Reliability in critical flow control applications

**Reliable operation**
when it matters

Assured reliability for critical applications and environments. Whether used 24/7 or infrequently, Rotork products will operate reliably and efficiently when called upon.

**Quality-driven**
global manufacturing

Products designed with 60 years of industry and application knowledge. Research and development across all our facilities ensures cutting edge products are available for every application.

**Customer-focused service**
worldwide support

Solving customer challenges and developing new solutions. From initial enquiry through to product installation, long-term after-sales care and Client Support Programmes (CSP).

**Low cost**
of ownership

Long-term reliability prolongs service life. Rotork helps to reduce long term cost of ownership and provides greater efficiency to process and plant.
Corporate social responsibility

A responsible business leads to being the best business.
We are socially, ethically, environmentally responsible
and committed to embedding CSR across all our processes
and ways of working.

Market leader
technical innovator

The recognised market leader for 60 years.
Our customers have relied upon Rotork for innovative
solutions to safely manage the flow of liquids, gases
and powders.

Global presence
local service

Global company with local support.
Manufacturing sites, service centres, sales offices and
Centres of Excellence throughout the world provide
unrivalled customer services and fast delivery.

Corporate social
responsibility

A responsible business leads to being the best business.
We are socially, ethically, environmentally responsible
and committed to embedding CSR across all our processes
and ways of working.

Comprehensive product range
serving multiple industries

Improved efficiency, assured safety and environmental
protection.
Rotork products and services are used throughout industry
inclusive of Power, Oil & Gas, Water & Wastewater,
HVAC, Marine, Mining, Pulp & Paper, Food & Beverage,
Pharmaceutical and Chemical industries around the world.

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Rotork Fairchild PAX range actuators can be supplied alone or combined with a time proven Fairchild pressure regulator, enabling remote control of pneumatic instrument pressure.

PAX: has a rotating linear output rod to control spring return pressure regulators.

PAXL: has a non-rotating linear output rod optimised for automation of small valves, pumps and other devices.

Operation
Low voltage DC powered PAX range actuators are designed for operation in remote explosionproof locations. Thrust output up to 2,890 N (650 lbf) enables actuation of most regulators, small valves and pumps.

Commissioning is performed using integral UP, DOWN and SET push buttons contained within the top enclosure. Manual operation during power loss is possible using an 8 mm (5/16") Allen (hex.) key.

PAX range actuators facilitate open loop control using two optically isolated switch inputs (up and down) to move the actuator thrust rod. Movement is permitted until one of the stroke limits is reached.

PAX range actuators include two fully adjustable SPDT limit switches (High and Low), triggered when the thrust rod reaches one of the set stroke positions. The limit relays are magnetically latched so the switch state is maintained when power is disconnected. An important design feature for typical solar applications that isolate power to conserve energy.

Intermediate position control is available using an isolated 4-20 mA analogue input option or the Modbus RTU network option. Signal is proportional to position across the set stroke. PAX range actuators will lock in place during a loss of signal or loss of power condition.

PAX range actuators can also include an optional 4-20 mA analogue feedback output, proportional to position. Analogue feedback is compatible with pulse control and analogue control configurations. Power is required to enable the analogue feedback output.

Applications
- Pump stroke control
- Damper systems
- Test equipment
- Automation of mechanical spring loaded pressure regulators

Actuator Features and Benefits
- Linear stroke is 25 mm (1")
- Max force is 2,890 N (650 lbf)
- Max linear speed is 60 mm (2.36") / minute
- Temperature ranges:
  - -40 to +80 °C (-40 to +176 °F) – intermittent duty
  - -40 to +65 °C (-40 to +149 °F) – continuous duty
- Less than 1 Watt power consumption during standby, ideal for installations in isolated locations
- Optional analogue control and feedback
- User defined stroke limits

Approval and Environmental Ratings
Hazardous Area
- FM
- CSA
- ATEX

Ingress Protection
- IP66
- IP68 (7 metres for 72 hours)
- Type 4X
- Type 6P
## Product Specifications – PAX1 and PAXL

### Electrical Supply

<table>
<thead>
<tr>
<th>PAX1</th>
<th>PAXL</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-30 VDC (12-24 VDC nominal)</td>
<td>11-30 VDC (12-24 VDC nominal)</td>
</tr>
</tbody>
</table>

### Control Methods

<table>
<thead>
<tr>
<th>PAX1</th>
<th>PAXL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analogue Control 4-20 mA</td>
<td>Analogue Control 4-20 mA</td>
</tr>
<tr>
<td>Pulse Control Switch closure (2) UP &amp; DN, 4-30 VDC loop isolated from supply</td>
<td>Pulse Control Switch closure (2) UP &amp; DN, 4-30 VDC loop isolated from supply</td>
</tr>
</tbody>
</table>

### Modbus Comm.

<table>
<thead>
<tr>
<th>PAX1</th>
<th>PAXL</th>
</tr>
</thead>
</table>
2-wire RS-485 network for direct communication to a PLC or DCS using Modbus RTU protocol |

### Thrust Rod Style

<table>
<thead>
<tr>
<th>PAX1</th>
<th>PAXL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear rotating rod - push action</td>
<td>Linear non-rotating rod - push and pull action M8 x 1.25 mm female thread coupling</td>
</tr>
</tbody>
</table>

### Maximum Stroke

<table>
<thead>
<tr>
<th>PAX1</th>
<th>PAXL</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 mm (1&quot;)</td>
<td>25 mm (1&quot;)</td>
</tr>
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</table>

### Mounting Interface

<table>
<thead>
<tr>
<th>PAX1</th>
<th>PAXL</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO 5211 - F05/F07</td>
<td>ISO 5211 - F07</td>
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### Accuracy

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<thead>
<tr>
<th>PAX1</th>
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</thead>
<tbody>
<tr>
<td>0.5% of Maximum Stroke</td>
<td>0.5% of Maximum Stroke</td>
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</table>

