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## РЕГУЛИРУЮЩИЕ КЛАПАНЫ



## 2-way motor valve

- Actuator isolated from flow path
- Excellent range and fast response times
- Low power consumption
- Orifice sizes 1 to 10 mm
- Versions: Standard, positioner, process controller and high pressure version up to 22 bar

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

### Can be combined with

	<b>Type 8006</b> Mass Flow Meter (MFM)	▶
	<b>Type 8008</b> Flowmeter for gases	▶
	<b>Type 8746</b> Mass flow controller (MFC) / Mass flow meter (MFM) for gases	▶
	<b>Type 8611</b> eCONTROL - Universal controller	▶
	<b>Type 8311</b> Pressure measuring device / Switch	▶

### Type description

The direct-acting motor 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.

## 1. General Technical Data

### 1.1. General

Product properties	
Dimensions	Detailed information can be found in chapter <a href="#">“4. Dimensions”</a> on page 6.
<b>Material</b>	
Fluid body	Brass or stainless steel
Valve body	PC (Polycarbonate), PPS (Polyphenylene sulfide)
Seal <sup>1.)</sup>	NBR for liquids EPDM for liquids and special gases (e. g. ammonia, acetylene), FKM for neutral gases
Weight	~0.7 kg
Status display	LED (Detailed information can be found in the instruction manual)
Performance data	
Nominal operating mode	Up to 100 % (depending on fluid and ambient temperature)
<b>Typical values of positioning behaviour<sup>2.)</sup></b>	
Hysteresis	<2 % of end value
Response sensitivity	<1 % of end value
Setting range	1:100
Repeatability	< ±2 %
Pressure range <sup>3.)</sup>	0...6 bar (high pressure version up to 22 bar (depending on orifice size, see <a href="#">“6.2. Pressure range”</a> on page 11) available)
Closing time	2.5 s (0...100 % valve opening)
Electrical data	
Operating voltage	24 V DC ± 10 % (max. residual ripple 10 %)
Power consumption	<1 W in holding position Max. 8 W (DN 2...6) resp. max. 12 W (DN 8 and 10, as well as high-pressure versions)
Medium data	
Operating medium	Neutral gases, liquids
Medium temperature	0 °C...70 °C
Viscosity (max.)	600 mm <sup>2</sup> /s (cSt)
Process/Port connection & communication	
Port connection size	G or NPT ¼, ⅜, ½, sub-base, Cartridge (on request)
Approvals and certificates	
Approval	FDA (optional and only available for certain versions) Detailed information can be found in chapter <a href="#">“2. Approvals”</a> on page 4.
Environment and installation	
Installation position	As required, preferably with actuator upright
Ambient temperature	-10 °C...+60 °C
Degree of protection	IP54

1.) For nominal sizes 1 and 1.5, PEEK seat seals are used. In this case the seat tightness of the valve is reduced.

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

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

## 1.2. Standard, positioner and process controller version

Technical data	Device variant					
	Standard		Positioner		Process controller	
	ON/OFF	Control valve	Analogue	Digital (fieldbus)	Analogue	Digital (fieldbus)
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 kΩ	60 Ω (current), 22 kΩ (voltage)	60 Ω (current), 22 kΩ (voltage)	–	60 Ω (current), 22 kΩ (voltage)	60 Ω (current), 22 kΩ (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)

## 2. Approvals

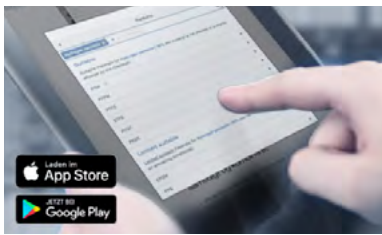
### Note:

- The approvals or conformities listed below must be mentioned in all enquiries. This is the only way to ensure that the product meets all the prescribed properties.
- Not all available device versions can be delivered with the mentioned approvals or conformities.

