



## 2/2 way Proportional Valve Low-Δp

- Direct-acting, normally closed
- 0 - 0.7 bar<sup>1)</sup>
- DN8 - 12 mm
- ½" or ¾"

Type 6024 can be combined with...



**Type 8605**

Control electronics  
Cable plug version



**Type 8605**

Digital control electronics  
DIN-rail version



**Type 2508**

Cable plug

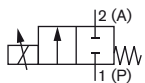


**Type 8611**

Universal controller

The direct-acting proportional valve Type 6024 works as an electromagnetically actuated control valve with relatively high flow rates at low operating pressures. The valve is normally closed.

### Valve operation A



2/2 way direct-acting,  
solenoid proportional  
control valve

It is controlled by Control Electronics Type 8605.

Further functional features of the Type 8605 electronic control unit:

- Temperature compensation for coil heating by internal current regulation
- Simple zero and span settings
- Ramp function to dampen fast status changes

### Technical data - valve

|                                          |                                                 |
|------------------------------------------|-------------------------------------------------|
| <b>Body material</b>                     | Brass, stainless steel                          |
| <b>Sealing material</b>                  | FKM, others on request                          |
| <b>Media</b>                             | technical vacuum                                |
| <b>Medium temperature</b>                | Neutral gasses, liquids                         |
| <b>Ambient temperature</b>               | - 10 to + 90 °C                                 |
| <b>Viscosity</b>                         | Max. 21 mm <sup>2</sup> /s                      |
| <b>Operating voltage</b>                 | 24 V DC                                         |
| <b>Power consumption</b>                 | Max. 18 W                                       |
| <b>Duty cycle</b>                        | 100 % continuously rated                        |
| <b>Port connection</b>                   | G ½, G ¾ (NPT ½ and NPT ¾ on request)           |
| <b>Electrical connection</b>             | Cable plug Type 2508 (DIN EN 175301-803 Form A) |
| <b>Mounting position</b>                 | Any, preferably with drive at top               |
| <b>Typical control data<sup>3)</sup></b> |                                                 |
| Hysteresis                               | < 7 %                                           |
| Repeatability                            | < 0.5 % of F.S.                                 |
| Sensitivity                              | < 0.5 % of F.S.                                 |
| Turn-down ratio                          | 1:25                                            |
| k <sub>vs</sub> value <sup>2)</sup>      | 1.4 to 2.8 m <sup>3</sup> /h                    |
| Max. operating pressure <sup>1)</sup>    | 0.1 to 0.7 bar (depending on DN)                |
| <b>Protection class - valve</b>          | IP65 with plug-in module or cable plug on valve |

<sup>1)</sup> Pressure data [bar]: Overpressure with respect to atmospheric pressure

<sup>2)</sup> K<sub>vs</sub> value [m<sup>3</sup>/h]: max. flow capacity for water

<sup>3)</sup> Characteristic data of control behaviour depends on process conditions

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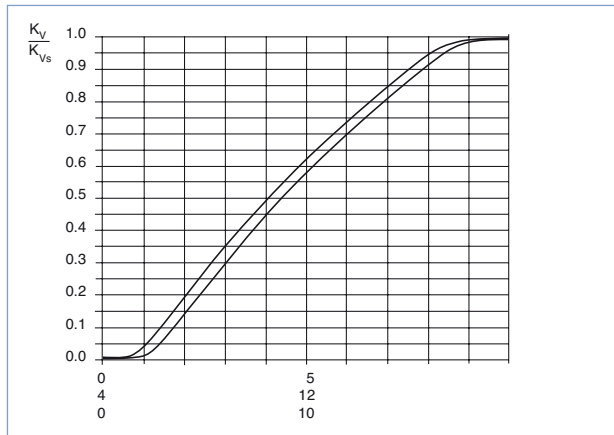
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## Characteristic of a proportional valve



## Advice for valve sizing

In continuous flow applications, the choice of appropriate valve size is much more important than with on/off valves. The optimum size should be selected such that the resulting flow in the system is not unnecessarily reduced by the valve. However, a sufficient part of the pressure drop should be taken across the valve even when it is fully opened.

**recommended value:  $\Delta p_{\text{valve}} > 30\%$  of total pressure drop within the system**

For that reason take advantage of Bürkert competent engineering services during the planning phase!

