

30 Series PRESSURE CALIBRATOR

Operation Manual



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Introduction

Thank you for choosing a Pressure Calibrator from Crystal Engineering Corporation.

The **30 Series** are compact and rugged pressure calibrators designed to bring laboratory accuracy to outdoor field conditions. Every **30 Series** Calibrator is fully temperature compensated through extensive testing of all measured parameters while being exposed to environments of 0°C (32°F) to 50°C (122°F).

All **30 Series** calibrators are intended for gauge pressure measurement. That is, they indicate the difference between applied pressure and ambient barometric pressure. The zero button also can be used as a tare function - extending the functionality of the calibrator for special applications.

They weigh less than a pound and advanced technology is employed throughout the product line. Sensors are constructed with stainless steel isolation diaphragms and permanent oil fill. This means **30 Series** products can be used with gases and liquids.

Long battery life is achieved with a low power, RISC (reduced instruction set) type micro-controller for computation of complex algorithms. A 24 bit analog to digital converter provides internal resolution of 1 part in 16.7 million. Internal resolution always exceeds the displayed resolutions for all measurements. Full accuracy is maintained even while the low battery icon is flashing.

The **30 Series** is specified in percent of reading - instead of percent of scale. Why? Because one calibrator could replace a series of calibrators by covering a wide range of pressure with high accuracy.

There are no internal potentiometers: All adjustments are accomplished via the optically isolated RS-232 interface. Power for the RS-232 communication is provided by the host PC. Therefore, there are no exposed "live" pins when not connected to a PC.

Your **30 Series** can be customized through the use of ConfigM30™ software available from Crystal Engineering. Your personal computer can disable, enable or modify a variety of features of your **30 Series**. Look for the **CONFIGM30PROGRAMMABLE** logo for programmable features, like:

- add or create new pressure units and/or disable unused pressure units
- password protection to prevent unauthorized changes
- load and save custom configurations
- view and print an *as received* versus *as left* change report
- select your preferred H2O water density: 4°C, 60°F, or 68°F/20°C
- store a message or identification number
- adjust (calibrate) the gauge

Finally, the **30 Series** is manufactured and serviced by a company that only makes pressure measuring equipment. It's the only thing we do and that's why we say: **PRESSURE is Our BUSINESS™**

Operating Instructions

To ensure safe and accurate operation, please be familiar with the following warnings:

WARNING: Severe injury or damage can occur through improper use of pressure instruments! Do not exceed recommended pressure limits of tubing and fittings. Be certain all pressure connections are secured.

WARNING: This gauge can display zero pressure when connected to a source of pressure! Do not rely on the display indication before disconnecting - it may not be indicating true pressure. Never disconnect pressure instrumentation without first relieving system pressure!

CAUTION: Never insert any object (other than the 1/8" NPT fitting) into the pressure connection! The sensor diaphragm is very thin and can be damaged or destroyed by solid or sharp objects. Cleaning of the sensor must be done with appropriate solvents only.

Zero

To make sure that the calibrator is performing to its rated accuracy, it should be exercised and re-zeroed whenever exposed to changes in temperature (see Specifications). It's also good practice to check zero as your final reading too, as these calibrators should return to a perfect zero reading. The 30 series does not automatically re-zero when first turned on. The zero button can be used as a "tare" button because it will "zero out" any value the selected range is capable of displaying. **The zero reading may also shift when the calibrator is moved from a vertical to a horizontal orientation.** This is due to the oil filling that transmits the pressure signal from the stainless steel diaphragm to the silicon pressure sensor. The magnitude of the shift is typically 0.3"H₂O or less.

Over-range Indication

Over-range conditions will be indicated regardless of the tare value. If the full scale rating of either the low or high pressure sensor are exceeded by 10% or more, appropriate warning messages will be displayed. Also, if the milliamp input exceeds 55 mA a warning message will appear.

Model 33 Only: These messages will only appear if the parameter being measured is selected for display. For example, if the milliamp input is greater than 55 mA, but milliamps is not selected for display, no over-range warning will be indicated. (The milliamp input is protected by a semiconductor type fuse that automatically resets once the fault condition is removed.)

Contrast button

The contrast button, left of the display, may never have to be pressed. It is provided to compensate in slight contrast changes with temperature and component aging. Press the button and the contrast will increase. If you press the contrast button repeatedly enough times the display will jump to the *least* contrast setting, allowing you to adjust it darker until you get the best contrast and legibility.

Units buttons and mA / % button

Pressing the units button updates the display to the next unit selection. The mA button scrolls through direct milliamps, %4-20 and %10-50.