Approvals	Description
FDA	<b>Conformity of all materials in contact with the medium</b> FDA – Code of Federal Regulations Title 21 Paragraph 177 (CFR 21 177.2600)

### 3. Materials

#### 3.1. Chemical Resistance Chart – Bürkert resistApp

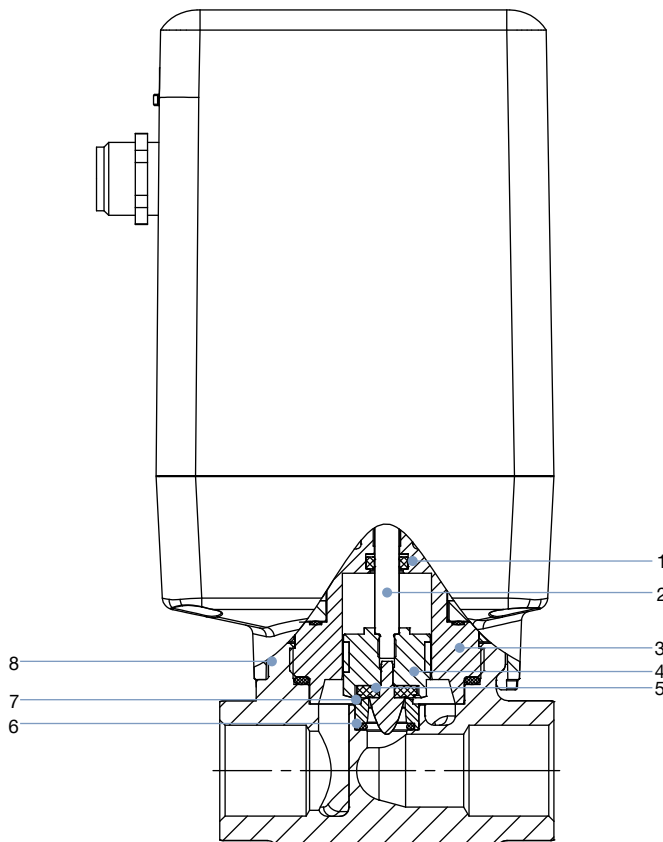


**Bürkert resistApp – Chemical Resistance Chart**

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](#)