10 [V]  
20 [mA]  
20 [mA]

## Determination of the $k_v$ value

| Pressure drop                          | $k_v$ value<br>for liquids<br>[m <sup>3</sup> /h] | $k_v$ value<br>for gases<br>[m <sup>3</sup> /h]                 |
|----------------------------------------|---------------------------------------------------|-----------------------------------------------------------------|
| Subcritical<br>$p_2 > \frac{p_1}{2}$   | $= Q \sqrt{\frac{\rho}{1000 \cdot p}}$            | $= \frac{Q_{N1}}{514} \sqrt{\frac{T_1 \cdot p_N}{p_2 \cdot p}}$ |
| Supercritical<br>$p_2 < \frac{p_1}{2}$ | $= Q \sqrt{\frac{\rho}{1000 \cdot p}}$            | $= \frac{Q_N}{257 \cdot p_1} \sqrt{T_1 \cdot p_N}$              |

$k_v$  Flow coefficient [m<sup>3</sup>/h] <sup>1)</sup>  $Q_N$   
Standard flow rate [m<sup>3</sup>/h] <sup>2)</sup>  $p_1$   
Inlet pressure [bar] <sup>3)</sup>  $p_2$   
Outlet pressure [bar] <sup>3)</sup>  
 $\Delta p$  Differential pressure  $p_1 - p_2$  [bar]  $\rho$   
Density [kg/m<sup>3</sup>]  
 $\rho_N$  Standard density [kg/m<sup>3</sup>]  
 $T_1$  Temperature if fluid medium [(273+t)K]

<sup>1)</sup> measured for water,  $\Delta p = 1$  bar, via the device

<sup>2)</sup> Standard conditions at 1.013 bar<sup>3)</sup> and 0 °C (273K)

<sup>3)</sup> Absolute pressure

## Ordering chart for valves

| Valve operation                                                            | Orifice [mm] | Port connection | $k_{vs}$ value for water [m <sup>3</sup> /h] <sup>1)</sup> | $Q_{N1}$ value [l/min] <sup>2)</sup> | Maximum operating pressure [bar] <sup>3)</sup> | Power consumption [W] | Maximum coil current [mA] | Article no. Brass body | Article no. Stainless steel body |
|----------------------------------------------------------------------------|--------------|-----------------|------------------------------------------------------------|--------------------------------------|------------------------------------------------|-----------------------|---------------------------|------------------------|----------------------------------|
| <b>A</b><br><br>2/2 way direct-acting, solenoid proportional control valve | 8            | G 1/2           | 1.4                                                        | 1500                                 | 0.7                                            | 18                    | 580                       | 150401                 | –                                |
|                                                                            |              | G 3/4           | 1.4                                                        | 1500                                 | 0.7                                            | 18                    | 580                       | 150427                 | –                                |
|                                                                            | 10           | G 1/2           | 2.0                                                        | 2150                                 | 0.4                                            | 18                    | 580                       | 150402                 | 150404                           |
|                                                                            |              | G 3/4           | 2.0                                                        | 2150                                 | 0.4                                            | 18                    | 580                       | 150428                 | 150429                           |
|                                                                            | 12           | G 1/2           | 2.8                                                        | 3020                                 | 0.2                                            | 18                    | 580                       | –                      | 150426                           |
|                                                                            |              | G 3/4           | 2.8                                                        | 3020                                 | 0.2                                            | 18                    | 580                       | 150406                 | 150408                           |

1)  $k_{vs}$  value: Flow rate value for water, measured at +20 °C and 1 bar pressure differential over a fully opened valve.

2)  $Q_{N1}$  value: Flow rate value for air with inlet pressure of 6 bar<sup>1)</sup>, 1 bar pressure differential and +20 °C.

3) Pressure data [bar]: Overpressure with respect to atmospheric pressure

**Please note** that the valves are delivered without control electronics unit and cable plug (see accessories below).

Devices also suitable for technical vacuum.

