

Direct-acting 2 way standard solenoid control valve



Type 2871 can be combined with...



Type 8605
Digital control electronics DIN-rail version



Type 2507
Cable plug

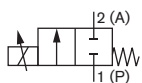


Type 8611
Universal controller



The direct-acting solenoid control valve Type 2871 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. 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



2/2 way direct-acting, solenoid proportional control valve

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. 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

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

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	220 mA ³⁾
Power consumption	2 W (up to DN0.6), 5 W (from DN0.8)
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 data⁴⁾ 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

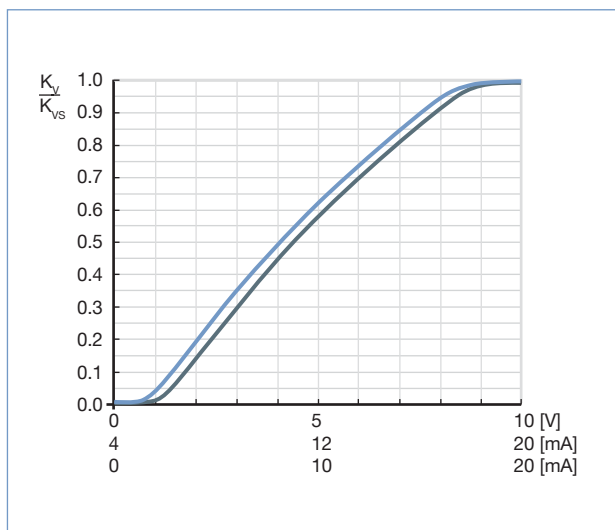
Technical data - Control electronics Type 8605 (see separate data sheet)

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: $\Delta p_{\text{valve}} > 25\%$ 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 [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	[m ³ /h] ⁶⁾
Q_N	Standard flow rate	[m ³ /h] ⁷⁾
p_1	Inlet pressure	[bar] ⁸⁾
	Outlet pressure	[bar] ⁸⁾
Δp	Differential pressure $p_1 - p_2$	[bar]
ρ	Density	[kg/m ³]
ρ_N	Standard density	[kg/m ³]
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

