

Direct-acting 2-way basic proportional valve



- High dynamics
- Orifice sizes DN2 ... 8 mm
- Good range
- Optional: Explosion-protected coil

Type 2865 can be combined with...



Type 8605
Digital control electronics DIN-rail version



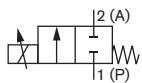
Type 2508
Cable plug



Type 8611
Universal controller

Type 2865 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 2875. 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.

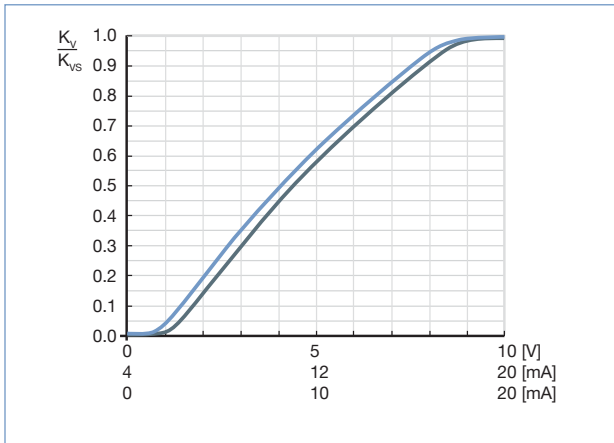
Technical Data - Valve	
Body material	Brass, stainless steel
Seal material	FKM, EPDM on request
Medium	Neutral gases, liquids on request
Pressure range	0 ... - 25 bar ²⁾
Medium temperature	- 10 ... +90 °C
Ambient temperature	max. +55 °C
Power supply	24 V DC
Max. current	750 mA (at 24 V hold)
Power consumption	16 W
Duty cycle	100 % continuously rated
PWM control frequency	280 Hz
Port connection	3/8", 1/2" others 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

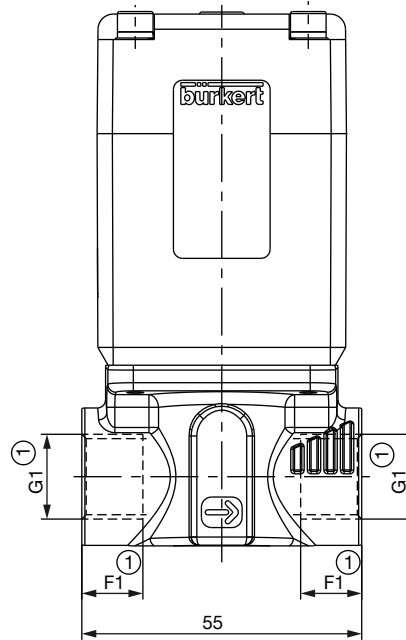
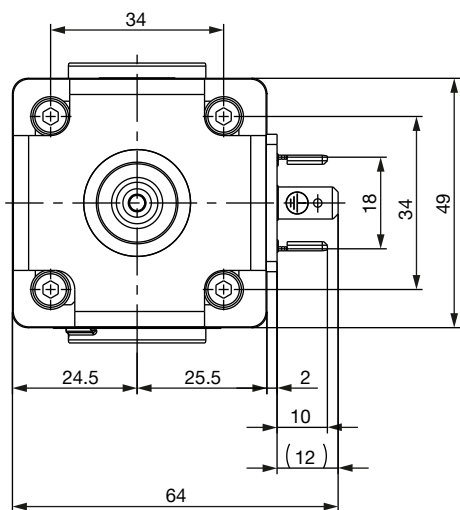
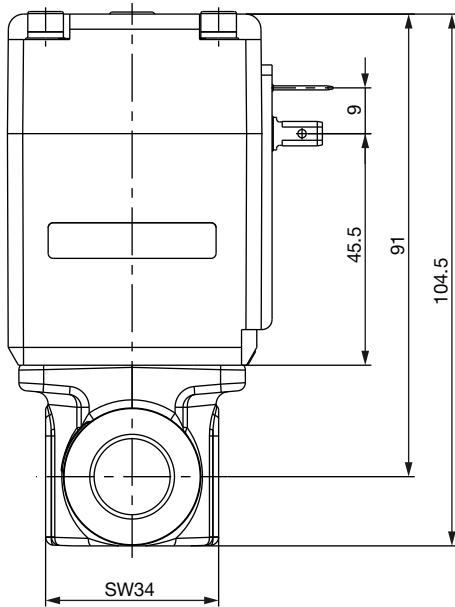
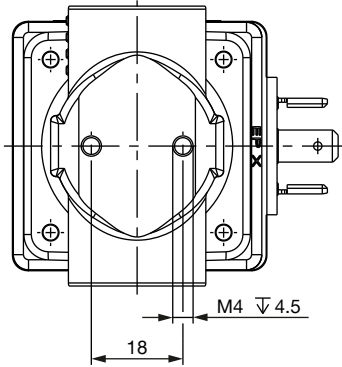
Pressure drop	k_v value for liquids [m ³ /h]	k_v value for gases [m ³ /h]
Subcritical $p_2 > \frac{p_1}{2}$	$= Q \sqrt{\frac{\rho}{1000 \Delta p}}$	$= \frac{Q_N}{514} \sqrt{\frac{T_1 \rho_N}{p_2 p}}$
Supercritical $p_2 < \frac{p_1}{2}$	$= Q \sqrt{\frac{\rho}{1000 \Delta p}}$	$= \frac{Q_N}{257 p_1} \sqrt{T_1 \rho_N}$

