

PC100 Series PC115/PC125

Pressure



PC100 Series

Ultra-High Purity Digital Pressure Control Devices

Overview

Brooks Instrument's PC100 Series pressure control and flow measurement devices deliver outstanding performance, reliability, and system simplicity. Built on the proven, advanced technology of the GF100 Series mass flow controllers, process throughput and yield are maximized while process costs are reduced. The PC100 Series is designed for semiconductor, MOCVD, and other pressure control applications that require a high purity all-metal flow path.

High Purity Flow Path

The Brooks PC100 Series has an all metal, corrosion resistant Semi F20 compliant wetted flow path with highly corrosion resistant Hastelloy® C-22 valve seat and jet orifice.

- Overall reduced surface area and un-swept volumes allow for faster dry-down during purge steps
- Long-term thermal or pressure sensor and device stability maximizes yield and throughput

Advanced Thermal Flow Measurement Sensor

The PC125 with embedded flow meter includes a proprietary highly corrosion resistant Hastelloy C-22 sensor. The enhanced sensor manufacturing and burn in process incorporate a unique orthogonal sensor mounting orientation to eliminate sensor drift caused by valve heating effects and eliminate thermal siphoning effects. This unique sensor configuration includes an optimized temperature profile for gases prone to thermal decomposition. This design results in:

- Enhanced signal to noise performance for improved accuracy at low set points
- Superior reproducibility at elevated temperatures through new isothermal packaging and onboard conditioning electronics with ambient temperature sensing and compensation
- Improved long-term stability

Enhanced Diagnostics and User Interface

The Brooks PC100 Series provides for in-line device evaluation and instantaneous troubleshooting resulting in limited service interruption and reduced downtime.

- Independent diagnostic/service port
- High visibility LCD display with easy accessible push button for local indication of Flow (%), Temperature (°C), Torr/Pressure (PSIA/kPa) and Network Address
- Zero button easily re-zeros the device during scheduled maintenance. Zero button will zero pressure transducer or the thermal sensor, depending on what is visible on the display.

Communication Interfaces

The PC100 Series supports DeviceNet™ communication protocol. DeviceNet is a multi-drop connection that allows a maximum of 64 devices to be connected on the same network. Brooks Instrument's DeviceNet profile has been certified by the ODVA™ (Open DeviceNet Vendor's Association).

Product Features

The Brooks PC100 Series digital pressure control with patented flow sensor combined with a high speed ARM processor and fast acting diaphragm-free valve assembly enables:

- Faster response and settling time for improved pressure control
- Reduced diverted gas consumption and associated abatement costs
- User programmable start-up function for processes requiring a slow ramped pressure control

Product Specifications

| Performance | PC115 | PC125 |
|-------------------------------|--|--|
| Embedded Thermal Flow Sensor: | No | Yes |
| Pressure Control Mode: | Downstream and Upstream | Downstream |
| Full Scale Range: | o Min Flow Range: 0-20 sccm H ₂ ; 0-20 sccm N ₂ o Max Flow Range: 0-5 slm H ₂ ; 0-5 slm N ₂ | 10 slm N ₂ and H ₂ |

Pressure Reading

| | | |
|-------------------------|--|----------------|
| Reference: | Downstream: 34 to 100 psia Upstream: 0 Torr to 350 Torr | 34 to 100 psia |
| Accuracy: | ±1% of reading | |
| Zero Temp. Coefficient: | ±0.02% of F.S./°C | |
| Span Temp. Coefficient: | ±0.04% of reading/°C | |

Pressure Control

| | | |
|--|--|-----------------------|
| Range: | Downstream: >20 Torr to 100% F.S. Upstream*: >150 Torr to 100% F.S. | >20 Torr to 100% F.S. |
| *Upstream controller turndown is directly tied to reference pressure. Control range is assuming hard vacuum on the outlet and 150 Torr min DP to achieve max flow. | | |
| Accuracy: | <10% F.S. = ±0.2% of F.S. >10% to 100% = ±1% of reading | |
| Response Time: | <1 sec typ. (excluding system time constant) | |

