



Digital electropneumatic positioner for the integrated mounting on process control valves

- Compact, robust stainless steel design
- Start-up by automatic TUNE-Function
- Contact-free position sensor
- Integrated control air routing
- Digital communication IO-Link, Bürkert system bus (bÜS)

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

Can be combined with

	Type 2301 ▶ Pneumatically operated 2 way Globe Control Valve ELEMENT
	Type 2300 ▶ Pneumatically operated 2 way angle seat con- trol valve ELEMENT
	Type 2103 ▶ Pneumatically operated 2/2-way diaphragm valve ELEMENT for de- centralized automation
	Hygienic process control valves ▶

Type description

Compact positioner for integrated mounting on pneumatically operated process valves. Remote setpoint adjustment via a 4-20 mA signal. A contact-free continuous sensor measures the position of the valve spindle. Simple installation through automatic tune function and setting through DIP-switch:

- Close tight function,
- Characteristic curves selection,
- Reversal of effective direction,
- Switching manual /automatic operation,
- Binary input.

A software interface can be used for, amongst others, linearisation of the operation characteristics by using free programmable fixed points. The valve position indication is shown through LED components. As an option an analogue position feedback can be integrated.

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1. General Technical Data

1.1. Digital electropneumatic positioner Type 8696

Product properties	
Dimensions	Detailed information can be found in chapter “3. Dimensions” on page 6.
Materials	
Body	PPS, stainless steel
Seal	EPDM
Cover	PC
Operation	
DIP switches	Yes (only for 24 V DC version without digital communication)
Service interface	Connection with PC through USB interface
Configuration tool	Bürkert Communicator
Commissioning	
AUTO-TUNE Function	Yes
Communication	
Digital	IO-Link, Bürkert system bus (based on CANopen)
Device status/Position indicator	Coloured illuminated LEDs
Position sensor/Position feedback	
Analogue Position sensor	Inductive (contactless)
Stroke range for linear actuators	
Valve spindle	3...32 mm
Electrical data	
Operating voltage	24 V DC $\pm 10\%$ UL: NEC Class 2
Residual ripple for DC	10 %
Input resistance	180 Ω
Power consumption	<3.5 W
Set-point value setting default	4...20 mA (default setting) / 0...20 mA
Analogue feedback (optional)	4...20 mA
Electrical connection	
Multipole	Circular plug M12 (8 pin), stainless steel
Inputs/Outputs	
Digital (binary)	1 binary input
Analogue	1 Analogue output
Pneumatic data	
Control medium	
Dust content	Neutral gases, air, quality classes acc. to ISO 8573-1 Class 7 (< 40 μm particle size)
Particle density	Class 5 (< 10 mg/m^3)
Pressure dew point	Class 3 (< -20 °C)
Oil content	Class X (< 25 mg/m^3)
Supply pressure	0...7 bar ¹⁾
Actuating system	
Actuator series 23xx/2103	For single-acting actuators, actuator $\varnothing$ 50 mm
Pilot air ports	Threaded connection G 1/8, stainless steel

Approvals and Certificates

Protection class	3 acc. to DIN EN 61140
Conformity	EMC directive 2014/30/EU
Ignition protection	II 3D Ex tc IIIC T135 °C Dc II 3G Ex ec IIC T4 Gc
UL	cULus Certificate; E238179
ATEX	II 3D Ex tc IIIC T135 °C Dc II 3G Ex ec IIC T4 Gc Certificate; BVS 14 ATEX E 008 X
IECEX	Ex tc IIIC T135 °C Dc Ex ec IIC T4 Gc Certificate; IECEX BVS 14.0009 X
Options	Analogue position feedback, 4...20 mA

Environment and installation**Operating conditions**

Ambient temperature	-10...+55 °C
Degree of protection	IP65/IP67 acc. to EN 60529, 4X acc. to NEMA 250 Standard
Max. operating altitude	2000 m above sea level

Installation and mechanical data

Installation variants	Direct mounting
Installation position	As required, preferably with actuator in upright position
Valve actuator	ELEMENT actuator series Type 23xx/2103, actuator size 50 mm and third party actuators
Adapter kits	Detailed information can be found in chapter "Adapter kits" on page 12.

1.) The supply pressure must be 0.5 to 1 bar above the minimum required pilot pressure of the valve actuator.