The pressure calibrator will display the following combinations of pressure and/or milliamps:

Top Line	36.000LP	20.000mA	36.000LP
Bottom Line	20.000mA	3000.0HP	3000.0HP

If LP, HP or mA are not being displayed, press the respective button and the parameter will appear. If the parameter is already on screen, pressing the corresponding button will cause it to cycle to the next scale or units for that button.

On/Off button

This function is obvious. What is not obvious is that all the settings are saved when you turn the unit off. When you turn the unit back on it will be set to the same combinations of ranges and scales. Even the zero or tare value stays the same.

Changing the battery

The battery is located on top of the unit, under the sliding cover. **Batteries must only be changed in a non-hazardous area!** The best way to change the battery is to first turn off the unit, then replace the battery. All settings will be retained if battery replacement is done this way. If the unit is stored for a long time, the battery should be removed, to avoid potential damage from battery leakage. If the battery has been removed for storage or the battery was disconnected while the unit was on, the unit will automatically reset 5 to 10 seconds after reconnecting the battery.

WARNING: The 30 Series is approved for use in potentially explosive atmospheres only if powered by one of the following battery types: Duracell Alkaline 9V, MN 1604; Eveready Energizer Alkaline 9V, 522; Eveready Energizer Lithium 9V, L522; Varta High Energy Alkaline 9V, 4922.

Reset

If, for some reason the unit needs to be reset, remove the battery. Either wait one minute, or short circuit the battery snap connections with any metal object. If the reset is successful the unit will begin operating when the battery is reconnected without pressing the "ON" button.

Measuring Vacuum

All sensors in 30 Series calibrators can be used to measure vacuum, but only ranges rated at 300 PSI (2000 kPa) or less have actually been certified. (Refer to your calibration certificate.) When measuring pressure less than ambient conditions the display will show a minus (-) sign in the left most position. On some scales (like kilograms per square centimeter which has 4 decimal places of resolution), this will cause the display to shift right one digit. Resolution won't be lost, but part of the range icon will disappear until positive pressure is restored.

CAUTION: 30 Series calibrators are not recommended for continuous use a high vacuum.

Calibration

There are no potentiometers in the 30 series. All adjustments are made through the RS232 interface. If adjustment is required, we recommend returning the unit to the factory, though we do offer software that allows you to adjust the gauge and reset the calibration due date. Refer to the Software descriptions later in this book.

Factory service offers benefits you won't find anywhere else. We have the facilities to provide calibration reports that include test data at a variety of temperatures utilizing NIST traceable standards. In addition, upgrades may be available to add or enhance operating features. We designed the product to last, and we support it so that you can get the most from your investment.

30 Series Model Numbering System

To determine the specifications for your model, use this table to decode the model number.

Available Units	Intrinsic Safety	Model	Sensors	1st Pressure Range Prefix	2nd Pressure Range Prefix	Pressure Unit	Manifold
SI	- IS	3	3	- 200	/ 2000	KPA	- SPSS
Standard (omit)			Single Sensor: 1			PSI: PSI	Standard (omit)
Metric units only: SI			Dual Sensor: 3			bar: BAR	Stainless Steel: SPSS
						kPa: KPA	

Serial Numbering System

The serial number of your 30 Series is located on the rear of the product. Serial numbers consist of 10 numbers, with the left-most digit of the second grouping representing the year of manufacturing. For example 043468 was manufactured in 2010.

Specifications

Note: Accuracy specifications are for one year, and include all effects of linearity, hysteresis, repeatability and temperature, within the specified operating temperature range.

Exposure to environmental extremes of temperature, shock or vibration may warrant a more frequent period.

Pressure

0 to Full Scale $\pm(0.05\%$ of Reading + Floor Term^{*})

^{*} Floor Term = 0.005% of FS or display resolution, whichever is greater.
See page 9 for resolution table.

Vacuum

$\pm(0.25\%$ of Reading + Vacuum Floor Term[†])

- [†] Vacuum Floor Term (VFT):
 - For 16 and 36 PSI, VFT = 0.004 PSI
 - For 300 PSI, VFT = 0.01 PSI
 - For 1 or 2 bar, and 100 or 200 kPa, VFT = 0.0003 bar or 0.03 kPa
 - For 20 bar or 2000 kPa, VFT = 0.001 bar or 0.1 kPa

Vacuum operation is not specified for 600 PSI (40 bar/4000 kPa) models and higher. However, all models can be safely connected to vacuum. The 30 Series calibrator is not recommended for continuous use at high vacuum.

