DATA SHEET

Type 2871

bürkert
FLUID CONTROL SYSTEMS

Direct-acting 2-way standard solenoid control valve

- Excellent range
- Very good response
- Compact valve design
- Orifice sizes 0.05…2.0 mm
- Port connection ⅛” or sub-base

Product variants described in the data sheet may differ from the product presentation and description.

Can be combined with

Type 8605 ▸
PWM Control Electronics for Solenoid Control Valves

Type 2507 ▸
Cable plug - industry standard - connector shape B

Type 8611 ▸
eCONTROL - Universal controller

Type description

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.).

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Visit product website ▸

Table of contents

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1. General Technical Data

Product properties	
Dimensions	Detailed information can be found in chapter "5. Dimensions" on page 5.
Material	
Body	Brass, stainless steel
Seal	FKM, EPDM
Performance data	
Typical values of positioning behaviour[1.)]	
Hysteresis	< 5 %
Repeatability	< 0.25 % v. E.[2.)]
Response sensitivity	< 0.25 % v. E.[2.)] – < 0.1 % v. E.[2.)] bei DN < 0.8 mm
Setting range	1:200: DN 0.8…2 1:500: DN 0.05…0.6
Actuating time (10…90 %)	< 15 ms
Pressure range[3.)]	0…12 bar (also applicable for technical vacuum)
Nominal operating mode	100 % continuous operation
Electrical data	
Operating voltage	24 V DC (12 V on request)
Power consumption	Maximum 5 W
Maximum coil current[4.)]	220 mA (at 5 W and 24 V coil)
PWM frequency[5.)]	1500 Hz
Medium data	
Operating medium	Neutral gases, liquids on request
Medium temperature	-10 °C…+90 °C (with FKM) -30 °C…+90 °C (with EPDM)
Viscosity	Maximum 21 mm^2/s (21 cSt)
Process/Port connection & communication	
Port connection size	Sub-base, G ⅛, NPT ⅛
Electrical connection	Cable plug Type 2507 acc. to DIN EN 175301-803 - form B Detailed information can be found in chapter "Cable plug Type 2507, Form B" on page 12.
Approvals and certificates	
Degree of protection	IP65
Environment and installation	
Installation position	Any, preferably actuator face up
Ambient temperature	Maximum +55 °C

1.) Characteristic data of control behaviour depends on process conditions

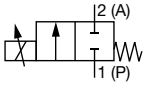
2.) By flow measurement

3.) Pressure data: Overpressure with respect to atmospheric pressure, depending on nominal diameter, tightness seal or nominal pressure

4.) Maximum value: value depends on operating pressure

5.) PWM: pulse width modulation

2. Circuit functions

Circuit functions	Description
	**Type: A, proportional control valve** 2/2 way Direct-acting Normally closed

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3. Approvals

Note:

- The following approvals or conformity certificates must be mentioned in all enquiries. This is the only way to ensure that the product fulfils all the required specifications.
- Not all available device versions can be delivered with the below-mentioned approvals or conformities.

Approvals	Description
	UL recognized
	Conformity of all materials in contact with the medium USP Class VI chapter „87 in vitro“ and „88 in vivo, Implantation“
	Conformity of all materials in contact with the medium FDA – Code of Federal Regulations Title 21 Paragraph 177 (CFR 21 177.2600)
	Conformity of all materials in contact with the medium Regulation (EC) No. 1935/2004 on materials and articles intended to come into contact with food

4. Materials

4.1. Chemical Resistance Chart – Bürkert resistApp

Bürkert resistApp – Chemical Resistance Chart

You want to ensure the reliability and durability of the materials in your individual application case? Verify your combination of media and materials on our website or in our resistApp.