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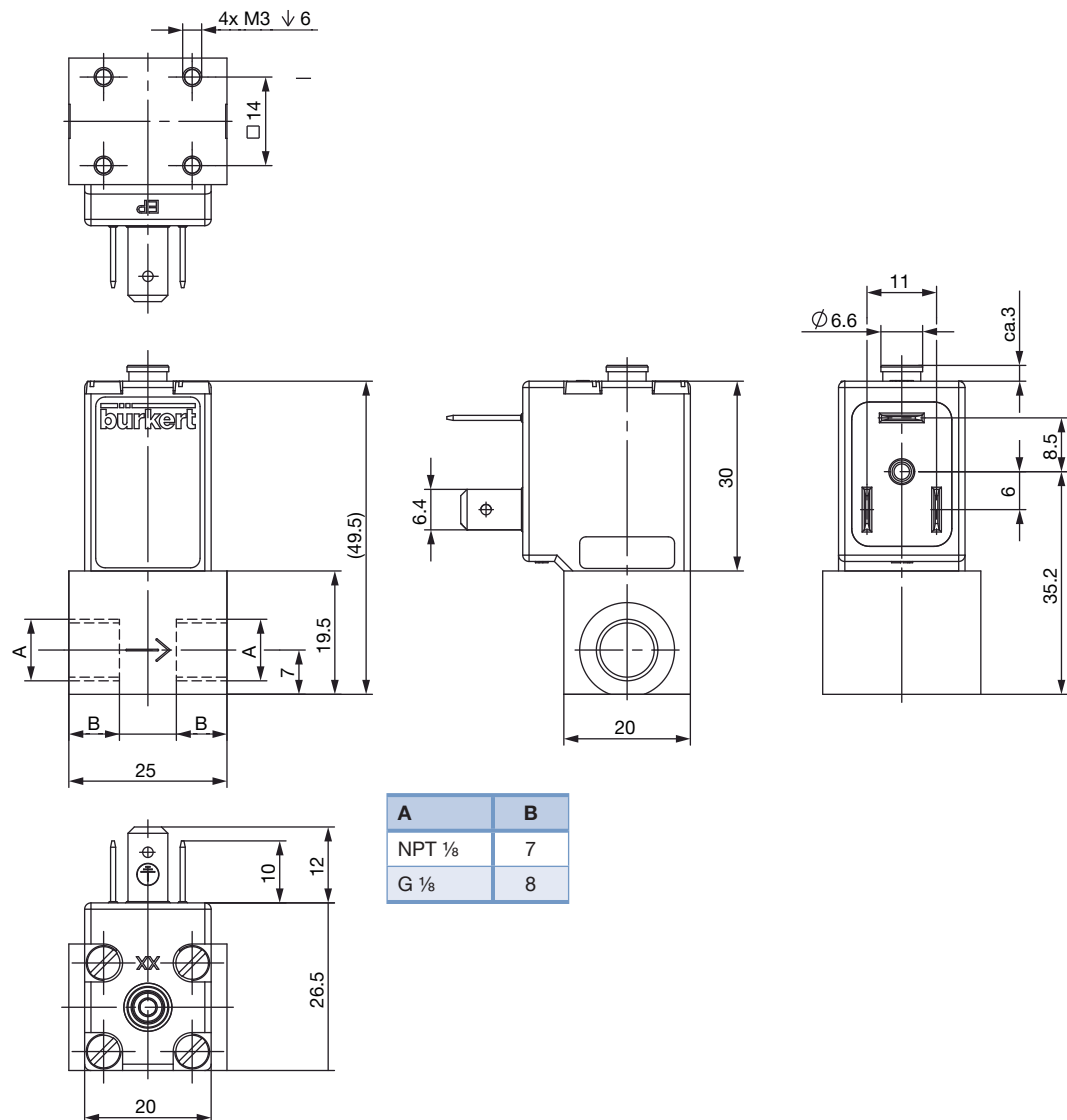
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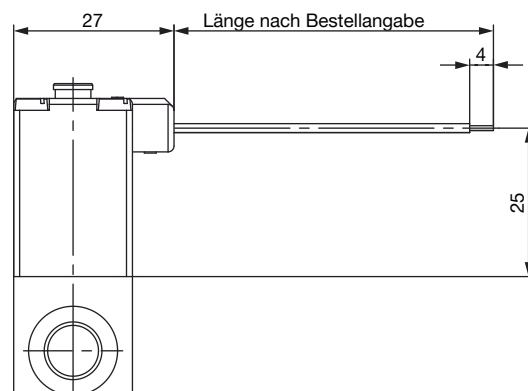
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Dimensions for threaded body version [mm]

