FLUKE®
Calibration

Fluke Calibration Products and Services

Short Form Catalog

Precision, performance, confidence.™

Electrical

RF

Temperature

Pressure

Flow

Software

Dear Customer,

In our 2011 product catalog, we asked the question, "What's next for Fluke Calibration?" and we went on to answer our own question like this:

> "Relentless continuous improvement. Our goal is to bring you more new products, better service and support, better operations impacting product quality and delivery times—and to do all of this all around the world and not just in the U.S. We want to be your preferred source for the best calibration instruments and we don't want it to even be close."

Three things are certain regarding those comments. We have made progress. We're not claiming victory. And high-quality products, high-quality service, and reliable operations remain high priorities for us.

Since that catalog came out in 2011, we have…

- Introduced a new product roughly every two months and updated and upgraded dozens of other products—including showing our continuing commitment to our popular MET/CAL software platform.
- Introduced new services and service support plans around the world.
- Improved on-time product delivery from our factories from about 75% to consistently better than 90%.
- Expanded service capabilities in a number of service centers around the world.
- Improved on-time service delivery in many parts of the world: going from about 45% on-time delivery (after acquisition-related reorganization) to consistently better than 93% in our U.S. service centers, making similarly dramatic improvements in China, and moderately accelerating in other geographies.

It's not enough, but it's a start—or, better said, it's a continuation of a course we set out on when the Fluke Calibration brand was born in 2010. Are we today "your preferred source for the best calibration instruments" (and software and services)? We hope so. But whether we are or are not, we understand that we won't be in the future unless we continue to get better and deliver more of the things you need all around the world.

We hope this catalog provides a helpful reference to you for the many products Fluke Calibration offers across electrical, temperature, pressure, flow and calibration software. We are committed to excellent metrology. We are committed to building upon the legacies of the brands we have acquired. We are committed to listening to you and your needs and responding as urgently as we can.

To that end, if you ever have an idea or concern that you'd like to take straight to the leadership team of Fluke Calibration, don't hesitate to contact us at flukecal-leadership@flukecal.com. We can't promise that we'll give you whatever you want as soon as you want it, but we will promise to listen and be as responsive as we can.

Enjoy the catalog and let us know directly—or through any of our sales representatives—how we can best serve you today.

Sincerely,

The Fluke Calibration Team

FLUKE®
Calibration

Table of contents

2 Electrical calibration

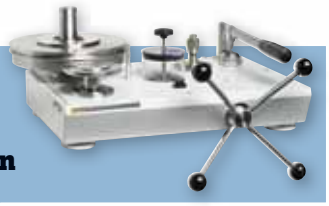
DC/LF Electrical Calibrators 5
Specialty Calibrators 6
Oscilloscope Calibrators 7
Precision Multimeters 7
Electrical Standards 8

9 RF calibration

RF References 10

11 Temperature calibration

Standard Platinum Resistance Thermometers 18
ITS-90 Fixed-Point Cells 18
Cell Maintenance Apparatus 19
Thermometer Readouts 20
Reference PRTs, Thermocouples and Thermistors 21
Temperature Calibration Baths 22
Dry-Well Calibrators 22
Infrared Calibrators 25
Thermocouple Furnaces 25
Miscellaneous Dry-Well Calibrators 25



26 Pressure calibration

Gas Pressure Controllers/Calibrators 30
High Pressure Controllers/Calibrators 31
Reference Pressure Indicators 31
PG7000 Series Piston Gauges 32
2400 Series Piston Gauges 32
Specialty Piston Gauges 33
Manual Pressure Generation and Control 33
Industrial Deadweight Testers 34
Pressure Calibrators 34
Air Data Calibration 36
Pressure Calibration Systems 36

37 Gas flow calibration

Gas Flow Standards 38
Primary Gas Flow Standard 38

39 Calibration software

Electrical and RF Calibration Software 41
Calibration Asset Management Software 41
Software Support Program 41
Temperature Calibration Software 42
Pressure/Flow Calibration Software 43

44 Data acquisition and general purpose test

Service programs **48**

Training **49**

Electrical calibration

Electrical calibration refers to the process of verifying the performance of, or adjusting, any instrument that measures, sources, or tests electrical parameters. This discipline is usually referred to as dc and low frequency ac electrical metrology. Principal parameters include voltage, current, resistance, inductance, capacitance, time and frequency. Other parameters, including electrical power and phase, are also in this segment of metrology. Ratiometric comparisons of similar parameters are often performed to compare a known parameter to an unknown similar parameter.

Electrical calibration involves the use of precise devices that evaluate the performance of key properties for other devices called units under test (UUTs). Because these precise devices have thoroughly known performance characteristics compared to the UUT, performance evaluation and/or calibration adjustment of the UUT to identify or minimize errors is possible. Typically, the performance of such precision devices should be four or more times better than the UUT.

These precision devices fall into two broad categories. Electrical signal sources are often referred to as either calibrators or standards. Precision measurement devices are often classified as reference digital multimeters, measurement standards, or ratio bridges.

Product highlights

5730A Multifunction Calibrator

The new gold standard in electrical calibration

The Fluke Calibration 5730A High Performance Multifunction Calibrator is the culmination of years of engineering development, customer research and industrial design, to bring to market the new "gold standard" in multifunction calibration. Like its predecessors, the 5700A and 5720A calibrators, the 5730A calibrates a wide range of digital multimeters, up to long-scale 8.5 digit DMMs, as well as a wide-range RF multimeters. This new model features improved specifications that will help you increase test uncertainty ratios (TURs) and improve test confidence.

- 6.5 inch VGA capacitive touchscreen with full color graphical user interface
- Menus and functions displayed in choice of nine languages
- Visual Connection Management™ terminals guide cable connections
- Extended operational reliability through the use of modern analog and digital components and state-of-the-art circuit board technologies
- Artifact Calibration—the process of using just three external standards—10 V, 1 ohm and 10 k ohm, to automatically adjust the entire instrument—optimizes performance to the best specified performance.
- Cal Check—a process that tests all function and ranges for any drift since the most recent calibration—provides ongoing confidence in performance. Any output drift is measured and evaluated it with respect to specification.
- Compatible with 52120A and 5725A amplifiers
- Full MET/CAL® compatibility with 5700A and 5720A procedures (MET/CAL versions 7.3 and above)

6135A/PMUCAL PMU Calibrator

Fast, automated, traceable calibrations that comply with IEEE C37 118.1™-2011

The 6135A/PMUCal Phasor Measurement Unit Calibration System is the only automated and traceable PMU calibration system available today. It is an ideal solution for PMU designers and manufacturers, as well national metrology institutes (NMIs). It's also a perfect solution for third party calibration houses and electrical utilities.

Applications include calibrating PMUs before they are installed, and as required throughout their operational life; performing type tests of PMUs and other power grid tools; and performing first article approvals. And because the 6135A includes a three-phase 6135A Electrical Power Calibration Standard, you can also use it to cover a wide workload of electrical power test instruments.

The 6135A/PMUCAL system enables you to:

- Calibrate and test a PMU from a PC, either at the site of the test system or remotely over the internet
- Quickly set up a PMU test
- Speed through automated calibration procedures quantifying the time savings would be a nice addition
- Simulate static and dynamic voltage and current conditions that occur in a power distribution grid
- Apply those signals to a phasor measurement unit
- Capture the PMU's reported results
- Compare those results with the original stimulus
- Evaluate against the thresholds defined in IEEE C37.118.1™–2011
- Create test reports, graphs and calibration certificates that can be readily printed or shared electronically

Selection guide

	Multi-Product Calibrators			Multifunction Calibrators		Oscilloscope Calibrators	Electrical Tester Calibrator	Power Standards		Precision Process Calibrators	
Workload	**5080A**	**5502A**	**5522A**	**5700A**	**5730A**	**9500B**	**5320A**	**6100B**	**6105A**	**525B**	**7526A**
Analog/panel meters											
High burden meters											
Low burden meters							V dc & V ac			V dc, I dc & R	V dc, I dc & R
DMMs											
Basic dc V accuracy	100 ppm	50 ppm	11 ppm	6.4 ppm	3.5 ppm	n/a	0.10 %	112 ppm	42 ppm	40 ppm	40 ppm
3.5 digits (typ. ± 0.3 % dc V)							V dc & V ac			V dc, I dc & R	V dc & V ac
4.5 digits (typ. ± 0.025 % dc V)											
5.5 digits (typ. ± 0.015 % dc V)											
6.5 digits (typ. ± 0.0024 % dc V)											
7.5 digits (typ. ± 12 ppm dc V)											
8.5 digits (typ. ± 3.9 ppm dc V)											
Temperature/pressure											
RTD simulate											
RTD measure											
Thermocouple simulate											
Thermocouple measure											
Pressure modules			opt							opt	opt
Two-wire transmitters											
Oscilloscopes	**1 to 5 channels**										
200 MHz to 600 MHz	200 MHz opt	300 MHz or 600 MHz opt	600 MHz opt			600 MHz std					
1.1 GHz			1 GHz opt			9510 Head opt					
3.2 GHz						9530 Head opt					
6.4 GHz						9560 Head opt					
25 ps fast edge (14 GHz)						9550 Head opt					
Safety testers											
Hipot											
Megohm meters	MEG opt										
Installation											
PATs											
Continuity	MEG opt										
Loop impedance											
Leakage current											
Ground bond											
RCD/GFCI											
Medical safety											
Power/energy											
Wattmeters											
Harmonic analyzers											
Flicker meters			PQ opt								
Phase angle meters			PQ opt								
Power analyzers			PQ opt								
Power recorders											
Secondary energy standards											
Watthour/ energy meters											
Other											
Clamp meters	5500A/ COIL	5500A/ COIL	5500A/ COIL	52120A Amp + COIL opt	52120A Amp + COIL opt						
LCR meters		RC only	RC only								
Process calibrators											
Data acquisition											
Non sine waveforms											
RF millivolt meters				30 MHz WB opt	30 MHz WB opt						
# of calibrator functions	**8**	**11**	**11**	**5**	**5**	**11+**	**9**	**8**	**8**	**9**	**9**

5730A

5502A

5700A

DC/LF Electrical Calibrators

5730A Multifunction Calibrator

The new gold standard in electrical calibration.

- The next generation high-performance multifunction calibrator
- Support instruments of up to 8.5 digits in measurement performance
- Artifact Calibration permits the lowest cost of support and highest confidence in performance
- New internal printed circuit boards with upgraded digital technology
- 6.5 inch VGA capacitive touchscreen with full color graphical user interface
- Menus and functions displayed in choice of nine languages
- Optional wideband output to 30 MHz

5522A

5080A

5502A Multi-Product Calibrator

Robust, transportable solution to match your workload and budget.

- Calibrates a wide variety of electrical test equipment
- Robust protection circuits prevent costly damage from operator error
- Ergonomically designed carrying handles
- Rugged optional case with built-in handles and wheels and removable front/rear access doors
- Optional oscilloscope calibration to 600 MHz

5522A Multi-Product Calibrator

Robust, transportable wide workload coverage.

- Calibrates a wide variety of electrical test equipment with more than 14 functional capabilities
- Accuracies intended to support DMMs to 6.5 digits
- Robust protection circuits prevent costly damage from operator error
- Optional oscilloscope calibration to 1100 MHz
- Easy to transport

5700A Multifunction Calibrators

A proven, high-accuracy calibrator.

- It will support instruments of up to 7.5 to 8.5 digits in measurement performance
- Artifact Calibration permits the lowest cost of support and highest confidence in performance
- Optional wideband output to 30 MHz

5080A High Compliance Multi-Product Calibrator

Solutions for your analog and digital workload.

- High compliance for difficult-to-calibrate analog instruments
- Robust protection circuits prevent costly damage from operator error
- Calibrates a wide workload, including analog meters and 3.5 and 4.5 digit DMMs
- Options for oscilloscope and megohm meter calibration

6105A/6100B

52120A

6135A/PMU

7526A

5725A

5320A

525B

Specialty Calibrators

6105A/6100B Electrical Power Standards

The most accurate, comprehensive and flexible sources of electrical power quality and energy signals.

- Power calibration with voltage to 1008 V and current to 21 amps, and optionally up to 80 amps
- Voltage and current accuracies better than 0.005 % (50 ppm)
- Current to voltage phase accuracy of 0.003 °
- Programmable harmonic distortion up to 100 harmonics
- Includes other power quality testing phenomena
- Complex measurements generating a wide variety of signals

5725A Amplifier

The Fluke 5725A Amplifier is a companion to the 57XX Series calibrators.

- Extends the calibrators' alternating volt-hertz product to 1100 V at 30 kHz and 750 V at 100 kHz
- Increases maximum direct and alternating current to 11 A

52120A Transconductance Amplifier

Test and calibrate power standards, power and energy meters, PQ analyzers, high-current clamp meters and Rogowski coils. Delivers:

- 120 A standalone
- 240 A or 360 A with parallel operation
- 3000 A or 6000 A with accessory coils
- Industry-leading amplifier accuracy:
  - 100 PPM dc to 850 Hz
  - 120 PPM dc and 260 PPM ac in stand-alone operation
- Frequency capability, dc to 10 kHz

7526A Precision Process Calibrator

Best balance of economy and accuracy for calibration of temperature and pressure process measurement instrumentation.

- Sources and measures dc voltage, current, resistance,
- Measures and simulates RTDs and thermocouples
- Measures pressure using Fluke 700/525A-P pressure modules
- Includes 24 V dc loop power supply, automated switch-test function and measures 4 mA to 20 mA

6135A/PMU Phasor Measurement Unit Calibrator

Fast, automated, IEEE C37 118.1-2011-compliant PMU calibrations. System includes:

- PMU control unit
- GPS receiver
- PMU test and calibration software
- Fluke 6135 Electrical Power Standard
- Configured server PC

5320A Multifunction Electrical Tester Calibrator

Verify and calibrate electrical test tools with a single instrument.

- Calibrate megohm meters, earth resistance testers, ground bond testers, hipots, installation testers and many more types of electrical safety testers
- Uses less bench space than custom solutions
- Built-in graphical calibration help guide
- LAN, GPIB, RS-232 interfaces for PC based automation

525B Temperature/Pressure Calibrator

Superior accuracy and functionality in an economical benchtop package.

- A calibrator to address process industry instrumentation
- Simulates and measures all ANSI thermocouples, as well as L and U types, and provides cold junction compensation to enable calibration of a wide variety of thermocouple instrumentation
- Direct input for storage of ITS-90 RTD constants
- RTD source uncertainties to 0.03 °C

9500B

55XX

8508A

8845A/8846A

8808A

Oscilloscope Calibrators

9500B Oscilloscope Calibrator

The highest performance, fully automated, upgradeable oscilloscope calibration workstation.

- Full automation provides totally hands-free calibration
- Bandwidths of 600 MHz, 1000 MHz, 3200 MHz, and 6400 MHz
- A fast edge of 25 ps to address bandwidths up to 14 GHz
- Connect up to five channels simultaneously

55XX Series Oscilloscope Calibration Options

Options for the 5502A and 5522A calibrators add capabilities to calibrate your digital and analog oscilloscopes with any of three different ranges of bandwidths.

