burkert
FLUID CONTROL SYSTEMS

2/2-Way Solenoid Control Valve



- Excellent range (1:200)
- Very good response
- Compact valve design
- Orifice sizes 0.8 ... 4 mm
- Port connection 1/8", 1/4" or sub-base

Type 2873 can be combined with…



Type 8605
Digital control electronics
Cable plug version



Type 8605
Digital control electronics
DIN-rail version



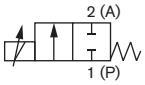
Type 2508
Cable plug



Type 8611
Universal controller

The direct-acting solenoid control valve Type 2873 (32mm 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 frictionless, which leads to an extraordinary adjustment 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, orifice further depends on nominal pressure
[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 ... 16 bar [2]
Medium temperature	-10 ... +90 °C
Ambient temperature	max. +55 °C
Power supply	24 V DC
PWM frequency	1200 Hz
Power consumption	9 W
Max. coil current [3]	420 mA
Duty cycle	100 % continuously rated
Port connection	Sub-base, G 1/8, G 1/4, NPT 1/8, NPT 1/4, further on request
Electrical connection	Cable plug Type 2508 according to DIN EN 175301-803, industrial standard Form A
Installation	As required, preferably with actuator in upright position
Typical control data [4] **at PWM control**	
Hysteresis	<5 %
Repeatability	< 0.5 % FS [5]
Sensitivity	< 0.25 % of FS [5]
Span	1:200
Response time (10 - 90%)	<20ms
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

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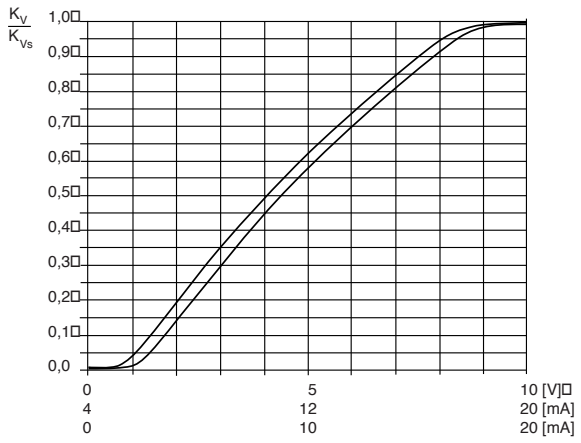
Characteristics of a solenoid control valve



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

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, via the device

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

[8] Absolute pressure

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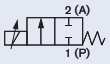
Ordering chart

All valves with FKM seal

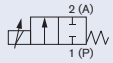
Circuit function	Orifice [mm]	Port connection	k_{Vs} value water [m³/h] [9]	Nominal pressure [bar] [10]	Max. differential pressure [bar]	Item no. Brass	Item no. Stainless steel
A 	0.8	sub-base FK01	0.018	16	8	234 291	234 306
		G 1/8	0.018	16	8	234 289	234 305
		NPT 1/8	0.018	16	8	236 229	236 230
	1.2	sub-base FK01	0.040	12	6	234 293	234 308
		G 1/8	0.040	12	6	234 292	234 307
		NPT 1/8	0.040	12	6	236 231	236 232
	1.5	sub-base FK01	0.060	10	5	234 295	234 310
		G 1/8	0.060	10	5	234 294	234 309
		NPT 1/8	0.060	10	5	236 233	236 234
	2.0	sub-base FK01	0.100	8	4	234 298	234 313
		G 1/8	0.100	8	4	234 296	234 311
		NPT 1/8	0.100	8	4	236 235	236 236
		G 1/4	0.100	8	4	234 297	234 312
		NPT 1/4	0.100	8	4	236 237	236 238
	2.5	sub-base FK01	0.150	5	2.5	234 300	234 315
		G 1/4	0.150	5	2.5	234 299	234 314
		NPT 1/4	0.150	5	2.5	236 239	236 241
	3.0	sub-base FK01	0.220	3.5	1.8	234 302	234 317
		G 1/4	0.220	3.5	1.8	234 301	234 316
		NPT 1/4	0.220	3.5	1.8	236 242	236 243
	4.0	sub-base FK01	0.320	2	1	234 304	234 319
		G 1/4	0.320	2	1	234 303	234 318
		NPT 1/4	0.320	2	1	236 244	236 245

[9] **k_{Vs} value:** Flow rate value for water, measured at +20 °C and 1 bar pressure differential over a fully opened valve.