Temperature

Operating & Compensated Range 0°C to 50°C (32°F to 122°F)

Storage Range -20°C to 70°C (-4°F to 158°F)

Humidity

Temperature Range	Humidity
0 to 10°C	Uncontrolled
10 to 30°C	0 to 95% Relative
30 to 40°C	0 to 75% Relative
40 to 50°C	0 to 45% Relative

SI (metric) Versions

“SI” is the French acronym for the International System of Units. 30 Series products with “KPA” in the part number are intended for markets where **only** SI units are permitted. Therefore, these models only have kPa and/or MPa, bar and/or mbar available.

Media Compatibility (LP and HP)

Liquids and gases compatible with PTFE (Polytetrafluoroethylene) penetrated, hard anodized aluminum (transducer housing), 316 stainless steel (sensor), and Viton® (O-ring). (Viton is a registered trademark of Dupont Dow Elastomers.)

Products with the letters "SPSS" in the suffix of the part number (e.g., "IS33-36/3000-SPSS"), have stainless steel manifolds and therefore the only wetted materials are stainless steel and Viton.

Pressure Conversions

- 1 PSI = 27.6806 inches of water column (water at 4°C [39.2°F])
- 703.087 millimeters of water column (water at 4°C [39.2°F])
- 70.3087 centimeters of water column (water at 4°C [39.2°F])
- 2.03602 inches of mercury (mercury at 0°C [32°F])
- 51.7149 millimeters of mercury (mercury at 0°C [32°F])
- 6.8948 kilopascals
- 0.070307 kilograms per square centimeter
- 0.068948 bar
- 68.948 millibar
- 0.0068948 megapascals

Note: Other conversions may have been specified at time of order. Refer to your certificate of calibration for details.

Electrical

- Range..... 0 to 55 mA
- Resolution..... 0.001 mA
- Accuracy ±(0.025% of reading + 0.001 mA)
- Maximum voltage 30VDC
- Maximum Current 100mA

Note: When connecting to circuits that included HART transmitters, a 250 ohm resistor must be placed in series with the calibrator, to prevent damage to the calibrator and any other equipment connected to the loop.

Power

Battery	One Alkaline or Lithium 9V battery
Approved Batteries	The 30 series is approved for use in potentially explosive atmospheres only if powered by one of the following battery types:
	Duracell® Alkaline 9V, MN 1604
	Eveready® Energizer® Alkaline 9V, 522 *
	Eveready® Energizer® Lithium 9V, L522 *
	Varta High Energy Alkaline 9V, 4922.

* Energizer is manufactured by Energizer Holdings, Inc., and the Eveready Battery Company, Inc.

Battery Life	90 hours typical
Low Battery Indicator	Flashing battery icon

Many other battery types and models have been tested but failed to meet the requirements for potentially explosive atmospheres—do not assume other models are equivalent.

Warning: Do not use the micro USB serial interface in a hazardous atmosphere.

Connections

Pressure Fitting	1/8" female NPT
Milliamperes	4mm jacks, 19mm (0.75") spacing
Communication	micro USB

Accessories



We offer a full range of accessories, including hand pumps, our specialized line of pressure fittings, hoses, fitting and hose kits, silicone test lead sets and the most complete and compact waterproof carrying cases available.

The carrying cases (with custom diecut foam inserts) can be ordered complete with all the accessories you need to maximize your productivity on the job. Refer to product brochures for more information.

You can also contact your local distributor, or any of the contact numbers or addresses at the back of this manual, for more information.

CPF: Crystal Pressure Fittings



Crystal supplies a full range of fittings (available individually or grouped into kits) for use with both the 30 Series calibrator and our portable handpumps. For a complete list of fittings and fitting kits available, contact your local distributor, or use one of the numbers listed on the inside back page to speak directly to Crystal's knowledgeable, helpful sales staff.

USB Cable



The durable and high-speed Micro-USB cable enables data transfer in the most convenient form.

USB A to micro USB Cable 6' [1.8m] P/N: 4431

Test Leads



Our test lead kit features high quality banana to banana test leads with rugged, hard plastic insulated alligator clips.

Test Lead Kit P/N: 1351

Handpumps



Crystal offers two different handpump options. Both provide a portable pressure source for the calibration of 30 Series calibrators, as well as other high pressure gauges, recorders, switches, and transmitters. A built-in variable volume control makes it easy to set precise pressure with the turn of a dial.

Additionally, the ComboPump can serve as both as both a pressure and vacuum source.

Hydraulic Pumps

5000 PSI: P/N 4182

ComboPumps

500 PSI: P/N 2908

Software

ConfigM30: Customize your calibrator! Eliminate scales you don't need, calibrate the gauge, create custom scales and password protect the calibrator from future changes! Available from our website at www.crystalengineering.net. (Requires micro USB cable , PN 4431).

