



2/2 way Proportional Valve (motor-driven)

- Actuator isolated from flow path
- Excellent range and fast response times
- Low power consumption
- Orifice sizes 2 to 10 mm
- Versions: Standard, positioner, process controller and high pressure version up to 22 bar



UR approval
optional

Type 3280 can be combined with ...



Type 8311

Pressure transmitter



Type 8006

Mass Flow Meter



Type 8008

BigFlow



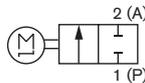
Type 8611

Compact PI Controller

The direct-acting proportional valve of Type 3280 is used for dosing of liquids and gases in closed or open control loops. The valve features a linear stepper motor as actuator. The integrated electronics simplify the process integration; additional actuation modules are not necessary. The motor's power consumption to hold a specific opening position of the valve is zero. This key feature can reduce the energy consumption of a plant dramatically and thus make it more efficient. Type 3280 is available as standard ON/OFF or proportional valve, as version with integrated positioner and as version with integrated process controller.

Circuit function

2 way valve for continuous control, motor driven, remains in position without further electrical power



Technical data	
Materials	Brass or stainless steel PC (Polycarbonate), PPS (Polyphenylene sulfide) FKM, others on request (NBR, EPDM, ...)
Medium	Neutral gases, liquids
Pressure Range ¹⁾	0 to 6 bar (high pressure version up to 22 bar (depending on orifice size, see ordering chart) available)
Closure time	2.5 s (0 to 100% stroke)
Fluid temperature	0 to +70 °C
Ambient temperature	-10 to +60 °C
Viscosity	Max. 600 mm ² /s (cSt)
Power supply	24 V DC ± 10% (max. residual ripple 10%)
Power consumption	< 1 W in holding position max. 8 W (DN2-6) resp. max. 12 W (DN8 & 10, as well as high-pressure versions)
Duty cycle	Up to 100% (depending on fluid and ambient temperature)
Port connection	G or NPT 1/4, 3/8, 1/2, flange, Cartridge (on request)
Typical control data ²⁾	Hysteresis < 5% Repeatability < 1% FS Sensitivity < 1% FS Span 1:100
Protection class - valve	IP54
Installation	As required, preferably with actuator upright
Status display	LED (details: see manual)
Dimensions	See drawings on page 6-7
Weight	~0.7 kg

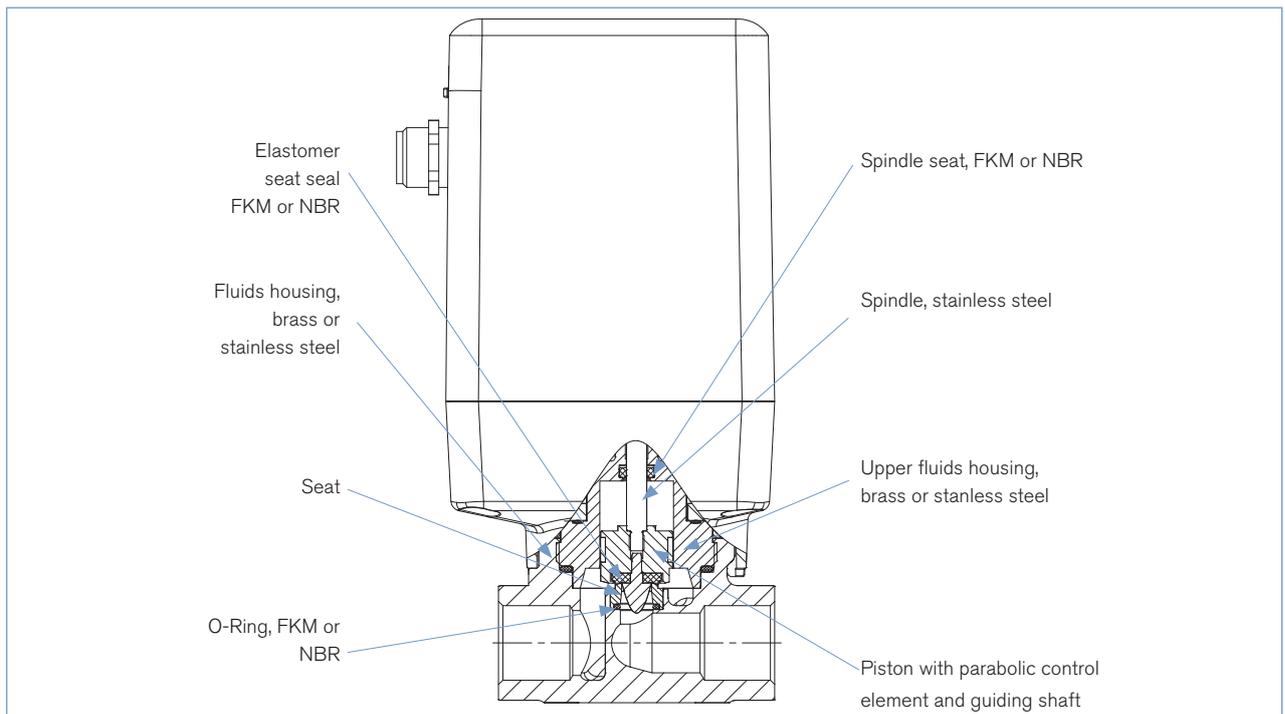
¹⁾ Pressure data [bar]: Overpressure with respect to atmospheric pressure