[10] **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 p

Ordering chart - variants for higher differential pressures

All valves with FKM seal

Circuit function	Orifice [mm]	Approvals	Port connection	k_{Vs} value water [m³/h]	Nominal pressure [bar]	Item no. Brass	Item no. Stainless steel
A 	0.8		G 1/8	0.018	16	239 070	239 072
		UR	G 1/8	0.018	16	275 009	275 016
		ATEX / IECEx	G 1/8	0.018	16	274 882	on request
	1.2		G 1/8	0.040	12	239 073	239 074
		UR	G 1/8	0.040	12	275 010	275 018
		ATEX / IECEx	G 1/8	0.040	12	274 883	on request
	1.5		G 1/8	0.060	10	239 075	239 076
		UR	G 1/8	0.060	10	275 011	275 019
		ATEX / IECEx	G 1/8	0.060	10	274 884	on request
	2.0		G 1/8	0.100	8	239 077	239 078
		UR	G 1/8	0.100	8	275 012	275 020
		ATEX / IECEx	G 1/8	0.100	8	274 885	on request
	2.5		G 1/4	0.150	5	239 079	239 080
		UR	G 1/4	0.150	5	275 013	275 022
		ATEX / IECEx	G 1/4	0.150	5	274 886	on request
	3.0		G 1/4	0.220	3.5	239 081	239 082
		UR	G 1/4	0.220	3.5	275 014	275 023
		ATEX / IECEx	G 1/4	0.220	3.5	274 887	on request
	4.0		G 1/4	0.320	2	239 083	239 084
		UR	G 1/4	0.320	2	275 015	275 024
		ATEX / IECEx	G 1/4	0.320	2	274 888	on request

Note: The following technical data changes compared with the data on page 1
PWM frequency 800 Hz, span 1:100.
Other connection variations (sub-base, NPT) on request.

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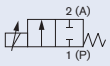
Ordering chart - variants with approvals

All valves with FKM seal

Circuit function	Orifice [mm]	Approvals	Port connection	k_{vs} value water [m^3/h]	Nominal pressure [bar]	Max. Differential pressure [bar]	Item no. Brass	Item no. Stainless steel
A 	0.8	UR	G 1/8	0.018	16	8	274 944	274 960
			NPT 1/8	0.018	16	8	274 945	274 961
		DVGW	G 1/8	0.018	16	8	275 044	on request
		ATEX / IECEx	G 1/8	0.018	16	8	276 539	on request
	1.2	UR	G 1/8	0.040	12	6	274 946	274 962
			NPT 1/8	0.040	12	6	274 947	274 963
		DVGW	G 1/8	0.040	12	6	275 045	on request
		ATEX / IECEx	G 1/8	0.040	12	6	276 540	on request
	1.5	UR	G 1/8	0.060	10	5	274 948	274 964
			NPT 1/8	0.060	10	5	274 949	274 965
		DVGW	G 1/8	0.060	10	5	275 046	on request
		ATEX / IECEx	G 1/8	0.060	10	5	276 542	on request
	2.0	UR	G 1/8	0.100	8	4	274 950	274 966
			NPT 1/8	0.100	8	4	274 951	274 967
		DVGW	G 1/8	0.100	8	4	275 047	on request
		ATEX / IECEx	G 1/8	0.100	8	4	276 544	on request
		UR	G 1/4	0.100	8	4	274 952	274 968
			NPT 1/4	0.100	8	4	274 953	274 969
	2.5	UR	G 1/4	0.150	5	2.5	274 954	274 970
			NPT 1/4	0.150	5	2.5	274 955	274 971
		DVGW	G 1/4	0.150	5	2.5	275048	on request
		ATEX / IECEx	G 1/4	0.150	5	2.5	276 545	on request
	3.0	UR	G 1/4	0.220	3.5	1.8	274 956	274 972
			NPT 1/4	0.220	3.5	1.8	274 957	274 973
		DVGW	G 1/4	0.220	3.5	1.8	275 049	on request
		ATEX / IECEx	G 1/4	0.220	3.5	1.8	276 546	on request
	4.0	UR	G 1/4	0.320	2	1	274 958	274 974
			NPT 1/4	0.320	2	1	274 959	274 975
		DVGW	G 1/4	0.320	2	1	275 051	on request
		ATEX / IECEx	G 1/4	0.320	2	1	276 547	on request

[11] **Approvals:** UR (UL recognized)
DVGW - Approval acc. to the European gas device guidelines (DIN 3394-1)
ATEX - II 2 G EEx m II T4 and T5
IECEx - Ex mb e IIC T4, T5 Gb

[12] **Port connection:** Others on request.