LabVIEW™ Drivers: The Model 30 LabVIEW Driver Library is a set of VIs that implement the serial commands of the Model 30. The library also provides parsing of the streaming data output, placing it into a simple cluster for easy access.

SerialDL: SerialDL is a free command line program that will log data from any 30 Series pressure calibrator, create a comma delimited text file, and can automatically format the data into a Microsoft® Excel spreadsheet.

Units, Resolution and Maximum Pressure Ratings

Your unit will have two of these pressure ranges and corresponding display resolution:

Pressure Range				Available Pressure										
PSI ¹	bar ²	kPa ³	Over-pressure	PSI	kg/cm ²	inch Hg	inch H ₂ O	mmHg	cmH ₂ O	mmH ₂ O	kPa	MPa	mbar	bar
16	1	100	6.5 x	0.001	0.0001	0.001	0.01	0.01		1	0.01		0.1	0.0001 ⁴
36	2	200	3.0 x	0.001	0.0001	0.001	0.01	0.01		1	0.01		0.1	0.0001 ⁴
300	20	2000	2.0 x	0.01	0.001	0.01	0.1	0.1	1		0.1		1	0.001
600	40	4000	2.0 x	0.01	0.001						0.1	0.0001		0.001
1500	100	10000	2.0 x	0.1	0.01						1	0.001		0.01
3000	200	20000	1.5 x	0.1	0.01						1	0.001		0.01
5000	300	30000	1.5 x	0.1	0.01						1	0.001		0.01

¹ PSI versions with ranges of 36 PSI and lower include all possible scales except bar.

² bar versions with ranges of 2 bar and lower include all possible scales except inch Hg, cmH₂O, and MPa.

³ kPa versions are restricted to kPa, MPa, bar and/or millibar, depending on pressure range.

⁴ Applies to bar and kPa only.

Enclosure

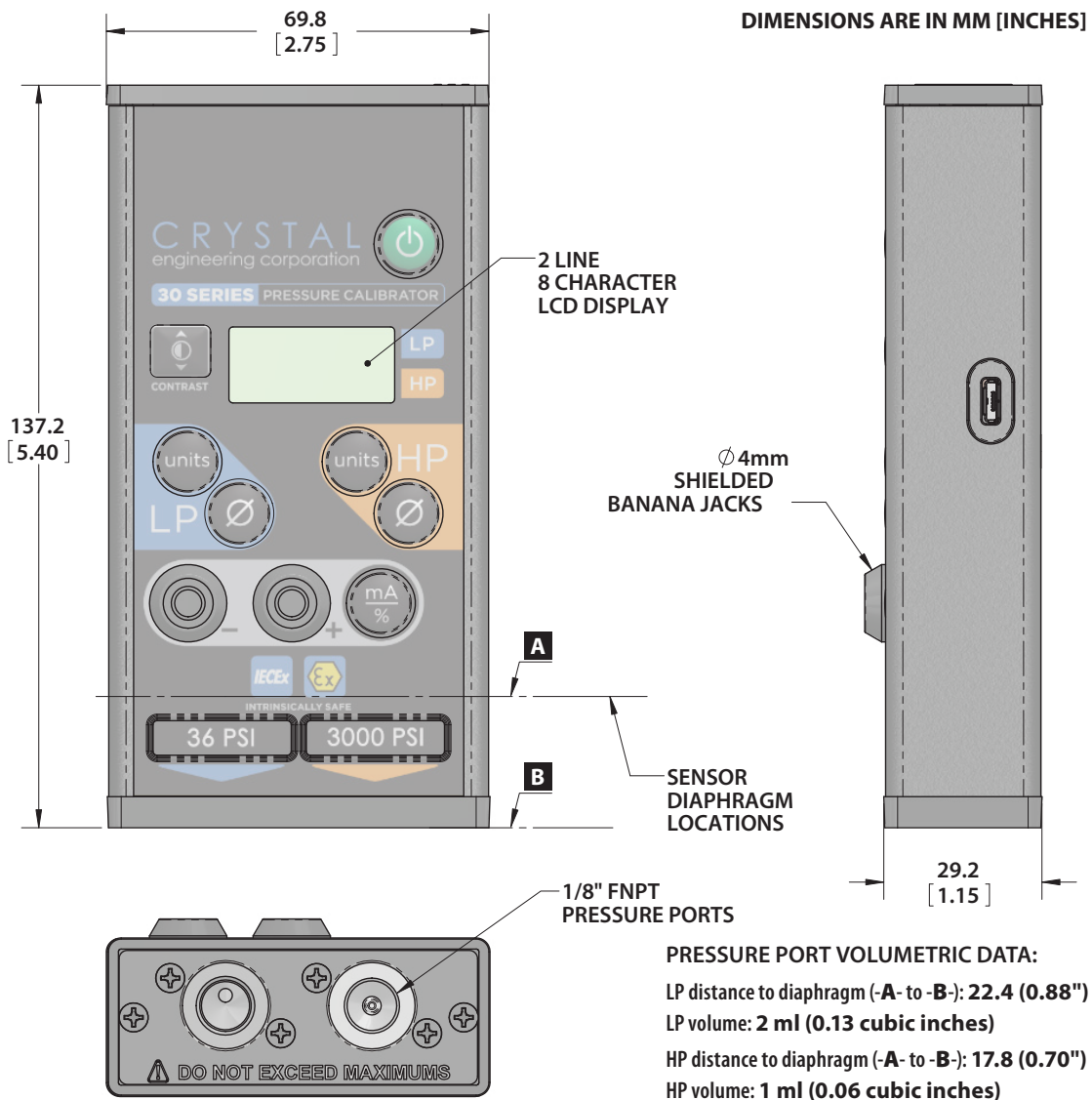
Description..... Extruded Aluminum with sealed membrane keypad.

