## Proportional Pressure Regulators

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<td>on PCB, accuracy 0.2%</td>
<td>± 0.2%</td>
<td>0 … 0.01/ 20</td>
<td>G½</td>
<td>PM</td>
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<tr>
<td>accuracy 0.2%, with single loop</td>
<td>± 0.2%</td>
<td>0 … 0.01/ 35</td>
<td>G½</td>
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<tr>
<td>accuracy 0.2% with double loop</td>
<td>± 0.2%</td>
<td>0 … 0.01/ 35</td>
<td>G½</td>
<td>PQ2</td>
<td>10.05</td>
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<tr>
<td>up to 2000 l/min</td>
<td>± 0.4%</td>
<td>0 … 0.1 / 35</td>
<td>¼”NPT - ¾“NPT</td>
<td>PQ3…PQ6</td>
<td>10.07</td>
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<tr>
<td>well-proven, many options</td>
<td>± 0.5%</td>
<td>0 … 0.5 / 1</td>
<td>G½ - G1</td>
<td>PR</td>
<td>10.09</td>
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<tr>
<td>rugged design, for flow applications</td>
<td>± 0.5%</td>
<td>0 … 6 / 50</td>
<td>G½</td>
<td>PF</td>
<td>10.11</td>
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<tr>
<td>digital control</td>
<td>± 0.5%</td>
<td>0 … 0.1 / 50</td>
<td>G½ - G1</td>
<td>PP</td>
<td>10.13</td>
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<tr>
<td>programmable</td>
<td>± 0.5%</td>
<td>0 … 1 / 12</td>
<td>G½ - G½</td>
<td>PD</td>
<td>10.15</td>
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<tr>
<td>failfreeze, low cost</td>
<td>± 1%</td>
<td>0 … 3 / 10</td>
<td>G¼</td>
<td>PRC</td>
<td>10.16</td>
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<tr>
<td>ATEX, piezo-operated</td>
<td>± 1%</td>
<td>0 … 2 / 6</td>
<td>G½</td>
<td>PCEX</td>
<td>10.17</td>
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<tr>
<td>with flapper-nozzle control</td>
<td>± 0.5%</td>
<td>0.2 … 1 / 8</td>
<td>¼”NPT</td>
<td>53.40…53.57</td>
<td>10.19</td>
</tr>
<tr>
<td>ATEX classification</td>
<td>± 0.5%</td>
<td>0.2 … 1 / 8</td>
<td>¼”NPT</td>
<td>PT6</td>
<td>10.20</td>
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<tr>
<td>ATEX classification, also pressure-capsulated</td>
<td>± 0.25%</td>
<td>0.2 … 1 / 8</td>
<td>¼”NPT</td>
<td>PT7</td>
<td>10.21</td>
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<tr>
<td>piezo, very fast, minimal power consumption</td>
<td>± 0.2%</td>
<td>0 … 0.1 / 16</td>
<td>G½ u. G¼</td>
<td>PRE</td>
<td>10.23</td>
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<tr>
<td>for high pressure, also with double loop</td>
<td>± 0.5%</td>
<td>0 … 40 / 70</td>
<td>G½</td>
<td>PQH</td>
<td>10.24</td>
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<tr>
<td>volume booster / proportional valve combination</td>
<td>G½ - G2½</td>
<td></td>
<td>BP1</td>
<td></td>
<td></td>
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<tr>
<td>volume booster / proportional valve combination</td>
<td>G½ - G2</td>
<td></td>
<td>BP2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>motorised pressure regulator</td>
<td>± 1%</td>
<td>0.14…1.8 / 8</td>
<td>¾”NPT</td>
<td>P180</td>
<td>10.28</td>
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</tbody>
</table>
Proportional Pressure Regulator on PCB, Accurate to 0.2% PM

Description
Proportional control valve with closed loop control technology for better control of pressurised gases. The instrument can be built as single closed loop or dual closed loop control valve.

Media
dry, lubricated or unlubricated and 5 μm filtered compressed air or non-corrosive gases

Fail freeze
constant outlet pressure at voltage drop

Supply voltage
15...24 V DC, residual ripple < 10%, with reverse voltage protection

Impedance
0...10 V / 4...20 mA / 100 Ω, jumper selectable command

Monitor signal
0...10 V at max. 10 mA

Power consumption
3.6 W regulating, 0.5 W non-regulating

Linearity / Hysteresis
< 0.15% FS

Temperature influence
< 1% FS at 0 °C to 50 °C / 32 °F to 122 °F

Temperature range
0 °C to 70 °C / 32 °F to 158 °F

Material
POM, brass, elastomers: FKM

Accessories, enclosed

For further details about double loop see PQ2

Order example: PM1DE-B1
Proportional Pressure Regulator with Single or Double Loop, Accurate to 0.2% PQ

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<td>• Input signal</td>
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<td>• Response time</td>
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<td>• Linearity</td>
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<td>• Response sensitivity</td>
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<td>• Repeatability</td>
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<tr>
<td>• Protection class</td>
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<tr>
<td>• Air consumption</td>
</tr>
</tbody>
</table>

General technical features

Description
Two solenoid valves control the system pressure. One valve is for inlet control, the other for outlet control. A strain gauge pressure transducer measures system pressure and provides a feedback signal to the electronic controls. Any difference between command and feedback signals causes one of the solenoid valves to open, causing system pressure to increase or decrease.

Mounting position
any, immune to shock and vibration up to 90 g

Protection class
IP 65 housing

Temperature range
-5 °C to 70 °C / 23 °F to 158 °F

Material
Body: aluminium
Elastomer: FKM
Ports: brass
Transducer: aluminium and silicon
Valves: nickel-plated brass

Pneumatic features

Media
dry, un lubricated and 5 μm filtered compressed air or non-corrosive gases

Supply pressure
see chart, minimum 10% above outlet pressure

Flow rate
35 l/min at 7 bar supply pressure and open outlet, optionally 100 l/min 3 l/min at controlled outlet pressure

Exhaust
same nominal size as an inlet valve, thus same relief capacity

Air consumption
without constant bleed

Electrical features

Supply voltage
15 … 24 V DC, reverse voltage protection existing

Power consumption
3.6 W for regulation, 0.5 W non-regulating

Signal range
0 … 10 V, optionally 4 … 20 mA

Impedance
4.7 kΩ at voltage signal, 100 Ω at current signal
10 kΩ at voltage signal, 100 Ω at current signal, for external feedback

Monitor signal impedance
> 4.7 kΩ at voltage signal, < 100 Ω at current signal

Electrical connector
plug M16 x 0.75, 7-pin, with coupling socket

Monitor signal
0 … 10 V, optionally 4 … 20 mA

Security
constant outlet pressure at voltage drop

Accuracy

Linearity/Hysteresis
± 0.15% FS

Response sensitivity
< 0.1% FS

Response time
10 to 15 ms

Repeatability
± 0.02% FS

Temperature influence
< 0.01% FS per °C/K at 0 °C to 50 °C / 32 °F to 122 °F
< 1.00% FS per °C/K at 50 °C to 70 °C / 122 °F to 158 °F

Regulating time
< 2 s to fill 0.1 l volume to 90% of the initial pressure (or to exhaust)
< 40 s to fill 2 l volume to 90% of the initial pressure (< 80 s to exhaust)

Adjustment

Zero point
The zero point can be increased by up to 20% of full scale, e.g. from 0 bar to 1.2 bar at a 6 bar regulator. External adjustment via potentiometer Z “zero”.

Span
The maximum pressure value of the control range can be reduced by up to 20% depending on the selected pressure range, e.g. from 8 to 4.8 bar. External adjustment via potentiometer S “span”.

Proport. pressure

PDF  CAD

www.arcom.net
Proportional Pressure Regulator with Single Loop, Accurate to 0.2% PQ1

**Description**

The pneumatic proportional valve produces outlet pressure in proportion to an electrical command input signal. It comprises a complete closed loop servo system consisting of valves, manifold, housing and electronic controls.

**Single loop**

Pressure is controlled by two solenoid valves. One valve functions as inlet control, the other as exhaust. The pressure outlet is measured by an internal pressure transducer which provides a feedback signal to the electronic controls. This feedback signal is compared with the command input signal. Any difference between the two signals causes one of the two solenoid valves to open, allowing flow into or out of the system. Accurate pressure is maintained by these two valves.

**Accuracy**

- Linearity / Hysteresis: 0.2% from 400 mbar
- Response sensitivity: < 0.1% FS
- Repeatability: < 0.02% FS

**Dimensions**

- Flow rate: l/min**
- Supply pressure: bar
- Accuracy: %
- Connection thread: G
- Pressure range: mbar/bar

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Flow rate</th>
<th>Supply pressure</th>
<th>Accuracy</th>
<th>Connection thread</th>
<th>Pressure range</th>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
<td>l/min**</td>
<td>max. mbar</td>
<td>%</td>
<td>G</td>
</tr>
<tr>
<td>68</td>
<td>96</td>
<td>18</td>
<td>35</td>
<td>20 mbar</td>
<td>5.0</td>
<td>G½</td>
</tr>
<tr>
<td>68</td>
<td>96</td>
<td>18</td>
<td>35</td>
<td>40 mbar</td>
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<td>G½</td>
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<td>96</td>
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<td>35</td>
<td>100 mbar</td>
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<td>G½</td>
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<td>68</td>
<td>96</td>
<td>18</td>
<td>35</td>
<td>200 mbar</td>
<td>0.8</td>
<td>G½</td>
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<td>68</td>
<td>96</td>
<td>18</td>
<td>35</td>
<td>400 mbar</td>
<td>0.5</td>
<td>G½</td>
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<tr>
<td>68</td>
<td>96</td>
<td>18</td>
<td>35</td>
<td>800 mbar</td>
<td>0.2</td>
<td>G½</td>
</tr>
<tr>
<td>68</td>
<td>96</td>
<td>18</td>
<td>35</td>
<td>1000 mbar</td>
<td>0.2</td>
<td>G½</td>
</tr>
</tbody>
</table>

**Special options**

- 0... 10 V input and feedback signal, supply voltage 24 V DC, 35 l/min**1, with coupling socket
- 4-20 mA input and monitor signal
- flow 100 l/min
- continuous regulation
- declining curve

**Accessories**

- coupling socket: M16x0,75, 7-pin with 2 m cable
- mounting bracket: made of steel

**Connection diagram for supply and signal**

**Technical details:** see previous page
Proportional Pressure Regulator with Single or Double Loop, Accurate to 0.2% PQ

**Technical features**

- **Pressure range**: 0...10 mbar up to 0...35 bar
- **Linearity**: ± 0.15% FS
- **Input signal**: 0...10 V and 4...20 mA
- **Hysteresis**: ± 0.15% FS
- **Security**: constant outlet pressure at voltage drop
- **Response sensitivity**: < 0.1% FS
- **Response time**: 10 to 15 ms
- **Repeatability**: ± 0.02% FS
- **Adjustment**: zero point and span
- **Protection class**: IP 65
- **Sensitivity**: immune to shock and vibration up to 90 g
- **Air consumption**: without constant bleed

**General technical features**

**Description**
Two solenoid valves control the system pressure. One valve is for inlet control, the other for outlet control. A strain gauge pressure transducer measures system pressure and provides a feedback signal to the electronic controls. Any difference between command and feedback signals causes one of the solenoid valves to open, causing system pressure to increase or decrease.