Start Chemical Resistance Check

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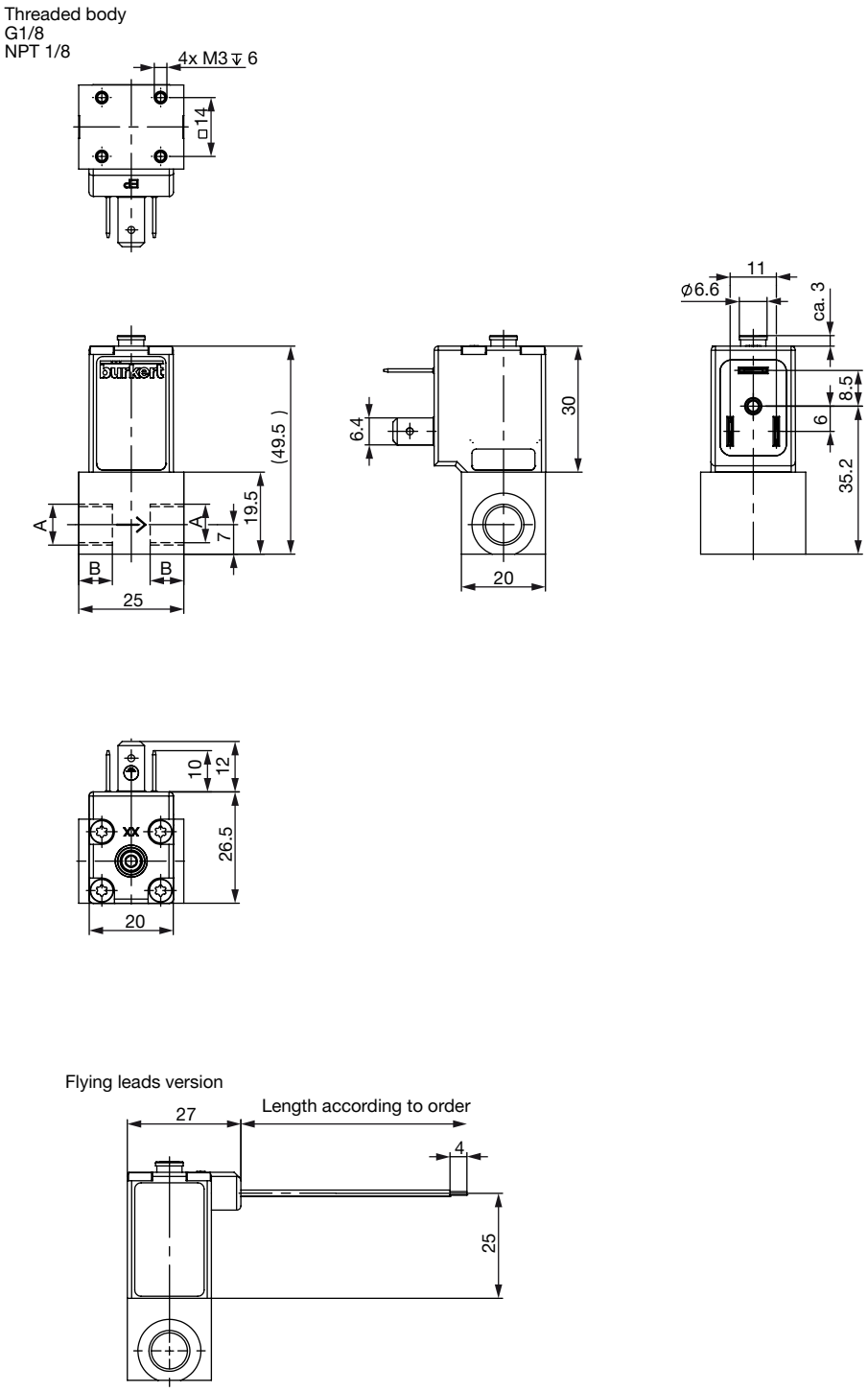
5. Dimensions

