bürkert
FLUID CONTROL SYSTEMS

Direct-acting 2-way basic proportional valve

- High dynamics
- Orifice sizes DN 2...DN 8 mm
- Good range
- Optional: Explosion-protected coil

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 electromagnetic proportional valves

Type 2518
Cable plug, form A according to DIN EN 175301-803

Type 8611
eCONTROL – Universal controller

Type description

Type 2865 is an extremely compact solenoid control valve and is available with an orifice up to 8 mm. It is based on the standard variant of Type 2875. It is used as an actuator in closed control loops (pressure, flow, temperature, etc.). Compared with the standard variant, the valve is essentially of simpler construction and assembly and testing procedures are optimized, easing high volume series production with shorter delivery times.

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Visit product website

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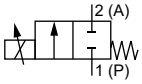
1. General technical data

Product properties	
Dimensions	Further information can be found in chapter "5. Dimensions" on page 5.
Material	
Seal	FKM, EPDM
Body	Brass, stainless steel
Circuit function	A Further information can be found in chapter "2. Circuit functions" on page 3.
Performance data	
Typical values of positioning behaviour [1.]	
Hysteresis	< 5 %
Repeat accuracy	< 1 % FS [2.]
Response sensitivity	< 1 % FS [2.]
Setting range	1:25
Actuating time (10...90 %)	< 25 ms
Pressure range [3.]	0...25 bar
Duty cycle	100 % continuous operation
Electrical data	
Operating voltage	24 V DC (12 V on request)
Power consumption	Max. 16 W
Maximum coil current [4.]	750 mA (at 16 W and 24 V coil)
PWM frequency [5.]	280 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	Max. 21 mm^2/s (21 cSt)
Product connections	
Electrical connection	Plug contacts according to DIN EN 175301 - 803 form A for cable plug **Type 2518** ▶. Further information can be found in chapter "Cable plug Type 2518, form A according to DIN EN 175301 - 803" on page 12.
Port connection size	G ⅜, G ½, NPT ⅜, NPT ½
Approvals and conformities	
Degree of protection	IP65
Explosion protection	Further information can be found in chapter "3.4. Explosion protection" on page 4.
Environment and installation	
Installation position	As required, preferably with actuator upright
Ambient temperature	Max. + 55 °C

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

Symbol	Description
	**Circuit function A (CF A)** 2/2-way solenoid proportional control valve Direct-acting Normally closed

3. Approvals and conformities

3.1. General notes

- The approvals and conformities listed below must be stated when making enquiries. This is the only way to ensure that the product complies with all required specifications.
- Not all available variants can be supplied with the below mentioned approvals or conformities.

3.2. Conformity

In accordance with the Declaration of conformity, the product is compliant with the EU Directives.

3.3. Standards

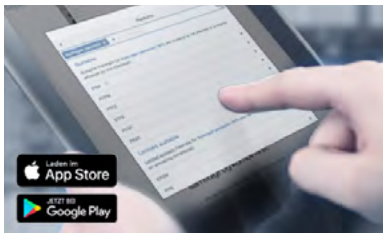
The applied standards which are used to demonstrate compliance with the EU Directives are listed in the EU-Type Examination Certificate and/or the EU Declaration of Conformity.

3.4. Explosion protection

Approval	Description
	Optional: Explosion protection As a category 2 device suitable for zone 1/21 and zone 2/22 (optional). **ATEX:** EPS 15 ATEX 1 073 X II 2 G Ex mb IIC T4 Gb II 2 D Ex mb IIIC T130 °C Db **IECEx:** IECEx EPS 15.0066X Ex mb IIC T4 Gb Ex mb IIIC T130 °C Db

