

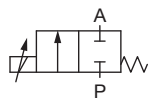


## 2/2-Way Solenoid Control Valve

- Made for custom engineered applications
- DN 0.8 ... 4 mm
- 1/8", 1/4" sub-base or custom engineered armature

Type 2863 is an extremely compact solenoid control valve and is available with an orifice up to 4mm. It is based on the standard version of Type 2873 (see datasheet). It is used as an actuator in closed control loops (pressure, flow, temperature, etc.). Compared with the standard version, the valve is essentially of simpler construction and assembly and testing procedures are optimized, easing high volume series production with shorter delivery times. Please follow the instructions for a customised design on page 5 of this datasheet.

### Circuit function A



direct acting 2-way  
solenoid control valve,  
normally closed

Valve control takes place through a PWM signal<sup>1)</sup>. 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 datasheet) converts an analog 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 on page 2.

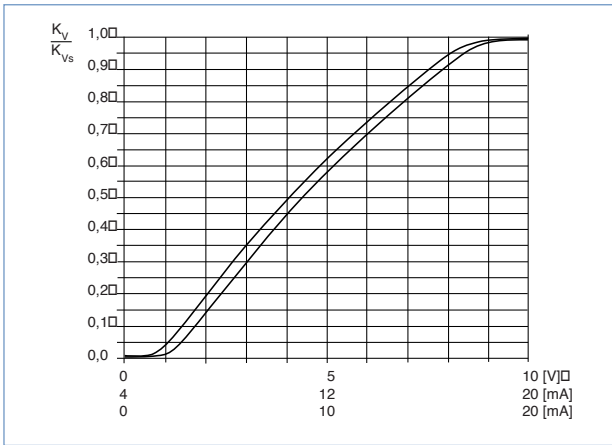
Technical Data - Valve	
<b>Body material</b>	Brass, stainless steel
<b>Seal material</b>	FKM, EPDM on request
<b>Medium</b>	Neutral gases, liquids on request
<b>Pressure range</b>	0 ... -16 bar <sup>2)</sup>
<b>Medium temperature</b>	-10 ... +90 °C
<b>Ambient temperature</b>	max. +55 °C
<b>Power supply</b>	24 V DC
<b>Max. current</b>	420mA (at 24V-hold)
<b>Power consumption</b>	9 W
<b>Duty cycle</b>	100% continuously rated
<b>PWM control frequency</b>	400 Hz
<b>Port connection</b>	Sub-base, G 1/8, G 1/4, NPT 1/8, NPT 1/4, further on request
<b>Electrical connection</b>	Cable plug Type 2508, Form B industrial standard Item no. 008 376
<b>Installation</b>	As required, preferably with actuator in upright position
<b>Typical control data<sup>3)</sup></b>	
Hysteresis	< 5%
Repeatability	< 1.0 % of F.S.
Sensitivity	< 1.0 % of F.S.
Span	1:25
<b>Protection class - valve</b>	IP65

<sup>1)</sup> PWM pulse width modulation

<sup>2)</sup> Pressure data [bar]: Measured as overpressure to the atmospheric pressure, orifice further depends on nominal pressure

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

### Characteristics 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:  $\Delta p_{\text{valve}} > 25\%$  of total pressure drop within the system**

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

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

### Determination of the $k_v$ value

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

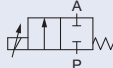
- $k_v$  Flow coefficient [m<sup>3</sup>/h]<sup>4)</sup>
- $Q_N$  Standard flow rate [m<sup>3</sup>/h]<sup>5)</sup>
- $p_1$  Inlet pressure [bar]<sup>6)</sup>
- $p_2$  Outlet pressure [bar]<sup>6)</sup>
- $\Delta p$  Differential pressure  $p_1 - p_2$  [bar]
- $\rho$  Density [kg/m<sup>3</sup>]
- $\rho_N$  Standard density [kg/m<sup>3</sup>]
- $T_1$  Medium temperature [(273+t)K]

<sup>4)</sup> measured for water,  $\Delta p = 1$  bar, via the device

<sup>5)</sup> Standard conditions at 1.013 bar<sup>6)</sup> and 0 °C (273K)

<sup>6)</sup> Absolute pressure

Standard orifice

Circuit function	Orifice [mm]	Port connection	$k_{vs}$ value water [m <sup>3</sup> /h] <sup>7)</sup>	$Q_{Nn}$ value [l/min] <sup>8)</sup>	Nominal pressure [bar] <sup>9)</sup>
<p>A</p> 	0.8	sub-base FK01	0.018	19	16
		G 1/8	0.018	19	16
		NPT 1/8	0.018	19	16
	1.2	sub-base FK01	0.040	43	12
		G 1/8	0.040	43	12
		NPT 1/8	0.040	43	12
	1.5	sub-base FK01	0.060	65	10
		G 1/8	0.060	65	10
		NPT 1/8	0.060	65	10
	2.0	sub-base FK01	0.100	108	8
		G 1/8	0.100	108	8
		NPT 1/8	0.100	108	8
		G 1/4	0.100	108	8
	2.5	sub-base FK01	0.100	108	8
		NPT 1/4	0.100	108	8
G 1/4		0.100	108	8	
3.0	sub-base FK01	0.150	162	5	
	G 1/4	0.150	162	5	
	NPT 1/4	0.150	162	5	
4.0	sub-base FK01	0.220	237	3.5	
	G 1/4	0.220	237	3.5	
	NPT 1/4	0.220	237	3.5	
4.0	sub-base FK01	0.320	345	2	
	G 1/4	0.320	345	2	
	NPT 1/4	0.320	345	2	

<sup>7)</sup>  $k_{vs}$  value: Flow rate value for water, measured at +20 °C and 1 bar pressure differential over a fully opened valve.

