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Calibration

6270A Modular Pressure Controller/Calibrator

The simple, easy-to-maintain solution for calibrating a wide range of pressure gauges and sensors

The 6270A can be used in system mode, allowing for multiple controllers to be operated through one front panel.

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6270A features at a glance

- Calibrate a wide range of gauges and sensors with a single instrument
- Modular configuration makes this a versatile and economical solution
- Easy to operate
- Easy to maintain
- Wide measurement range—vacuum to 20 MPa (3000 psi)
- Two levels of accuracy—0.02 % FS or 0.01 % reading—let you balance accuracy and budget
- High speed, stable pressure control
- Localized graphical user interface in choice of nine languages
- Can be fully automated with COMPASS® for Pressure software
- Optional contamination prevention system helps keep valves clean and free from debris

Calibrate a wide range of pressure gauges and sensors with this reliable, easy-to-maintain instrument

The Fluke Calibration 6270A Pressure Controller/Calibrator is a robust, reliable solution that lets you dramatically simplify the task of pneumatic pressure calibration. Thanks to its modular design, it is so flexible that it can be configured to meet a wide variety of needs and budgets, and expanded to cover a very broad workload, at purchase or later as your needs change and grow.

The 6270A is ideal for pressure sensor manufacturers who want to avoid downtime on the production line and need a pressure source that performs both quickly and accurately. Its modular design makes it easy to maintain; its high speed control and accuracy over a wide range give them the throughput they require.

Managers and technicians in calibration laboratories and instrument shops appreciate the 6270A calibrator's control precision and accuracy over a wide pressure range, which enables them to calibrate a wide range of devices with a single calibrator. They also like the contamination prevention option that provides an important safeguard against that pervasive hazard.

The 6270A is easy to learn and use, thanks to a graphical user interface and an intuitive hardware design.

The 6270A works as a benchtop or rack-mounted solution.

6270A overview

The large main display enables you to easily view and edit important information.

Make minor adjustments to the pressure using the Jog Wheel, ideal for calibration of analog dial gauges.

A simple, calculator-style keyboard makes it easy to enter values quickly.

Front panel abort button allows for fast venting in emergency situations.

Real time graph makes it easy to see pressure stability or procedure status.

The touch screen display in choice of ten languages features an easy-to-read, intuitive menu structure that lets you access any feature within four button presses or less.

To access the measurement and control modules, simply open the front panel. Modules are easy to replace, even when the 6270A is rack-mounted.

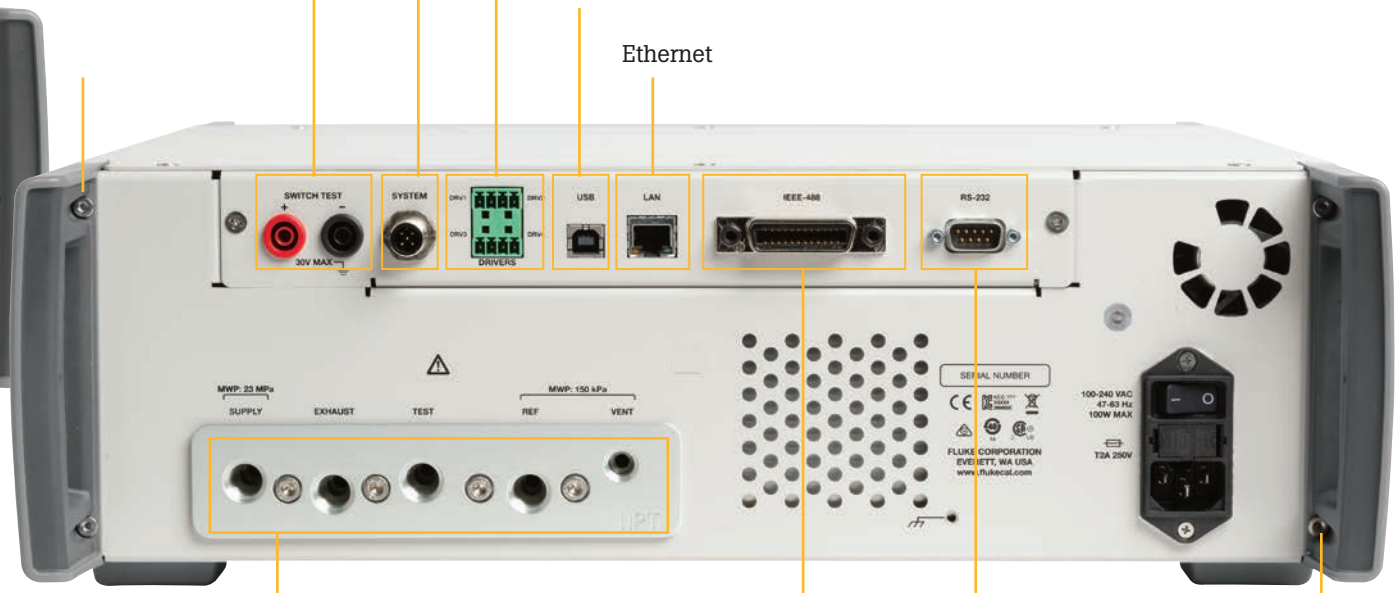
Switch Testing—6270A has built-in ability to read the state of a pressure switch allowing for closed loop testing of pressure switches.