- Leveled sine wave generator with optional bandwidths of 300 MHz, 600 MHz and 1100 MHz for verifying oscilloscope bandwidth
- DC and square wave voltage generators for calibrating voltage gain
- Horizontal time base calibration functions
- Edge source including a 300 ps fast edge with low aberrations for verifying dynamic response
- Fast edge risetime pulse generator (< 1 ns) for checking pulse response

Precision Multimeters

8508A Reference Multimeter

Reference standard accuracy and stability, in one functionally versatile, easy-to-use solution.

- 8.5 digit resolution, exceptional linearity and low noise and stability
- Optional electronic front/rear inputs with unique ratio measurement option
- Broad range of measurement capabilities
- 365 day stability as low as 2.7 ppm, 24-hour stability of 0.5 ppm, transfer uncertainty of 0.12 ppm

8845A/8846A Precision Multimeters

Precision and versatility for bench or systems applications.

- 6.5 digit resolution
- Basic V dc accuracy of up to 0.0024 %
- Dual display, showing two different measurements at once

8808A Digital Multimeter

Versatile multimeter for manufacturing, development and service applications.

- 5.5 digit resolution
- Basic V dc accuracy of 0.015 %
- Dual display, showing two different measurements at once

732B/734A

792A

5790A

742A

A40B

A40/A40A

752A

720A

910/910R

908/909

Electrical Standards

732B/734A DC Reference and Transfer Standards

The simple way to maintain and disseminate your volt.

- A primary standard for traceability of dc voltage to better than 1 ppm
- Complete mechanical and electrical independence of each of its four standards (734A)
- Battery powered for easy shipping

792A AC/DC Transfer Standard

Support for your most demanding ac traceability requirements.

- A primary standard that is accurate, fast and easy to use
- Fully traceable performance with ac/dc difference to better than 10 ppm
- Nine ranges from 22 mV to 1000 V (with external range resistor)

5790A AC Measurement Standard

Automated ac measurement with precision that is easy to use.

- Direct ac measurements to 22 ppm, or ac/dc difference measurements to 15 ppm
- Digital voltmeter style operation that features a fully autoranging instrument that selects the best voltage range for the measurement you are making
- Robust 1200 V input protection on all voltage ranges
- Optional 30 MHz wideband measurement

742A Resistance Standard

High accuracy working standard for on-site resistance calibration.

- Small and rugged standard resistors with six-month stabilities to 2.5 ppm
- Open air use so no oil or air baths required
- 18 °C to 28 °C operating range
- Standard values from 1 ohm to 100 Megohms

A40B Series Precision Current Shunts

Precision, low inductance shunts for dc and ac current metrology.

- Simplifies calibration/verification of precision calibrators and current sources
- Shunts sized for current from 1 mA to 100 A
- Usable from dc to 100 kHz
- Ultra low phase shift to support power quality instrument metrology

A40/A40A Current Shunts

- AC current transfer measurements from 2.5 mA to 20 A
- Frequency between 5 Hz to 100 kHz

752A Reference Divider

Setting the standard for ratio accuracy and ease of use.

- Key standard for calibrating 57xx Series Calibrators
- 10:1 and 100:1 divider outputs
- Output uncertainty 0.2 ppm and 0.5 ppm
- Built-in calibration bridge

720A Kelvin-Varley Divider

A primary standard for ratio measurements.

- 0.1 ppm resolution, seven decades
- 0.1 ppm of input absolute linearity
- Built-in self-calibration bridge

910/910R GPS Controlled Frequency Standard

Cesium controlled frequency standard that uses GPS technology and connectivity to provide primary standard traceability from any location.

- Unique traceability feature means no more re-calibrations
- Two high-stability models to meet your application and fit your budget
- Built-in rubidium atomic clock (910R)
- Up to 13 outputs, maximizing cost efficiency

908/909 Frequency References

Stable frequency references for test systems and calibration labs.

- Accurate reference “atomic clock” in automated test systems
- Affordable and very cost effective
- Designed for portability with optional carrying case

RF calibration

RF and microwave calibration refers to the process of verifying the performance of, or adjusting/deriving corrections for, any instrument or component that will be used in the measurement or testing of RF and microwave parameters. This discipline is usually referred to as RF and microwave metrology. Principal parameters include RF voltage, RF power, impedance, modulation, distortion, time, frequency and phase. High dynamic range ratiometric comparisons are often performed and results are expressed in the logarithmic "dB" form.

As with any other calibration, RF and microwave calibration compares a device or unit under test (DUT or UUT) to a traceably calibrated standard or reference device. The process typically involves comparing a measuring UUT to a reference source; a sourcing UUT with a measuring reference; or quite commonly a measuring UUT with a measuring reference, using a stable but unknown source.

In each case, the uncertainty or stability of the reference should significantly exceed the specified performance of the device or unit under test. RF metrologists typically look for performance margins of 4:1, however, test uncertainty ratios lower than this usual target are more frequently encountered in RF than in other calibration disciplines. Conversion from logarithmic (dB) to linear units is recommended practice when combining uncertainty contributions and considering test uncertainty ratios.

Precision devices that are commonly used in RF and microwave calibration fall broadly into four categories:

Sourcing instruments. Reference signals and/or modulation sources, frequency references, pulse or arbitrary waveform generators, reference attenuators.

Measuring instruments. Power sensors, spectrum analyzers, measuring receivers, oscilloscopes, RF voltmeters, frequency counters.

Source-measure instruments. Vector or scalar network analyzers.

Precision components

- Power splitters, power dividers or couplers, attenuating pads
- Inter-series, polarity or sacrificial cables and adapters
- Short, open, load or sliding terminators
- Reflection bridges or directional couplers

9640A

9640A-LPNX

RF References

9640A RF Reference

A unique blend of accuracy, stability, resolution, purity, dynamic range and low noise.

The Fluke 9640A is an RF reference source, reference attenuator, reference local oscillator and frequency counter and is the key component in a simplified, streamlined RF and microwave calibration system.

- Takes the central role and typically halves the cost of a higher capability RF calibration system and delivers certified accuracy directly to the UUT via a single signal connection
- Via MET/CAL software and an extensive procedure library, realizes “walk away” automation and a new level of efficiency for spectrum analyzer calibration
- A highly integrated and robust solution for on-site RF calibration and a GPIB emulating drop-in replacement for the legacy HP3335 RF source and attenuator
- Performs 80 to 100 percent of tests required on high performance high frequency spectrum analyzers
- Also calibrates power sensor linearity, millivoltmeters, signal level meters, modulation analyzers, receivers and counter/timers

9640A-LPNX RF Reference

With higher performance, state-of-the-art phase noise or timing jitter, the LPNX version of the 9640A RF Reference addresses the most demanding RF calibration and local oscillator applications.

- –138 dBc/Hz at 1 GHz and 5 kHz to 100 kHz offset
- Optional drop-in GPIB emulation of the legacy HP8662/3 RF sources
- Optional 9600FLT 1GHz phase noise filter for high margin calibrations at > 5 MHz offset

FLUKE®
Calibration

Temperature calibration

Temperature calibration refers to the calibration of any device used in a system that measures temperature. Most importantly, this usually means the temperature sensor, itself, which is typically a platinum resistance thermometer (PRT or PT-100), thermistor, or thermocouple. Readings from these thermometers are made by "thermometer readout" devices which measure their electrical outputs and convert them to temperature according to the International Temperature Scale of 1990 (ITS-90).

Thermometers are typically calibrated by placing them in a stable temperature environment (heat source) and comparing their output to that of a calibrated "reference thermometer" or "standard thermometer." Fluke Calibration provides three general categories of heat sources: industrial heat sources (dry-well calibrators, Micro-Baths, etc.) for field use; fluid baths and thermocouple furnaces for laboratory use; and fixed-point cells for "primary" calibrations. Fluke Calibration also offers a variety of reference thermometers, including SPRTs, and thermometer readout instruments.

In addition, Fluke Calibration provides laboratory and field solutions for calibrating the electronics used in temperature measurement circuits.

Product highlights

9190A Ultra-Cool Field Metrology Well

Ultra-cool dry-block calibrator with best-in-class stability

The 9190A Ultra-Cool Field Metrology Well is the most accurate and stable, cold temperature dry-block on the market. It's ideal for applications that demand strict quality control and regulatory process compliance. These applications include on-location validation and calibration of RTDs, thermocouples, thermometers, and sensors used with process control equipment such as medical freezers, laboratory refrigerators, cold rooms, blood banks, sterilizers (autoclaves), and freeze dryers.

- Wide temperature range from –95 °C to 140 °C
- Best-in-class stability: ± 0.015 °C full range
- Accuracy using built-in reference thermometer readout: ± 0.05 °C full range
- Display accuracy: ± 0.2 °C full range

1586A Super-DAQ Precision Temperature Scanner

The most accurate, flexible temperature data acquisition system

The 1586A is ideal for benchtop calibration of temperature sensors in secondary calibration labs, as well as temperature data acquisition applications in industries such as pharmaceutical, bio-technology, aerospace, food and energy where accurate temperature measurements are critical.

- Measure thermocouples, PRTs, thermistors, dc V, dc I, and resistance
- Best-in-class temperature measurement accuracy:
  - PRTs: ± 0.005 °C (using external DAQ-STAQ Multiplexer)
  - Thermocouples: ± 0.5 °C (using High-Capacity Module and internal CJC)
  - Thermistors: ± 0.002 °C
- Connect up to 40 isolated inputs
- Scan speed of up to 10 channels per second
- Four modes of operation: Scan, Monitor, Measure, DMM
- Real-time color trending—chart up to four channels simultaneously
- Controls Fluke Calibration temperature sources such as dry-wells or micro-baths for automated calibration routines
- MX + B scaling and channel offset zero function
- Built-in data security levels

Selection guides

Primary standards

Standard platinum resistance thermometers (SPRTs)		
Model	RTPW	Description
5681	25.5 Ω	–200 °C to 670 °C, quartz sheath
5683	25.5 Ω	–200 °C to 480 °C, quartz sheath
5684	0.25 Ω	0 °C to 1070 °C, quartz sheath
5685	2.5 Ω	0 °C to 1070 °C, quartz sheath
5698	25.5 Ω	–200 °C to 670 °C, working standard, quartz sheath
5699	25.5 Ω	–200 °C to 670 °C, high temperature, metal sheath
5686	25.5 Ω	–260 °C to 232 °C, glass capsule

ITS-90 Fixed-point cells

Model	Description	Temperature
Triple point of water cells		
5901A-G	TPW Cell, 12 mm ID with handle, glass shell	0.01 °C
5901A-Q	TPW Cell, 12 mm ID with handle, quartz shell	0.01 °C
5901C-G	TPW Cell, 13.6 mm ID with handle, glass shell	0.01 °C
5901C-Q	TPW Cell, 13.6 mm ID with handle, quartz shell	0.01 °C
5901D-G	TPW Cell, 12 mm ID, glass shell	0.01 °C
5901D-Q	TPW Cell, 12 mm ID, quartz shell	0.01 °C
5901B-G	TPW Cell, mini, glass shell	0.01 °C
Standard size fixed-point cells		
5900E	TP Mercury, SST	–38.8344 °C
5904	Freezing Point of Indium	156.5985 °C
5905	Freezing Point of Tin	231.928 °C
5906	Freezing Point of Zinc	419.527 °C
5907	Freezing Point of Aluminum	660.323 °C
5908	Freezing Point of Silver	961.78 °C
5909	Freezing Point of Copper	1084.62 °C
5924	Open Freezing Point of Indium	156.5985 °C
5925	Open Freezing Point of Tin	231.928 °C
5926	Open Freezing Point of Zinc	419.527 °C
5927A	Open Freezing Point of Aluminum	660.323 °C
5928	Open Freezing Point of Silver	961.78 °C
5929	Open Freezing Point of Copper	1084.62 °C
5943	Melting Point of Gallium, SST	29.7646 °C
Mini triple point of water and fixed-point cells		
5901B	Mini Triple Point of Water	0.01 °C
5914A	Mini Freezing Point of Indium	156.5985 °C
5915A	Mini Freezing Point of Tin	231.928 °C
5916A	Mini Freezing Point of Zinc	419.527 °C
5917A	Mini Freezing Point of Aluminum	660.323 °C
5918A	Mini Freezing Point of Silver	961.78 °C
5919A	Mini Freezing Point of Copper	1084.62 °C
5944	Mini Freezing Point of Indium, Metal Cased	156.5985 °C
5945	Mini Freezing Point of Tin, Metal Cased	231.928 °C
5946	Mini Freezing Point of Zinc, Metal Cased	419.527 °C
5947	Mini Freezing Point of Aluminum, Metal Cased	660.323 °C

Model	Features/use
Maintenance apparatus	
7012	Maintains: triple point of water and gallium cells. Comparisons: –10 °C to 110 °C.
7037	Maintains: triple point of water and gallium cells. Comparisons: –40 °C to 110 °C.
7312	Maintains: two TPW cells. Compact size, runs quietly. Comparisons: –5 °C to 110 °C.
7341	Maintains: triple point of mercury cell. Comparisons: –45 °C to 150 °C.
9210	Maintains: mini triple point of water. Comparisons: –10 °C to 125 °C.
9230	Maintains: stainless steel gallium cell. Comparisons: 15 °C to 35 °C.
9260	Maintains: indium, tin, zinc, and aluminum cells. Comparisons: 50 °C to 680 °C.
9114	Maintains: indium, tin, zinc, and aluminum cells. Comparisons: 100 °C to 680 °C.
9115A	Maintains: aluminum and silver cells. Comparisons: 550 °C to 1000 °C.
9116A	Maintains: aluminum, silver, gold, and copper cells. Comparisons: 400 °C to 1100 °C.
9117	Anneals SPRTs, HTPRTs, and thermocouples to 1100 °C. Protects them against contamination from metal ions.
Boiling point of liquid nitrogen	
7196	Affordable substitute for a triple point of argon system. Provides for low-temperature comparison calibrations at approximately –196 °C with uncertainties of 2 mK.
Triple point of argon system	
5960A	Lowest uncertainty for any commercially available triple point of argon system.
Standard resistors	
742A	Excellent performance without oil or air baths. Values from 1 ohm to 19 megohm.
5430	Highest stability oil-filled resistors (< 2 ppm/year drift). AC cal uncertainty to 3 ppm.

