

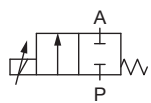


2/2-Way Solenoid Control Valve

- Made for custom engineered applications
- DN 0.8 ... 2.0 mm
- 1/8", sub-base or custom engineered armature

Type 2861 is an extremely compact solenoid control valve and is available with an orifice up to 2mm. It is based on the standard version of Type 2871 (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 signal¹⁾. 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.

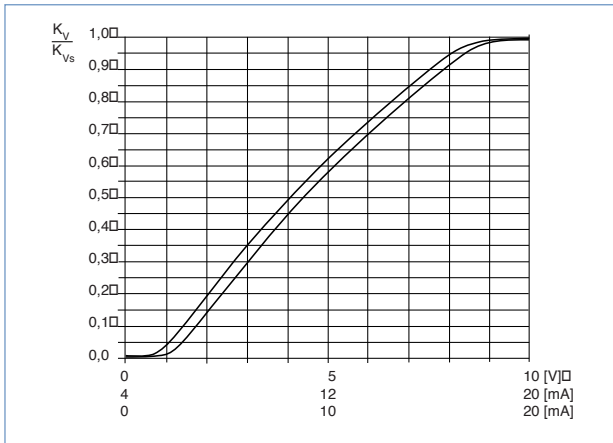
Technical Data - Valve	
Body material	Brass, stainless steel
Seal material	FKM, EPDM on request
Medium	Neutral gases, liquids on request
Pressure range	0 ... -12 bar ²⁾
Medium temperature	-10 ... +90 °C
Ambient temperature	max. +55 °C
Power supply	24 V DC
Max. current	220mA (at 24V-hold)
Power consumption	5 W
Duty cycle	100% continuously rated
PWM control frequency	800 Hz
Port connection	Sub-base , G 1/8, NPT 1/8, others on request
Electrical connection	Cable plug Type 2507, Form B industrial standard Item no. 423 845
Installation	As required, preferably with actuator in upright position
Typical control data³⁾	
Hysteresis	< 5%
Repeatability	< 1.0 % of F.S.
Sensitivity	< 1.0 % of F.S.
Span	1:25
Protection class - valve	IP65

¹⁾ PWM pulse-width modulation

²⁾ Pressure values [bar]: Measured as overpressure to the atmospheric pressure, orifice further depends on nominal pressure

³⁾ 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 ³ /h]	k_v value for gases [m ³ /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 $p_2 < \frac{p_1}{2}$	$= Q \sqrt{\frac{\rho}{1000 \Delta p}}$	$= \frac{Q_N}{257 p_1} \sqrt{T_1 \rho_N}$

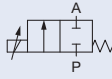
- k_v Flow coefficient [m³/h]⁴⁾
- Q_N Standard flow rate [m³/h]⁵⁾
- p_1 Inlet pressure [bar]⁶⁾
- p_2 Outlet pressure [bar]⁶⁾
- Δp Differential pressure $p_1 - p_2$ [bar]
- ρ Density [kg/m³]
- ρ_N Standard density [kg/m³]
- T_1 Medium temperature [(273+t)K]

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

⁵⁾ Standard conditions at 1.013 bar⁶⁾ and 0 °C (273K)

⁶⁾ Absolute pressure

Standard orifice

Circuit function	Orifice [mm]	Port connection	k_{vs} value water [m ³ /h ⁷⁾	Q_{Nin} value [l/min] ⁸⁾	Nominal pressure ⁹⁾ [bar]
 <p>A</p>	0.8	sub-base FK01	0.018	19	12
		G 1/8	0.018	19	12
		NPT 1/8	0.018	19	12
	1.0	sub-base FK01	0.027	29	10
		G 1/8	0.027	29	10
		NPT 1/8	0.027	29	10
	1.2	sub-base FK01	0.038	41	8
		G 1/8	0.038	41	8
		NPT 1/8	0.038	41	8
	1.6	sub-base FK01	0.055	59	6
		G 1/8	0.055	59	6
		NPT 1/8	0.055	59	6
2.0	sub-base FK01	0.090	97	3	
	G 1/8	0.090	97	3	
	NPT 1/8	0.090	97	3	

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

⁸⁾ Q_{Nin} value: Flow rate for air with inlet pressure of 6 bar, 1 bar pressure differential and +20 °C.