**Mounting position**
Any, immune to shock and vibration up to 90 g

**Protection class**
IP 65 housing

**Temperature range**
-5 °C to 70 °C / 23 °F to 158 °F

**Material**
- Body: aluminium
- Transducer: aluminium and silicon
- Elastomer: FKM
- Ports: brass
- Valves: nickel-plated brass

**Pneumatic features**

- **Media**: dry, unlubricated and 5 μm filtered compressed air or non-corrosive gases
- **Supply pressure**: see chart, minimum 10% above outlet pressure
- **Flow rate**: 35 l/min at 7 bar supply pressure and open outlet, optionally 100 l/min
- **Exhaust**: same nominal size as on inlet valve, thus same relief capacity
- **Air consumption**: without constant bleed

**Electrical features**

- **Supply voltage**: 15 ... 24 V DC, reverse voltage protection existing
- **Power consumption**: 3.6 W for regulation, 0.5 W non-regulating
- **Signal range**: 0 ... 10 V, optionally 4 ... 20 mA
- **Impedance**: 4.7 kΩ at voltage signal, 100 Ω at current signal
- **Monitor signal impedance**: > 4.7 kΩ at voltage signal, < 100 Ω at current signal
- **Electrical connector**: plug M16 x 0.75, 7-pin, with coupling socket
- **Monitor signal**: 0 ... 10 V, optionally 4 ... 20 mA
- **Security**: constant outlet pressure at voltage drop

**Accuracy**

- **Linearity/Hysteresis**: ± 0.15% FS
- **Response sensitivity**: < 0.1% FS
- **Response time**: 10 to 15 ms
- **Repeatability**: ± 0.02% FS
- **Temperature influence**: < 0.01% FS per °C/K at 0 °C to 50 °C / 32 °F to 122 °F
  < 1.00% FS per °C/K at 50 °C to 70 °C / 122 °F to 158 °F
- **Regulating time**: < 2 s to fill 0.1 l volume to 90% of the initial pressure (or to exhaust)
  < 40 s to fill 2 l volume to 90% of the initial pressure (< 80 s to exhaust)

**Adjustment**

- **Zero point**: The zero point can be increased by up to 20% of full scale, e.g. from 0 bar to 1.2 bar at a 6 bar regulator. External adjustment via potentiometer Z “zero”.
- **Span**: The maximum pressure value of the control range can be reduced by up to 20% depending on the selected pressure range, e.g. from 8 to 4.8 bar. External adjustment via potentiometer S “span”.

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**PDF**  **CAD**

www.aircom.net

10.03
Proportional Pressure Regulator with Double Loop, Accurate to 0.2% PQ2

Description
The pneumatic proportional valve produces outlet pressure in proportion to an electrical command input signal. It comprises a complete closed loop servo system consisting of valves, manifold, housing and electronic controls.

Double loop
The servo valve expands in single loop operation by combining an additional feedback from an external sensing device with the internal transducer. The external sensor provides information on the control status. The PQ2 then compares the command signal with the second loop feedback signal. Should there be a difference in the signal comparisons, the servo valve will make adjustments to the internal loop to bring the system into balance. This provides accurate final outlet. The acceptance of electrical feedback from an external sensor enables precise control of conditions such as pressure, force, torque, position or flow.

External pressure transducer
Any pressure transducer for 0-10 V and 4-20 mA output signal and suitable for 15-24 V DC supply voltage can be applied. An appropriate coupling socket plus cable is required.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Flow rate</th>
<th>Supply pressure</th>
<th>Accuracy</th>
<th>Connection thread</th>
<th>Pressure range</th>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm mm mm l/min**</td>
<td>max. mbar/bar**</td>
<td>%</td>
<td>G</td>
<td>mbar/bar</td>
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<td></td>
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<tr>
<td>**1</td>
<td>max. mbar</td>
<td>bar</td>
<td>**2</td>
<td>mbar/bar</td>
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<tr>
<td>66 96 18 35</td>
<td>20 mbar</td>
<td>5.0</td>
<td>0... 10 mbar</td>
<td>PQ2EE-B1</td>
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<tr>
<td>66 96 18 35</td>
<td>40 mbar</td>
<td>3.0</td>
<td>0... 20 mbar</td>
<td>PQ2EE-B2</td>
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<tr>
<td>66 96 18 35</td>
<td>100 mbar</td>
<td>1.0</td>
<td>0... 50 mbar</td>
<td>PQ2EE-B5</td>
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<tr>
<td>66 96 18 35</td>
<td>200 mbar</td>
<td>0.8</td>
<td>0... 100 mbar</td>
<td>PQ2EE-C1</td>
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<tr>
<td>66 96 18 35</td>
<td>400 mbar</td>
<td>0.5</td>
<td>0... 200 mbar</td>
<td>PQ2EE-C2</td>
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<td>66 96 18 35</td>
<td>800 mbar</td>
<td>0.2</td>
<td>0... 400 mbar</td>
<td>PQ2EE-C4</td>
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<td>66 96 18 35</td>
<td>1000 mbar</td>
<td>0.2</td>
<td>0... 600 mbar</td>
<td>PQ2EE-C6</td>
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<tr>
<td>66 96 18 35</td>
<td>2 bar</td>
<td>0.2</td>
<td>G¼</td>
<td>0... 1 bar</td>
<td>PQ2EE-01</td>
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<tr>
<td>66 96 18 35</td>
<td>3 bar</td>
<td>0... 2 bar</td>
<td>PQ2EE-02</td>
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<tr>
<td>66 96 18 35</td>
<td>9 bar</td>
<td>0... 4 bar</td>
<td>PQ2EE-04</td>
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<td>66 96 18 35</td>
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<td>0... 6 bar</td>
<td>PQ2EE-06</td>
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<tr>
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<td>0... 8 bar</td>
<td>PQ2EE-08</td>
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<td>66 96 18 35</td>
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<td>0... 10 bar</td>
<td>PQ2EE-10</td>
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<td>0... 12 bar</td>
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<td>66 96 18 35</td>
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<td>0... 16 bar</td>
<td>PQ2EE-16</td>
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<td>24 bar</td>
<td>0... 20 bar</td>
<td>PQ2EE-20</td>
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<tr>
<td>66 96 18 35</td>
<td>38 bar</td>
<td>0... 25 bar</td>
<td>PQ2EE-25</td>
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<tr>
<td>66 96 18 35</td>
<td>38 bar</td>
<td>0... 30 bar</td>
<td>PQ2EE-30</td>
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<td>66 96 18 35</td>
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<td>0... 35 bar</td>
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<tr>
<td>66 96 18 35</td>
<td>0 bar</td>
<td>0.2</td>
<td>G¼</td>
<td>0... -1 bar</td>
<td>PQ2EE-V0</td>
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</tr>
<tr>
<td>66 96 18 35</td>
<td>2 bar</td>
<td>0... -1 bar</td>
<td>PQ2EE-V1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Special options, add the appropriate letter or number
4-20 mA input / feedback / second loop signal PQ2IC ... PQ2 ... PQ2 ... PQ2 ... PQ2C ...
flow 100 l/min increased flow rate, max. 20 bar PQ2 ... PQ2 ... PQ2 ... PQ2 ...
continuous regulation improved characteristic curve through proportional inlet valve, max. 10 bar PQ2 ... PQ2 ... PQ2 ...
declining curve inverted outlet PQ2 ... PQ2 ...

Accessories
- coupling socket M16x0.75, 7-pin with 2.0 m cable, supply and signal, straight PRK-A2L
- coupling socket ½" UNF, 3-pin with 0.9 m cable, for second loop, straight PRK-C2L
- mounting bracket made of steel PRK-L1

Connection diagram for second electrical loop

Technical details: see previous page
Proportional Pressure Regulator with High Accuracy and High Flow PQ3...PQ6

Technical features

- **Pressure range**: -1...35 bar
- **Input signal**: 0-10 V, 4-20 mA
- **Protection class**: IP65
- **Response time**: 15...20 ms
- **Power consumption**: 6 W

**General technical features**

**Description**
Two solenoid valves control the system pressure. One valve is for inlet control, the other for outlet control. In order to achieve high volume flow the regulator is pilot-controlled, i.e. the valves control an integral volume booster. Extraordinary accuracy is reached by measuring the outlet pressure of the booster and feeding back the according signal.

**Mounting position**
any, preferably upright

**Protection class**
IP65

**Temperature range**
0 °C to 70 °C / 32 °F to 158 °F

**Material**
- Booster body: nickel-plated aluminium
- Elastomer: FKM, NBR/Suna-N
- Transducer: aluminium and silicon
- Valves: nickel-plated brass

**Pneumatic features**

- **Media**: dry, unlubricated and 5 μm filtered compressed air or non-corrosive gases
- **Supply pressure**: see chart, minimum 10% above outlet pressure
- **Flow rate**
  - PQ3: 700 l/min at 8 bar supply pressure and 6 bar outlet pressure
  - PQ4 / PQ6: 2000 l/min at 8 bar supply pressure and 6 bar outlet pressure
- **Exhaust**: nearly same relief capacity as ventilation capacity
- **Air consumption**: without constant bleed

**Electrical features**

- **Supply voltage**: 15-24 V DC
- **Power consumption**: max. 6 W
- **Command signal**: 0-10 V, optionally 4-20 mA
- **Command signal impedance**: 10 kΩ at voltage signal, 100 Ω at current signal
- **Electrical connector**: plug M16 x 0.75, 7-pin, with coupling socket, optionally plug M12
- **Monitor signal**: 0-10 V, optionally 4-20 mA

**Accuracy**

- **Linearity / Hysteresis**: ± 0.3% FS > 7 bar outlet pressure ± 0.5% FS
- **Response sensitivity**: < 0.1% FS
- **Response time**: 10...15 ms
- **Repeatability**: ± 0.2% FS
- **Accuracy**: ± 0.4% FS

**Adjustment**

- **Adjustment**: Adjustment by calibration access cap on the top of the valve.
- **Zero point**: The zero point can be changed by up to 10% of full scale, e.g. from 0 bar to 0.6 bar at a 6 bar regulator. External adjustment via potentiometer Z “zero”.
- **Span**: The maximum pressure value of the control range can be reduced by up to 10%, e.g. from 6 bar to 5.4 bar. External adjustment via potentiometer S “span”.
- **Hysteresis**: Response sensitivity can be adjusted via potentiometer H “hysteresis”.