5.1. Threaded body

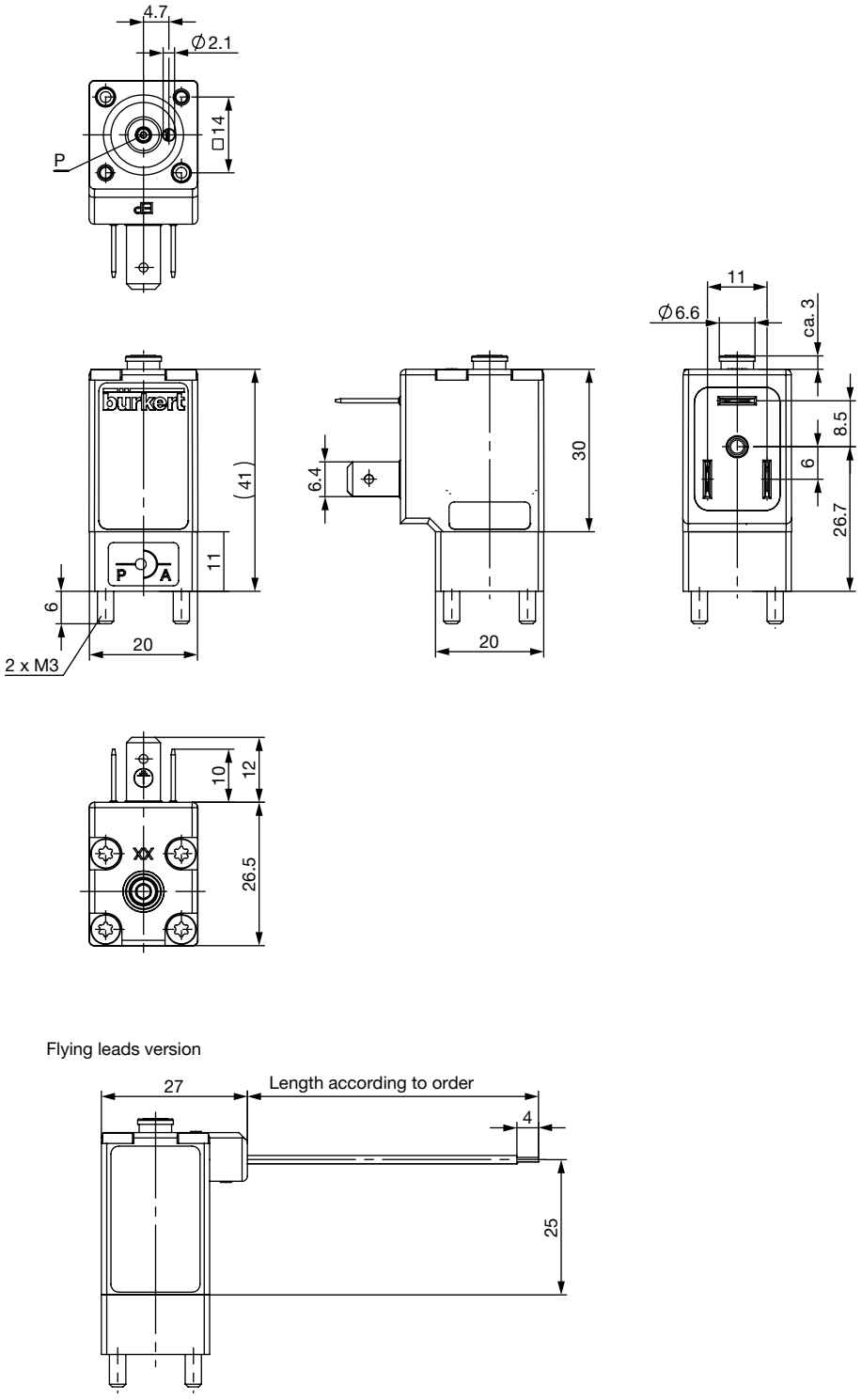
Note:
Dimensions in mm



Body version	Threaded body	
A	G ⅛	NPT ⅛
B	8	7

5.2. Sub-base body for DN up to 0.4 mm