Note: Delivery without electronic control, Type 8605 and cableplug (see ordering chart for accessories).

Ordering chart for accessories

Cable plug Type 2508 according to DIN EN 175301-803 Form A

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

Circuitry	Voltage/ Frequency	Item no.
None	0 - 250 V AC/DC	008 376
None, with 3 m cable	0 - 250 V AC/DC	783 573

Control elecronics, Type 8605 - please see datasheet

Further versions on request

Materials
Seal materials EPDM, FFKM

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

Electrical connection
12 V Coil

Approvals
UR (UL recognized)
DVGW / Gas device guidelines
ATEX / IECEx

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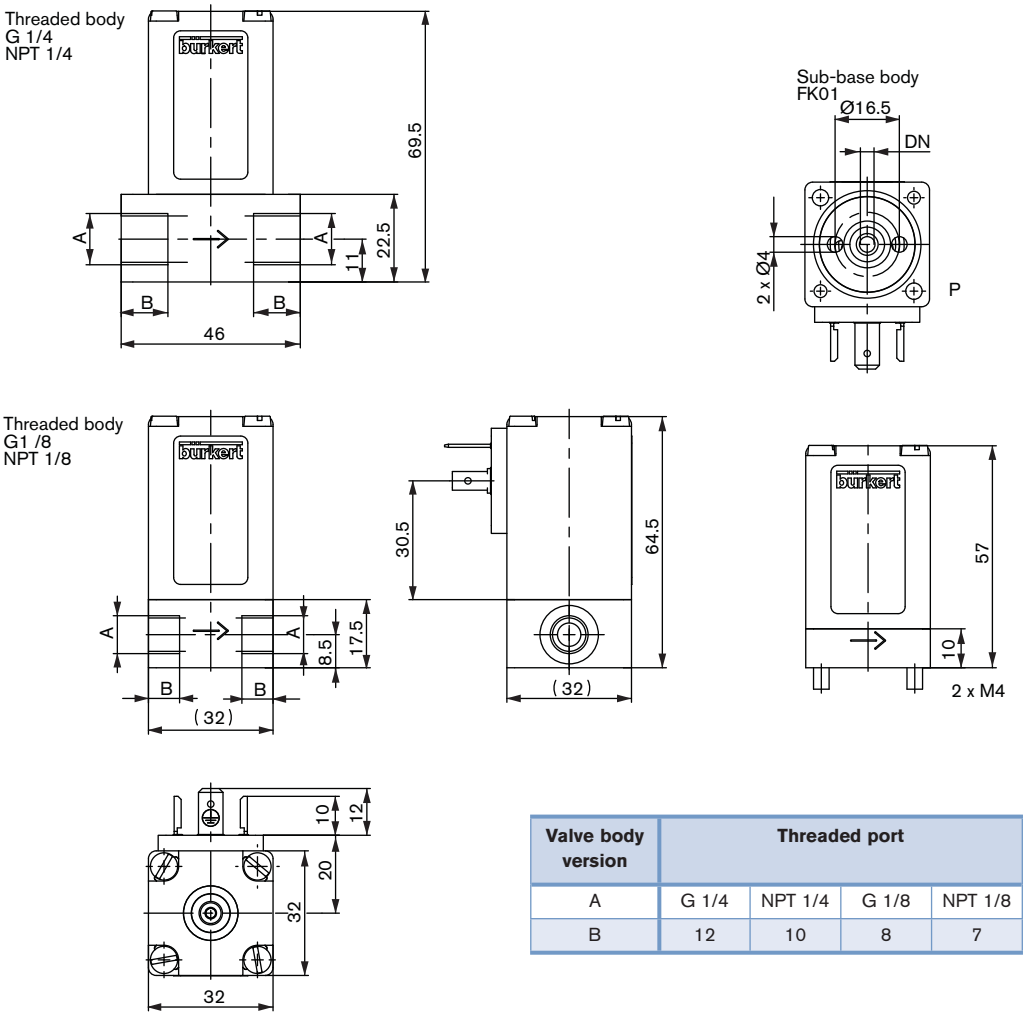
Dimensions [mm]



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

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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	Qmin =		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 2mm
20mm coil width



Type 2873
Orifice 0.8 to 4mm
32mm coil width



Type 2875
Orifice 2 to 8mm
49mm coil width

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Reset Form

In case of special application conditions, please consult for advice.

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