**Connection diagram for supply and signal**
Proportional Pressure Regulator with High Accuracy and High Flow PQ3...PQ6

**Description**

Closed loop electronic pressure regulator consisting of two solenoid valves, an internal pressure transducer, and an electronic control circuit mounted to an integral volume booster. The pressure is controlled by activating the solenoid valves, which apply pressure to the pilot side of the volume booster.

**Single loop**

Pressure is controlled by two solenoid valves. One valve functions as inlet control, the other as exhaust. The pressure outlet is measured by an internal pressure transducer which provides a feedback signal to the electronic controls. This feedback signal is compared with the command input signal. Any difference between the two signals causes one of the two solenoid valves to open, allowing flow into or out of the system. Accurate pressure is maintained by these two valves.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Flow rate</th>
<th>Supply pressure</th>
<th>Accuracy</th>
<th>Connection</th>
<th>Pressure range</th>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (mm)</td>
<td>B (mm)</td>
<td>C (mm)</td>
<td>l/min**n</td>
<td>max. bar</td>
<td>G/NPT</td>
<td>bar</td>
</tr>
<tr>
<td>4-20 mA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M12 connector</td>
<td>5-pin (coupling socket not included)</td>
<td>24 V DC, with coupling socket</td>
<td>PQ3/PQ4/PQ6</td>
<td>0...10 V input and feedback signal</td>
<td>PQ . I C...</td>
<td>PQ . ... M12</td>
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<tr>
<td>coupling socket</td>
<td>M16x0.75, 7-pin with 2 m cable</td>
<td>straight</td>
<td>PRK-A2L</td>
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</tr>
<tr>
<td>coupling socket</td>
<td>M12x1, 5-pin with 2 m cable, 5 x 0.25</td>
<td>angular</td>
<td>PRK-C2L</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mounting bracket</td>
<td>made of steel</td>
<td>for PQ3</td>
<td>KM12-C5-2</td>
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<td></td>
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<tr>
<td>mounting bracket</td>
<td>made of steel</td>
<td>for PQ4/PQ6</td>
<td>KM12-C5-5</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Technical details: see previous page</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
Proportional Pressure Regulator "AirTronic"®

**Description**
The pneumatic proportional valve controls the outlet pressure in proportion to an electrical command input signal. It comprises a complete closed loop servo system in a compact monoblock assembly with proportional solenoid valve, electronic regulator and internal pressure transducer.

In the process, the outlet pressure is transformed into a proportional electrical signal and compared with the input signal. If the outlet pressure exceeds the preset setpoint, the valve exhausts down to the pressure desired.

The valve has no constant bleed. At absence of input signal or supply voltage the valve exhausts. The power supply of the setpoint potentiometer is provided by the proportional valve via connector pin number 5.

**Pressure transducer**
Open transducers: 100 mbar, 500 mbar, 1 bar and vacuum

**Application examples**
Proportional pressure regulators are being used for blowing machines, ultrasonic equipments, testing machines, painting systems, contouring systems, laser welding machines, textile machines, cheese presses, pneumatic brakes, clamping devices and medical engineering.

**General technical features**

| Description | 3-port/2-way valve with proportional magnet, integrated hybrid PCB and closed loop with pressure transducer in compact monoblock assembly. |
| Mounting position | any, preferably upright |
| Temperature range | 0 °C up to 50 °C / 32 °F to 122 °F, high temperature version on request |
| Linearity / Hysteresis | < 0.1% FS |
| Response sensitivity | < 0.1% FS |
| Repeatability | < 0.1% FS |
| Over all accuracy | ± 0.5% |
| Regulating time | < 1 s over the range, 70 ms at 10 to 90% or 90 to 10% of the range |

**Pneumatic features**

| Media | dry, lubricated, un lubricated and 50 μm filtered compressed air or non-corrosive gases |
| Supply pressure | see chart, min. 10% above outlet pressure |
| Flow rate | see chart, at 7 bar inlet pressure and open outlet |
| Exhaust | same nominal size as on inlet valve, thus same relief capacity |
| Air consumption | without constant bleed |

**Electrical features**

| Supply voltage | 24 V DC + 15% - 10%, residual ripple max. 10% |
| Power consumption | 12 W at G ⅛, 22 W at G ⅛, 30 W at G ⅛, 40 W at G 1 |
| Current consumption | 0.5A at G ⅛, 1.0A at G ⅛, 1.25A at G ⅛, 1.7A at G 1 |
| Command signal | 0…10 V, 0…20 mA, 4…20 mA, digital or Profibus DB |
| Impedance | 500 Ω at current signal |
| Electrical connector | circular plug according to DIN 43651, 7-pin plug for analogue signal, 16-pin plug for digital signal |

**Accuracy**

| Linearity/Hysteresis | < 1% FS |
| Response sensitivity | < 0.1% FS |
| Repeatability | < 0.1% FS |
| Over all accuracy | ± 0.5% |
| Regulating time | < 1 s over the range, 70 ms at 10 to 90% or 90 to 10% of the range |

**Adjustment**

| Zero point | calibration ± 10% FS via potentiometer P2 |
| Range | calibration + 5% FS or -10% FS via potentiometer P1 |
| Amplification | calibration 1:1 up to 1:10 via potentiometer P7 |

**Downstream regulation (V1)**
The vacuum pump saves energy and it is easy to fill the tank either with vacuum or pressure. A filter is recommended at orifice 3.

**Upstream regulation (V2)**
Upstream installation is preferred if rapid evacuation of a tank or system is required. A filter is recommended at orifice 3.
Proportional Pressure Regulator "AirTronic"®

Technical features

- Pressure range 0...-1.0 bar to 0...1.0 bar
- Command signal 0...10 V, 0...20 mA, 4...20 mA, digital
- Feedback signal 0...10 V, 0...20 mA, 4...20 mA
- Adjustment zero point, range and amplification
- Pressure sensors 100 / 500 mbar, 1 bar
- Flow rate 250 / 820 / 1700 / 6500 l/min

Proportional pressure valve

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Nominal size</th>
<th>Kₐ value</th>
<th>Flow rate</th>
<th>Supply max.</th>
<th>Connection</th>
<th>Pressure range</th>
<th>Order number</th>
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</thead>
<tbody>
<tr>
<td>A mm</td>
<td>B mm</td>
<td>C mm</td>
<td>DN</td>
<td>(m³/h)</td>
<td>bar</td>
<td>G</td>
<td>bar</td>
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<tr>
<td>35</td>
<td>80</td>
<td>63</td>
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<td>1700</td>
<td>-1</td>
<td>G¼</td>
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<td></td>
<td></td>
<td></td>
<td>2</td>
<td>0... 1.0</td>
</tr>
</tbody>
</table>

Special options, add the appropriate letter or number

- input signal 0-20 mA PR . . . 1----
- 4-20 mA PR . . . 2----
- 8 bit digital with hold function Interbus S PR . . . 7----
- Profibus DP from G¼ on PR . . . 8----
- feedback signal 0-10 V PR . . . 1----
- 0-20 mA PR . . . 2----
- 4-20 mA PR . . . 3----
- external feedback signal 0-10 V PR . . . 4----
- 0-20 mA PR . . . 5----
- 4-20 mA PR . . . 6----
- deviant pressure range indicate on order PR . . . XX ----
- for vacuum Bypass version PR . . . V2
- for absolute pressure PR . . . 0A
- protection class IP65 special cable box, PRK-IP65 PR . . . .06
- body made of stainless steel valve body and inner parts 1.4304, EPDM seals, G¼ and G½ PR . . . .SS
- body made of aluminium only valve body, max. 20 bar G¼ only PR . . . .19
- for oxygen specially cleaned, FKM elastomer PR . . . .15
- for hydrogen / helium P = max. 10 bar, Atex not available from G¼ on PR . . . .0W

Accessories

- coupling socket 7-pin with 2 m cable straight PRK-A2L
- 7-pin with 5 m cable straight PRK-A5L
- 7-pin with 2 m cable, IP65 straight PRK-12L
- 7-pin with 2 m cable angular PRK-C2L
- 7-pin with 5 m cable angular PRK-CSL
- other cable length e.g. 10 m available

Technical details: see previous page

Order example: PRA00-00V1

---

*1 at 7 bar supply pressure and open outlet
"AirTronic"® proportional pressure regulator with integrated PCB

Dimensions and Connection Diagram "AirTronic"®

Proport. regulator thread | A | B | C | D | E
---|---|---|---|---|---
PRA ... | G | ½ | 35 | 60 | 63 | 29 | 18
PR0 ... | G | ⅛ | 52 | 105 | 74 | 43 | 10
PR1 ... | G | ½ | 70 | 150 | 101 | 57.5 | 12
PR2 ... | G | 1 | 96 | 190 | 115 | 79 | 15

Proport. regulator F | G | H | I | K | L
---|---|---|---|---|---
PRA ... | 7 | M 4 | 15 | 10 | 16.6 | 25
PR0 ... | 20 | M 4 | 16 | 11* | 34 | 45
PR1 ... | 28 | M 6 | 23 | 15 | 48.5 | 45
PR2 ... | 33 | M 8 | 30 | 20 | 60 | 60

* 14 mm from 30 bar pressure range on

"AirTronic"® connection diagram

colour of wire
- pin 1 white
- pin 2 brown
- pin 3 yellow
- pin 4 green
- pin 5 pink
- pin 6 white
- pin 7 pink

pin numbers seen from solder pin side

Connection diagram with potentiometer

"AirTronic"® connection diagram

external potential compensation necessary

Connection diagram for digitally controlled proportional pressure regulator

Adjustment of the proportional regulator

external electronic feedback

e.g. booster

External electronic feedback
0...10 V or 0/4...20 mA

Internal electronic feedback
as standard

proportional pressure regulator

proportional pressure regulator

signal

signal

external feedback
Proportional Pressure Regulator for Flow Applications

**Description**
The pneumatic proportional valve controls the outlet pressure in proportion to an electrical command input signal. It comprises a complete closed loop servo system in a compact mono block assembly with proportional solenoid valve, electronic regulator and internal pressure transducer. The valve works as a slide valve and is designed for flow applications such as thermal cutting. The digital control system offers advantages at installation and commissioning for adapting the valve to special applications. The regulator can be set and optimised using a PC, RS232 adapter and software. Data record can be saved and used for further valves. The valve has a constant bleed. At absence of input signal or supply voltage the valve exhausts.