Threaded body

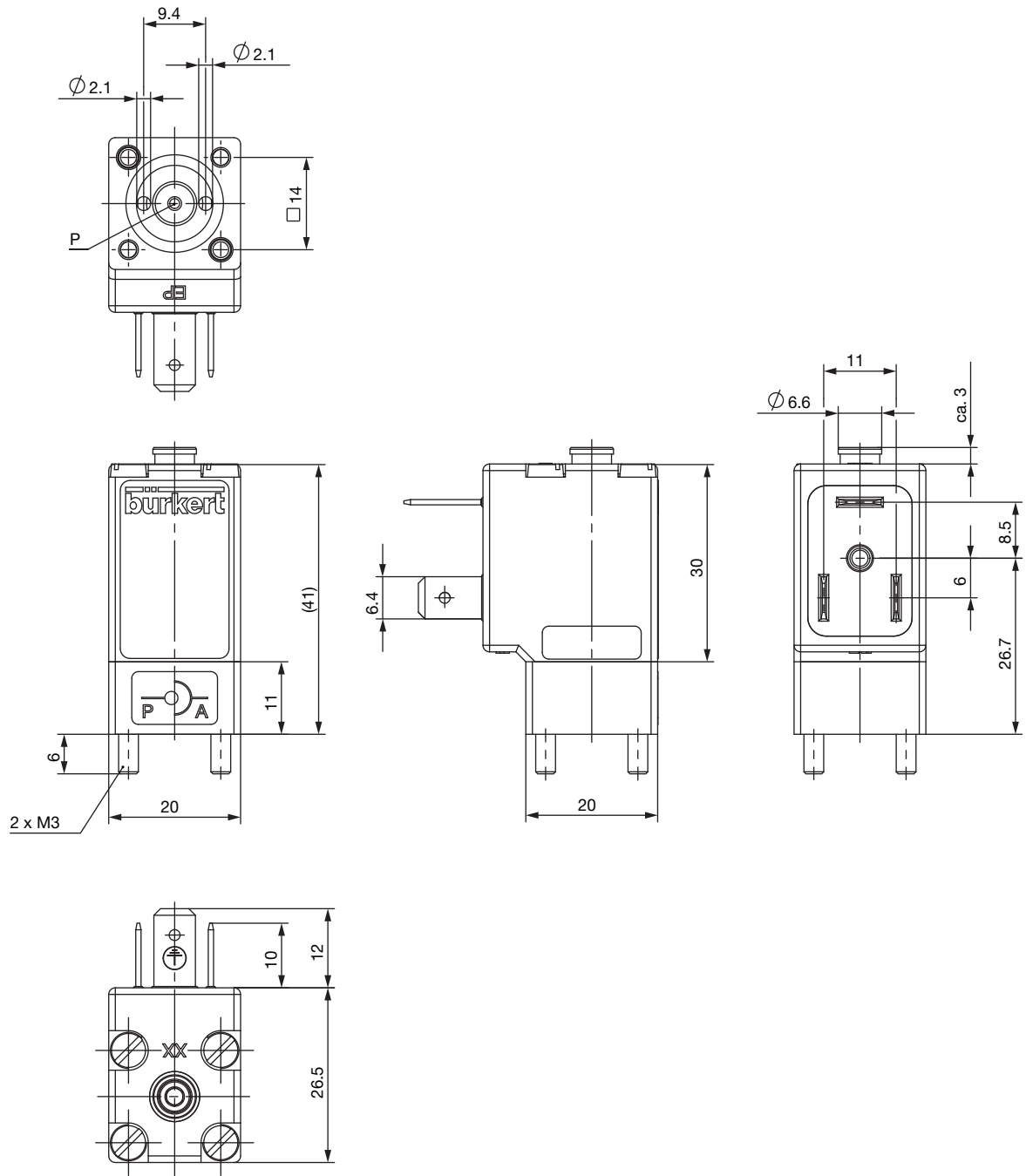


Flying leads version



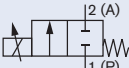
Dimensions for sub-base body version [mm]

Sub-base body



Ordering chart

All valves with FKM seals (DN0.05 and DN0.1 with PCTFE seat seal)

Circuit function	Orifice [mm]	Port connection	k_{vs} value water [m ³ /h] ⁹⁾	Nominal pressure [bar] ¹⁰⁾	Max. differential pressure [bar]	Article no. Brass	Article no. Stainless steel
	0.05	sub-base FK01	0.00006	10	10	254985 	254986 
		G 1/8	0.00006	10	10	254443 	254444 
		NPT 1/8	0.00006	10	10	254968 	254971 
	0.1	sub-base FK01	0.00025	10	10	254987 	254988 
		G 1/8	0.00025	10	10	254446 	254447 
		NPT 1/8	0.00025	10	10	254972 	254973 
	0.2	sub-base FK01	0.001	10	10	254989 	254990 
		G 1/8	0.001	10	10	254448 	254450 
		NPT 1/8	0.001	10	10	254974 	254975 
	0.3	sub-base FK01	0.002	10	10	254991 	254992 
		G 1/8	0.002	10	10	254451 	254452 
		NPT 1/8	0.002	10	10	254977 	254978 
	0.4	sub-base FK01	0.004	8	8	254993 	254994 
		G 1/8	0.004	8	8	254453 	254454 
		NPT 1/8	0.004	8	8	254979 	254980 
	0.6	sub-base FK01	0.01	6	6	254995 	254996 
		G 1/8	0.01	6	6	254455 	254457 
		NPT 1/8	0.01	6	6	254981 	254982 
	0.8	sub-base FK01	0.018	12	6	235992 	235993 
		G 1/8	0.018	12	6	235994 	235995 
		NPT 1/8	0.018	12	6	235996 	235997 
	1.0	sub-base FK01	0.027	10	5	235998 	235999 
		G 1/8	0.027	10	5	236000 	236001 
		NPT 1/8	0.027	10	5	236002 	236003 
	1.2	sub-base FK01	0.038	8	4	236004 	236260 
		G 1/8	0.038	8	4	236261 	236262 
		NPT 1/8	0.038	8	4	236263 	236264 
	1.6	sub-base FK01	0.055	6	3	236265 	236266 
		G 1/8	0.055	6	3	236267 	236268 
		NPT 1/8	0.055	6	3	236269 	236270 
	2.0	sub-base FK01	0.090	3	1.5	236271 	236272 
		G 1/8	0.090	3	1.5	236273 	236274 
		NPT 1/8	0.090	3	1.5	236275 	236276 