4. Materials

4.1. 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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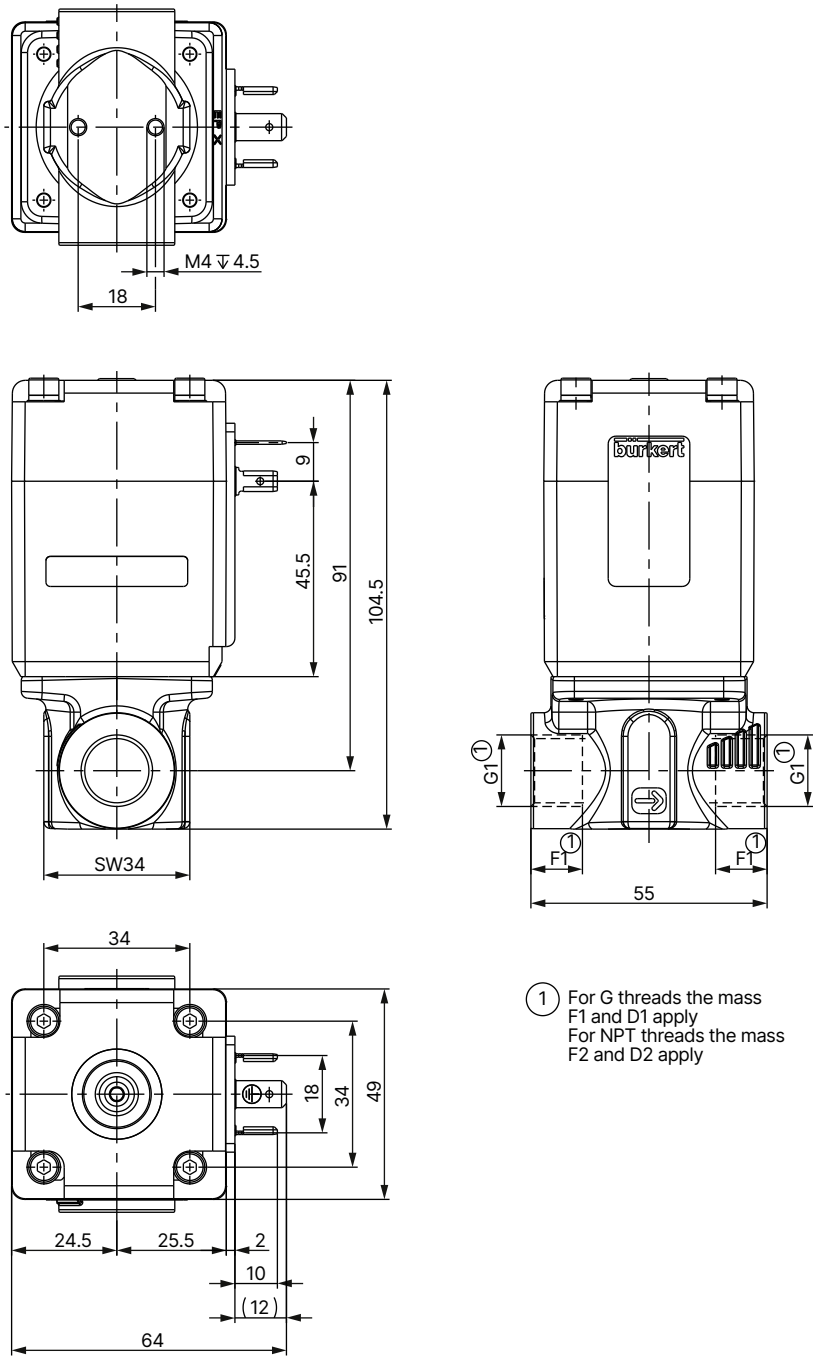
5. Dimensions

