bürkert
FLUID CONTROL SYSTEMS

2/2-Way Solenoid Control Valve

- Excellent range (1:200)
- Very good response
- Compact valve design
- Orifice sizes 0.05 ... 2.0 mm
- Port connection 1/8" or sub-base

Type 2871 can be combined with…

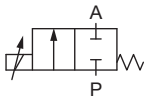
Type 8605
Digital control electronics
DIN-rail version

Type 2507
Cable plug

Type 8611
Universal controller

The direct-acting solenoid control valve Type 2871 (20mm installation width) 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, see ordering chart on page 3.
The plunger of the valve is assembled friction-less, which leads to an extraordinary adjust-ment characteristic. This valve is particularly suitable for demanding control tasks (high control range, dry gases, etc.).

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. Optionally the valve can also be driven with DC voltage.

Please note the sizing comments for such a control valve on page 2.

[1] PWM pulse width modulation
[2] Pressure data [bar]: Measured as overpressure to the atmospheric pressure, nominal pressure further depends on orifice size
[3] Maximum value, value depends on operating pressure
[4] Characteristic data of control behaviour depends on process conditions
[5] by flow measurement

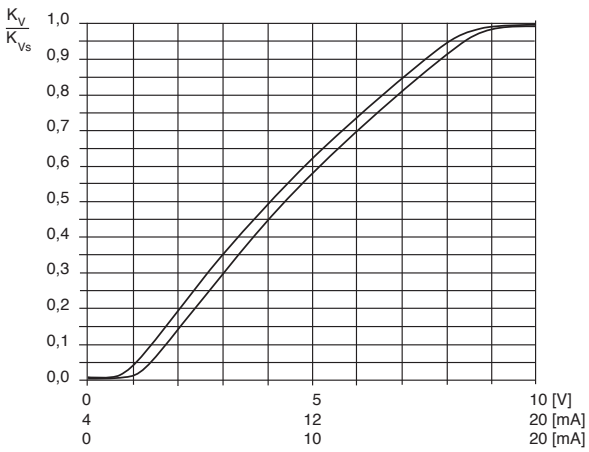
Technical Data - Valve	
Body material	Brass, stainless steel
Seal material	FKM, EPDM on request
Medium	Neutral gases, liquids on request
Pressure range	0 ... 12 bar [2] – also applicable for technical vacuum
Medium temperature	-10 ... +90 °C
Ambient temperature	max. +55 °C
Power supply	24 V DC
PWM frequency	1500 Hz
Max. coil current	220mA [3]
Power consumption	2 W (up to DN 0,6), 5 W (from DN 0,8)
Duty cycle	100% continuously rated
Port connection	Sub-base , G 1/8, NPT 1/8, others on request
Electrical connection	Cable plug Type 2507, Form B industrial standard
Installation	As required, preferably with actuator in upright position
Typical control data [4] at PWM control	
Hysteresis	< 5%
Repeatability	< 0.25% FS[5]
Sensitivity	< 0.25% FS – <0.1% FS with DN <0.8 mm [5]
Span	1:200 (DN0.8-2), 1:500 (DN0.05-0.6)
Response time (10 -90%)	< 15 ms
Protection class valve	IP65

Technical data - Control electronics Type 8605 (see separate datasheet)

The valve control can take place through the control electronics of Type 8605, which converts an analogue input signal into a PWM signal.

Further functional features of the Type 8605 electronic control unit:
- Temperature compensation for coil heating by internal current regulation
- Simple adaptation of zero and span settings
- Ramp function to dampen fast set point changes

Characteristics of a solenoid control valve



Advice for valve sizing

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: Δp_{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, the characteristics may change.