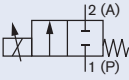
⁹⁾ k_{vs} value: Flow rate value for water, measured at +20 °C and 1 bar pressure differential over a fully opened valve.

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 possible."

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

Ordering chart - variants with approvals

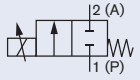
All valves with FKM seals (DN0.05 and DN0.1 with PCTFE seat seal)

Circuit function	Orifice [mm]	Approvals ¹¹⁾	Port connection ¹²⁾	k _{vs} value water [m³/h]	Nominal pressure [bar]	Max. differential pressure [bar]	Article no. Brass	Article no. Stainless steel
	0.05	UR	G 1/8	0.00006	10	10	274900 	274904 
			NPT 1/8	0.00006	10	10	274901 	274905 
	0.1	UR	G 1/8	0.00025	10	10	274902 	274906 
			NPT 1/8	0.00025	10	10	274903 	274907 
	0.2	UR	G 1/8	0.001	10	10	274908 	274926 
			NPT 1/8	0.001	10	10	274909 	274927 
	0.3	UR	G 1/8	0.002	10	10	274910 	274928 
			NPT 1/8	0.002	10	10	274911 	274929 
	0.4	UR	G 1/8	0.004	8	8	274912 	274930 
			NPT 1/8	0.004	8	8	274913 	274931 
	0.6	UR	G 1/8	0.01	6	6	274914 	274932 
			NPT 1/8	0.01	6	6	274915 	274933 
	0.8	UR	G 1/8	0.018	12	6	274916 	274934 
			NPT 1/8	0.018	12	6	274917 	274935 
	1.0	UR	G 1/8	0.027	10	5	274918 	274936 
			NPT 1/8	0.027	10	5	274919 	274937 
	1.2	UR	G 1/8	0.038	8	4	274920 	274938 
			NPT 1/8	0.038	8	4	274921 	274939 
	1.6	UR	G 1/8	0.055	6	3	274922 	274940 
			NPT 1/8	0.055	6	3	274923 	274941 
	2.0	UR	G 1/8	0.090	3	1.5	274924 	274942 
			NPT 1/8	0.090	3	1.5	274925 	274943 

¹¹⁾ Approvals: UR (UL recognized)¹²⁾ Port connection: others on request.**Note:** Delivered without electronic control, Type 8605 and cableplug (see ordering table for accessories).

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]	Article no. Brass	Article no. Stainless steel
 A	0.8		G 1/8	0.018	12	238928	238930
		UR	G 1/8	0.018	12	275025	275030
	1.0		G 1/8	0.027	10	238936	238931
		UR	G 1/8	0.027	10	275026	275031
	1.2		G 1/8	0.038	8	238937	238932
		UR	G 1/8	0.038	8	275027	275032
	1.6		G 1/8	0.055	6	238939	238933
		UR	G 1/8	0.055	6	275028	275033
	2.0		G 1/8	0.090	3	238940	238934
		UR	G 1/8	0.090	3	275029	275034

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.

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	Article no.
Without circuitry	0 ... 250 V AC/DC	423845

Control electronics, 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 300 mm



Approvals

UR (UL recognized)

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)	$p_{1 max} =$	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 6.0 mm
32 mm coil width



Type 2875
Orifice 2.0 to 9.5 mm
49 mm coil width

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