5.1. Standard variant

Threaded body

Note:
Dimensions in mm



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

Port connection	F1	G1	F2	G2
Thread	12	G ⅜	10.3	NPT ⅜
	14	G ½	13.7	NPT ½

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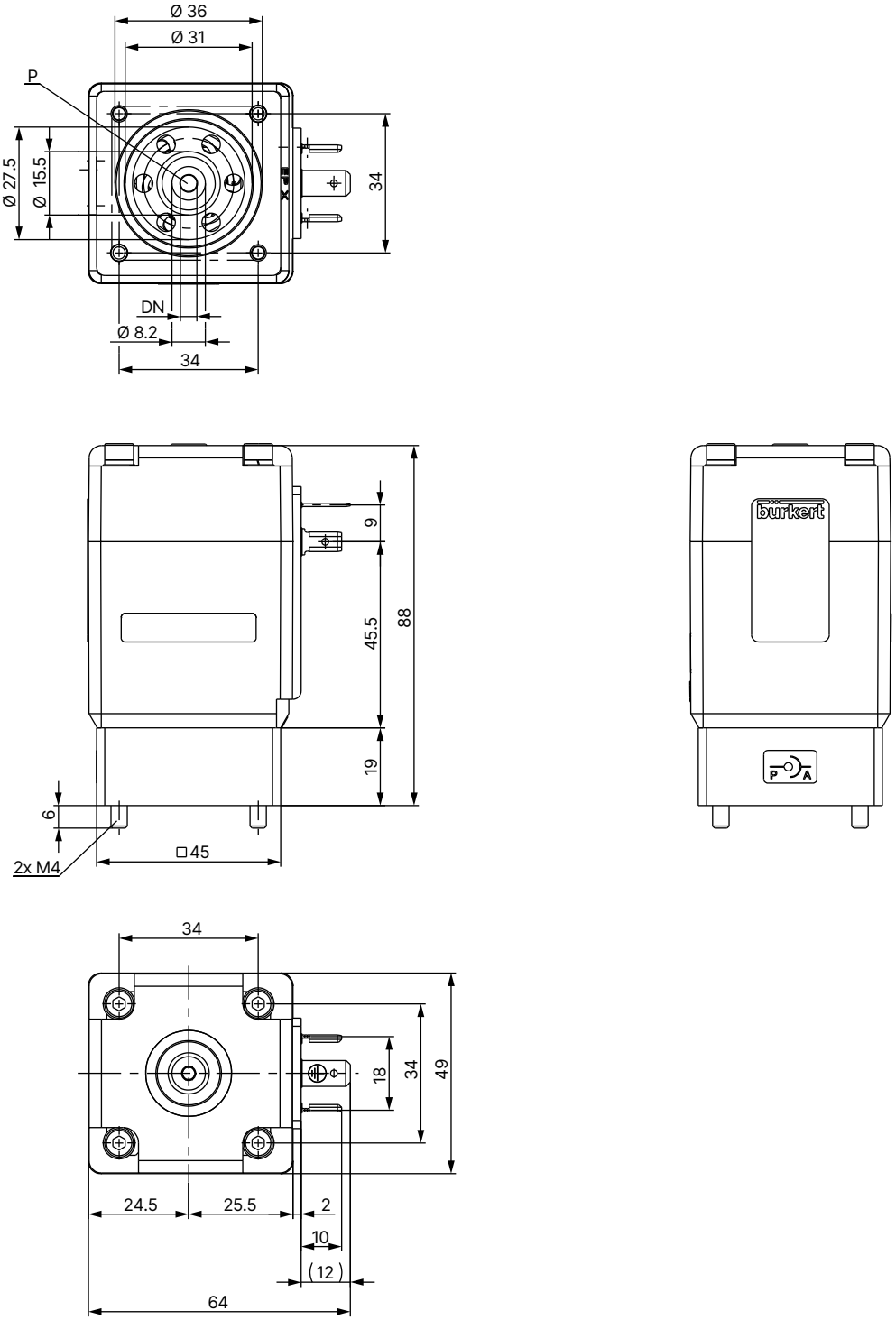
Sub-base body

