAME OF AUTHORIZED PERSON)

Director of Engineering
(TITLE OF AUTHORIZED PERSON)

(SIGNATURE OF THE AUTHORIZED PERSON)

2 July 2010
(DATE OF ISSUE)