

CRYSTAL  
engineering corporation

# 30 Series

W I D E R A N G E  
P R E S S U R E C A L I B R A T O R S

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



When a **Crystal Calibrator**  
can do the **whole job!**

Now available with  
**ATEX Approval!**

# 30 Series WIDE RANGE

PRESSURE CALIBRATORS fit easily into your shirt pocket, yet provide unparalleled performance. 30 Series calibrators measure vacuum and pressure from zero to pipeline pressures, and everything in between—and without any external sensors!

There are two models to choose from:

Model 31s have one sensor, while Model 33s 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 helps 30 Series calibrators resist interference from two-way radios and cellular phones. Sensors are stainless steel so they're compatible with gases and liquids—and are built in.

every 30 series calibrator is tested in an environmental test chamber



## Advanced Design

A 24 bit analog to digital converter provides measurement resolution of 1 part in 16.7 million (equivalent to 7.5 digits), exceeding the displayed resolution (5.5 digits) for all measurements. Temperature compensation is achieved by constantly measuring the temperature of each sensor and the circuit board itself. Therefore, even milliamp readings are fully temperature compensated.

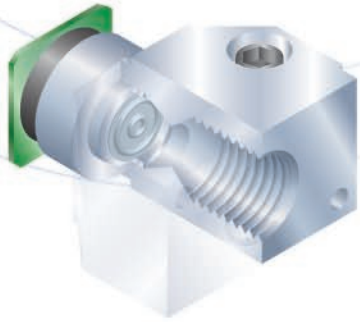
**30 Series Calibrators are designed and proven for field use.** Accuracy is 0.05% of the indicated pressure, 0.025% of the indicated current (up to 55mA). These specifications are not affected by temperature because each and every 30 Series calibrator is tested in an environmental test chamber over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

Crystal Engineering has been designing and manufacturing pressure measuring equipment for over 25 years, and that's why we say: **Pressure is Our Business.**

# FEATURES & TECHNOLOGY

## ► No Menus. No Manual? No Problem!

**30 Series calibrators are very easy to use** and you will never get lost in a multi-level menu system. In fact, you may never need to open the operation manual. Varying by model, up to 10 different pressure units (PSI, kPa, bar, etc.) are selectable from the keypad. Milliamps can display in percentages of 4-20mA or 10-50mA.



## ► Rugged and Reliable

**Advanced technology is employed throughout the 30 Series product line.** Pressure is measured using highly repeatable silicon sensors protected by all welded and permanently filled stainless steel diaphragm seals.

hot or cold,  
your 30 Series  
calibrator will  
provide accurate  
measurements

## ► A Calibration Toolbox in the Palm of Your Hand

**30 Series calibrators bring laboratory accuracy to outdoor field conditions.** With an overall length of just 137mm (5.4") and weighing less than a pound, 30 Series calibrators are small enough to be taken anywhere safely and easily.

## ► Safe and Accurate Readings

**Each and every 30 Series calibrator is fully temperature compensated** from controlled testing and exposure to the entire operating temperature range. So when you're working outside, whether in desert heat or arctic cold, your 30 Series calibrator will provide you with measurements that are just as accurate as when you use it indoors!

**Special circuitry precisely monitors the 30 Series battery condition** to prevent inaccurate measurements due to an over-depleted battery. This circuit helps extend battery life up to 90 hours from an ordinary 9V alkaline battery.



Config30 is a free,  
self-extracting application

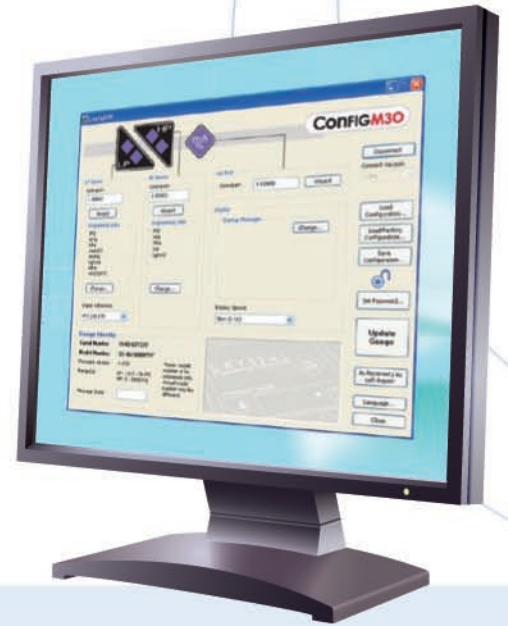
- Download from [www.crystalengineering.net](http://www.crystalengineering.net)

## ► Customize Your 30 Series Calibrator with Config30™ Software

A 30 Series calibrator includes more features than you may actually need. Config30 provides an easy way to disable features you don't want (or to enable features you do). Using a computer running Windows® and Config30 software, and a special serial cable you can easily tailor your 30 Series to fit your specific needs.