Note:
Dimensions in mm



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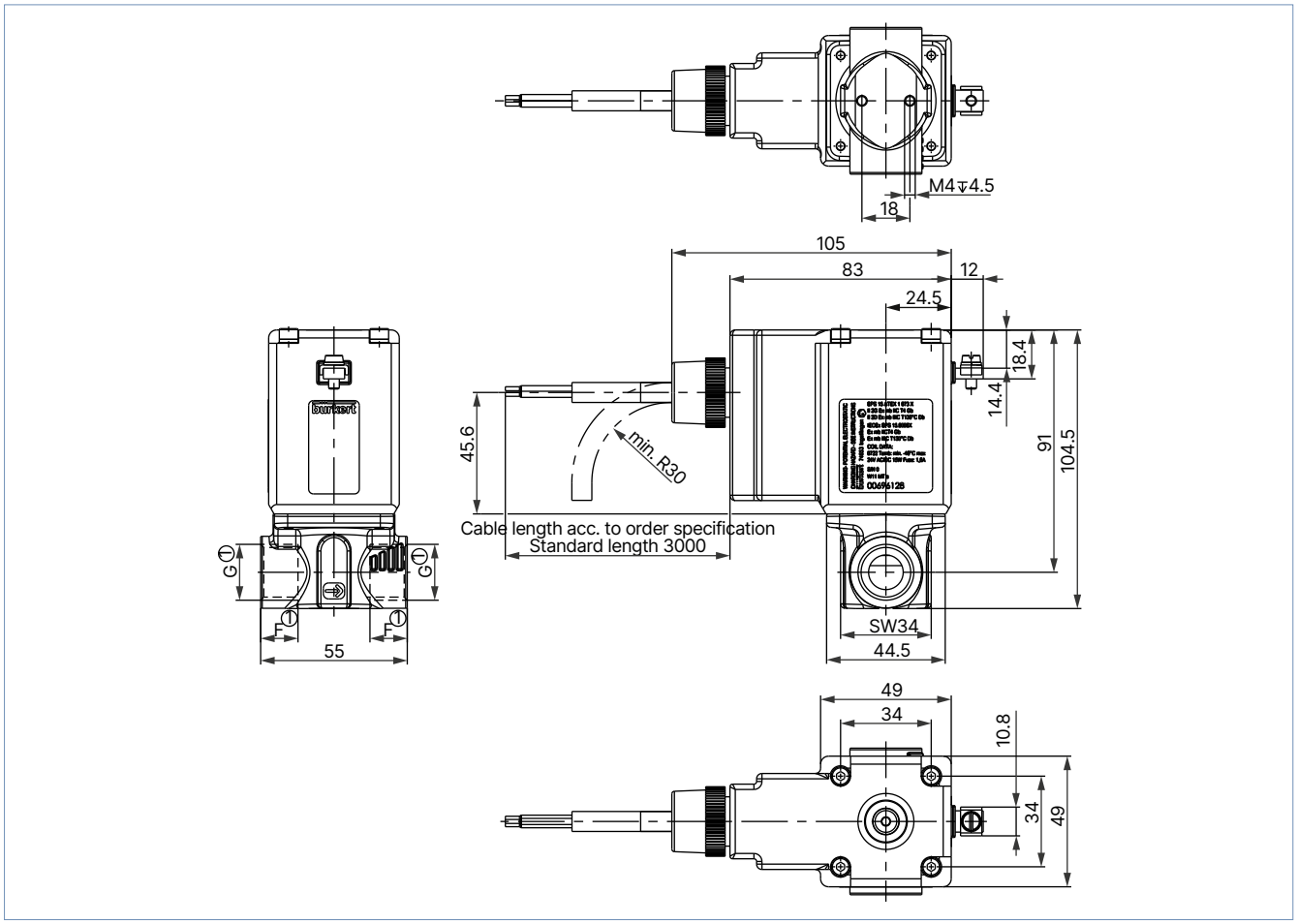
5.2. ATEX/IECEx variant

Threaded body

Note:
Dimensions in mm



Port connection	F1	G1	F2	G2
Thread	12	G ⅜	10.3	NPT ⅜
	14	G ½	13.7	NPT ½

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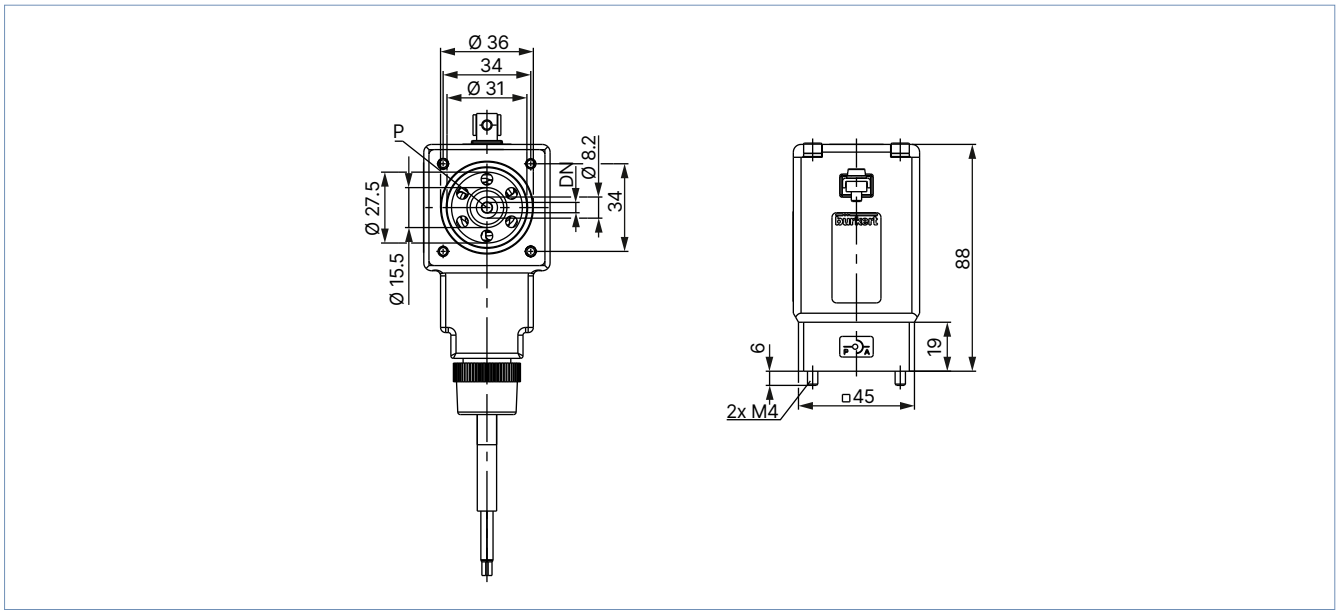
Sub-base body

