3/2 way pneumatic cartridge solenoid valve

- Compact design with 11 mm width per station
- Orifices from 0.5 mm (9 bar) to 1.2 mm (1.5 bar)
- High durability and reliability
- Low power consumption, as well as optional ATEX Ex ib version
- Design for optimum integration

Type description

Customer specific applications are becoming more complex. Size, fluidic performance, low power consumption and cost efficiency are critical criteria. Therefore the demands on the components used are increasing. Type 6164 was developed with the goal, to simplify pneumatic control with optimum integration of a pilot valve in block and plastic moulding parts. Thus, making a more compact design possible.

This valve sets new standards with its uncompromising reliability, above average life cycle span and excellent fluidic characteristics.

Various certifications and conformities make the use of the valve in medical applications such as media multiplexers in dental technology and oxygen control in respirators possible.
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1. General Technical Data

### Product properties

- **Dimensions**
  
  Detailed information can be found in chapter “4. Dimensions” on page 6.

### Material

- **Seal**
  - FKM

- **Body**
  - PEEK

- **Further materials in contact with the medium**
  
  PA, LCP, MS, Edelstahl...

  Detailed information can be found in chapter “3.2. Material specifications” on page 5.

- **Permissible leakage**
  
  Vac...10 bar (dependent on the version used)

- **Weight**
  
  6 g (standard version)

- **Nominal diameter**
  
  DN 0.5 / DN 0.8 / DN 1.0 / DN 1.2

- **Switching function**
  
  Detailed information can be found in chapter “2. Circuit functions” on page 4.

### Performance data

- **Pressure range**
  
  DN 0.5 (Vac...9 bar) / DN 0.8 (Vac...7.5 bar) / DN 1.0 (Vac...5 bar) / DN 1.2 (Vac...1.5 bar)

- **Switching times**
  
  Opening: <5 ms (pressure rise 0...10%)
  
  Closing: <5 ms (pressure drop 100...90%)

### Electrical data

- **Operating voltage**
  
  12 or 24 V DC (other voltages on request)

- **Voltage tolerance**
  
  +10%

- **Power consumption**
  
  0.7 W
  
  2.8 W/0.3 W (with external electric power reduction)
  
  0.3 W (for explosion proof version)

- **Duty cycle**
  
  100 % ED continuous rating

- **Switching frequency**
  
  16 Hz

- **Switching noise**
  
  42 dB

### Medium data

- **Medium temperature**
  
  Standard version FKM -10 °C...+55 °C
  
  Low temperature version FKM -20 °C...+55 °C (on request)

- **Operating medium**
  
  Neutral gases

### Process/Port connection & communication

- **Port connection**
  
  Bürkert Cartridge Connection

- **Electrical connection**
  
  Plug/Solder, flying leads

### Approvals and certificates

- **Explosion proof (on request)**
  
  Detailed information can be found in chapter “6.1. Electrical data for the Exi version” on page 10.

  - BVS 16 ATEX E 088 X
    - II 2G Ex ib IIC T6...T4 Gb
    - II 2D Ex ib IIIB T155 °C Db
  
  - IECEx BVS 16.0053 X
    - Ex ib IIC T6...T4 Gb
    - Ex ib IIIB T155 °C Db

- **Conformity (on request)**
  
  UL class 2

  Oxygen compatible

### Protection class

- **Pins**
  
  IP00

- **Special plug**
  
  IP40

- **Flying leads**
  
  IP54

### Environment and installation

- **Installation position**
  
  As required

### Ambient temperature

- **Standard version FKM**
  
  -10 °C...+55 °C

- **Low temperature version FKM**
  
  -20 °C...+55 °C

---

1.) Technical vacuum (-0.8 bar)

2.) Life span is dependent on temperature, pressure, sealing material and operating conditions.