⁹⁾ 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

Material
 Other seal materials
 Valve body with special armature

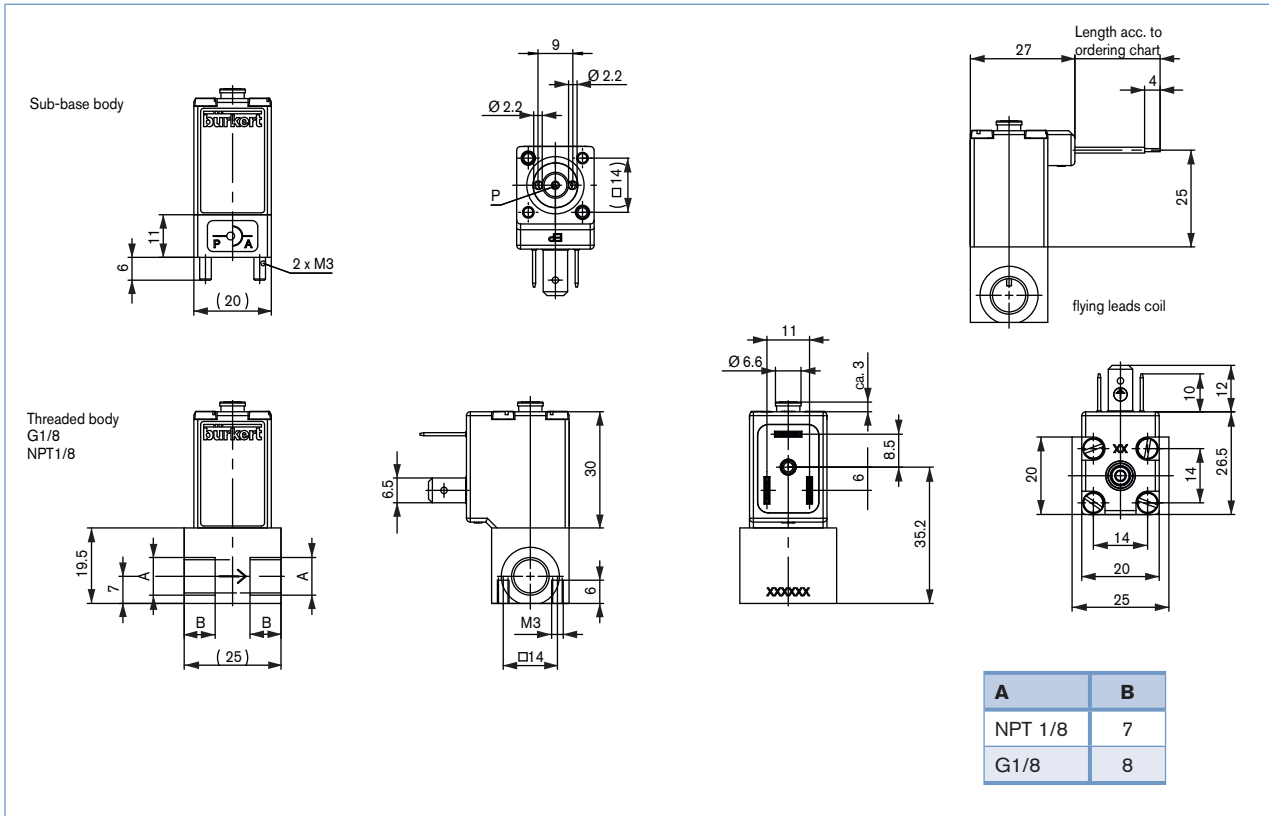
Analytical
 Oxygen version
 Parts oil-, fat- and silicon free

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

Valve armature
 Special valve orifice

Approvals
 UL
 CSA
 DVGW/ Gas Appliances Directive (GAD)

Dimensions for sub-base and threaded body versions [mm]



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
Process data		
<input type="checkbox"/> Medium	<input type="text"/>	
<input type="checkbox"/> State of medium	<input type="checkbox"/> liquid	<input type="checkbox"/> gaseous
<input type="checkbox"/> 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
<input type="checkbox"/> Max. inlet pressure (nominal pressure)	$p_{1max} =$ <input type="text"/>	barg
<input type="checkbox"/> Ambient temperature	<input type="text"/> °C	
Additional specifications		
<input type="checkbox"/> Body material	<input type="checkbox"/> Brass	<input type="checkbox"/> Stainless steel <input type="checkbox"/> other _____
<input type="checkbox"/> Seal material	<input type="checkbox"/> FKM	<input type="checkbox"/> other _____

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