#### 3.2. Material specifications



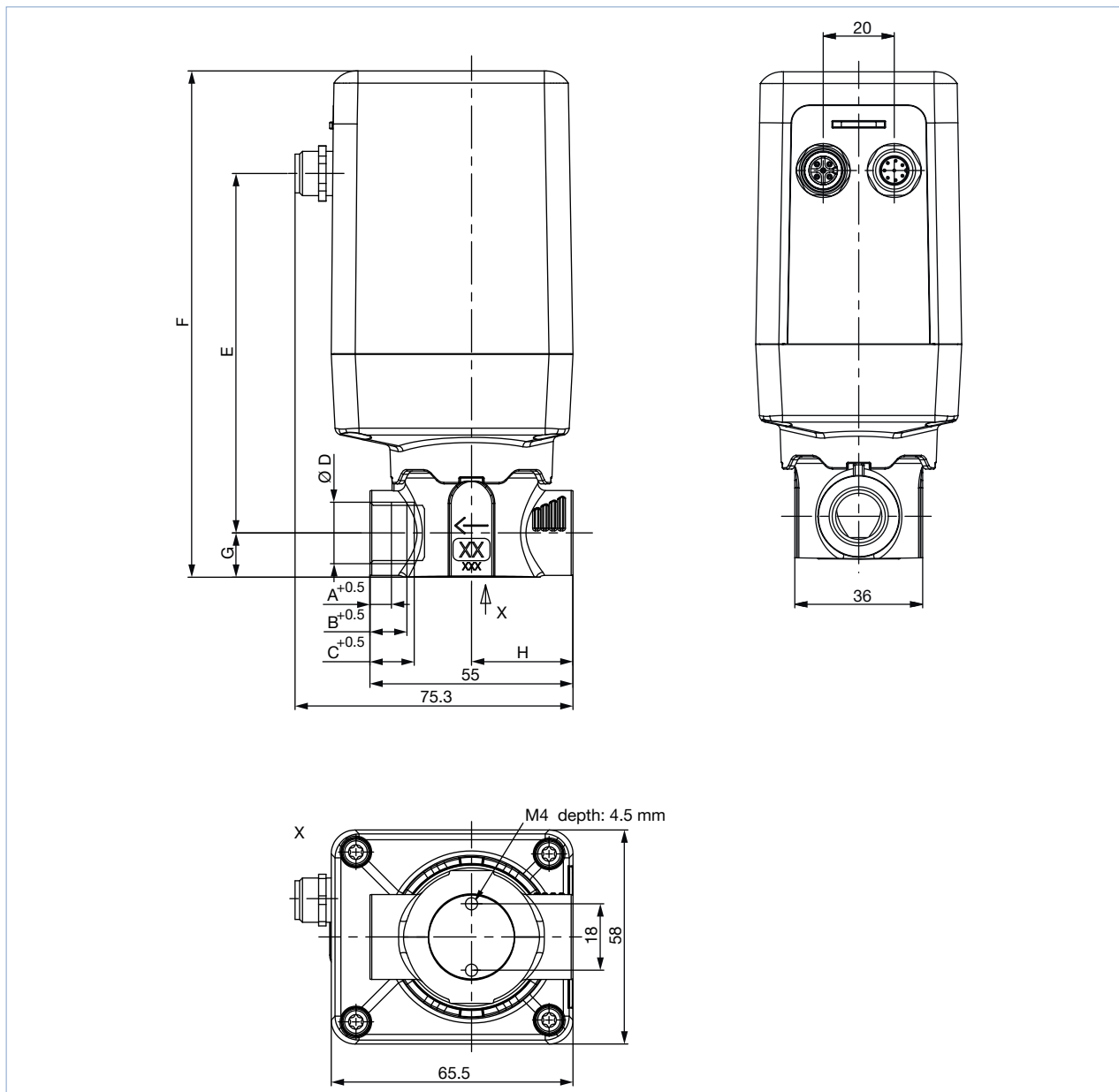
No.	Element	Material
1	Spindle seat	FKM/EPDM/NBR
2	Spindle	Stainless steel
3	Upper fluids housing	Brass or Stainless steel
4	Piston with parabolic control element and guiding shaft	Stainless steel
5	Elastomer seat seal	FKM/EPDM/NBR
6	O-Ring	FKM/EPDM/NBR
7	Seat	Stainless steel
8	Fluids housing	Brass or Stainless steel

## 4. Dimensions

### 4.1. Threaded body

**Note:**

- Dimensions in mm
- The actuator housing may be twisted against the fluidic body by up to 4.5°.