Flow Reading

| | | |
|-------------------------|--|---|
| Measurement Range: | N/A | 2 to 100% of F.S. |
| Accuracy: | N/A | ±1% of reading > 35% F.S. ±0.35% of F.S. 2 to 35% F.S. |
| Repeatability: | N/A | ±0.2% of F.S. |
| Resolution: | N/A | ±0.1% of F.S. |
| Zero Temp. Coefficient: | N/A | <0.05% of F.S./°C |
| Span Temp. Coefficient: | N/A | <0.08% of reading/°C |
| Zero Stability: | N/A | <0.5% per year |
| Valve Leak-by: | <1% of orifice F.S. (N ₂ @ 25 psig inlet to atm.) | |

Ratings

| | | |
|---------------------------------|---|----------------|
| Operating Temperature Range: | 10 to 50°C | |
| Transducer Pressure Range: | 1000 Torr F.S. | |
| Transducer Over Pressure Limit: | 2 x F.S. range | |
| Differential Pressure: | Upstream min DP 150 Torr; Downstream max DP 45 psid | Max DP 45 psid |
| Leak Integrity (external): | 1 x 10 ⁻¹⁰ atm. cc/sec He | |

Electrical

| | | |
|----------------------------------|-------------------------------------|--|
| Digital Communication: | DeviceNet | |
| Electrical Connection DeviceNet: | via 5-pin "M12" connector | |
| Diagnostic/Service Port: | RS485 via 2.5 mm jack | |
| Power Supply/Consumption | DeviceNet: 545 mA max. @ +11-25 Vdc | |

Diagnostics & Display

| | | |
|-------------------------|--|--|
| Status Lights: | MFC Health, Network Status | |
| Display Type: | Top Mount Rotatable Integrated LCD | |
| Viewing Distance Fixed: | 10 feet | |
| Units Displayed: | Resolution Flow (%), Temp. (°C), Pressure (Torr, psia, kPa)/0.1 (unit) | |

Mechanical

| | | |
|-------------------|--|--|
| Valve Type: | Normally Closed | |
| Wetted Materials: | SEMI F20 HP Compliant, 316L VIM/VAR, Hastelloy C-22, 316L Stainless Steel, 304 | |
| Surface Finish: | 5µ inch Ra (0.1 µm Ra) | |

Compliance

| | | |
|---------------------------|--|--|
| EMC: | EMC Directive 2014/30/EU CE: EN61326-1: 2013 | |
| Environmental Compliance: | RoHS Directive (2011/65/EU) | |
| | REACH Directive EC 1907/2006 | |

