

## Technical data

# 8270A and 8370A Modular Pressure Controllers/Calibrators



## The widest workload coverage in an automated pressure controller

The 8270A and 8370A are automated pneumatic pressure controllers that calibrate a wide workload of pressure sensors, covering twice the pressure ranges at twice the speed of other high-pressure controllers. Two models let you balance price and performance:

- The 8270A measures and controls pressures from vacuum to 44 MPa (6400 psi). It can be configured with ranges as low as 100 kPa (15 psi).
- The 8370A measures and controls pressures from atmosphere to 107 MPa (15,500 psi). It can be configured with ranges as low as 700 kPa (100 psi).

Fluke Calibration's unique control technology enables you to use these calibrators at low or high pressures, all in the same instrument. Control precision is 0.002 % of active range.

Expand workload coverage by using the optional Contamination Prevention System (CPS).

## 100:1 control turndown

A pressure range 100 times smaller than the full scale will meet the control specifications without reducing supply pressure. For example, an 8370A with a 70 MPa (10,000 psi) high range module and a 700 kPa (100 psi) low range module will be able to control pressures below 700 kPa (100 psi) to within  $\pm 0.014$  kPa (0.002 psi) without reducing the supply pressure.

## Flexible configuration options

The 8270A and 8370A are modular systems that can be configured with up to five measurement modules at the same time, so they can handle high pressure, low pressure, and everything in between. Three families of modules provide three levels of performance that let you set up a system matching your needs for accuracy and value.



| <b>Good: PM2000 Pressure Measurement Modules</b>                                                                                                                                                                                                                                                                                                                                                                   | <b>Better: PM500 Pressure Measurement Modules</b>                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Best: PM600 Pressure Measurement Modules</b>                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• 0.02 % FS specification makes it ideal for calibrating or testing pressure dial gauges, lower accuracy transmitters, or pressure switches</li> <li>• Rugged silicon pressure sensor design allows for faster pressure control</li> <li>• Economic price point helps facilitate the purchase of back-up modules, making sure you are never down for calibration</li> </ul> | <ul style="list-style-type: none"> <li>• Highly characterized and linearized silicon pressure sensor provides an economical way of making accurate pressure measurements</li> <li>• 0.01 % reading measurement uncertainty from 50 % to 100 % for most ranges allows for a wide workload coverage</li> <li>• More than 45 ranges, from low pressures up to 20 MPa (3,000 psi) to choose from. Your application is covered with this wide flexibility in configuration.</li> </ul> | <ul style="list-style-type: none"> <li>• Fluke Calibration Quartz Reference Pressure Transducer (Q-RPT) technology provides precise measurement with long term stability</li> <li>• 0.01 % reading measurement uncertainty from 30 % to 100 % of the modules' span allows for extremely wide workload coverage</li> <li>• Onboard barometer included with absolute mode modules, allowing them to be used in both absolute and gauge mode</li> </ul> |



**The widest workload coverage in an automated pressure controller**

## Modern replacements for deadweight testers and comparators

### Safety: the number one priority

Safety is the top priority in the design and manufacture of our pressure products, especially high-pressure pneumatic controllers. The 8270A and 8370A meet all appropriate safety standards. Each unit is equipped with over-pressure protection as well as a front-panel abort button. Pressing the abort button vents the test pressure and returns the unit to a safe condition. Additionally, an abort valve accessory allows for faster, directed vent, as well as automated venting at loss of power. High-pressure gas does have more stored energy than high-pressure oil, but it is a safe option under the right conditions. By using the 8270A or 8370A with the available accessories, you have safe operation with a clean pressure media.

### Easiest to use high-pressure standards available

Automated pressure controllers are some of the simplest, easiest-to-use pressure standards. Controlling and measuring pressure is as simple as typing in the required pressure and pressing Enter. Unlike deadweight testers, you do not need to spin weights at a particular speed or calculate gravity or temperature corrections. Unlike pressure comparators, the process can be fully automated and stability is achieved and maintained in a fraction of the time.

### Flexibility to handle a wide variety of applications and workloads

The 8270A and 8370A can be configured with different classes of modules with different pressure ranges. This gives you flexibility to handle a variety of applications and workloads. Uncertainties as good as 0.01 % reading are available across the vast majority of the range, making it an ideal replacement for deadweight testers.