Note:
Dimensions in mm



6. Performance specifications

6.1. Flow characteristic

Determination of the K_V value

Pressure drop	K_V value for liquids	K_V value for gases
	[m³/h]	[m³/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 $p_2 < \frac{p_1}{2}$	$= Q\sqrt{\frac{\rho}{1000\,\Delta p}}$	$= \frac{Q_N}{257\,p_1}\sqrt{T_1\,\rho_N}$

Value	Description	Unit
K_V	Flow coefficient	[m³/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/m³]
ρ_N	Standard density	[kg/m³]
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

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6.2. Exemplary characteristic curve of a proportional valve

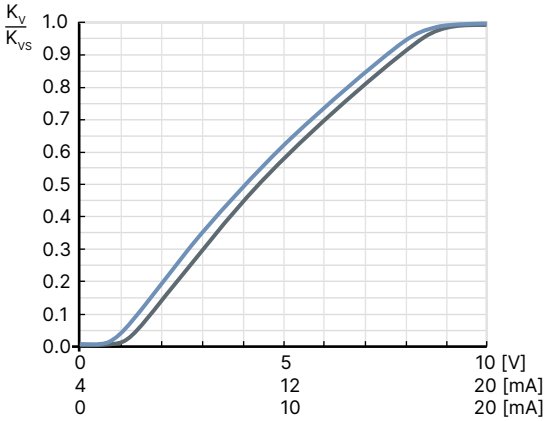
Note:
The dimensioning of the nominal diameter is very important for proportional valves to function properly within the application. The nominal diameter must be selected so that, on the one hand, the desired flow range is achieved and, on the other hand, when the valve is fully open, a sufficient portion of the total pressure drop occurs across the valve.

Reference value: $\Delta p_{valve} > 25\,\%$ of the total pressure drop

Otherwise, an ideal, linear valve characteristic is deformed into a curved system characteristic.

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.



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 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 minimum and maximum 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 9**.

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8. Ordering information

8.1. Bürkert eShop

Bürkert eShop – Easy ordering and quick 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:

- Use the product enquiry form (see "8.4. Bürkert Product Enquiry Form" on page 10) for information about the device layout and send it to us after completion.
- Please note the chapter "6.2. Exemplary characteristic curve of a proportional valve" on page 9 on product selection.

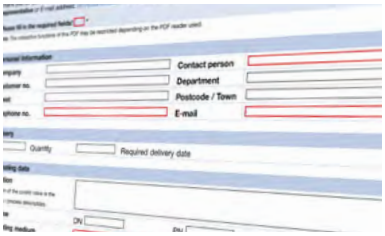
8.3. Bürkert product filter

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

8.4. Bürkert Product Enquiry Form



Bürkert Product Enquiry Form – Your enquiry quickly and compactly

Would you like to make a specific product enquiry based on your technical requirements? Use our Product Enquiry Form for this purpose. There you will find all the relevant information for your Bürkert contact. This will enable us to provide you with the best possible advice.