System mode allows multiple units to be connected together, providing the ultimate in rangeability.

External valve drivers enable users to create fully automated custom systems and operate accessories like the optional Contamination Prevision System (CPS).

USB Connection

Ethernet

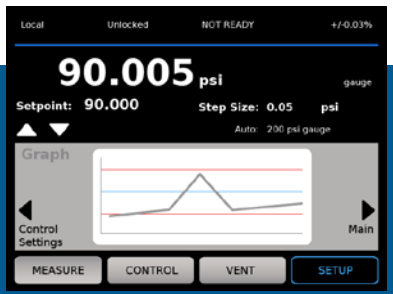


GPIB

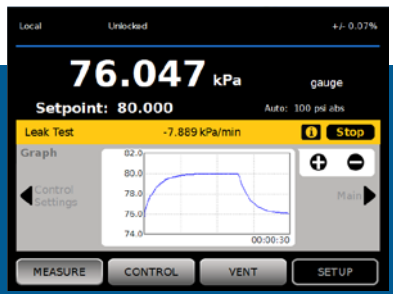
RS-232

All pressure connections are located on a single, easily replaceable manifold block. Connectors in NPT, BSP, or 7/16-20 SAE enable you to choose the most popular fitting type for your region.

An optional rack-mount kit enables the 6270A to be installed in a standard 19-inch rack.



Real time graph makes it easy to see pressure stability or procedure status.



Built-in leak testing simplifies the process for validating system integrity.

User-selectable choice of languages.

Hook up to five measurement modules.

Calibrate a wide workload—quickly, accurately, dependably

The 6270A features pressure ranges from low differential pressure to 20 MPa (3000 psi), which covers the requirements of most gauges and sensors. Two levels of accuracy, 0.02 % FS or 0.01 % reading, let you balance your need for accuracy with the limits of your budget.

Thanks to its modular design, the 6270A is flexible enough that you can install modules with different accuracy classes within the same chassis. You can buy the highest level of accuracy for the pressure ranges that require it and a lower, more economical level of accuracy for everything else.

The 6270A's accuracy specifications are provided in full and supported by a Technical Note that details its measurement uncertainty, so you know exactly what you are getting. The Technical Note is available for download on the flukecal.com website. As with all Fluke Calibration instruments, these specifications are conservative, complete, and dependable.