3.) Measurement at the valve outlet according to DIN ISO 12238:2001

4.) According to ISO 3745, testing environment in brass manifold, free-hanging

5.) Depending on installation conditions (see manual), higher temperatures on request
2. Circuit functions

Note:
See “5.1. Pin assignment standard version” on page 9

<table>
<thead>
<tr>
<th>Circuit functions</th>
<th>Description</th>
</tr>
</thead>
</table>
| ![Type A](image1) | Type: A, solenoid valve
2/2 way
Direct-acting
Normally closed |
| ![Type B](image2) | Type: B, solenoid valve
2/2 way
Direct-acting
Normally open |
| ![Type C](image3) | Type: C, solenoid valve
3/2 way
Direct-acting
Normally closed |
| ![Type D](image4) | Type: D, solenoid valve
3/2 way
Direct-acting
Normally open |
| ![Type T](image5) | Type: T, solenoid valve
3/2 way
Direct-acting
Flow direction optional
Normally closed |
3. Materials

3.1. Chemical Resistance Chart – Bürkert resistApp

Bürkert resistApp – Chemical Resistance Chart

You want to ensure the reliability and durability of the materials in your individual application case? Verify your combination of media and materials on our website or in our resistApp.

Start Chemical Resistance Check

3.2. Material specifications

<table>
<thead>
<tr>
<th>No.</th>
<th>Element</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Coil housing</td>
<td>1.4113</td>
</tr>
<tr>
<td>2</td>
<td>Core (wetted parts)</td>
<td>1.4113</td>
</tr>
<tr>
<td>3</td>
<td>O-Rings (wetted parts)</td>
<td>FKM</td>
</tr>
<tr>
<td>4</td>
<td>Body (wetted parts)</td>
<td>PEEK</td>
</tr>
<tr>
<td>5</td>
<td>Seal switch (wetted parts)</td>
<td>PA</td>
</tr>
<tr>
<td>6</td>
<td>Seal (wetted parts)</td>
<td>FKM</td>
</tr>
<tr>
<td>7</td>
<td>Spring (wetted parts)</td>
<td>1.4310</td>
</tr>
<tr>
<td>8</td>
<td>Fitting (wetted parts)</td>
<td>Brass</td>
</tr>
<tr>
<td>–</td>
<td>Coil body (wetted parts, not visible)</td>
<td>LCP</td>
</tr>
</tbody>
</table>
4. Dimensions

4.1. Pin and flying leads version

Note:
Dimensions in mm

<table>
<thead>
<tr>
<th>Pin version</th>
<th>Flying leads version</th>
</tr>
</thead>
<tbody>
<tr>
<td>ØD</td>
<td>Ø 1.15</td>
</tr>
<tr>
<td>Ø0.5</td>
<td>2.6</td>
</tr>
<tr>
<td>8.3</td>
<td>10</td>
</tr>
<tr>
<td>5.08</td>
<td>Ø 9.1 (max.)</td>
</tr>
<tr>
<td>3.3</td>
<td>19.7 (without seal)</td>
</tr>
<tr>
<td>3.8</td>
<td>6.9</td>
</tr>
<tr>
<td>6.9</td>
<td>3.8</td>
</tr>
<tr>
<td>3.2</td>
<td>4.3</td>
</tr>
<tr>
<td>2.65</td>
<td>2.65</td>
</tr>
<tr>
<td>1.4</td>
<td>1.4</td>
</tr>
<tr>
<td>1.65</td>
<td>1.65</td>
</tr>
<tr>
<td>6.9</td>
<td>6.9</td>
</tr>
<tr>
<td>max. Ø 9.1</td>
<td>10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Version</th>
<th>Measurement D</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN &lt; 0.65</td>
<td>Ø 2.7</td>
</tr>
<tr>
<td>DN &gt; 0.65</td>
<td>Ø 3.3</td>
</tr>
</tbody>
</table>
4.2. Defining of the installation area

Cartridge connection (fully sunken)

Note:
- For explanation see also “7. Product design and assembly” on page 11
- Observe max. tightening torque of the screw (see User Manual Type 6164)
- Dimensions in mm