Weight:..... Model 33 - 400g (14.0 oz); Model 31 - 342g (12.0 oz.);
Model 31, High Pressure - 360g (13.0 oz.)

Weight w/SS Manifold:..... Model 33 - 485g (17.0 oz); Model 31 - 428g (15.0 oz.);

Carry Case w/strap: PN 2490 (included). Clear cover protects keypad - calibrator can be operated while in case. Also provides a way to hang the calibrator while in use.

Hazardous Locations



The 30 Series pressure calibrator includes the following Intrinsic Safety approvals:

II 2G Ex ia IIC T4 Gb



FTZU 06 ATEX0010X

This product conforms to the following standards:

EN60079-0: 2006 | EN60079-11: 2007



IECEX FTZU 10.0018X

This product conforms to the following standards:

IEC 60079-0: 2007 | IEC 60079-11: 2006

Milliamp Input Entity Parameters:

U _i =30V	U _o =9.9V
I _i =100mA	I _o =2.62mA
P _i =0.75W	P _o =6.5mW
C _i =0	C _o =3.2uF
L _i =0	L _o =100uH

Entity parameters specify the safe voltage, current, capacitance and inductance that can either be connected to the device, or is internal to the device.

T_a = 0C to 50C

WARNINGS

The mini USB B 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 an U_m of 6V.

Substitution of components may impair intrinsic safety.

Replace batteries with approved type in non-hazardous locations only.

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.

Certifications

The 30 Series has been tested and certified to comply with a variety of international standards.

Crystal Engineering declares that the 30 Series has been designed and manufactured in accordance with the Electromagnetic Compatibility Directive and the Pressure Equipment Directive.

ATEX Safety Instructions

Bezpečnostní instrukce pro prostředí s nebezpečím výbuchu – ČESKY (Czech)

- V prostředí s nebezpečím výbuchu nepoužívejte přípojku RS-232.
- Baterie vyměňujte pouze v bezpečném prostředí. Používejte pouze schválené baterie.
- Za správné použití tohoto přístroje v prostředí s nebezpečím výbuchu odpovídá jeho uživatel.

Schválené baterie – ČESKY (Czech)

Přístroj 30 Series je jiskrově bezpečný pouze pokud je napájen jedním z následujících typů baterií:

- Duracell® Alkaline 9V, MN1604
- Eveready® Energizer® Alkaline 9V, 522
- Eveready® Energizer® Lithium 9V, L522
- Varta® High Energy Alkaline 9V, 4922

Mnoho dalších druhů a typů baterií bylo zkoušeno, ale nesplnily požadavky na jiskrovou bezpečnost - nepředpokládejte, že jiné typy jsou rovnocenné.

Energizer vyrábí Energizer Holdings, Inc. a the Eveready Battery Company, Inc.

Sicherheitshinweise für explosionsgefährdeten Orten – DEUTSCH (German)

- Die RS-232 Schnittstellenverbindung darf niemals in einer explosionsgefährdeten Umgebung benutzt werden.
- Der Batteriewechsel muß ausschließlich in sicherer Umgebung mit den vom Hersteller vorgeschriebenen Batterie-Typen erfolgen.
- Der Benutzer ist für den richtigen Umgang des Digitalmanometers in explosions- gefährdeter Umgebung verantwortlich.

