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An Interworld Highway, LLC Company

FLUKE®
Calibration

PPC4E Pressure Controller/Calibrator

Superior rangeability and reliability

Technical Data

± 0.02 % of AutoRanged spans from ± 1 kPa (0.15 psi) to 14 MPa (2,000 psi)

The Fluke Calibration PPC4E brings high performance to a wide range of pneumatic pressure calibrations, from the cal lab to production or field calibration environments. Move up to the well-known reliability and precision of DH Instruments PPC pressure controller/calibrators and enjoy great value and return on investment.

PPC4E combines the best features, measurement technology, and patented PPC pressure control from our PPC4 family of controller/calibrators to deliver extremely broad pressure range coverage at a level of performance that addresses your most common calibration workload. Calibrate transmitters, transducers and analog and digital gauges with ease using the color graphical user interface, or automate through remote connection to a PC.

PPC4E makes it extremely easy to ensure that you're getting the performance and uncertainty you need for all of your calibrations. PPC4E's AutoRange feature instantly sets up multiple parameters to achieve optimum precision, safety, and measurement performance anywhere in its pressure range. Users simply enter the range and tolerance of the unit under test. PPC4E's measurement uncertainty is then a percentage of a span that is aligned with the UUT range, providing an easy-to-understand test accuracy ratio.

Rangeability of PPC4E models

Models are designated either PPC4E or PPC4EX, indicating either one or two internal reference pressure transducers and defining the minimum AutoRange span that can be selected while still maintaining the calibrator's best measurement uncertainty.

Nominal measurement uncertainty is **± 0.02 % of AutoRanged span** for any AutoRange down to:

PPC4E **10 % of controller span**
PPC4EX **1 % of controller span**

See PPC4E measurement specifications for details. Fluke Calibration provides a complete and reliable product measurement uncertainty specification including all sources and valid for one year.

Features at a glance

- Switch between absolute, gauge and bidirectional gauge modes and meet easy-to-understand full-year measurement specifications without added hardware or special calibration or maintenance operations
- Controls pressure over the absolute range of 1 kPa (0.15 psi) to 14 MPa (2,000 psi) and gauge equivalent, including very low differential pressures
- Up to 100:1 accurate measure and control range turndown can truly be realized by a single calibrator
- AutoRange feature optimizes and sets measurement, control and safety features for the specific range of the test being run with a few simple entries
- RS-232 and IEEE-488.2 remote interfaces included. Valve drivers built-in for ATE system design
- Self purging liquid trap accessory available to automatically protect PPC4E from system contamination
- Measurement uncertainty is calculated real-time and displayed in the current pressure units
- On-board, programmable calibration sequences and leak testing routines
- Set point jog feature to quickly perform cardinal point calibrations of analog gauges
- Standard color graphical user interface with full support in 11 languages

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Realize control precision and low uncertainty over the entire PPC4E range

PPC4E may take the place of two or more pressure controllers. There's no need for two separate control modules in PPC4E. Control precision better than ± 0.0006 % of the controller's span, and up to ten times tighter at the low end, allows users to take full advantage of PPC4E's remarkable measurement rangeability. This is important because the uncertainty of pressure delivered to a UUT during calibration depends on control as well as measurement precision in typical dynamic control operation. PPC4E's quartz sensor technology is also superior to that of other controller/calibrators in its class. PPC4E gives you all the range and precision you need with a single interface and a single test port.

PPC4E rangeability vs. typical controller uncertainty specifications

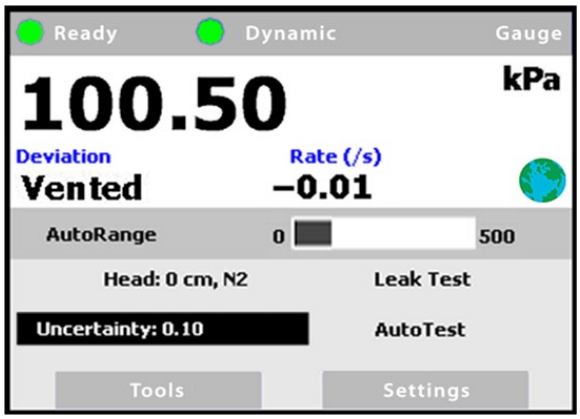
Compare the workload coverage of PPC4E's one year total uncertainty specification:

Assumes gauge pressure UUT with ± 0.1 % of FS uncertainty and 4:1 TAR (test accuracy ratio) required between reference and UUT.