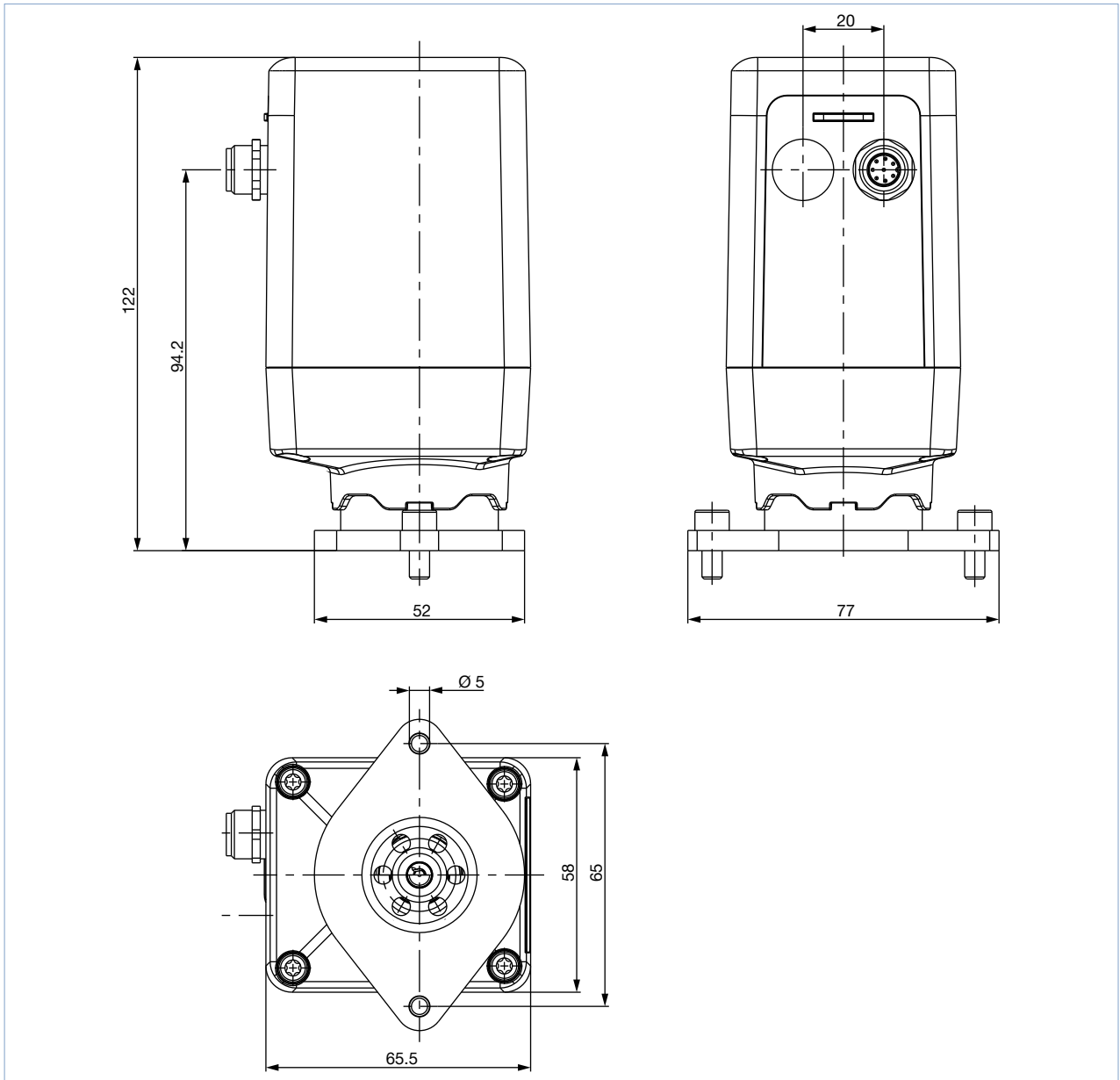


A	B	C	D	E	F	G	H
-	-	12	G 3/8	97.4	137.2	12	27.5
6	10.3	-	NPT 3/8	97.4	137.2	12	27.5
-	-	12	G 1/4	96.4	134.2	10	27.5
5.8	10	-	NPT 1/4	96.4	134.2	10	27.5
-	-	14	G 1/2	97.4	139.2	14	29.5
8.2	13.7	-	NPT 1/2	97.4	139.2	14	29.5