Vom Hersteller vorgeschriebene Batterien – DEUTSCH (German)

Das 30 Series ist nur dann eigensicher, wenn die vom Hersteller vorgeschriebenen Batterien eingesetzt werden:

- Duracell® Alkaline 9V, MN1604
- Eveready® Energizer® Alkaline 9V, 522
- Eveready® Energizer® Lithium 9V, L522
- Varta® High Energy Alkaline 9V, 4922

Es wurden viele andere Batterietypen vom Hersteller getestet, aber diese haben den Hersteller-Anforderungen für Eigensicherheit nicht entsprochen

Aus diesem Grund dürfen nur vom Hersteller vorgeschriebene Batterie-Typen in das Gerät eingesetzt werden, um die Eigensicherheit zu gewährleisten.

Energizer wird von Energizer Holdings, Inc., und der Eveready Battery Company, Inc. hergestellt.

Safety Instructions for Hazardous Locations – ENGLISH (English)

- Do not use the RS-232 connector in a hazardous location.
- Replace batteries in non-hazardous locations, with approved batteries, only.
- It is the users responsibility to understand the proper application of this product in potentially explosive atmospheres.

Approved Batteries – ENGLISH (English)

The 30 Series is Intrinsically Safe **only** if powered by one of the following battery types:

- Duracell® Alkaline 9V, MN1604
- Eveready® Energizer® Alkaline 9V, 522
- Eveready® Energizer® Lithium 9V, L522
- Varta® High Energy Alkaline 9V, 4922

Many other battery types and models have been tested but failed to meet the requirements for Intrinsic Safety - do not assume other models are equivalent.

Energizer is manufactured by Energizer Holdings, Inc., and the Eveready Battery Company, Inc.

Instrucciones de seguridad para zonas peligrosas – ESPAÑOL (Spanish)

- No use el conector RS-232 en zona clasificada.
- Cambie las pilas en zona no clasificada, solo con pilas aprobadas.
- Es responsabilidad del usuario comprender la aplicación de este producto en atmósferas potencialmente explosivas

Pilas aprobadas – ESPAÑOL (Spanish)

El 30 Series solo es intrínsecamente seguro si se alimenta con uno de los siguientes tipos de pilas:

- Duracell® Alkaline 9V, MN1604
- Eveready® Energizer® Alkaline 9V, 522
- Eveready® Energizer® Lithium 9V, L522
- Varta® High Energy Alkaline 9V, 4922

Se han probado muchos otros tipos de baterías pero han fallado el cumplimiento de los requisitos para la seguridad intrínseca - No asuma que otros modelos son equivalentes.

Energizer está fabricado por Energizer Holdings, Inc., y por Eveready Battery Company, Inc.

Instructions de sécurité pour les Zones Dangereuses – FRANÇAIS (French)

- Ne pas utiliser le connecteur RS-232 dans une Zone Dangereuse.
- Remplacez les piles dans des Zones non-dangereuses, avec les piles appropriées, uniquement.
- Il est de la responsabilité de l'utilisateur de bien comprendre l'application appropriée de ce produit en atmosphères explosives.

Piles approuvées – FRANÇAIS (French)

Le 30 Series est un système à sécurité Intrinsèque seulement s'il est alimenté par un des Piles de type suivant:

- Duracell® Alkaline 9V, MN1604
- Eveready® Energizer® Alkaline 9V, 522
- Eveready® Energizer® Lithium 9V, L522
- Varta® High Energy Alkaline 9V, 4922

Beaucoup d'autres types et modèles de Piles ont été examinés mais ne conviennent pas pour répondre aux conditions de sécurité intrinsèque - Ne jamais supposez que d'autres modèles pourraient être équivalents.

Les batteries Energizer sont fabriquées par les sociétés Energizer Holdings inc. et Eveready Battery Inc.

Prescrizioni di Sicurezza per Area Pericolosa – ITALIANO (Italian)

- Non utilizzare il connettore Rs-232 in Area Pericolosa.
- Sostituire le batterie in Aree non Pericolose e solamente con Batterie approvate.
- E' responsabilità dell'utilizzatore comprendere l'adatta applicazione di questo prodotto in atmosfere potenzialmente esplosive.

Batterie Approvate – ITALIANO (Italian)

L' 30 Series è a Sicurezza Intrinseca solo se alimentato da uno dei seguenti tipi di batteria:

- Duracell® Alkaline 9V, MN1604
- Eveready® Energizer® Alkaline 9V, 522
- Eveready® Energizer® Lithium 9V, L522
- Varta® High Energy Alkaline 9V, 4922

Molti altri tipi e modelli di batteria sono stati testati ma non sono risultati conformi alle richieste per Sicurezza Intrinseca - non supponete che altri modelli siano equivalenti.