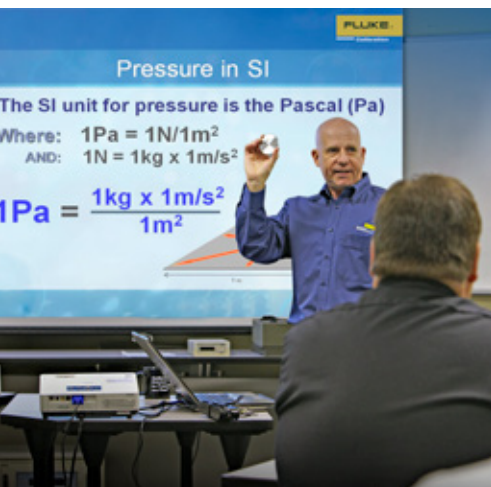
### An affordable solution that can grow as your requirements do

With their wide pressure range coverage, the 8270A and 8370A can replace multiple standards at once. Thanks to the modular design, pressure ranges and capabilities can be added at any time, allowing for lower cost of entry in favor of future expansion, growing with your needs.

### Ideal for characterization or calibration in production lines

Whether you manufacture large batches of low cost pressure sensors or customized, expensive pressure sensors for aerospace and other mission critical applications, the 8270A and 8370A are ideal for use in your production line.





### Robust design provides unsurpassed control performance

The 8270A and 8370A make use of our unique pressure control technology, first developed to handle some of the harshest pressure calibration applications. This technology provides unsurpassed control performance over a wide pressure range over an extended life cycle, reducing your downtime and maintenance costs.

### Modularity makes maintenance a snap

The 8270A and 8370A make use of Fluke Calibration's modular platform design. Measurement and control modules can be easily removed through the front panel to simplify maintenance or re-ranging requirements.

### Control speed meets the demands of a manufacturing environment

With times to setpoint as low as 30 seconds, the 8270A and 8370A can control pressures faster than traditional high-pressure controllers can.

### Support for remote communication and automation

The 8270A and 8370A support remote communication over RS-232, GPIB, USB, and ethernet connections. Using either the native SCPI protocol or a variety of emulation modes, these controllers can be used in a wide range of automated processes.

### Clean operation to 100 MPa (15,000 psi)

The wide pressure range control allows you to use the same test station for low, medium, or high-pressure work. By using a pneumatic pressure controller in your production process, you can provide your customers with a clean product, free of oil contamination.

### Automate with COMPASS™ software

COMPASS for Pressure software enables you to automate the 8370A and 8270A and run complete pressure calibration sequences on single or multiple devices under test (DUTs). The 8270A and 8370A feature a full remote interface that also lets you use it with custom software or other data acquisition equipment.

### Support and services when you need them

Fluke Calibration offers testing, repair and calibration services to meet your needs quickly and at a fair cost while maintaining the high level of quality that you expect. Our pressure calibration laboratories are accredited for conformance to ISO Guide 17025 and we maintain global calibration and repair facilities.

### Get peace of mind and uptime with a Gold CarePlan

A Priority Gold Instrument CarePlan gives you peace of mind and maximum uptime from the people who know your Fluke product best. It includes an expedited annual calibration and extended warranty to help you reduce downtime by a week<sup>1</sup> and get the best performance from your instruments. Choose from one-year, three-year or five-year CarePlans.

### Training options help you to get the most from your investment

Fluke Calibration sponsors pressure and flow calibration courses for both novice and expert pressure calibration professionals in our Phoenix, Arizona facility. We also host a series of free webinars about a wide variety of pressure calibration topics. If you need training to help you maintain your fleet of pressure controllers, we can help you there too.



<sup>1</sup> Priority shipping times vary by country. Contact your local Fluke Calibration sales representative for details.

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

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

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



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

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



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

To access the measurement and control modules, simply open the front panel. Modules are easy to replace, even when the 8270A or 8370A is rack-mounted.

Switch testing – 8270A and 8370A have 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 Prevention System (CPS).

USB connector

Ethernet connector

GPIB connector

RS-232 connector



An optional rack-mount kit enables the 8270A and 8370A to be installed in a standard 19-inch rack.

