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FLUKE®
Calibration

6270A
Pressure Controller/ Calibrator



Extended Specifications

FLUKE®
Calibration

Specifications

General Specifications

Mains

Power Requirements	100 V ac to 240 V ac, 47 Hz to 63 Hz
Fuse	T2A 250 V ac
Max Power Consumption	100 W

Environment

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
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-28800E
Altitude (Operation)	<2000 m
Warmup Time	15 minutes after power up or module installation, when items previously stored within Operating Ambient Temperature Range.

Electromagnetic Compatibility (EMC)

IEC 61326-1	
(Controlled EM environment)	IEC 61326-2-1; CISPR 11: Group 1, Class A
	Group 1 equipment has intentionally generated and/or use conductively coupled radio-frequency energy which is necessary for the internal functioning of the equipment itself.
	Class A equipment is equipment suitable for use in all establishments other than domestic and those directly connected to a low voltage power supply network which supplies buildings used for domestic purposes.
	Emissions which exceed the levels required by CISPR 11 can occur when the equipment is connected to a test object. The equipment may not meet the immunity requirements of 61326-1 when test leads and/or test probes are connected.
USA (FCC)	47 CFR 15 subpart B, this product is considered an exempt device per clause 15.103
Korea (KCC)	Class A Equipment (Industrial Broadcasting & Communication Equipment) This product meets requirements for industrial (Class A) electromagnetic wave equipment and the seller or user should take notice of it. This equipment is intended for use in business environments and not to be used in homes.

Compliance

Ingress Protection	IEC 60529: IP20
Safety	IEC 61010-1, Installation Category II, Pollution degree 2

Dimensions and Weight

Dimensions

Height	147 mm (5.78 in)
Width	452 mm (17.79 in)
Depth	488 mm (19.2 in)
Rack Mount Dimensions	3U-19-inch rack

Weight

Chassis only	13 kg (28.5 lbs)

Communication Interfaces

Primary remote Interfaces	IEEE, Ethernet, RS232, USB
System Connection	Supports interconnection of 2 or 3 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)

Performance Specifications

The performance specifications describe the complete instrumental uncertainty of the Product. The specifications include all relevant error components (linearity, hysteresis, repeatability, resolution, reference standard measurement uncertainty, 1-year drift, and temperature effects). The specifications are provided at a level of confidence of 95 %, k=2, normally distributed. Precision uncertainty includes linearity, hysteresis, repeatability, resolution, and temperature effects.

PM200 Modules

Specifications are valid from 18 °C to 28 °C. For temperatures from 15 °C to 18 °C and 28 °C to 35 °C, add 0.003 % FS/°C.

Table 1. PM200 Module Measurement Specifications

Model	Range (SI Units)	Range (Imperial Units)	Measurement Mode [1]	1-Year Instrumental Uncertainty % FS	Precision Uncertainty % FS
PM200-BG2.5K	-2.5 kPa to 2.5 kPa	-10 inH_2O to 10 inH_2O	bi-directional gauge	0.2	0.055
PM200-BG35K	-35 kPa to 35 kPa	-5 psi to 5 psi	bi-directional gauge	0.05	0.015
PM200-BG40K	-40 kPa to 40 kPa	-6 psi to 6 psi	bi-directional gauge	0.05	0.015
PM200-BG60K	-60 kPa to 60 kPa	-8.7 psi to 8.7 psi	bi-directional gauge	0.05	0.015
PM200-BG100K	-100 kPa to 100 kPa	-15 psi to 15 psi	bi-directional gauge	0.02	0.01
PM200-A100K	2 kPa to 100 kPa	0.3 psi to 15 psi	absolute	0.1	0.02
PM200-A200K	2 kPa to 200 kPa	0.3 psi to 30 psi	absolute	0.1	0.02
PM200-BG200K	-100 kPa to 200 kPa	-15 psi to 30 psi	bi-directional gauge	0.02	0.01
PM200-BG250K	-100 kPa to 250 kPa	-15 psi to 36 psi	bi-directional gauge	0.02	0.01
PM200-G400K	0 kPa to 400 kPa	0 psi to 60 psi	gauge	0.02	0.01
PM200-G700K	0 kPa to 700 kPa	0 psi to 100 psi	gauge	0.02	0.01
PM200-G1M	0 MPa to 1 MPa	0 psi to 150 psi	gauge	0.02	0.01
PM200-G1.4M	0 MPa to 1.4 MPa	0 psi to 200 psi	gauge	0.02	0.01
PM200-G2M	0 MPa to 2 MPa	0 psi to 300 psi	gauge	0.02	0.01
PM200-G2.5M	0 MPa to 2.5 MPa	0 psi to 360 psi	gauge	0.02	0.01
PM200-G3.5M	0 MPa to 3.5 MPa	0 psi to 500 psi	gauge	0.02	0.01
PM200-G4M	0 MPa to 4 MPa	0 psi to 580 psi	gauge	0.02	0.01
PM200-G7M	0 MPa to 7 MPa	0 psi to 1000 psi	gauge	0.02	0.01
PM200-G10M	0 MPa to 10 MPa	0 psi to 1500 psi	gauge	0.02	0.01
PM200-G14M	0 MPa to 14 MPa	0 psi to 2000 psi	gauge	0.02	0.01
PM200-G20M	0 MPa to 20 MPa	0 psi to 3000 psi	gauge	0.02	0.01

