

Direct acting 2-way basic proportional valve



Type 2863 can be combined with...



Type 8605
Digital control electronics DIN-rail version



Type 2508
Cable plug

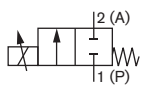


Type 8611
Universal controller



Type 2863 is an extremely compact solenoid control valve and is available with an orifice up to 4mm. It is based on the standard version of Type 2873. 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.

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.

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.

- High dynamics
- Orifice sizes DN 0.8 ... 4.0 mm
- Good range
- Optional: Explosion-protected coil

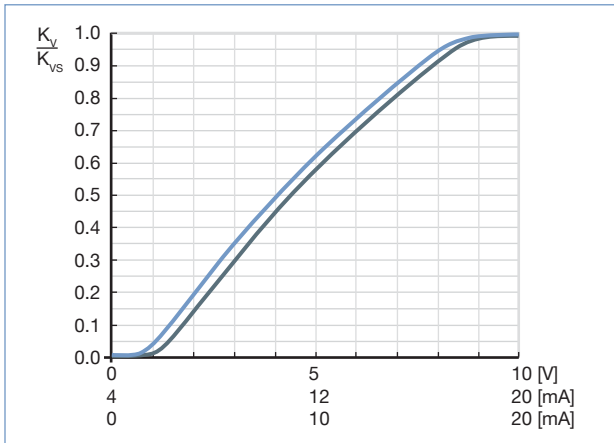
Technical Data - Valve	
Body material	Brass, stainless steel
Seal material	FKM, EPDM on request
Medium	Neutral gases, liquids on request
Pressure range	0 ... - 16 bar ²⁾
Medium temperature	- 10 ... + 90 °C
Ambient temperature	max. + 55 °C
Power supply	24 V DC
Max. current	420 mA (at 24 V hold)
Power consumption	9 W
Duty cycle	100 % continuously rated
PWM control frequency	400 Hz
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, Form A industrial standard Article no. 008376
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 data [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 $p_2 > \frac{p_1}{2}$	$= Q \sqrt{\frac{\rho}{1000 \Delta p}}$	$= \frac{Q_N}{514} \sqrt{\frac{T_1 \rho_N}{p_2 \rho}}$
Supercritical $p_2 < \frac{p_1}{2}$	$= Q \sqrt{\frac{\rho}{1000 \Delta p}}$	$= \frac{Q_N}{257 p_1} \sqrt{T_1 \rho_N}$