## Summary specifications

| General specifications                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mains</b>                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Power requirements                         | 100 V ac to 240 V ac, 47 Hz to 63 Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Fuse                                       | T3.15 A 250 V ac                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Max power consumption                      | 100 W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Environment</b>                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 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<br>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)                       | <3,000 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Warmup time                                | 15 minutes after power up or module installation, when items previously stored within Operating Ambient Temperature Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Compliance</b>                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Ingress protection                         | IEC 60529: IP20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Safety                                     | IEC 61010-1, Installation Category II, Pollution degree 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Electromagnetic compatibility (EMC)</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| IEC 61326-1<br>(Controlled EM environment) | IEC 61326-2-1; CISPR 11: Group 1, Class A<br>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.<br>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.<br>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 and Communication Equipment)<br>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.                                                                                                                                                                                                                                                                                                                                                                            |
| Dimensions and weight                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Dimensions</b>                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Weight</b>                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Chassis only                               | 13 kg (28.5 lbs)/15 kg (35.25 lbs)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Communication interfaces</b>            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Primary remote interfaces                  | IEEE, Ethernet, RS232, USB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| System connection                          | Supports interconnection of 2 or 3 systems                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Switch test connection                     | Standard BNC Jack:<br>Nominal 24 V dc isolated drive<br>Maximum 30 V dc w.r.t. chassis ground                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Aux drivers                                | 4 external Solenoid Drivers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

## 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.

**Table 1. PM200 and PM230 module measurement specifications (Specifications are valid from 15 °C to 35 °C)<sup>2</sup>**

| Model                           | Range (SI units) <sup>1</sup> | Range (Imperial units) | Measurement mode <sup>2</sup> | 1-Year Instrumental Uncertainty (% FS unless otherwise stated) | Precision Uncertainty (% FS) |
|---------------------------------|-------------------------------|------------------------|-------------------------------|----------------------------------------------------------------|------------------------------|
| <b>PM200-BG100K<sup>3</sup></b> | -100 kPa to 100 kPa           | -15 psi to 15 psi      | bi-directional gauge          | 0.02                                                           | 0.01                         |
| <b>PM200-A200K<sup>3</sup></b>  | 2 kPa to 200 kPa              | 0.3 psi to 30 psi      | absolute                      | 0.1                                                            | 0.02                         |
| <b>PM200-BG200K<sup>3</sup></b> | -100 kPa to 200 kPa           | -15 psi to 30 psi      | bi-directional gauge          | 0.02                                                           | 0.01                         |
| <b>PM200-BG250K<sup>3</sup></b> | -100 kPa to 250 kPa           | -15 psi to 36 psi      | bi-directional gauge          | 0.02                                                           | 0.01                         |
| <b>PM200-G400K<sup>3</sup></b>  | 0 kPa to 400 kPa              | 0 psi to 60 psi        | gauge                         | 0.02                                                           | 0.01                         |
| <b>PM200-G700K</b>              | 0 kPa to 700 kPa              | 0 psi to 100 psi       | gauge                         | 0.02                                                           | 0.01                         |
| <b>PM200-G1M</b>                | 0 MPa to 1 MPa                | 0 psi to 150 psi       | gauge                         | 0.02                                                           | 0.01                         |
| <b>PM200-G1.4M</b>              | 0 MPa to 1.4 MPa              | 0 psi to 200 psi       | gauge                         | 0.02                                                           | 0.01                         |
| <b>PM200-G2M</b>                | 0 MPa to 2 MPa                | 0 psi to 300 psi       | gauge                         | 0.02                                                           | 0.01                         |
| <b>PM200-G2.5M</b>              | 0 MPa to 2.5 MPa              | 0 psi to 360 psi       | gauge                         | 0.02                                                           | 0.01                         |
| <b>PM200-G3.5M</b>              | 0 MPa to 3.5 MPa              | 0 psi to 500 psi       | gauge                         | 0.02                                                           | 0.01                         |
| <b>PM200-G4M</b>                | 0 MPa to 4 MPa                | 0 psi to 580 psi       | gauge                         | 0.02                                                           | 0.01                         |
| <b>PM200-G7M</b>                | 0 MPa to 7 MPa                | 0 psi to 1,000 psi     | gauge                         | 0.02                                                           | 0.01                         |
| <b>PM200-G10M</b>               | 0 MPa to 10 MPa               | 0 psi to 1,500 psi     | gauge                         | 0.02                                                           | 0.01                         |
| <b>PM200-G14M</b>               | 0 MPa to 14 MPa               | 0 psi to 2,000 psi     | gauge                         | 0.02                                                           | 0.01                         |
| <b>PM200-G20M</b>               | 0 MPa to 20 MPa               | 0 psi to 3,000 psi     | gauge                         | 0.02                                                           | 0.01                         |
| <b>PM200-G28M</b>               | 0 MPa to 28 MPa               | 0 psi to 4,000 psi     | gauge                         | 0.02                                                           | 0.01                         |
| <b>PM200-G35M</b>               | 0 MPa to 35 MPa               | 0 psi to 5,000 psi     | gauge                         | 0.02                                                           | 0.01                         |
| <b>PM200-G40M</b>               | 0 MPa to 40 MPa               | 0 psi to 6,000 psi     | gauge                         | 0.02                                                           | 0.01                         |
| <b>PM230-G70<sup>4</sup></b>    | 0 MPa to 70 MPa               | 0 psi to 10,000 psi    | gauge                         | 0.02                                                           | 0.01                         |
| <b>PM230-G100M<sup>4</sup></b>  | 0 MPa to 100 MPa              | 0 psi to 15,000 psi    | gauge                         | 0.015 % FS + 0.02 % of reading                                 | 0.015                        |

