

FLUKE®

Calibration



**2271A Industrial
Pressure Calibrator**
Extended specifications

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 35 °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-28800D CLASS 3
Altitude (Operation)	<2000 m
Ingress Protection	IEC 60529: IP20
Safety	IEC 61010-1, Installation Category II, Pollution degree 2
Warmup Time	15 minutes typical

Electromagnetic Compatibility (EMC)

International	IEC 61326-1: Controlled Electromagnetic Environment CISPR 11: Group 1, Class A <i>Group 1: Equipment has intentionally generated and/or uses conductively-coupled radio frequency energy that is necessary for the internal function of the equipment itself.</i> <i>Class A: Equipment is suitable for use in all establishments other than domestic and those directly connected to a low-voltage power supply network that supplies buildings used for domestic purposes. There may be potential difficulties in ensuring electromagnetic compatibility in other environments due to conducted and radiated disturbances. Emissions that exceed the levels required by CISPR 11 can occur when the equipment is connected to a test object.</i>
Korea (KCC)	Class A Equipment (Industrial Broadcasting & Communication Equipment) <i>Class A: Equipment meets requirements for industrial 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.</i>
USA (FCC)	47 CFR 15 subpart B. This product is considered an exempt device per clause 15.103.

Weight

Chassis only	15 kg (33.06 lbs)
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Dimensions

Height	2271A-NPT-HC20	305 mm (12 in)
	2271A-BSP-HC20	305 mm (12 in)
	2271A-NPT-P3K	237 mm (9.33 in)
	2271A-BSP-P3K	237 mm (9.33 in)
Width	442 mm (17.40 in)	
Depth.....	446 mm (17.55 in)	

Pressure Limits

- Working Pressure Range -97.90 kPa (-14.2 psi) gauge to 20 MPa (3000 psi) gauge
- Supply Port 23 MPa (3300 psi) gauge
- Test Port 20 MPa (3000 psi) absolute
- Reference Port 115 kPa (17 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 ~830 kPa (120 psi).
- Each Pressure Measurement Module (PMM) includes a module-specific pressure protection device.

Supply Gas Type

- Clean Dry Air or Nitrogen (Industrial Grade, 99.5 %)
- Maximum 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
- Exhaust gas will pass through the vacuum supply. Appropriate protections should be taken when operating at higher pressures.

Interface / Communications

- Primary remote Interfaces Ethernet, RS232, USB
- Electrical Measurement Module (EMM)
- Connection..... Banana Jack
 - Maximum 30 V dc w.r.t. chassis ground
- Aux Drivers 4 external Solenoid Drivers
 - 24 V dc. 100 % duty cycle when turned, reducing to 40 % shortly after.

Pressure Control Specifications

Control Precision (Dynamic Mode)

- PM200-BG2.5K..... 0.005 % Range Span
- All other Ranges 0.001 % Range Span
- Control Turndown..... 10:1 (Typical)

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) provides 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

Time to Setpoint (Typical)

- PM200-BG2.5K..... 40 seconds
- All other Ranges 20 seconds

Typical set time is the time required to be within 0.005 % of the setpoint for 10 % steps into volumes of 0 to 50 cm³ and pressures above 50 kPa (7.25 psi) absolute. Lower absolute pressures requires longer set times depending upon quality of the vacuum pump, diameter and material of tubing used, and test volume.

Maximum Overshoot..... 0.02 % Range Span

Pressure Measurement Specifications

The Product specifications describe the absolute instrumental uncertainty for the Product. The Product specifications include linearity, hysteresis, repeatability, resolution, reference uncertainty, 1-year stability and temperature effects from 18 °C to 28 °C. The Product specifications are provided at a 95 % level of confidence, k=2, normally distributed.