Fill out the form now

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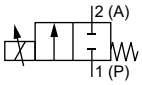
8.5. Ordering chart

Standard variant

Note:

- All valves are delivered with FKM seals.
- Please note that the cable plug must be ordered separately, see "Cable plug Type 2518, form A according to DIN EN 175301-803" on page 12 or separate data sheet for **Type 2518** ▶.

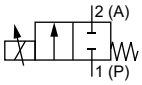
Circuit function	Port connection 1.)	Orifice	K_{VS} value water 2.)	Nominal pressure 3.)	Article no. Brass body	Article no. Stainless steel body
		[mm]	[m³/h]	[bar]		
CF A 2/2-way solenoid proportional control valve Direct-acting Normally closed 	G ⅜	2	0.12	25	275058	250669
	G ⅜	3	0.25	10	256811	249133
	G ⅜	4	0.45	8	249264	250213
	G ½		0.45	8	242298	247295
	G ½	6	0.80	4	242435	247294
	G ½	8	1.10	2	250089	275059

1.) NPT and sub-base on request
2.) Measurement at + 20 °C, 1 bar pressure differential over a fully opened valve
3.) Pressure data: overpressure with respect to atmospheric pressure

ATEX/IECEx variant

Note:

- All valves are delivered with FKM seals.
- ATEX variants are delivered with a 3 m connection cable.
- Further information on ATEX and IECEx approvals can be found in chapter "3. Approvals and conformities" on page 4.
- Use the Product Enquiry Form (see "8.4. Bürkert Product Enquiry Form" on page 10) for information about the device layout and send it to us after completion.

Circuit function	Port connection 1.)	Orifice	K_{VS} value water 2.)	Nominal pressure 3.)	Article no. Brass body	Article no. Stainless steel body
		[mm]	[m³/h]	[bar]		
CF A 2/2-way solenoid proportional control valve Direct-acting Normally closed 	G ⅜	2	0.12	20	291478	o. r.
	G ⅜	3	0.25	9	291479	o. r.
	G ⅜	4	0.45	7	291480	o. r.
	G ½	6	0.80	3.5	291460	o. r.
	G ½	8	1.10	1.5	291482	o. r.

o. r. = on request
1.) NPT and sub-base on request
2.) Measurement at + 20 °C, 1 bar pressure differential over a fully opened valve.
3.) Pressure data: overpressure with respect to atmospheric pressure

Further variants on request			
	Material Other seal materials		**Analytical** Oxygen variant, parts oil-, fat- and silicon free
	Approval Further information can be found in chapter "3. Approvals and conformities" on page 4.		**Orifice** Special valve orifice
	Coil Specific, low-power setting for lower pressures Other operating voltages		

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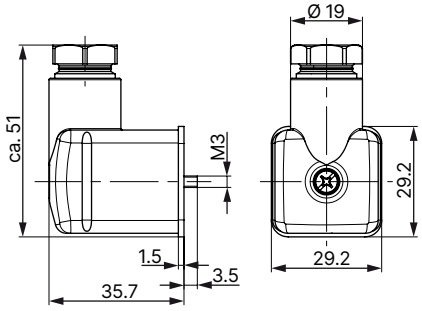
8.6. Ordering chart accessories

Cable plug Type 2518, form A according to DIN EN 175301 - 803

Note:

- Dimensions in mm
- For further variants see data sheet **Type 2518** ▶.

Cable plug	Dimensions	Variant	Voltage	Article no.
		Without wiring (AC/DC)	0...250 V AC/DC	314802

Control electronics Type 8605 for proportional valves

Note:
Refer to data sheet **Type 8605** ▶ for more information about the control electronics.

Control electronics	Variant	Max. coil current range	Voltage		Article no.
		[mA]	24 V DC	12 V DC	
	Cable plug with PG cable gland	200...1000	X	X	316530
	Cable plug with M12 connection	200...1000	X	X	316528
	Cable plug with PG cable gland	500...2000	–	X	316529
	Cable plug with M12 connection	500...2000	–	X	316526
	Cable plug with PG cable gland without operating unit	200...1000	X	X	316521
	Cable plug with M12 connection without operating unit	200...1000	X	X	316522
	Cable plug with PG cable gland without operating unit	500...2000	–	X	316523
	Cable plug with M12 connection without operating unit	500...2000	–	X	316525
	Standard rail	200...1000	X	X	316532
	Standard rail	500...2000	–	X	316533

X = available
– = not availablee

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