### Notes

1. PM200 and PM230 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 the 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.
2. For modules with full scales <28 MPa (4,000 psi) temperatures from 15 °C to 18 °C and 28 °C to 35 °C, add 0.003 % FS/°C.
3. Can be used with 8270A only.
4. Can be used with 8370A only.

**Table 2. PM500 module measurement specifications (Specifications are valid from 15 °C to 35 °C)**

| Model                     | Range (SI units)       | Range (Imperial units) | Measurement mode <sup>2</sup> | 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 <sup>1)</sup> ) | Precision Uncertainty (% of reading or % FS, whichever is greater) |
|---------------------------|------------------------|------------------------|-------------------------------|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| PM500-G100K <sup>3</sup>  | 0 kPa to 100 kPa       | 0 psi to 15 psi        | gauge                         | 0.01 or 0.005                                                                                        | -                                                                                              | 0.007 or 0.0035                                                    |
| PM500-G200K <sup>3</sup>  | 0 kPa to 200 kPa       | 0 psi to 30 psi        | gauge                         | 0.01 or 0.005                                                                                        | -                                                                                              | 0.007 or 0.0035                                                    |
| PM500-G250K <sup>3</sup>  | 0 kPa to 250 kPa       | 0 psi to 36 psi        | gauge                         | 0.01 or 0.005                                                                                        | -                                                                                              | 0.007 or 0.0035                                                    |
| PM500-G350K <sup>3</sup>  | 0 kPa to 350 kPa       | 0 psi to 50 psi        | gauge                         | 0.01 or 0.005                                                                                        | -                                                                                              | 0.007 or 0.0035                                                    |
| PM500-G400K <sup>3</sup>  | 0 kPa to 400 kPa       | 0 psi to 60 psi        | gauge                         | 0.01 or 0.005                                                                                        | -                                                                                              | 0.007 or 0.0035                                                    |
| PM500-G600K <sup>3</sup>  | 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                | -100 kPa to 1000 kPa   | -15 psi to 150 psi     | bi-directional gauge          | 0.01 or 0.005                                                                                        | -                                                                                              | 0.007 or 0.0035                                                    |
| PM500-BG1.4M              | -100 kPa to 1400 kPa   | -15 psi to 200 psi     | bi-directional gauge          | 0.01 or 0.005                                                                                        | -                                                                                              | 0.007 or 0.0035                                                    |
| PM500-BG2M                | -100 kPa to 2000 kPa   | -15 psi to 300 psi     | bi-directional gauge          | 0.01 or 0.005                                                                                        | -                                                                                              | 0.007 or 0.0035                                                    |
| PM500-BG2.5M              | -100 kPa to 2500 kPa   | -15 psi to 400 psi     | bi-directional gauge          | 0.01 or 0.005                                                                                        | -                                                                                              | 0.007 or 0.0035                                                    |
| PM500-BG3.5M              | -100 kPa to 3500 kPa   | -15 psi to 500 psi     | bi-directional gauge          | 0.01 or 0.005                                                                                        | -                                                                                              | 0.007 or 0.0035                                                    |
| PM500-BG4M                | -100 kPa to 4,000 kPa  | -15 psi to 600 psi     | bi-directional gauge          | 0.01 or 0.005                                                                                        | -                                                                                              | 0.007 or 0.0035                                                    |
| PM500-BG7M                | -100 kPa to 7,000 kPa  | -15 psi to 1,000 psi   | bi-directional gauge          | 0.01 or 0.005                                                                                        | -                                                                                              | 0.007 or 0.0035                                                    |
| PM500-BG10M               | -100 kPa to 10,000 kPa | -15 psi to 1,500 psi   | bi-directional gauge          | 0.01 or 0.005                                                                                        | -                                                                                              | 0.007 or 0.0035                                                    |
| PM500-BG14M               | -100 kPa to 14,000 kPa | -15 psi to 2,000 psi   | bi-directional gauge          | 0.01 or 0.005                                                                                        | -                                                                                              | 0.007 or 0.0035                                                    |
| PM500-BG20M               | -100 kPa to 20,000 kPa | -15 psi to 3,000 psi   | bi-directional gauge          | 0.01 or 0.005                                                                                        | -                                                                                              | 0.007 or 0.0035                                                    |
| PM500-BA120K <sup>4</sup> | 60 kPa to 120 kPa      | 8 psi to 17 psi        | absolute                      | 0.01 % of reading                                                                                    | 0.05                                                                                           | 0.005 % of reading                                                 |
| PM500-A120K <sup>4</sup>  | 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 <sup>3</sup>  | 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 <sup>3</sup>  | 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-NG100K <sup>3</sup> | -100 kPa to 0 kPa      | -15 psi to 0 psi       | negative gauge                | 0.01 + 0.01                                                                                          | -                                                                                              | 0.005 + 0.005                                                      |
| PM500-BG100K <sup>3</sup> | -100 kPa to 100 kPa    | -15 to 15 psi          | bi-directional gauge          | 0.01                                                                                                 | -                                                                                              | 0.005                                                              |
| PM500-BG200K <sup>3</sup> | -100 kPa to 200 kPa    | -15 to 30 psi          | bi-directional gauge          | 0.01                                                                                                 | -                                                                                              | 0.005                                                              |
| PM500-BG250K <sup>3</sup> | -100 kPa to 250 kPa    | -15 to 36 psi          | bi-directional gauge          | 0.01                                                                                                 | -                                                                                              | 0.005                                                              |
| PM500-BG350K              | -100 kPa to 350 kPa    | -15 to 50 psi          | bi-directional gauge          | 0.01                                                                                                 | -                                                                                              | 0.005                                                              |
| PM500-BG400K              | -100 kPa to 400 kPa    | -15 to 60 psi          | bi-directional gauge          | 0.01                                                                                                 | -                                                                                              | 0.005                                                              |
| PM500-BG700K              | -100 kPa to 700 kPa    | -15 to 100 psi         | bi-directional gauge          | 0.01                                                                                                 | -                                                                                              | 0.005                                                              |