²⁾ Characteristic data of control behaviour depends on process conditions

Technical data, continued

Device variations	Standard ON/OFF		Positioner		Process controller	
	Standard ON/OFF	Proportional valve	Analogue	Digital	Analogue	Digital
Electrical connection	M12 Plug, A-coded, 8-pin	M12 Plug, A-coded, 8-pin	M12 Plug, A-coded, 8-pin	M12 Plug, A-coded, 5-pin	M12 Plug, A-coded, 8-pin and M12 Socket, A-coded, 5-pin	M12 Plug, A-coded, 5-pin and M12 Socket, A-coded, 5-pin
Input signal (setpoint)	Digital input: 0...5 V (log. 0, valve closed) or 10...30 V (log. 1, valve open)	4...20 mA, 0...10 V, or PWM (800 Hz)	4...20 mA, 0...20 mA, 0...10 V, or 0...5 V	---	4...20 mA, 0...20 mA, 0...10 V, or 0...5 V	---
Input signal (actual value from ext. Sensor)	---	---	---	---	4...20 mA, 0...20 mA, 0...10 V, 0...5 V	4...20 mA, 0...20 mA, 0...10 V, 0...5 V, or Frequency (5...2000 Hz)
Input impedance for analogue input	22 k Ω	60 Ω (current), 22 k Ω (voltage)	60 Ω (current), 22 k Ω (voltage)	---	60 Ω (current), 22 k Ω (voltage)	60 Ω (current), 22 k Ω (voltage)
Output signal (actual value)	Digital output: PNP, max. 100 mA current limits, feedback function (output signal active, when valve closed)	Digital output: PNP, max. 100 mA current limits, feedback function (output signal active, when valve closed)	0/4...20 mA (max. load: 560 Ω), 0...5/10 V (max. current: 10 mA)	---	0/4...20 mA (max. load: 560 Ω), 0...5/10 V (max. current: 10 mA)	---
Fieldbus interface	---	---	---	büS / CANopen	---	büS / CANopen
Parameterization Tool	---	---	Bürkert Communicator (Connection via büS stick)	Bürkert Communicator (Connection via büS stick)	Bürkert Communicator (Connection via büS stick)	Bürkert Communicator (Connection via büS stick)

Materials



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: Pressure drop of valve > 25% of total pressure drop within the system

Please 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 [m³/h]³⁾
- Q_N Standard flow rate [m³/h]⁴⁾
- p_1 Inlet pressure [bar]⁵⁾
- p_2 Outlet pressure [bar]⁵⁾
- 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]

³⁾ Measured with water, $\Delta p = 1$ bar, differential pressure over the valve
⁴⁾ Standard conditions at 1.013 bar and 0 °C (273K)
⁵⁾ Absolute pressure