Model Code

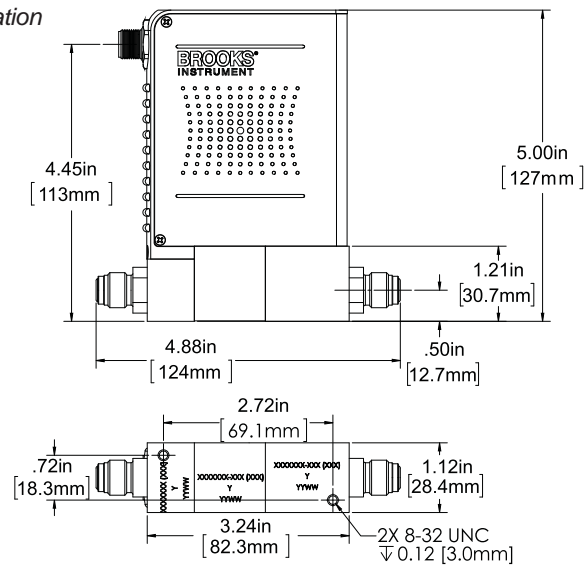
| Code Description | Code Option | Option Description | | | | | | | |
|---------------------------------|----------------------|--|--------------------|--------------------|--------------------|---------------------------|---------------------------|--------------------------|--------------------|
| I. Base Model Code | PC115 | Pressure Controller, N2 & H2 at flow rates 0 to 5 slpm | | | | | | | |
| | PC125 | Pressure Controller with Flow Meter, N2 & H2 at 10 SLPM only | | | | | | | |
| II. Configurability | X | Specific Gas and Range Required | | | | | | | |
| III. Flow Direction | U | Upstream (For PC115 only) | | | | | | | |
| | D | Downstream (For PC125 and PC115) | | | | | | | |
| IV. Full Scale Pressure | 1000 | Full Scale Pressure | | | | | | | |
| V. Pressure Measurement | T | Torr | | | | | | | |
| VI. Reference Pressure | 0045 | Reference Pressure - Downstream (psia) (default) | | | | | | | |
| | 0004 | Reference Pressure - Upstream (psia) (default) | | | | | | | |
| VII. Pressure Measurement | P | PSIA | | | | | | | |
| VIII. Gas and Flow Rate Options | 0013 010L | N2 at 10 slpm (PC125) | | | | | | | |
| | 0007 010L | H2 at 10 slpm (PC125) | | | | | | | |
| | XXXX XXXX | Specific Gas (H2 & N2 only), and flow rate 0 to 5 slpm for PC115 | | | | | | | |
| IX. Fitting | VX | 1 1/8" body width, 1/4" VCR male | | | | | | | |
| X. Communications/Connector | Option | Power On State | Full Scale Setting | Full Scale Setting | Full Scale Setting | Poll IO Instance Producer | Poll IO Instance Consumer | Poll IO State Transition | External Baud Rate |
| | D0 | Idle | Count | Integer | 6000h | 2 | 7 | Executing | 500KB |
| | D1 | Idle | Count | Integer | 6000h | 21 | 7 | Executing | 500KB |
| | D2 | Idle | SCCM | Float | 7FFFh | 13 | 19 | Executing | 500KB |
| | D3 | Idle | Count | Integer | 6000h | 22 | 7 | Executing | 500KB |
| | D4 | Executing | Count | Integer | 6000h | 22 | 8 | Executing | 500KB |
| | D5 | Idle | Count | Integer | 6000h | 6 | 8 | Executing | 500KB |
| | D6 | Idle | Count | Integer | 7FFFh | 3 | 7 | Executing | 500KB |
| | D7 | Idle | Count | Integer | 7FFFh | 6 | 8 | Executing | 500KB |
| | D8 | Idle | Count | Integer | 6000h | 3 | 7 | Executing | 500KB |
| | D9 | Executing | Count | Integer | 6000h | 2 | 7 | Executing | 500KB |
| | DA | Idle | Count | Integer | 7FFFh | 22 | 7 | Executing | 500KB |
| | DB | Idle | Count | Integer | 6000h | 22 | 8 | Executing | 500KB |
| | DC | Idle | Count | Integer | 7FFFh | 3 | 7 | Idle | 500KB |
| | DD | Executing | Count | Integer | 7FFFh | 22 | 8 | Executing | 500KB |
| | DE | Executing | SCCM | Float | 6000h | 15 | 19 | Executing | 500KB |
| DX | To be defined by CSR | | | | | | | | |
| XI. CSR | XXXX | Customer Special Request Number | | | | | | | |
| XII. Reference Temperature | 000 | 0 Degree C Reference | | | | | | | |
| XIII. Firmware | XXX | Locked in Firmware Revision | | | | | | | |
| | LFW | Latest Firmware | | | | | | | |
| | CSR | Firmware defined by CSR | | | | | | | |

Sample Model Code

| I | II | III | IV | V | VI | VII | VIII | IX | X | XI | XII | XIII | | | | | | |
|-------|----|-----|----|------|----|------|------|----|-----------|----|-----|------|---|------|---|-----|---|-----|
| PC125 | X | D | - | 1000 | T | 0045 | P | - | 0013 010L | - | VX | DO | - | XXXX | - | 000 | - | 108 |

Product Dimensions

PC100 Series - VCR® Configuration



Brooks Service and Support

Brooks is committed to assuring all of our customers receive the ideal flow solution for their application, along with outstanding service and support to back it up. We operate first class repair facilities located around the world to provide rapid response and support. Each location utilizes primary standard calibration equipment to ensure accuracy and reliability for repairs and recalibration and is certified by our local Weights and Measures Authorities and traceable to the relevant International Standards. Visit www.BrooksInstrument.com to locate the service location nearest to you.

START-UP SERVICE AND IN-SITU CALIBRATION

Brooks Instrument can provide start-up service prior to operation when required. For some process applications, where ISO-9001 Quality Certification is important, it is mandatory to verify and/or (re)calibrate the products periodically. In many cases this service can be provided under in-situ conditions, and the results will be traceable to the relevant international quality standards.

CUSTOMER SEMINARS AND TRAINING

Brooks Instrument can provide customer seminars and dedicated training to engineers, end users, and maintenance persons. Please contact your nearest sales representative for more details.

Due to Brooks Instrument's commitment to continuous improvement of our products, all specifications are subject to change without notice.

TRADEMARKS

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