Cutting edge technology and performance

The PM600 Pressure Measurement Modules use the Fluke Calibration Quartz Reference Pressure Transducer (Q-RPT) technology to provide 0.01 % reading measurement uncertainty from 30 % to 100 % of the modules span. The modules are available in 14 different ranges including modules that are inherently absolute mode and gauge mode. The absolute mode modules include an onboard barometer. The barometer provides dynamic compensation of changes in atmospheric pressure, allowing for the modules usage in both absolute and gauge mode. The wide percent of reading capability combined with its ability to measure both gauge and absolute gives the PM600 Pressure Measurement Module the ability to cover an extremely wide workload.

The PM200 Pressure Measurement Modules use a highly characterized silicon pressure sensor to provide an economical method of making accurate pressure measurements. The 0.02 % FS specification includes the short term performance of the module (linearity, hysteresis, and repeatability) as well as its long term stability and the uncertainty of the calibration standard. Users can be confident in the PM200 measurement performance.

Wide rangeability assures wide workload coverage

The Pressure Control Module can handle a wide range of pressures.

The 6270A features pulse-width-modulated control, a proven technology that enables it to deliver wide rangeability, the ratio of the maximum to the minimum specified measured value at which the instrument performs correctly. A wide rangeability is what enables you to calibrate a wide workload.

Safety features protect operators and instruments

Each measurement and control module, as well as the main chassis, has pressure relief valves to protect the instrument and its operators from accidental overpressure. The 6270A has been designed using Sound Engineering Practices (SEP). With the internal relief valves, user-setable pressure limits, and emergency abort button, safety is the highest priority.

Preventing contamination

If your workload includes devices that contain different substances like water, oil, and gas, you could be at risk for contamination—something getting into your system that isn't supposed to be there. Contamination can clog a calibrator's valves, wear out its parts, and make it difficult to maintain pressure. If the contamination gets into the sensor, it can actually change the calibrator's behavior and throw off your readings. If contamination is a concern for you, order the optional 6270A Contamination Prevention System (CPS) to help keep the calibrator's valves clean and free from debris.

The CPS provides an unprecedented level of protection by maintaining uni-directional flow away from the controller, a gravity sump system, and a two-stage filtering system.

Create an automated piston gauge system

The 6270A is a flexible workhorse on its own, but you can also use it as the first step in creating an automated piston gauge system. Use the 6270A with a Fluke Calibration PG7601 or PG7202 Piston Gauge to automate the flotation of the piston. Add a PG7000-AMH Automated Mass Handler for PG7000 Piston Gauges to complete the automated system.

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Change modules in about 20 seconds.

Modular configuration gives you almost unlimited flexibility

Install up to five pressure modules in a single 6270A chassis, mixing and matching module types and ranges to get the combination that best suits your needs. Buy just what you need to calibrate the pressure ranges in your current workload. Add modules later as your workload grows and changes.

Modules snap in and out quickly and easily; just slide each one into a specially-designed track and tighten the knob until you hear it click into place. The click tells you that the module is safely in place; a special "anti-torque" guard on the knob prevents over-tightening. You never have to wonder if you tightened it too much or not enough.

Modules are installed and uninstalled through the front of the chassis. You can easily install and remove both the measurement modules and the control module from the chassis, even if the 6270A is installed in a rack mount.

Each module uses an enhanced face-seal design that has been leak tested to pressures that are three times higher than the maximum working pressure. You don't have to worry about a leak in the system affecting your ability to measure and control pressure.

So easy to maintain, you can do it in house

We designed the 6270A to be easy to maintain, making your cost of ownership very reasonable. We publish a Service and Calibration Manual with detailed instructions on how to replace valves and components. An on-board screen capture routine can be used for troubleshooting help.

Control and measurement modules are separate, allowing for quick and easy repair. Just pull out the module and replace it; no autotuning required. You can change the pressure ranges just as easily by installing a new module and possibly changing the supply pressure. No need to send the 6270A back to the factory.

The modules can be calibrated inside or outside of the chassis using the optional PMM Calibrator Kit. Once calibrated, you can use them in any 6270A chassis without impacting the uncertainty of your measurements. Modules can be removed and replaced, easily; no specialized tools required.