## Notes

- For absolute PM500s, the 1-Year Stability can be eliminated with a zeroing technique described in the operators manual. If not adhered to, the 1-Year Specification is:

$$\sqrt{\left(\frac{1 \text{ year instrumental uncertainty}}{2}\right)^2 + \left(\frac{1 \text{ year zero stability}}{2}\right)^2} \times 2$$

- PM500 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.
- Can be used with 8270A only.
- For 8x70A chassis, the PM500-A120K can only be used as a barometer to enable gauge mode PMMs to measure absolute pressure and as an AutoZero reference for A1.4 and A2 M ranges

**Table 3. PM600 and PM630 module measurement specifications (Specifications are valid from 15 °C to 35 °C)**

| Model                            | Absolute mode range(SI Units) | Absolute mode range (Imperial Units) | Gauge mode range (SI Units) | Gauge mode range (Imperial Units) | 1-Year Instrumental Uncertainty (% of reading or % span, whichever is greater, unless otherwise stated) | Precision Uncertainty (% of reading or % span, whichever is greater, unless otherwise stated) |
|----------------------------------|-------------------------------|--------------------------------------|-----------------------------|-----------------------------------|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| <b>BRM600-BA100K</b>             | 70 kPa to 110 kPa             | 10 psi to 16 psi                     | N/A                         | N/A                               | 0.01 % of reading                                                                                       | 0.008 or 0.0024                                                                               |
| <b>PM600-A200K<sup>3,6</sup></b> | 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 <sup>1</sup>                                                                              | 0.008 or 0.0024                                                                               |
| <b>PM600-A350K<sup>3,6</sup></b> | 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 <sup>1</sup>                                                                              | 0.008 or 0.0024                                                                               |
| <b>PM600-A700K</b>               | 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 <sup>1</sup>                                                                              | 0.008 or 0.0024                                                                               |
| <b>PM600-A1.4M</b>               | 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 <sup>1</sup>                                                                              | 0.008 or 0.0024                                                                               |
| <b>PM600-A2M</b>                 | 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 <sup>1</sup>                                                                              | 0.008 or 0.0024                                                                               |
| <b>PM600-A3.5M</b>               | 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 <sup>1</sup>                                                                              | 0.008 or 0.0024                                                                               |
| <b>PM600-A7M</b>                 | ATM <sup>5</sup> to 7 MPa     | ATM <sup>5</sup> to 1,000 psi        | 0 MPa to 7 MPa              | 0 psi to 1,000 psi                | 0.01 or 0.003 <sup>1</sup>                                                                              | 0.008 or 0.0024                                                                               |
| <b>PM600-A10M</b>                | ATM <sup>5</sup> to 10 MPa    | ATM <sup>5</sup> to 1,500 psi        | 0 MPa to 10 MPa             | 0 psi to 1,500 psi                | 0.01 or 0.003 <sup>1</sup>                                                                              | 0.008 or 0.0024                                                                               |