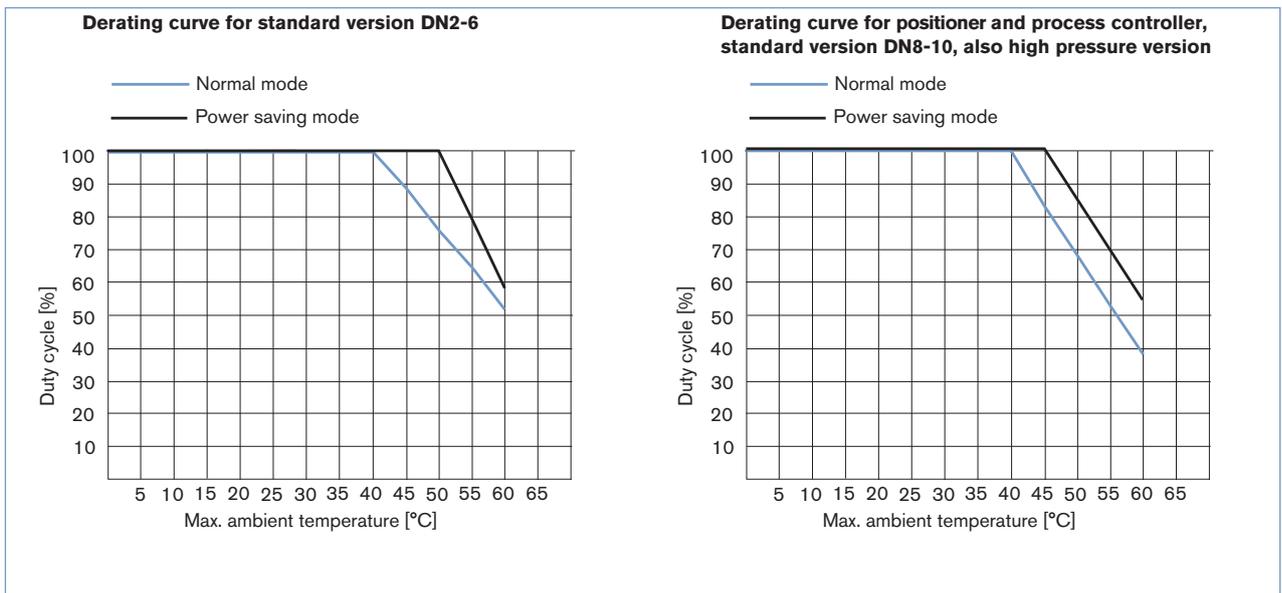
Once the k_v value needed for the application has been calculated, you can compare it with the k_{vs} values shown in the ordering chart. The k_{vs} must be higher than the k_v value of the application, but neither too high, nor too close – as a recommendation: 10% higher.

Duty Cycle Derating Curve

For motor valves it is essential to know the duty cycle during operation. Self-heating of the motor limits the maximum duty cycle. High ambient temperatures amplify the risk of damage due to overheating. The diagram below shows the suggested duty cycles dependent on the ambient temperature. Running the motor control valve in the power saving mode (lower actuator force) allows higher duty cycles. The motor is optimized for the valve function regarding dimensions, power consumption and costs.

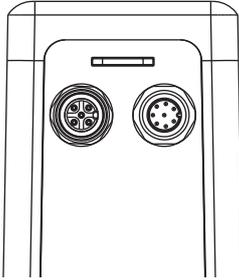
The duty cycle does not refer to the duty cycle of the device but to the duty cycle of the motor. This is not switched on unless the valve is to move. Frequent set-point value changes will drastically increase the duty cycle of the motor.

Note: Operating the valve beyond the suggested duty cycles leads to a drastically reduced lifetime of the valve.



Pin Assignment

Analogue version

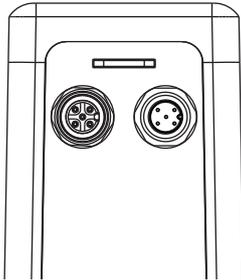


Circular connector M12 - 8-pin	Pin	Assignment
	1	24 V DC
	2	Power supply GND
	3	Internal use ⁶⁾
	4	Internal use ⁶⁾
	5	Internal use ⁶⁾
	6	Signal input +
	7	Signal output
	8	Signal GND

⁶⁾ Only for positioners and process controllers version, for connection of the parameterization tools: Bürkert Communicator. The connection is via the büS-Stick. Using an adapter cable (M12 8-pin to M12 5-pin) the büS-Stick can be connected (see ordering chart for accessories).

Additional for process controller version

Socket M8 - 5-pin	Pin	Assignment
	1	24 V DC sensor power supply
	2	Analog IN (0-20 mA, 4-20 mA, 0-5 V or 0-10 V)
	3	GND
	4	GND (Bridge acc. to GND Pin 3)
	5	not connected

Digital version
(fieldbus)

Circular connector M12 - 8-pin	Pin	Belegung
	1	Shield
	2	24 V DC
	3	GND
	4	CAN high
	5	CAN low

Bei Prozessreglerausführung zusätzlich:

Socket M8 - 5-pin	Pin	Belegung
	1	24 V DC sensor power supply
	2	Analog IN (0-20 mA, 4-20 mA, 0-5 V oder 0-10 V)
	3	GND
	4	GND (Bridge acc. to GND Pin 3)
	5	not connected

For parameterisation and configuration of the positioner and the process controller versions, please use the Bürkert Communicator software tool.
http://www.burkert.com/en/sitesearch?search_term=3280+communicator

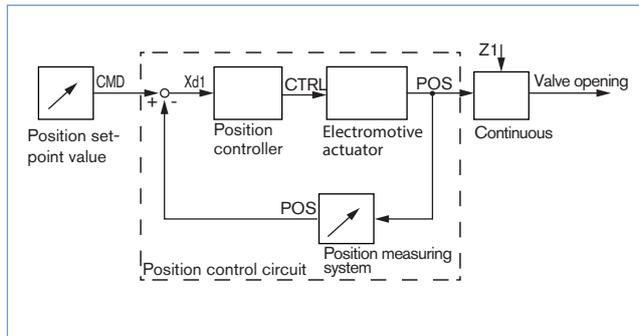
Ausführungen

Standard ON/OFF

In the ON / OFF version, an external voltage signal is digitized and the valve is closed or opened. The status of the two end positions of the valve are indicated on the LED. In addition, the valve position "closed" is reached via the digital output.