4.2. Sub-base body

**Note:**

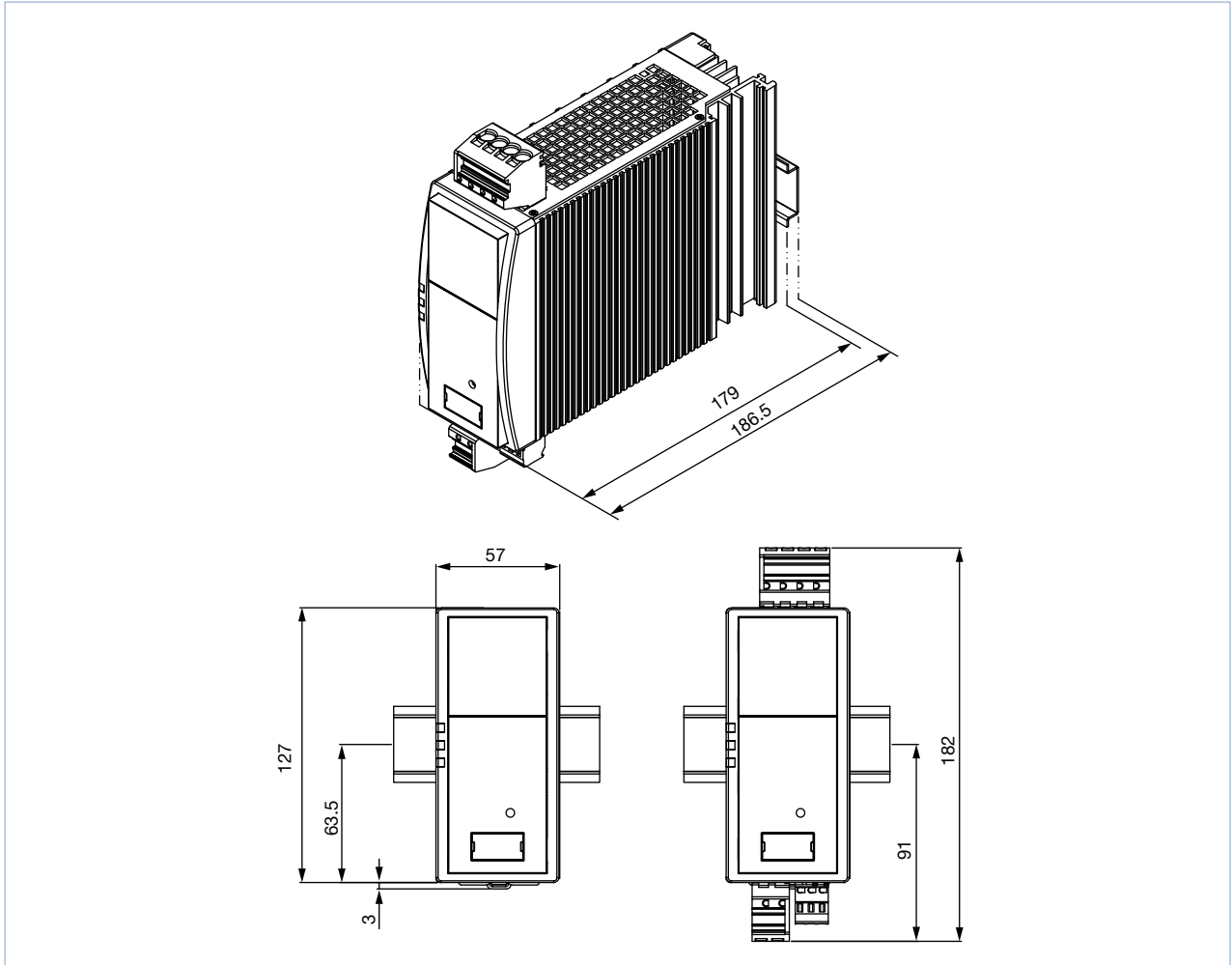
Dimensions in mm



### 4.3. Capacitive buffer module

**Note:**

- Dimensions in mm
- Detailed information can be found in chapter “8.1. Accessories capacitive buffer module” on page 14.



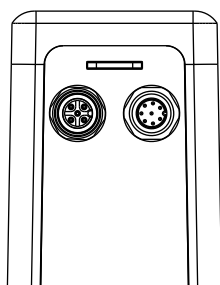


## 5. Device/Process connections

### 5.1. Analogue

**Note:**

For parameterisation and configuration of the positioner and the process controller versions, please use the Bürkert Communicator software tool, [“8.2. Software Bürkert Communicator” on page 14.](#)



Circular connector M12, 8 pin	Pin	Configuration
	1	24 V DC
	2	Power supply GND
	3	Internal use <sup>1)</sup>
	4	Internal use <sup>1)</sup>
	5	Internal use <sup>1)</sup>
	6	Signal input +
	7	Signal output
	8	Signal GND

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 [“9.4. Ordering chart accessories” on page 15\).](#)

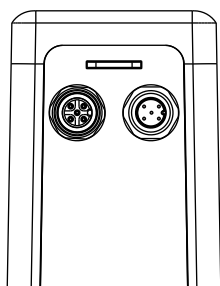
Additional for process controller version:

Socket M12, 5 pin	Pin	Configuration
	1	24 V DC sensor power supply
	2	Analogue IN (0...20 mA, 4...20 mA, 0...5 V or 0...10 V)
	3	GND
	4	GND (Bridge acc. to GND Pin3)
	5	Not connected

### 5.2. Digital (Feldbus)

**Note:**

For parameterisation and configuration of the positioner and the process controller versions, please use the Bürkert Communicator software tool, [“8.2. Software Bürkert Communicator” on page 14.](#)



Circular connector M12, 5 pin	Pin	Configuration
	1	Shield
	2	24 V DC
	3	GND
	4	CAN high
	5	CAN low

Additional for process controller version:

Socket M12, 5 pin	Pin	Configuration
	1	24 V DC sensor power supply
	2	Analogue IN (0...20 mA, 4...20 mA, 0...5 V or 0...10 V)
	3	GND
	4	GND (Bridge acc. to GND Pin3)
	5	Not connected

## 6. Performance specifications

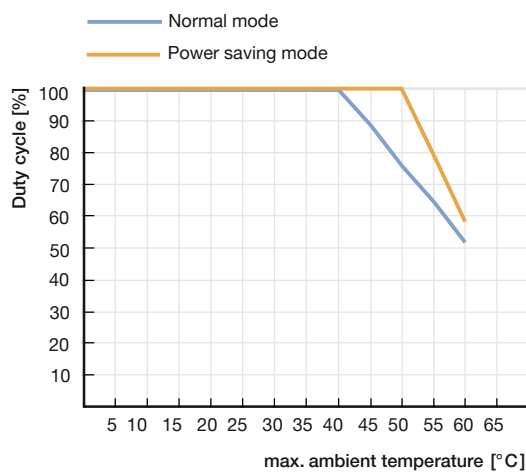
### 6.1. Duty cycle derating diagram

**Note:**

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

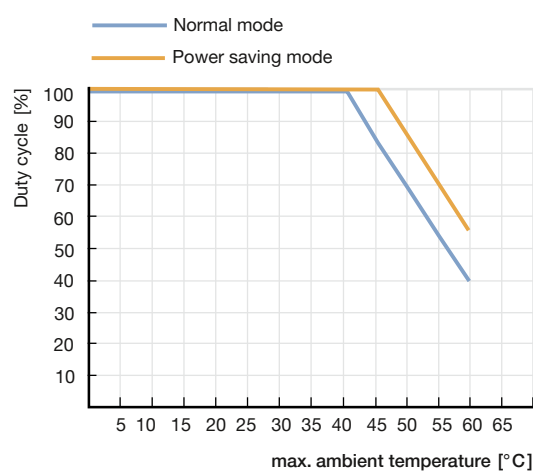
**Type 3280**

Seat DN1...6 < 6 bar standard



**Type 3280**

Seat DN1...6 < 6 bar positioner and process controller  
 DN8...10 < 6 bar standard  
 DN1...10 > 6 bar standard



Derating curve for positioner and process controller DN 8...10: see instruction manual.

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## 6.2. Pressure range

### Standard version

#### Note:

Please use the product filter of our [eShop](#) on the Bürkert website to order from the standard program. Alternatively, the form can be used at the end of the data sheet.

Valve function	DN	Port connection <sup>1.)</sup>	K <sub>vs</sub> -value water	Pressure range
	[mm]		[m <sup>3</sup> /h] <sup>2.)</sup>	[bar(g)]
Control valve, without safety position in case of power failure	1	G ¼	0.03	0...6
	1.5	G ¼	0.065	0...6
	2	G ¼	0.15	0...6
	3	G ¼	0.3	0...6
	4	G ⅜	0.5	0...6
	5	G ⅜	0.75	0...6
	6	G ⅜	0.9	0...6
	8	G ½	1.5	0...6
	10	G ½	1.9	0...6

1.) Other cable connections (NPT, sub-base) on request

2.) K<sub>vs</sub>-value: Measured with water (20 °C) and 1 bar pressure drop over valve

### High-pressure version

#### Note:

- Please use the product filter of our [eShop](#) on the Bürkert website to order from the standard program. Alternatively, the form can be used at the end of the data sheet.
- For applications requiring a higher operating pressure, high-pressure versions are available. Please note that for the high-pressure version, the control in the lower range of the characteristic curve (<5 % of the max. set point) can be impaired.