### Maximum Force

<table>
<thead>
<tr>
<th>PAX1</th>
<th>PAXL</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,890 N (650 lbf)</td>
<td>2,890 N (650 lbf)</td>
</tr>
</tbody>
</table>

### Maximum Linear Speed

<table>
<thead>
<tr>
<th>PAX1</th>
<th>PAXL</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 mm (2.36&quot;) / min</td>
<td>60 mm (2.36&quot;) / min</td>
</tr>
</tbody>
</table>
*at lower supply voltages, slower motor speed may be required to reach maximum force

### Operating Temperature Rating

<table>
<thead>
<tr>
<th>PAX1</th>
<th>PAXL</th>
</tr>
</thead>
<tbody>
<tr>
<td>-40 to +80 ºC (-40 to +176 ºF) intermittent duty</td>
<td>-40 to +80 ºC (-40 to +176 ºF) intermittent duty</td>
</tr>
<tr>
<td>-40 to +70 ºC (-40 to +158 ºF) continuous duty</td>
<td>-40 to +70 ºC (-40 to +158 ºF) continuous duty</td>
</tr>
</tbody>
</table>

### Analogue Feedback

<table>
<thead>
<tr>
<th>PAX1</th>
<th>PAXL</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-20 mA, isolated from supply</td>
<td>4-20 mA, isolated from supply</td>
</tr>
</tbody>
</table>

### EMC Testing

<table>
<thead>
<tr>
<th>PAX1</th>
<th>PAXL</th>
</tr>
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<tbody>
<tr>
<td>Testing per IEC/EN 61326-1</td>
<td>Testing per IEC/EN 61326-1</td>
</tr>
</tbody>
</table>

### Hazardous Area Ratings

<table>
<thead>
<tr>
<th>PAX1</th>
<th>PAXL</th>
</tr>
</thead>
<tbody>
<tr>
<td>FM Approval</td>
<td>FM Approval</td>
</tr>
</tbody>
</table>
Class I Div I Groups ABCD T6...T5 | Class I Div I Groups ABCD T6...T5 |
Class II, III Div I Groups EFG T6...T5 | Class II, III Div I Groups EFG T6...T5 |
Class 1, Zone 1, AEx db IIC, T6...T5 Gb | Class 1, Zone 1, AEx db IIC, T6...T5 Gb |
Zone 21, AEx tb IIC T85ºC...100ºC Db | Zone 21, AEx tb IIC T85ºC...100ºC Db |
T6[T85ºC]: Ta = -40 to +65 ºC (-40 to +149 ºF) | T6[T85ºC]: Ta = -40 to +65 ºC (-40 to +149 ºF) |
T5[T100ºC]: Ta = -40 to +70 ºC (-40 to +158 ºF) | T5[T100ºC]: Ta = -40 to +70 ºC (-40 to +158 ºF) |
Type 4X/6P, IP 66/68* | Type 4X/6P, IP 66/68* |

<table>
<thead>
<tr>
<th>PAX1</th>
<th>PAXL</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSA Approval</td>
<td>CSA Approval</td>
</tr>
</tbody>
</table>
Class I Div I Groups BCD T6...T5 | Class I Div I Groups BCD T6...T5 |
Class II, III Div I Groups EFG T6...T5 | Class II, III Div I Groups EFG T6...T5 |
Ex db IIC, T6...T5 Gb | Ex db IIC, T6...T5 Gb |
Ex tb IIC T85ºC...100ºC Db | Ex tb IIC T85ºC...100ºC Db |
T6[T85ºC]: Ta = -40 to +65 ºC (-40 to +149 ºF) | T6[T85ºC]: Ta = -40 to +65 ºC (-40 to +149 ºF) |
T5[T100ºC]: Ta = -40 to +70 ºC (-40 to +158 ºF) | T5[T100ºC]: Ta = -40 to +70 ºC (-40 to +158 ºF) |
IP 66 | IP 66 |

<table>
<thead>
<tr>
<th>PAX1</th>
<th>PAXL</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATEX / IECEx Approval</td>
<td>ATEX / IECEx Approval</td>
</tr>
</tbody>
</table>
Ex db IIC, T6...T5 Gb | Ex db IIC, T6...T5 Gb |
Ex tb IIC T85ºC...100ºC Db | Ex tb IIC T85ºC...100ºC Db |
Ex II 2GD | Ex II 2GD |
T6[T85ºC]: Ta = -40 to +65 ºC (-40 to +149 ºF) | T6[T85ºC]: Ta = -40 to +65 ºC (-40 to +149 ºF) |
T5[T100ºC]: Ta = -40 to +70 ºC (-40 to +158 ºF) | T5[T100ºC]: Ta = -40 to +70 ºC (-40 to +158 ºF) |
IP 66 | IP 66 |

### Power Supply Sizing

#### 12 VDC system:
- 12 VDC, 2A power supply recommended

#### 24 VDC system:
- 24 VDC, 1A power supply recommended

![Power Supply Sizing Chart](chart.png)
Ordering Information – PAX₁ and PAXₐ

Model Code: PAX * * * 1 D * *

Actuation
- Basic (Push action) __________ 1
- Linear Adapter (Push and pull action) ___ L

Approval
- FM ______________ F
- CSA ____________ C
- ATEX ___________ E

Conduit Port Size
- ½" __________ 4
- ¾" __________ 6

Conduit Port Openings
- 1 ___________ 1

Power
- 12-24 VDC ______________________ D

Feedback
- None ______________ 0
- Analogue Feedback ___________ 1

Digital Communications
- None ______________ 0
- MODBUS Digital Communication ______________ M

PAX₁ Linear actuator

PAXₐ Linear actuator
The Rotork Fairchild PAXi is optimised for controlling Fairchild precision pressure regulators. PAXi can control pressures up to 20,684 kPa (3,000 psig) in isolated locations and hazardous area environments. PAXi moves in both directions using the integral motor but avoids the requirement for a coupling by acting against or with the regulator spring. PAXi locks in place to maintain position during power or control signal loss.