| <b>PM600-A14M</b>                | ATM <sup>5</sup> to 14 MPa    | ATM <sup>5</sup> to 2,000 psi        | 0 MPa to 14 MPa             | 0 psi to 2,000 psi                | 0.01 or 0.003 <sup>1</sup>                                                                              | 0.008 or 0.0024                                                                               |
| <b>PM600-A20M</b>                | ATM <sup>5</sup> to 20 MPa    | ATM <sup>5</sup> to 3,000 psi        | 0 MPa to 20 MPa             | 0 psi to 3,000 psi                | 0.01 or 0.003 <sup>1</sup>                                                                              | 0.008 or 0.0024                                                                               |
| <b>PM600-A28M</b>                | ATM <sup>5</sup> to 28 MPa    | ATM <sup>5</sup> to 4,000 psi        | 0 MPa to 28 MPa             | 0 psi to 4,000 psi                | 0.01 or 0.003 <sup>2</sup>                                                                              | 0.008 or 0.0024                                                                               |
| <b>PM600-A35M</b>                | ATM <sup>5</sup> to 35 MPa    | ATM <sup>5</sup> to 5,000 psi        | 0 MPa to 35 MPa             | 0 psi to 5,000 psi                | 0.01 or 0.003 <sup>2</sup>                                                                              | 0.008 or 0.0024                                                                               |
| <b>PM600-A40M</b>                | ATM <sup>5</sup> to 40 MPa    | ATM <sup>5</sup> to 6,000 psi        | 0 MPa to 40 MPa             | 0 psi to 6,000 psi                | 0.01 or 0.003 <sup>2</sup>                                                                              | 0.008 or 0.0024                                                                               |
| <b>PM630-A70M<sup>4</sup></b>    | ATM <sup>5</sup> to 70 MPa    | ATM <sup>5</sup> to 10,000 psi       | 0 MPa to 70 MPa             | 0 psi to 10,000 psi               | 0.01 or 0.003 <sup>2</sup>                                                                              | 0.008 or 0.0024                                                                               |
| <b>PM630-A100M<sup>4</sup></b>   | ATM <sup>5</sup> to 100 MPa   | ATM <sup>5</sup> to 15,000 psi       | 0 MPa to 100 MPa            | 0 psi to 15,000 psi               | 0.012 or 0.004 <sup>2</sup>                                                                             | 0.01 or 0.003                                                                                 |

## Notes

- For PM600s modules with full scale less than 28 MPa, when used in absolute mode, root sum square (RSS) with 0.007 % of FS (reduced to k=1 by square root of 3). This specification may be reduced or eliminated with the use of a separate more stable module as an AutoZero reference.

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

- PM600 and PM630 modules, with full scales of 28 MPa and higher, use an internal barometer in the PMM to correct for changes in barometric pressure when they are used in gauge mode and as a zeroing reference when used in absolute mode, hence there is no need to RSS 0.007 % FS.
- Can be used with 8270A only.
- Can be used with 8370A only.
- ATM is any atmospheric pressure from 70 kPa to 110 kPa (10 psi to 16 psi absolute)
- For absolute ranges used in gauge mode there is an additional uncertainty of ±14 Pa for dynamic barometric compensation. When combined with other uncertainties, the uncertainty of the PM600-A200K is ±0.016 kPa. The threshold uncertainty for the PM600-A350K is ±0.005 % Span.

## Operating characteristics

### Control specifications

95% of setpoints are within specification limits for stated conditions as calculated by mean plus 1.67 standard deviations of test data.