Notes

1. PM200 gauge mode modules support absolute mode measurement when used with a barometric reference module. Instrumental 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 root sum squared with the uncertainty of the barometric reference module. Uncertainty for gauge mode assumes routine zeroing which is default operating mode when used in a chassis. Uncertainty for absolute mode modules includes 1-year zero stability. This specification can be reduced to 0.05 % FS if the PM200 module is zeroed on a continuing basis to remove the 1-year zero stability component.

PM500 Modules

Specifications are valid from 15 °C to 35 °C.

Table 2. PM500 Module Measurement Specifications

Model	Range (SI Units)	Range (Imperial Units)	Measurement Mode [2]	1-Year Instrumental Uncertainty (% of reading or % FS, whichever is greater) unless otherwise stated	1-Year Zero Instrumental Drift % FS, RSS with 1-Year Instrumental Uncertainty [1]	Precision Uncertainty (% of reading or % FS, whichever is greater)
PM500-G100K	0 kPa to 100 kPa	0 psi to 15 psi	gauge	0.01 or 0.005	-	0.007 or 0.0035
PM500-G200K	0 kPa to 200 kPa	0 psi to 30 psi	gauge	0.01 or 0.005	-	0.007 or 0.0035
PM500-G250K	0 kPa to 250 kPa	0 psi to 36 psi	gauge	0.01 or 0.005	-	0.007 or 0.0035
PM500-G350K	0 kPa to 350 kPa	0 psi to 50 psi	gauge	0.01 or 0.005	-	0.007 or 0.0035
PM500-G400K	0 kPa to 400 kPa	0 psi to 60 psi	gauge	0.01 or 0.005	-	0.007 or 0.0035
PM500-G600K	0 kPa to 600 kPa	0 psi to 90 psi	gauge	0.01 or 0.005	-	0.007 or 0.0035
PM500-G700K	0 kPa to 700 kPa	0 psi to 100 psi	gauge	0.01 or 0.005	-	0.007 or 0.0035
PM500-BG1M	-0.1 MPa to 1 MPa	-15 psi to 150 psi	bi-directional gauge	0.01 or 0.005	-	0.007 or 0.0035
PM500-BG1.4M	-0.1 MPa to 1.4 MPa	-15 psi to 200 psi	bi-directional gauge	0.01 or 0.005	-	0.007 or 0.0035
PM500-BG2M	-0.1 MPa to 2 MPa	-15 psi to 300 psi	bi-directional gauge	0.01 or 0.005	-	0.007 or 0.0035
PM500-BG2.5M	-0.1 MPa to 2.5 MPa	-15 psi to 400 psi	bi-directional gauge	0.01 or 0.005	-	0.007 or 0.0035
PM500-BG3.5M	-0.1 MPa to 3.5 MPa	-15 psi to 500 psi	bi-directional gauge	0.01 or 0.005	-	0.007 or 0.0035
PM500-BG4M	-0.1 MPa to 4 MPa	-15 psi to 600 psi	bi-directional gauge	0.01 or 0.005	-	0.007 or 0.0035
PM500-BG7M	-0.1 MPa to 7 MPa	-15 psi to 1000 psi	bi-directional gauge	0.01 or 0.005	-	0.007 or 0.0035
PM500-BG10M	-0.1 MPa to 10 MPa	-15 psi to 1500 psi	bi-directional gauge	0.01 or 0.005	-	0.007 or 0.0035
PM500-BG14M	-0.1 MPa to 14 MPa	-15 psi to 2000 psi	bi-directional gauge	0.01 or 0.005	-	0.007 or 0.0035
PM500-BG20M	-0.1 MPa to 20 MPa	-15 psi to 3000 psi	bi-directional gauge	0.01 or 0.005	-	0.007 or 0.0035
PM500-BA120K	60 kPa to 120 kPa	8 psi to 17 psi	absolute	0.01 % of reading	0.05	0.005 % of reading
PM500-A120K	0.08 kPa to 120 kPa	0.01 psi to 16 psi	absolute	0.01 or 0.005	0.05	0.007 or 0.0035
PM500-A160K	0.08 kPa to 160 kPa	0.01 psi to 23 psi	absolute	0.01 or 0.005	0.05	0.007 or 0.0035
PM500-A200K	0.08 kPa to 200 kPa	0.01 psi to 30 psi	absolute	0.01 or 0.005	0.05	0.007 or 0.0035
PM500-A350K	0.08 kPa to 350 kPa	0.01 psi to 50 psi	absolute	0.01 or 0.005	0.03	0.007 or 0.0035
PM500-A700K	0.08 kPa to 700 kPa	0.01 psi to 100 psi	absolute	0.01 or 0.005	0.025	0.007 or 0.0035
PM500-A1.4M	0.035 MPa to 1.4 MPa	5 psi to 200 psi	absolute	0.01 or 0.005	0.015	0.007 or 0.0035
PM500-A2M	0.07 MPa to 2 MPa	10 psi to 300 psi	absolute	0.01 or 0.005	0.015	0.007 or 0.0035