La batteria (Energizer) è fabbricata da Energizer Holdings Inc. e Eveready Battery Company Inc.

Veiligheidsinstructie voor gebruik in een explosie gevaarlijke omgeving – NEDERLANDS (Dutch)

- Het gebruik van de RS232 interface is niet toegestaan in een explosie gevaarlijke omgeving.
- Vervang de batterijen uitsluitend in een niet explosie gevaarlijke omgeving en gebruik alleen batterijen welke zijn goedgekeurd en toegestaan.
- De gebruiker dient er mee bekend te zijn welke gevaren er kunnen optreden in een explosie gevaarlijke ruimte bij gebruik van dit product
Het is de verantwoordelijkheid van de gebruiker om dit product op een juiste wijze toe te passen.

Batterijen welke zijn goedgekeurd – NEDERLANDS (Dutch)

De 30 Series is alleen intrinsiek veilig bij gebruik van de volgende batterijen:

- Duracell® Alkaline 9V, MN1604
- Eveready® Energizer® Alkaline 9V, 522
- Eveready® Energizer® Lithium 9V, L522
- Varta® High Energy Alkaline 9V, 4922

Bij gebruik van andere niet gecertificeerde batterijen vervalt de intrinsiek veilige ATEX certificering.

Een aantal andere batterij merken en types zijn getest maar voldeden niet aan de ATEX voorwaarden voor intrinsieke veiligheid, U mag er daarom niet van uitgaan dat andere equivalenten types wel geschikt zullen zijn.

Energizer wordt gefabriceerd door Energizer Holdings, Inc en de Eveready Battery Company, Inc

Instrukcja Bezpieczeństwa Dla Srefy Zagrożonej Wybuchem

– POLSKI (Polish)

- Połączenie RS232 może być używane tylko poza strefą zagrożenia wybuchem.
- Wymiana baterii tylko poza strefą zagrożenia wybuchem, używaj tylko zatwierdzony typ baterii.
- Odpowiedzialnością użytkownika jest używanie tego produktu we właściwy sposób w strefie zagrożonej wybuchem.

Zatwierdzone baterie. – POLSKI (Polish)

30 Series wersja Iskrbezpieczna może być tylko zasilana przez następujące typy baterii:

- Duracell® Alkaline 9V, MN1604
- Eveready® Energizer® Alkaline 9V, 522
- Eveready® Energizer® Lithium 9V, L522
- Varta® High Energy Alkaline 9V, 4922

Wiele innych typów i modeli baterii przetestowano lecz nie spełniały wymagań Iskrbezpieczeństwa - nie przyjmuje się że inne modele są równoważne.

Energizer jest produkowany przez Energizer Holdings, Inc. lub przez Eveready Battery Company, Inc.

Räjähdyksvaarallisten tilojen turvallisuusohjeita – SUOMEN KIELI (Finnish)

- RS-232 väylää/liitintä EI saa käyttää räjähdysvaarallisissa tiloissa.
- RS-232 väylää/liitintä EI saa käyttää räjähdysvaarallisissa tiloissa. Käytettävä ehdottomasti ja ainoastaan hyväksytyjä paristoja.
- Käyttäjän vastuulla on laitteen käyttö räjähdysvaarallisissa tiloissa. Mittausovellus ja käyttöympäristö on ehdottomasti selvitettävä ennen käyttöä.

Käyttöön hyväksytyt paristot – SUOMEN KIELI (Finnish)

30 Series mittari on turvallinen määritellyissä räjähdysvaarallisissa tiloissa ainoastaan, kun käytetään seuraavia paristoja:

- Duracell® Alkaline 9V, MN1604
- Eveready® Energizer® Alkaline 9V, 522
- Eveready® Energizer® Lithium 9V, L522
- Varta® High Energy Alkaline 9V, 4922

Monia muita paristotyyppjä on testattu, mutta on osoittautunut, etteivät ne täytä räjähdysvaarallisten tilojen vaatimuksia.

Energizer tuotemerkkiä valmistaa Energizer Holdings, Inc., ja Eveready Battery Company, Inc.