= Can calibrate this UUT
— = Cannot calibrate this UUT

UUT Range		± 0.02 % of AutoRanged span		± 0.01 % of reading from 50 % to 100 % of each sensor		± (0.005 % FS +0.005 % Rdg) precision, each sensor, with ± 0.01 % Rdg 1 yr stability	
kPa	psi	PPC4E 7M AutoRange down to 10 % FS	PPC4EX 7M AutoRange down to 1 % FS	With 2 sensors: 1000 psi and 500 psi (7 and 3.5 MPa)	With 4 sensors: 1000 psi, 500 psi, 250 psi, 125 psi (7, 3.5, 1.7, .9 MPa)	With 1 sensor: 1000 psi (7 MPa)	With 2 sensors: 1000 and 500 psi (7 and 3.5 MPa)
7000	1000	✓	✓	✓	✓	✓	✓
5500	800	✓	✓	✓	✓	✓	✓
4100	600	✓	✓	✓	✓	✓	✓
2750	400	✓	✓	✓	✓	✓	✓
1400	200	✓	✓	✓	✓	—	✓
700	100	✓	✓	✓	✓	—	—
550	80	✓	✓	—	✓	—	—
410	60	—	✓	—	✓	—	—
275	40	—	✓	—	✓	—	—
140	20	—	✓	—	—	—	—
70	10	—	✓	—	—	—	—
55	8	—	✓	—	—	—	—

Uncertainty of the measured or delivered pressure is calculated and displayed continuously by PPC4E. The calculation uses uncertainty components based on PPC4E specifications and the component values can be tailored by the user.

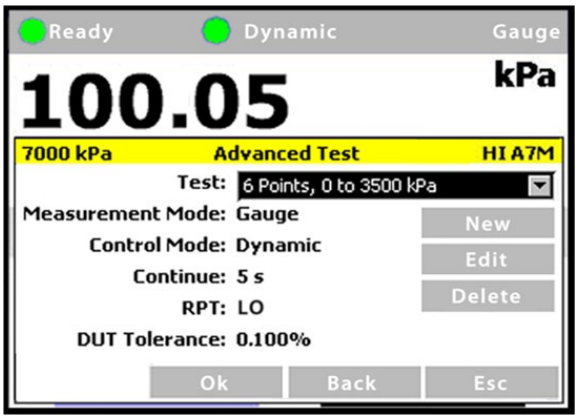


PPC4E displays real-time measurement uncertainty at each pressure.

Easy-to-use, information-packed user interface

Operation of PPC4E from its local user interface offers you instant optimization of all its important settings and parameters to the range and accuracy of your UUT with a few touches of a button using the AutoRange function. Operators will find common calibration tasks simple to perform without specialized training or experience.

PPC4E supports setting up and running quick tests on the fly and creating and storing test sequences for recall and execution. A "jog" feature allows for the pressure at each target point to be manually adjusted so the UUT reads a cardinal target pressure, a useful feature for analog gauge calibration. When running a test sequence, the PPC4E measured pressure corresponding to each UUT cardinal point is recorded and displayed later for reporting.



PPC4E AutoTest setup.

COMPASS® software for automation

PPC4E is ready for integration into a fully automated test system. Rear panel RS-232 and IEEE-488.2 interfaces are included for communication with a remote computer. Remote operation is supported by a complete set of easy-to-use, well documented command strings.

Fluke COMPASS® for Pressure calibration software provides an off-the-shelf path to automation, enabling you to realize the benefits of automation without dedicating your engineering resources to create a custom program. COMPASS for Pressure has the power and flexibility to automate nearly any level of testing imaginable, including all aspects of test execution, data acquisition and report generation, whether for a bench top calibration system or a complete, multi-function sensor test stand.

Fluke Calibration also offers integrated, turnkey calibration systems including pressure generation, control and data acquisition hardware in solutions ranging from mobile carts to attractive, small-footprint rack systems.

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Specifications

PPC4E measurement uncertainty (includes precision and one year stability)

Model	Gauge uncertainty[1] Equal to % of AutoRanged span		Absolute uncertainty[1] Equal to % of AutoRanged span + Constant		
	% of AutoRanged span	Minimum AutoRanged span[2]	% of AutoRanged span	Constant	Minimum AutoRanged span[2]
PPC4EX 14M	0.02	140 kPa (20 psi)	0.02	0.1 kPa (0.015 psi)	140 kPa (20 psi)
PPC4E 14M	0.02	1,400 kPa (200 psi)	0.02	1 kPa (0.15 psi)	1,400 kPa (200 psi)
PPC4EX 7M	0.02	70 kPa (10 psi)	0.02	0.05 kPa (0.007 psi)	70 kPa (10 psi)
PPC4E 7M	0.02	700 kPa (100 psi)	0.02	0.5 kPa (0.07 psi)	700 kPa (100 psi)
PPC4EX 1.4M	0.02	14 kPa (2 psi)	0.02	0.014 kPa (0.002 psi)	70 kPa (10 psi)
PPC4E 1.4M	0.02	140 kPa (20 psi)	0.02	0.1 kPa (0.015 psi)	140 kPa (20 psi)
PPC4EX 100K	0.02	± 1 kPa (± 0.15 psi)	0.02	0.014 kPa (0.002 psi)	70 kPa (10 psi)
PPC4E 100K	0.02	± 10 kPa (± 1.5 psi)	0.02	0.014 kPa (0.002 psi)	70 kPa (10 psi)
PPC4E 15K	0.02	± 1.5 (± 0.2 psi)	—	—	—

[1] Maximum deviation of the RPT indication from the true value of applied pressure including precision, predicted one year stability limit, temperature effect and calibration uncertainty, combined and expanded (k=2) following the ISO "Guide to the Expression of Uncertainty in Measurement."
[2] For AutoRange spans below the Minimum AutoRanged span uncertainty is equal to the value at the Minimum AutoRanged span.