				(% FS + % of reading)		(% FS + % of reading)
PM500-G2.5K	0 kPa to 2.5 kPa	0 inH_2O to 10 inH^2O	gauge	0.03 + 0.02	-	0.015 + 0.01
PM500-G7K	0 kPa to 7 kPa	0 inH_2O to 30 inH_2O	gauge	0.01 + 0.01	-	0.005 + 0.005
PM500-G14K	0 kPa to 14 kPa	0 inH_2O to 50 inH_2O	gauge	0.01 + 0.01	-	0.005 + 0.005
PM500-G20K	0 kPa to 20 kPa	0 inH_2O to 80 inH_2O	gauge	0.01 + 0.01	-	0.005 + 0.005
PM500-G35K	0 kPa to 35 kPa	0 psi to 5 psi	gauge	0.01 + 0.01	-	0.005 + 0.005
PM500-G70K	0 kPa to 70 kPa	0 psi to 10 psi	gauge	0.01 + 0.01	-	0.005 + 0.005
PM500-NG100K	-100 kPa to 0 kPa	-15 psi to 0 psi	negative gauge	0.01 + 0.01	-	0.005 + 0.005
PM500-BG1.4K	-1.4 kPa to 1.4 kPa	-5 inH_2O to 5 inH_2O	bi-directional gauge	0.03 + 0.02	-	0.015 + 0.01
PM500-BG2.5K	-2.5 kPa to 2.5 kPa	-10 inH_2O to 10 inH_2O	bi-directional gauge	0.03 + 0.02	-	0.015 + 0.01
PM500-BG3.5K	-3.5 kPa to 3.5 kPa	-15 inH_2O to 15 inH_2O	bi-directional gauge	0.01 + 0.01	-	0.005 + 0.005
PM500-BG7K	-7 kPa to 7 kPa	-30 inH_2O to 30 inH_2O	bi-directional gauge	0.01 + 0.01	-	0.005 + 0.005
PM500-BG14K	-14 kPa to 14 kPa	-50 InH_2O to 50 InH_2O	bi-directional gauge	0.01 + 0.01	-	0.005 + 0.005
PM500-BG25K	-25 kPa to 25 kPa	-100 InH_2O to 100 InH_2O	bi-directional gauge	0.01 + 0.01	-	0.005 + 0.005
PM500-BG40K	-40 kPa to 40 kPa	-6 psi to 6 psi	bi-directional gauge	0.01 + 0.01	-	0.005 + 0.005
PM500-BG60K	-60 kPa to 60 kPa	-9 psi to 9 psi	bi-directional gauge	0.01 + 0.01	-	0.005 + 0.005
				% FS		**% FS**
PM500-BG100K	-100 kPa to 100 kPa	-15 psi to 15 psi	bi-directional gauge	0.01	-	0.005
PM500-BG200K	-100 kPa to 200 kPa	-15 psi to 30 psi	bi-directional gauge	0.01	-	0.005
PM500-BG250K	-100 kPa to 250 kPa	-15 psi to 36 psi	bi-directional gauge	0.01	-	0.005
PM500-BG350K	-100 kPa to 350 kPa	-15 psi to 50 psi	bi-directional gauge	0.01	-	0.005
PM500-BG400K	-100 kPa to 400 kPa	-15 psi to 60 psi	bi-directional gauge	0.01	-	0.005
PM500-BG700K	-100 kPa to 700 kPa	-15 psi to 100 psi	bi-directional gauge	0.01	-	0.005

