

Crystal iS33 Specs

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Why carry a **toolbox** full
of **gauges** and **modules**?

When a
CRYSTAL
Calibrator
can do
the
whole
job
!

30 Series

WIDE RANGE Pressure Calibrators

PRESSURE
is Our
BUSINESS™



CRYSTAL
engineering corporation



The 30 Series WIDE RANGE PRESSURE CALIBRATORS

These shirt-pocket-sized pressure calibrators can measure vacuum and pressure from zero up to pipeline pressures, and everything in between—without any external sensors! There are a variety of models to choose from. Model 31's have one sensor, while Model 33's allow you to combine two sensors into one calibrator. All 30 Series calibrators indicate milliamps.

30 Series Calibrators are built with aluminum and stainless steel.

The aluminum housing of 30 series calibrators is rugged and resists interference from two-way radios and cellular phones better than plastic. Sensors are stainless steel, compatible with gases and liquids, and *are built in*.

Each and every 30 Series Calibrator is Intrinsically Safe!



Class I, Groups A, B, C, D.

Designed and proven for field use.

Accuracy is 0.05% of the indicated pressure, 0.025% of the indicated current (up to 55mA). These specifications are not affected by temperature because each and every 30 Series calibrator is tested in an environmental test chamber over the full operating range of 0°C (32°F) up to 50°C (122°F), duplicating field conditions. As a result, every calibrator is supplied with an NIST traceable certificate of calibration that includes data at 5 temperatures!

You simply won't find better performance or value in any size!

Features

Portable: With an overall length of just 130mm (5 1/8"), 30 Series calibrators are compact and rugged enough to be taken anywhere, safely and easily.

Accurate: Each and every 30 Series calibrator is fully temperature compensated, as a result of extensive testing and exposure to the entire operating temperature range (0°C [32°F] to 50°C [122°F] in our environmental test chambers. So when you're outside, whether it's hot or cold, your 30 Series calibrator will provide you with measurements that are just as accurate as when you use it indoors!

Easy to Use: No menus! You won't need the manual to operate this calibrator (though a comprehensive manual *is* included). Up to 10 different pressure units (PSI, kPa, bar, etc.) are selectable from the keypad, depending on the model—see specifications. Milliamps can display in percentages of 4-20mA or 10-50mA.

Efficient: 90 hours of battery life with an ordinary 9V alkaline battery. Special circuitry precisely monitors the battery condition, warns when the battery is getting low and prevents measurements due to inadequate battery voltage.

Customize your Calibrator: Eliminate scales you don't need, create custom scales, calibrate it and password protect the calibrator from future changes with ConfigM30.

Reliable: Advanced technology is employed throughout the 30 Series product line. Sensors are very robust, because they are constructed with stainless steel isolation diaphragms and permanent oil fill.

Specifications (Specifications are for **one year**, and include **all effects** of linearity, hysteresis, repeatability, and temperature.)

Pressure (refer to the pressure ranges table on the top of the back page)
0 to Full Scale..... $\pm(0.05\%$ of Reading + Floor Term*)

*Floor Term = 0.005% of FS or display resolution, whichever is greater. See next page 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 = 0.03 kPa
For 20 bar or 2000 kPa, VFT = 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.

Temperature Ranges
Operating and Compensated... 0°C to 50°C (32°F to 122°F)
Storage -20°C to 70°C (-4°F to 158°F)

Power
Battery..... One 9V carbon or alkaline battery
Battery Life..... 90 hours, typical (alkaline battery)
Low Battery Indicator Displayed battery icon

Electrical
Range 0 to 55 mA
Resolution 0.001 mA
Accuracy..... $\pm(0.025\%$ of Reading + 0.001 mA)
Percentage Conversion .. 4 mA = 0.00%; 20mA = 100.00%
or ... 10 mA = 0.00%; 50 mA = 100.00%
Connection 4mm jacks, 19mm (0.75") spacing

NOTES: Over-range occurs at 110% of full scale, causing "HP Over" or "LP Over" to be displayed.
Standard factory setting is 1"H₂O = 0.036126 PSI (density of water @ 4°C). Specify at time of order if you require a different density (e.g., for water @ 68°F, 1"H₂O = 0.036063 PSI).

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 (also requires RS232 cable, PN1928).

LabVIEW™ Drivers: Do you use LabVIEW? Then you can easily take advantage of the performance and capabilities offered by 30 Series calibrators, with the 30 Series LabVIEW library. Best of all, it's free! LabVIEW is a trademark of National Instruments Corporation.

SerialDL: SerialDL is a free command line program that will log data from any 30 Series pressure calibrator and create a comma delimited text file that can be easily opened with other applications like Microsoft® Excel spreadsheets or Access databases.

WinUserspan: WinUserspan allows you to change the "Calibration Due" date and, if required, adjust the calibrator. And it's free!

Media Compatibility
Liquids and gases compatible with PTFE (Polytetrafluoroethylene) penetrated and anodized aluminum sensor manifold, 316 stainless steel (sensor), Viton® (O-ring). (Viton is a registered trademark of Dupont Dow Elastomers.) PTFE can be eliminated, if required, by specifying option SPSS, in which case aluminum manifold(s) will be replaced with stainless steel manifold(s). (Refer to the 30 Series Model Numbering System chart on the following page.)