### Further versions on request



#### Analytical

Oil and fat-free version

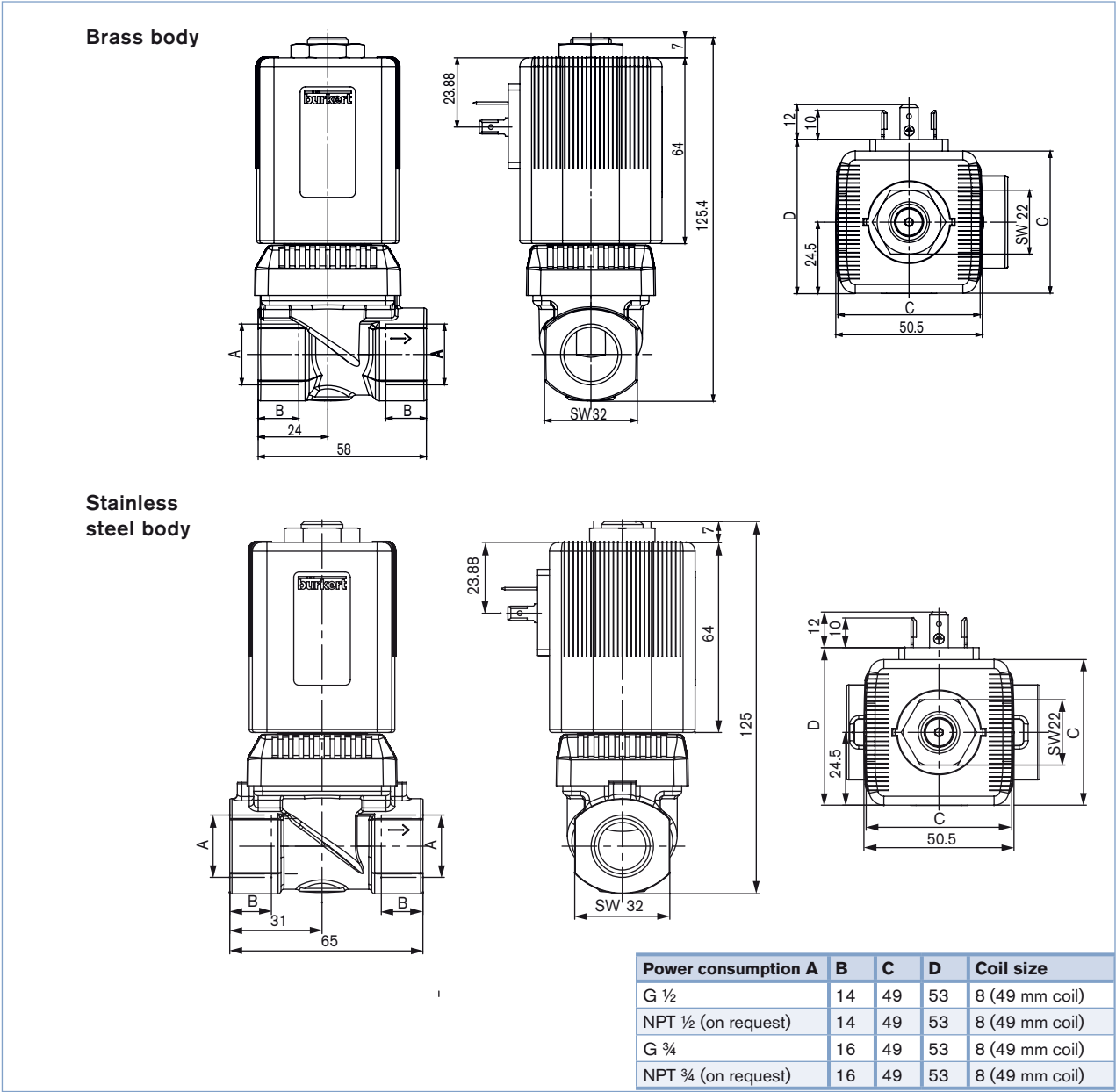


#### Port connection

NPT 1/2, NPT 3/4

Please also use the "request for quotation" form on last page

Dimensions [mm]



Ordering chart for accessories

Cable plug Type 2508 according to DIN EN 175301-803 Form A

The delivery of a cable plug includes the flat seal and fixing screw

| Circuitry            | Voltage / frequency | Article no. |
|----------------------|---------------------|-------------|
| None                 | 0 - 250 V AC/DC     | 008376      |
| None, with 3 m cable | 0 - 250 V AC/DC     | 783573      |

Electronic Control Type 8605

Please see separate datasheet. Click on the box "More info."... you will come to our website for this product where you can download the datasheet.

## Proportional valves – request for quotation

► Please fill out this form and send to your local Bürkert Sales Centre\* with your inquiry or order

|                 |                |
|-----------------|----------------|
| Company         | Contact person |
| Customer no.    | Dept.          |
| Address         | Tel./Fax       |
| Town / Postcode | E-Mail         |

☐ = Mandatory fields

Quantity

Desired delivery date

## Process data

|                                                               |                                   |                                  |                      |
|---------------------------------------------------------------|-----------------------------------|----------------------------------|----------------------|
| <input type="checkbox"/> Medium                               | <input type="text"/>              |                                  |                      |
| <input type="checkbox"/> State of medium                      | <input type="checkbox"/> liquid   | <input type="checkbox"/> gaseous |                      |
| Medium temperature                                            | <input type="text"/>              | °C                               |                      |
| <input type="checkbox"/> Maximum flow rate                    | $Q_{nom} =$ <input type="text"/>  | Unit:                            | <input type="text"/> |
| <input type="checkbox"/> Minimum flow rate                    | $Q_{min} =$ <input type="text"/>  | Unit:                            | <input type="text"/> |
| <input type="checkbox"/> Inlet pressure at nominal operation  | $p_1 =$ <input type="text"/>      | barg                             |                      |
| <input type="checkbox"/> Outlet pressure at nominal operation | $p_2 =$ <input type="text"/>      | barg                             |                      |
| Maximum inlet pressure                                        | $p_{1max} =$ <input type="text"/> | barg                             |                      |
| Ambient temperature                                           | <input type="text"/>              | °C                               |                      |

## Additional specifications

|               |                                |                                                     |
|---------------|--------------------------------|-----------------------------------------------------|
| Body material | <input type="checkbox"/> Brass | <input type="checkbox"/> Stainless steel            |
| Seal material | <input type="checkbox"/> FKM   | <input type="checkbox"/> other <input type="text"/> |

**Note** Please state all pressure values as **overpressures with** respect to atmospheric [barg].

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