Proportional valve VEMP

Small, light, inexpensive

The trend in diagnostic and therapeutic medicine is towards ever-smaller and lighter devices. In mobile applications, for example oxygen therapy, the emphasis is on minimal power consumption, low weight and high reliability. The proportional valve VEMP with piezo technology is perfect for these requirements.

No heat build-up
The extremely compact proportional valve VEMP requires very little energy, i.e. just 1 mW: It retains its actual status without any current, and the flow rate can be changed with minimal current. This means that there is no heat generation. At 20 g it is light weight, making it for installation in mobile devices like portable oxygen therapy apparatus.

Silent
The piezo technology uses a completely different mechanical system to solenoid valves, and is quiet in operation.

Proportional behaviour
The VEMP enables extremely precise proportional control of gas flows from 0 ... 30 l/min as well as pressures. With a switching speed of 15 ms, it can react very quickly to setpoint changes. It is ideal for oxygen/ventilation therapy, medical mattresses, ophthalmology and dialysis. The flow setpoint can be set using a DC voltage, which means that no pulse-width modulated signal is required for control.

Highlights
- Unrivalled price/performance ratio
- Very low energy consumption thanks to piezo technology
- Compact design, minimal weight
- Silent
- Highly dynamic
- No heat build-up
- Long service life
- Proportional behaviour
Proportional valve VEMP

Sample applications

Dialysis: regulating pressures for controlling flows

Ophthalmology: controlling pneumatically operated surgical tools

Oxygen and ventilation therapy/anaesthesia/gas mixer: regulating gas flows and pressures

Medical mattresses/compression therapy: regulating gas flows and pressures

Operational principle of piezo technology

Festo uses the piezoelectric characteristics of certain ceramics, which mechanically deform when a voltage is applied. This makes piezo valves infinitely adjustable and simplifies the dosing of concentrations.

Operational 3/3-way valve

Bending transducer: three functions in one valve

Valve normally closed
No voltage
No flow rate
Pressure is maintained

Exhaust air
Pressure is reduced

Supply air
Pressure is increased

Medium voltage
Medium flow rate

High voltage
High flow rate

Medium flow rate

High flow rate

Technical data

<table>
<thead>
<tr>
<th>Valve function</th>
<th>Proportional valves VEMP</th>
<th>VEMP-BS-3-13-D7</th>
<th>VEMP-BS-3-16-D7</th>
<th>VEMP-BS-3-13-D19</th>
<th>VEMP-BS-3-16-D5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size [mm]</td>
<td>1.3</td>
<td>1.6</td>
<td>1.3</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>Maximum input pressure (port 1) [bar]</td>
<td>1.1</td>
<td>1.1</td>
<td>1.7</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>Exhaust (port 3) [bar]</td>
<td>0 (ambient)</td>
<td>0 (ambient)</td>
<td>0 (ambient)</td>
<td>0 (ambient)</td>
<td></td>
</tr>
<tr>
<td>Flow rate 1 → 2 (typ)</td>
<td>21 slpm at 1 bar 12.5 slpm at 0.5 bar</td>
<td>28 slpm at 1 bar 16 slpm at 0.5 bar</td>
<td>27 slpm at 1.5 bar</td>
<td>18 slpm at 0.5 bar 13 slpm at 0.3 bar 7 slpm at 0.1 bar</td>
<td></td>
</tr>
<tr>
<td>Flow rate 2 → 3 (typ)</td>
<td>22 slpm at 1 bar 15 slpm at 0.5 bar</td>
<td>29 slpm at 1 bar 19 slpm at 0.5 bar</td>
<td>29 slpm at 1.5 bar</td>
<td>19 slpm at 0.5 bar 14 slpm at 0.3 bar</td>
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</tr>
<tr>
<td>Operating medium</td>
<td>Air, oxygen, nitrogen, inert gases</td>
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</tbody>
</table>

The flow rate is calibrated according to DIN 1343 (1013 mbar, 0°C).