

30 Series Operation Manual

for the 30 Series Pressure Calibrator



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Overview

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 30 Series calibrator could replace several conventional calibrators by covering a wide range of pressure with high accuracy.

The Model 30 does not require any manual adjustments or trimming. All calibration is accomplished via an optically isolated communications port using a USB physical interface. The optical isolation protects the Model 30 from electrical transients that may appear on the USB connector or cabling to a PC.

Your 30 Series can be customized through the use of our free [ConfigM30™](#) software. Your personal computer can disable, enable, or modify a variety of features of your 30 Series.

- 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 specializes in making pressure measuring equipment.

It's the only thing we do and that's why we say:

 **Pressure** is our **Business**™

Functions

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.

Battery Replacement

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.

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/off)** button.

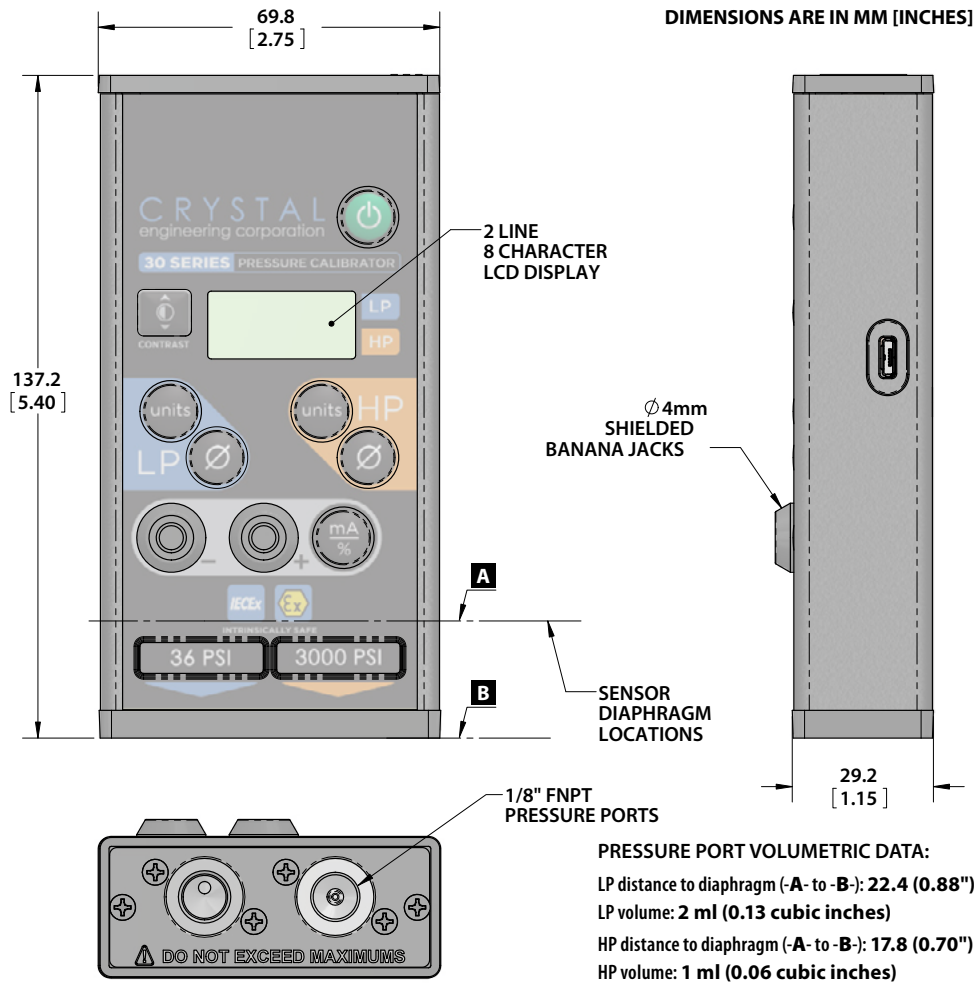
Measuring Vacuum

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.

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.



Specifications

Note: Accuracy includes all effects of linearity, hysteresis, repeatability, temperature, and stability for one year.

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

Pressure

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

*Floor Term = 0.005% of FS or display resolution, whichever is greater.

See [Pressure Ranges, Display Scales, & Resolution](#) on page 8.