Every component in the system is designed for simple, modular replacement, from the front panel to the rear pressure connections.

Internal components, like the main CPU, are designed to be easily replaced.

The pressure connectors on the back of the 6270A are made from anodized aluminum, a robust material that stands up well to normal usage. However, if threads are stripped or there is galling from metal connectors sliding against it, you can easily remove the block without having to open the chassis. Simply remove the screws holding it in place and pull it out. The block does not have any items attached to it, so replacement is simple and low cost.

The removable rear manifold makes it easy to remove the 6270A from a rack-mounted system. Simply vent the test and supply ports and disconnect the connection manifold from the back of the chassis. You won't need to question which pressure line is the supply port and which one is the test port; they stay connected to the manifold, and the manifold can only be connected one way. Three types of manifolds—NPT, BSP, and 7/16-20—are available to meet the needs of different geographic regions. The isolation valves on the main manifolds are easily removed from the top of the 6270A chassis.

Automation, training and support

Automate with COMPASS® software for improved consistency and throughput

Fluke Calibration COMPASS for Pressure software is designed specifically for pressure calibration. It enables you to automate the 6270A and run complete pressure calibration sequences on single or multiple devices under test (DUTs). COMPASS software removes the unknowns often associated with getting automated systems online.

The 6270A also features a full remote interface that enables you to use it with custom software or other data acquisition equipment. Details about the interface are provided in the 6270A User Manual.

If you need support, we're here to help

Fluke Calibration's testing, repair and calibration services are dedicated to filling your needs quickly and at a fair cost while maintaining the unmatched level of quality that is our trademark. Our pressure calibration laboratories are accredited for conformance to ISO Guide 17025. We maintain global calibration and repair facilities to help you keep your hardware in top working order.

CarePlans help you manage cost of ownership

Reduce downtime and control your cost of ownership with a CarePlan. Fluke Calibration offers one-year, three-year and five-year Priority Gold CarePlans, which feature an annual standard or accredited calibration of your 6270A calibrator with guaranteed six-day in-house turnaround[1], plus free repairs with guaranteed ten-day in-house repair (includes calibration).

One-year, three-year, and five-year Silver CarePlans are available for those customers who only want extended warranty coverage.

A range of training options get you up and running quickly

We sponsor a range of pressure and flow calibration courses in our Phoenix, Arizona facility in the United States. We also host periodic web seminars at no charge on a wide variety of pressure calibration topics. If you need service or maintenance training to help you maintain your fleet of pressure controllers, we can help you there, too.

priority Gold Instrument CarePlan

Silver Instrument CarePlan

Gold CarePlans	Silver CarePlans
Annual calibration	Extended warranty coverage beyond original factory warranty
Free repairs with guaranteed turnaround time	Calibration included on repair
Pre-paid priority freight on return of instrument	Free product updates performed at time of repair
Free product updates	Discounts on regular calibrations and out-of-plan service charges
Discounts on product upgrades	
Discounts on training	

[1] Six-day in-house turnaround not available in all countries; contact your local Fluke Calibration representative for details. Priority shipping times vary by country.


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Calibration
%Span Error vs. Reference Pressure
%Span Error
Reference Final Output(psi)
Ready
4.9999 psi
gauge
Setpoint: 5.0000
Step Size: 5.0000 psi
Atm.: 14.6959 psi
Head Height: 0.00 in
MEASURE
CONTROL
VENT
SETUP