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] [6]
Q_N	Standard flow rate	[m_N^3/h] [7]
p_1	Inlet pressure	[bar] [8]
p_2	Outlet pressure	[bar] [8]
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]

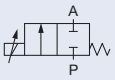
[6] measured for water 20°C, Δp 1 bar over the value

[7] At reference conditions 1.013 bar and 0°C (273K)

[8] Absolute pressure

Ordering chart

All valves with FKM seals (DN 0.05 and DN 0.1 with PCTFE seat seal)

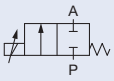
Circuit function	Orifice [mm]	Port connection	k_{vs} value water [m³/h] [9]	Q_{Nn} value [l/min] [10]	Nominal pressure [11] [bar]	Max. differential pressure [bar]	Item no. Brass	Item no. Stainless steel
A 	0.05	Flansch FK01	0.00006	0.06	10	10	254 985	254 986
		G 1/8	0.00006	0.06	10	10	254 443	254 444
		NPT 1/8	0.00006	0.06	10	10	254 968	254 971
	0.1	Flansch FK01	0.00025	0.27	10	10	254 987	254 988
		G 1/8	0.00025	0.27	10	10	254 446	254 447
		NPT 1/8	0.00025	0.27	10	10	254 972	254 973
	0.2	Flansch FK01	0.001	1	10	10	254 989	254 990
		G 1/8	0.001	1	10	10	254 448	254 450
		NPT 1/8	0.001	1	10	10	254 974	254 975
	0.3	Flansch FK01	0.002	2	10	10	254 991	254 992
		G 1/8	0.002	2	10	10	254 451	254 452
		NPT 1/8	0.002	2	10	10	254 977	254 978
	0.4	Flansch FK01	0.004	4	8	8	254 993	254 994
		G 1/8	0.004	4	8	8	254 453	254 454
		NPT 1/8	0.004	4	8	8	254 979	254 980
	0.6	Flansch FK01	0.01	11	6	6	254 995	254 996
		G 1/8	0.01	11	6	6	254 455	254 457
		NPT 1/8	0.01	11	6	6	254 981	254 982
	0.8	sub-base FK01	0.018	19	12	6	235 992	235 993
		G 1/8	0.018	19	12	6	235 994	235 995
		NPT 1/8	0.018	19	12	6	235 996	235 997
	1.0	sub-base FK01	0.027	29	10	5	235 998	235 999
		G 1/8	0.027	29	10	5	236 000	236 001
		NPT 1/8	0.027	29	10	5	236 002	236 003
	1.2	sub-base FK01	0.038	41	8	4	236 004	236 260
		G 1/8	0.038	41	8	4	236 261	236 262
		NPT 1/8	0.038	41	8	4	236 263	236 264
	1.6	sub-base FK01	0.055	59	6	3	236 265	236 266
		G 1/8	0.055	59	6	3	236 267	236 268
		NPT 1/8	0.055	59	6	3	236 269	236 270
	2.0	sub-base FK01	0.090	97	3	1.5	236 271	236 272
		G 1/8	0.090	97	3	1.5	236 273	236 274
		NPT 1/8	0.090	97	3	1.5	236 275	236 276

[9] k_{Vs} value: Flow rate value for water, measured at +20 °C and 1 bar pressure differential over a fully opened valve.
[10] Q_{Nn} value: Flow rate for air with inlet pressure of 6 bar, 1 bar pressure differential and +20 °C.
[11] Pressure data [bar]: Overpressure with respect to atmospheric pressure, with a differential pressure (difference between inlet and outlet pressure) above half of the nominal pressure there are discontinuities in the valve's characteristics possible."

▪ **Please note** that the valves are delivered without control electronics and cable plug (see accessory ordering information).

Ordering chart - variants for higher differential pressures

All valves with FKM seal

Circuit function	Orifice [mm]	Port connection	k_{vs} value water [m³/h]	Q_{Nn} value [l/min]	Nominal pressure [bar]	Item no. Brass	Item no. Stainless steel
A 	0.8	G 1/8	0.018	19	12	238 928	238 930
	1.0	G 1/8	0.027	29	10	238 936	238 931
	1.2	G 1/8	0.038	41	8	238 937	238 932
	1.6	G 1/8	0.055	59	6	238 939	238 933
	2.0	G 1/8	0.090	97	3	238 940	238 934

The following technical data changes compared with the data on page 1:
PWM frequency 1000 Hz, span 1:100.