Thermometer readouts

Intrinsically safe thermometers			
1551A Ex	100 Ω thin-film RTD	–50 °C to 160 °C (–58 °F to 320 °F)	Accuracy of ± 0.05 °C (± 0.09 °F) over full range. Intrinsically safe (ATEX and IECEx compliant). Two models to choose from (-50 °C to 160 °C or -80 °C to 300 °C)
1552A Ex	100 Ω wire-wound PRT	–80 °C to 300 °C (–112 °F to 572 °F)	
Precision digital thermometer readouts			
Model	Probe types	Accuracy at 0 °C	Features
Tweener			
1502A	PRTs	± 0.006 °C	Resolution of 0.001 °C and accuracy to match; uses ITS-90, IPTS-68, CVD, or DIN (IEC 751) conversions
1504	Thermistors	± 0.002 °C	Reads thermistors from 0 to 500 KW; uses Steinhart-Hart and CVD
Handheld			
1523	PRTs, Thermistors, Thermocoouples	± 0.002 °C	Battery-powered, handheld reference thermometer; INFO-CON connector reads coefficients without programming; saves 25 readings on demand; graphs trends
1524	PRTs, Thermistors, Thermocoouples	± 0.002 °C	Handheld reference thermometer same as 1523 but with inputs for two thermometers; logs up to 15,000 readings and stores 25 more on demand
Chub-E4			
1529	PRTs, Thermistors, Thermocouples	± 0.006 °C (PRT)	Four channels can all be measured simultaneously; battery-powered; logs up to 8,000 readings; flexible display
Super-Thermometers			
1594A	SPRTs, PRTs, Thermistors	± 0.00006 °C	Ratio accuracy of 0.8 ppm; temperature-controlled internal reference resistors; six input channels
1595A	SPRTs, PRTs, Thermistors	± 0.000015 °C	Ratio accuracy of 0.2 ppm; Ratio Self-Calibration; automated zero-power measurements
Multi-channel			
1586A	PRTs, Thermistors, Thermocouples	± 0.005 °C	40 channels with scan rate of 10 channels per second
1560	Accepts any combination of the modules below; all are easily added to and removed from the 1560 Black Stack base		
2560	SPRTs, PRTs	± 0.005 °C	2 channels of 25W or 100W PRTs
2561	HTPRTs	± 0.013 °C	2 channels to 1200 °C
2562	PRTs	± 0.01 °C	8 channels of 2-, 3-, or 4-wire RTDs
2563	Thermistors	± 0.0013 °C	2 channels of resolution to 0.0001 °C
2564	Thermistors	± 0.0025 °C	8 channels for data acquisition
2565	Thermocouples	± 0.05 °C	Reads most TC types with 0.0001 mV resolution
2566	Thermocouples	± 0.1 °C	Reads any combination up to 12 channels of virtually any type of TC
2567	1000 Ω PRTs	± 0.006 °C	2 channels of high-resistance PRTs
2568	1000 Ω PRTs	± 0.01 °C	8 channels of high-resistance PRTs
Thermo-hygrometer			
1620A	The "DewK" Thermo-Hygrometer	Two channels measure ambient temperature to ± 0.125 °C and %RH to ±1.5 %. Onboard memory holds up to two years of time/date-stamped readings. Visual and audio alarms. Detachable sensors contain their own calibration data for easy recalibrations. Ethernet and wireless capabilities.	

Thermometer probes

Platinum resistance thermometers (PRTs)			
Model	Range	Size	Basic Accuracy†
Secondary standard PRT			
5608-9-X	–200 °C to 500 °C	9 in x 1/8 in	Select from available calibration options
5608-12-X	–200 °C to 500 °C	12 in x 1/8 in	
5609-12-X	–200 °C to 670 °C	12 in x 1/4 in	
5609-15-X	–200 °C to 670 °C	15 in x 1/4 in	
5609-20-X	–200 °C to 670 °C	20 in x 1/4 in	
5609-300-X	–200 °C to 670 °C	300 mm x 6 mm	
5609-400-X	–200 °C to 670 °C	400 mm x 6 mm	
5609-500-X	–200 °C to 670 °C	500 mm x 6 mm	
5626	–200 °C to 661 °C	305 or 381 x 6.35 mm (12 or 15 x 0.25 in	± 0.007 °C at 0 °C
5628	–200 °C to 661 °C	305 or 381 x 6.35 mm (12 or 15 x 0.25 in)	± 0.006 °C at 0 °C
Secondary reference PRT			
5616-12	–200 °C to 420 °C	6.35 mm x 298 mm (0.250 x 11.75 in)	± 0.010 °C at 0.010 °C
5615-6	–200 °C to 300 °C	4.76 mm x 152 mm (0.188 x 6.0 in)	± 0.013 °C at 0.010 °C
5615-9	–200 °C to 420 °C	4.76 mm x 229 mm (0.188 x 9.0 in)	± 0.013 °C at 0.010 °C
5615-12	–200 °C to 420 °C	6.35 mm x 305 mm (0.250 x 12.0 in)	± 0.013 °C at 0.010 °C
Precision industrial PRT			
5627A-6	–200 °C to 300 °C	152 mm x 4.7 mm (6 x 0.187 in)	± 0.05 °C at 0 °C
5627A-9	–200 °C to 300 °C	229 mm x 4.7 mm (9 x 0.187 in)	± 0.05 °C at 0 °C
5627A-12	–200 °C to 420 °C	305 mm x 6.35 mm (12 x 0.25 in)	± 0.05 °C at 0 °C
Fast response PRT			
5622-05	–200 °C to 350 °C	100 mm x 0.5 mm	± 0.04 °C at 0 °C
5622-10	–200 °C to 350 °C	100 mm x 1.0 mm	± 0.04 °C at 0 °C
5622-16	–200 °C to 350 °C	200 mm x 1.6 mm	± 0.04 °C at 0 °C
5622-32	–200 °C to 350 °C	200 mm x 3.2 mm	± 0.04 °C at 0 °C
Small diameter industrial PRTs			
5618B-6	–200 °C to 300 °C	152 mm x 3.2 mm (6 x 0.125 in)	± 0.05 °C
5618B-9	–200 °C to 500 °C	229 mm x 3.2 mm (9 x 0.125 in)	± 0.05 °C
5618B-12	–200 °C to 500 °C	305 mm x 3.2 mm (12 x 0.125 in)	± 0.05 °C
Full immersion PRTs			
5606 Immersion PRT	–200 °C to 160 °C	50 mm x 3.1 mm (2 x 1/8 in)	± 0.05 °C
5623B Freezer Probe	–100 °C to 156 °C	152 mm x 6.35 mm (6 x 0.25 in)	± 0.05 °C
High temperature PRT			
5624	0 °C to 1000 °C	508 mm x 6.35 mm (20 x 0.125 in)	± 0.055 °C
Thermistors			
Standards			
5640	0 °C to 60 °C	229 mm x 6.35 mm (9 x 0.25 in)	± 0.0015 °C
5641	0 °C to 60 °C	114 mm x 3.2 mm (4.5 x 0.125 in)	± 0.001 °C
5642	0 °C to 60 °C	229 mm x 3.2 mm (9 x 0.125 in)	± 0.001 °C
5643	0 °C to 100 °C	114 mm x 3.2 mm (4.5 x 0.125 in)	± 0.0025 °C
5644	0 °C to 100 °C	229 mm x 3.2 mm (9 x 0.125 in)	± 0.0025 °C
Secondary probes			
5610	0 °C to 100 °C	152 mm or 229 x 3.2 mm (6 or 9 x 0.125 in)	± 0.01 °C
5611A	0 °C to 100 °C	1.5 mm (0.06 in) tip dia.	± 0.01 °C
5611T	0 °C to 100 °C	28 mm x 3 mm (1.1 x 0.12 in)	± 0.01 °C
5665	0 °C to 100 °C	76 mm x 3.2 mm (3 x 0.125 in)	± 0.01 °C
Thermocouples			
Type R and S standards			
5649/5650-20	0 °C to 1450 °C	508 mm x 6.35 mm (20 x 0.25 in)	± 0.7 °C at 1100 °C
5649/5650-20C	0 °C to 1450 °C	508 mm x 6.35 mm (20 x 0.25 in)	± 0.7 °C at 1100 °C
5649/5650-25	0 °C to 1450 °C	635 mm x 6.35 mm (20 x 0.25 in)	± 0.7 °C at 1100 °C
5649/5650-25C	0 °C to 1450 °C	635 mm x 6.35 mm (20 x 0.25 in)	± 0.7 °C at 1100 °C
†"Basic Accuracy" includes calibration uncertainty and short-term repeatability. It does not include long-term drift.			

Calibration baths

Compact calibration baths			
Model	Range	Stability	Depth
6330	35 °C to 300 °C	± 0.005 °C at 100 °C ± 0.015 °C at 300 °C	234 mm (9.25 in)
7320	–20 °C to 150 °C	± 0.005 °C at –20 °C ± 0.005 °C at 25 °C	234 mm (9.25 in)
7340	–40 °C to 150 °C	± 0.005 °C at –40 °C ± 0.005 °C at 25 °C	234 mm (9.25 in)
7380	–80 °C to 100 °C	± 0.006 °C at –80 °C ± 0.010 °C at 0 °C	178 mm (7 in)
6331	35 °C to 300 °C	± 0.015 °C at 300 °C ± 0.005 °C at –20 °C	457 mm (18 in)
7321	–20 °C to 150 °C	± 0.005 °C at 25 °C ± 0.005 °C at –40 °C	457 mm (18 in)
7341	–45 °C to 150 °C	± 0.005 °C at –40 °C ± 0.005 °C at 25 °C	457 mm (18 in)
7381	–80 °C to 110 °C	± 0.006 °C at –80 °C ± 0.005 °C at 0 °C	457 mm (18 in)
Standard size calibration baths			
7080	–80 °C to 110 °C	± 0.0025 °C at –80 °C ± 0.0015 °C at 25 °C	305 mm (12 in)
7008	–5 °C to 110 °C	± 0.0007 °C at 25 °C ± 0.0008 °C at 0 °C	331 mm (13 in)
7011	–10 °C to 110 °C	± 0.0008 °C at 25 °C ± 0.0008 °C at 0 °C	305 mm (12 in)
7040	–40 °C to 110 °C	± 0.0015 °C at 25 °C ± 0.001 °C at 40 °C	305 mm (12 in)
6020	40 °C to 300 °C	± 0.005 °C at 300 °C ± 0.001 °C at 40 °C	305 mm (12 in)
6022	40 °C to 300 °C	± 0.005 °C at 300 °C ± 0.001 °C at 40 °C	464 mm (18.25 in)
6024	40 °C to 300 °C	± 0.005 °C at 300 °C ± 0.002 °C at 200 °C	337 mm (13.25 in)
6050H	180 °C to 550 °C	± 0.007 °C at 500 °C ± 0.006 °C at –80 °C	305 mm (12 in)

Other	
Item	Description
Bath accessories	Stands, rods, and clamps to suspend and support your probes and thermometers
Bath fluids	Silicone oils, salt, and cold fluids in convenient, small quantities.
Rosemount bath controllers	Model 7900 controller designed by Hart integrates the features of Hart's 2100 controller and can be used in place of the Rosemount 915 controller with Rosemount-designed baths.
Fluke Calibration bath controllers	Model 2100 and 2200 controllers can be integrated with homemade baths or other heat sources to achieve performance levels approaching Fluke Calibration baths.

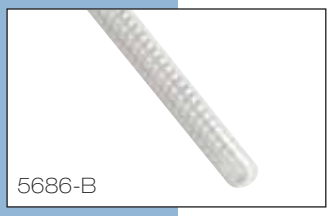
Industrial temperature calibrators

Field metrology wells		
Model	Range	Accuracy
9142	–25 °C to 150 °C	± 0.2 °C
9143	33 °C to 350 °C	± 0.2 °C
9144	50 °C to 660 °C	± 0.35 °C at 50 °C ± 0.35 °C at 420 °C ± 0.5 °C at 660 °C
Micro-Baths		
6102	35 °C to 200 °C (95 °F to 392 °F)	± 0.25 °C
7102	–5 °C to 125 °C (23 °F to 257 °F)	± 0.25 °C
7103	–30 °C to 125 °C (–22 °F to 257 °F)	± 0.25 °C
Handheld dry-wells		
9100S	35 °C to 375 °C (95 °F to 707 °F)	± 0.25 °C at 100 °C ± 0.5 °C at 375 °C
9102S	–10 °C to 122 °C (14 °F to 252 °F)	± 0.25 °C
Field dry-wells		
9009	–15 °C to 350 °C (5 °F to 662 °F)	Cold block: ±0.2 °C Hot block: ±0.6 °C
9103	–25 °C to 140 °C (–13 °F to 284 °F)	± 0.25 °C
9140	35 °C to 350 °C (95 °F to 662 °F)	± 0.5 °C
9141	50 °C to 650 °C (122 °F to 1202 °F)	± 0.5 °C to 400 °C ± 1 °C to 650 °C

Infrared calibrators		
4180	–15 °C to 120 °C	± 0.40 °C at –15 °C ± 0.40 °C at 0 °C ± 0.50 °C at 50 °C ± 0.50 °C at 100 °C ± 0.55 °C at 120 °C
4181	35 °C to 500 °C	± 0.35 °C at 35 °C ± 0.50 °C at 100 °C ± 0.70 °C at 200 °C ± 1.20 °C at 350 °C ± 1.60 °C at 500 °C
9132	50 °C to 500 °C (122 °F to 932 °F)	± 0.5 °C at 100 °C ± 0.8 °C at 500 °C
9133	–30 °C to 150 °C (–22 °F to 302 °F)	± 0.4 °C
Metrology Wells		
9170	–45 °C to 140 °C (–49 °F to 284 °F)	± 0.1 °C
9171	–30 °C to 155 °C (–22 °F to 311 °F)	± 0.1 °C
9172	35 °C to 425 °C (95 °F to 797 °F)	± 0.1 °C at 100 °C ± 0.15 °C at 225 °C ± 0.2 °C at 425 °C
9173	50 °C to 700 °C (122 °F to 1292 °F)	± 0.2 °C at 425 °C ± 0.25 °C at 660 °C
Zero point dry-well		
9101	0 °C (32 °F)	± 0.05 °C
Dual block dry-well		
9011	50 °C to 670 °C (122 °F to 1238 °F)	± 0.15 °C at 100 °C ± 0.65 °C at 600 °C
	–30 °C to 140 °C (–22 °F to 284 °F)	± 0.25 °C (insert wells) ± 0.65 °C (fixed wells)
Thermocouple furnaces		
9150	150 °C to 1200 °C (302 °F to 2192 °F)	± 0.5 °C

5681, 5683, 5684, and 5685

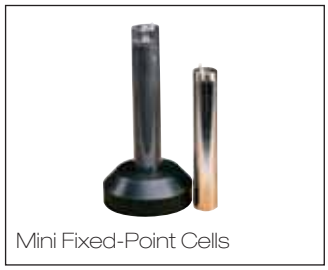
5698-25


5686-B

5699

5901

ITS-90


Mini Fixed-Point Cells

Standard Platinum Resistance Thermometers (SPRTs)

5681, 5683, 5684, and 5685 Quartz-Sheath SPRTs

The performance you expect from world-class SPRTs.

- Drift rates as low as 0.0005 K
- Proprietary gas mixtures ensures high stability
- Most experienced SPRT design team in the business

5698-25 Working Standard SPRT

High performance-to-price ratio.

- Conforms to ITS-90 SPRT Guidelines
- Drift rate typically 0.003 °C
- Calibration options by fixed point

5686-B Glass Capsule SPRT

Designed for metrology work requiring small SPRTs.

- Temperatures from -260 °C (13 K) to 232 °C
- Stability typically 0.001 °C over 100 °C range
- Miniature capsule package eliminates stem conduction

5699 High-Temperature Metal-Sheath SPRT

Affordable working standard SPRT.

- Range to aluminum point (660 °C)
- Inconel™ sheaths guard against contamination of sensor
- Drift rates less than 8 mK/year

ITS-90 Fixed-Point Cells

5901 Triple Point of Water Cells

Must-have, primary temperature standards.