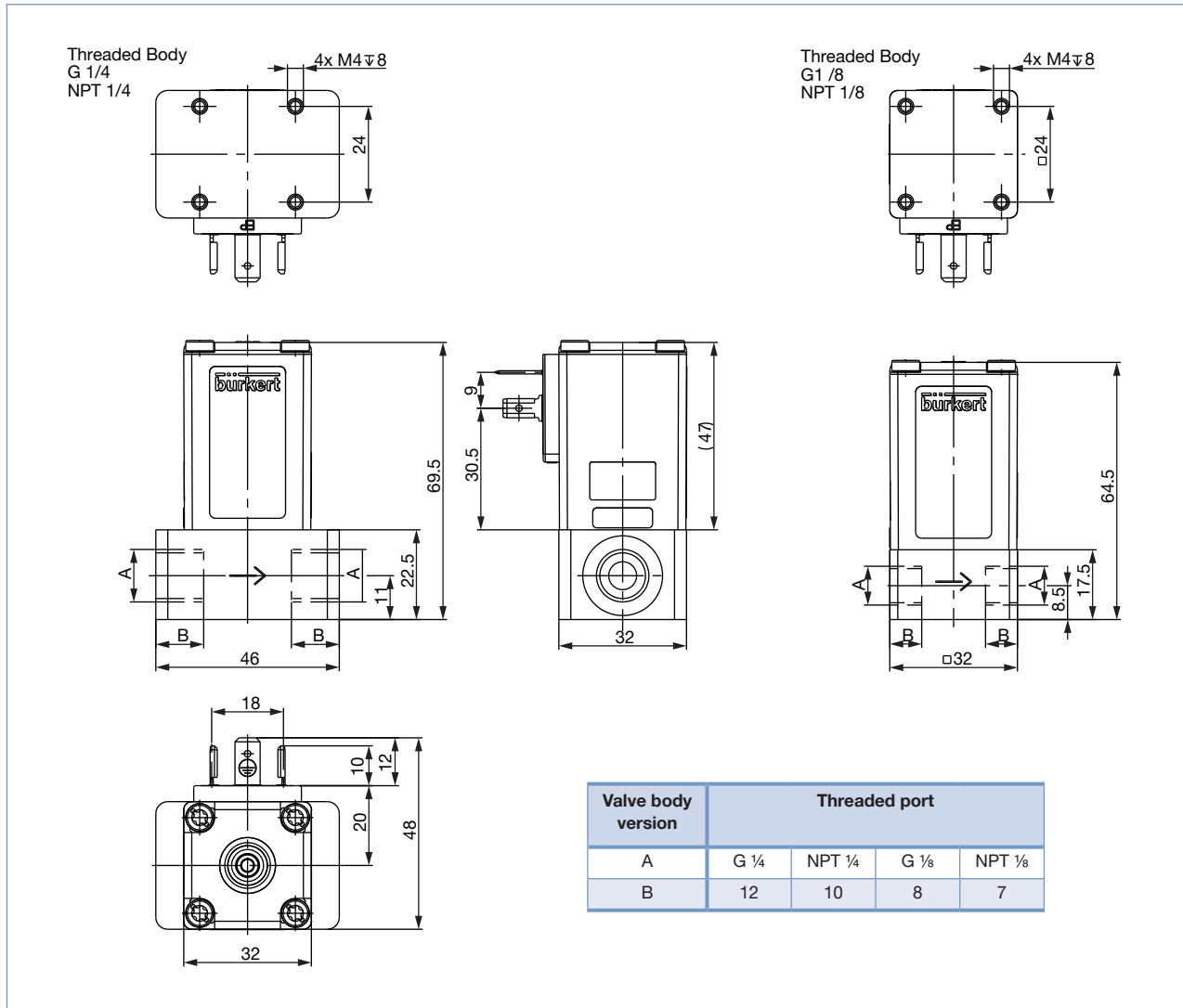
- k_v Flow coefficient [m³/h]⁴⁾
- Q_N Standard flow rate [m³/h]⁵⁾
- p_1 Inlet pressure [bar]⁶⁾
- p_2 Outlet pressure [bar]⁶⁾
- Δp Differential pressure $p_1 - p_2$ [bar]
- ρ Density [kg/m³]
- ρ_N Standard density [kg/m³]
- T_1 Medium temperature [(273+t)K]