Summary Specifications

General specifications		
Power requirements	100 V ac to 240 V ac, 47 Hz to 63 Hz	
Fuse	T2A 250 V ac	
Max power consumption	100 W	
Operating ambient temperature range	15 °C to 35 °C	
Storage temperature	–20 °C to 70 °C	
Relative humidity	Operating: <80 % to 30 °C, <70 % to 40 °C, <40 % to 50 °C	
	Storage: <95 %, non–condensing. A power stabilization period of four days may be required after extended storage at high temperature and humidity.	
Vibration	MIL–T–28800	
Altitude (operation)	<2000 m	
Ingress protection	IEC 60529: IP20	
Safety	IEC 61010–1, Installation Category II, Pollution degree 2	
Weight (Chassis only)	13 kg (28.5 lbs)	
Dimensions	Height: 147 mm (5.78 in)	
	Width: 454 mm (17.79 in)	
	Depth 488 mm (19.2 in)	
Rack mount dimensions	3U–19 inch rack	
Warm up time	15 minutes typical	
Control specifications		
Control precision (dynamic mode)	PM200–BG2.5K range	+/– 0.005 % range
	All other ranges	+/– 0.001 % range
Control turndown[1]	10:1	
Low control point	1 kPa (0.15 psi) absolute	
Supply pressure requirements		
Clean dry N_2 or air – Industrial grade nitrogen, 99.5 %+		
Particulate contamination	≤ 1.25 micrometer (50 microinches)	
Maximum moisture content	–50 °C dew point	
Maximum hydrocarbon content	30 ppm	
Vacuum supply requirements (when operating near or sub–atmospheric)		
>50 liters per minute capacity with Auto Vent feature		
Appropriate protections for High Pressure Gauge work system exhaust gas will pass through the Vacuum supply system.		
Interface/communications		
Primary remote interfaces	IEEE 488.2, Ethernet, RS232, USB	
System connection	Supports interconnection of two or three systems	
Switch test connection	Standard 4 mm jack: Nominal 24 v dc isolated drive Maximum 30 V dc w.r.t. chassis ground	
Aux drivers	4 external solenoid drivers 24 V dc drive (maximum drive 6 W continuous per channel)	

[1] Control turndown is defined as the relationship between the provided supply pressure and the appropriate supply pressure for the range. For example, a unit with a 7 MPa (1000 psi) and 700 kPa range (100 psi) with a supply pressure of 7.7 MPa (1100 psi) will provide control precision of 0.001 % range because 7 MPa is 10 times greater than 700 kPa. A system with ranges of 20 MPa (3000 psi) and 700 kPa (100 psi) with supply pressure of 22 MPa (3300 psi) will have 0.001 % range control precision on the 20 MPa range but only 0.003 % control precision on the 700 kPa range. Control precision of 0.001 % on the low range can be achieved by reducing the supply pressure.