- Easy-to-use, inexpensive standard with uncertainty better than ± 0.0001 °C
- Four sizes and two shells (glass and quartz) to choose from
- Isotopic composition of Vienna Standard Mean Ocean Water

ITS-90 Fixed-Point Cells

Best cell uncertainties commercially available.

- Every ITS-90 fixed point available from mercury to copper
- Plateaus last days (gallium for weeks and TPW for months)
- Manufactured and tested by Fluke Calibration's primary standards scientists

Mini Fixed-Point Cells

Least expensive, easiest-to-use fixed-point standards.

- Lower uncertainties than comparison calibrations
- All ITS-90 fixed points from TPW to copper
- Reduced equipment and annual recalibration costs

9114, 9115A, 9116A

9117

7196B

9210

9230

9260

7312

Cell Maintenance Apparatus

9114, 9115A, 9116A Freeze-Point Furnaces

Designed for maximum-length plateaus.

- Designed to extend plateaus
- High-stability OEM controllers, RS-232 included
- External cooling coils

9210 Mini Triple Point of Water Maintenance Apparatus

Simple supercool-and-shake realization and maintenance of the 5901B Mini TPW Cell.

- Easy preprogrammed realization
- Inexpensive fixed-point solution
- Training complete in less than an hour

9230 Gallium Cell Maintenance Apparatus

Realize and maintain the melting point of the 5943 Gallium Cell.

- One week plateau duration
- No hassle automatic realizations
- Used daily in our Primary Lab

9260 Mini Fixed-Point Cell Furnace

Inexpensive, easy-to-use fixed-point maintenance apparatus.

- Realize and maintain In, Sn, Zn and Al fixed-point cells
- Good introduction to fixed-point calibration
- User friendly and inexpensive

7012/7312 Triple Point of Water Maintenance Baths

Keep your cells up and running reliably for weeks at a time.

- Maintains TPW cells for up to six weeks
- Optional immersion freezer for simple cell freezing
- Up to 496 mm (19.5 in) of immersion depth

9117 Annealing Furnace

Keeps SPRTs and PRTs performing at their highest levels.

- Relieves mechanical strain
- Guards against contamination
- Anneals both SPRTs and HTSPRTs

7196B LN_2 Comparison Calibrator

Lowest-cost calibration to –196 °C.

- Simple to use
- Uncertainty less than 2 mK

1586A

1620A

Thermometer Readouts

1594A/1595A

5430

1560

1529

1502A/1504

1523/1524

1551A Ex and 1552A Ex

1586A Super-DAQ Precision Temperature Scanner

Best-in-class temperature measurement accuracy and up to 40 isolated input channels for measuring RTDs, thermocouples, thermistors, dc Voltage, dc current, and resistance.

- Thermocouple accuracy (± 0.5 °C)
- Scan speed of up to 10 channels per second
- Real-time color trending—chart up to four channels simultaneously
- Control Fluke Calibration temperature sources such as dry-wells or micro-baths for automated calibration routines

1594A/1595A Super-Thermometers

Thermometry bridge accuracy combined with time-saving features.

- Calibrate SPRTs, PRTs, RTDs and thermistors (0 Ω to 500 kΩ)
- Accuracy as good as 0.06 ppm (0.000015 °C)
- "Ratio Self-Calibration" verifies and calibrates resistance ratio accuracy

5430 Standard AC/DC Resistor

Best performance available in an ac/dc resistor.

- Long-term stability better than 2 ppm/year (< 1 ppm typical)
- Traceable ac and dc calibrations available
- National lab design proven for more than 25 years

1560 Black Stack Thermometer Readout

Accurate, expandable and configurable readout.

- Reads SPRTs, RTDs, thermistors, and thermocouples
- Any configuration you like up to eight modules
- High-accuracy reference thermometer (to ± 0.0013 °C)

1529 Chub-E4 Standards Thermometer

Lab-quality accuracy on four channels for PRTs, thermistors and thermocouples.

- Four channels for PRTs, thermistors, and thermocouples
- Displays eight user-selected data fields from any channel
- Logs up to 8,000 readings with date and time stamps

1502A/1504 Thermometer Readouts

Best performance thermometers in their price range.

- Single-channel reference thermometers
- Two models to choose from—reading PRTs or thermistors
- Best price/performance package

1523/1524 Reference Thermometers

Measure, graph and record three sensor types with one tool.

- High accuracy: PRTs: ± 0.011 °C; Thermocouples: ± 0.24 °C; Thermistors: ± 0.002 °C
- A simple user interface to see trends quickly
- Smart connectors to load probe information automatically

1551A Ex and 1552A Ex "Stik" Thermometer

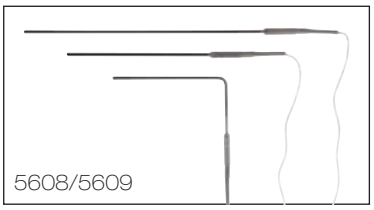
The best substitute for precision mercury-filled glass thermometers.

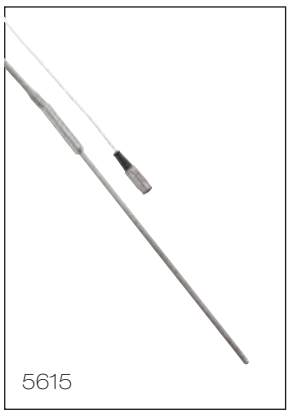
- Accuracy of ± 0.05 °C (± 0.09 °F) over full range
- Intrinsically safe (ATEX and IECEx compliant)
- Two models to choose from (-50 °C to 160 °C or -80 °C to 300 °C)

1620A Digital Thermometer-Hygrometer

The most accurate temperature and humidity graphical data logger on the market.

- Superior accuracy
- Network enabled
- Powerful logging and analysis tools





Secondary Standard PRTs

5608/5609 Secondary PRTs

Very stable thermometer from –200 °C to 670 °C.

- 5608: –200 °C to 500 °C (80 mm minimum immersion)
- 5609: –200 °C to 670 °C (100 mm minimum immersion)
- Calibration not included, NVLAP-accredited calibration optional, lab code 200348-0

5615 Secondary PRT

Reference-grade platinum sensing element.

- –200 °C to 420 °C
- ± 0.012 °C accuracy at 0 °C
- Drift of ± 0.007 °C after 100 hours at max temperature

5626/5628 Secondary SPRT, PRT, Temperature Sensors

High-temperature secondary standards.

- -200 °C to 661 °C
- Meets all ITS-90 requirements for resistance ratios
- Rtp drift < 20 mK after 500 hours at 661°C

Secondary Reference PRTs

5616 Secondary Reference PRT

- –200 °C to 420 °C
- Excellent stability: ± 0.007 °C
- Calibrated accuracy ± 0.011 °C at 0 °C

Thermistor Standards

5640 Series Thermistor Standards Probes

High accuracy temperature probes with excellent stability.

- Accuracy to ± 0.001 °C
- Affordable system accuracy to ± 0.004 °C or better
- NIST-traceable calibration included from manufacturer

HighTemperature PRT

5624 Platinum Resistance Thermometer

Precision PRT accuracy at thermocouple temperatures.

- Temperature range of 0 °C to 1000 °C
- Accuracy of ± 0.05 °C to 962 °C (includes short-term stability and calibration uncertainty)
- Long-term drift of 0.01 °C at 0 °C after 100 hours at 1000 °C

Thermocouple Standards

5649/5650 Type R and Type S Thermocouple Standards

Eight models to fit any type R or S thermocouple applications.

- 0 °C to 1450 °C
- Two sizes available, each with or without reference junction
- Optional fixed-point calibration, uncalibrated accuracy is the greater of ± 0.6 °C or ± 0.1 % of reading

Precision Industrial PRTs

5627A Precision Industrial PRTs

Durable PRTs with temperature range to 420 °C and accuracy to 0.025 °C.

- Vibration and shock resistant
- NVLAP-accredited calibration included, lab code 200706-0

Fast Response PRTs

5622 Fast Response PRTs

Designed for temperature measurements requiring fast response or short immersion over a wide range.

- Time constants as fast as 0.4 seconds
- Available as DIN/IEC Class A PRTs or with NVLAP-accredited calibration, lab code 200348-0
- Small probe diameters ranging from 0.5 mm to 3.2 mm

Small Diameter Indust. PRTs

5618B Small Diameter Industrial RTD

Secondary level performance with full ITS-90 calibration.

- Small diameter sheath, 3.2 mm (0.125 in)
- Excellent stability
- Includes ITS-90 coefficients

Full Immersion PRTs

5606 Full Immersion PRT

PRTs for laboratory freezers, autoclaves, and furnaces.

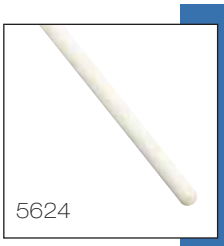
- Transition junction designed to withstand full temperature range of probe
- 5606: -200 °C to 160 °C
- Calibration accuracy of ± 0.05 °C

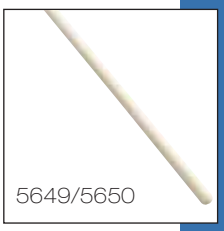
Secondary Thermistor Probes

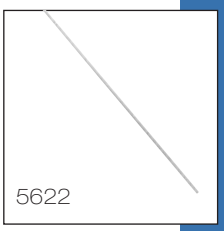
5610/5611/5611T/5665 Secondary Reference Thermistor Probes

Lab-grade thermistors probes for accurate work across a narrow temperature range.

- Short-term accuracy to ± 0.01 °C; one-year drift < ± 0.01 °C
- Accredited NVLAP calibration optional
- Flexible Teflon and silicone coated fast-response models







6330/7320/7340/7380

6331/7321/7341/7381

7312

6020/6022/6024

6050H

7008/7040/7037/7012/7011

7080

Compact Calibration Baths

6330/7320/7340/7380 Compact Temperature Calibration Baths

Compact baths with the stability and uniformity required for thermometer calibration.

- Stability and uniformity each better than ± 0.008 °C
- Metrology-level performance in lab-friendly sizes
- Convenient use on benchtops or on matching carts

6331/7321/7341/7381 Deep-Well Compact Baths

Ample immersion depth and great stability, in a high value compact bath.

- 457 mm (18 in) of depth with just 15.9 liters (4.2 gal) of fluid
- Perfect for liquid-in-glass thermometers with optional LIG kit
- Fast, quiet, compact (yet deep), and economical

7312 Triple Point of Water Maintenance Bath

Keep your cells up and running reliably for weeks at a time.

- Maintains TPW cells for up to six weeks
- Optional immersion freezer for simple cell freezing
- Independent cutout circuit protects cells from breaking

Standard Calibration Baths

6020/6022/6024 High Temperature Calibration Oil Baths

Stable, uniform heat sources for calibrations up to 300 °C.

- Stability as good as 0.001°C
- Large-capacity tanks for higher productivity
- Built-in cooling coils for external cooling sources

6050H Extremely High Temperature Calibration Salt Bath

Designed for high-temperature calibration—up to 550 °C.

- Eliminates messy sand baths
- Electronically adjustable temperature cutouts
- Stability of ± 0.008 °C at 550 °C

7008/7040/ 7037/ 7012/7011 Cold Temperature Calibration Baths

High stability means low calibration uncertainties—no other bath performs this well.

- Stability to ± 0.0007 °C
- Best digital temperature controller available
- "Super Tweak" function provides set-point resolution to 0.00003 °C

7080 Really Cold Temperature Calibration Baths

Cool to –40, –60, or –80 °C without external coolants.

- Self-contained refrigeration—no LN2 or chiller required
- Temperatures as low as –80 °C in real metrology baths
- Stability of ± 0.0025 °C at –80 °C

6054/6055/7007

7009/7108/7015

Special Application Baths

6054/6055/7007 Deep-Well Baths

Extra-deep wells for thermometry work requiring extra tank depth and ultimate stability.

- Constant liquid levels through concentric-tube design
- Special design for sighting LIG thermometers
- Depth up to 60 cm (24 in)

7009/7108/7015 Resistor Baths

Three size options for any quantity of resistors.

- Stability to ± 0.0007 °C
- Independent high- and low-temperature cutout circuit

2100 and 2200

7900

Bath Controllers

2100 and 2200 Benchtop Temperature Controllers

Most stable temperature controllers available.

- Resolution as high as 0.00018 °C
- RS-232 interface included for automating applications

7900 Controller for Rosemount-Designed Baths

All the features of the Fluke Calibration 2100 Controller.

- Installs easily
- Two independent over-temperature cutout circuits

9170/9171/9172/9173

Metrology Wells

9170/9171/9172/9173 Metrology Well Calibrators

Accurate enough for lab use yet rugged and portable.

- Best-performing industrial heat sources (accuracy, stability, uniformity) in the world
- −45 °C to 700 °C
- Immersion depth to 203 mm (8 in)
- Optional ITS-90 reference input reads PRTs to ± 0.006 °C

9190A

9100S/9102S

9009

9142/9143/9144

9011

9103/9140/9141

6102/7102/7103

Field Metrology Wells

9190A Ultra-Cool Field Metrology Well

Ultra-cool dry-block calibrator with best-in-class stability.

- Wide temperature range from –95 °C to 140 °C
- Best-in-class stability: ± 0.015 °C full range
- Accuracy using built-in reference thermometer readout: ± 0.05 °C full range
- Display accuracy: ± 0.2 °C full range

9142/9143/9144 Field Metrology Wells

Small dry wells for big field applications.

- Lightweight, portable, and fast
- Cool to –25 °C in 15 minutes and heat to 660 °C in 15 minutes
- Built-in two-channel readout for PRT, RTD, thermocouple, 4-20 mA current

Dual-Block Dry-Well

9011 High-Accuracy Dual-Well Calibrator

Widest temperature range available in a single dry-well.

- Combined range from –30 °C to 670 °C, one unit—two blocks
- Two independent temperature controllers (hot and cold side)
- Stability to ± 0.02 °C

Field Dry-Well Calibrators

9103/9140/9141 Field Dry-Well Calibrators

Great performance in portable instruments.

- Lightweight and very portable
- Accuracy to ± 0.25 °C
- RS-232 and Interface-*it* software included

Micro-Baths

6102/7102/7103 Micro-Bath Thermometer Calibrators

Portable and extremely stable.

- World's smallest portable calibration baths
- Calibrates sensors of any size or shape
- Stability to ± 0.015 °C

Handheld Calibrators

9100S/9102S Handheld Dry-Wells

World's smallest, lightest and most portable dry-wells.

- Smallest dry-wells in the world
- Ranges from –10 °C to 375 °C
- Accuracy to ± 0.25 °C, stability of ± 0.05 °C at 0 °C

9009 Industrial Dual-Block Thermometer Calibrator

Double your productivity or cut your calibration time in half.

- Temperatures from –15 °C to 350 °C in one unit
- Two wells in each block for simultaneous comparison calibrations
- Rugged, lightweight, water-resistant enclosure

4180/81

9132 and 9133

Infrared Calibrators

4180/81 Precision Infrared Calibrators

Accredited performance for point-and-shoot calibrations.