The position of the M2.5 thread is freely selectable on the diameter Ø13.2

Slot for dismantling is recommended

* Diameter tolerance acc. to ISO 14405
Cartridge connection (half sunken)

Note:

- For explanation see also “7. Product design and assembly” on page 11
- A mounting bracket set is required for mounting, see “9.4. Ordering chart accessories” on page 15.
- Dimensions in mm
5. Device/Process connections

5.1. Pin assignment standard version

Note:
- The pin assignment (marked No. 1, 2 and 3 in the drawing) depends on the circuit function. In the table, compare the respective pin assignment with the corresponding circuit function.
- The polarity must be observed only in the Ex version.

<table>
<thead>
<tr>
<th>Circuit functions</th>
<th>Port 1</th>
<th>Port 2</th>
<th>Port 3</th>
<th>3 way</th>
</tr>
</thead>
<tbody>
<tr>
<td>A, solenoid valve</td>
<td>Pressure port</td>
<td>Working port</td>
<td>Blind</td>
<td></td>
</tr>
<tr>
<td>2/2 way</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct-acting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normally closed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><img src="image1.png" alt="Diagram" /></td>
<td><img src="image2.png" alt="Diagram" /></td>
<td><img src="image3.png" alt="Diagram" /></td>
<td><img src="image4.png" alt="Diagram" /></td>
</tr>
<tr>
<td></td>
<td>(same valve as for circuit function C by blind connection to 3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B, solenoid valve</td>
<td>Pressure port</td>
<td>Working port</td>
<td>Blind</td>
<td></td>
</tr>
<tr>
<td>2/2 way</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct-acting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normally open</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><img src="image5.png" alt="Diagram" /></td>
<td><img src="image6.png" alt="Diagram" /></td>
<td><img src="image7.png" alt="Diagram" /></td>
<td><img src="image8.png" alt="Diagram" /></td>
</tr>
<tr>
<td></td>
<td>(same valve as for circuit function D by blind connection to 3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C, solenoid valve</td>
<td>Pressure port</td>
<td>Working port</td>
<td>Ventilation</td>
<td></td>
</tr>
<tr>
<td>3/2 way</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct-acting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normally closed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><img src="image9.png" alt="Diagram" /></td>
<td><img src="image10.png" alt="Diagram" /></td>
<td><img src="image11.png" alt="Diagram" /></td>
<td><img src="image12.png" alt="Diagram" /></td>
</tr>
<tr>
<td></td>
<td>(applicable to circuit function A by using blind connectors on 3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D, solenoid valve</td>
<td>Pressure port</td>
<td>Working port</td>
<td>Ventilation</td>
<td></td>
</tr>
<tr>
<td>3/2 way</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct-acting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normally open</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><img src="image13.png" alt="Diagram" /></td>
<td><img src="image14.png" alt="Diagram" /></td>
<td><img src="image15.png" alt="Diagram" /></td>
<td><img src="image16.png" alt="Diagram" /></td>
</tr>
<tr>
<td></td>
<td>(applicable to circuit function B by using blind connectors on 3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T, solenoid valve</td>
<td>Pressure port</td>
<td>Working port</td>
<td>Ventilation</td>
<td></td>
</tr>
<tr>
<td>3/2 way</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct-acting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow direction optional</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normally closed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><img src="image17.png" alt="Diagram" /></td>
<td><img src="image18.png" alt="Diagram" /></td>
<td><img src="image19.png" alt="Diagram" /></td>
<td><img src="image20.png" alt="Diagram" /></td>
</tr>
</tbody>
</table>
6. Performance specifications

6.1. Electrical data for the Exi version

Note:

- The valve is designed to operate on 24 V DC outputs through an intermediary intrinsically safe apparatus (isolating block or barrier).
  Please refer to the Type 6164 Instruction Manual for the permissible maximum values/value pairs.