Valve function	DN	Port connection <sup>1.)</sup>	K <sub>vs</sub> -value water	Pressure range fluid media	Pressure range gaseous media
	[mm]		[m <sup>3</sup> /h] <sup>2.)</sup>	[bar(g)]	[bar(g)]
Control valve, without safety position in case of power failure	1	G ¼	0.03	0...15	0...22
	1.5	G ¼	0.065	0...15	0...22
	2	G ⅜	0.15	0...15	0...22
	3	G ⅜	0.3	0...15	0...22
	4	G ⅜	0.5	0...12 <sup>3.)</sup>	0...12 <sup>3.)</sup>
	5	G ⅜	0.75	0...12 <sup>3.)</sup>	0...12 <sup>3.)</sup>
	6	G ⅜	0.9	0...15	0...16
	8	G ½	1.5	0...12	0...12
	10	G ½	1.9	0...10	0...10

1.) Other cable connections (NPT, sub-base) on request

2.) K<sub>vs</sub>-value: Measured with water (+20 °C) and 1 bar pressure drop over valve.

3.) Pressure range 0...12 bar for sealing material FKM, Pressure range 0...15 bar for sealing material EPDM, NBR

### Further versions on request



#### Analytical

Oxygen version

Parts oil-, fat- and silicon free

### 6.3. Flow characteristic

#### Determination of the $K_V$ value

##### Note:

Once the  $K_V$ -value required for the application has been calculated, it can be compared with the  $K_{VS}$ -values from the ordering chart. The  $K_{VS}$ -value must be higher than the  $K_V$ -value of the application, but should be neither too high nor too close to it - as a recommendation: 10% higher.

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

$K_V$ Flow coefficient	[m <sup>3</sup> /h] <sup>1.)</sup>
$Q_N$ Standard flow rate	[m <sup>3</sup> /h] <sup>2.)</sup>
$p_1$ Inlet pressure	[bar] <sup>3.)</sup>
$p_2$ Outlet pressure	[bar] <sup>3.)</sup>
$\Delta p$ Differential pressure $p_1 \dots p_2$	[bar]
$\rho$ Density	[kg/m <sup>3</sup> ]
$\rho_N$ Standard density	[kg/m <sup>3</sup> ]
$T_1$ Medium temperature	[(273+t)K]

- 1.) Measured for water,  $\Delta p = 1$  bar, over the value
- 2.) At reference conditions 1.013 bar and 0 °C (273 K)
- 3.) Absolute pressure

## 7. Product operation

### Standard on/off valve

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 control 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.

Process diagram	Description
	<p><b>Positioner version</b></p> <p>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 (Xd1), the motor control signal is sent to the actuating drive as the actuating variable. Z1 is a disturbance value.</p> <p>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.</p>
	<p><b>Process controller version</b></p> <p>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.</p> <p>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 (Xd2), the actual position (POS) and therefore the valve opening are changed by the control variable (CTRL). Z2 represents a disturbance variable.</p>


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## 8. Product accessories

### 8.1. Accessories capacitive buffer module

**Note:**

- Dimensions see “4.3. Capacitive buffer module” on page 8.
- Ordering information see “9.4. Ordering chart accessories” on page 15.