- Calibrated radiometrically for meaningful, consistent results.
- Accredited calibration included
- Accurate, reliable performance from –15 °C to 500 °C

9132 and 9133 Portable Infrared Calibrators

Precision when you need it for infrared temperature calibration.

- Certify IR pyrometers from –30 °C to 500 °C (–22 °F to 932 °F)
- Large 57 mm (2.25 in) black-body target
- RTD reference well for contact temperature measurement

Zero-Point Dry-Well

9101 Series Metrology Well Calibrators

Ice-point reference without the ice.

- ± 0.005 °C stability in a portable ice-point reference
- Easy re-calibration for long-term reliability
- Ready light frees user's time and attention

Surface Probe Calibrator

3125 Surface Probe Calibrator

Milled aluminum for a smooth and true calibration work area with maximum thermal conductivity.

- Calibrates surface sensors up to 400 °C
- Uses Fluke Calibration 2200 Controller for excellent accuracy and stability
- NIST-traceable calibration included

Thermocouple Furnaces

9150 Thermocouple Furnace

Convenient, portable thermocouple furnace.

- 150 °C to 1200 °C
- Stability of ± 0.5 °C over full range
- NIST-traceable calibration included
- RS-232 port standard

9150

9101

3125

Pressure calibration

Pressure calibration is the comparison of the output of a device used to measure pressure with that of another pressure measurement device, or pressure measurement standard. This usually involves plumbing the unit under test (UUT) to the standard device and generating a common pressure in the measurement circuit. The outputs of the devices are compared at one or more pressures, typically from the lowest to highest readings of the UUT's full scale range, or the range over which it is normally used.

The comparison process can be performed in a chain from the highest level of fundamental pressure realization down to everyday pressure measurement devices, such as analog gauges, transducers and transmitters, to ensure that pressure measurements are accurate and comply with accepted or mandated standards.

The test fluid inside a pressure calibration system may be liquid or gas depending on the application. In general, gas (usually compressed nitrogen or air) is used for cleanliness and precision at lower pressures, and liquids (usually oil or water) are often used for safety, leak integrity, and ease of pressure generation at higher pressures above 7 MPa to 21 MPa (1000 psi to 3000 psi). There is a great deal of overlap in the actual ranges for which liquid or gas may be used practically, as reflected in the range of Fluke Calibration instruments that are specialized for each type of test fluid.

Product highlights

4322 Automated Pressure Calibrator

Reliable performance across a wide pressure range

- Rugged, lightweight, compact components for use on the bench or in-situ
- Precise automated pressure control from vacuum to 70 MPa gauge (10k psi)
- Greater of 0.1 % of reading or 25 Pa (0.1 in H_2O) accuracy across the entire pressure range
- Gauge, vacuum (negative gauge), compound and absolute modes
- Onboard pressure/vacuum generation from 3.5 kPa (0.5 psi) absolute to 2 MPa (300 psi)
- Simple, intuitive GUI steps users through calibration of pressure gauges, transducers and switches
- Integrated contamination prevention system allows direct calibration of hydraulic devices without cleaning
- Electrically-driven intensifier provides on-demand supply to 70 MPa (10 k psi)

2700G Series Reference Pressure Gauges

Best-in-class measurement performance in a rugged, easy-to-use, economical package.

Improved measurement accuracy allows the 2700G to be used for a wide variety of applications. It is ideal for calibrating pressure measurement devices such as pressure gauges, transmitters, transducers, and switches. In addition, it can be used as a check standard or to provide process measurements with data logging.

- Precision pressure measurement from 100 kPa (15 psi) to 70 MPa (10,000 psi)
- Accuracy to 0.02 % of full scale
- Easy-to-use, rugged construction for reliable performance
- Combine with the 700PTPK or 700HTPK pump kits for a complete portable pressure testing solution for up to 4 MPa (600 psi) with the PTP-1 pneumatic pump and up to 70 MPa (10 000 psi) with the HTP-2 hydraulic pump
- Combine with the P5510, P5513, P5514, or P5515 Pressure Comparators for a complete bench top pressure calibration solution
- Test port is 1/4 NPT Male. 1/4 BSP and M20 X 1.5 adapters are included standard
- USB communications cable and universal power supply included standard

3130 Portable Pressure Calibrator

The 3130 packs everything you need for accurate calibration of pneumatic field instrumentation into a rugged case suitable for harsh industrial environments.

- Measure and generate pressures from vacuum to 2 MPa (300 psi, 20 bar)
- Internal pump can generate vacuum to -80 kPa (-12 psi, -0.8 bar) or pressure to 2 MPa (300 psi, 20 bar)
- Supply pressure connection allowing the use of external gas supply up to 2 MPa (300 psi, 20 bar)
- Includes variable volume for fine adjustment of pressures
- Pressure measurement accuracy of 0.025 % reading ± 0.01 % FS
- Electrical measurement and 24 volt supply for close looped calibrations
- Measure or generate 4 mA to 20 mA
- Measure 0 to 30 V dc
- Powered by internal, rechargeable, high capacity NiMH battery or universal ac mains adapter
- Compatible with Fluke 700P Pressure Modules

Selection guide

Gas Pressure Calibrators

This selection guide presents only some of the Fluke Calibration gas pressure calibration line. Other, higher accuracy, solutions are available for all pressure ranges.

	Manual										Automated								
	Deadweight testers										PPC4E					PPC4Ex			
											6241					6242			
	P3011	P3012	P3013	P3014	P3015	P3022	P3023	P3025	P3031	P3032	15K	100K	1.4M	7M	14M	100K	1.4M	7M	14M
Workload																			
Gauges/sensors	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Gage	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Absolute												■	■	■	■	■	■	■	■
Bidirectional*						■	■	■			■	■	■	■	■	■	■	■	■
Pressure range																			
Vacuum																			
90 % vacuum	■					■	■	■											
–ATM to maximum sensor range**											■	■	■	■	■	■	■	■	■
Absolute pressure																			
0.15 psi (1 kPa) to maximum sensor range												■	■			■	■		
0.5 psi (3.5 kPa) to maximum sensor range														■				■	
1 psi (7 kPa) to maximum sensor range															■				■
Positive gage pressure																			
5 in$H_2$0 (1.5 kPa)		■				■					■	■	■	■	■	■	■	■	■
12 in$H_2$0 (3 kPa)		■	■			■	■				■	■	■	■	■	■	■	■	■
1.5 psi (10.3 kPa)		■	■			■	■				■	■	■	■	■	■	■	■	■
2 psi (13.8 kPa)		■	■			■	■				■	■	■	■	■	■	■	■	■
2.2 psi (15 kPa)		■	■			■	■				■	■	■	■	■	■	■	■	■
3 psi (20.7 kPa)		■	■	■	■	■	■	■				■	■	■	■	■	■	■	■
5 psi (34.4 kPa)		■	■	■	■	■	■	■	■			■	■	■	■	■	■	■	■
10 psi (68.9 kPa)		■	■	■	■	■	■	■	■			■	■	■	■	■	■	■	■
15 psi (103.4 kPa)		■	■	■	■	■	■	■	■			■	■	■	■	■	■	■	■
20 psi (137.9 kPa)			■	■	■		■	■	■				■	■	■		■	■	■
30 psi (200 kPa)			■	■	■		■	■	■	■			■	■	■		■	■	■
40 psi (275.8 kPa)				■	■			■	■	■			■	■	■		■	■	■
100 psi (.7 MPa)				■	■			■	■	■			■	■	■		■	■	■
150 psi (1 MPa)				■	■			■	■	■			■	■	■		■	■	■
200 psi (1.4 MPa)					■			■	■	■			■	■	■		■	■	■
300 psi (2 MPa)					■			■	■	■				■	■			■	■
500 psi (3.4 MPa)					■			■	■	■				■	■			■	■
600 psi (4 MPa)									■	■				■	■			■	■
1000 psi (7 MPa)									■	■				■	■			■	■
2000 psi (14 MPa)										■					■				■
Accessories																			
Hand pump	O	■	■	■	O	O	O	O											
Fine Inc. Weights				O	O	O	O	O											

*Requires vacuum pump	
O=Optional	
** ATM represents the current atmospheric pressure –ATM is the lowest pressure achievable in negative gage mode	
0.02 % auto-ranged span	0.0015 % FS
0.015 % reading uncertainty	0.0002 % instrument Span
.002 % instrument span	

Selection guide

FLUKE® Calibration

Hydraulic Pressure Calibrators

This selection guide presents only some of the Fluke Calibration hydraulic pressure calibration line. Other, higher accuracy, solutions are available for all pressure ranges.

	Manual																Semi Automated									
	Deadweight Testers																EDWT Electronic Deadweight Tester									
																	6531							6532		
	P3111	P3112	P3113	P3114	P3115	P3116	P3123	P3124	P3125	P3830	P3840	P3860	P3211	P3213	P3214	P3223	P3224	7M	14M	20M	40M	70M	140M	200M	70M	140M	200M
Fluid type																											
Oil																											
Water																											
Workload																											
Gauges/sensors*																											
Gage																											
Pressure range																											
10 psi (68.9 kPa)																											
15 psi (103.4 kPa)																											
20 psi (137.9 kPa)																											
30 psi (200 kPa)																											
40 psi (275.8 kPa)																											
100 psi (.7 MPa)																											
150 psi (1 MPa)																											
200 psi (1.4 MPa)																											
300 psi (2 MPa)																											
500 psi (3.4 MPa)																											
600 psi (4 MPa)																											
1000 psi (7 MPa)																											
2000 psi (14 MPa)																											
3000 psi (20 MPa)																											
5000 psi (35 MPa)																											
6000 psi (40 MPa)																											
10000 psi (70 MPa)																											
16000 psi (110 Mpa)																											
20000 psi (140 MPa)																											
30000 psi (200 MPa)																											
40000 psi (275.8 MPa)																											
60000 psi (400 MPa)																											

0.015 % reading uncertainty
0.002 % full scale uncertainty
0.0015 % full scale uncertainty
0.0075 psi (0.05 kPa) uncertainty
0.0002 % span uncertainty

7250LP

7250/7250i

Gas Pressure Controllers/ Calibrators

7250LP Low Pressure Controller/ Calibrator

Specialized measurement and control for very low draft pressure range.

- Precision: 0.005 % of reading
- Control stability: 0.004 % of each range
- Resolution to 0.0001 in H_2O
- Full scale ranges from 0 to 10 in H_2O (2.5 kPa) to 0 to 100 in H_2O (25 kPa)

7250/7250i Gas Pressure Controllers/Calibrators

Combining advanced precision, stability, speed and affordability.

- Pressure ranges from 0 to 40 kPa and to 21 MPa (0 to 5 psi and to 3000 psi, 0 to 400 mbar and to 210 bar)
- Model 7250i provides precision of 0.005 % of reading
- Model 7250 provides 0.003 % of full scale precision
- Stability: 0.0075 % of reading per year
- Time to setpoint: 15 seconds with no overshoot

7250xi High Performance Gas Pressure Controllers/Calibrators

Unmatched precision and speed.

- Pressure ranges from 0 to 40 kPa and to 17 MPa (0 to 5 psi and to 2500 psi, 0 to 400 mbar and to 170 bar)
- Advanced precision of 0.005 % of reading from 5 % to 100 % of full scale
- Stability: 0.0075 % of reading per year
- Time to setpoint: 15 seconds with no overshoot

7252/7252i Dual Output Gas Pressure Controllers

A unique and flexible approach to performing automated calibrations over a wide pressure range.

- Two independent pressure measurement and control modules
- Two performance models available, 7252i and 7252
- Fast control: <15 seconds with zero overshoot
- Full scale ranges from 0 to 2.5 kPa and to 21 MPa (0 to 0.36 psi and to 3000 psi)

PPC4 Gas Pressure Controller/ Calibrator

Wide rangeability and flexibility in a single controller. Ranges and accuracy classes can be selected to best suit the application.

- Up to two internal Quartz Reference Pressure Transducers (Q-RPTs) from absolute (vacuum) to 14 MPa (2000 psi)
- Full-scale standard class Q-RPTs provide 0.015 % full scale of selected range measurement uncertainty
- Standard class Q-RPTs provide 0.01 % reading measurement uncertainty
- Premium class Q-RPTs provide 0.008 % reading measurement uncertainty
- 4 ppm control precision as low as 1 kPa (0.15 psia) with large turndown
- Can use RPM4 reference pressure monitors as integrated remote pressure references for additional Q-RPT ranges

PPC4E Pressure Controller/ Calibrator

Very wide rangeability and reliability at a great value, for everyday pressure calibration.

- Models available with 10:1 or 100:1 accurate measure and control range turndown for maximum workload coverage
- Absolute, gauge and bidirectional gauge modes included in most models
- Gauge calibration measurement uncertainty ± 0.02 % of selected range, with range options available from ± 1 kPa (± 0.15 psi) to 14 MPa (2000 psi)
- Absolute range of 1 kPa (0.15 psi) to 14 MPa (2000 psi)

7250xi

7252/7252i

PPC4

PPC4E

*6241 and 6242 PPC4E gas pressure controller kits feature PPC4E models and accessories to form a complete system that covers a very wide workload.

7350

PPCH-G

FLUKE®
Calibration

High Pressure Controllers/ Calibrators

7350 High Pressure Gas Controller/Calibrator

Safe, easy-to-use, and effective high pressure test and calibration.

- Ranges to 70 MPa (10 k psi, 700 bar)
- Measurement precision to 0.01 % of range
- Control stability 0.007 % FS

PPCH-G High Pressure Gas Controller/Calibrator

Wide rangeability and flexibility with precise high pressure gas control.

- Ranges to 100 MPa (15k psi)
- One or two internal Q-RPTs with large range turndown
- Can use RPM4 reference pressure monitors as integrated remote pressure references for additional Q-RPT ranges

7615 Hydraulic Pressure Controller/Calibrator

Unique, high speed approach to high pressure calibration and testing.

- Ranges to 280 MPa (40 k psi)
- Measurement precision to 0.01 % of range
- Available in a variety of fluids, including water
- High speed pressure control

PPCH Hydraulic Pressure Controller/Calibrator

Wide rangeability and flexibility with precise high pressure hydraulic control.

- Ranges to 200 MPa (30 k psi)
- One or two internal Q-RPTs with large range turndown
- High precision control over wide range
- Can use RPM4 reference pressure monitors as integrated remote pressure references for additional Q-RPT ranges

Reference Pressure Indicators

RPM4 Reference Pressure Monitor

Premium measurement performance in a compact and rugged instrument.

- One or two independent quartz reference pressure transducer modules (Q-RPTs) with individual self-defense systems (SDS™) to prevent over-pressure
- Infinite Ranging and AutoRange™
- Differential measurement mode (channel 1- channel 2)
- Dedicated version available for air data ranges units and features, RPM4-AD
- Can be used as integrated external reference pressure transducer for PPC pressure controller/calibrators

7050 Series Digital Pressure Indicators

Unmatched precision with long term stability.