Features and Benefits
- Pressure ranges from vacuum to 20,684 kPa (3,000 psig)
- Full range actuation speeds down to 10 secs
- Ingress Protection IP66 / IP68 / Type 4X / Type 6P
- Temperature range -40 to +80 °C (-40 to +176 °F)
- Less than 1 Watt power consumption during standby, ideal for installations in isolated locations
- Optional analogue control and feedback
- User defined stroke limits

Applications
- Natural gas distribution systems
- Natural gas pipeline systems
- Pilot operated regulator systems
- Plunger lift systems

Pneumatic Pressure Regulators
Fairchild manufactures a complete line of precision pneumatic regulators including positive pressure, back pressure and vacuum models. Quality engineering and manufacturing excellence assures our pressure regulators meet all the requirements of a precision device.

Our large selection of pressure ranges and flow capacities lets you select the models that meet your needs for instrument or general industrial control applications.

While we have included our most popular models in this brochure, other pressure regulators and relays are adaptable. Contact Fairchild for your needs.
### PAX Range Electric Actuators

#### Vacuum

- **Flow Capacity - m³/hr (SCFM)**
  - Supply = 6.9 bar (100 psi)
  - 4 (2.5) @ Vacum¹ or 68 (40) Positive flow

- **Exhaust Capacity - m³/hr (SCFM)**
  - 9.4 (5.5)

- **Sensitivity - cm of WC (inches of WC)**
  - 1.27 (0.5)²

- **Supply Pressure Variation - kPa (psig)**
  - <0.7 (<0.1)
  - 689 kPa (100 psig)

- **Maximum Supply Pressure - kPa (psig)**
  - 1,724 (250)

- **Dimensions (Approx.) - mm (Inches)**
  - Dia. 176 x 348 mm (Dia. 6.93 x 13.71")

- **Output Pressure Range - kPa (psig)**
  - Vacuum: 14 (2)
  - 0 - 14 (0 - 2)

- **Port Size**
  - ¼”, ⅜”, ½”

#### Low Pressure

- **Flow Capacity - m³/hr (SCFM)**
  - Supply = 6.9 bar (100 psi)
  - 4 (2.5) @ Vacuum¹ or 68 (40) Positive flow

- **Exhaust Capacity - m³/hr (SCFM)**
  - 9.4 (5.5)

- **Sensitivity - cm of WC (inches of WC)**
  - 1.27 (0.5)²

- **Supply Pressure Variation - kPa (psig)**
  - <0.7 (<0.1)
  - 689 kPa (100 psig)

- **Maximum Supply Pressure - kPa (psig)**
  - 1,724 (250)

- **Dimensions (Approx.) - mm (Inches)**
  - Dia. 176 x 348 mm (Dia. 6.93 x 13.71")

- **Output Pressure Range - kPa (psig)**
  - Vacuum: 14 (2)
  - 0 - 14 (0 - 2)

- **Port Size**
  - ¼”, ⅜”, ½”

#### Standard (Pneumatic) Pressure

- **Flow Capacity - m³/hr (SCFM)**
  - Supply = 100 psi
  - 85 (50)

- **Exhaust Capacity - m³/hr (SCFM)**
  - 9.4 (5.5)

- **Sensitivity - cm of WC (inches of WC)**
  - <0.254 (<0.1)

- **Supply Pressure Variation - kPa (psig)**
  - <1.4 (<0.2)
  - 689 kPa (100 psig)

- **Maximum Supply Pressure - kPa (psig)**
  - 1,034 (150)

- **Dimensions (Approx.) - mm (Inches)**
  - Dia. 176 x 348 mm (Dia. 6.93 x 13.71")

- **Output Pressure Range - kPa (psig)**
  - Vacuum: 14 (2)
  - 0 - 14 (0 - 2)

- **Port Size**
  - ¼”, ⅜”, ½”

- **Body Material**
  - Aluminium

### Notes:

1. Maximum Supply Pressure 689 kPa (100 psig)
2. Downstream pressure is 0.7 kPa (0.1 psig) above 7 kPa (1.0 psig) set point
PAX Range – Adapter Kits

PAX range actuators can directly interface with a regulator or valve to provide a motorised assembly. PAX\textsubscript{1} is designed for pressure regulators with motorised push and spring return pull actions. PAX\textsubscript{L} is designed for valves with motorised push and pull actions.

Universal PAX Mounting Kit P/N 22619-1

Mounting Kit for the Fisher 161EBM Regulator P/N 23043-1

Mounting Kit for the Mooney 20H and 20L Pilot Regulator P/N 22819-1

Mounting Kit for the Fisher Y600A Pilot Regulator P/N 23027-1
Model 16 Vacuum Regulator

The Model 16 is designed for systems that require system pressure control above and/or below atmospheric pressure.

The regulated output pressure is precisely maintained by balancing forces acting on the top and bottom of the diaphragm assembly. The main supply valve is pressure balanced by utilising a rolling diaphragm, ensuring a constant output pressure even under a wide range of supply pressure variations. An aspirator tube automatically adjusts the supply valve in accordance with the flow demand to ensure output pressure is maintained at a constant value under varying flow conditions.