<sup>8)</sup>  $Q_{Nn}$ -value: Flow rate for air with inlet pressure of 6 bar, 1 bar pressure differential and +20 °C.

<sup>9)</sup> Pressure data [bar]: Overpressure with respect to atmospheric pressure.

Please use page 5 of this datasheet to inquire about your individual requirements

**i Further versions on request**

**Materials**  
Other seal materials  
Valve body with special armature

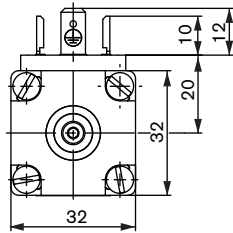
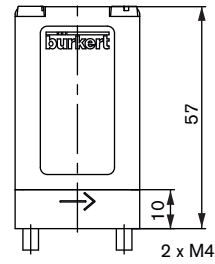
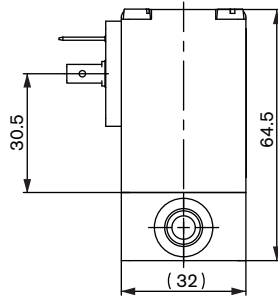
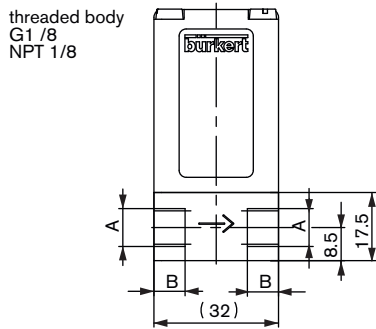
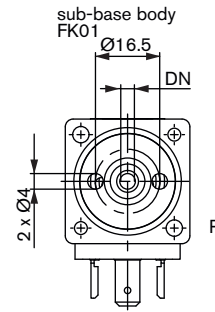
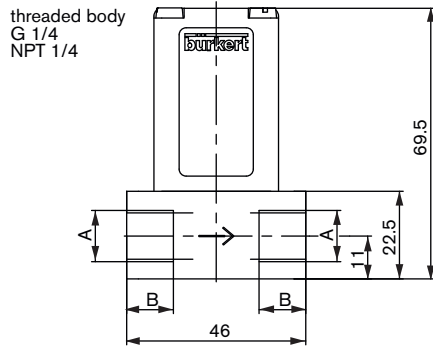
**Analytical**  
Oxygen version  
Parts oil-, fat- and silicon free

**Coil**  
Other coil power  
Specific, power setting for lower pressure  
Other operating voltages  
Coil with flying leads

**Valve armature**  
Special valve orifice

**Approvals**  
ATEX  
UL  
CSA  
DVGW/ Gas Appliances Directive (GAD)

Dimensions [mm]



Valve body version	Threaded port			
	G 1/4	NPT 1/4	G 1/8	NPT 1/8
A				
B	12	10	8	7

**Note**

You can fill out the fields directly in the PDF file before printing out the form.

**Design data for custom engineered solenoid control valves**

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

Company	Contact person
Customer No	Department
Address	Tel./Fax
Postcode/Town	E-mail

<input type="checkbox"/> = Mandatory fields	<input type="text"/> Quantity	<input type="text"/> Requested delivery date
<b>Process data</b>		
<input type="checkbox"/> <b>Medium</b>	<input type="text"/>	
<input type="checkbox"/> <b>State of medium</b>	<input type="checkbox"/> liquid	<input type="checkbox"/> gaseous
<input type="checkbox"/> <b>Medium temperature</b>	<input type="text"/> °C	
<input type="checkbox"/> <b>Maximum flow rate</b>	$Q_{nom} =$ <input type="text"/>	Unit: <input type="text"/>
<input type="checkbox"/> <b>Minimum flow rate</b>	$Q_{min} =$ <input type="text"/>	Unit: <input type="text"/>
<input type="checkbox"/> <b>Inlet pressure at nominal operation</b>	$p_1 =$ <input type="text"/>	barg
<input type="checkbox"/> <b>Outlet pressure at nominal operation</b>	$p_2 =$ <input type="text"/>	barg
<input type="checkbox"/> <b>Max. inlet pressure (nominal pressure)</b>	$p_{1max} =$ <input type="text"/>	barg
<input type="checkbox"/> <b>Ambient temperature</b>	<input type="text"/> °C	
<b>Additional specifications</b>		
<input type="checkbox"/> <b>Body material</b>	<input type="checkbox"/> Brass	<input type="checkbox"/> Stainless steel <input type="checkbox"/> other <input type="text"/>
<input type="checkbox"/> <b>Seal material</b>	<input type="checkbox"/> FKM	<input type="checkbox"/> other <input type="text"/>

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

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