- Pressure ranges from 0 to 10 in H_2O and 0 to 1,500 psi (0 to 25 mbar and 0 to 100 bar)
- Model 7050i provides precision of 0.005 % of reading
- Model 7050 provides 0.003 % of full scale precision
- Active matrix color screen with enhanced navigation menus
- Model 7050LP provides precision of 0.005 % reading for very low draft pressure ranges

7615

PPCH

RPM4

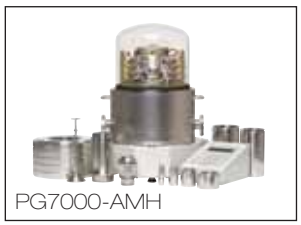
7050

PG7601

PG7102

PG7202

PG7302


PG7000-AMH

2465A

2470

Piston Gauges

PG7601 Absolute Gas Piston Gauge

Gas piston gauge with vacuum reference for defining absolute pressures.

- Gas pressure from 5 kPa to 7 MPa (0.7 psi to 1000 psi) gauge or absolute pressure
- Onboard measurement of test conditions, and real-time calculation and display of test pressure
- Compatible with PPC4 pressure controller and AMH-38 Automated Mass Handler

PG7102 Gas Piston Gauge

Gas piston gauge with 55 kg mass set for extended range measurement of gauge pressures.

- Gas pressures from 100 kPa to 11 MPa (15 to 1,600 psig)
- Onboard measurement of test conditions, and real-time calculation and display of test pressure
- Compatible with PPC4 pressure controller and AMH-100 Automated Mass Handler

PG7202 High Pressure Gas Piston Gauge

Gas piston gauge with oil-lubricated piston-cylinder for operation in high pressure gas or oil.

- Gas pressures from 100 kPa to 110 MPa (15 to 16,000 psig), oil pressures from 100 kPa to 200 MPa (15 to 30,000 psig)
- Gas operated, liquid lubricated for robust operation and low piston sink rates
- Onboard measurement of test conditions, and real-time calculation and display of test pressure
- Compatible with PPCH-G pressure controller and AMH-100 Automated Mass Handler

PG7302 Piston Gauge

Oil piston gauge for measurement of high gauge pressures.

- Oil pressures from 100 kPa to 500 MPa (15 psi to 75,000 psig)
- Onboard measurement of test conditions, and real-time calculation and display of test pressure
- Compatible with PPCH pressure controller and AMH-100 Automated Mass Handler

PG7000-AMH Automated Mass Handler

Automated Mass Handler for PG7000 Piston Gauges.

- Add to PG7000 Series piston gauge to fully automate pressure testing in gauge or absolute mode
- Designed and tested to provide years of reliable, maintenance free operation
- Reduce wear and possible mass value changes caused by manual mass handling

2465A Absolute Gas Piston Gauge

Gas piston gauge capable of very low pressures, for defining gauge and absolute pressures.

- Gas pressure from 1.5 kPa to 7 MPa (0.2 psi to 1000 psi) gauge or absolute pressure
- Lightweight, compact system with small masses for reduced bench space, transportability and ergonomic mass handling
- Compatible with Autofloat Controller and WinPrompt and COMPASS software

2470 Gas Piston Gauge

Gas piston gauge capable of very low to high gauge pressures.

- Pressures ranges from 1.5 kPa to 20 MPa (0.2 psi to 3000 psig)
- Lightweight, compact system with small masses for reduced bench space, transportability and ergonomic mass handling
- Compatible with WinPrompt and COMPASS software

PG9607/ PG9602

2482

FPG8601

3990

Specialty Piston Gauges

PG9607 Gas Piston Gauge

Fully automated primary pressure reference for absolute and gauge pressures to 500 kPa.

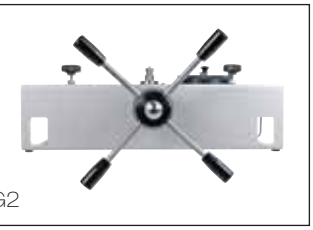
- Gauge and absolute pressures from 11 kPa to 500 kPa with a single piston-cylinder
- Large diameter 50 mm piston-cylinder with improved geometry allows direct traceability to dimensional measurements with very low uncertainties

PG9602 Gas Piston Gauge

Fully automated primary pressure reference for absolute and gauge pressures to 11 MPa.

- Gauge and absolute pressures from 10 kPa to 11 MPa
- Up to 100 kg mass load under vacuum bell jar for large turndown and overlap of piston-cylinder ranges

GPC1


MPG2

OPG1

2482 Differential Piston Gauge

High precision differential pressure measurement at elevated line pressures.

- Measures differential pressures using a gas or oil medium
- Differential pressure to 210 kPa (30 psi, 2100 mbar) at static line pressure range to 20 MPa (2900 psi, 200 bar)
- Quickly and easily set differential pressures with lightweight masses
- Fully automated pressure control and pressure determination using WinPrompt software

FPG8601 Force-Balanced Piston Gauge

Gas pressure calibration system for very low gauge, differential and absolute pressures.

- Gas pressure from 0 to 15 kPa (113 Torr) in gauge, differential and absolute modes
- Measurement uncertainty to ± (5 mPa + 30 ppm of reading) in gauge and absolute differential mode, ± (8 mPa + 30 ppm of reading) in absolute mode
- Fully automated, including test execution, pressure control and reference and device under test data collection

Manual Pressure Generation and Control

3990 Gas Pressure Control Pack

Precise, manual absolute and gauge pressure control for gas piston gauges and indicators.

- Models from vacuum to 7 MPa and 20 MPa (1000 psi and 3000 psi)
- Self-contained for intuitive, easy use

GPC1 High Gas Pressure Controller

Precise, assisted manual control for high pressure gas piston gauges and indicators.

- Models to 70 MPa and 110 MPa (10 k psi and 16 k psi)
- Precise control to full pressure with simple, ergonomic push-button operation

MPG2 Hydraulic Pressure Generator/Controller

Precise, manual control for hydraulic piston gauges and indicators.

- Models to 100 MPa and 200 MPa (15 k psi and 30 k psi)
- Self-contained for intuitive and easy generation and precise control to full pressure

OPG1 Hydraulic Pressure Generator/Controller

Precise, assisted manual control for hydraulic piston gauges and indicators.

- Pressure to 200 MPa (30 k psi)
- Precise generation and control to full pressure with simple, ergonomic push-button operation

P3000

P3100

P3200

P3800

P5510

P5513

P5514

P5515

Industrial Deadweight Testers

P3000 Pneumatic Deadweight Tester

High performance gas deadweight testers, with unique suspended piston design for vacuum calibration.

- 0.015 % of reading accuracy standard (0.008 % optional)
- 3 to 500 psi (0.2 to 35 bar) pressure
- Optional low range 0.03 to 1 bar vacuum (1 to 30 inHg)
- Integrated vacuum and pressure pump available to 2 MPa (300 psi)

P3100 Hydraulic Deadweight Tester

Highly accurate oil deadweight tester, with quick and easy-to-use single and dual piston deadweight models.

- Pressure ranges to 140 MPa (20 k psi, 1400 bar)
- 0.015 % of reading accuracy standard (0.008 % optional)
- Built-in pressure generation and adjustment
- Single or dual piston formats

P3200 Hydraulic Deadweight Tester

Hydraulic deadweight tester specially designed to use water as a test medium.

- Pressure ranges to 70 MPa (10 k psi, 700 bar)
- 0.015 % of reading accuracy standard (0.008 % optional)
- Built-in pressure generation and adjustment is standard
- Single or dual piston formats
- Water media

P3800 Hydraulic Deadweight Tester

High performance and simplicity for very high pressure hydraulic calibration.

- Pressure ranges to 400 MPa (60 k psi, 4000 bar)
- 0.02 % of reading accuracy standard (0.015 % optional)
- Includes hand pump and intensifier for generating and adjusting high pressures

P5514
with 2700G

Pressure Comparators

P5510 Pneumatic Pressure Comparator*

Precise, cost effective solution for checking pressure measuring instruments to 300 psi (20 bar).

- Dual pressure/vacuum capability
- Pressure to 20 MPa (300 psi, 20 bar)
- Vacuum from 0 to 80 kPa (0 to 24 inHg, 800 mbar)
- Built-in pressure and vacuum generation

P5513 Pneumatic Pressure Comparator*

Precise, cost effective solution for checking pressure measuring instruments to 3,000 psi (7210 bar).

- Pressure range 0 to 210 MPa (3 k psi, 210 bar)
- High pressure pneumatic operation
- Screw press for fine pressure adjustments
- High quality needle valves for fine control

P5514 and P5515 Series Hydraulic Pressure Comparators*

Quick and easy solutions for checking pressure measuring instruments to 10,000 psi (700 bar).

- Compatible with a wide range of fluids
- P5514 Test Pump generates pressures to 70 MPa (10 k psi, 700 bar)
- P5515 Test Pump generates pressures to 140 MPa (20 k psi, 1400 bar)
- P5515 has a built-in hand pump for system priming and large volume applications

* Can be used with the 2700G Reference Pressure Gauge to provide a complete calibration solution

Pressure Calibrators

4322 Automated Pressure Calibrator

- Rugged, lightweight, compact components for use on the bench or in-situ
- Precise automated pressure control from vacuum to 70 MPa gauge (10,000 psi)
- Greater of 0.1 % of reading or 25 Pa (0.004 psi, 0.1 in H_2O) accuracy across the entire pressure range
- Onboard pressure/vacuum generation from 3.5 kPa (0.5 psi) absolute to 2 MPa (300 psi)

3130 Portable Pressure Calibrator

Everything you need to generate, control and measure pressure, as well as read the output of the device under test (DUT).

- Measure and generate pressures from vacuum to 2 MPa (300 psi, 20 bar)
- Internal pump can generate vacuum to -80 kPa (-12 psi, -0.8 bar) or pressure to 2 MPa (300 psi, 20 bar)
- Supply pressure connection allowing the use of external gas supply up to 2 MPa (300 psi, 20 bar)
- Includes variable volume for fine adjustment of pressures
- Pressure measurement accuracy of 0.025 % reading ± 0.01 % FS
- Electrical measurement and 24 volt supply for close looped calibrations
- Measure or generate 4 mA to 20 mA
- Measure 0 to 30 V dc
- Powered by internal, rechargeable, high capacity NiMH battery or universal ac mains adapter
- Compatible with Fluke 700P Pressure Modules

E-DWT-H Electronic Deadweight Tester

A digital alternative to the traditional deadweight tester.

- Set and measure pressure precisely without limitation of mass loading resolution
- Pressure measurement is insensitive to local gravity and orientation
- One year uncertainty of ± 0.02 % of reading
- Run onboard test routines and store calibration data for review and export to a PC

2700G Series Reference Pressure Gauges

Best-in-class measurement performance in a rugged, easy-to-use, economical package.

- Precision pressure measurement from 100 kPa (15 psi) to 70 MPa (10,000 psi)
- Accuracy to 0.02 % of full scale
- Easy-to-use, rugged construction for reliable performance
- Combine with the 700PTPK or 700HTPK pump kits for a complete portable pressure testing solution for up to 4 MPa (600 psi) with the PTP-1 pneumatic pump and up to 70 MPa (10,000 psi) with the HTP-2 hydraulic pump
- Combine with the P5510, P5513, P5514, or P5515 Pressure Comparators for a complete bench top pressure calibration solution
- Test port is 1/4 NPT Male. 1/4 BSP and M20 X 1.5 adapters are included standard
- USB communications cable and universal power supply included standard

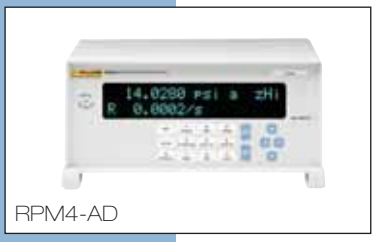
4322

3130

E-DWT-H

2700G

7750i



RPM4-AD

2468A

ADCS-601

7250sys

Air Data Calibration

7750i Air Data Calibrator

Air data test set with unequalled precision and long term stability and superior pressure control technology.

- High accuracy, RVSM compliant
- Accuracy to ± 2 feet, 0.02 knots
- True differential sensor for airspeed (Qc)

RPM4-AD Reference Pressure Monitor

Specialized pressure indicator for the absolute and differential pressure ranges in air data instruments.

- Fixed wing and rotary wing range versions
- True Pt, Ps, Qc operation

2468A Pitot/Static Primary Standard

Gas piston gauge specialized for air data absolute and differential pressure ranges.

- Pressure range: 0.4 inHg to 103 inHg.
- Optional range: 3.4 inHg to 400 inHg
- Accuracy to ± 0.5 feet, 0.003 knots
- Extended mass set covers entire air data range without the need to change pistons
- Compatible with Autofloat Controller and WinPrompt and COMPASS software

ADCS-601 Air Data Calibration System

Gas pressure calibration bench system for absolute and differential measurement in the air data range.

- Primary pressure calibration of the entire air data range
- Fully automated, including test execution, pressure control and reference and device under test data collection

Pressure Calibration Systems

7250sys Multi-Range Pressure Calibration System

Turn-key automated gas pressure calibration system.

- Gas pressure measurement and control from low absolute to 17 MPa (2500 psi)
- Fully integrated multi-range pressure test and calibration systems with a single interface and single test port
- Select either an 8 range or the 12 range system for maximum performance and coverage

Custom Pressure Calibration Systems

Engineered custom systems integrate standard Fluke Calibration products into a complete system based on the user's specific requirements. These are often multi-range systems that include pressure generation and supply accessories, data acquisition hardware and software and/or test instrument connection manifolds. Custom systems include but are not limited to turn-key pressure calibration rack systems, portable calibration carts and automated pressure calibration bench systems.

Gas flow calibration

What is gas flow calibration?
Gas flow calibration refers to the calibration of a flow sensing device such as a flow meter or flow controller by comparing its measurement against a flow measurement reference. Typically, the device, or unit under test (UUT), is pneumatically connected in series with the flow reference so they measure the same gas flow; then the indications of the two devices are compared.

molbloc™/molbox™ system components
Fluke Calibration's molbloc/molbox gas flow calibration system consists of molbloc flow elements that connect to a flow terminal (either molbox1+ or molbox RFM) so the terminal can use pressure and temperature measurements from around the flow element, combined with gas properties and prior molbloc calibration data, to determine and display the gas flow rate.

Mass flow vs. volume flow
A frequent topic of discussion and confusion surrounding gas flow measurement is that of mass flow versus volume flow. Flow meters and flow units used for flow measurements are used to measure and express either the amount of volume of gas or the amount of mass (number of moles or molecules) passing through the device. When performing a gas flow calibration, it is nearly always beneficial to use a mass flow reference measurement, because the mass flow rate stays constant throughout a flow system in steady state. Since gas is compressible, the volume flow rate varies at different locations in a flow system due to changes in density caused by changing temperature and pressure. molblocs are mass flow standards, which allow reliable comparisons to other flow devices. The molbox terminal is also able to calculate and express the flow rate in terms of volume flow at another point in the system to allow testing of volume-based devices.

molbox1+

molboc-L

molbloc-S

molbox RFM

Gas Flow Standards

molbox1+ Flow Terminal

0.125 % of reading—lowest uncertainty for gas flow calibration.

- Allows coverage of flow range from less than 1 sccm to over 5000 slm with a single user interface and transportable system
- Real-time flow measurements makes adjusting analog flow devices fast and easy
- No moving parts that cause pressure/flow fluctuations or threaten reliability
- Perform fully-automated flow calibrations using molbox terminal with COMPASS for Flow software
- Updated design

molboc-L Laminar Flow Element

Laminar flow elements for flow from 1 sccm to 100 slm.