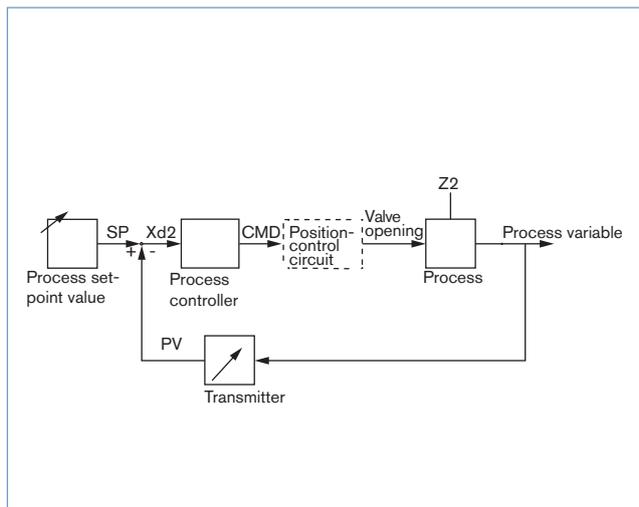
Standard proportional valve

The standard proportional valve converts an external standard signal (position set-point value) into a valve position. Both valve end positions are indicated by the LED status. Additionally, the digital output indicates when the "closed" valve position has been achieved.



Positioner version

The positioner proportional valve converts an external standard signal (position set-point value) into a valve position. The position of the actuator is controlled according to the position set-point value. The current position (POS) of the electromotive valve is recorded by the position measuring system. The position controller compares this position actual value to the set-point value (CMD) specified as the standard signal. In case of a control difference (X_{d1}), the motor control signal is sent to the actuating drive as the actuating variable. Z_1 is a disturbance value. Both valve end positions are indicated by the LED status. Moreover, the position actual value recorded using the position measuring system is output via the M12 circular plug-in connector.



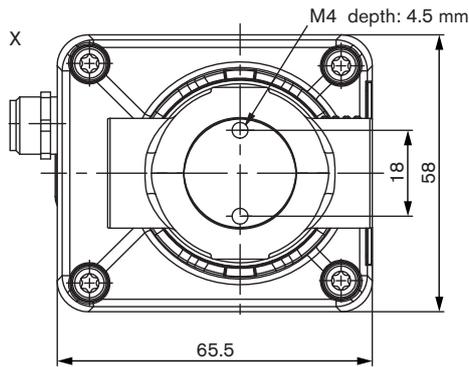
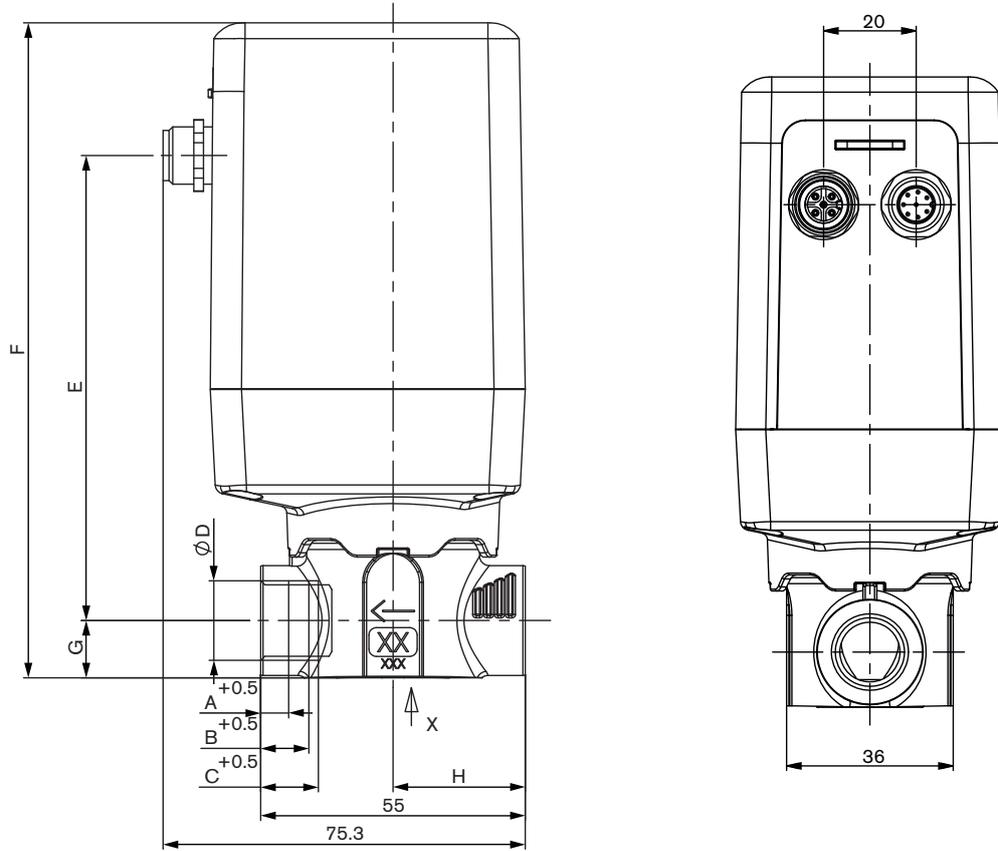
Process controller version