Note:
Dimensions in mm



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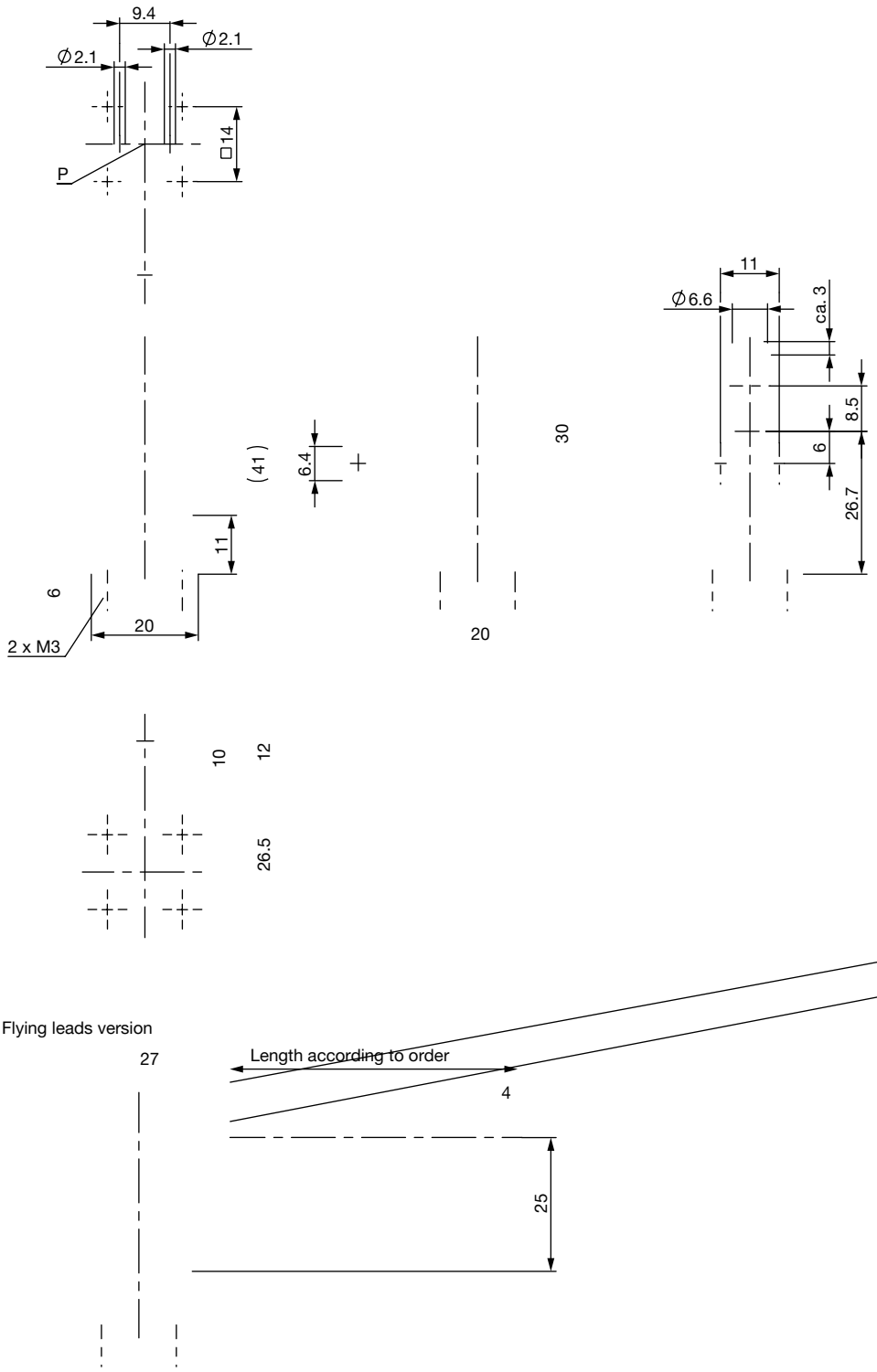
5.3. Sub-base body for DN from 0.6 mm