1.2. With digital communication: IO-Link**Electrical data**

IO-Link specification	V1.1.2
SIO-Mode	No
VendorID	0x0078, 120
DeviceID	See IODD File (The IODD file can be downloaded from the website www.burkert.com)
Transmission rate	230.4 kbit/s (COM 3)
Data storage	Yes
Max. cable length	20 m
Port Class	B
Electrical connection	M12×1, 5 pin, A-coded
Power supply	Over IO-Link

Operating voltage

System supply (Pin 1 + 3)	24 V DC ± 25 % (acc. to specification)
Actuator supply (Pin 2 + 5)	24 V DC ± 25 % (acc. to specification)

Current consumption

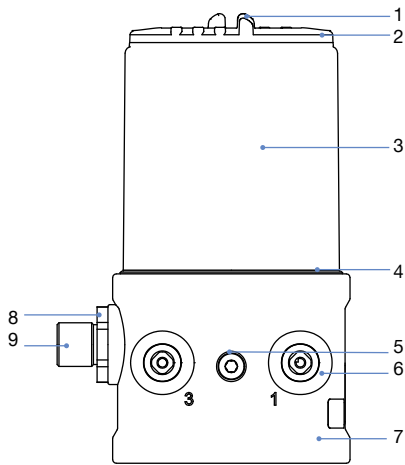
System supply (Pin 1 + 3)	Max. 50 mA
Actuator supply (Pin 2 + 5)	Max. 100 mA

1.3. With digital communication: Bürkert system bus (bÜS)**Electrical data**

Operating voltage	18...30 V DC (acc. to specification)
Electrical connection	M12×1, 5 pin, A-coded
Current consumption	Max. 150 mA

2. Materials

2.1. Material specifications



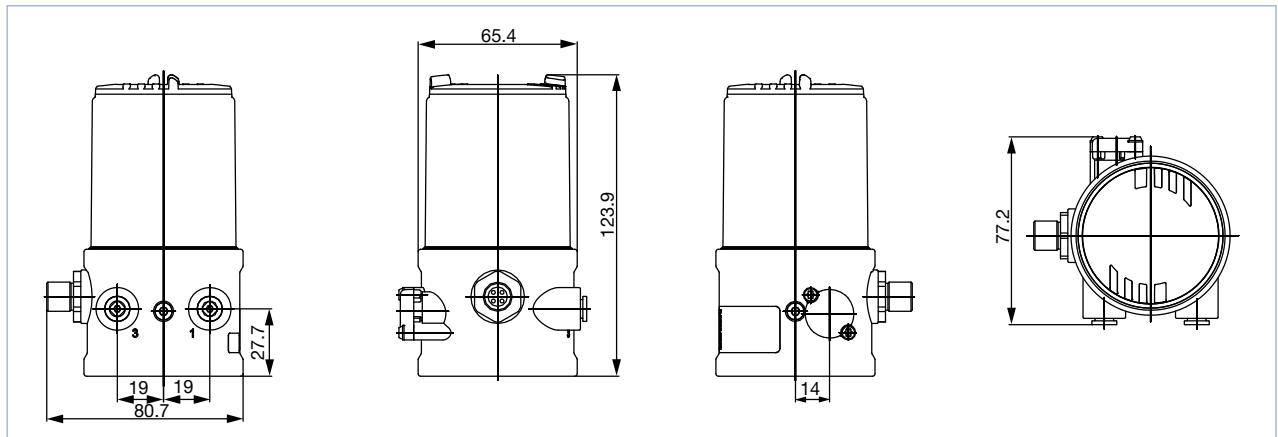
Nr.	Element	Material
1	Cover	PC
2	Seal	EPDM
3	Body casing	Stainless steel
4	Seal	EPDM
5	Screws	Stainless steel
6	Push-in connector Threaded ports G 1/8	POM/Stainless steel Stainless steel
7	Basic housing	PPS
8	Screws	Stainless steel
9	Plug connector M12	Stainless steel