**Software**
Display: signal, outlet pressure, PID parameters, pressure switch signal etc.

**Scope function**
View setpoint, outlet pressure, internal signals from PID control

**Media**
dry, lubricated, unlubricated and 50 μm filtered compressed air or non-corrosive gases

**Supply voltage**
24 V DC ± 10 V, residual ripple < 10%

**Electrical connection**
plug M12x1, 5-pin (protection class IP65)

**Accuracy**
Hysteresis: 0.5% FS

**Temp. range**
fluid / ambient: 0 °C to 60 °C / 32 °F to 140 °F

**Proportional pressure regulator**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>size</th>
<th>Nominal K-</th>
<th>Flow</th>
<th>K-</th>
<th>Flow rate</th>
<th>max.</th>
<th>Connection</th>
<th>Pressure</th>
<th>Order</th>
<th>number</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>DN</td>
<td>m³/h</td>
<td>(m³/h)</td>
<td>l/min**</td>
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<td></td>
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<tr>
<td>52</td>
<td>105</td>
<td>74</td>
<td>8</td>
<td>1.45</td>
<td>1700</td>
<td>12</td>
<td>G¾</td>
<td>0...6</td>
<td>PF</td>
<td>PF000-0600</td>
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<tr>
<td>18</td>
<td>0...10</td>
<td>PF</td>
<td>PF000-1000</td>
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</tr>
<tr>
<td>50</td>
<td>0...40</td>
<td>PF</td>
<td>PF000-4000</td>
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</tr>
</tbody>
</table>

**Special options**, add the appropriate letter or number

- **command signal**: 0-20 mA - 4-20 mA
- **monitor signal**: 0-10 V - 4-20 mA
- **deviant pressure range**: indicate on order
- **for oxygen**: specially cleaned, FKM elastomers

**Accessories**, enclosed

- **RS232 module**: with 9-pin D-sub plug and 2 m cable (PDRS232)
- **software**: basic version "light" (PDSOFT1)
- **coupling socket**: M12x1, 5-pin, with 2 m cable, 5 x 0.25 angular (KM12-C5-2)
- **coupling socket**: M12x1, 5-pin, with 5 m cable, 6 x 0.25 angular (KM12-C5-5)

**Proportional Pressure Regulator for Flow Applications**

**Order example**: PF000-0600

The position of the slide is continuously shifting according to command signal and pressure change at the outlet. Thereby a constant outlet pressure is achieved.
### Digital Proportional Pressure Regulator "AirTronic"®D PP

**Description**
The pneumatic proportional valve controls the outlet pressure in proportion to an electrical command input signal. It comprises a complete closed loop servo system in a compact mono block assembly with proportional solenoid valve, electronic regulator and internal pressure transducer. The valve works as a 3-port/2-way valve with proportional magnet. The digital control system offers advantages at installation and commissioning for adapting the valve to special applications. The regulator can be set and optimised using a PC, RS232 adapter and software. Data record can be saved and used for further valves. The valve has no constant bleed. At absence of input signal or supply voltage the valve exhausts.

**Software**
- **Display**: signal, outlet pressure, parameter, pressure switch signal etc.
- **Scope function**: view setpoint, outlet pressure, internal signals from PID control
- **Parameters**: command signal, zero point, overload threshold, ramp
- **Valve diagnosis**: parameters factory set or customised, optimization of the valve

---

### General technical features

<table>
<thead>
<tr>
<th>Description</th>
<th>3-port/2-way valve with proportional magnet and digital control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting position</td>
<td>any, preferably vertical</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP65 with mounted coupling socket</td>
</tr>
<tr>
<td>Temperature range</td>
<td>0 °C to 60 °C / 32 °F to 140 °F, fluid / ambient temperature</td>
</tr>
<tr>
<td>Material</td>
<td>Body: brass (for G1∕8 and G½) or aluminium (for G½ and G1), Inner valve: brass and stainless steel</td>
</tr>
<tr>
<td>Seals</td>
<td>NBR/Buna-N, EPDM or FKM on request, FKM for 50 bar version</td>
</tr>
</tbody>
</table>

---

### Pneumatic features

| Media | dry, lubricated, unlubricated and 5 μm filtered compressed air or non-corrosive gases |
| Supply pressure | see chart |
| Flow rate | see chart, at 7 bar supply pressure and open outlet |
| Exhaust | same nominal size as on inlet valve, thus same relief capacity |
| Air consumption | without constant bleed |

---

### Electrical features

| Supply voltage | 24 V DC ±10% |
| Electrical connection | M12, 5-pin coupling socket |
| Power consumption | 12 W at G1∕8, 24 W at G¼, 34 W at G½, 44 W at G1 |
| Current consumption | 500 mA at G1∕8, 1000 mA at G¼, 1400 mA at G½, 1800 mA at G1 |
| Command signal | 0-10 V, 0-20 mA, 4-20 mA |
| Impedance | 100 kΩ at voltage signal (0.1 mA current consumption), 250 Ω at current signal |
| Setpoint input | 0-10 V, 0-20 mA, 4-20 mA |

---

### Accuracy

| Linearity / Hysteresis | < ± 0.5% FS |
| Repeatability | < 0.1% FS |
| Response sensitivity | < 0.1% FS |
| Over all accuracy | ± 0.5% |

---

### Adjustment and parameter settings

| Zero point / range | Zero point and range can be calibrated percentagewise. |
| Control mode / Amplification | Through the software different control modes may be chosen. All parameters of P/P/PID controllers can be tuned. |
| Diagnosis | A diagnostic tool including data recording is available within the software. |
| Characteristic curve | Increasing or decreasing curve can be set (increasing by standard). |

---

### Downstream regulation for vacuum/positive pressure regulators (V1)
Recommeded when tank shall be evacuated or filled with positive pressure. At inlet port (1) either compressed air or atmosphere has to be applied. The use of a filter is advisable.

---

### Downstream regulation for vacuum regulators (V3)
Recommended when tank shall be evacuated. Exhaust port (3) will be closed. Inlet port (1) must be connected with vacuum pump. Outlet port (2) has to be connected with consumer or tank.
### Digital Proportional Pressure Regulator "AirTronic®D" PP

**Technical features**

- **Pressure range**: 0...0.1 bar bis 0...50 bar
- **Command signal**: 0-10 V, 0-20 mA, 4-20 mA
- **Output signal**: 0-10 V, 0-20 mA, 4-20 mA
- **Adjustment**: zero point, range
- **Pressure sensor**: 100 / 500 mbar, 1 / 5 / 10 / 16 / 20 / 30 / 50 bar
- **Flow rate**: 250 / 820 / 1700 / 6500 l/min
- **Linearity / Hysteresis**: ± 0.5%
- **Response sensitivity**: < 0.1% v.E.
- **Repeatability**: < 0.1% v.E.
- **Regulating time**: < 1 s
- **Rated input**: 12 / 22 / 30 / 40 W
- **Relief capacity**: full nominal size

### Proportional pressure regulator

0-10 V command signal, supply voltage 24 V DC, with coupling socket PP

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>Nominal size</th>
<th>K- value</th>
<th>Flow rate</th>
<th>Supply max.</th>
<th>Connection thread</th>
<th>Pressure range</th>
<th>Order number</th>
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<tbody>
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<td>0.6</td>
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<td>190</td>
<td>101</td>
<td>20</td>
<td>4.8</td>
<td>6500</td>
<td>-1</td>
<td>G1</td>
<td>0...-1.0</td>
<td>PP200-00V3</td>
</tr>
</tbody>
</table>

**Special options**, add the appropriate letter or number

- **setpoint input**: 0-20 mA 1 4-20 mA PP...-2.....
- **feedback output**: 0-10 V 1 0-20 mA 2 4-20 mA PP...-3.....
- **deviant pressure range**: indicate on order PP...-XX..
- **for absolute pressure**
- **body made of stainless steel**: valve body and inner parts, 1.4304, EPDM G¼ and G½ PP...-SS
- **body made of aluminium**: valve body only, max. 20 bar G½ only PP0...-19
- **for oxygen**: specially cleaned, FKM elastomer PP...-15
- **for hydrogen / helium**: P1 = max. 10 bar, Atex not available from G¼ PP...-0W
- **for dynamic application**: P2 = for 30 bar to 50 bar version G¼ only PP...-DY
- **cascade regulation**: w/o monitor signal 2. sensor, electr. feedback 0-10 V PP...-KU
- **w/o monitor signal 2. sensor, electr. feedback 4-20 mA PP...-K1

### Accessories

- **S232 module**: with D-sub plug and 2 m cable PDRS232
- **coupling socket**: M12x1, 5-pin with 2 m cable, 5 x 0.25 angular KM12-C5-2
- **software**: basic version "light" KM12-C5-5

**Order example** PPA00-00V3
Proportional Pressure Regulator, programmable PD

**Description**
The proportional pressure regulator is digitally controlled and works as a 3/2 valve with proportional magnet and closed loop. The digital control system offers advantages at installation and commissioning for adapting the valve to special applications. The regulator can be set and optimised using a PC, RS232 adapter and software.

**Software**
Display: signal, outlet pressure, PID parameters, pressure switch signal etc.
Scope function: view setpoint, outlet pressure, internal signals from PID control

**Parameters**
command signal, zero point, overload threshold, ramp
Valve diagnosis: parameters factory-set or customised, optimization of the valve.

---

### General technical features

**Description**
3-port/2-way valve with proportional magnet and digital control

**Mounting position**
any, preferably upright

**Protection class**
IP65 with mounted coupling socket

**Temperature range**
0 °C to 50 °C / 32 °F to 122 °F ambient

**Material**
Body: aluminium  Inner valve: POM (Polyacetal)
Elastomer: NBR/Buna N and FPM

**Media**
dry, lubricated or unlubricated and 50 μm filtered compressed air or non-corrosive gases

**Supply pressure**
see chart

**Flow rate**
see chart, at 7 bar supply pressure and open outlet

**Exhaust**
same nominal size as on inlet valve, thus same relief capacity

**Air consumption**
without constant bleed

**Supply voltage**
24 V DC ± 10%

**Electrical connection**
M12x1, 5-pin plug, with coupling socket

**Power consumption**
12 W at nominal size 4, 40 W at nominal size 8

**Current consumption**
850 mA at nominal size 4, 1640 mA at nominal size 8

**Command signal**
0-10 V, 0-20 mA, 4-20 mA

**Impedance**
100 kΩ at voltage signal (0.1 mA current consumption)
500 kΩ at current signal

**Feedback output**
0-10 V = 3 bar only, 6 bar and 10 bar pressure range possible

**Accuracy**

<table>
<thead>
<tr>
<th>Linearity/Hysteresis</th>
<th>Response sensitivity</th>
<th>Minimum setpoint</th>
<th>Over all accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1.0% FS</td>
<td>&lt; 0.5% FS</td>
<td>100 mV (0.2 mA / 4.2 mA)</td>
<td>± 0.5%</td>
</tr>
</tbody>
</table>

**Adjustment and parameter settings**

**Zero point / range**
Zero point and range can be calibrated percentagewise.

**Control mode / Amplification**
Through the software different control modes may be chosen.
All parameters of P/PI/PID controllers can be tuned.