The additionally implemented PID controller can perform not only the actual position control but also a process control in the sense of a cascade control. The process controller is integrated in a control circuit. The position set-point value of the valve is calculated from the process set-point value and the process actual value using the control parameters (PID controller). The process set-point value can be specified by an external signal. During the process control the position control mentioned above becomes the subordinate auxiliary control circuit; this results in a cascade control. The process controller in the main control circuit has a PID function.

The process set-point value (SP) is specified as a set-point value and is compared with the actual value (PV) of the process variable to be controlled. The position measuring system records the current position (POS) of the electromotive linear actuator. This position actual value is compared by the position controller with the set-point value (CMD) specified by the process controller. If there is a control difference (X_{d2}), the actual position (POS) and therefore the valve opening are changed by the control variable (CTRL). Z_2 represents a disturbance variable.

Dimensions [mm]

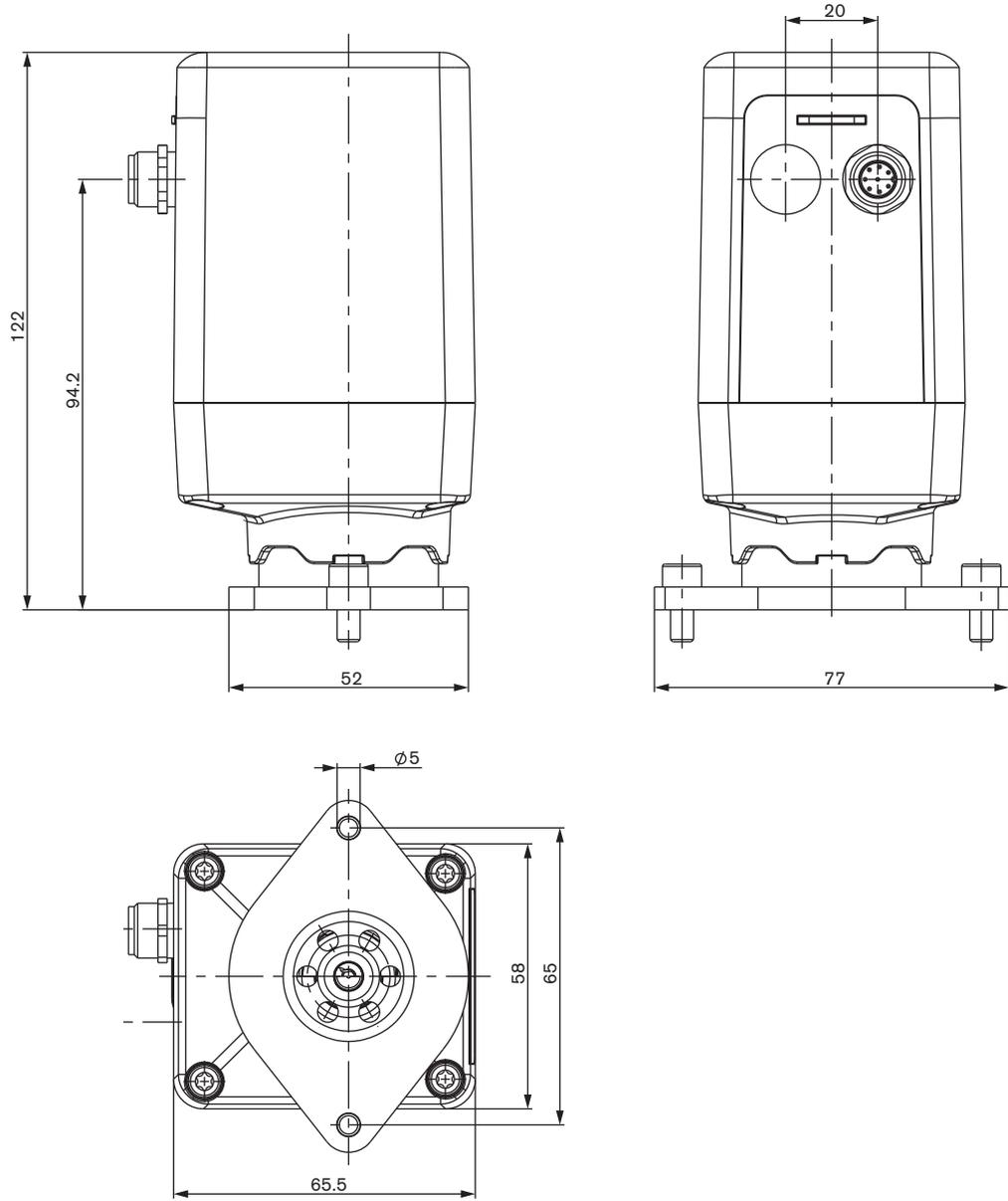
Threaded body



A	B	C	D	E	F	G	H
		12	G 3/8	97.4	137.2	12	27.5
6	10.3		NPT 3/8	97.4	137.2	12	27.5
		12	G 1/4	96.4	134.2	10	27.5
5.8	10		NPT 1/4	96.4	134.2	10	27.5
		14	G 1/2	97.4	139.2	14	29.5
8.2	13.7		NPT 1/2	97.4	139.2	14	29.5

Dimensions [mm]

Flange body



Ordering Chart

The ordering tables show only a small selection of the available versions. Please use the form at the end of the document for further versions or visit our eShop.