Note:
Dimensions in mm



6. Performance specifications

6.1. Flow characteristic

Determination of the K_V value

Pressure drop	K_V value for liquids [m^3/h]	K_V value for gases [m^3/h]
Sub-critical $p_2 > \frac{p_1}{2}$	$= Q\sqrt{\frac{\rho}{1000\,\Delta p}}$	$= \frac{Q_N}{514}\sqrt{\frac{T_1\,\rho_N}{p_2\,\Delta p}}$
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][1.)]
Q_N	Standard flow rate	[m_N^3/h][2.)]
p_1	Inlet pressure	[bar][3.)]
p_2	Outlet pressure	[bar][3.)]
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]

1.) Measured for water, Δp = 1 bar, over the value

2.) At reference conditions 1.013 bar and 0 °C (273 K)

3.) Absolute pressure

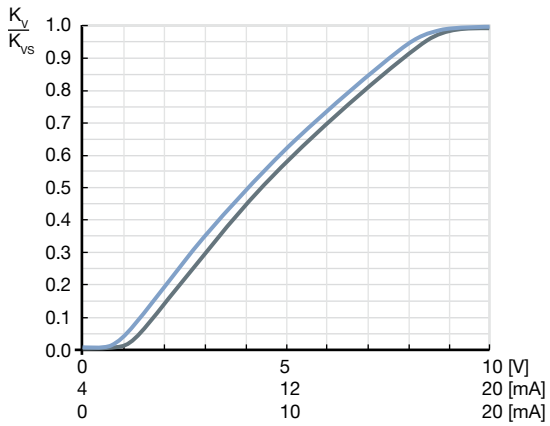
6.2. Exemplary characteristic curve of a proportional valve

Note:
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: $\Delta p_{valve} > 25\,\%$ 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 discontinuities may occur.
For that reason take advantage of Bürkert competent engineering services during the planning phase!



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7. Product operation

7.1. Control unit

Valve control takes place through a PWM signal (pulse-width modulation). 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 data sheet **Type 8605** ▶) converts an analogue 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 in chapter "6.2. Exemplary characteristic curve of a proportional valve" on page 8.

8. Ordering information

8.1. Bürkert eShop – Easy ordering and quick delivery

Bürkert eShop – Easy ordering and fast delivery

You want to find your desired Bürkert product or spare part quickly and order directly? Our online shop is available for you 24/7. Sign up and enjoy all the benefits.

Order online now

8.2. Recommendation regarding product selection

Note:

- Please use the **Product Inquiry Form** at the end of this data sheet for the specifications of the device configuration and send us a copy of the inquiry with information about the application.
- Please note the chapter "6.2. Exemplary characteristic curve of a proportional valve" on page 8 on product selection.

8.3. Bürkert product filter

Bürkert product filter – Get quickly to the right product

You want to select products comfortably based on your technical requirements? Use the Bürkert product filter and find suitable articles for your application quickly and easily.

Try out our product filter

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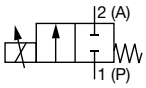
8.4. Ordering chart

Standard version

Note:

- All valves with FKM seal
- DN 0.05 and DN 0.1 with PCTFE seat seal
- Please note that the cable plug must be ordered separately, see "Cable plug Type 2507, Form B" on page 12 or separate data sheet for **Type 2507** ▶.