**Diagnosis**
A diagnostic tool including data recording is available within the software.

**Characteristic curve**
Increasing or decreasing curve can be set (increasing by standard).

---

### Pneumatic features

**Supply pressure**
see chart

**Flow rate**
see chart, at 7 bar supply pressure and open outlet

**Exhaust**
same nominal size as on inlet valve, thus same relief capacity

**Air consumption**
without constant bleed

**Electrical features**

- **Supply voltage**: 24 V DC ± 10%
- **Electrical connection**: M12x1, 5-pin plug, with coupling socket
- **Power consumption**: 12 W at nominal size 4, 40 W at nominal size 8
- **Current consumption**: 850 mA at nominal size 4, 1640 mA at nominal size 8
- **Command signal**: 0-10 V, 0-20 mA, 4-20 mA
- **Impedance**: 100 kΩ at voltage signal (0.1 mA current consumption)
- **Feedback output**: 0-10 V = 3 bar only, 6 bar and 10 bar pressure range possible

**Accuracy**

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</table>

**Adjustment and parameter settings**

**Zero point / range**
Zero point and range can be calibrated percentagewise.

**Control mode / Amplification**
Through the software different control modes may be chosen.
All parameters of P/PI/PID controllers can be tuned.

**Diagnosis**
A diagnostic tool including data recording is available within the software.

**Characteristic curve**
Increasing or decreasing curve can be set (increasing by standard).

---

### Electrical features

- **Supply voltage**: 24 V DC ± 10%
- **Electrical connection**: M12x1, 5-pin plug, with coupling socket
- **Power consumption**: 12 W at nominal size 4, 40 W at nominal size 8
- **Current consumption**: 850 mA at nominal size 4, 1640 mA at nominal size 8
- **Command signal**: 0-10 V, 0-20 mA, 4-20 mA
- **Impedance**: 100 kΩ at voltage signal (0.1 mA current consumption)
- **Feedback output**: 0-10 V = 3 bar only, 6 bar and 10 bar pressure range possible

**Accuracy**

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</tr>
</tbody>
</table>

**Adjustment and parameter settings**

**Zero point / range**
Zero point and range can be calibrated percentagewise.

**Control mode / Amplification**
Through the software different control modes may be chosen.
All parameters of P/PI/PID controllers can be tuned.

**Diagnosis**
A diagnostic tool including data recording is available within the software.

**Characteristic curve**
Increasing or decreasing curve can be set (increasing by standard).

---

### General technical features

**Description**
3-port/2-way valve with proportional magnet and digital control

**Mounting position**
any, preferably upright

**Protection class**
IP65 with mounted coupling socket

**Temperature range**
0 °C to 50 °C / 32 °F to 122 °F ambient

**Material**
Body: aluminium  Inner valve: POM (Polyacetal)
Elastomer: NBR/Buna N and FPM

**Media**
dry, lubricated or unlubricated and 50 μm filtered compressed air or non-corrosive gases

**Supply pressure**
see chart

**Flow rate**
see chart, at 7 bar supply pressure and open outlet

**Exhaust**
same nominal size as on inlet valve, thus same relief capacity

**Air consumption**
without constant bleed

**Supply voltage**
24 V DC ± 10%

**Electrical connection**
M12x1, 5-pin plug, with coupling socket

**Power consumption**
12 W at nominal size 4, 40 W at nominal size 8

**Current consumption**
850 mA at nominal size 4, 1640 mA at nominal size 8

**Command signal**
0-10 V, 0-20 mA, 4-20 mA

**Impedance**
100 kΩ at voltage signal (0.1 mA current consumption)
500 kΩ at current signal

**Feedback output**
0-10 V = 3 bar only, 6 bar and 10 bar pressure range possible

**Accuracy**

<table>
<thead>
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<th>Minimum setpoint</th>
<th>Over all accuracy</th>
</tr>
</thead>
<tbody>
<tr>
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<td>± 0.5%</td>
</tr>
</tbody>
</table>

**Adjustment and parameter settings**

**Zero point / range**
Zero point and range can be calibrated percentagewise.

**Control mode / Amplification**
Through the software different control modes may be chosen.
All parameters of P/PI/PID controllers can be tuned.

**Diagnosis**
A diagnostic tool including data recording is available within the software.

**Characteristic curve**
Increasing or decreasing curve can be set (increasing by standard).
Proportional Pressure Regulator, programmable

**Description**
The proportional pressure regulator is digitally controlled and works as a 3/2 valve with proportional magnet and closed loop. The digital control system offers advantages at installation and commissioning for adapting the valve to special applications. The regulator can be set and optimised using a PC, RS232 adapter and software.

**Media**
dry, lubricated, unlubricated and 50 μm filtered compressed air or non-corrosive gases

**Supply voltage**
24 V DC ± 10 V, residual ripple < 10%

**Signal range**
0-10 V, 100 kΩ impedance, 0-20 mA, 250 Ω impedance

**Electrical connection**
plug M12x1, 5-pin, with coupling socket

**Power consumption**
21 W at DN4, 40 W at DN8

**Linearity/Hysteresis**
< 0.5% FS / < 1% FS

**Mounting position**
any

**Protection class**
IP65

**Temperature range**
fluid: 0 °C to 60 °C / 32 °F to 140 °F
ambient: 0 °C to 50 °C / 32 °F to 122 °F

**Material**
Body: aluminium
Elastomer: NBR/Buna-N
Inner valve: POM

---

### Proportional pressure regulator

<table>
<thead>
<tr>
<th>Dimensions A</th>
<th>Nominal Flow</th>
<th>Pressure</th>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>DN</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>52</td>
<td>112</td>
<td>67</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>9</td>
<td>0...3</td>
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<tr>
<td>9</td>
<td>0...5</td>
<td>PDA41-050</td>
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<tr>
<td>9</td>
<td>0...6</td>
<td>PDA41-060</td>
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<td>9</td>
<td>0...8</td>
<td>PDA41-080</td>
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<td>6</td>
<td>6</td>
<td>9</td>
<td>0...3</td>
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<tr>
<td>13</td>
<td>0...12</td>
<td>PDA82-120</td>
<td></td>
</tr>
</tbody>
</table>

---

### Special options, add the appropriate letter or number

- **Display**: 3-digit, red
- **NPT**: connection thread
- **0-20 mA**: setpoint input and monitor signal
- **4-20 mA**: setpoint input and monitor signal
- **Cascade regulation**: w/o monitor signal 2. sensor, electr. feedback 0-10 V
- **w/o monitor signal 2. sensor, electr. feedback 4-20 mA**

---

### Accessories

- **RS232 module**: with D-sub plug and 2 m cable
- **Software**: basic version “light”
- **Coupling socket**: M12x1, 5-pin, with 2 m cable, 5 x 0.25 angular

---

*1 at 10 bar supply pressure and 6 bar outlet pressure and flow rate of same size

---

Technical details: see previous page
Eco-Proportional Pressure Regulator, failfreeze

**Description**
Proportional valve with closed loop from an internal pressure transducer. Outlet pressure is proportional to an electrical input signal. Pressure control by two solenoid valves. The valve can be mounted in any position, is immune to shock and vibration and is without constant bleed in a steady state. Lubricated, unlubricated and 20 μm filtered compressed air or non-corrosive gases.

**Media**
Supply voltage: 24 V DC ± 10%, residual ripple < 10%
Electrical connector: coupling socket, 5-pin M12

**Power consumption**
Current consumption: max. 150 mA
Linearity/Hysteresis: < 1% FS
Repeatability: < 0.5% FS
Adjustment: Zero point: approx. ± 20% FS

**Temperature range**
Media: 0 °C to 60 °C / 32 °F to 140 °F
Ambient: 0 °C to 50 °C / 32 °F to 122 °F

**Material**
Body: POM
Inner valve: Elastomer: NBR/Buna-N and FKM

**Dimensions**

<table>
<thead>
<tr>
<th>A (mm)</th>
<th>B (mm)</th>
<th>C (mm)</th>
<th>Kₐ-value (m³/h)</th>
<th>Flow rate (l/min)</th>
<th>Command signal (V)</th>
<th>Supply pressure max. (bar)</th>
<th>Pressure range (bar)</th>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td>46</td>
<td>144</td>
<td>38</td>
<td>0.25</td>
<td>470</td>
<td>0-10 V</td>
<td>PRC1-03</td>
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<tr>
<td>46</td>
<td>144</td>
<td>38</td>
<td>0.25</td>
<td>470</td>
<td>4-20 mA</td>
<td>PRC2-03</td>
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<tr>
<td>46</td>
<td>144</td>
<td>38</td>
<td>0.25</td>
<td>470</td>
<td>0-20 mA</td>
<td>PRC3-03</td>
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</tr>
</tbody>
</table>

**Economic-Proportional pressure regulator**
G¼, DN4, supply 24 V DC failfreeze

**Special options, add the appropriate number**
- Monitor signal 0-10 V: PRC-...1
- Monitor signal 4-20 mA: PRC-...2
- Monitor signal 0-20 mA: PRC-...3

**Accessories, enclosed**
- S232 module with Sub-D plug and 2 m cable: PDRS232
- Software, basic version “Light”: PDSOFT1
- Coupling socket M12x1, 5-pin, with 2 m cable, 5 x 0.25 angular: KM12-C5-2
- 5 m cable, 6 x 0.25 angular: KM12-C5-5

**Connection diagram**

**Order example:**
PRC1-03

*1 at 7 bar supply pressure and open outlet and equal exhaust forward flow
### Piezo Proportional Pressure Regulator with ATEX approval PCEX

**Description**
Piezo-operated proportional pressure valve with closed loop in a two-wire system. Outlet pressure is proportional to an electrical input signal. The valve can be mounted in any position and is immune to shock or vibration. It is pilot-controlled to reach a higher flow rate.

**Media**
lubricated or unlubricated and 50 μm filtered compressed air or non-corrosive gases

**Supply voltage**
not necessary due to two-wire system (supply through 4...20 mA command signal)

**Electrical connector**
coupling socket, 4-pin according to DIN 43651, size 15 x 15 mm connector turnable in 90° steps

**ATEX classification**
Compliance with directive 94/9/EC for use in potentially explosive atmosphere of group IIC, temperature classification T4.

**Power consumption**
< 200 mW

**Linearity/Hysteresis**
< 1% FS

**Mounting position**
any

**Air consumption**
The pilot valve has an air consumption of 1.6 l/min

**Temperature range**
Media: 0 °C to 60 °C / 32 °F to 140 °F
Ambient: 0 °C to 60 °C / 32 °F to 140 °F

**Order example:**
Order example: PCEX-02

---

**Dimensions**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Nominal A (mm)</th>
<th>B (mm)</th>
<th>C (mm)</th>
<th>Size (DN)</th>
<th>Flow rate (m³/h)</th>
<th>Supply pressure (bar G)</th>
<th>Connection thread (M5)</th>
<th>Pressure range (bar)</th>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportional pressure regulator</td>
<td>42</td>
<td>143</td>
<td>36</td>
<td>4.0</td>
<td>0.24</td>
<td>550</td>
<td>G1/8</td>
<td>0…2</td>
<td>PCEX-02</td>
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<td></td>
<td></td>
<td>PCEX-06</td>
</tr>
</tbody>
</table>

---

**Connection diagram**

1: supply port
2: outlet port
3: exhaust

---

**Material**
- Body: aluminium and plastic
- Elastomer: NBR/Buna-N and FKM

**Technical Specifications**
- Dimensions Nominal Flow Supply Connection Pressure Order
- A B C size value rate min./max. thread number
- mm mm mm DN (m³/h) l/min bar
- *1 at 7 bar supply pressure and open outlet and equal exhaust forward flow
Proportional Pressure Regulator with Flapper-Nozzle Control, Type 100X  53.40...53.57

Description
The pneumatic proportional valve translates an electrical command signal into a proportional pneumatic outlet signal (I/P or E/P converter). The transducer works on the flapper-nozzle principle. The electrical command signal generates a magnetic field in the coil. At the lower end of the coil there is a flapper valve which operates against a precision ground nozzle to create back pressure on the control diaphragm of a booster relay. The current flowing through the coil produces a force which proportionately controls the nozzle back pressure. This control pressure is applied to a servo mechanism which operates the high flow inlet and exhaust valves. An integral volume booster provides excellent flow capacity to give fast response in the majority of applications, including dead end service.