Standard proportional valve (Item no. for 4-20 mA input signal)

Valve function	Orifice [mm]	Port Connection ⁸⁾	Seal material ⁸⁾	k_{vs} value water [m ³ /h] ⁹⁾	Pressure range [bar(g)]	Item no. brass	Item no. stainless steel
Control valve, without safety position in case of power failure	2	G 1/4	FKM	0.15	0-6	268 611	268 620
	3	G 1/4	FKM	0.3	0-6	268 613	268 621
	4	G 3/8	FKM	0.5	0-6	268 614	268 622
	6	G 3/8	FKM	0.9	0-6	268 615	268 623
	8	G 1/2	FKM	1.5	0-6	297 219	297 233
	10	G 1/2	FKM	1.9	0-6	297 226	297 234

Positioner (Item no. for 4-20 mA signal (selectable via Bürkert Communicator))

Valve function	Orifice [mm]	Port Connection ⁸⁾	Seal material ⁸⁾	k_{vs} value water [m ³ /h] ⁹⁾	Pressure range [bar(g)]	Item no. brass	Item no. stainless steel
Control valve, without safety position in case of power failure	2	G 1/4	FKM	0.15	0-6	277 717	277 725
	3	G 1/4	FKM	0.3	0-6	277 718	277 726
	4	G 3/8	FKM	0.5	0-6	277 719	277 727
	6	G 3/8	FKM	0.9	0-6	277 720	277 728
	8 ¹⁰⁾	G 1/2	FKM	1.5	0-6	on request	on request
	10 ¹⁰⁾	G 1/2	FKM	1.9	0-6	on request	on request

Process controller (Item no. for 4-20 mA signal (selectable via Bürkert Communicator))

Valve function	Orifice [mm]	Port Connection ⁸⁾	Seal material ⁸⁾	k_{vs} value water [m ³ /h] ⁹⁾	Pressure range [bar(g)]	Item no. brass	Item no. stainless steel
Control valve, without safety position in case of power failure	2	G 1/4	FKM	0.15	0-6	287 834	287 838
	3	G 1/4	FKM	0.3	0-6	287 835	287 839
	4	G 3/8	FKM	0.5	0-6	287 836	287 840
	6	G 3/8	FKM	0.9	0-6	287 837	287 841
	8 ¹⁰⁾	G 1/2	FKM	1.5	0-6	on request	on request
	10 ¹⁰⁾	G 1/2	FKM	1.9	0-6	on request	on request

Standard proportional valve - high pressure version (Item no. for 4-20 mA input signal)