3. Dimensions

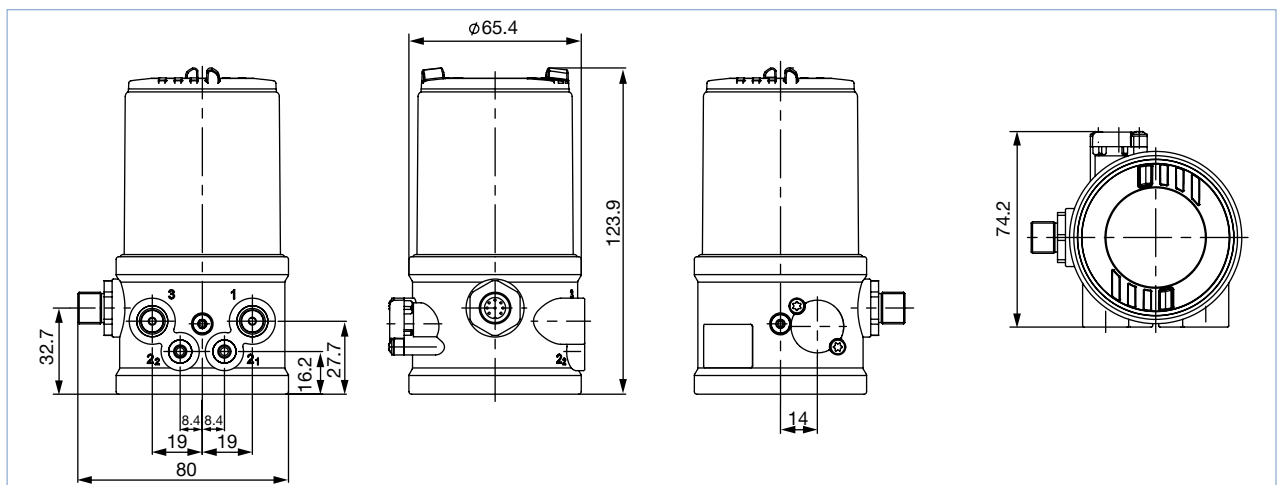
3.1. Mounting on process valve ELEMENT Type 23xx / 2103

Note:

- Internal control air supply to the actuator
- Dimensions in mm



3.2. Mounting on hygienic process valves of third party suppliers



4. Device/Process connections

4.1. Electrical connections

Without fieldbus communication 24 V DC

Circular plug M12, 8 pin																			
	<table><tr><th>Pin</th><th>Pin assignment</th></tr><tr><td>1</td><td>Setpoint + (0/4...20 mA / 0...5/10 V)</td></tr><tr><td>2</td><td>Setpoint GND</td></tr><tr><td>3</td><td>Operating voltage GND</td></tr><tr><td>4</td><td>Operating voltage + 24 V DC</td></tr><tr><td>5</td><td>Binary input +</td></tr><tr><td>6</td><td>Binary input GND</td></tr><tr><td>7</td><td>Analogue position feedback GND</td></tr><tr><td>8</td><td>Analogue position feedback +</td></tr></table>	Pin	Pin assignment	1	Setpoint + (0/4...20 mA / 0...5/10 V)	2	Setpoint GND	3	Operating voltage GND	4	Operating voltage + 24 V DC	5	Binary input +	6	Binary input GND	7	Analogue position feedback GND	8	Analogue position feedback +
Pin	Pin assignment																		
1	Setpoint + (0/4...20 mA / 0...5/10 V)																		
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6	Binary input GND																		
7	Analogue position feedback GND																		
8	Analogue position feedback +																		

IO-Link connection

Circular plug M12, 5 pin

Pin	Description	Pin assignment
1	L +	24 V DC
2	P24	24 V DC
3	L –	0 V (GND)
4	Q/C	IO-Link
5	M24	0 V (GND)