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

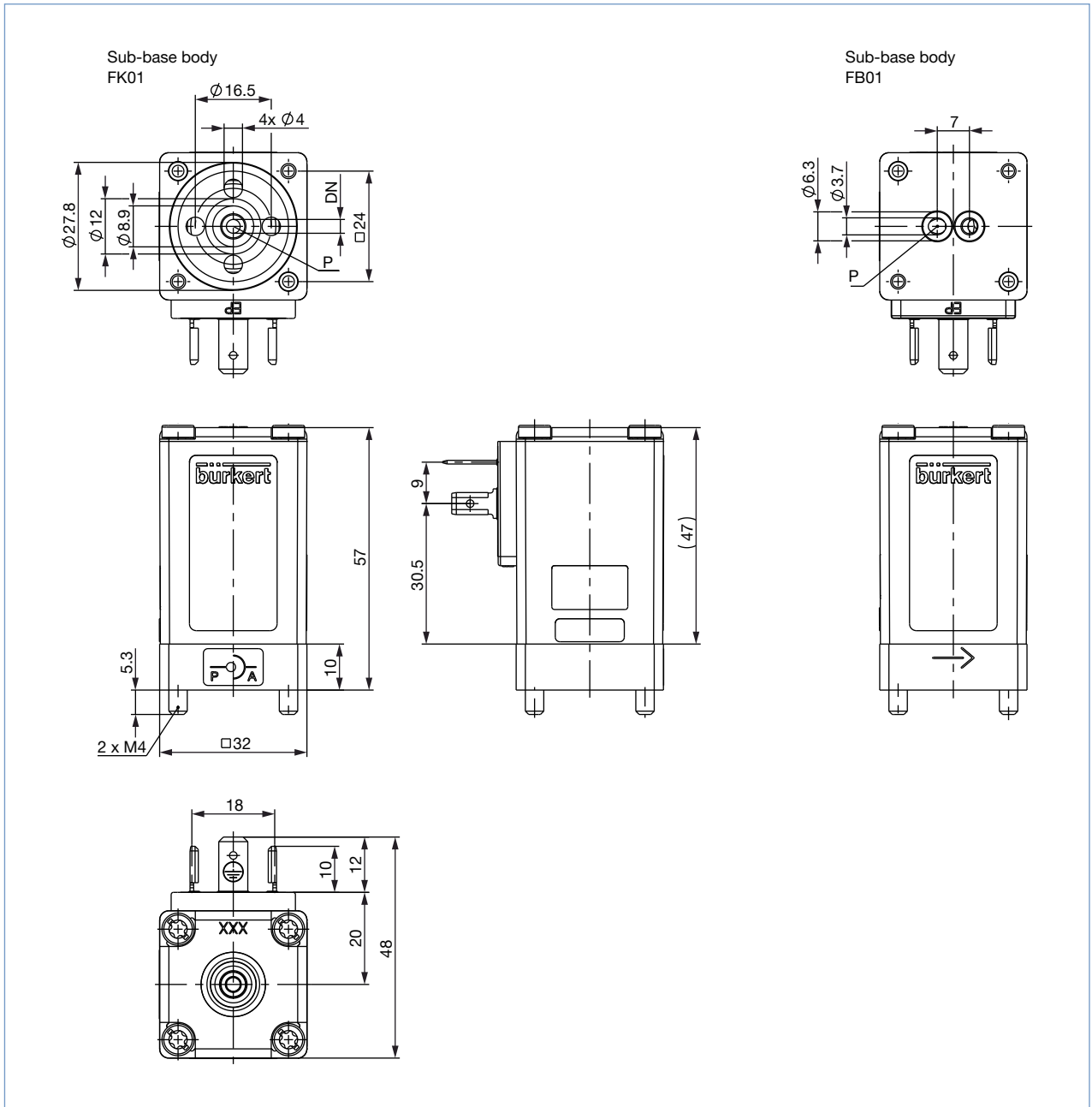
⁵⁾ Standard conditions at 1.013 bar⁶⁾ and 0 °C (273K)