Notes

1. The 1 Year Instrumental Uncertainty is specified with a zeroing technique in the Operators Manual. If not adhered to the 1 Year Instrumental Uncertainty is:

$$\sqrt{\left(\frac{1\ year\ instrumental\ uncertainty}{2}\right)^2 + \left(\frac{1\ year\ zero\ drift}{1.73}\right)^2}\ X\ 2$$

2. PM500 gauge or bi-directional mode modules support absolute mode measurement when used with a Barometric Reference Module. Instrumental 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 root sum squared with the uncertainty of the barometric reference module. Uncertainty for gauge mode assumes routine zeroing which is default operation mode when used in a chassis.

PM600 Modules

Specifications are valid from 15 °C to 35 °C.

Table 3. PM600 Module Measurement Specifications

Model	Absolute Mode Range (SI Units)	Absolute Mode Range (Imperial Units)	Gauge Mode Range [3] (SI Units)	Gauge Mode Range (Imperial Units)	1-Year Instrumental Uncertainty (% of reading or % FS, whichever is greater)	Precision Uncertainty (% of reading or % FS, whichever is greater)
BRM600-BA100K	70 kPa to 110 kPa	10 psi to 16 psi	-	-	0.01 % of reading	0.008 or 0.0024
PM600-BG15K	-	-	-15 kPa to 15 kPa	-60 inH2O to 60 inH2O	0.01 or 0.003	0.008 or 0.0024
PM600-G100K	-	-	0 kPa to 100 kPa	0 psi to 15 psi	0.01 or 0.003	0.008 or 0.0024
PM600-G200K	-	-	0 kPa to 200 kPa	0 psi to 30 psi	0.01 or 0.003	0.008 or 0.0024
PM600-A100K	6 kPa to 100 kPa	0.9 psi to 15 psi	-94 kPa to 0 kPa	-13.8 psi to 0 psi	0.01 or 0.003 [1,3]	0.008 or 0.0024
PM600-A200K	10 kPa to 200 kPa	1.5 psi to 30 psi	-90 kPa to 100 kPa	-13.2 psi to 15 psi	0.01 or 0.003 [1,3]	0.008 or 0.0024
PM600-A350K	10 kPa to 350 kPa	1.5 psi to 50 psi	-90 kPa to 250 kPa	-13.2 psi to 35 psi	0.01 or 0.003 [1]	0.008 or 0.0024
PM600-A700K	18 kPa to 700 kPa	2.6 psi to 100 psi	-82 kPa to 700 kPa	-12.1 psi to 100 psi	0.01 or 0.003 [1]	0.008 or 0.0024
PM600-A1.4M	0.035 MPa to 1.4 MPa	5 psi to 200 psi	-0.065 MPa to 1.4 MPa	-10 psi to 200 psi	0.01 or 0.003 [1]	0.008 or 0.0024
PM600-A2M	0.07 MPa to 2 MPa	10 psi to 300 psi	-0.03 MPa to 2 MPa	-5 psi to 300 psi	0.01 or 0.003 [1]	0.008 or 0.0024
PM600-A3.5M	0.07 MPa to 3.5 MPa	10 psi to 500 psi	-0.03 MPa to 3.5 MPa	-5 psi to 500 psi	0.01 or 0.003 [1]	0.008 or 0.0024
PM600-A7M	ATM [2] to 7 MPa	ATM [2] to 1000 psi	0 MPa to 7 MPa	0 psi to 1000 psi	0.01 or 0.003 [1]	0.008 or 0.0024
PM600-A10M	ATM [2] to 10 MPa	ATM [2] to 1500 psi	0 MPa to 10 MPa	0 psi to 1500 psi	0.01 or 0.003 [1]	0.008 or 0.0024
PM600-A14M	ATM [2] to 14 MPa	ATM [2] to 2000 psi	0 MPa to 14 MPa	0 psi to 2000 psi	0.01 or 0.003 [1]	0.008 or 0.0024
PM600-A20M	ATM [2] to 20 MPa	ATM [2] to 3000 psi	0 MPa to 20 MPa	0 psi to 3000 psi	0.01 or 0.003 [1]	0.008 or 0.0024