							1 year specification[1]		
Model	**Gauge mode range (SI units)**	**Absolute mode range (SI units)**	**Gauge mode range (Imperial units)**	**Absolute mode range (Imperial units)**	**Relative Precision (% Rdg)[5]**	**Threshold Precision (% Span)[5]**	**Relative uncertainty (% Reading)[2]**	**Threshold uncertainty (% Span)[2]**	**Absolute mode adder (% Full scale)[3]**
PM600-BG15K	-15 to 15 kPa	-	-60 to 60 inH_2O	-	0.008%	0.0024%	0.01%	0.003%	-
PM600-G100K	0 to 100 kPa	-	0 to 15 psi	-	0.008%	0.0024%	0.01%	0.003%	-
PM600-G200K	0 to 200 kPa	-	0 to 30 psi	-	0.008%	0.0024%	0.01%	0.003%	-
PM600-A100K	-100 to 0 kPa	6 to 100 kPa	-13.8 to 0 psi	0.9 to 15 psi[4]	0.008%	0.0024%	0.01%	0.003%	0.007%
PM600-A200K	-90 to 100 kPa	10 to 200 kPa	-13.2 to 15 psi	1.5 to 30 psi[4]	0.008%	0.0024%	0.01%	0.003%	0.007%
PM600-A350K	-90 to 250 kPa	10 to 350 kPa	-13.2 to 35 psi	1.5 to 50 psi	0.008%	0.0024%	0.01%	0.003%	0.007%
PM600-A700K	-82 to 700 kPa	18 to 700 kPa	-12.1 to 100 psi	2.6 to 100 psi	0.008%	0.0024%	0.01%	0.003%	0.007%
PM600-A1.4M	-0.065 to 1.4 MPa	0.035 to 1.4 MPa	-10 to 200 psi	5 to 200 psi	0.008%	0.0024%	0.01%	0.003%	0.007%
PM600-A2M	-0.03 to 2 MPa	0.07 to 2 MPa	-5 to 300 psi	10 to 300 psi	0.008%	0.0024%	0.01%	0.003%	0.007%
PM600-A3.5M	-0.03 to 3.5 MPa	0.07 to 3.5 MPa	-5 to 500 psi	10 to 500 psi	0.008%	0.0024%	0.01%	0.003%	0.007%
PM600-A7M	0 to 7 MPa	atmosphere to 7 MPa	0 to 1000 psi	atmosphere to 1000 psi	0.008%	0.0024%	0.01%	0.003%	0.007%
PM600-A10M	0 to 10 MPa	atmosphere to 10 MPa	0 to 1500 psi	atmosphere to 1500 psi	0.008%	0.0024%	0.01%	0.003%	0.007%
PM600-A14M	0 to 14 MPa	atmosphere to 14 MPa	0 to 2000 psi	atmosphere to 2000 psi	0.008%	0.0024%	0.01%	0.003%	0.007%
PM600-A20M	0 to 20 MPa	atmosphere to 20 MPa	0 to 3000 psi	atmosphere to 3000 psi	0.008%	0.0024%	0.01%	0.003%	0.007%
BRM600-BA100K	-	70 to 110 kPa	-	10 to 16 psi	0.008%	-	0.01%	-	-

[1] 1-year specification is instrumental measurement uncertainty that includes linearity, hysteresis, repeatability, resolution, reference uncertainty, 1-year stability, and temperature effects from 15 °C to 35 °C. The uncertainties are provided at 95 % confidence, k=2, normally distributed.
[2] Gauge mode uncertainty is the greater of the relative uncertainty and the threshold uncertainty. For absolute ranges used in gauge mode there is an additional uncertainty of ± 7 Pa for dynamic barometric compensation. When combined with other uncertainties this changes the threshold uncertainty for the PM600-A100K to 0.008 % span and for the PM600-A200K to 0.004 % span.
[3] Absolute mode adder is the additional uncertainty that must be included when the module is not AutoZeroed. For specific details, see "Guide to determining pressure measurement uncertainty for 6270A Pressure Controller/Calibrator pressure modules."
[4] The PM600-A100K and PM600-A200K can be operated below the calibrated range to the lowest controllable pressure of the system.
[5] Precision is defined as the combined effects of linearity, hysteresis, and repeatability.

Model	**Precision (% FS)**	**Range (SI units)**	**Range (Imperial units)**	**Measurement mode[1]**	**1 year specification (% FS)[2,4]**
PM200-BG2.5K	0.055%	-2.5 to 2.5 kPa	-10 to 10 inH_2O	gauge	0.20%
PM200-BG35K	0.015%	-35 to 35 kPa	-5 to 5 psi	gauge	0.05%
PM200-BG40K	0.015%	-40 to 40 kPa	-6 to 6 psi	gauge	0.05%
PM200-A100K	0.032%	2 to 100 kPa	0.3 to 15 psi	absolute	0.10%[3]
PM200-BG60K	0.015%	-60 to 60 kPa	-8.7 to 8.7 psi	gauge	0.05%
PM200-BG100K	0.011%	-100 to 100 kPa	-15 to 15 psi	gauge	0.02%
PM200-A200K	0.032%	2 to 200 kPa	0.3 to 30 psi	absolute	0.10%[3]
PM200-BG200K	0.011%	-100 to 200 kPa	-15 to 30 psi	gauge	0.02%
PM200-BG250K	0.011%	-100 to 250 kPa	-15 to 36 psi	gauge	0.02%
PM200-G400K	0.011%	0 to 400 kPa	0 to 60 psi	gauge	0.02%
PM200-G700K	0.011%	0 to 700 kPa	0 to 100 psi	gauge	0.02%
PM200-G1M	0.011%	0 to 1 MPa	0 to 150 psi	gauge	0.02%
PM200-G1.4M	0.011%	0 to 1.4 MPa	0 to 200 psi	gauge	0.02%
PM200-G2M	0.011%	0 to 2 MPa	0 to 300 psi	gauge	0.02%
PM200-G2.5M	0.011%	0 to 2.5 MPa	0 to 360 psi	gauge	0.02%
PM200-G3.5M	0.011%	0 to 3.5 MPa	0 to 500 psi	gauge	0.02%
PM200-G4M	0.011%	0 to 4 MPa	0 to 580 psi	gauge	0.02%
PM200-G7M	0.011%	0 to 7 MPa	0 to 1000 psi	gauge	0.02%
PM200-G10M	0.011%	0 to 10 MPa	0 to 1500 psi	gauge	0.02%
PM200-G14M	0.011%	0 to 14 MPa	0 to 2000 psi	gauge	0.02%
PM200-G20M	0.011%	0 to 20 MPa	0 to 3000 psi	gauge	0.02%

