



# Direct-acting 2-way standard solenoid control valve

- Excellent range
- Very good response
- Compact valve design •
- Orifice sizes 0.05...2.0 mm •
- Port connection 1/8" or sub-base



Product variants described in the data sheet may differ from the product presentation and description.

## Can be combined with



Type 8605 PWM control electronics for electromagnetic proportional valves

Type 2507 Cable plug - industry standard plug Form B



Type 8611 ▶ eCONTROL - Universal controller

## **Type description**

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The direct-acting solenoid control valve Type 2871 is used as the regulating unit in control loops. Due to an elastomeric seat seal the valve closes tight (integrated shut-off function) ,up to the DN specific nominal pressure. The plunger of the valve is assembled frictionless, which leads to an extraordinary adjustment characteristic. This valve is particularly

suitable for demanding control tasks (high control range, dry gases, etc.).



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# 1. General Technical Data

Product properties	
Dimensions	Detailed information can be found in chapter "5. Dimensions" on page 5.
Material	
Body	Brass, stainless steel
Seal	FKM, EPDM
Performance data	
Typical values of positioning behaviour <sup>1.)</sup>	
Hysteresis	<5%
Repeatability	<0.25% of end value <sup>2.)</sup>
Response sensitivity	< 0.25 % of end value <sup>2.</sup> < 0.1 % of end value <sup>2.)</sup> with DN < 0.8 mm
Setting range	1:200: DN 0.82
	1:500: DN 0.050.6
Actuating time (1090%)	<15 ms
Pressure range <sup>3.)</sup>	012 bar (also applicable for technical vacuum)
Nominal operating mode	100 % continuous operation
Electrical data	
Operating voltage	24 V DC (12 V on request)
Power consumption	Maximum 5 W
Maximum coil current <sup>4.)</sup>	220 mA (at 5 W and 24 V coil)
PWM frequency <sup>5.)</sup>	1500 Hz
Medium data	
Operating medium	Neutral gases, liquids on request
Medium temperature	-10 °C+90 °C (with FKM) -30 °C+90 °C (with EPDM)
Viscosity	Maximum 21 mm <sup>2</sup> /s (21 cSt)
Process/Port connection & communicati	on
Port connection size	Sub-base, G 1/8, NPT 1/8
Electrical connection	Cable plug Type 2507 acc. to DIN EN 175301-803 - form B Detailed information can be found in chapter "Cable plug Type 2507, Form B" on page 12.
Approvals and certificates	
Degree of protection	IP65
Environment and installation	
Installation position	Any, preferably actuator face up
Ambient temperature	Maximum + 55 °C
1) Characteristic data of control behaviour depends on pr	pages conditions

1.) Characteristic data of control behaviour depends on process conditions

2.) By flow measurement

3.) Pressure data: Overpressure with respect to atmospheric pressure, depending on nominal diameter, tightness seal or nominal pressure

4.) Maximum value: value depends on operating pressure

5.) PWM: pulse width modulation

# 2. Circuit functions

Circuit functions	Description
2 (A)	Type: A, proportional control valve
	2/2 way
	Direct-acting
II (P)	Normally closed



# 3. Approvals

### Note:

- The following approvals or conformity certificates must be mentioned in all enquiries. This is the only way to ensure that the product fulfils all the required specifications.
- Not all available device versions can be delivered with the below-mentioned approvals or conformities.

Approvals	Description
<b>FN</b> ®	UL recognized
	<b>Conformity of all materials in contact with the medium</b> USP Class VI chapter "87 in vitro" and "88 in vivo, Implantation"
	<b>Conformity of all materials in contact with the medium</b> FDA – Code of Federal Regulations Title 21 Paragraph 177 (CFR 21 177.2600)
זי	<b>Conformity of all materials in contact with the medium</b> Regulation (EC) No. 1935/2004 on materials and articles intended to come into contact with food

## 4. Materials

## 4.1. Chemical Resistance Chart – Bürkert resistApp





# 5. Dimensions

## 5.1. Threaded body

## Note:

Dimensions in mm



Body version	Threaded body	
A	G 1/8	NPT 1/8
В	8	7

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## 5.2. Sub-base body for DN up to 0.4 mm

Note:





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## 5.3. Sub-base body for DN from 0.6 mm

Note:



# 6. Performance specifications

## 6.1. Flow characteristic

### Determination of the $K_v$ value

Pressure drop	K <sub>v</sub> value for liquids	K <sub>v</sub> value for gases
	[m³/h]	[m³/h]
Sub-critical $p_2 > \frac{p_1}{2}$	$= Q \sqrt{\frac{\rho}{1000 \Delta p}}$	$= \frac{\mathbf{Q}_{N}}{514} \sqrt{\frac{T_{1} \rho_{N}}{p_{2} \Delta p}}$
Supercritical $p_2 < \frac{p_1}{2}$	$= Q \sqrt{\frac{\rho}{1000 \Delta p}}$	$=\frac{Q_{_N}}{257p_1}\sqrt{T_{_1}\rho_{_N}}$

$K_{v}$	Flow coefficient	[m <sup>3</sup> /h] <sup>1.)</sup>
$Q_{_{N}}$	Standard flow rate	[m <sub>N</sub> <sup>3</sup> /h] <sup>2.)</sup>
$\mathbf{p}_1$	Inlet pressure	[bar] <sup>3.)</sup>
$\mathbf{p}_2$	Outlet pressure	[bar] <sup>3.)</sup>
Δр	Differential pressure $p_1$ - $p_2$	[bar]
ρ	Density	[kg/m³]
$\rho_{\scriptscriptstyle N}$	Standard density	[kg/m³]
Τ,	Medium temperature	[(273+t)K]

1.) Measured for water,  $\Delta p = 1$  bar, over the value

2.) At reference conditions 1.013 bar and 0  $^\circ\text{C}$  (273 K)

3.) Absolute pressure

#### 6.2. Exemplary characteristic curve of a proportional valve

#### Note:

In continuous flow applications, the choice of an 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:  $\Delta p_{_{valve}}{>}25\,\%$  of total pressure drop within the system

Otherwise, the ideal, linear valve curve characteristic is changed.

If the differential pressure (difference between inlet and outlet pressure) exceeds half the value of the nominal pressure discontinuities may occur.

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





# 7. Product operation

### 7.1. Control unit

Valve control takes place through a PWM signal (pulse-width modulation). The duty cycle of the PWM signal determines the coil current and hence the position of the plunger.

The Bürkert control electronics Type 8605 (see relevant data sheet **Type 8605**) converts an analogue signal to a reference value corresponding to the valve type PWM signal and provides additional functions such as temperature compensation (coil heating), ramp function and the adjustment of min. and max. duty cycle/coil current for the control range.

Please note the sizing comments for such a control valve in chapter "6.2. Exemplary characteristic curve of a proportional valve" on page 8.

## 8. Ordering information

#### 8.1. Bürkert eShop – Easy ordering and quick delivery



### 8.2. Recommendation regarding product selection

#### Note:

- Please use the **Product Inquiry Form** at the end of this data sheet for the specifications of the device configuration and send us a copy of the inquiry with information about the application.
- Please note the chapter "6.2. Exemplary characteristic curve of a proportional valve" on page 8 on product selection.

#### 8.3. Bürkert product filter