Features
- Control sensitivity of 1.27 cm (0.5") water column, allows precise pressure control
- Pressure balanced supply valve prevents supply pressure changes from affecting the setpoint
- Separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- An aspirator tube compensates downstream pressure droop under flow conditions

Specifications
Supply Pressure
- 1,724 kPa (250 psig) maximum

Positive Flow Capacity
- 65.2 m³/hr (40 SCFM) @ 689 kPa (100 psig) supply and 138 kPa (20 psig) setpoint

Vacuum Flow Capacity
- 4 m³/hr (2.5 SCFM) @ 74 cmHg (29 “Hg) vacuum with pump connected to the exhaust port
- 65.2 m³/hr (40 SCFM) @ 689 kPa (100 psig) supply connected to inlet port

Supply Pressure Effect
- <0.7 kPa (0.1 psig) for a 689 kPa (100 psig) change in supply pressure

Sensitivity
- 1.27 cm (0.5") water column
# Model 16 Vacuum Regulator

| Model Code: | PAX | 1 | * | 1 | D | * | * | – | 16 | 2 | * | * | * | * | * | * | * | * |
|-------------|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Actuation   | Basic (Push Action) | 1 |
| Approval    | FM | F |
|             | CSA | C |
|             | ATEX | E |
| Conduit Port Size | ⁴/₅" | 4 |
|             | ⁶/₅" | 6 |
| # Conduit Ports: | 1 | 1 |
| Power: | 12-24 VDC | D |
| Feedback | None | 0 |
|           | Analogue Feedback | 1 |
| Digital Communication | None | 0 |
|             | MODBUS RTU | M |
| Pressure Regulator Series: | 16 | 16 |
| Revision: | 2 | 2 |
| Range kPa   | Vacuum - 14 | Vacuum - 2 | 1 |
|             | Vacuum - 69 | Vacuum - 10 | 2 |
|             | Vacuum - 207 | Vacuum - 30 | 3 |
|             | Vacuum - 689 | Vacuum - 100 | 4 |
|             | Vacuum - 1,034 | Vacuum - 150 | 5 |
| Port Size   | ⁴/₅" | 2 |
|             | ⁶/₅" | 3 |
|             | ⁴/₅" | 4 |
| Port Thread | BSPP | H |
|             | NPTF | N |
|             | BSPT | U |
| Elastomers  | Fluorocarbon | J |
|             | Nitrile | N |
| Relief Valve | Relieving, Normal M16 Bleed | R |
|             | Relieving, Increased Sensitivity | L |

‡BSPP @ In & Out, BSPT @ Exhaust & Gage
Model 11 Precision Low Pressure Regulator

The Model 11 is designed for applications that require moderate capacity and accurate low pressure control.

The main supply valve is pressure balanced by utilising a rolling diaphragm, ensuring a constant output pressure even during wide supply pressure variations. An aspirator tube automatically adjusts the supply valve in accordance with the flow demand to ensure output pressure is maintained at a constant value under varying flow conditions.

Features
- Large area, high sensitivity diaphragm provides control sensitivity of 0.127 cm (0.05”) water column, ideal for precision applications
- Pressure balanced supply valve prevents supply pressure changes from affecting the setpoint
- Separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- An aspirator tube compensates downstream pressure droop for flow demand
- Non-relieving option available for applications requiring containment of gas

Specifications
Supply Pressure
- 1,034 kPa (150 psig) maximum

Flow Capacity
- 34 m³/hr (20 SCFM) @ 689 kPa (100 psig) supply and 7 kPa (1.0 psig) setpoint

Exhaust Capacity
- 0.85 m³/hr (0.5 SCFM) where downstream pressure is 0.7 kPa (0.1 psig) above 7 kPa (1.0 psig) setpoint

Supply Pressure Effect
- <0.07 kPa (0.01 psig) for 689 kPa (100 psig) change in supply

Sensitivity
- 0.127 cm (0.05”) water column

Materials of Construction
Body and housing: Aluminum
Diaphragm: Nitrile or Fluorocarbon
Trim: Zinc plated steel, Stainless steel
## Model 11 Precision Low Pressure Regulator

<table>
<thead>
<tr>
<th>Model Code: PAX 1 * * 1 D * * - 11 1 * * * *</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Actuation</strong></td>
</tr>
<tr>
<td>Basic (Push Action)</td>
</tr>
<tr>
<td><strong>Approval</strong></td>
</tr>
<tr>
<td>FM:</td>
</tr>
<tr>
<td>CSA: C</td>
</tr>
<tr>
<td>ATEX: E</td>
</tr>
<tr>
<td><strong>Conduit Port Size</strong></td>
</tr>
<tr>
<td>1/2&quot;</td>
</tr>
<tr>
<td>3/4&quot;</td>
</tr>
<tr>
<td><strong># Conduit Ports</strong></td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td><strong>Power</strong></td>
</tr>
<tr>
<td>12-24 VDC</td>
</tr>
<tr>
<td><strong>Feedback</strong></td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td>Analogue Feedback</td>
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<td><strong>Digital Communication</strong></td>
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<tr>
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<tr>
<td><strong>Range</strong></td>
</tr>
<tr>
<td>kPa</td>
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<td>0 - 3.4</td>
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<td>0 - 14</td>
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<td>0 - 28</td>
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<td>0 - 41</td>
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<tr>
<td>0 - 83</td>
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<tr>
<td><strong>Port Size</strong></td>
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<tr>
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</tr>
<tr>
<td>3/4&quot;</td>
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<tr>
<td><strong>Port Thread</strong></td>
</tr>
<tr>
<td>BSPP†</td>
</tr>
<tr>
<td>NPTF</td>
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<tr>
<td>BSPT</td>
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<td><strong>Elastomers</strong></td>
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<td>Nitride</td>
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<tr>
<td><strong>Relief Valve</strong></td>
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<tr>
<td>Relieving, Normal Bleed</td>
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<tr>
<td>Relieving, No Bleed</td>
</tr>
<tr>
<td>Non Relieving</td>
</tr>
</tbody>
</table>

†BSPP @ In & Out, BSPT @ Exhaust & Gage
The Model 4100A is designed for applications requiring high flow capacity and accurate low pressure control.

The main supply valve is pressure balanced by utilising a rolling diaphragm, ensuring a constant output pressure even during extreme supply pressure variations. An aspirator tube automatically adjusts the supply valve in accordance with the flow demand to ensure output pressure is maintained at a constant value under varying flow conditions.