- Type of protection: BVS 16 ATEX E 088 X: II 2G Ex ib IIC T6…T4 Gb & II 2D Ex ib IIIB T155 °C Db
  IECEx BVS 16.0053 X: Ex ib IIC T6…T4 Gb & Ex ib IIIB T155 °C Db

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Version for use with 300 Ω</td>
<td>320</td>
<td>9.3</td>
<td>29</td>
</tr>
<tr>
<td>supply module</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-resistance version</td>
<td>510</td>
<td>11.7</td>
<td>23</td>
</tr>
</tbody>
</table>

SPS 24 V DC Barrier/ isolation module > 30 mA
> 9.3 V DC
7. Product design and assembly

7.1. Application examples

<table>
<thead>
<tr>
<th>Single block with Cartridge</th>
<th>Cartridge installation position</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Single block with Cartridge" /></td>
<td><img src="image2" alt="Cartridge installation position" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fully sunken multi-manifold</th>
<th>Semi-sunken multi-manifold</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image3" alt="Fully sunken multi-manifold" /></td>
<td><img src="image4" alt="Semi-sunken multi-manifold" /></td>
</tr>
</tbody>
</table>
8. Product accessories

8.1. Single manifold fully sunken

Note:
- Dimensions in mm
- Max. tightening torque of the screw must be observed (see operating instructions Type 6164)

<table>
<thead>
<tr>
<th>Description</th>
<th>Article no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manifold 1 place, brass</td>
<td>695913</td>
</tr>
</tbody>
</table>

9. Ordering information

9.1. Bürkert eShop – Easy ordering and quick delivery

Bürkert eShop – Easy ordering and fast delivery

You want to find your desired Bürkert product or spare part quickly and order directly? Our online shop is available for you 24/7. Sign up and enjoy all the benefits.

Order online now

9.2. Bürkert product filter

Bürkert product filter – Get quickly to the right product

You want to select products comfortably based on your technical requirements? Use the Bürkert product filter and find suitable articles for your application quickly and easily.

Try out our product filter
### 9.3. Ordering chart

#### Standard version

<table>
<thead>
<tr>
<th>Circuit functions</th>
<th>Port connection</th>
<th>Orifice ventilation 1 → 2 [mm]</th>
<th>Orifice ventilation 2 → 3 [mm]</th>
<th>Q&lt;sub&gt;m&lt;/sub&gt; value (air)&lt;sup&gt;1)&lt;/sup&gt; 1 → 2 [l/min]</th>
<th>Q&lt;sub&gt;m&lt;/sub&gt; value (air)&lt;sup&gt;1)&lt;/sup&gt; 2 → 3 [l/min]</th>
<th>Pressure range&lt;sup&gt;2)&lt;/sup&gt; [bar]</th>
<th>Voltage/Frequency [V/Hz]</th>
<th>Power rating [W]</th>
<th>Article no. with connection pins</th>
</tr>
</thead>
<tbody>
<tr>
<td>C, solenoid valve</td>
<td>Bürkert Cartridge connection</td>
<td>0.5</td>
<td>0.65</td>
<td>6</td>
<td>9.55</td>
<td>Vac...9</td>
<td>12/DC</td>
<td>0.7</td>
<td>273612</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.8</td>
<td>1.1</td>
<td>16</td>
<td>20</td>
<td>Vac...7.5</td>
<td>24/DC</td>
<td>2.8/0.3&lt;sup&gt;3)&lt;/sup&gt;</td>
<td>272893</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.0</td>
<td>1.1</td>
<td>20</td>
<td>20</td>
<td>Vac...5</td>
<td>24/DC</td>
<td>271022</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.2</td>
<td>1.1</td>
<td>25</td>
<td>22</td>
<td>Vac...1.5</td>
<td>285701</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D, solenoid valve</td>
<td>Bürkert Cartridge connection</td>
<td>0.65</td>
<td>0.5</td>
<td>6.5</td>
<td>6</td>
<td>Vac...6</td>
<td>12/DC</td>
<td>0.7</td>
<td>273615</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>24/DC</td>
<td>273614</td>
<td></td>
</tr>
<tr>
<td>T, solenoid valve</td>
<td>Bürkert Cartridge connection</td>
<td>0.5</td>
<td>0.65</td>
<td>6</td>
<td>6</td>
<td>Vac...4</td>
<td>24/DC</td>
<td>0.7</td>
<td>292608</td>
</tr>
</tbody>
</table>