Valve function	Orifice [mm]	Port Connection ⁸⁾	Seal material ⁸⁾	k_{vs} value water [m ³ /h] ⁹⁾	Pressure range [bar(g)] fluid media	Pressure range [bar(g)] gaseous media	Item no. brass	Item no. stainless steel
Control valve, without safety position in case of power failure	2	G 3/8	FKM	0.15	0-15	0-22	302 806	302 813
	3	G 3/8	FKM	0.3	0-15	0-22	302 807	302 814
	4	G 3/8	FKM	0.5	0-15	0-22	302 808	302 815
	6	G 3/8	FKM	0.9	0-15	0-16	302 809	302 816
	8	G 1/2	FKM	1.5	0-12	0-12	302 811	302 818
	10	G 1/2	FKM	1.9	0-10	0-10	302 812	302 821

⁸⁾ Other cable connections (NPT, flange) and sealing materials (EPDM, NBR) on request

⁹⁾ k_{vs} -value: Measured with water (20°C) and 1 bar pressure drop over valve.

¹⁰⁾ Derating curve: see manual

Fieldbus version - positioner (item no. for CANopen)

Valve function	Orifice [mm]	Port Connection ⁸⁾	Seal material ⁹⁾	k _v value water [m ³ /h] ⁹⁾	Pressure range [bar(g)]	Item no. brass	Item no. stainless steel
Control valve, without safety position in case of power failure	2	G 1/4	FKM	0.15	0-6	311 341	311 357
	3	G 1/4	FKM	0.3	0-6	311 342	311 359
	4	G 3/8	FKM	0.5	0-6	310 195	311 361
	6	G 3/8	FKM	0.9	0-6	311 343	311 390
	8 ¹⁰⁾	G 1/2	FKM	1.5	0-6	311 344	311 392
	10 ¹⁰⁾	G 1/2	FKM	1.9	0-6	311 345	311 396

Fieldbus version - process controller (item no. for CANopen and 4...20 mA Signal input)

Valve function	Orifice [mm]	Port Connection ⁸⁾	Seal material ⁹⁾	k _v value water [m ³ /h] ⁹⁾	Pressure range [bar(g)]	Item no. brass	Item no. stainless steel
Control valve, without safety position in case of power failure	2	G 1/4	FKM	0.15	0-6	311 349	311 397
	3	G 1/4	FKM	0.3	0-6	311 351	311 398
	4	G 3/8	FKM	0.5	0-6	310 198	311 399
	6	G 3/8	FKM	0.9	0-6	311 353	311 400
	8 ¹⁰⁾	G 1/2	FKM	1.5	0-6	311 354	311 401
	10 ¹⁰⁾	G 1/2	FKM	1.9	0-6	311 356	311 402

⁸⁾ Other cable connections (NPT, flange) and sealing materials (EPDM, NBR) on request

⁹⁾ k_v-value: Measured with water (20°C) and 1 bar pressure drop over valve.

¹⁰⁾ Derating curve: see manual



Further versions on request



Material
Seal material NBR
Seal material EPDM



Approvals
cURus



Analytical
Oxygen version
Parts oil-, fat- and silicon free

Ordering Chart for Accessories

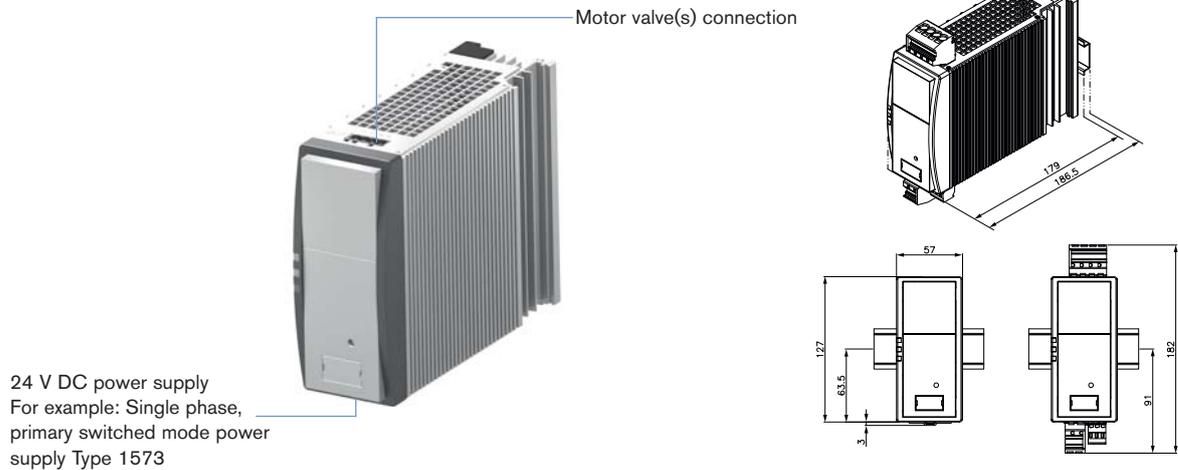
Article	Item No.
M12 socket, 8-pin with 2m ready to use cable	919 061
M12 socket, 8-pin with 2m ready to use cable shielded cable	918 991
Power supply Type 1573 for rail mounting, 100-240 V AC/ 24 V DC, 1.25A, NEC Class 2 (UL 1310)	772 438
Power supply Type 1573 for rail mounting, 100-240 V AC/ 24 V DC, 1A	772 361
Power supply Type 1573 for rail mounting, 100-240 V AC/ 24 V DC, 2A	772 362
Power supply Type 1573 for rail mounting, 100-240 V AC/ 24 V DC, 4A	772 363
Buffer module Type 1573 for safety position when power failure	773 440