Vacuum

$\pm(0.25\% \text{ of Reading} + \text{Vacuum Floor Term}^\dagger)$

[†] *Vacuum Floor Term (VFT):*

For 16 & 36 PSI: VFT = 0.004 PSI

For 300 PSI: VFT = 0.01 PSI

For 1 or 2 bar, & 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. Refer to [XP2i-DP](#) data sheet for gauges that are intended for continuous high vacuum use.

Temperature

Operating 0° to 50°C (32° to 122°F)

Non-condensing. No change in accuracy over operating temperature range. Gauge must be zeroed to achieve rated specification.

Storage. -20° to 70°C (-4° to 158°F)

Battery should be removed if stored for more than one month.

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 30 VDC
 Maximum Current 100 mA

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. mA can be displayed as a percentage, where 0 to 100% corresponds to either 4 to 20 mA or 10 to 50 mA.

Power

Battery One Alkaline or Lithium 9V battery

► Approved Batteries

ATEX/IECEX: The 30 Series is Intrinsically Safe only if powered by one of the following battery types.

Approved Battery Type	Ta=	Marking
Duracell Alkaline 9V, MN 1604	0 to 50° C	Ex ia IIC T4 Gb
Energizer Alkaline 9V, 522		
Energizer Lithium 9V, L522		
Varta High Energy Alkaline 9V, 4922	0 to 45° C	

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.

Do not mix battery types or manufacturers.

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

Approved Battery Type	Marking
Duracell Alkaline 9V, MN 1604	Class I, Division 1, A, B, C, D T4
Energizer Alkaline 9V, 522	
Energizer Lithium 9V, L522	
Varta High Energy Alkaline 9V, 4922	Class I, Division 1, A, B, C, D T3C

Battery Life 90 hours typical

Low Battery Indicator Flashing battery icon

Connections

Pressure Fitting 1/8" female NPT

Milliamperes 4mm jacks, 19mm (0.75") spacing

Communication micro USB

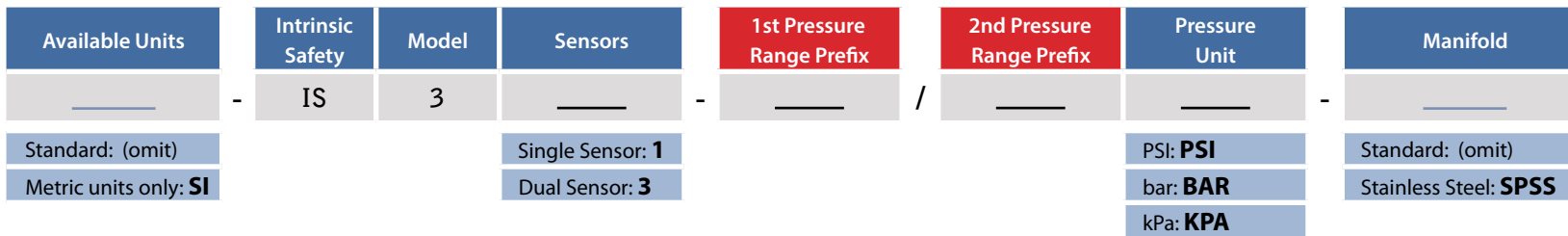
! WARNING: Do not use the micro USB serial interface in hazardous locations.

PRESSURE RANGES, DISPLAY SCALES, & RESOLUTION

PSI	bar	kPa	Overpressure	PSI	inch H ₂ O	inch Hg	mmHg	mmH ₂ O	cmH ₂ O	kg/cm ²	bar	mbar	kPa	MPa
16	1	100	6.5 x	0.001	0.01	0.001	0.01	1		0.0001	0.0001	0.1	0.01	
36	2	200	3.0 x	0.001	0.01	0.001	0.01	1		0.0001	0.0001	0.1	0.01	
300	20	2000	2.0 x	0.01	0.1	0.01	0.1		1	0.001	0.001		0.1	
1500	100	10000	2.0 x	0.1						0.01	0.01		1	0.001
3000	200	20000	1.5 x	0.1						0.01	0.01		1	0.001
5000	300	30000	1.5 x	0.1						0.01	0.01		1	0.001

- PSI versions with ranges of 36 PSI and lower include all possible scales except bar.
- bar versions with ranges of 2 bar and lower include all possible scales except inch Hg, cmH₂O, and MPa.
- kPa versions are restricted to kPa, MPa, bar and/or millibar, depending on pressure range.