- Traceable to primary gravimetric mass flow measurements
- Multiple gases supported
- Useable with existing molbox1+ and molbox RFM mass flow terminals and COMPASS software
- Integrated filter to protect against contamination
- Integral gas temperature conditioning and measurement

molstic-L

molstic-S

molbloc-S Sonic Nozzle Flow Element

Sonic nozzle based molblocs for gas flow up to 5,000 slm.

- Covers ranges up to 5,000 slm in N_2 and air
- Multiple gases supported
- Useable with molbox1+, or existing molbox1 and molbox RFM mass flow terminals and COMPASS software
- Proven critical flow venturi (sonic) nozzle operating principle supported by primary gravimetric calibration

molbox RFM Reference Flow Monitor

Compact terminal for making mass flow measurements using molbloc-L and molbloc-S flow elements.

- Traceable to primary gravimetric mass flow measurements
- Economical alternative to molbox1+ terminal
- ± 0.5 % of reading uncertainty
- Covers the flow range of 1 sccm to 100 slm with molbloc-L, and up to 5000 slm with molbloc-S
- 5141/5142/5144 kits feature molbox RFM, molbloc-L and other hardware for a complete calibration system

molstic Mounting Systems

Used to conveniently mount and protect molbloc elements, connect to units under test and provide flow and pressure control.

molstic-L used for molboc-L mass flow elements.

- Quick connector input
- 2 micron (0.5 micron for low flow) filter to protect the downstream components
- Adjustable regulator protects the molbox transducers

molstic-S used for molbloc-S mass flow elements.

- Available in 1/2 inch or 1/4 inch system plumbing sizes
- Integrated flow shut-off/metering valves

MFC-CB™

MFC Switchbox

GFS™

Gas Flow Automation Accessories

MFC-CB™ Control Box

Stand-alone unit for setting/reading analog mass flow controllers (MFCs) and mass flow meters (MFMs).

- Set and read 0 to 5 V or 4 to 20 mA on two (2) channels
- Complete front panel local control and remote operation via RS-232 and IEEE-488 interfaces

MFC Switchbox™

Supplies power and switches between up to five MFCs or MFMs on one molbox1+ or MFC-CB channel.

- Duplicates MFC channel without switching cables

Primary Gas Flow Standard

GFS Dynamic Gravimetric Mass Flow Standard

True Primary Mass Flow Standard that makes the fundamental measurement of low gas mass flow rates practical.

- Covers the range of 0.2 to 200 mg/s in various gases (10 sccm to 10 slm N2)
- Measurements can be transferred higher flow ranges using Successive Addition method
- Flow measurement uncertainty as low as ± 0.013 % of reading

Calibration Software

"Calibration software" refers to applications that automate all or part of a calibration process via computer control. Calibration software also allows users to manage their calibration and asset data.

If you've heard about the benefits of automated calibration and asset management but are puzzled about how everything fits together, call on Fluke Calibration for solutions.

Other types of calibration software from Fluke Calibration include data-logging software, software that generates calibration constants and references, and various add-on and plug-in software programs.

Why use calibration software?
Using software to automate all or part of the calibration process offers several important advantages.

Consistency—Software automation ensures that calibrations can be performed exactly the same way by multiple operators in multiple locations. This improves the quality of results, reduces errors and standardizes methods.

Efficiency—Automating the calibration process allows technicians to set up tests and then go on to perform other tasks, making more efficient use of their time. Calibrations are typically completed much more quickly, saving time and money. If the software is capable of calibrating multiple units under test simultaneously, automation increases throughput as well.

Documentation and reports—Calibration automation software typically includes features for documenting calibration procedures, storing calibration data, and producing reports, allowing users to eliminate paper records or spreadsheets.

Because Fluke Calibration software does such a good job of keeping accurate records of all parts of the calibration process, it also supports compliance with a wide variety of quality standards.

Product highlights

MET/TEAM® Test Equipment Asset Management Software

MET/TEAM® software is a powerful, flexible, and scalable calibration management software solution for managing your calibration assets. Designed by metrologists for metrology, it is ideal for calibration professionals who need to manage workflow through the calibration laboratory.

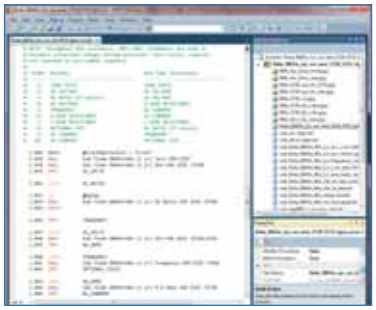
- Browser-based software enables access that is convenient, yet secure
- Fully featured for tracking and managing assets
- Fully integrated with the Run Time function of industry leading MET/CAL® software
- Replaces MET/TRACK as the recommended database engine for MET/CAL software
- Popular Microsoft SQL server database for reliable, affordable, non-proprietary data storage
- Workflow management
- Highly customizable fields and labels
- Shortcuts (quick links) for easy navigation
- Promotes quality processes to support accreditation
- Customizable reports with Crystal Reports Professional
- Automated email alerts and recall escalation
- Mobile module for on-site calibration
- Customer web portal to allow read-only access for remote customers
- Commerce module for quoting, billing, and contract pricing
- Designed for metrology by metrologists
- Backed by Fluke Calibration, expert in calibration instrumentation and software
- Collect and store manual calibration data

MET/CAL® *Plus* Calibration Management Software

MET/CAL *Plus* software automates the calibration process to help you manage your workload more efficiently and consistently. The MET/CAL suite of applications includes MET/CAL software, the industry leader for automated calibration; plus MET/TEAM software for asset management.

MET/CAL *Plus* software provides you with the tools you need to:

- Perform automated calibration on all kinds of test and measurement tools and equipment, including dc/lf, RF and microwave instruments
- Create, edit, test, and document calibration procedures, quickly and easily
- Configure and report a wider range of measurement uncertainty parameters and include verification data to provide an audit trail and support further analysis
- Track asset information including calibration and maintenance history and status, traceability, users, customers, and location
- Analyze and report asset information; produce customized printed certificates and reports.
- Make data available to other corporate systems
- Import asset and calibration data into MET/CAL *Plus* software
- Help meet the requirements of quality standards like ISO 9000, ISO/IEC 17025, NRC 10 CFR, ANSI Z540.3, and others



MET/CAL®

Warranted Procedures for MET/CAL

5080A/CAL

MET/TEAM

Electrical/RF Calibration Software

MET/CAL®

The complete solution for automating calibration processes plus managing and reporting measurement assets.

- Perform fast, repeatable, and powerful calibration
- Full storage of calibration data
- Rich reporting capabilities
- Configure and report a wider range of measurement uncertainty parameters

Warranted Procedures for MET/CAL®

Fully tested, ready-to-go procedures designed to satisfy your needs.

- Optional calibration procedures for MET/CAL® *Plus* Calibration Software
- Warranted by Fluke Calibration to produce valid calibrations on the intended unit under test (UUT) for the specified model and revision level
- These procedures automate the calibration process under MET/CAL control

5080A/CAL

Easy-to-use standalone software for the 5080A Multi-Product Calibrator.

- Quickly calibrate a wide range of analog and digital workload
- Provides automated control of the calibrator; technician simply enters readings from the item being calibrated
- Easy-to-use procedure designer; simply select the type of signal needed to perform a test from a drop-down menu, enter the test level and set the test limits

Calibration Asset Management Software

MET/TEAM Test Equipment Asset Management Software

Manage more workload with less work with MET/TEAM software.

- Browser-based calibration asset management software
- Fully integrated with MET/CAL® Software
- Microsoft SQL Server database
- Highly customizable
- Email automation
- On-site calibration
- Work flow management
- Pricing/billing/invoicing
- Customer web portal
- Installation and training services

Software Support Programs

MET/SUPPORT℠ Gold

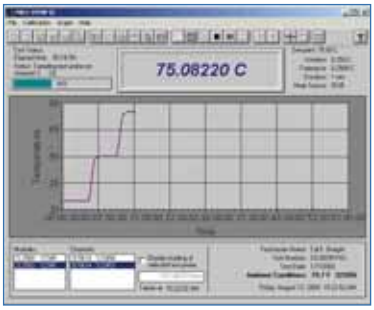
Annual support programs for MET/CAL and MET/TEAM software. These premier support services help you maximize your software investment.

- Premium support and services to help you maximize productivity with MET/CAL and MET/TEAM software
- Three levels of support let you choose the services you need
  - MET/SUPPORT Gold: priority support, free access to warranted procedures, free software upgrades
  - MET/SUPPORT Procedures: priority support, free access to warranted procedures
  - MET/SUPPORT Upgrades: priority support, free software upgrades
- Priority web content (all levels)
- Discounts on a variety of services (all levels)

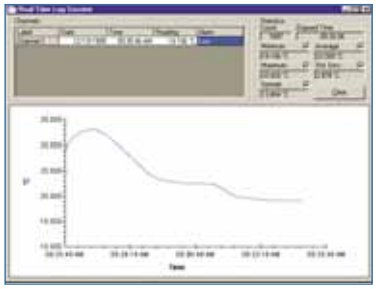
MET/TEAM Software Services

A range of services to help you maximize your investment in MET/TEAM software.

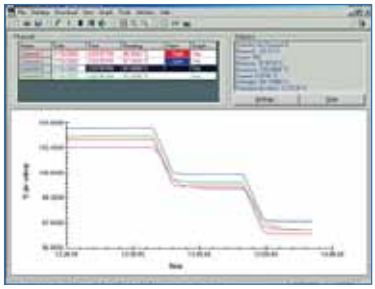
- MET/TEAM software installation and startup
- Standard MET/BASE-to-MET/TEAM database migration
- Standard MET/TEAM database import
- MET/TEAM self-validation
- Custom software services



MET/TEMP II



Log*Ware*



Log*Ware II*

Temperature Calibration Software

MET/TEMP II

Fully automated calibration of RTDs, TCs, thermistors, and many heat sources.

- Calibrates up to 100 sensors at up to 40 points
- Performs coefficient calculations and generates tables and reports

Log*Ware*

Turn a Fluke Calibration single-channel handheld or 1502A/1504 readout into a real-time data logger.

- Collects real-time data
- Calculates statistics and displays customizable graphs
- Allows user-selected start times, stop times and sample intervals

Log*Ware II*

Turn any Fluke Calibration multi-channel thermometer readout into a real-time data logger.

- Collects real-time data using Fluke Calibration multi-channel readouts
- Calculates statistics and displays customizable graphs
- Allows user-selected start times, stop times and sample intervals

Log*Ware III*

Remotely monitor and log a virtually unlimited number of concurrent log sessions into a central data repository.

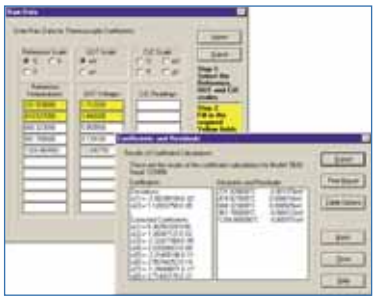
- Up to two temperature and two humidity inputs for each DewK
- Customize your graph trace color, alarms, and statistics as you go

Table*Ware*

Calculate-and-generate data software package for manually entered data.

- Generates temperature vs. resistance, temperature vs. ratio and temperature vs. EMF tables
- Calculates coefficients for RTDs, thermistors and thermocouples
- Generates coefficients, calculates residual values and generates useful tables

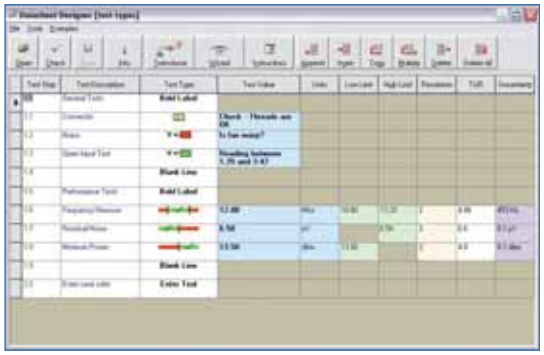
Log*Ware III*



Table*Ware*

COMPASS for Pressure

COMPASS for Flow



COMPASS for Pressure

Pressure/Flow Calibration Software

COMPASS® for Pressure

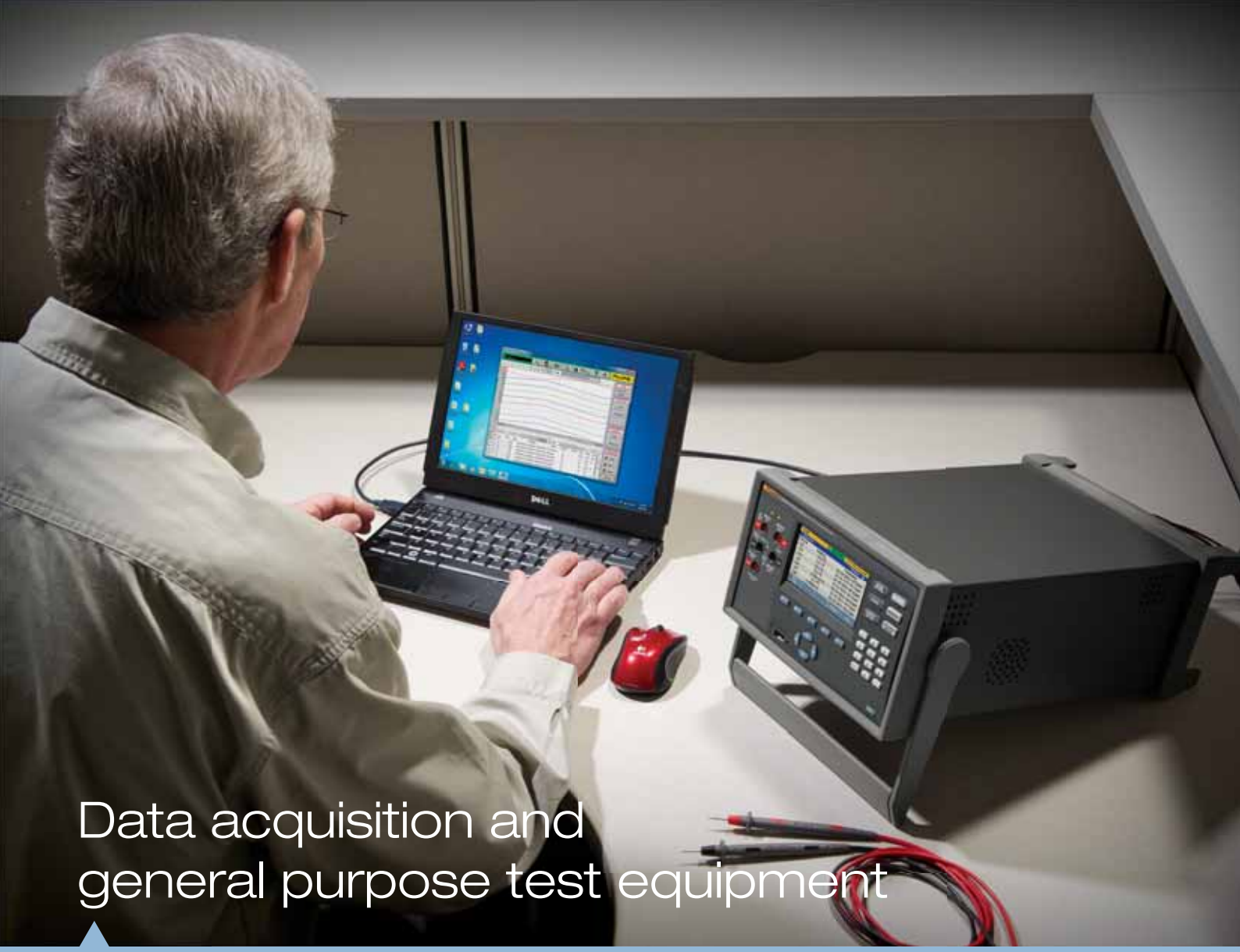
Universal platform for automating pressure calibration.