**Control precision (Dynamic mode)** 0.002 % Range Span or 0.01 kPa (whichever is greater)

**Control turndown** 100:1 (typical)

To meet the control specifications, supply pressure should not be greater than 100 times the range of the measurement module. Control turn-down is defined as the relationship between the provided supply pressure and the appropriate supply pressure for the range.

**Low control point** 1 kPa (0.15 psi) absolute (8270A only)

7 kPa (1.0 psi) gauge (8370A, 8270A without vacuum pump)

### Settling time

Settling time is the time required to be within 0.005 % of setpoint for 10 % steps into volumes up to 50 cm<sup>3</sup> for all pressures >7 kPa absolute (8270A) or 7 kPa gauge (8370A). Settling time may be affected by multiple variables, including temperature effects, component flow rates, leaks, and overall volume configurations.

| Pressure measurement module (PMM) | Dynamic A mode* |                | Dynamic B mode |                |
|-----------------------------------|-----------------|----------------|----------------|----------------|
|                                   | Range < 44 MPa  | Range > 44 MPa | Range < 44 MPa | Range > 44 MPa |
| PM200/PM230                       | 30 seconds      | 45 seconds     | 60 seconds     | 75 seconds     |
| PM500                             | 35 seconds      | -              | 60 seconds     | -              |
| PM600/PM630                       | 45 seconds      | 60 seconds     | 60 seconds     | 75 seconds     |

\*8270A: Settling time for setpoints ≤ 200 kPa absolute may require an additional 15 seconds.

8370A: Settling time for setpoints ≤ 700 kPa gauge may require an additional 15 seconds.

**Overshoot (Dynamic A)** 0.08 % Full Scale or 2 kPa (whichever is greater)

**Overshoot (Dynamic B)** 0.008 % Full Scale or 2 kPa (whichever is greater)

### Pressure limits

Supply port (8270A/8370A) Maximum 48 MPa (7,000 psi) gauge/110 MPa (16,000 psi) gauge

Minimum 2 MPa (300 psi) gauge for 8270A and 8370A

Test port (8270A/8370A) 44 MPa (6,400 psi) gauge/107 MPa (15,500 psi) gauge

Reference port 150 kPa (22 psi) absolute

Vent port 150 kPa (22 psi) absolute

### Relief valves/Rupture disk

8270A chassis supply port relief valve is set to 52 MPa (7,500 psi)

8370A chassis supply has a rupture disk installed which is designed to burst at 152 MPa (22,000 psi). Low pressure manifold relief valve is set to 52 MPa (7,500 psi).

Modules with full scales ≤44 MPa include pressure relief valves.

### Supply gas type

Clean dry nitrogen, helium, argon, or air—Industrial grade nitrogen, 99.5 %+

### Vacuum supply

>50 liters per minute capacity with Auto Vent feature

System will exhaust gas through the vacuum system when controlling down in pressure. Appropriate protections are necessary.

## Ordering information

| Models          | Description                                    |
|-----------------|------------------------------------------------|
| 8270A-2-BSP-PCM | MODULAR PRESSURE CONTROLLER, 2-BAY, BSP, W/PCM |
| 8270A-2-NPT-PCM | MODULAR PRESSURE CONTROLLER, 2-BAY, NPT, W/PCM |
| 8270A-2-SAE-PCM | MODULAR PRESSURE CONTROLLER, 2-BAY, SAE, W/PCM |
| 8270A-5-BSP-PCM | MODULAR PRESSURE CONTROLLER, 5-BAY, BSP, W/PCM |
| 8270A-5-NPT-PCM | MODULAR PRESSURE CONTROLLER, 5-BAY, NPT, W/PCM |
| 8270A-5-SAE-PCM | MODULAR PRESSURE CONTROLLER, 5-BAY, SAE, W/PCM |
| 8370A-2-PCM     | HIGH-PRESSURE MODULAR CONTROLLER, 2-BAY, W/PCM |
| 8370A-5-PCM     | HIGH-PRESSURE MODULAR CONTROLLER, 5-BAY, W/PCM |