- k_v Flow coefficient [m³/h]⁴⁾
- Q_N Standard flow rate [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 bar³⁾ and 0 °C (273K)
⁶⁾ Absolute pressure

Dimensions [mm] - standard version

Threaded version

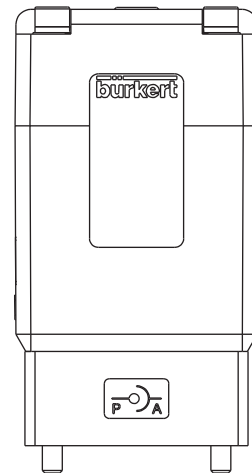
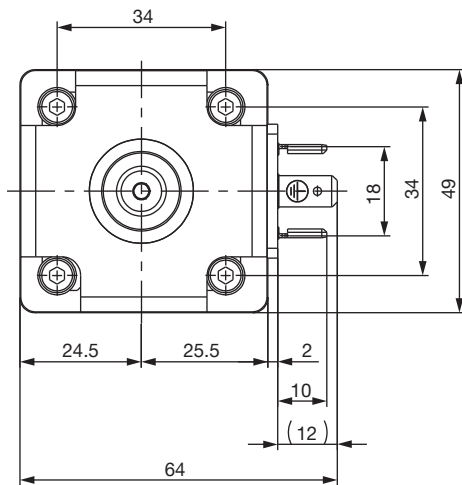
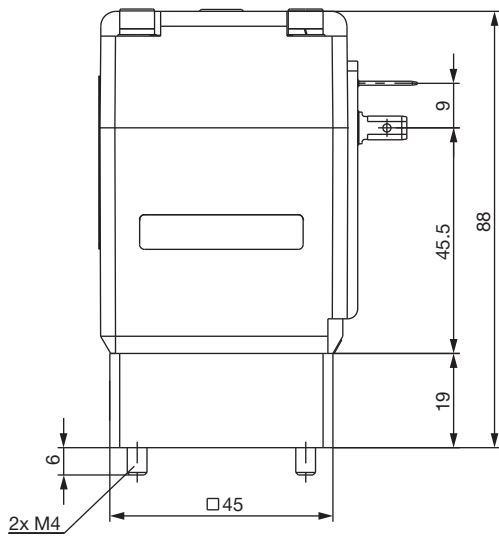
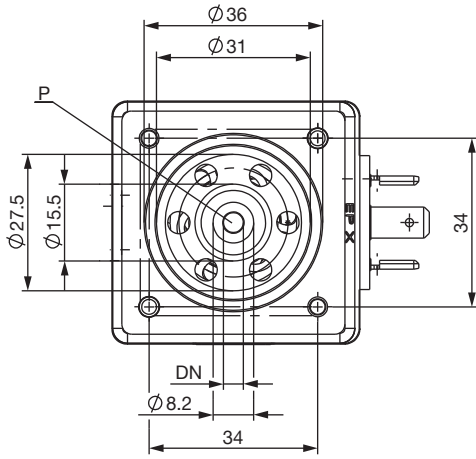


① For G threads the mass
F1 and D1 apply
For NPT threads the mass
F2 and D2 apply