MODEL NUMBERING SYSTEM



SAMPLE PART NUMBERS

IS31-36PSI Calibrator with one sensor (36 PSI)

IS33-36/3000PSI Calibrator with two sensors (36 PSI and 3000 PSI)

IS33-16/1500PSI-SPSS Calibrator with two sensors (16 PSI and 1500 PSI) with two stainless steel manifolds

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.

Safety & Certifications

HAZARDOUS LOCATIONS

Every **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



Ex ia IIC T4 Gb
IECEX FTZU 10.0018X

This product conforms to the following standards:
IEC 60079-0: 2007 | IEC 60079-11: 2006



Intrinsically Safe and Non-incendive for Hazardous Locations: Class I, Division 1, Groups A, B, C and D, Temperature Code T4/T3C.

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 = 0 to 50° C

! WARNINGS: The following warnings apply to the 30 Series Pressure Calibrator:

- Substitution of components may impair intrinsic safety.
- Replace batteries with approved type in non-hazardous locations only.

CERTIFICATIONS

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



This 30 Series complies with the Australian requirements for the C-tick mark. The instrument was tested against AS/NZS 3584, C-tick EMC/EMI requirements.



Crystal Engineering declares that the 30 Series is in accordance with the ATEX Directive, the Electromagnetic Compatibility Directive, and the Pressure Equipment Directive per our declaration(s).



This 30 Series is approved for use as a portable test instrument for Marine use and complies with Det Norsjke Veritas' Rules for Classification of Ships, High Speed & Light Craft and Offshore Standards.

EMC 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

Pressure Calibrator
30 Series Digital Pressure Calibrator

In accordance with the following directives

2004/108/EC **The Electromagnetic Compatibility Directive per:**
EN 55011:2007
EN 61326:2006

have been designed and manufactured to the following specifications

EN 55011:2007	Radiated Emissions	Class B	Pass
EN 61000-4-2:2001	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)

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 60079-11:2007

EC-Type Examination Certificate: FTZU 06 ATEX 0010X
FTZU, Notified Body 1026
Pikartská 7, 716 07 Ostrava Radvanice
Czech Republic

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

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
nVision Series Lab Reference	M1 Series Digital Pressure Gauge
30 Series Digital Pressure Calibrator	CPF Series Fittings and Hoses

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 less than or equal to 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)	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. Note: CPF Hoses (MPH series) not for use with Group 1 fluids and gases	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)

22 July 2011
(DATE OF ISSUE)

MULTI-LANGUAGE 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:

Approved Battery Type	Ta=	Marking
Duracell Alkaline 9V, MN 1604	0 to 50° C	Ex ia IIC T4 Gb
Energizer Alkaline 9V, 522		
Energizer Lithium 9V, L522		
Varta High Energy Alkaline 9V, 4922	0 to 45° C	

Mnoho dalších druhů a typů baterií bylo zkoušeno, ale nespĺnily 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:

Approved Battery Type	Ta=	Marking
Duracell Alkaline 9V, MN 1604	0 to 50° C	Ex ia IIC T4 Gb
Energizer Alkaline 9V, 522		
Energizer Lithium 9V, L522		
Varta High Energy Alkaline 9V, 4922	0 to 45° C	

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:

Approved Battery Type	Ta=	Marking
Duracell Alkaline 9V, MN 1604	0 to 50° C	Ex ia IIC T4 Gb
Energizer Alkaline 9V, 522		
Energizer Lithium 9V, L522		
Varta High Energy Alkaline 9V, 4922	0 to 45° C	

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:

Approved Battery Type	Ta=	Marking
Duracell Alkaline 9V, MN 1604	0 to 50° C	Ex ia IIC T4 Gb
Energizer Alkaline 9V, 522		
Energizer Lithium 9V, L522		
Varta High Energy Alkaline 9V, 4922	0 to 45° C	

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:

Approved Battery Type	Ta=	Marking
Duracell Alkaline 9V, MN 1604	0 to 50° C	Ex ia IIC T4 Gb
Energizer Alkaline 9V, 522		
Energizer Lithium 9V, L522		
Varta High Energy Alkaline 9V, 4922	0 to 45° C	

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:

Approved Battery Type	Ta=	Marking
Duracell Alkaline 9V, MN 1604	0 to 50° C	Ex ia IIC T4 Gb
Energizer Alkaline 9V, 522		
Energizer Lithium 9V, L522		
Varta High Energy Alkaline 9V, 4922	0 to 45° C	

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 gevaarlijkeomgeving – 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:

Approved Battery Type	Ta=	Marking
Duracell Alkaline 9V, MN 1604	0 to 50° C	Ex ia IIC T4 Gb
Energizer Alkaline 9V, 522		
Energizer Lithium 9V, L522		
Varta High Energy Alkaline 9V, 4922	0 to 45° C	

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 equivalente 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:

Approved Battery Type	Ta=	Marking
Duracell Alkaline 9V, MN 1604	0 to 50° C	Ex ia IIC T4 Gb
Energizer Alkaline 9V, 522		
Energizer Lithium 9V, L522		
Varta High Energy Alkaline 9V, 4922	0 to 45° C	

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:

Approved Battery Type	Ta=	Marking
Duracell Alkaline 9V, MN 1604	0 to 50° C	Ex ia IIC T4 Gb
Energizer Alkaline 9V, 522		
Energizer Lithium 9V, L522		
Varta High Energy Alkaline 9V, 4922	0 to 45° C	

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

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

Support

CALIBRATION

If adjustment is required, we recommend returning your 30 Series Calibrator to our factory. Factory service offers benefits you won't find anywhere else. Factory calibration tests the 30 Series at a variety of temperatures utilizing NIST traceable standards, resulting in calibration certificates that provide performance data over temperature. Our calibration facilities are A2LA accredited to ISO 17025:2005 & ANSI/NCSL Z540-1-1994. A2LA is internationally recognized as an accreditation body by the International Laboratory Accreditation Cooperation, ILAC.

Under normal operating conditions, we recommend the 30 Series be calibrated on an annual basis. Your quality system may require more or less frequent calibration, or your experience, or operating environment may suggest longer or shorter intervals.

Although we prefer that you return the 30 Series to us for calibration, ordinary recertification and/or adjustments may be performed by any qualified personnel with appropriate training and equipment.

There are no internal potentiometers. The 30 Series contains a "span" factor (userspan), set to approximately 1 (as shipped from the factory).

As components age this may need to be changed to a value slightly higher or lower, to slightly increase or decrease all readings.

This adjustment can be made with a computer through our free [ConfigM30 software](#).

ACCESSORIES AND REPLACEMENT PARTS

CPF: Crystal Pressure Fittings (FITTINGS **FOR LIFE**)

The Crystal Pressure Fittings & Hose line is purpose-designed for applications in instrumentation, field testing and pressure calibration. The CPF design improves on standard cone-type fittings with a replaceable O-ring seal. This new sealing method allows users to create leak-free connections, up to 10,000 PSI, without using tools or thread tape.

Connections between CPF fittings maintain a 4:1 Factor of Safety. When necessary, the 316 Stainless Steel fittings can also be wrench tightened for a vibration-resistant, metal-to-metal seal. A Safety Weep Hole designed into the side of the fitting alerts users, by leaking gas or test fluid, before a disconnection under pressure causes injury or damage.

CPF offers one of the widest selections from a single manufacturer, featuring over 90 adapters to other types like NPT and BSP, and other manufacturers like HiP and Autoclave. More information about CPF Fittings can be found at crytalengineering.net/cpf.

USB Cable

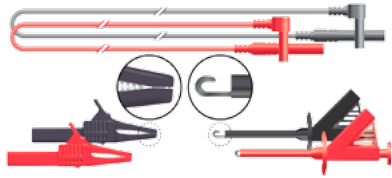
P/N: 4431 USB A to micro USB Cable 6' [1.8m]

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

Test Leads

P/N: 1351 Test Lead Kit

Two 4 mm shrouded banana plug, straight to right angle, 122 cm (48 inch) leads with alligator clip and spring loaded hook tip probes.



SOFTWARE

ConfigM30

[ConfigM30](#) is free software to customize your calibrator. Eliminate scales you don't need, calibrate, create custom scales, and password protect the calibrator from future changes! Requires micro USB cable , PN 4431.

LabVIEW™ Drivers and Digital Interface Instructions

Communicate with your 30 Series Calibrator using National Instrument's [LabVIEW](#), or our [Digital Interface Instructions](#).

CONTACT US

Phone(805) 595-5477
Toll-Free(800) 444-1850
Fax(805) 595-5466
Emailservice@crystalengineering.net
Webcrystalengineering.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 us.

Send your comments to: sales@crystalengineering.net

TRADEMARKS

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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.

WARRANTY

Crystal Engineering Corporation warrants the 30 Series Pressure Calibrator 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.

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708 Fiero Lane, Suite 9, San Luis Obispo, California 93401-8701