**Features**
- Large area, high sensitivity diaphragm provides control sensitivity of 0.13 cm (0.05") water column for precision control in low pressure applications
- Pressure balanced supply valve prevents supply pressure changes from affecting the setpoint
- Large relief valve provides high exhaust flow capacity
- Soft seat valves minimise air consumption
- Aspirator tube compensates for downstream pressure droop during flow demand

**Specifications**

**Supply Pressure**
- 1,034 kPa (150 psig) maximum

**Flow Capacity**
- 119 m³/hr (70 SCFM) @ 345 kPa (150 psig) supply, and 21 kPa (3 psig) setpoint

**Exhaust Capacity**
- 22 m³/hr (13 SCFM), where downstream pressure is 1.4 kPa (0.2 psig) above 21 kPa (3 psig) setpoint

**Sensitivity**
- 0.13 cm (0.05") water column

**Supply Pressure Effect**
- None detected

**Materials of Construction**
- Body and Housing: Aluminum
- External Trim: Zinc plated steel, Stainless steel
- Diaphragms and seals: Nitrile on Dacron, optional Fluorocarbon on Dacron

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Model 4100A High Capacity Low Pressure Regulator
Model 4100A High Capacity Low Pressure Regulator

Model Code: PAX 1 * 1 D * * 41 * A * *

Actuation
Basic (Push Action) 1

Approval
FM  F
CSA  C
ATEX  E

Conduit Port Size
1/2"  4
3/4"  6

# Conduit Ports: 1  1

Power: 12-24 VDC  D

Feedback
None  0
Analogue Feedback  1

Digital Communication
None  0
MODBUS RTU  M

Pressure Regulator Series: 4100A  41

Range
kPa  PSIG
0-5  0-0.7  1
0-10  0-1.4  2
0-21  0-3   3
0-34  0-5   4

Port Size
1/2"  4
3/4"  6

Revision: A

Port Thread
BSPT  H
NPTF  N
BSPP  U

Elastomers
Fluorocarbon  J
Nitrile  N

Relief Valve
Relieving, No Bleed

Model 4100A Specifications:

- **Model Code:** PAX 1 * 1 D * * 41 * A * *
- **Actuation:** Basic (Push Action) 1
- **Approval:** FM  F, CSA  C, ATEX  E
- **Conduit Port Size:**
  - 1/2"  4
  - 3/4"  6
- **# Conduit Ports:** 1  1
- **Power:** 12-24 VDC  D
- **Feedback:** None  0, Analogue Feedback  1
- **Digital Communication:** None  0, MODBUS RTU  M
- **Pressure Regulator Series:** 4100A  41
- **Range:**
  - kPa  PSIG
  - 0-5  0-0.7  1
  - 0-10  0-1.4  2
  - 0-21  0-3  3
  - 0-34  0-5  4
- **Port Size:**
  - 1/2"  4
  - 3/4"  6
- **Revision:** A
- **Port Thread:**
  - BSPT  H
  - NPTF  N
  - BSPP  U
- **Elastomers:**
  - Fluorocarbon  J
  - Nitrile  N
- **Relief Valve:** Relieving, No Bleed

**Diagram:**

- **Model 4100A Diagram:**
  - Parts and dimensions shown for a low pressure regulator model.
  - Key features include:
    - MOUNTING HOLES
    - BRACKET
    - GAGE
    - EXHAUST
    - M5 GROUND SCREW HOLE
    - 1/4-18 NPT, 1/4-18 BSPT

**Technical Specifications:***

- **Inlet & Outlet:**
  - 1/4-18 NPT, 1/4-18 BSPP

**Hardware Included:**

- M5 GROUND SCREW
- 1/4-18 NPT, 1/4-18 BSPT
- BRACKET
- GAGE

**Dimensions:**

- **Dimensions provided:**
  - MOUNTING HOLES
  - BRACKET
  - GAGE
  - EXHAUST
  - M5 GROUND SCREW HOLE
  - 1/4-18 NPT, 1/4-18 BSPT
Model 10 Precision Pressure Regulator

The Model 10 is designed for applications that require moderate flow capacity and accurate pressure control.

The main supply valve is pressure balanced by utilising a rolling diaphragm, ensuring a constant output pressure even during wide supply pressure variations. An aspirator tube automatically adjusts the supply valve in accordance with the flow demand to ensure output pressure is maintained at a constant value under varying flow conditions.

Features
- Control sensitivity of 0.32 cm (0.125") water column allows use in precision processes
- Pressure balanced supply valve prevents supply pressure changes from affecting the setpoint
- Separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- An aspirator tube compensates downstream pressure droop under flow conditions
- Non-relieving option available for applications requiring containment of gas

Specifications
Supply Pressure
- 3,447 kPa (500 psig) maximum

Flow Capacity
- 68 m³/hr (40 SCFM) @ 689 kPa (100 psig) supply and 138 kPa (20 psig) setpoint

Exhaust Capacity
- 9.35 m³/hr (5.5 SCFM) where downstream pressure is 34 kPa (5 psig) above 138 kPa (20 psig) setpoint

Supply Pressure Effect
- Less than 0.7 kPa (0.1 psig) for 689 kPa (100 psig) change in supply pressure

Sensitivity
- 0.32 cm (0.125") water column

Materials of Construction
Body and housing: Aluminum
Diaphragms: Nitrile or Fluorocarbon
Trim: Brass, Zinc plated steel
## Model 10 Precision Pressure Regulator

### Model Code:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAX 1 1 D 10 2</td>
<td></td>
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</tbody>
</table>

### Actuation

- Basic (Push Action) 1

### Approval

- FM 1
- CSA 2
- ATEX 3

### Conduit Port Size

- 1/2” 4
- 3/4” 8
- 1” 16

### # Conduit Ports:

- 1

### Power:

- 12-24 VDC

### Feedback

- Digital Communication 0
- Analogue Feedback 1

### Pressure Regulator Series:

- 10 2

### Range

<table>
<thead>
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<th>kPa (PSIG)</th>
<th>Range</th>
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<tr>
<td>0 - 14</td>
<td>0 - 2</td>
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<td>0 - 69</td>
<td>0 - 10</td>
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<tr>
<td>0 - 138</td>
<td>0 - 20</td>
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<tr>
<td>3 - 207</td>
<td>0.5 - 30</td>
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<tr>
<td>7 - 414</td>
<td>1 - 60</td>
</tr>
<tr>
<td>14 - 1,034</td>
<td>2 - 150</td>
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<td>34 - 2,758</td>
<td>5 - 400</td>
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</table>