Ordering chart for accessories

Cable plug Type 2507, form B

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

Circuitry	Voltage / frequency	Item no.
Without circuitry	0 ... 250 V AC/DC	423 845

Control elecronics, Type 8605 – see separate datasheet

Further versions on request

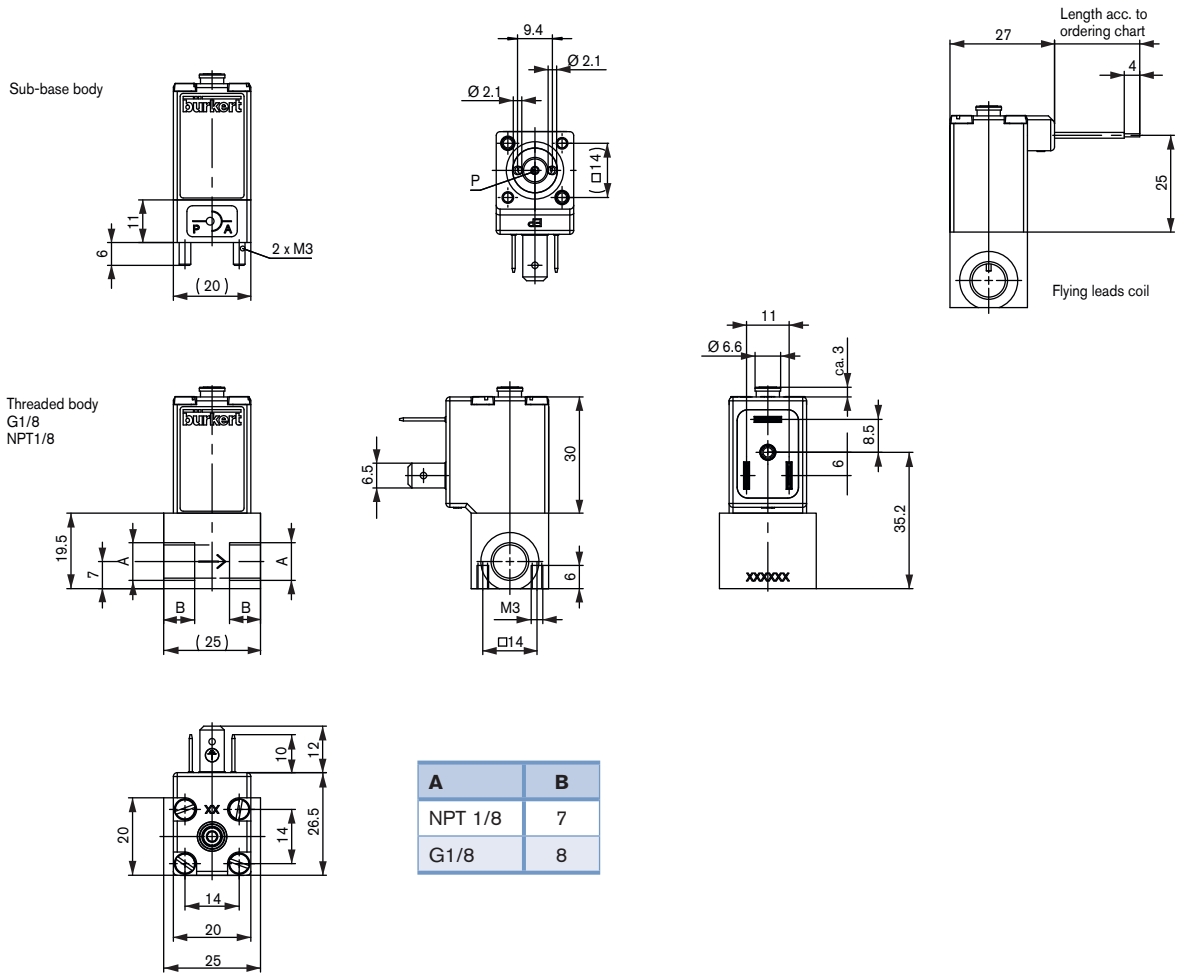
Materials
Seal materials EPDM, FFKM

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

Electrical connection
12 V Coil
Wire leads 300mm

Approvals
UL
CSA
DVGW/ Gas Appliances Directive (GAD)

Dimensions [mm]



A	B
NPT 1/8	7
G1/8	8

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

Design data for 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		
Seal material	☐ FKM	☐ other		

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

Standard series of solenoid control valves

Type 2871
Orifice 0.05 to 2 mm
20 mm coil width

Type 2873
Orifice 0.8 to 4 mm
32 mm coil width

Type 2875
Orifice 2 to 8 mm
49 mm coil width

Reset Form