Two-wire system
For the two-wire system no additional supply voltage is necessary. The current consumption is 20 mA in the 1 bar range and 60 mA in the 8 bar range. Also available with declining characteristic curve.

Three-wire system
Additional supply voltage of 12 to 28 V necessary for the amplifier. Thereby the signal input is high-impedance (10 kΩ). The current consumption is only 1 mA at 10 V.

Ex from
intrinsically safe according to ATEX II 1 G Ex ia IIC T4

Mounting position
upright, protection against vibration is necessary

General features

Description
Flapper-nozzle principle: The electromagnetic field changes the space between flapper and nozzle and thus generates a proportional pressure variation.

Mounting position
upright ± 15°

Protection class
IP 65

Temperature range
-10 °C to 60 °C / 14 °F to 140 °F

Note
protection against vibration is necessary

Material
Body: zinc die-cast and plastic
Elastomer: NBR/Buna-N
Magnet: Magloy
Flapper and nozzle: plastic and copper

Pneumatic features

Media
dry, un lubricated and 5 μm filtered compressed air or non-corrosive gases

Supply pressure
max. 1.4 bar at pressure range 0.2...1 bar, max. 6 bar for 0.14...4 bar, max. 10 bar for 0.14...8 bar

Flow rate
280 l/min

Exhaust
The exhaust valve’s diameter is three times greater than the regulating valve’s diameter.

Air consumption
max. 2 l/min, max. 1% of volume flow

Electrical features

Supply voltage
12 ... 28 V DC ± 10%, necessary for three-wire systems only.

Command signal
4 ... 20 mA / 0 ... 60 mA / 1 ... 10 V, adjustable to 0 ... 10 mA / 0 ... 20 mA / 1 ... 5 V

ATEX version
ATEX II 1 G Ex ia IIC T4

Impedance
10 kΩ at voltage signal
150 Ω or 200 Ω at current signal

Electrical connector
square connector according to DIN 43650, size 30 x 30 mm

Note
For long connection lines shielding is to be used. Pay attention to voltage drops. As the case may be, current signal is preferable.

Accuracy

Linearity
< 0.5 % FS at type 100X
< 1 % FS at type 101X

Hysteresis
< 0.3 % FS at type 100X
< 0.5% FS at type 101X

Response sensitivity
< 0.07% FS at type 100X
< 0.3% FS at type 101X

Repeatability
< 0.5 % FS at type 100X
< 1 % FS at type 101X

Regulating time
< 1 s over pressure range and 0.1 l volume flow

Adjustment

Zero point
The zero point can be considerably increased, e.g. from 0.2 bar to 0.6 bar.
External adjustment via potentiometer “ZERO”.

Range
The maximum pressure value of the control range can be reduced by up to 20%, e.g. from 1 to 0.8 bar. External adjustment via potentiometer “RANGE”.

* at 7 bar supply pressure and 1.4 bar outlet pressure
Proportional Pressure Regulator with Flapper-Nozzle Control, Type 100X  53.40 ... 53.57

Technical features
- Pressure range: 0.2 ... 1 bar and 0.14 ... 4 / 6 or 8 bar
- Command signal: 4 ... 20 mA, 1 ... 10 V and 0 ... 60 mA
- Exhaust: nominal size 3x larger than on the main valve
- ATEX version: up to 3 bar
- Adjustment: zero point and range
- Flow rate: 280 l/min

- Linearity: < 0.5% or < 1%
- Hysteresis: < 0.3% or < 0.5%
- Response sensitivity: < 0.07% or < 0.3%
- Repeatability: < 0.05% or < 0.1%
- Regulating time: < 1 s
- Air consumption: < 2 l/min, max. 1% of volume flow

Proportional pressure valve

<table>
<thead>
<tr>
<th>Model</th>
<th>Supply voltage VDC</th>
<th>Two-/Three-wire system</th>
<th>Command signal mA/V</th>
<th>Pressure range bar</th>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td>100X</td>
<td>-</td>
<td>2</td>
<td>4-20 mA</td>
<td>0.2 ... 1</td>
<td>53.4021.00</td>
</tr>
<tr>
<td>100XS</td>
<td>-</td>
<td>2</td>
<td>1-10 V</td>
<td>0.2 ... 1</td>
<td>53.4421.00</td>
</tr>
<tr>
<td>100X-IS</td>
<td>¼ version</td>
<td>2</td>
<td>4-20 mA</td>
<td>0.2 ... 1</td>
<td>53.4921.00</td>
</tr>
<tr>
<td>101XA</td>
<td>12-28</td>
<td>3</td>
<td>1-10 V</td>
<td>0.14 ... 4</td>
<td>53.5600.3X</td>
</tr>
<tr>
<td>100X</td>
<td>-</td>
<td>2</td>
<td>4-20 mA</td>
<td>0.14 ... 4</td>
<td>53.4000.5X</td>
</tr>
<tr>
<td>101XA</td>
<td>12-28</td>
<td>3</td>
<td>4-20 mA</td>
<td>0.14 ... 6</td>
<td>53.5701.2X</td>
</tr>
<tr>
<td>101X</td>
<td>-</td>
<td>2</td>
<td>0-60 mA</td>
<td>0.14 ... 8</td>
<td>53.5024.00</td>
</tr>
<tr>
<td>101XS</td>
<td>-</td>
<td>2</td>
<td>1-10 V</td>
<td>0.14 ... 8</td>
<td>53.5424.00</td>
</tr>
<tr>
<td>101XA</td>
<td>12-28</td>
<td>3</td>
<td>4-20 mA</td>
<td>0.14 ... 8</td>
<td>53.5724.00</td>
</tr>
<tr>
<td>101XA</td>
<td>12-28</td>
<td>3</td>
<td>1-10 V</td>
<td>0.14 ... 8</td>
<td>53.5624.00</td>
</tr>
</tbody>
</table>

Special options, add the appropriate letter or number
- Q¼ connection thread
- declining characteristic curve inverser Ausgang
- deviant pressure range indicate on order
- mounting clips for DIN rail

Order example: 53.4021.00

Technical details: see previous page
### Description

The proportional pressure transducer translates a direct current or voltage input signal into a proportional pneumatic outlet signal. The valve uses proven moving coil and flapper nozzle technology with a built-in pneumatic relay with slight amplification and positive bias. Additional supply voltage is not necessary. The device has to be protected against vibration.

#### Media
- 5 μm filtered compressed air or non-corrosive gases

#### Supply voltage
- not required

#### Electrical connector
- plug according to DIN 43650A, contact gap 18 mm, 3-pin, with coupling socket 30 x 30 mm

#### Command signal
- 0…10 V / 1.1 kΩ at PT6..-B, otherwise ±20 mA / 200 Ω at PT6..-B, otherwise ±260 Ω

#### Linearity
- < 0.5 % FS at 0.2…2 bar, otherwise < 1% FS

#### Hysteresis
- < 0.25% FS at 0.2…2 bar, otherwise < 1% FS

#### Zero point
- by 0.3 bar

#### Range
- ±40% FS

#### Pressure
- exhaust at power breakdown

#### Response sensitivity
- 0.2% FS

#### Repeatability
- < 0.1% FS

#### Vibration sensitivity
- < 2% FS, for 10 g and 15…500 Hz

#### Mounting position
- upright ± 15°

#### Protection class
- IP 65

#### Material
- Body: chromated aluminium
- Nozzle: sapphire in nickel-plated brass plate
- Inner valve: stainless steel, brass, zinc-plated steel

#### Dimensions

<table>
<thead>
<tr>
<th>A (mm)</th>
<th>B (mm)</th>
<th>C (mm)</th>
<th>Flow rate (l/min**)</th>
<th>Supply pressure max. bar</th>
<th>Command signal V mA</th>
<th>Pressure range</th>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td>57</td>
<td>93</td>
<td>13</td>
<td>250</td>
<td>8</td>
<td>0-10 V</td>
<td>0.2…1</td>
<td>PT600-B100</td>
</tr>
<tr>
<td>57</td>
<td>93</td>
<td>13</td>
<td>250</td>
<td>8</td>
<td>0-10 V</td>
<td>0.2…2</td>
<td>PT600-B200</td>
</tr>
<tr>
<td>57</td>
<td>132</td>
<td>13</td>
<td>300</td>
<td>10</td>
<td>0-10 V</td>
<td>0…2</td>
<td>PT600-0200</td>
</tr>
<tr>
<td>57</td>
<td>132</td>
<td>13</td>
<td>300</td>
<td>10</td>
<td>0-10 V</td>
<td>0…4</td>
<td>PT600-0400</td>
</tr>
<tr>
<td>57</td>
<td>132</td>
<td>13</td>
<td>300</td>
<td>10</td>
<td>0-10 V</td>
<td>0…8</td>
<td>PT600-0800</td>
</tr>
</tbody>
</table>

#### Proportional pressure regulator 0-10 V

- **Order example:** PT600-B100

#### Proportional pressure regulator 4-20mA

- **Order example:** PT602-B200

#### Special options, change the appropriate number

- **Ex Atex version**
  - intrinsically safe: Atex II 1G Ex ia IIC T4
  - 4-20 mA only
  - PT602-...-01

#### Accessories, enclosed

- mounting bracket: made of steel, for standard version
- isolate transmitter: Ex ia II C, E/A: 0-20 mA, 24 V DC, EX 1-32

- SA-PT1
- SA-PT2
- KFD2-CD

#### Connection diagram

- PT60.-B.
- PT60.-0.

---

* at 7 bar supply pressure and 1.4 bar outlet pressure
### Description
The proportional valve translates a direct current or voltage signal into a linear proportional pneumatic outlet signal. With rapid response controls using low-powered piezo microelectronics, flapper nozzle and solid state control circuit. The proportional valve has internal electronics with an electrical feedback sensor and is housed in NEMA4X (IP65) enclosure with six outlet ranges, jumper selectable. Input and outlet ports on both ends of the body simplify pneumatic piping.