Circuit function	Orifice	Port connection	K_{VS}-value water[1.]	Nominal pressure[2.]	Maximum differential pressure	Article no. brass body	Article no. stainless steel body
	[mm]		[m³/h]	[bar]	[bar]		
A, proportional control valve 2/2 way Direct-acting Normally closed  	0.05	Sub-base FK01	0.00006	10	10	254985	254986
		G ⅛	0.00006	10	10	254443	254444
		NPT ⅛	0.00006	10	10	254968	254971
	0.1	Sub-base FK01	0.00025	10	10	254987	254988
		G ⅛	0.00025	10	10	254446	254447
		NPT ⅛	0.00025	10	10	254972	254973
	0.2	Sub-base FK01	0.001	10	10	254989	254990
		G ⅛	0.001	10	10	254448	254450
		NPT ⅛	0.001	10	10	254974	254975
	0.3	Sub-base FK01	0.002	10	10	254991	254992
		G ⅛	0.002	10	10	254451	254452
		NPT ⅛	0.002	10	10	254977	254978
	0.4	Sub-base FK01	0.004	8	8	254993	254994
		G ⅛	0.004	8	8	254453	254454
		NPT ⅛	0.004	8	8	254979	254980
	0.6	Sub-base FK01	0.01	6	6	254995	254996
		G ⅛	0.01	6	6	254455	254457
		NPT ⅛	0.01	6	6	254981	254982
	0.8	Sub-base FK01	0.018	12	6	235992	235993
		G ⅛	0.018	12	6	235994	235995
		NPT ⅛	0.018	12	6	235996	235997
	1.0	Sub-base FK01	0.027	10	5	235998	235999
		G ⅛	0.027	10	5	236000	236001
		NPT ⅛	0.027	10	5	236002	236003
	1.2	Sub-base FK01	0.038	8	4	236004	236260
		G ⅛	0.038	8	4	236261	236262
		NPT ⅛	0.038	8	4	236263	236264
	1.6	Sub-base FK01	0.055	6	3	236265	236266
		G ⅛	0.055	6	3	236267	236268
		NPT ⅛	0.055	6	3	236269	236270
	2.0	Sub-base FK01	0.090	3	1.5	236271	236272
		G ⅛	0.090	3	1.5	236273	236274
		NPT ⅛	0.090	3	1.5	236275	236276

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

2.) Pressure data: 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."

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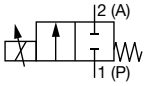
Version with approvals

Note:

- All valves with FKM seal
- DN 0.05 and DN 0.1 with PCTFE seat seal
- Please note that the cable plug must be ordered separately, see "Cable plug Type 2507, Form B" on page 12 or separate data sheet for **Type 2507** ▶.
- For detailed information regarding the approval UR (UL recognized) see "3. Approvals" on page 4.

Circuit function	Orifice	Port connection[1.)]	Approvals	K_{VS}-value water	Nominal pressure[2.)]	Maximum differential pressure	Article no. brass body	Article no. stainless steel body
	[mm]			[m³/h]	[bar]	[bar]		
A, proportional control valve 2/2 way Direct-acting Normally closed  	0.05	G ⅛	UR	0.00006	10	10	274900	274904
		NPT ⅛		0.00006	10	10	274901	274905
	0.1	G ⅛	UR	0.00025	10	10	274902	274906
		NPT ⅛		0.00025	10	10	274903	274907
	0.2	G ⅛	UR	0.001	10	10	274908	274926
		NPT ⅛		0.001	10	10	274909	274927
	0.3	G ⅛	UR	0.002	10	10	274910	274928
		NPT ⅛		0.002	10	10	274911	274929
	0.4	G ⅛	UR	0.004	8	8	274912	274930
		NPT ⅛		0.004	8	8	274913	274931
	0.6	G ⅛	UR	0.01	6	6	274914	274932
		NPT ⅛		0.01	6	6	274915	274933
	0.8	G ⅛	UR	0.018	12	6	274916	274934
		NPT ⅛		0.018	12	6	274917	274935
	1.0	G ⅛	UR	0.027	10	5	274918	274936
		NPT ⅛		0.027	10	5	274919	274937
	1.2	G ⅛	UR	0.038	8	4	274920	274938
		NPT ⅛		0.038	8	4	274921	274939
	1.6	G ⅛	UR	0.055	6	3	274922	274940
		NPT ⅛		0.055	6	3	274923	274941
	2.0	G ⅛	UR	0.090	3	1.5	274924	274942
		NPT ⅛		0.090	3	1.5	274925	274943