[1] Gauge mode modules (PM200-GXXX or PM200-BGXXX) with ranges of 100 kPa (15 psi) or greater will support absolute mode measurement when used with a Barometric Reference Module.
[2] 1 year specification is Instrumental Measurement Uncertainty that includes linearity, hysteresis, repeatability, resolution, reference uncertainty, 1 year stability, and temperature effects from 18 °C to 28 °C. The uncertainties are provided at 95 % confidence, k=2, normally distributed. For temperatures from 15 °C to 18 °C and 28 °C to 35 °C, add 0.003 % FS/°C
[3] Uncertainty for gauge mode modules assumes routine zeroing. Uncertainty for absolute mode modules includes one year zero stability. If routinely zeroed, uncertainty is 0.05 % FS
[4] Instrumental Measurement Uncertainty for gauge mode modules used in absolute mode by addition of a barometric reference module is calculated as the uncertainty of the gauge mode module plus the uncertainty of the barometric reference module.

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Ordering Information

Models

6270A-NPT	Modular Pressure Controller Chassis, NPT Manifold
6270A-BSP	Modular Pressure Controller Chassis, BSP Manifold
6270A-7/16	Modular Pressure Controller Chassis, SAE 7/16-20 Manifold

Control modules

PCM-STD-20M	Pressure Control Module, Standard Turndown

Pressure modules

Please refer to the Summary Specifications for details about the pressure measurement modules.

Accessories

RMK-19IN-3U	Rack Mount Kit, 19 in width, 3U
CASE-6270	Shipping Case, 6270A
CASE-PMM	Shipping Case, 3 PMM Modules
PK-6270-NPT	Lines and Fittings Kit, 6270A NPT
PK-6270-BSP	Lines and Fittings Kit, 6270A BSP
PMM-CAL-KIT-20M	Pressure Measurement Module Calibration Kit, 20 MPa (3000 psi)
CPS-20M-P3K	Contamination Prevention System, 20 MPa (3000 psi), with P3000 Test Port
CPS-20M-HC20	Contamination Prevention System, 20 MPa (3000 psi) with HC20 Test Port and hand tight adaptors
TST-20M	Test Station, 20 MPa (3000 psi)
VA-PPC/MPC-REF-110	Vacuum Pump Package, 110 V
VA-PPC/MPC-REF-220	Vacuum Pump Package, 220 V

The broadest range of calibration solutions

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.flukecal.com** for more information about Fluke Calibration products and services.

The Contamination Prevention System acts as a test stand for connecting units under test, as well as for preventing contamination from reaching the 6270A.

PMM-CAL-KIT Pressure Measurement Module Calibration Kit

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

Electrical | RF | Temperature | Pressure | Flow | Software

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