### Chassis

|             |                                                                       |
|-------------|-----------------------------------------------------------------------|
| 8370A-2     | HIGH-PRESSURE MODULAR CONTROLLER CHASSIS, 2 BAY, 100 MPA (15,000 PSI) |
| 8370A-5     | HIGH-PRESSURE MODULAR CONTROLLER CHASSIS, 5 BAY, 100 MPA (15,000 PSI) |
| 8270A-2-BSP | MODULAR PRESSURE CONTROLLER CHASSIS, 2-BAY, BSP MANIFOLD              |
| 8270A-2-NPT | MODULAR PRESSURE CONTROLLER CHASSIS, 2-BAY, NPT MANIFOLD              |
| 8270A-2-SAE | MODULAR PRESSURE CONTROLLER CHASSIS, 2-BAY, 7/16-20 MANIFOLD          |
| 8270A-5-BSP | MODULAR PRESSURE CONTROLLER CHASSIS, 5-BAY, BSP MANIFOLD              |
| 8270A-5-NPT | MODULAR PRESSURE CONTROLLER CHASSIS, 5-BAY, NPT MANIFOLD              |

### Control modules

|              |                                                                       |
|--------------|-----------------------------------------------------------------------|
| PCM-STD-100M | HIGH-PRESSURE CONTROL MODULE, STANDARD TURNDOWN, 100 MPA (15,000 PSI) |
| PCM-STD-40M  | PRESSURE CONTROL MODULE, 827X, STANDARD TURNDOWN, 40 MPA (6,000 PSI)  |

### Pressure modules

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

### Accessories

#### Contamination prevention

|              |                                                                  |
|--------------|------------------------------------------------------------------|
| CPS-100M     | HIGH-PRESSURE CONTAMINATION PREVENTION SYSTEM, STD PORT/ADAPTORS |
| CPS-40M-HC40 | CONTAMINATION PREVENTION SYSTEM, STD PORT/ADAPTORS               |
| SPLT-40M     | SELF-PURGING LIQUID TRAP                                         |

#### Lines and fittings/DUT connections

|              |                                               |
|--------------|-----------------------------------------------|
| PK-8270-BSP  | LINES AND FITTINGS KIT, 8270A BSP             |
| PK-8270-NPT  | LINES AND FITTINGS KIT, 8270A NPT             |
| PK-8270-SAE  | LINES AND FITTINGS KIT, 8270A 7/16-20         |
| PK-8370-100M | LINES AND FITTINGS KIT, 837X                  |
| TST-100M     | HIGH-PRESSURE TEST STATION, STD PORT/ADAPTORS |
| TST-40M-HC40 | TEST STATION, STD PORT/ADAPTORS               |

### Pressure/vacuum supply

|                    |                                             |
|--------------------|---------------------------------------------|
| GBK-110M           | GAS BOOSTER KIT, 152:1, 110 MPA (16,000PSI) |
| GBK-50M            | GAS BOOSTER KIT, 75:1 50 MPA (7,300 PSI)    |
| VA-PPC/MPC-REF-110 | VACUUM PUMP PACKAGE, 110 V AC               |
| VA-PPC/MPC-REF-220 | VACUUM PUMP PACKAGE, 220 V AC               |

### Transit cases

|           |                                |
|-----------|--------------------------------|
| CASE-PMM  | SHIPPING CASE, 3 PMM MODULES   |
| CASE-XX70 | REUSABLE TRANSIT CASE FOR XX70 |

### Module calibration/zeroing

|                  |                                                                        |
|------------------|------------------------------------------------------------------------|
| KIT-PMM-CAL-100M | HIGH-PRESSURE MEASUREMENT MODULE CALIBRATION KIT                       |
| KIT-PMM-CAL-40M  | PRESSURE MEASUREMENT MODULE CALIBRATION KIT                            |
| 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         |

### System integration

|                   |                                    |
|-------------------|------------------------------------|
| RMK-XX70          | RACK MOUNT KIT, 19 IN WIDTH, 3U    |
| PK-VLV-ABORT-100M | KIT, HIGH-PRESSURE ABORT VALVE     |
| PK-VLV-ISO-100M   | KIT, HIGH-PRESSURE ISOLATION VALVE |
| PK-VLV-ISO-40M    | KIT, PRESSURE ISOLATION VALVE      |
| 6270-SYS-CBL      | 6270 SYSTEM CABLE KIT              |

### DUT electrical measurement

|              |                                                    |
|--------------|----------------------------------------------------|
| KIT-EMM300   | ELECTRICAL MEASUREMENT MODULE WITH DOCKING STATION |
| DS70-KIT-EMM | ELECTRICAL MEASUREMENT MODULE WITH DOCKING STATION |
| EMM300       | ELECTRICAL MEASUREMENT MODULE                      |

### Replacement seal kits

|                 |                         |
|-----------------|-------------------------|
| SK-8270-SERVICE | SEALS KIT, 8270 SERVICE |
| SK-8370-SERVICE | SEALS KIT, 8370 SERVICE |

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