You can:

- Disable pressure units that you never use
- Change the inches of water temperature conversion factor. Choose either 60F, 68F, or 4C (39.2F).
- Adjust the calibrator (if required) using the built-in wizard
- Disable all changes to the calibrator with a password
- Save configuration to a file—use the file to quickly copy the configuration to additional calibrators



### What you can do with Config30 and a 30 Series Calibrator

- Identify firmware version
- Store a message or identification number
- Create special pressure units (e.g., feet of seawater)
- Eliminate operator errors by removing features
- Prevent tampering

## ► Collect and Control Data from Your 30 Series Calibrator with LabVIEW™ Drivers

**Do you use LabVIEW?** If so, you can easily take advantage of the performance and capabilities offered by 30 Series calibrators with the Model 30 LabVIEW Driver Library. The 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. The library is made up of two basic parts: the command VIs that implement the Model 30 commands like Zero, Units, and Reset; and the data collecting and parsing VIs that handle the reception and parsing of data packets. In addition there is a sample M30 Test Panel.vi file that demonstrates the use of all commands and the data collection components. The Model 30 LabVIEW Driver Library is available as a free download! Visit our website at [www.crystalengineering.net](http://www.crystalengineering.net).

the LabVIEW driver library is a set of vi's that implement the serial commands of the model 30

### ► Log Data with SerialDL

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

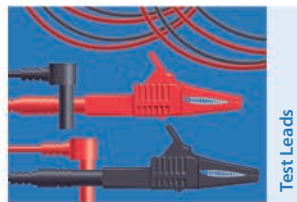
LabVIEW is a trademark of National Instruments Corporation. Microsoft and Excel are either registered trademarks or trademarks of Microsoft in the United States and/or other countries.

# ACCESSORIES

## ► Accessories for 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 a few of the 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. P/N: **1351**
- **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. Our Hydraulic Pumps (P/Ns **2819** and **2820**) are capable of generating up to 5000 PSI (35 MPa/350 bar) and includes a variable volume

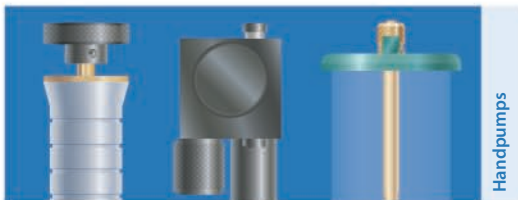


tors, but we recommend compact size. Our Hydraulic pumps are capable of generating up to 5000 PSI to set pressure exactly.

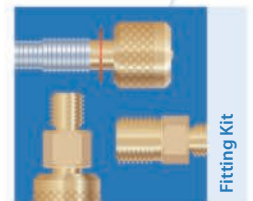
We also recommend our ComboPumps (P/Ns **2907** and **2908**). These pneumatic pumps can be used for

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 Hand-accessories brochure for our complete line of easy to connect fittings and fitting kits. ► **Carrying Cases**



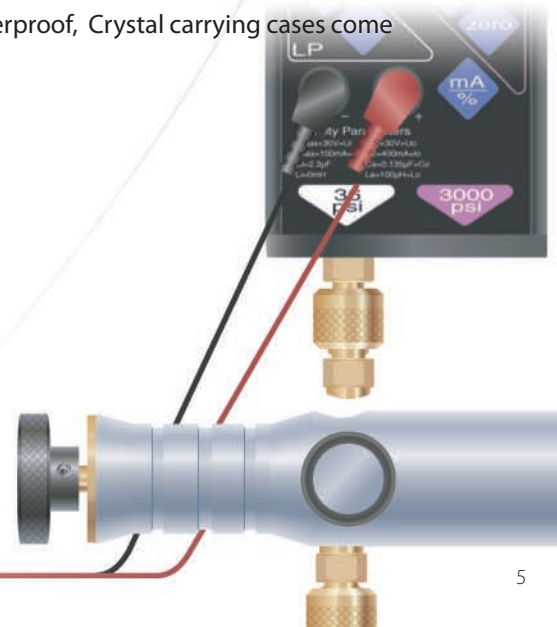
Rugged, compact, and waterproof, Crystal carrying cases come equipped with custom die-cut foam inserts, and can be ordered as part of a complete calibration kit with all the accessories you need to maximize your productivity on the job. See our Handpumps and Accessories brochure for information on our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



