bürkert
FLUID CONTROL SYSTEMS

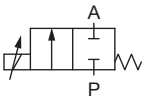
2/2-Way Solenoid Control Valve

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

DTS 1000173850 EN Version: A Status: RL (released | freigegeben | validé) printed: 29.08.2013

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 signal [1]. The duty cycle of the PWM signal determines the coil current and hence the position of the plunger.

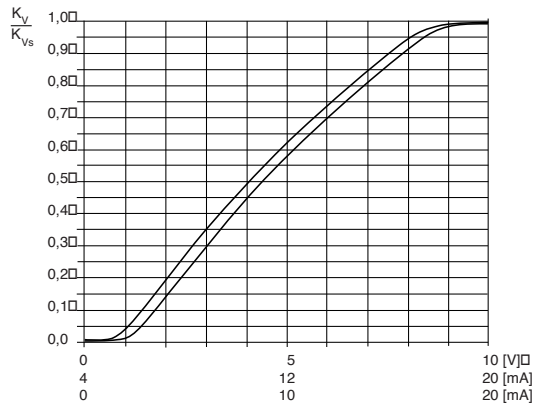
The Bürkert control electronics Type 8605 (see relevant datasheet) converts an analog signal to a reference value corresponding to the valve type PWM signal and provides additional functions such as temperature compensation (coil heating), ramp function and the adjustment of min. and max. duty cycle/coil 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 data [3]	
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: Δp_{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 [m³/h]	k_v value for gases [m³/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	[m_N^3/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, Δp = 1 bar, via the device

[5] Standard conditions at 1.013 bar[3] and 0 °C (273K)

[6] Absolute pressure

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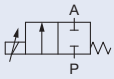
Standard orifice

Circuit function	Orifice [mm]	Port connection	k_{Vs} value water [m³/h] [7]	Q_{Nn} value [l/min] [8]	Nominal pressure [9] [bar]
A 	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_{Nn} 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

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)

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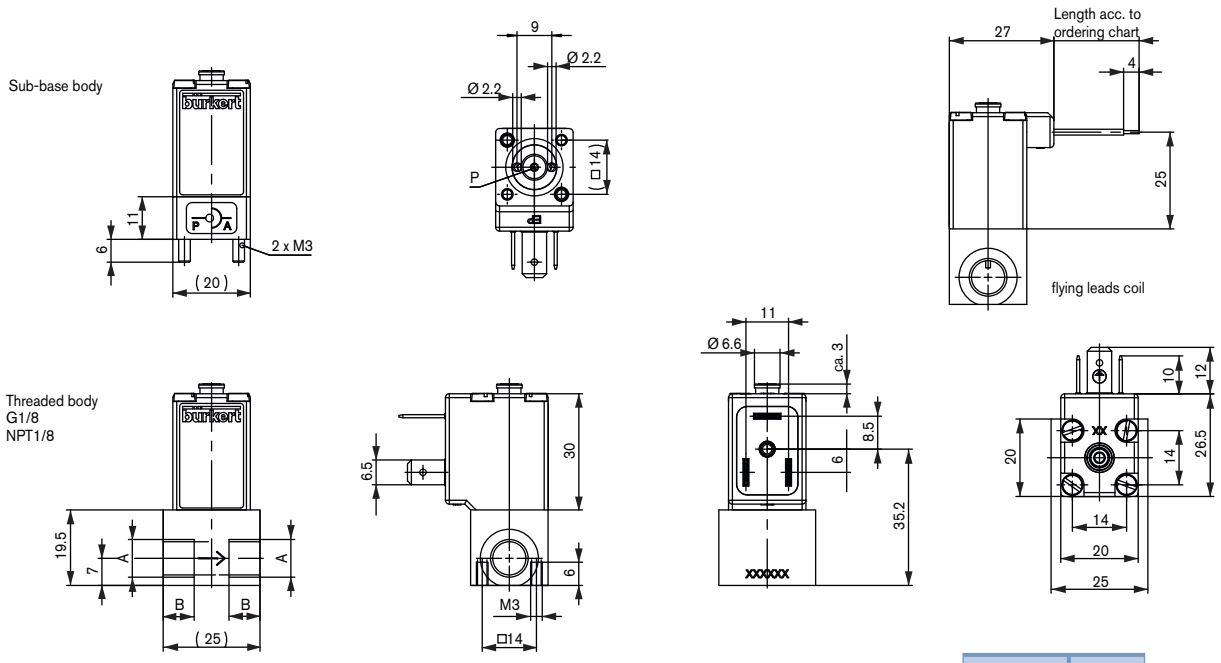
Dimensions for sub-base and threaded body versions [mm]



A	B
NPT 1/8	7
G1/8	8

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

= Mandatory fields | Quantity | Requested delivery date

Process data

Medium				
State of medium		☐ liquid	☐ gaseous	
Medium temperature			°C	
Maximum flow rate	Q_{nom} =		Unit:	
Minimum flow rate	Q_{min} =		Unit:	
Inlet pressure at nominal operation	p_1 =		barg	
Outlet pressure at nominal operation	p_2 =		barg	
Max. inlet pressure (nominal pressure)	p_{1max} =		barg	
Ambient temperature			°C	

Additional specifications

Body material	☐ Brass	☐ Stainless steel	☐ other	
Seal material	☐ FKM	☐ other		

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

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