Ordering Chart for Accessories - for positioner and process controller versions

Article	Item No.
M12 plug, 5 pin with 2m ready to use cable shielded cable	559 177
büS adapter, M12 socket, 8-pin to M12 plug, 5 pin (for büS stick connection) ¹¹⁾	773 286
büS-Stick Set 1 (incl. power supply, büS-Stick, termination resistor, Y-connector, cable, ...)	772 426
büS-Stick Set 2 (incl. büS-Stick, termination resistor, Y-connector, cable)	772 551
Software Bürkert Communicator	Download from www.burkert.com

¹¹⁾ For the fieldbus version this is not necessary. The büS-Stick contained in büS-Stick-Set 1 and 2 is connected via a 5-pin M12 cable. Therefore an adapter for 8-pin M12 connector of the valve is necessary. Please note that the valve must be supplied with power during the connection of the parameterization interface. In büS-Stick-Set 1 a corresponding power supply is included.

Capacitive buffer module ID 773 440 for safety position in case of power failure



In the case of power failure the valve can be moved into a safety position, using the capacitive buffer module. In case of power failure the buffer module maintains the power supply for a few seconds at 18 V DC. The reduced input voltage is detected by the valve, and the safety position is established. Up to three type 3280 valves and two type 3285 valves can be connected to one buffer module.

Factory setting of the safety position: "valve closed"

- For standard version (functionality available as of software version A.08): adjustable via DIP switches (for the reverse operating direction, the safety position changes to "valve open")
- For positioner and process controller version (functionality available as of software version A.06): adjustable via Bürkert Communicator (user-defined safety position)

Note
You can fill out the fields directly in the PDF file before printing out the form.

Design data for proportional valves

▶ Please fill out this form and send to your local Bürkert Sales Centre* with your inquiry or order

Company	Contact person
Customer no.	Dept.
Address	Tel./Fax
Town / Postcode	E-Mail

= Mandatory fields Quantity Requested delivery date

Process data

Fluid	<input type="text"/>		
State of fluid	<input type="checkbox"/> liquid	<input type="checkbox"/> gaseous	<input type="checkbox"/> vaporous
Fluid temperature	<input type="text"/>	°C	
Maximum flow rate	$Q_{nom} =$ <input type="text"/>	Unit:	<input type="text"/>
Minimum flow rate	$Q_{min} =$ <input type="text"/>	Unit:	<input type="text"/>
Inlet pressure at nominal operation	$p_1 =$ <input type="text"/>	barg	
Outlet pressure at nominal operation	$p_2 =$ <input type="text"/>	barg	
Maximum inlet pressure	$p_{1max} =$ <input type="text"/>	barg	
Ambient temperature	<input type="text"/>	°C	

Additional specifications

Control version	<input type="checkbox"/> Standard ON/OFF	<input type="checkbox"/> Standard Proportional	<input type="checkbox"/> Positioner controller	<input type="checkbox"/> Process controller
Input signal / Output signal	<input type="checkbox"/> 4-20 mA	<input type="checkbox"/> 0-20 mA ¹¹⁾		
	<input type="checkbox"/> 0-10 V	<input type="checkbox"/> 0-5 V ¹¹⁾	¹¹⁾ only with positioner and process controller version	
	<input type="checkbox"/> bÜS	<input type="checkbox"/> CANopen		
Body material	<input type="checkbox"/> Brass	<input type="checkbox"/> Stainless steel		
Seal material	<input type="checkbox"/> FKM	others	<input type="text"/>	
Port connection	<input type="checkbox"/> G-Threaded	<input type="checkbox"/> NPT-Threaded	<input type="checkbox"/> 1/4"	<input type="checkbox"/> 3/8"
	<input type="checkbox"/> Flange			<input type="checkbox"/> 1/2"
Approval	<input type="checkbox"/> UR			

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

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In case of special application conditions, please consult for advice.

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