1.) Port connection: others on request

2.) UR (UL recognized)

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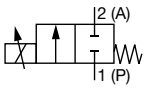
Version for higher differential pressures

Note:

- All valves with FKM seal
- Other connection variations (Sub-base, NPT) on request
- Please note that the cable plug must be ordered separately, see "Cable plug Type 2507, Form B" on page 12 or separate data sheet for **Type 2507**.
- PWM frequency: 1000 Hz
- Span: 1:100

Circuit function	Orifice [mm]	Port connection	Approvals	K_{VS}-value water [m^3/h]	Nominal pressure [bar]	Article no. brass body	Article no. stainless steel body
A, proportional control valve 2/2 way Direct-acting Normally closed 	0.8	G ⅛		0.018	12	238928	238930
		G ⅛	UR	0.018	12	275025	275030
	1.0	G ⅛		0.027	10	238936	238931
		G ⅛	UR	0.027	10	275026	275031
	1.2	G ⅛		0.038	8	238937	238932
		G ⅛	UR	0.038	8	275027	275032
	1.6	G ⅛		0.055	6	238939	238933
		G ⅛	UR	0.055	6	275028	275033
	2.0	G ⅛		0.090	3	238940	238934
		G ⅛	UR	0.090	3	275029	275034

Further versions on request	
Material Seal material FFKM Seal material EPDM	**Analytical** Oxygen version, Parts oil-, fat- and silicon free
Coil 12 V Coil Wire leads 300 mm	**Approval** UR (UL recognized)

8.5. Ordering chart accessories

Cable plug Type 2507, Form B

Note:

- The delivery includes the flat seal and fixing screw.
- Further versions see data sheet **Type 2507**.

Cable plug	Version	Voltage	Article no.
	Without circuitry (AC/DC)	0…250 V AC/DC	423845

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Control electronics Type 8605

Note:
Further versions see data sheet **Type 8605**.

Control electronics	Version	Max. coil current range [mA]	Type 2861 24 V DC	Type 2861 12 V DC	Article no.
	Standard rail	40…220	x	–	316531
	Standard rail	200…1000	x	x	316532