### Port Size

- 1/2” 2
- 3/4” 3
- 1” 4

### Port Thread

- BSPP 4
- NPTF 6
- BSPT 3

### Elastomers

- Fluorocarbon 1
- Nitrile 1

### Relief Valve

- Relieving, Normal Bleed R
- Relieving, No Bleed D
- Non Relieving N

### INLET & OUTLET

- 1/2-14 NPTF OR 3/4-14 NPTF

### EXHAUST

- 1/4-18 NPTF OR 1/4-19 BSPT

### GAGE PORT

- 1/4-18 NPTF OR 1/4-19 BSPT

---

Two-dimensional diagrams are shown for the top, front, back, and left views of the regulator, illustrating the various components and their positions. Dimensions such as 1/2 (12.7mm), 1-3/4 (44.45mm), etc., are indicated. Hardware included: M5 ground screw holes (hardened steel nuts included).

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Diagram notes: BSPP @ In & Out, BSPT @ Exhaust & Gage.
**Model 4000A Precision Pressure Regulator**

The Model 4000A is designed for applications that require high flow capacities and accurate pressure control. The intrinsic no constant bleed design minimises gas consumption.

The regulated output pressure is precisely maintained by balancing forces acting on the top and bottom of the diaphragm assembly. The main supply valve is pressure balanced by utilising a rolling diaphragm, ensuring a constant output pressure even under a wide range of supply pressure variations. An aspirator tube automatically adjusts the supply valve in accordance with the flow demand to ensure output pressure is maintained at a constant value under varying flow conditions.

### Features
- Control sensitivity of 1.27 cm (0.5") water column, allows precise pressure control
- Pressure balanced supply valve prevents supply pressure changes from affecting the setpoint
- Separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- An aspirator tube compensates downstream pressure droop under flow conditions

### Specifications

**Supply Pressure**
- 1,724 kPa (250 psig) maximum

**Flow Capacity**
- 255 m³/hr (150 SCFM) @ 689 kPa (100 psig) supply and 138 kPa (20 psig) setpoint

**Exhaust Flow Capacity**
- 65.2 m³/hr (40 SCFM) where downstream pressure is 34 kPa (5 psig) above 138 kPa (20 psig) setpoint

**Supply Pressure Effect**
- <0.7 kPa (0.1 psig) for a 689 kPa (100 psig) change in supply pressure

**Sensitivity**
- 1.27 cm (0.5") water column
**Model 4000A Precision Pressure Regulator**

<table>
<thead>
<tr>
<th>Model Code:</th>
<th>PAX 1 * 1 D * * - 40 * * A * *</th>
</tr>
</thead>
</table>

- **Actuation**: Basic (Push Action) 1
- **Approval**: FM  F  CSA  C  ATEX  E
- **Conduit Port Size**: 
  - 1/2” 4
  - 5/8” 6
- **# Conduit Ports**: 1 1
- **Power**: 12-24 VDC  D
- **Feedback**: None 0  Analogue Feedback 1
- **Digital Communication**: None 0  MODBUS RTU  M
- **Pressure Regulator Series**: 4000A  40

<table>
<thead>
<tr>
<th>Range</th>
<th>kPa</th>
<th>PSIG</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.4 - 69</td>
<td>0.5-10</td>
<td>2</td>
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<td>3.4 - 207</td>
<td>0.5-30</td>
<td>3</td>
</tr>
<tr>
<td>7 - 414</td>
<td>1-60</td>
<td>4</td>
</tr>
<tr>
<td>14 - 1,034</td>
<td>2-150</td>
<td>6</td>
</tr>
<tr>
<td>34 - 1,724</td>
<td>5-250</td>
<td>7</td>
</tr>
</tbody>
</table>

| Port Size | 
|-----------|-----|
| 1/2”  | 4 |
| 5/8”  | 6 |

- **Revision**: A
- **Port Thread**: BSPP  H  NPT  N  BSPT  U
- **Elastomers**: Fluorocarbon  J  Nitrile  N
- **Relief Valve**: Relieving, No Bleed  D

---

**Model Code Details**:

- **Model Code**: Ø1766.9883.5231.3642.51526. INLET
- **Mounting Holes**: 10-14 NPT OR 3/4-14 NPT CONDUIT PORT
- **Gauge Port**: 14-18 NPTF
- **Outlet**: 3/8-14 NPTF 3/8-14 BSPP  3/4-14 BSPP
- **Tap**: 1/4-18 NPTF 1/4-19 BSPT
- **M5 Grounding Screw**: (Hardware Included)
- **Inlet**: Same sizes as outlet
Model 81 Precision Two Stage Pressure Regulator

The Model 81 is designed for applications that require moderate flow capacities and very high accuracy pressure control.

The regulated output pressure is precisely maintained using two stage regulation, combining a pilot control system with a basic force balance system. The main supply valve is also pressure balanced by utilising a rolling diaphragm, ensuring a constant output pressure even under a wide range of supply pressure variations. An aspirator tube automatically adjusts the supply valve in accordance with the flow demand to ensure output pressure is maintained at a constant value under varying flow conditions.