Notes

1. For PM600s absolute mode modules used in absolute mode, root sum square (RSS) with 0.007 % of FS (reduced to k=1 by square root of 3).

$$\sqrt{\left(\frac{1\ year\ instrumental\ uncertainty}{2}\right)^2 + \left(\frac{0.007\%\ FS}{1.73}\right)^2}\ X\ 2$$

2. ATM is any atmospheric pressure from 70 kPa to 110 kPa (10 psi to 16 psi).
3. 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.

Operating Characteristics

Control Precision (Dynamic Mode)

PM200-BG2.5K..... 0.005 % Range Span

PM500 <20 kPa full scale..... 0.002 % Range Span

All other Ranges ..... 0.001 % Range Span

Control Turndown ..... 10:1 (typical)

To meet the control specifications, supply pressure should not be greater than 10 times the range of the measurement module. 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.

Low Control Point ..... 1 kPa (0.15 psi) absolute

Settling Time (Typical)

PM200-BG2.5K..... 40 seconds

PM200, all other ranges ..... 20 seconds

PM500 ≤20 kPa full scale..... 45 seconds

PM500 >20 kPa full scale..... 30 seconds

PM600 ..... 35-55 seconds

Typical settling time is the time required to be within 0.005 % of setpoint for 10 % steps into volumes of 0 to 50 cm^3 and pressures above 50 kPa (7.25 psi) absolute. Lower absolute pressures will require longer settling times depending upon quality of the vacuum pump, diameter and material of tubing used, and test volume.

Maximum Overshoot..... 0.01 % Range Span

Pressure Limits

Supply Port ..... 23 MPa (3300 psi) gauge

Test Port ..... 20 MPa (3000 psi) gauge

Reference Port ..... 150 kPa (22 psi) absolute

Vent Port ..... 150 kPa (22 psi) absolute

Relief Valves

Chassis Supply port relief valve is set to 24.1 MPa (-0/+700 kPa), 3500 psi (-0/+100 psi)

Exhaust port relief valve is set to ~700 kPa (100 psi).

Each PMM includes a module-specific pressure protection device.

Supply Gas Type

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

>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.

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Calibration

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
CDG-REF-1TORR	Capacitance Diaphragm Gauge for zeroing of absolute mode PM500 modules
PK-PMM-ZERO	Interconnection Kit for zeroing of Absolute mode PM500 modules



PMM-CAL-KIT Pressure Measurement Module Calibration Kit

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

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

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Electrical | RF | Temperature | Humidity | Pressure | Flow | Software

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