### Media
- **Supply voltage:** 7…30 V DC, 90 mW, required for 0…10 V setpoint input only, with reverse voltage protection
- **Electrical connector:** plug according to DIN 43650A, contact gap 18 mm, 3-pin, with coupling socket 30 x 30 mm.
- **Command signal:** 0…10 V / 10 kΩ, 24 V DC supply voltage, 4…20 mA / 330 Ω, two-wire, min. 7 V DC on input
- **Fail-safe:** exhaust at power breakdown
- **Linearity:** < 0.25% FS
- **Hysteresis:** < 0.1% FS at 0.2…0.5 bar, otherwise < 0.25% FS
- **Adjustment:** Zero point: by 0.3 bar, Range: 40% FS
- **Temperature range:** -40 °C to 70 °C / -40 °F to 158 °F
- **Material:** Body: chromated aluminium, Elastomer: NBR/Buna-N, Nozzle: sapphire in nickel-plated brass plate

### Dimensions

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>Flow rate</th>
<th>Supply pressure</th>
<th>Command signal</th>
<th>Pressure range</th>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td>57</td>
<td>95</td>
<td>13</td>
<td>250</td>
<td>8</td>
<td>0-10 V</td>
<td>0-10 V</td>
<td>PT780-B100</td>
</tr>
<tr>
<td>57</td>
<td>133</td>
<td>13</td>
<td>300</td>
<td>10</td>
<td>0-10 V</td>
<td>0-10 V</td>
<td>PT780-B200</td>
</tr>
</tbody>
</table>

### Special options
- **ATEX version**
  - Intrinsically safe: ATEX II 1G Ex ia IIB T4
  - Explosion-proof: ATEX ds IIIC T6, max. 2 bar

### Accessories
- **Mounting bracket** made of steel, for standard version
  - SA-PT1
- **Mounting clip** made of steel, for DIN rail
  - SA-PT2
- **Isolate transmitter** Ex ia II CE/A: 0…20 mA, 24 V DC, EX 1-32
  - KFD2-CD

### Properties
- **Accurate to 0.25% piezo-controlled**
- **Response sensitivity:** < 0.2% FS
- **Repeatability:** < 0.1% FS
- **Vibration sensitivity:** < 1% FS, for 10 g and 15…500 Hz
- **Linearity:** < 0.25% FS
- **Repeatability:** < 0.1% FS
- **Hysteresis:** < 0.1% FS at 0.2…0.5 bar, otherwise < 0.25% FS
- **Vibration sensitivity:** < 1% FS, for 10 g and 15…500 Hz
- **Accuracy:** 0.25%

### Pressure
<table>
<thead>
<tr>
<th>Pressure range</th>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-20 mA / 330 Ω</td>
<td>SA-PT1</td>
</tr>
</tbody>
</table>

### Connection Diagram
- **PT780**
- **PT782**

---

<table>
<thead>
<tr>
<th>Proportional Pressure Regulator with Piezo Element and Feedback</th>
<th>PT7</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Order example:</strong></td>
<td>PT780-B100</td>
</tr>
</tbody>
</table>

---

*1 at 7 bar supply pressure and 1.4 bar outlet pressure
Piezo Proportional Pressure Regulator, Very Quick, 400 mW

Description
Piezo-operated proportional pressure valve based on the principle of a piezo element which bends when voltage is applied. At the end of the piezo element is a flapper valve, which operates against a precision nozzle to create back pressure on the control diaphragm of a booster relay. A pressure transducer provides feedback of the outlet pressure compared with the setpoint value with correction by the electronic control system if necessary.

Minimal power consumption
- no self-heating, even none at pressure absence
- safe battery operation over a long period
- almost no power consumption necessary for regulation
- extremely quick regulating operations
- low-noise regulation especially for medical and laboratory technology
- particularly suitable for portable devices in conjunction with battery operation
- ideal for limited space conditions

Small and light design
- PRE1: DN 2.5, 350 l/min, coupling socket M8x1, 3-pin, monitor signal, 4-pin
- monitor signal optionally 0…P2max ≜ 0…10 V, max. 1 mA, R load > 1kΩ
- PRE2: DN 6, 1600 l/min, coupling socket M12x1.5, 5-pin, monitor signal standard 0…P2max ≜ 0…10 V, max. 1 mA, R load > 1kΩ

Pneumatic features
Media
- dry, unlubricated and 5 μm filtered compressed air or non-corrosive gases
Supply pressure
- min. 1.5 bar or 1 bar above outlet pressure
- max. 2.5 to 12 bar, depending on pressure range according to chart
Flow rate
- PRE1: max. 350 l/min at P1 = 10 bar, P2 = 6 bar and open outlet DN 2.5
- PRE2: max. 1600 l/min at P1 = 10 bar, P2 = 6 bar and open outlet DN 6
Exhaust
- PRE1: 180 l/min at P1 = 6 bar, 20 l/min at P1 = 200 mbar
- PRE2: 1000 l/min at P1 = 6 bar, 400 l/min at P1 = 2 bar
Air consumption
- PRE1: < 0.4 l/min at 0…200 mbar, < 0.5 l/min at 0…2 bar, < 0.6 l/min at 0…8 bar
- PRE2: < 1.5 l/min independent of pressure range

Electrical features
Supply voltage
- PRE1: 24 V DC ± 10%, 0.4 W, current consumption max. 15 mA
- PRE2: 24 V DC ± 10%, 0.8 W, current consumption max. 30 mA
Command signal
- 4…20 mA or 0…10 V
Impedance
- PRE1: 61 kΩ at voltage signal, 550 Ω at current signal
- PRE2: 55 kΩ at voltage signal, 500 Ω at current signal
Electrical connector
- PRE1: coupling socket M8x1, 3-pin
- PRE1-R: coupling socket M8x1, 4-pin
- PRE2: coupling socket M12x1.5, 5-pin
Monitor signal
- PRE1: as option 0…P2max ≜ 0…10 V, max. 1 mA, R load > 1kΩ
- PRE2: standard 0…P2max ≜ 0…10 V, max. 1 mA
Electronic switch
- PRE2 only, PNP, “on” when setpoint and actual value match in the tolerance range
- 0 V: off, 23 V = on, output current < 200 mA, tolerance P2: < 2%
Fail-safe
- If signal or electrical supply fails, outlet pressure falls to zero and the regulator exhausts.
Note
- For long connection lines shielding is to be used. Pay attention to voltage drops. As the case may be, current signal is preferable.

Accuracy
Linearity
- < 0.5% FS, at 0.1 and 0.2 bar range < 1 % FS
Hysteresis
- < 0.2% FS, at 0.1 and 0.2 bar range < 0.5% FS
Response sensitivity
- < 0.1% FS, at 0.1 and 0.2 bar range < 0.5% FS at PRE1 < 0.2% FS at PRE2
Repeatability
- < 0.2% FS, at 0.1 and 0.2 bar range < 0.5% FS
Response time
- 10 ms
Over all accuracy
- ± 0.5%

Adjustment
Zero point
- calibration only by factory
Range
- calibration only by factory
Piezo Proportional Pressure Regulator, Very Quick, 400 mW

**Technical features**
- Highly dynamic: 10 ms, critical frequency 43 Hz
- Low power consumption: 400 mW / 800 mW nominal power
- No self-heating: due to low power consumption
- Battery operation: due to low power consumption
- For portable devices: up to 3 bar pressure range
- No over-oscillation: adjustable closed loop amplification
- No resonance oscillation: adjustable closed loop amplification

**Dimensions**

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>Supply pressure</th>
<th>Flow rate</th>
<th>Connection thread</th>
<th>Pressure range for inlet signal</th>
<th>Order number</th>
<th>Preis</th>
</tr>
</thead>
<tbody>
<tr>
<td>36</td>
<td>61</td>
<td>54</td>
<td>2.5</td>
<td>50</td>
<td>G1/4</td>
<td>0…1</td>
<td>PRE1-I</td>
<td>PRE1-UA1</td>
</tr>
<tr>
<td>6.0</td>
<td>150</td>
<td>0.2</td>
<td>1</td>
<td>PRE1-I</td>
<td>PRE1-U</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>250</td>
<td>0…5</td>
<td>PRE1-I</td>
<td>PRE1-U</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>280</td>
<td>0…6</td>
<td>PRE1-I</td>
<td>PRE1-U</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>350</td>
<td>0…8</td>
<td>PRE1-I</td>
<td>PRE1-U</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Proportional valve**
- supply voltage: 24 V DC, constant bleed, with straight coupling socket and 5 m cable

**Special options**
- monitor signal: 0-10 V, standard at PRE2 for PRE1 PRE1-...
- flange connection: without manifold
- w/o coupling socket: and without cable
- mounting clips: for DIN rail

**Accessories**
- coupling socket: with 5 m cable, angular

**Order example:**
- PRE1-IA1
Proportional Regulator for Pressure up to 70 bar

PQH

Description
Proportional control valve with closed loop control technology for better control of pressurised gases. The instrument can be built as single closed loop or dual closed loop control valve.

Media
dry, lubricated or unlubricated and 20 μm filtered compressed air or non-corrosive gases

Fail freeze
constant outlet pressure at voltage drop

Second loop
0-10 V, impedance 4.7 kΩ, ratio of internal to external relationship is 10% to 90%

Supply voltage
15-24 V DC, residual ripple < 10%, with reverse voltage protection

Impedance
0-10 V / 10 kΩ, 4-20 mA / 100 Ω

Protection class
IP65

Electrical connector
"Brad Harrison" round connector 6-pin

Power consumption
24 W (985mA) regulating, 2.4W (100mA) non-regulating

Linearity/Hysteresis
< 0.5% FS

Adjustment
zero, span, hysteresis

Temperature range
0 °C to 70 °C / 32 °F to 158 °F

Material
Ports: brass
Transducer: silicon

Protection class
IP65

Electrical connector
"Brad Harrison" round connector 6-pin

Power consumption
15-24 V DC, residual ripple < 10%, with reverse voltage protection

Impedance
0-10 V / 10 kΩ, 4-20 mA / 100 Ω

Protection class
IP65

Electrical connector
"Brad Harrison" round connector 6-pin

Order example:
PQH1EE-40

Special options, add the appropriate letter or number
4-20 mA input and feedback signal for oxygen stainless steel manifold

Order number
PQH . IC- .. PQH . . . .15 PQH . . . .SS

For further details about double loop see PQ2
What are volume booster / proportional valve combinations used for?
Combinations of volume boosters and proportional valves lend themselves for electronically regulating high volume flows. On the one hand common proportional valves are not available with connection sizes big enough, on the other hand combinations are in most cases more economic. There are two ways of regulating: Single loop systems are suitable for standard applications without high requirements for accuracy and without consideration of pressure drop at high flow. Double loop regulations on the contrary are much more accurate and also qualified for dynamic processes.

General operational description:
The volume booster and proportional valve are fed by the supply pressure. When no command signal is applied the outlet pressure behind the booster is zero. When the command signal is increased the outlet pressure rises in proportion to it. Since the transmission ratio is not exactly 1:1, a slight pressure difference occurs between the outlet pressure of the proportional valve and the booster’s outlet on single loop systems. This can be balanced by a feedback signal (double loop), though.