- Integrated piston gauge support
- Runs complete automated calibration sequences
- Supports multiple units under test
- Automates virtually any pressure standard or device under test

COMPASS® for Flow

Macro-enabled mass flow calibration software package.

- Fully customizable
- Supports non Fluke Calibration flow references
- Performs complex real time flow computations, and allows you to alter test scenarios based on data collected



Data acquisition and general purpose test equipment

Data acquisition equipment

Get the data you want, where, how and when you want it. Fluke gives you a broad choice in data acquisition for process monitoring and laboratory test systems. You can choose a stationary or portable data logger. Transfer data to internal memory, to a removable memory card, or to your PC. Choose a standalone or distributed networked units. And you can expand your system from 20 to 1,000+ channels, depending on the series.

All Fluke data acquisition products feature unique, built-in universal signal conditioning and a plug-in Universal Input Module to enable you to measure virtually any type of signal without having to purchase extra equipment. Plus, powerful, easy-to-use Windows®-based software supports easy configuration, advanced trend analysis, professional- quality reporting, and enables you to quickly build human-machine-interfaces without any programming.

General purpose test equipment

Fluke Calibration designs and manufactures bench instruments in a wide variety of product categories. Besides their use on the bench, these instruments have several characteristics in common as you will find below:

- Each bench instrument is accurate and provides precise information. They reflect the professionalism of the people who buy and use them.
- Each is reliable, dependable, and rugged.
- All are easy to operate. Many owners of Fluke bench instruments say that the controls are intuitive and help them work more efficiently.
- These bench instruments are compact and easily transported, but they are also multi-functional.
- You will find that these instruments are a good value, particularly when compared against other tools for their cost/function ratio.

Product highlights

2638A Hydra Series III Data Acquisition System

A price performance breakthrough in standalone data acquisition system

The Fluke Hydra Series III continues the Hydra series legacy in data acquisition. This new Hydra series improves on the long standing, industry leading specification of best-in-class thermocouple accuracy. With basic dc measurement accuracy of 0.0024 %, 0.5 °C thermocouple accuracy, color trend display, easy-to-use menu system and world-class industrial safety ratings, the 2638A is a truly industrial grade, precision data acquisition system.

Expandable from 22 to 66 channels of analog differential measurement, the Hydra 2638A offers the flexibility of our Universal Input Connector, which allows quick connect and disconnect of any type of input to any channel. AC and dc voltage, resistance, thermocouple, RTD, thermistor, frequency and dc and ac current are all selectable inputs for the 2638A. If your measurement need is from under twenty channels to over sixty-six channels per unit or thousands of channels per system, we have you covered.

- DC accuracy of 0.0024 %
- Best-in-class thermocouple accuracy of 0.5 °C
- Up to 67 universal differential, isolated inputs
- On-screen color trend graphing
- Easy menu system for setup and data management
- Multi-channel real-time data display
- 6.5 digit DMM function selections
- Monitor function for real-time viewing and charting between scans
- 20 on-board separate math channels
- 45 channels/sec basic dc scan rate
- Internal 75,000 scan memory plus USB drive port
- Data security features
- CAT II 300 V input safety rated

2638A

2686A

NetDAQ (2640)

Data Acquisition Equipment

2638A Hydra Series III Data Acquisition System/DMM

A price performance breakthrough in standalone data acquisition system.

- DC accuracy of 0.0024 %
- Best in class thermocouple accuracy of 0.5 °C
- Up to 67 universal differential, isolated inputs
- On screen color trend graphing
- Easy menu system for setup and data management
- 6.5 digit DMM function selections
- Monitor function for real-time viewing and charting between scans
- 20 on-board separate math channels
- 45 channels/sec basic dc scan rate
- Internal 75,000 scan memory plus USB drive port
- Expands to thousands of channels with application software
- Data security features
- USB flash drive support for data transfer to PC
- CAT II 300 V input safety rated

2680 Series Data Acquisition Systems

Standalone or networked precision multi-channel data acquisition

- 20 to 120 universal analog inputs per chassis; systems to +2,000 channels
- Stand-alone data logger operation with the 2686A
- Large scalable LAN systems using the 2680A with 10BaseT/100BaseT
- Two types of Universal Input Modules: high-isolation precision modules or fast scan modules, with 16- to 18-bit resolution
- Throughput of more than 3,000 channels-per-second-per-chassis with 2680A-FAI modules
- Superior thermocouple measurement accuracy (J, K, R, S, T, N, I, U, C, B)
- 20 digital I/O and 8 form C, 1 Amp relay output modules for direct control of equipment
- Up to 300 V input isolation, 1600 V transient overvoltage protection (2680A-PAI)
- Universal input conditioning for any input, on any channel, in any combination (V dc, V ac, Ohms, frequency, RTD, thermocouple, thermistor or current
- ATA flash memory card for stand-alone operation – from 16 MB to 1 GB (2686A only)
- Multiple power sources: 100 V to 240 V and 9 V to 45 V dc
- Includes Fluke DAQ Software: Controls all 2680 Series functions, provides real-time and historical and also communicates with NetDAQ and Hydra Series III products

NetDAQ® Networked Data Acquisition Unit

Powerful combination of hardware and software that is ideal for small-to-medium scale process monitoring and test systems.

- Data acquisition, up to 1,000 readings per second
- 20 analog input channels expandable up to 2,000 channels
- Extensive optional plotting and trending capabilities
- Includes Fluke DAQ software
- Flexible ac or dc power
- Replaces chart recorders

8845A/8846A

80/81

397

8808A

271

290

280

General Purpose Test Equipment

8845A/8846A 6.5 Digit Precision Multimeters

Precision and versatility for bench or systems applications.

- 6.5 digit resolution
- Basic V dc accuracy of up to 0.0024 %
- Dual display
- 100 µA to 10 A current range, with up to 100 pA resolution
- Wide ohms range from 10 Ω to 1 GΩ with up to 10 µΩ resolution
- 2 x 4 ohms 4-wire measurement technique
- Both models measure frequency and period
- 8846A also measures capacitance and temperature
- USB memory drive port (8846A)
- Fluke 45 and Agilent 34401A emulation
- Graphical display
- Trendplot™ paperless recorder mode, statistics, histogram
- CAT I 1000 V, CAT II 600 V
- Three-year warranty

8808A Digital Multimeter

Versatile multimeter for manufacturing, development and service applications.

- 5.5 digit resolution
- Basic V dc accuracy of 0.015 %
- Dual display
- Dedicated dc leakage current measurement
- 2x4 ohms 4-wire measurement technique
- Six dedicated buttons for fast access to instrument setups
- Hi/Lo limit compare for Pass/Fail testing
- Three-year warranty

80/81 Function Pulse Generators

50 MHz function/pulse generators, ideal for both benchtop and ATE applications.

- Model 81 pulse/function generator
- Model 80 function generator
- Powerful performance
- AM, FM, VCO, and phaselock/offset control modes
- Automated calibration
- Ideal for both benchtop and ATE applications
- HP 8116A emulation mode (81 only)

271 DDS Function Generator with ARB

High performance function generator.

- High stability 10 MHz DDS function generator
- Arbitrary capability with storage for five user defined waveforms
- Multiple standard and complex waveforms recalled from internal memory
- Extensive modulation capabilities include sweep, AM, Gating, Trigger/Burst, FSK and Hop
- GPIB and RS-232 interfaces

397 Universal Waveform Generator

125 MS/s high performance universal waveform generators.

- Unprecedented combination of universal generator and synthesizer
- Versatile performance
- High resolution and wide frequency range
- Extremely good performance-to-price ratio

290 Series Waveform Generators

One, two, or four channel 100 MS/s waveform generators.

- 100 MS/s 12-bit arbitrary waveform capability
- 1 M point waveform memory
- 40 MHz function generator capabilities using DDS (50 MHz for square waves)
- 10 ns pulse pattern generator
- Waveform sequencing with up to 1024 segments
- Unlimited waveform storage using CF® memory card
- Waveform Manager Plus for Windows software
- USB interface in addition to RS-232 and GPIB

280 Series Waveform Generators

Universal waveform generators offering superior performance and value.

- Choice of 1, 2 and 4 independent or linked channels
- 40 MS/s max. sampling speed
- 16 MHz function generator
- 10 MHz pulse generator
- Pulse train pattern generator
- Arbitrary waveforms of up to 65 k points
- Powerful modulation capabilities
- Built-in trigger generators
- Waveform Manager Plus for Windows® software
- Multiple standard waveforms recalled from internal memory
- RS-232 and GPIB interfaces

Service programs

priority Gold Instrument CarePlan

Silver Instrument CarePlan

Fluke Priority Gold CarePlan

The Fluke Priority Gold CarePlan is a comprehensive instrument calibration and repair support plan that minimizes your downtime and protects your investment in your Fluke calibrators. It's the "good as gold" priority customer service program that gives you all these extra privileges:

- Annual calibration included (standard or accredited) with guaranteed three-day in-house turnaround[1,2] for electrical calibrators and six-day guarantee for pressure and temperature products
- Free repairs with guaranteed ten-day in-house repair (includes calibration)[2,3]
- Pre-paid, priority freight on return of instrument
- Free product updates
- One-year, three-year and five-year plans available
- 10 % off on calibration product upgrades
- 20 % off any scheduled Fluke Calibration metrology training for any of your personnel
- Automatic 45-day and 15-day calibration due notification
- Free transit case for your instruments (Europe)

Silver CarePlan

The Fluke Silver CarePlan is a comprehensive instrument warranty support plan that puts you in charge of your operating costs and protects your investment in your new Fluke Calibration instrument.

- Extended warranty coverage for your instrument
- Calibration included on repairs covered by your plan
- 15 % discount on regular calibrations during your factory and Silver CarePlan term
- 15 % discount on any out-of-plan service changes
- Free product updates (PCNs) performed at the time of repair
- One, two, three, four and five-year plans available

1. Guaranteed in-house turnaround not available in all countries; contact your local Fluke representative for details. Priority shipping times vary by country.
2. One-year and three-year Priority Gold CarePlans do not cover instrument repairs in the first 60 days and 30 days respectively after plan purchase. Five-year plans are eligible for immediate repair services covered under the program.
3. Instruments showing signs of failure due to physical abuse, improper operation or application do not qualify for free repair and will be repaired at 15 % discount from standard repair rates.

Register your Fluke Calibration product online

Visit **www.flukecal.com/register-product** to register your product today!

Authorized Fluke Calibration Service Centers

Fluke Calibration offers calibration and repair services and support through our flagship metrology laboratories and service partners worldwide. To find the best solution for your calibration product you can visit **www.flukecal.com/service-centers**, call us at **877-355-3225**, or email us at **service@flukecal.com**.

Training

Calibration and metrology training from Fluke Calibration can help you and your staff become more knowledgeable in a wide variety of disciplines. Instructors are experts who work in electrical, temperature, pressure and flow calibration, and who really want to help you learn the foundation and techniques of metrology that you can put to immediate use in your workplace. Fluke Calibration offers introductory, intermediate, and advanced level courses in a variety of formats to meet your needs.

Instructor-led classroom courses

Our instructor-led courses cover a variety of metrology topics and range from one to five days in length. Held in various locations around the world, training from Fluke Calibration is a great way to maximize your investment in your calibration equipment.

Instructor-led web-based training

Our instructor-led web-based trainings offer the same great access to Fluke Calibration experts, with the added benefit of not having to travel. Instructor-led web-based trainings are designed to fit into your schedule, without disrupting your workflow. Courses are set up in anywhere from one to five parts, two hours each, held on consecutive days.

Self-paced online training

Our self-paced calibration and metrology training courses were developed by Fluke Calibration and other technical experts in the metrology community using proven instructional design components. At the start of each module, a brief tutorial describes how the course is laid out. The learning objectives are clearly stated. Topics are selected from easy-to-navigate menus and sub-menus. Embedded questions are presented frequently to increase retention. Engaging graphics, photos, formulas and tables support text material. A final post-test provides proof of competency. Tests are shuffled after each use. Most importantly, a certificate of completion satisfies documentation requirements.

Self-paced training tools

In addition to self-paced online training, Fluke Calibration offers several additional self-paced training tools for metrology software and dc/low frequency metrology. Our self-paced metrology software CD-ROMs give you the ability to learn at your own pace. The familiar web interface makes navigating this program easy, and upon successful completion of the course you will be provided with a completion certificate. Fluke Calibration also offers the only comprehensive text book on dc/low frequency metrology, *Calibration: Philosophy in Practice, Second Edition*. It covers real world concepts and applications, and is designed and written for the working technician.

On-site training

Fluke Calibration instructor-led courses may also be taught at your facility. If you have a large number of students, or if the material you wish to discuss is considered confidential, you may find On-Site Training an attractive alternative. Contact your local Fluke Calibration representative to discuss specific requirements and arrangements, or email **training@flukecal.com** for a Fluke Calibration representative to contact you.

For an up-to-date course schedules, and pricing, and training resources visit: **www.flukecal.com/training**

Installation and training supplemental services

Fluke Calibration offers expert consulting to help you configure and use your calibration products as productively and cost-effectively as possible. We can help:

- Minimize downtime
- Make sure your equipment runs efficiently
- Confirm that systems are operating properly
- Train you and/or your staff at your site, a separate site, at Fluke Calibration or online

FLUKE®
Calibration

Fluke Calibration. *Precision, performance, confidence.*™

Electrical	RF	Temperature	Pressure	Flow	Software

Fluke Calibration
PO Box 9090,
Everett, WA 98206 U.S.A.

Fluke Europe B.V.
PO Box 1186, 5602 BD
Eindhoven, The Netherlands
Web access: http://www.flukecal.eu

For more information call:
In the U.S.A. (877) 355-3225 or Fax (425) 446-5116
In Europe/M-East/Africa +31 (0) 40 2675 200 or Fax +31 (0) 40 2675 222
In Canada (800)-36-FLUKE or Fax (905) 890-6866
From other countries +1 (425) 446-5500 or Fax +1 (425) 446-5116
Web access: http://www.flukecal.com

©2011-2014 Fluke Calibration. Specifications subject to change without notice.

Printed in U.S.A. 4/2014 4026225C_EN Pub-ID: 12124-eng

Modification of this document is not permitted without written permission from Fluke Calibration.