Pressure control specifications

Control precision	PPC4E: ± 0.0006 % of controller span PPC4EX: ± 0.0006 % of controller span (AutoRanged span > 10 % of controller span) ± 0.00006 % of controller span (AutoRanged span ≤ 10 % of controller span)
Lowest controllable pressure (gauge mode)	Zero set by automated venting. Lowest point above or below zero limited only by RPT resolution and control precision.
Lowest controllable pressure (absolute, negative gauge modes)	1 kPa absolute (0.15 psia) or gauge equivalent, for all models except PPC4E 7M and PPC4E 14M 3.5 kPa (0.5 psia) for PPC4E 7M 7 kPa (1 psia) for PPC4E 14M
Ultimate pressure (absolute, negative gauge) Depending on vacuum pump and connections	200 to 700 Pa absolute (2 to 7 mbar, 0.03 to 0.1 psia) or gauge equivalent
Typical pressure setting ready time (0.005 % hold limit, 50 cc test volume)	15 to 30 s
Typical test volume	0 to 1000 cc for controller range of 1.4 MPa [300 psi] or less 0 cc to 500 cc for controller range greater than 1.4 MPa [300 psi]

General specifications

Warm up time	None required, 30 minute temperature stabilization recommended for best performance from cold power up
Resolution	To 1 ppm, user adjustable
Power requirements	100 V ac to 240 V ac (–15 %, +10 %), 50 Hz to 60 Hz, 70 VA max consumption
Operating temperature range	10 °C to 40 °C
Weight	16.6 kg (36.5 lb)
Dimensions	19 cm H x 35 cm W x 45 cm D (7.5 in. x 13.8 in. x 17.7 in.)
Remote communication interfaces	RS-232 (COM1, COM2), IEEE-488.2, USB (front panel, firmware load only)
Operating medium	Any clean, dry, non-corrosive gas
Pressure connections	Test (+), Test (–): 1/8 in. NPT F Supply: 1/8 in. NPT F Exhaust: 3/8 in. NPT F ATM: 10-32 UNF

Ordering information

Models

Model Designation	Item Number	Pressure Range[1]			
		Gauge [kPa][2]	Gauge [psi][2]	Absolute [kPa]	Absolute [psi]
PPC4EX 14M	3842637	-ATM to 14 000	-ATM to 2 000	0 to 14 000	0 to 2 000
PPC4E 14M	3842628				
PPC4EX 7M	3842619	-ATM to 7 000	-ATM to 1 000	0 to 7 000	0 to 1 000
PPC4E 7M	3842604				
PPC4EX 1.4M	3842598	-ATM to 1 400	-ATM to 200	0 to 1 400	0 to 200
PPC4E 1.4M	3842580				
PPC4EX 100K	3842571	-ATM to 100	-ATM to 15	0 to 200	0 to 30
PPC4E 100K	3842567				
PPC4E 15K	3842559	± 15	± 2.2	—	—

[1] Pressure range is nominal measurement range. See pressure control specifications (Section 1.2.3) for lowest controllable pressure.
[2] ATM represents the current atmospheric pressure. ATM is the lowest pressure achievable in negative gauge mode (vacuum).

Accessories				
SPLT		3069823	Self purging liquid trap for PPC4E test port	
Case		3338097	Rugged, reusable molded shipping case	
Rack Mount Kit		3338072	Rack mount kit for 48 cm (19 in) rack. (4U)	
PK-PPC-BG-DVU		3070389	Dual volume unit for use with 15 kPa bi-directional gauge range control in PPC4E 15K and PPC4EX 100K	
Reference vacuum kit, 220V		3584486	Vacuum pump package for PPC EXHAUST port, includes connections	
Reference vacuum kit, 110V		3584473		
RS-232 Cable	(Non CE)	2758335	9 pin, 2 m (6.6 ft) for PPC4E COM1	
	(CE Version)	3077381		
COMPASS for Pressure	ENH-SNGL	3070175	Software to automate testing, data acquisition, reporting and asset management	
	BAS-SNGL	3071106		
	ENH-MULTI	3072374		
	BAS-SITE	3072407		
Silver CarePlans		3891264	Two-year	Extended warranties including calibration upon repair
		3891273	Four-year	

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Other solutions in calibration

Fluke Calibration provides the broadest range of calibrators and standards, software, service, support and training in electrical, temperature, pressure, RF and flow calibration.

Visit **www.fluke.com/FlukeCal** for more information about Fluke Calibration solutions.

Pressure and flow calibration

- High performance pressure and gas flow standards
- Accredited pressure and gas flow calibration services
- Calibration software
- Services and training

Temperature calibration

- Contact and non-contact temperature calibrators and standards
- Temperature calibration software
- Services and training

Electrical calibration

- DC/LF electrical calibrators and standards
- Power calibrators and standards
- RF calibrators
- Timer/counters and frequency standards
- Calibration software
- Services and training

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

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