**Features**
- Control sensitivity of less than 0.25 cm (0.1") of water column, allows high precision pressure control
- Pressure balanced supply valve prevents supply pressure changes from affecting the setpoint
- Separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- An aspirator tube compensates downstream pressure droop under flow conditions

**Specifications**

**Supply Pressure**
- 689 kPa (100 psig) maximum for ranges 1 and 2
- 1,034 kPa (150 psig) maximum for ranges 3 to 5

**Flow Capacity**
- 85 m³/hr (50 SCFM) @ 689 kPa (100 psig) supply and 138 kPa (20 psig) setpoint

**Exhaust Flow Capacity**
- 9.4 m³/hr (5.5 SCFM) where downstream pressure is 34 kPa (5 psig) above 138 kPa (20 psig) setpoint

**Supply Pressure Effect**
- <0.7 kPa (0.1 psig) for a 689 kPa (100 psig) change in supply pressure

**Sensitivity**
- <0.25 cm (0.1") water column
Model 81 Precision Two Stage Pressure Regulator

Model Code: PAX 1 * 1 D * – 81 4 * 2 *

Actuation
Basic (Push Action) 1

Approval
FM F
CSA C
ATEX E

Conduit Port Size
\( \frac{1}{2} " \) 4
\( \frac{3}{4} " \) 6

# Conduit Ports: 1 1

Power: 12-24 VDC D

Feedback
None 0
Analogue Feedback 1

Digital Communication
None 0
MODBUS RTU M

Pressure Regulator Series: 81 81

Revision: 4 4

Range
\( \text{kPa} \) \( \text{PSIG} \)
0 - 14 0 - 2 1
0 - 34 0 - 5 2
0 - 138 0 - 20 3
3.4 - 414 0 - 60 4
3.4 - 689 0 - 100 5

Port Size
\( \frac{1}{2} " \) 2

Port Thread
NPT

BSPT

INLET & OUTLET
1/4-18 NPT
OR
1/4-19 BSPT

EXHAUST
1/4-18 NPT
OR
1/4-19 BSPT

1/2" NPT CONDUIT PORT

3/4" NPT CONDUIT PORT

M5 GROUNDING SCREW (HARDWARE INCLUDED)

GAGE PORT 1/4-18 NPT
OR
1/4-19 BSPT

MOUNTING HOLES

2 MOUNTING HOLES
**Model 66 Stainless Steel Pressure Regulator**

The Model 66 is designed for applications in corrosive material environments that require moderate flow capacities.

The regulated output pressure is well maintained as a result of large control diaphragm, for increased sensitivity. An aspirator port automatically adjusts the supply valve in accordance with the flow demand to maintain output pressure at a constant value under varying flow conditions.

**Features**

- Control sensitivity of 2.54 cm (1”) of water column
- Viton elastomers and stainless steel body are compatible with corrosive materials
- Separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- An aspirator design compensates downstream pressure droop under flow conditions

**Specifications**

**Supply Pressure**
- 3,447 kPa (500 psig) maximum

**Flow Capacity**
- 28.9 m³/hr (17 SCFM) @ 689 kPa (100 psig) supply and 138 kPa (20 psig) setpoint

**Supply Pressure Effect**
- <0.7 kPa (0.1 psig) for a 172 kPa (25 psig) change in supply pressure

**Sensitivity**
- 2.54 cm (1”) water column

**Materials of Construction**

Body and housing: Stainless steel
Diaphragms: Viton (Fluorocarbon) with Teflon on control side
Trim: Stainless steel and Teflon
# Model 66 Stainless Steel Pressure Regulator

| Model Code: | PAX  | 1 | * | 1 | D | * | * | – | 66 | 2 | * | * | * | * |
|-------------|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Actuation   | Basic (Push Action) | 1 |
| Approval    | FM: F | CSA: C | ATEX: E |
| Conduit Port Size | 1/4" | 6 |
| Power:      | 12-24 VDC | D |
| Feedback    | None | 0 | Analogue Feedback | 1 |
| Digital Communication | None | 0 | MODBUS RTU | M |
| Pressure Regulator Series: | 66 | 66 |
| Revision:   | 2 |
| Range kPa:  | 0 - 69 PSIG | 2 |
| Port Size   | 1/4" | 2 |
| Port Thread | BSPP‡ | H |
| Elastomers  | Fluorocarbon |
| Relief Valve | Non Relieving - Aluminum Bonet | N |

‡BSPP @ In & Out, BSPT @ Exhaust & Gage

## Dimensions

- INLET: 1/4-18 NPT
- OUTLET: 1/4-18 NPT
- TAPPED EXHAUST: 1/4-19 NPT
- TAPPED GAGE: 1/4-19 NPT

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Rotork®

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Model 66

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1/4-18 NPT CONDUIT PORT

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MS GROUNDING SCREW (HARDWARE INCLUDED)

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OUTLET

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2 X M8 X 1.25 MOUNTING HOLES
Model HPD High Pressure Regulator

The Model HPD is a diaphragm sensed low capacity high pressure regulator. A stainless steel supply valve with a polymer seat insures accurate and reliable sealing of the valve for trouble free operation.

The fatigue resistant Inconel diaphragm provides long life and leak free operation. Using metal to metal and Teflon sealing ensures the regulator does not contaminate the medium with rubber type elastomers.

Features
- Three seat material choices for a wide range of chemical compatibility (PEEK, CTFE and Vespel)
- High maximum supply pressure to allow more through put of gas

Specifications
Supply Pressure
- 41,369 kPa (6,000 psig) maximum depending on seal material
- Supply Valve Cv 0.06, 0.25
- Exhaust Valve Cv 0.02

Supply Pressure Effect
- <4 kPa (0.6 psig) change for a 689 kPa (100 psig) change in supply pressure

Materials of Construction
Body and housing: Alloy 316L stainless steel
Valve: 316L stainless steel
Seal: Teflon

Installation
Refer to the Fairchild Model HPD Installation, Operation and Maintenance Instructions, IS-10000HPD.
Model HPD High Pressure Regulator