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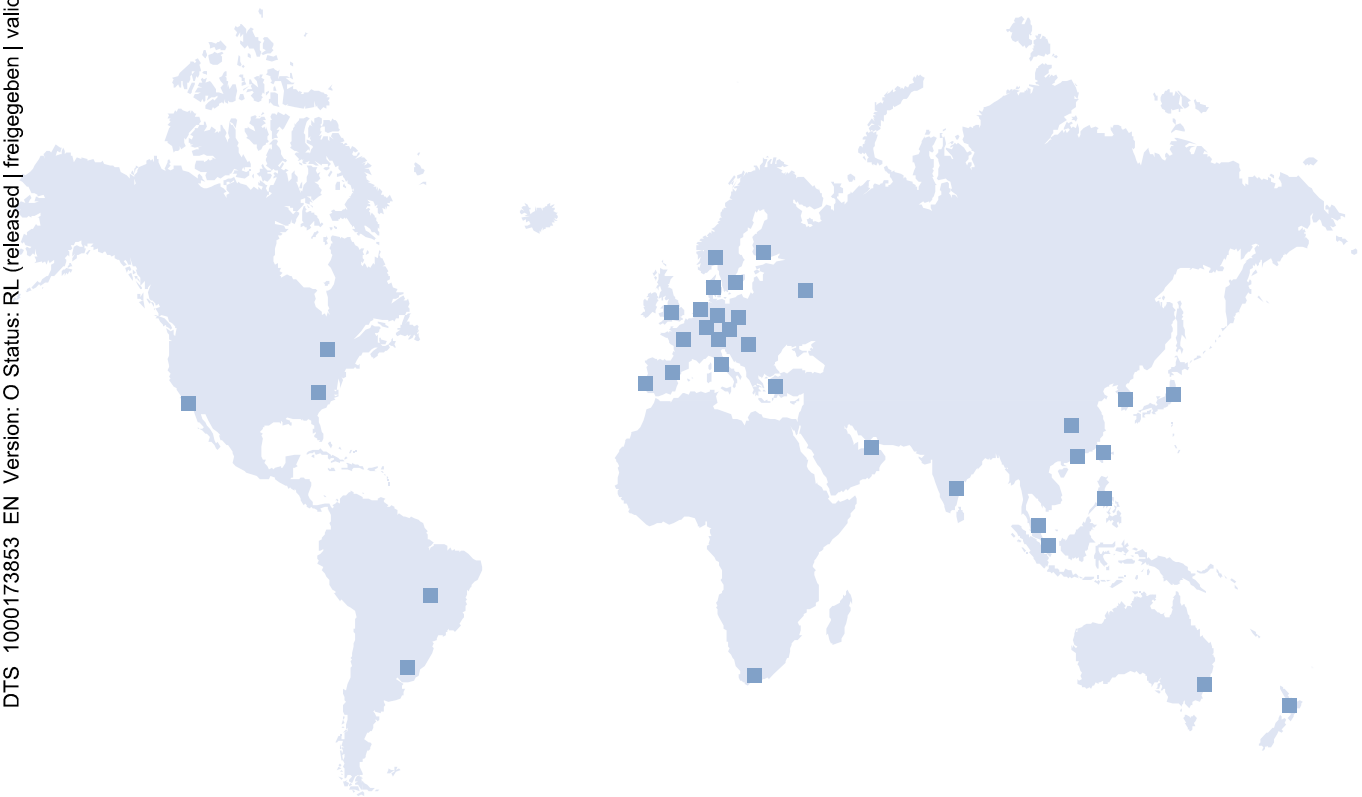

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Product Enquiry Form - Proportional valve

Thank you for your interest in our products! In order to provide you with optimum advice, please fill out the following form and send it to your **Bürkert representative** or e-mail address: info@burkert.com. All information submitted will of course be kept strictly confidential.

Please fill in the **required fields**! *

***Note:** The interactive functions of this PDF may be restricted depending on the PDF reader used.

Personal Information			
Company		**Contact person**	
Customer no.		**Department**	
Street		**Postcode / Town**	
Telephone no.		**Email**	

Delivery

Quantity Required delivery date

Operating data	
Function (Function of the control valve in the process / process description)	
Operating medium	
Type of medium	○ Fluid ○ Steam ○ Gas
Supply voltage	V
Ambient temperature (max.)	$t_{u\,max}$ = ○ °C / ○ °F

Fluidic data					
Flow range Q_{Nom}	min.	max.	unit		
Inlet pressure at Q_{Nom}	p_1 =	barg[1.)]			
Outlet pressure at Q_{Nom}	p_2 =	barg[1.)]			
Max. inlet pressure	p_{1max} =	barg[1.)]			
Medium temperature (min./ max.)	$t_{m\,min}$ =	$t_{m\,max}$ =	○ °C / ○ °F		
Port connection	○ G (DIN ISO 228/1) ○ Flange		○ NPT (ANSI B1.2) ○ Other		

1.) Please indicate all pressure values as overpressure to atmospheric pressure [barg] (g = relative pressure)

Material specifications			
Body	○ Stainless steel	○ Brass	○ Other
Seals	○ FKM	○ EPDM	○ Other

Approvals / Conformities

e. g. UL/UR, KTW W270, DVGW Gas, ATEX/IECEx, EAC, etc.

Additional Requirements / Comment

Send form Print form

Delete form

Visit this product area on the website ▸

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