Single loop
At single loop combinations the pressure difference between command signal and outlet pressure is being ignored because the proportional valve only refers to its own outlet pressure within the pilot chamber. The outlet pressure performance is dependent of the volume booster’s accuracy.

Double loop
Combinations with a second feedback have the possibility to balance pressure differences. For this a pressure transducer is installed in the outlet line of the booster. The electrical signal of the transducer is applied as a feedback signal onto the proportional valve. The valve detects any pressure differences and compensates them automatically. In high flow applications a pressure drop at the outlet of the pilot regulator is thus minimised.

General features
- **Construction type**: The volume booster / proportional valve combinations are delivered completely assembled and calibrated.
- **Mounting position**: preferred horizontal (see figure)
- **Protection class**: IP 54 with ordinary coupling socket as standard, optionally IP 65 for some devices (see according product information sheets)
- **Temperature range**: 0 °C to 50 °C / 32 °F to 122 °F for all proportional valves, for booster ranges refer to according product sheets

Pneumatic features
- **Command signal**: The proportional valves may only be fed with dry and 5 μm filtered compressed air. The pneumatic command signal must always be air!
- **Media**: Preferred dry, 5 μm filtered compressed air for supply of the proportional valves. The volume boosters can operate with air or non-corrosive gases, model R120 even with liquids. The respective air consumption and the relieving function strongly have to be regarded.
- **Inlet pressure**: dependent of the according combination (see according product information sheets)
- **Pressure supply**: The proportional valve has to be separately supplied with compressed air with regard to the valve’s maximum inlet pressure.
- **Exhaust**: The proportional valve exhausts only the booster’s pilot chamber. The booster, if in relieving version, exhausts the volume of the supply pressure line. The relief capacity is subject to the differential pressure.
- **Volume flow**: see specifications of the according volume booster

Electrical features
- **Supply voltage**: All valves have to be supplied with 24 V DC.
- **Power consumption**: see according product information sheets
- **Setpoint input**: 0-10 V as standard, optionally 4-20 mA for all valves
- **Monitor signal**: A feedback signal is not reasonable for the single loop version because here only the pressure of the booster’s pilot chamber is monitored. That value does not give any information about the outlet pressure behind the booster.
Volume Booster / Proportional Valve Combination

General operational description:
The volume booster and proportional valve are fed by the supply pressure. When no command signal is applied the outlet pressure behind the booster is zero. When the command signal is increased the outlet pressure rises in proportion to it. Since the transmission ratio is not exactly 1:1, a slight pressure difference occurs between the outlet pressure of the proportional valve and the booster's outlet on single loop systems. This can be balanced by a feedback signal (double loop), though.
At single loop combinations the pressure difference between command signal and outlet pressure is being ignored because the proportional valve only refers to its own outlet pressure within the pilot chamber. The outlet pressure performance is dependent of the volume booster’s accuracy.

Single loop combination examples

<table>
<thead>
<tr>
<th>Flow</th>
<th>Connection</th>
<th>Outlet</th>
<th>Part number</th>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td>rate</td>
<td>thread</td>
<td>pressure</td>
<td>Booster</td>
<td>Prop.valve</td>
</tr>
<tr>
<td>l/min</td>
<td>G</td>
<td>G</td>
<td>G</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Booster</td>
<td>Prop.valve</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>of combination</td>
<td></td>
</tr>
</tbody>
</table>

R750 with PRE1, for compressed air or non-corrosive gases

- 1000 G¼ 0... 8 R750-02I PRE1-U08 BP1U750-02

R450 with PRE1, for compressed air or non-corrosive gases

- 4000 G½ 0... 8 R450-04I PRE1-U08 BP1U450-04

R119 with PPA, for compressed air or non-corrosive gases

- 5600 G½ 0... 10 R119-04J PPA00-1000 BP1U119-04
- 9000 G¾ 0... 10 R119-06J PPA00-1000 BP1U119-06
- 10000 G1 0... 10 R119-10J PPA00-1000 BP1U119-10
- 12000 G1½ 0... 10 R119-12J PPA00-1000 BP1U119-12
- 42000 G½ 0... 10 R119-16J PPA00-1000 BP1U119-16
- 44000 G½ 0... 10 R119-20J PPA00-1000 BP1U119-20
- 11000 G3 0... 10 R119-24J PPA00-1000 BP1U119-24

RGB4 with PRE1-A2, for compressed air or gases

- 700 G½ 0...0,2 RGB4-04J PRE1-UA2 BP1U84-04
- 2800 G1 0...0,2 RGB4-08J PRE1-UA2 BP1U84-08
- 5600 G1½ 0...0,2 RGB4-12J PRE1-UA2 BP1U84-12

RZ1 with PRE1-.01/02, for compressed air or gases

- 2900 G1 0... 1 RZ1-08J PRE1-U02 BP1UZ-08
- 5700 G1½ 0... 1 RZ1-12J PRE1-U02 BP1UZ-12
- 21000 G2 0... 1 RZ1-16J PRE1-U02 BP1UZ-16

R120 with PPA, for compressed air, gases or liquids

- 1200 G½ 0... 15 R120-04J PPA00-1600 BP1U120-04
- 4200 G¾ 0... 15 R120-06J PPA00-1600 BP1U120-06
- 5000 G1 0... 15 R120-08J PPA00-1600 BP1U120-08
- 1200 G½ 0... 50 R120-04J PPA00-5000 BP1U120-04J5
- 4200 G¾ 0... 50 R120-06J PPA00-5000 BP1U120-06J5
- 5000 G1 0... 50 R120-08J PPA00-5000 BP1U120-08J5
- 14000 G1½ 0... 50 R120-12J PPA00-5000 BP1U120-12J5
- 15000 G2 0... 50 R120-16J PPA00-5000 BP1U120-16J5

Special options, add the appropriate letter

- 4-20mA input signal BP1I...-

Gauges: see chapter for measuring devices
Further details: see chapter for single devices

Order example: BP1U750-02
Volume Booster / Proportional Valve Combination

**General operational description:**
The volume booster and proportional valve are fed by the supply pressure. When no command signal is applied the outlet pressure behind the booster is zero. When the command signal is increased the outlet pressure rises in proportion to it. Since the transmission ratio is not exactly 1:1, a slight pressure difference occurs between the outlet pressure of the proportional valve and the booster’s outlet on single loop systems. This can be balanced by a feedback signal (double loop), though.

Combinations with a second feedback have the possibility to balance pressure differences. For this a pressure transducer is installed in the outlet line of the booster. The electrical signal of the transducer is applied as a feedback signal onto the proportional valve. The valve detects any pressure differences and compensates them automatically. In high flow applications a pressure drop at the outlet of the pilot regulator is thus minimised.

**Double loop combination example**

<table>
<thead>
<tr>
<th>Flow rate</th>
<th>Connection thread</th>
<th>Outlet pressure bar</th>
<th>Sensor</th>
<th>Booster</th>
<th>Prop.valve</th>
<th>Order number of combination</th>
</tr>
</thead>
<tbody>
<tr>
<td>l/min</td>
<td>G</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**R450 with PQ2, for compressed air or non-corrosive gases**
setpoint 0-10 V, P1 max. 17 bar

- 4000 G½, 0... 1: DAV-01H, R450-04I, PQ2EE-01
- 4000 G½, 0... 6: DAV-06H, R450-04I, PQ2EE-06
- 4000 G½, 0...10: DAV-10H, R450-04I, PQ2EE-10

**R200 with PQ2, for compressed air or non-corrosive gases**
setpoint 0-10 V, P1 max. 17 bar

- 2800 G1, 0... 1: DAV-01H, R200-08I, PQ2EE-01
- 2800 G1, 0... 6: DAV-06H, R200-08I, PQ2EE-06
- 2800 G1, 0...10: DAV-10H, R200-08I, PQ2EE-10

**RGB4 with PQ2, for compressed air or gases**
setpoint 0-10 V, P1 max. 4 bar

- 700 G½, 0...0,35: DAV-C4H, RGB4-04J, PQ2EE-C4
- 2800 G1, 0...0,35: DAV-C4H, RGB4-08J, PQ2EE-C4
- 5600 G1½, 0...0,35: DAV-C4H, RGB4-12J, PQ2EE-C4

**RZ1 with PQ2, for compressed air or gases**
setpoint 0-10 V, P1 max. 16 bar

- 2900 G1, 0...1: DAV-01H, RZ1-08J, PQ2EE-01
- 5700 G1½, 0...1: DAV-01H, RZ1-12J, PQ2EE-01
- 21000 G2, 0...1: DAV-01H, RZ1-16J, PQ2EE-01

**Special options**, add the appropriate letter

- 4-20mA input signal: BP2I ...

**Gauges:** see chapter for measuring devices

**Further details:** see chapter for single devices

**PDF CAD**

**Order example:** BP2U450-0401
Motorised Pressure Regulator P180

Description: Motorised air pressure regulator designed for precise pneumatic control using an electrical signal from a remote location. A slip clutch prevents from motor damages at overload or end position limitations.

Media: dry, oil-free and 5 μm filtered compressed air or non-corrosive.

Power consumption: 6 W for 6 rpm motor as standard, 4 W for 2 rpm motor.

Control signal: 220 V AC, optionally 24 V DC, 24 V AC or 110 V AC.

Electrical connector: 4 single wires, optionally plug according to DIN 43650A, contact gap 18 mm, 3-pin with coupling socket.

Accuracy: at varying supply pressures: ≤ 0.1 mbar pressure deviation.

Relieving function: relaxing.

Relief capacity: 140 l/min at 1.5 bar outlet and 0.35 bar overpressure above setpoint.

Gauge port: 1/4” NPT on both sides of the body.


Dimensions:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>Power</th>
<th>Flow rate</th>
<th>Switching time</th>
<th>Connection</th>
<th>Pressure range</th>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td>62</td>
<td>195</td>
<td>14</td>
<td>6</td>
<td>280</td>
<td>40</td>
<td>1/4” NPT</td>
<td>0,14...1,8</td>
<td>P180-02A</td>
</tr>
<tr>
<td>30</td>
<td>14</td>
<td>4,0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0,14...4,0</td>
<td>P180-02B</td>
</tr>
<tr>
<td>50</td>
<td>14</td>
<td>8,0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0,14...8,0</td>
<td>P180-02C</td>
</tr>
</tbody>
</table>

Special options, add the appropriate letter:

- 24 V DC control signal P180-02 . V
- 110 V AC control signal P180-02 . W
- switching time three times greater than standard not for 24 V P180-02 . T
- higher exhaust two times greater than standard P180-02 . H
- DIN connector connection with DIN plug 30x30 mm P180-02 . D

Accessories, enclosed:

- Pressure gauge Ø 50 mm, 0...2.5 bar, G1/4, connecting parts necessary MA5002... *
- gauge connecting parts adapter 1/4” NPT - R1/4 f VP-0202N

Order example: P180-02A