**Model Code:**

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<tr>
<td>Port Configuration</td>
<td>2 (1 inlet, 1 outlet)</td>
<td>A</td>
<td></td>
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<tr>
<td></td>
<td>4 (2 inlets, 2 outlets)</td>
<td>B</td>
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<tr>
<td>Seal Material &amp; Max Supply</td>
<td>kPa</td>
<td>PSIG</td>
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<tr>
<td>PEEK</td>
<td>41,369</td>
<td>6,000</td>
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</tr>
<tr>
<td>CTFE</td>
<td>24,132</td>
<td>3,500</td>
<td></td>
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<tr>
<td>VESPEL</td>
<td>41,369</td>
<td>6,000</td>
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<tr>
<td>Relief Valve</td>
<td>Relieving</td>
<td>R</td>
<td></td>
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<tr>
<td></td>
<td>Non Relieving</td>
<td>N</td>
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</tbody>
</table>

- **Actuation:** Basic (Push Action)
- **Approval:** FM, CSA, ATEX
- **Conduit Port Size:** 1/2", 3/4"
- **Power:** 12-24 VDC
- **Feedback:** None, Analogue Feedback
- **Digital Communication:** None, MODBUS RTU
- **Pressure Regulator Series:** HPD
- **Valve:** 0.06 Cv, 0.25 Cv
- **Range:** 0 - 172 kPa, 0 - 25 PSIG
- **Port Size:** 1/4"
- **Port Thread:** NPTF, U
- **Seal Material & Max Supply:** PEEK, 41,369 kPa, 6,000 PSIG
- **Relief Valve:** Relieving, Non Relieving

---

**Model HPD Diagrams:**

- Configuration A
- Configuration B

---

**Technical Specifications:**

- Model Code: PAX 1 1 D 1 – HPD 1 2
- Actuation: Basic (Push Action)
- Approval: FM, CSA, ATEX
- Conduit Port Size: 1/2", 3/4"
- Power: 12-24 VDC
- Feedback: None
- Digital Communication: None
- Pressure Regulator Series: HPD
- Valve: 0.06 Cv, 0.25 Cv
- Range: 0 - 172 kPa, 0 - 25 PSIG
- Port Size: 1/4"
- Port Thread: NPTF, U
- Seal Material & Max Supply: PEEK, 41,369 kPa, 6,000 PSIG
- Relief Valve: Relieving, Non Relieving

---

**Model Code:**

- Model Code: PAX 1 1 D 1 – HPD 1 2
- Actuation: Basic (Push Action)
- Approval: FM, CSA, ATEX
- Conduit Port Size: 1/2", 3/4"
- Power: 12-24 VDC
- Feedback: None
- Digital Communication: None
- Pressure Regulator Series: HPD
- Valve: 0.06 Cv, 0.25 Cv
- Range: 0 - 172 kPa, 0 - 25 PSIG
- Port Size: 1/4"
- Port Thread: NPTF, U
- Seal Material & Max Supply: PEEK, 41,369 kPa, 6,000 PSIG
- Relief Valve: Relieving, Non Relieving

---

**Technical Specifications:**

- Model Code: PAX 1 1 D 1 – HPD 1 2
- Actuation: Basic (Push Action)
- Approval: FM, CSA, ATEX
- Conduit Port Size: 1/2", 3/4"
- Power: 12-24 VDC
- Feedback: None
- Digital Communication: None
- Pressure Regulator Series: HPD
- Valve: 0.06 Cv, 0.25 Cv
- Range: 0 - 172 kPa, 0 - 25 PSIG
- Port Size: 1/4"
- Port Thread: NPTF, U
- Seal Material & Max Supply: PEEK, 41,369 kPa, 6,000 PSIG
- Relief Valve: Relieving, Non Relieving
The Model HPP is a piston sensed low capacity high pressure regulator. A stainless steel supply valve with a polymer seat insures accurate and reliable sealing of the valve for long life, leak free operation.

**Features**
- Three seat material choices for a wide range of chemical compatibility (PEEK, CTFE and Vespel)
- High maximum supply pressure to allow more through put of gas

**Specifications**

**Maximum Supply Pressure**
- 41,369 kPa (6,000 psig) maximum depending on seal material
- Supply Valve Cv 0.06
- Exhaust Valve Cv 0.02

**Supply Pressure Effect**
- <34 kPa (5 psig) change for 689 kPa (100 psig) change in supply pressure

**Materials of Construction**
- Body and Housing: Alloy 316L stainless steel
- Valve: 316L stainless steel
- Seal: Viton A

**Installation**
Refer to the Fairchild Model HPP Installation, Operation and Maintenance Instructions, IS-10000HPP.
## Model HPP: High Pressure Regulator

### Model Code: PAX 1 * 1 D * * – HPP 1 * 2 * * *

| Actuation | Basic (Push Action) | 1 |
| Setup | PM | F |
| Approval | CSA | C |
| | ATEX | E |
| Conduit Port Size | ¹/₁₆" | 4 |
| | ¹/₄" | 6 |
| # Conduit Ports | 1 | 1 |
| Power | 12-24 VDC | D |
| Feedback | None | 0 |
| | Analogue Feedback | 1 |
| Digital Communication | None | 0 |
| | MODBUS RTU | M |
| Pressure Regulator Series | HPP | HPP |
| Valve | 0.06 Cv | 1 |
| Range | kPa | PSIG |
| 0 - 6,895 | 0 - 1,000 | 2 |
| 0 - 13,790 | 0 - 2,000 | 4 |
| 0 - 20,684 | 0 - 3,000 | 5 |
| Port Size | ¹/₄" | 2 |
| Port Thread | NPT | N |
| | BSPT | U |
| Port Configuration | 2 (1 inlet, 1 outlet) | A |
| | 4 (2 inlets, 2 outlets) | B |
| Seal Material & Max Supply | PEEK | kPa | PSIG |
| | | 41,369 | 6,000 | P |
| | CTFE | 24,132 | 3,500 | T |
| | VESPEL | 41,369 | 6,000 | V |
| Relief Valve | Relieving | R |
| | Non-Relieving | N |

### Diagrams

- Configuration A: 1 inlet, 1 outlet (1/4" NPT or BSPT)
- Configuration B: 2 inlets, 2 outlets (1/4" NPT or BSPT)
A full listing of our worldwide sales and service network is available on our website.