PM200 Modules

Model	Range (SI Units)	Range (Imperial Units)	Measurement Mode	1 Year Specification (%FS)
PM200-BG2.5K	-2.5 kPa to 2.5 kPa	-10 inH ₂ O to 10 inH ₂ O	gauge	0.20 %
PM200-BG35K	-35 kPa to 35 kPa	-5 psi to 5 psi	gauge	0.05 %
PM200-BG40K	-40 kPa to 40 kPa	-6 psi to 6 psi	gauge	0.05 %
PM200-BG60K	-60 kPa to 60 kPa	-9 psi to 9 psi	gauge	0.05 %
PM200-A100K	2 kPa to 100 kPa	0.3 psi to 15 psi	absolute	0.10 %
PM200-BG100K	-100 kPa to 100 kPa	-15 psi to 15 psi	gauge	0.02 %
PM200-A200K	2 kPa to 200 kPa	0.3 psi to 30 psi	absolute	0.10 %
PM200-BG200K	-100 kPa to 200 kPa	-15 psi to 30 psi	gauge	0.02 %
PM200-BG250K	-100 kPa to 250 kPa	-15 psi to 36 psi	gauge	0.02 %
PM200-G400K	0 kPa to 400 kPa	0 psi to 60 psi	gauge	0.02 %
PM200-G700K	0 kPa to 700 kPa	0 psi to 100 psi	gauge	0.02 %
PM200-G1M	0 MPa to 1 MPa	0 psi to 150 psi	gauge	0.02 %
PM200-G1.4M	0 MPa to 1.4 MPa	0 psi to 200 psi	gauge	0.02 %
PM200-G2M	0 MPa to 2 MPa	0 psi to 300 psi	gauge	0.02 %
PM200-G2.5M	0 MPa to 2.5 MPa	0 psi to 360 psi	gauge	0.02 %
PM200-G3.5M	0 MPa to 3.5 MPa	0 psi to 500 psi	gauge	0.02 %
PM200-G4M	0 MPa to 4 MPa	0 psi to 580 psi	gauge	0.02 %
PM200-G7M	0 MPa to 7 MPa	0 psi to 1000 psi	gauge	0.02 %
PM200-G10M	0 MPa to 10 MPa	0 psi to 1500 psi	gauge	0.02 %
PM200-G14M	0 MPa to 14 MPa	0 psi to 2000 psi	gauge	0.02 %
PM200-G20M	0 MPa to 20 MPa	0 psi to 3000 psi	gauge	0.02 %

Notes

- 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.
- For temperatures from 15 °C to 18 °C and 28 °C to 35 °C, add 0.003 % FS/°C.
- Uncertainty for gauge mode modules assumes routine zeroing. 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.
- 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.

Electrical Specifications

The Product specifications describe the absolute instrumental uncertainty for the Product. The Product specifications include linearity, hysteresis, repeatability, resolution, reference uncertainty, 1-year stability and temperature effects from 18 °C to 28 °C. The Product specifications are provided at a 99 % level of confidence, k=2.58, normally distributed.

EM300 Electrical Measurement Specifications

DC Voltage		
Range ^[2]	Resolution	1 Year Specification ^[1]
30 V	1 mV	0.01 % of RDG + 2 mV
DC Current		
Range ^[2]	Resolution	1 Year Specification ^[1]
24 mA	1 µA	0.01 % of RDG + 2 µA
1. Temperature coefficient adder for temperatures outside 23 ±5 °C: 20 ppm of Full Scale / °C. 2. All outputs are positive only.		

Source

Loop Compliance Voltage ≥24 V dc @ 20 mA (without 250 Ω built in resistor)
 ≥19 V dc @ 20 mA (with 250 Ω built in resistor)

Switch Testing

Current Limits ≤4 mA
 Conditions..... Closed >1.5 mA, Open <0.5 mA

HART Communication and Functions

HART Modes..... HART mA measurement with 24 V (Loop)
 Automatic HART Detection..... HART connected with automatic polling
 HART Selectable Resistor Built-in 250 Ω loop resistor. Selectable ON/OFF
 HART Commands HART universal and common practice commands (no device specific commands)
 Write Protection..... HART Write enable/disable

Ordering information

Models	Description
2271A-NPT-HC20	Industrial Pressure Calibrator Chassis, NPT Manifold, HC20 Test Port Connections
2271A-NPT-P3K	Industrial Pressure Calibrator Chassis, NPT Manifold, P3000 Test Port Connections
2271A-BSP-HC20	Industrial Pressure Calibrator Chassis, BSP Manifold, HC20 Test Port Connections
2271A-BSP-P3K	Industrial Pressure Calibrator Chassis, BSP Manifold, P3000 Test Port Connections

Pressure modules

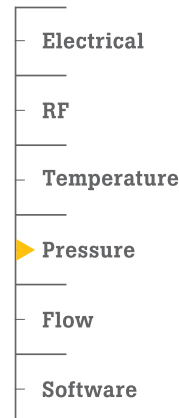
Please refer to the summary specifications for details about the pressure measurement modules.

Accessories

CASE-2271	Shipping Case, 2271A
CASE-PMM	Shipping Case, 3 PMM Modules
PK-2271-NPT-HC20	Lines and Fittings Kit, 2271A-NPT-HC20
PK-2271-NPT-P3K	Lines and Fittings Kit, 2271A-NPT-P3K
PK-2271-BSP-HC20	Lines and Fittings Kit, 2271A-BSP-HC20
PK-2271-BSP-P3K	Lines and Fittings Kit, 2271A-BSP-P3K
PMM-CAL-KIT-20M	Pressure Module Calibration Kit, 20 MPa (3000 psi)
VA-PPC/MPC-REF-110	Vacuum Pump Package, 110 V
VA-PPC/MPC-REF-220	Vacuum Pump Package, 220 V

Fluke Calibration.

Precision, performance, confidence.™



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

Fluke Europe B.V.
PO Box 1186, 5602 BD
Eindhoven, The Netherlands

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>

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Printed in U.S.A. 2/2016 6007521a-en

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