Accessories	Description
<p>Motor valve(s) connection</p>  <p>24 V DC power supply For example: Single phase, primary switched mode power supply Type 1573</p>	<ul style="list-style-type: none"> <li>• Capacitive buffer module for moving to a safety position in case of power failure</li> <li>• In order to be able to move to a safety position of the valve in the event of a power failure, the valve must be supplied with voltage via the capacitive buffer module. In the event of a power failure, the buffer module provides an output voltage of 18 V DC for a few seconds. The reduced input voltage is detected by the valve and the safety position is approached accordingly. Up to 3 valves of Type 3280 or 2 valves of Type 3285 can be connected to a buffer module. Factory setting of the safety position: “valve closed”</li> <li>• 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”.</li> <li>• For positioner and process controller version (functionality available as of software version A.06): adjustable via Bürkert Communicator (user-defined safety position)</li> </ul>

### 8.2. Software Bürkert Communicator

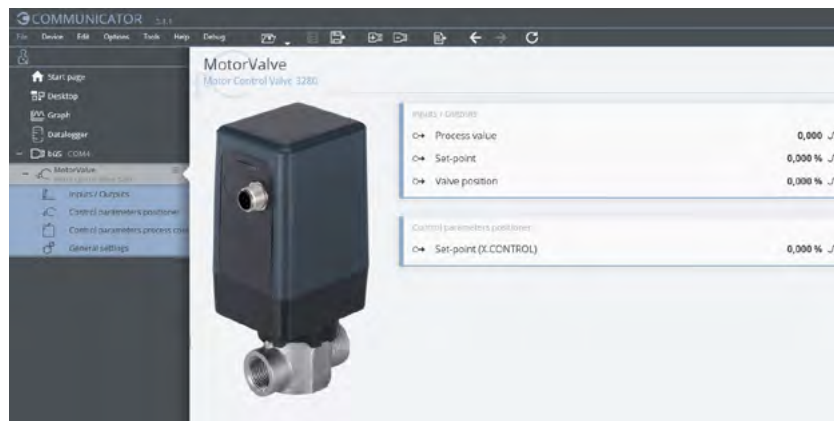
**Note:**

To install the software, click [here](#).

An adjustment of the valve by the Bürkert Communicator is only possible with the positioner or process controller versions.

Part of Bürkert’s new EDIP program (Efficient Device Integration Platform) is the Bürkert Communicator. This software can be run under MS-Windows and it is available on Bürkert’s website for free. The Bürkert Communicator allows convenient system configuration and parametrisation of all connected field devices. An accessory part, the bÜS stick serves as the interface between computer and process instruments (see “9.4. Ordering chart accessories” on page 15). The Communicator allows:

- Diagnostics
- Parameterisation
- Registration and storage of process data
- To watch graph of process
- To update firmware of the device connected
- Guided re-calibration



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**Connection Type 3280 with Bürkert Communicator software**

The interface to the “Bürkert Communicator” software tool is based on CANopen. A corresponding bus termination is mandatory. For versions with standard signal interfaces, please activate the switchable terminating resistor on the büS stick. For versions with büS / CANopen communication interface, this terminating resistor should not be switched on if the device is already integrated in a properly terminated bus network.

- A büS stick is required to connect the motor valve to the “Bürkert Communicator” software tool. The büS stick sets contain the necessary accessories.
- Versions with büS / CANopen communication interface are connected directly via the 5 pin M12 plug (büS stick set 1 contains the necessary accessories).
- Versions with standard signal interfaces are connected via the 8 pin M12 plug on the device (büS stick set 1 + büS adapter; socket 8 pin-M12 to plug 5 pin-M12 contain the necessary accessories).

## 9. Ordering information

### 9.1. Bürkert eShop – Easy ordering and quick delivery



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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.


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### 9.2. Recommendation regarding product selection

**Note:**

- The configuration of the nominal diameter/orifice is very important for proportional valves to ensure proper functioning within the application. The nominal diameter/orifice must be selected in such a way that on the one hand the desired flow range is achieved and on the other hand a sufficient part of the total pressure drop across the valve takes place when the valve is fully open.
- Reference value: pressure drop of the valve >25 % of the total pressure drop
- Let Bürkert engineers advise you already in the planning phase!

### 9.3. 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](#)

### 9.4. Ordering chart accessories

**General accessories**

Description	Article no.
M12 socket, 8 pin with 2 m ready to use cable	919061
M12 socket, 8 pin with 2 m ready to use cable shielded cable	918991
Power supply Type 1573 for rail mounting, 100–240 V AC/ 24 V DC, 1.25 A, NEC Class 2 (UL 1310)	772438