⁶⁾ Absolute pressure

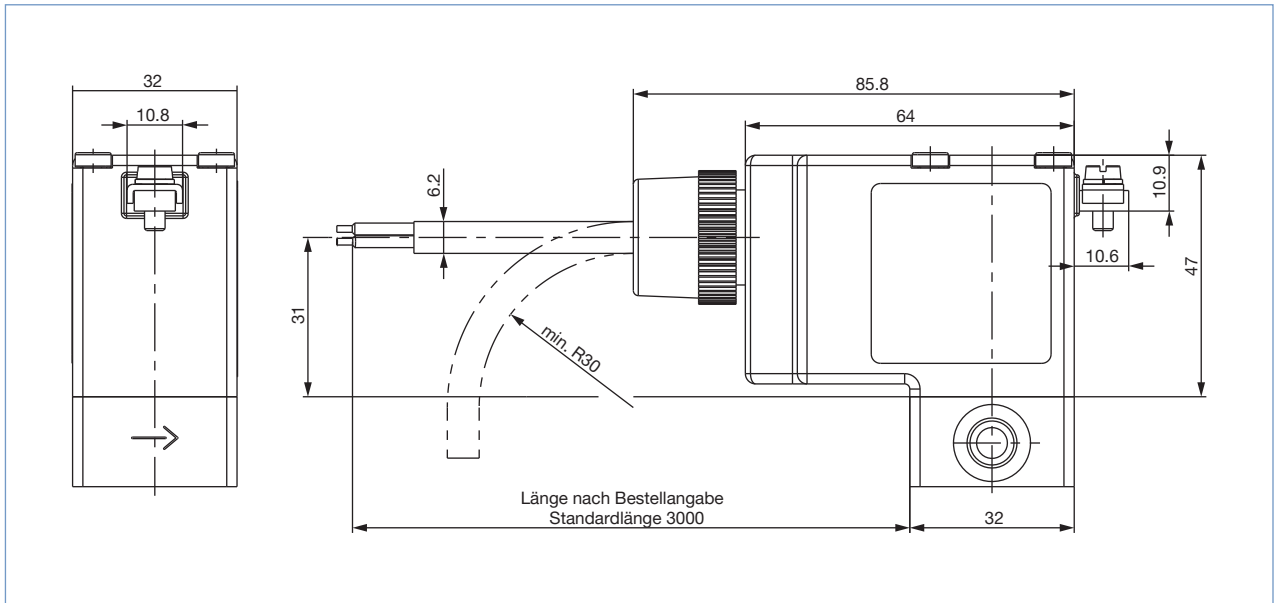
Dimensions [mm] - Threaded body



Dimensions [mm] - Sub-base body

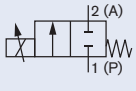


Dimensions [mm] - ATEX



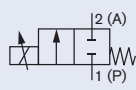
Ordering chart

All valves with FKM seal

Circuit function	Orifice [mm]	Port connection	k_{vs} value water [m ³ /h] ⁷⁾	Q_{Nn} value [l/min] ⁸⁾	Nominal pressure [bar] ⁹⁾	Article no. brass	Article no. stainless steel
	0.8	G 1/8	0.018	19	16	275060	275063
	1.2	G 1/8	0.040	43	12	249140	275064
	1.5	G 1/8	0.060	65	10	249141	275065
	2.0	G 1/8	0.100	108	8	254182	275066
			0.100	108	8	255699	276517
	2.5	G 1/4	0.150	162	5	275061	275067
	3.0	G 1/4	0.220	237	3.5	275062	275068
	4.0	G 1/4	0.320	345	2	251831	255700

Ordering chart - variants with ATEX / IECEx¹¹⁾

All valves with FKM seal

Circuit function	Orifice [mm]	Port connection ⁷⁾	k_{vs} value water [m ³ /h] ⁸⁾	Q_{Nn} value [l/min] ⁹⁾	Nominal pressure [bar] ¹⁰⁾	Article no. brass	Article no. stainless steel
	0.8	G 1/8	0.018	19	8	343042	on request
	1.2	G 1/8	0.040	43	6	343044	on request
	1.5	G 1/8	0.060	65	6	337721	on request
	2.0	G 1/8	0.100	108	6	310840	on request
	2.5	G 1/4	0.150	162	2.5	343045	on request
	3.0	G 1/4	0.220	237	2	343047	on request
	4.0	G 1/4	0.320	345	1	343049	on request

⁷⁾ Port connection: NPT and sub-base on request

⁸⁾ k_{vs} value: Flow rate value for water, measured at +20 °C and 1 bar pressure differential over a fully opened valve.

⁹⁾ Q_{Nn} value: Flow rate for air with inlet pressure of 6 bar, 1 bar pressure differential and +20 °C.

¹⁰⁾ Pressure data [bar]: Overpressure with respect to atmospheric pressure.

¹¹⁾ Approvals:

ATEX – II 2 G Ex mb IIC T4...T5 Gb, II 2 D Ex mb IIIC T130°C Db

IECEx – Ex mb IIC T4...T5 Gb, Ex mb IIIC T130°C Db

Please use page 4 of this datasheet to inquire about your individual requirements

Further versions on request



Materials

Other seal materials



Analytical

Oxygen version

Parts oil-, fat- and silicon free



Coil

Specific, power setting for lower pressure

Other operating voltages



Valve armature

Special valve orifice



Approvals

ATEX/IECEx

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) $p_{1 max} =$	<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="text"/>
<input type="checkbox"/> Seal material	<input type="checkbox"/> FKM	<input type="checkbox"/> other <input type="text"/>

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

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