Version	F1	G1	F2	G2
Thread	12	G 3/8	10.3	NPT 3/8
	14	G 1/2	13.7	NPT 1/2

Dimensions [mm] - standard version

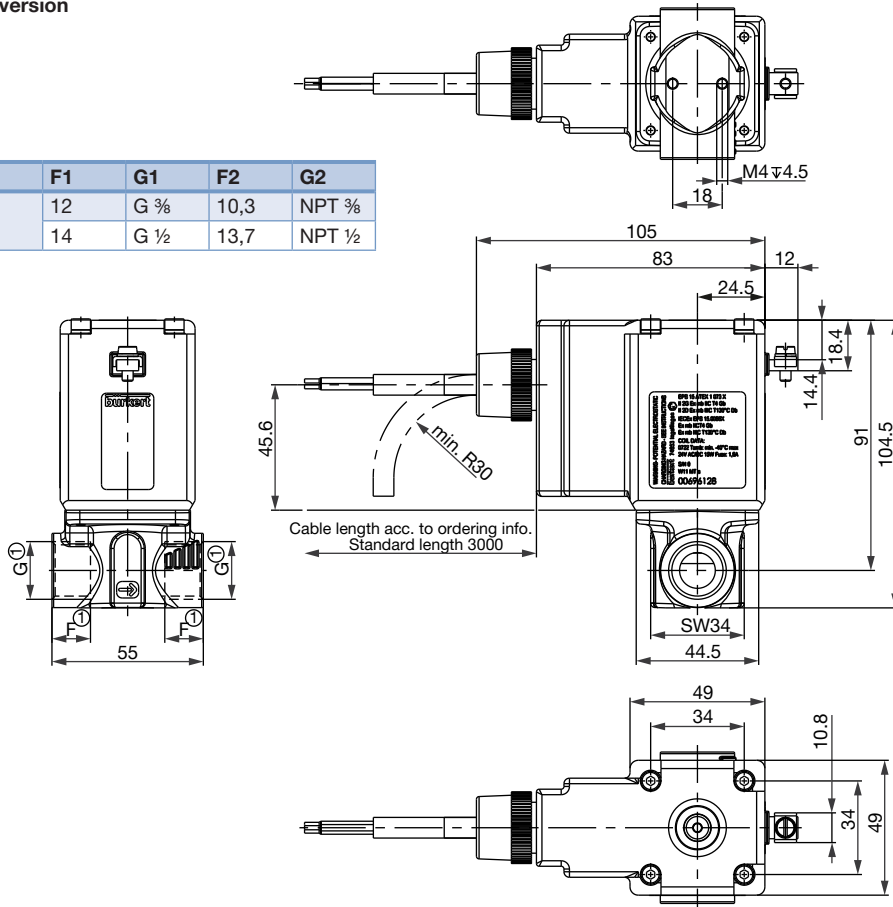
Subbase version



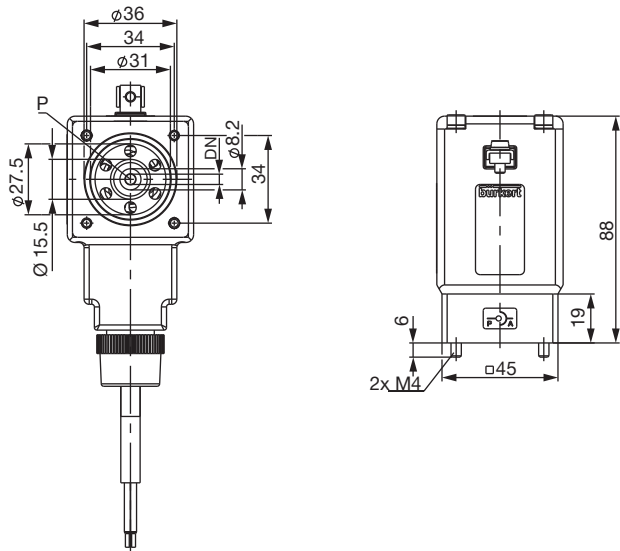
Dimensions [mm] - ATEX version

Threaded version

Version	F1	G1	F2	G2
Thread	12	G 3/8	10,3	NPT 3/8
	14	G 1/2	13,7	NPT 1/2

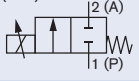


Subbase version



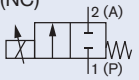
Ordering chart

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
A 2/2 way normally closed (NC) 	2	G 3/8	0.12	129	25	275058	250669
	3	G 3/8	0.25	270	10	256811	249133
	4	G 3/8	0.45	485	8	249264	250213
		G 1/2	0.45	485	8	242298	247295
	6	G 1/2	0.80	862	4	242435	247294
	8	G 1/2	1.10	1186	2	250089	275059

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
A 2/2 way normally closed (NC) 	2	G 3/8	0.12	129	20	291478	on request
	3	G 3/8	0.25	270	9	291479	on request
	4	G 3/8	0.45	485	7	291480	on request
		G 1/2	0.80	862	3,5	291460	on request
	6	G 1/2	1.10	1186	1,5	291482	on request
	8	G 1/2	1.10	1186	1,5	291482	on request

⁷⁾ Port connection: NPT and flange 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.

¹⁰⁾ Pressure specification [bar]: Overpressure to atmospheric pressure


¹¹⁾ Approvals:


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


IECEx - Ex mb IIC T4 Gb ; Ex mb IIIC T130°C Db


Please use page 7 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 settings 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
PLZ-Ort	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 other _____

Seal material FKM other _____

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

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