1.) Measurement at +20 °C, 6 bar pressure at the valve input and 1 bar pressure difference
2.) Technical vacuum (-0.8 bar)
3.) External power reduction electronics necessary
**Type 6164**

**Explosion proof version**

**Note:**
- BVS 16 ATEX E 088 X
  - II 2G Ex ib IIC T6…T4 Gb & II 2D Ex ib IIIb T155 °C Db
- IECEx BVS 16.0053 X
  - Ex Ib IIC T6…T4 Gb & Ex ib IIIb T155 °C Db

<table>
<thead>
<tr>
<th>Circuit functions</th>
<th>Port connection</th>
<th>Orifice ventilation 1 → 2</th>
<th>Orifice ventilation 2 → 3</th>
<th>( Q_{\text{air}} ) value 1 → 2</th>
<th>( Q_{\text{air}} ) value 2 → 3</th>
<th>Pressure range at 20 °C ± 4%</th>
<th>Resistance at 20 °C ± 4%</th>
<th>Min. holding current</th>
<th>Article no. with connection pins</th>
</tr>
</thead>
<tbody>
<tr>
<td>C, solenoid valve</td>
<td>Bürkert Cartridge connection</td>
<td>0.5</td>
<td>0.65</td>
<td>6</td>
<td>9.5</td>
<td>Vac...6</td>
<td>320</td>
<td>29</td>
<td>289027 ( \frac{\Omega}{\text{mA}} )</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>510</td>
<td>23</td>
<td>289028 ( \frac{\Omega}{\text{mA}} )</td>
</tr>
</tbody>
</table>

**D, solenoid valve**
- 3/2 way Direct-acting
- Normally open

| Bürkert Cartridge connection | 0.65 | 0.5 | 6.5 | 6 | Vac...4 | 320 | 29 | auf Anfrage |

1.) Measurement at +20 °C, 6 bar pressure at the valve input and 1 bar pressure difference
2.) Technical vacuum (-0.8 bar)

**Further versions on request**

- **Additional**
  - Leads version up to 300 mm
- **Voltage**
  - Voltages 9 V, 6 V, 3 V
- **Approval**
  - Oxygen compatibility: Suitable for the oxygen application labeled with a blue sticker

Visit product website →
9.4. Ordering chart accessories

Single manifold fully sunken

Ordering information and dimensions of the single manifold fully sunken can be found in chapter “8.1. Single manifold fully sunken” on page 12.

Further accessories

<table>
<thead>
<tr>
<th>Accessories</th>
<th>Description</th>
<th>Article no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve and manifold block not included in spare parts set</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mounting bracket set for semi-recessed mounting for type 6164</td>
<td>696032</td>
</tr>
<tr>
<td></td>
<td>Scope of delivery:</td>
<td></td>
</tr>
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<td></td>
<td>• 2 x fixing screws; M1.6x5; stainless steel A2</td>
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<td>• 1 x mounting bracket; 1.4310</td>
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<td></td>
<td>Plug for Type 6164 with two PVC wires; AWG 24; length 300 mm</td>
<td>695951</td>
</tr>
</tbody>
</table>
### Valve not included in spare parts set

**Spare parts set for Type 6164**

**Scope of delivery:**
- 1 x cheese head screw with internal TORX T8; M2.5x5; stainless steel A2
- 2 x O-ring large; FKM
- 1 x O-ring small; FKM