ATEX EC Declarations of Conformity

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: 30 Series Digital Pressure Calibrator

is in conformity with the provisions of the Directive 94/9/EC for use in potentially explosive atmospheres

Marking:  II 2G Ex ia IIC T4 Gb

Standards: EN 60079-0: 2006
EN 600-79-11: 2007

EC-Type Examination Certificate: FTZU 06 ATEX 0010X Supplement: No. 1
FTZU, Notified Body 1026
Pikartska 7, 716 07 Ostrava Radvanice
Czech Republic

Production Quality Assurance Notification: KEMA 04ATEXQ3155
KEMA Quality B.V., Notified Body 0344

EC Directives: 94/9/EC ATEX Directive

Name: David K. Porter, P.E.
Title: Director of Engineering
Date: 24 Sept 2010

PED EC Declarations of Conformity

EC Declaration of Conformity



I/We **Crystal Engineering Corporation**

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

declare that

nVision Series Reference Pressure Recorder	XP2i and XP2i-DD Series Digital Pressure Gauge
30 Series Digital Pressure Calibrator	M1 Series Digital Pressure Gauge

in accordance with the following directives

97/23/EC Pressure Equipment Directive (PED)

have been designed and manufactured to the following

Pressure Gauges, Calibrators, and Recorders		CE Mark
Pressure gauges, calibrators, and recorders (pressure accessories per guideline 1/6)	The above listed pressure gauges, calibrators and reference recorders are designed and manufactured in accordance with applicable portions of Annex I, Essential Safety Requirements, and sound engineering practices. These pressure gauges or calibrators (classified as pressure accessories per guideline 1/6) have a volume (V) of less than 0.1 liter (Article 3, 1.1.(a) first indent, Group 1 fluids).	
Maximum Allowable Pressure (PS) < 200 bar (2 900 psig)	All pressure gauges, calibrators and reference recorders for use on gases or liquids below 200 bar (2 900 psig) are not subject to the essential requirements of the directive 97/23/EC (PED, Annex I) will be classed as Sound Engineering Practice (SEP), and shall not have the CE mark applied.	No
Maximum Allowable Pressure (PS) > 200 bar (2 900 psig), and < 1 000 bar (14 500 psig)	For pressure gauges, calibrators and reference recorders for use on gases or liquids above 200 bar (2 900 psig) on Class 1 & 2 gases or liquids, Crystal Engineering maintains a technical file in accordance with Annex III, Module A (internal production control) when CE mark is required.	Yes

I hereby declare that the equipment named above has been designed and manufactured to comply 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)

3 June 09
(DATE OF ISSUE)

EMC Declarations of Conformity

EC Declaration of Conformity



I/We

Crystal Engineering Corporation

of

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

declare that

**Pressure Calibrator
30 Series Digital Pressure Calibrator**

In accordance with the following directives

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

have been designed and manufactured to the following specifications

CISPR 11:2003	Radiated Emissions	Class A	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	Criteria A	Pass
EN 61326-1:2006 / EN 61000-4-8:2001	Magnetic Field Immunity	Criteria A	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)

22 Sept 2010
(DATE OF ISSUE)

Trademarks

This manual contains the following third-party trademarks, both registered and unregistered. All marks are the property of their respective companies.

Varta® VARTA Consumer Batteries GmbH & CO. KGaA

Duracell® Duracell Inc. Corporation

Energizer® and Eveready Eveready Battery Company, Inc.

“Pressure is Our Business” is a registered trademark of Crystal Engineering Corp.

Service and Support

How to Contact Us:

Phone (805) 595-5477

Toll-Free (800) 444-1850

Fax (805) 595-5466

Email service@crystalengineering.net

Web www.crystalengineering.net

If calling, have ready the model number, serial number, date of purchase and reason for return. You will receive instructions for returning the device to Crystal Engineering.

Send your comments to: sales@crystalengineering.net

Warranty

Crystal Engineering Corporation warrants the **30 Series Pressure Calibrators** to be free from defects in material and workmanship under normal use and service for one (1) year from date of purchase to the original purchaser. It does not apply to batteries or when the product has been misused, altered or damaged by accident or abnormal conditions of operation.

Crystal Engineering will, at our option, repair or replace the defective device free of charge and the device will be returned, transportation prepaid. However, if we determine the failure was caused by misuse, alteration, accident or abnormal condition of operation, you will be billed for the repair.

CRYSTAL ENGINEERING CORPORATION MAKES NO WARRANTY OTHER THAN THE LIMITED WARRANTY STATED ABOVE. ALL WARRANTIES, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE, ARE LIMITED TO A PERIOD OF ONE (1) YEAR FROM THE DATE OF PURCHASE. CRYSTAL ENGINEERING SHALL NOT BE LIABLE FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, WHETHER IN CONTRACT, TORT OR OTHERWISE.

Note (USA only): Some states do not allow limitations of implied warranties or the exclusion of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may have other rights which vary from state to state.

Notes

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