► **RS232 Cable** Required in order to use Crystal software with your 30 series calibrator. P/N: **1928** ► **RS232 to USB Adapter** P/N: **3313**

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### About Resolution

Resolution refers to the smallest change in pressure that can be indicated for a given model and unit of measure. For instance, the smallest change in *pounds per square inch* of pressure that can be indicated on a 16 PSI 30 Series calibrator (on the PSI scale) is 0.001 PSI, while the smallest change in PSI that can be indicated on a 3000 PSI 30 Series is 0.1 PSI.

## ► Units, Resolution & Pressure Ranges

### ► Pressure Ranges

PSI	bar	kPa*	Over-pressure
16	1	100	6.5 x
36	2	200	3.0 x
300	20	2000	2.0 x
600	40	4000	2.0 x
1500	100	10000	2.0 x
3000	200	20000	1.5 x
5000	300	30000	1.5 x

### ► Pressure Units and Resolution

PSI	kg/cm <sup>2</sup>	inch Hg	inch H <sub>2</sub> O	mm Hg	cm H <sub>2</sub> O	mm H <sub>2</sub> O	kPa	MPa	mbar	bar
16	0.0001	0.001	0.01	0.01		1	0.01		0.1	
36	0.0001	0.001	0.01	0.01		1	0.01		0.1	
300	0.001	0.01	0.1	0.1	1		0.1			0.001
600	0.001	0.01	0.1	0.1			0.1	0.0001		0.001
1500	0.01	0.1	0.1	0.1			1	0.001		0.01
3000	0.01	0.1	0.1	0.1			1	0.001		0.01
5000	0.01	0.1	0.1	0.1			1	0.001		0.01

\* 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.

Model 33 calibrators, including all ATEX models, have dual pressure sensors. This chart shows all of the sensor combinations.

### ► First Pressure Range

16 PSI	1 bar	100 kPa
36 PSI	2 bar	200 kPa
300 PSI	20 bar	2K kPa

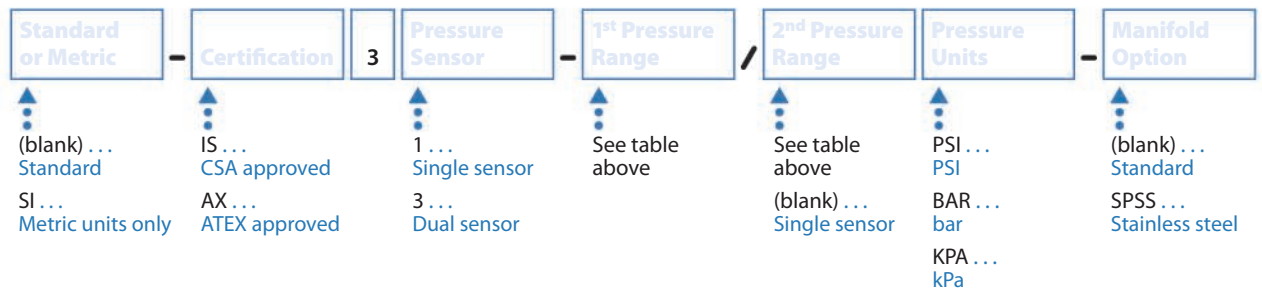
### ► Second Pressure Range

300 PSI	600 PSI	1.5K PSI	3K PSI	5K PSI
20 bar	40 bar	100 bar	200 bar	300 bar
2K kPa	4K kPa	10K kPa	20K kPa	30K kPa

✓	✓	✓	✓	✓
✓	✓	✓	✓	✓
n/a	n/a	✓	✓	n/a

## ► The 30 Series Numbering System

**30 Series part numbers** are based on a simple system of numbers and letters that define every attribute of a specific calibrator. Use this table to define the 30 Series model that best suits your requirements.



### ► Sample Part Numbers

**IS33-36/3000PSI ...**

CSA approved, intrinsically safe gauge with two sensors (36 PSI and 3000 PSI pressure ranges).

**SI-IS31-200KPA ...**

Metric (kPa, mbar and bar scales only) CSA approved, intrinsically safe gauge with one sensor (200 kPa pressure range).

**AX33-2/300BAR-SPSS ...**

ATEX approved, intrinsically safe gauge with two sensors (2 bar and 300 bar pressure ranges) with stainless steel manifolds.





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