Enclosure
Description..... Extruded Aluminum
with sealed membrane keypad
Dimensions 29mm (1 1/8") D x 70mm (2 3/4") W
x 130mm (5 1/8") L
Weight... Model 33 485g (17.0 oz)
Model 31 (1500 PSI and above) .. 401g (14.1 oz)
Model 31 (up to 600 PSI)..... 342g (12.1 oz)

Pressure Fitting(s)
1/8" female NPT

Intrinsically Safe Certifications
CENELEC EEx ia IIC, T4
CSA..... Exia Intrinsically Safe,
Class I, Groups A, B, C, D,
Temperature Code T4

Included with the Calibrator
Operation Manual and Soft Carrying Case

Units, Resolution, and Pressure Ranges

First Pressure Range				Available Pressure Units and Resolution										Second Pressure Range				
range PSI	range bar	range kPa*	Over- pressure	PSI	kg/cm ²	inch Hg	inch H ₂ O	mm Hg	cm H ₂ O	mm H ₂ O	kPa	MPa	mbar	bar	300 PSI 20 bar 2000 kPa	600 PSI 40 bar 4000 kPa	1500 PSI 100 bar 10000 kPa	3000 PSI 200 bar 20000 kPa
16	1	100	6x	0.001	0.0001	0.001	0.01	0.01		1	0.01		0.1		x	x	x	x
36	2	200	3x	0.001	0.0001	0.001	0.01	0.01		1	0.01		0.1		x	x	x	x
300	20	2000	6x	0.01	0.001	0.01	0.1	0.1	1		0.1			0.001	n/a	n/a	x	x
600	40	4000	3x	0.01	0.001						0.1	0.0001		0.001	n/a	n/a	n/a	n/a
1500	100	10000	4x	0.1	0.01						1	0.001		0.01	n/a	n/a	n/a	n/a
3000	200	20000	2x	0.1	0.01						1	0.001		0.01	n/a	n/a	n/a	n/a

*kPa versions are restricted to kPa, MPa, bar, or millibar, depending on pressure range. PSI versions, with ranges of 36 PSI and lower, include all possible scales except bar. The 300 PSI version includes all possible scales except mbar. Bar versions, with ranges of 2 bar and lower, include all possible scales except inch Hg.

30 Series Model Numbering System

Use this table to enter the specifications for the 30 Series model that best suits your requirements.

Part Number:	Standard or Metric	IS3	1 or 2 sensors	First Pressure Range	Second Pressure Range	Pressure Units	Manifold Option
	(blank): Standard		1: Single Sensor	Refer to pressure table displayed above	(blank)	PSI	(blank): Standard
	SI - Metric units only		3: Two Sensors		/+ range from pressure table displayed above	BAR	-SI : Stainless Steel
						KPA	

Example Part Numbers: **IS33-36/3000PSI** Two sensors: 36 PSI and 3000 PSI pressure ranges.
SI-IS31-200KPA-SPSS One sensor: 200 kPa with a stainless steel manifold, kPa, mbar and bar scales only.

Optional Accessories

Crystal Engineering can supply everything you need to satisfy the daily requirements of field testing, measurement, and calibration. In our Accessories brochure, you'll find not only test leads, cables, and a selection of individual fittings and handpumps, but a complete line of Calibration Kits that include everything you need for pressure calibration work—handpumps, fittings, and hoses—packed into our rugged, watertight carrying case. Here are just a few of the optional accessories available.



Test Leads This set features high quality, safety banana plugs, super-flexible silicone-insulated test leads, and rugged, hard plastic insulated alligator clips.

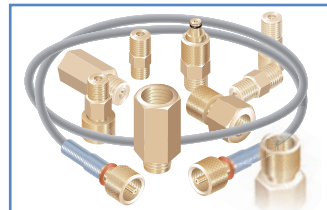
Test Lead Kit P/N: 1351

RS232 Cable Required in order to use Crystal software with your 30 series calibrator.

P/N: 1928



Handpumps There are a number of different handpumps available for use with 30 Series calibrators, but we recommend the following pumps for their versatility and compact size. **P/N 2820** is a hydraulic pump capable of generating up to 5000 PSI (35 MPa/350 bar) and includes a variable volume to set pressure exactly. We also recommend **ComboPumps**. These pneumatic pumps can be used for both vacuum and pressure, and include a pressure-balanced variable volume. With a ComboPump, it's always easy to set pressure precisely, because the variable volume is easy to turn at any pressure.



Fitting Kits We offer a full range of fittings and hoses designed specifically for test and calibration. When calibrating or testing, you only need temporary connections. Unfortunately, connecting to a gauge, transmitter, or other device to be tested can take more time than the actual test or calibration—not to mention what happens when there's a leak! To simplify your job, you can eliminate the need for wrenches and pipe thread tape, and avoid the frustration of finding and fixing leaks. Take a look at our *Handpumps and Accessories* brochure for our complete line of easy to use quick-connect fittings and fitting kits.



Carrying Cases Rugged, compact, and waterproof, Crystal carrying cases come equipped with custom die-cut foam inserts, and can be ordered as part of a complete calibration kit with all the accessories you need to maximize your productivity on the job. See our *Handpumps and Accessories* brochure for information on our complete line of carrying cases and calibration kits. **Hard Carrying Case with Foam Insert P/N: 2888**

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Email us at sales@crystalengineering.net

Visit us on the web at www.crystalengineering.net

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