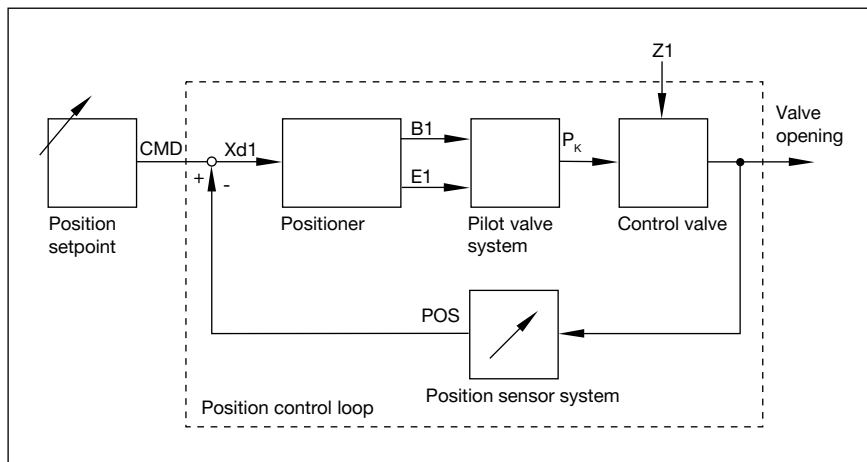
Bürkert system bus (bÜS) connection

Circular plug M12, 5 pin																			
	<table><tr><th>Pin</th><th>Description</th><th>Cable colour</th></tr><tr><td>1</td><td>CAN Shield/Shielding</td><td>CAN Shield/Shielding</td></tr><tr><td>2</td><td>+24 V DC ±25 %, max. residual ripple 10 %</td><td>Red</td></tr><tr><td>3</td><td>GND / CAN_GND</td><td>Black</td></tr><tr><td>4</td><td>CAN_H</td><td>White</td></tr><tr><td>5</td><td>CAN_L</td><td>Blue</td></tr></table>	Pin	Description	Cable colour	1	CAN Shield/Shielding	CAN Shield/Shielding	2	+24 V DC ±25 %, max. residual ripple 10 %	Red	3	GND / CAN_GND	Black	4	CAN_H	White	5	CAN_L	Blue
Pin	Description	Cable colour																	
1	CAN Shield/Shielding	CAN Shield/Shielding																	
2	+24 V DC ±25 %, max. residual ripple 10 %	Red																	
3	GND / CAN_GND	Black																	
4	CAN_H	White																	
5	CAN_L	Blue																	

5. Performance specifications

5.1. Signal flow diagram

Position control loop



TopControl BASIC functions

- Automatic start of the control system
- Binary input (safety position)
- Analogue position feedback (optional)

DIP-Switch activated device

- Close-tight function
- Inversion of the operating direction of the setpoint signal
- Linear characteristic curves selection or customised programming (software interface)
- Manual and automatic operation

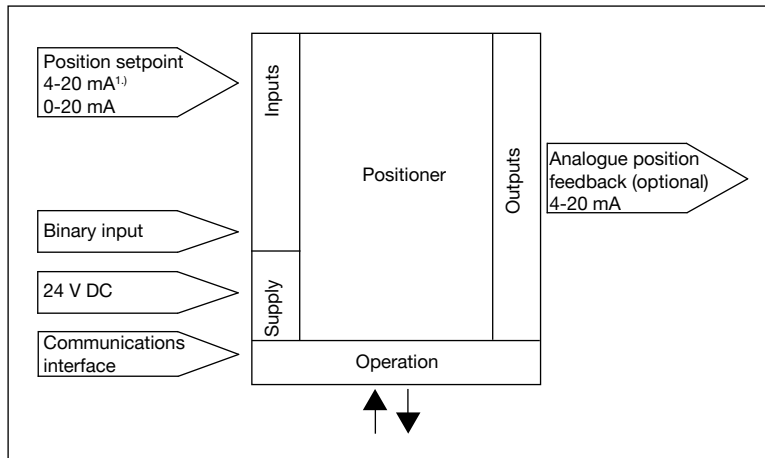
Communications software with activatable and parameter driven functions

- Customised programming transmission characteristics
- Choices of setpoint signal
- Range splitting setpoint signal
- Limitation of the valve stroke
- Limitation of the operation speed.
- Definition of the safety position
- Signal failure detection

5.2. Interface diagram

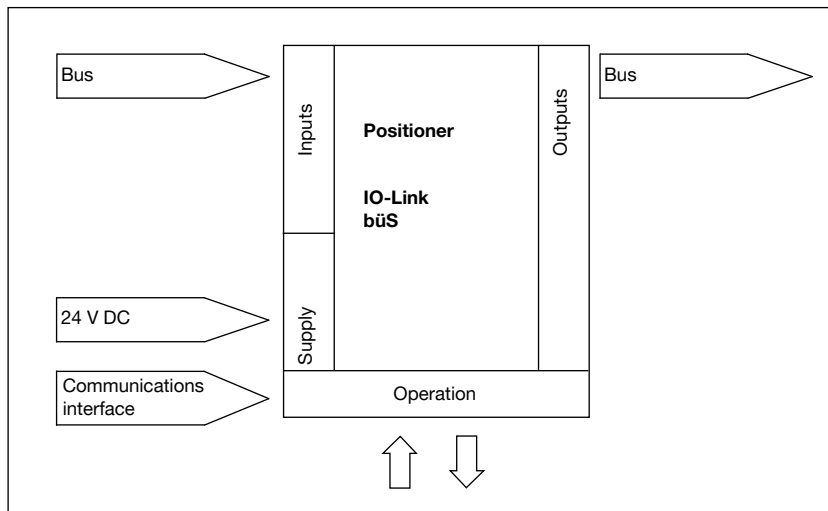
TopControl Positioner BASIC

Without fieldbus communication 24 V DC



1.) Default setting

With digital communication IO-Link, Bürkert system bus (bÜS)



6. Product installation

6.1. Combination options with pneumatic process valves

Note:

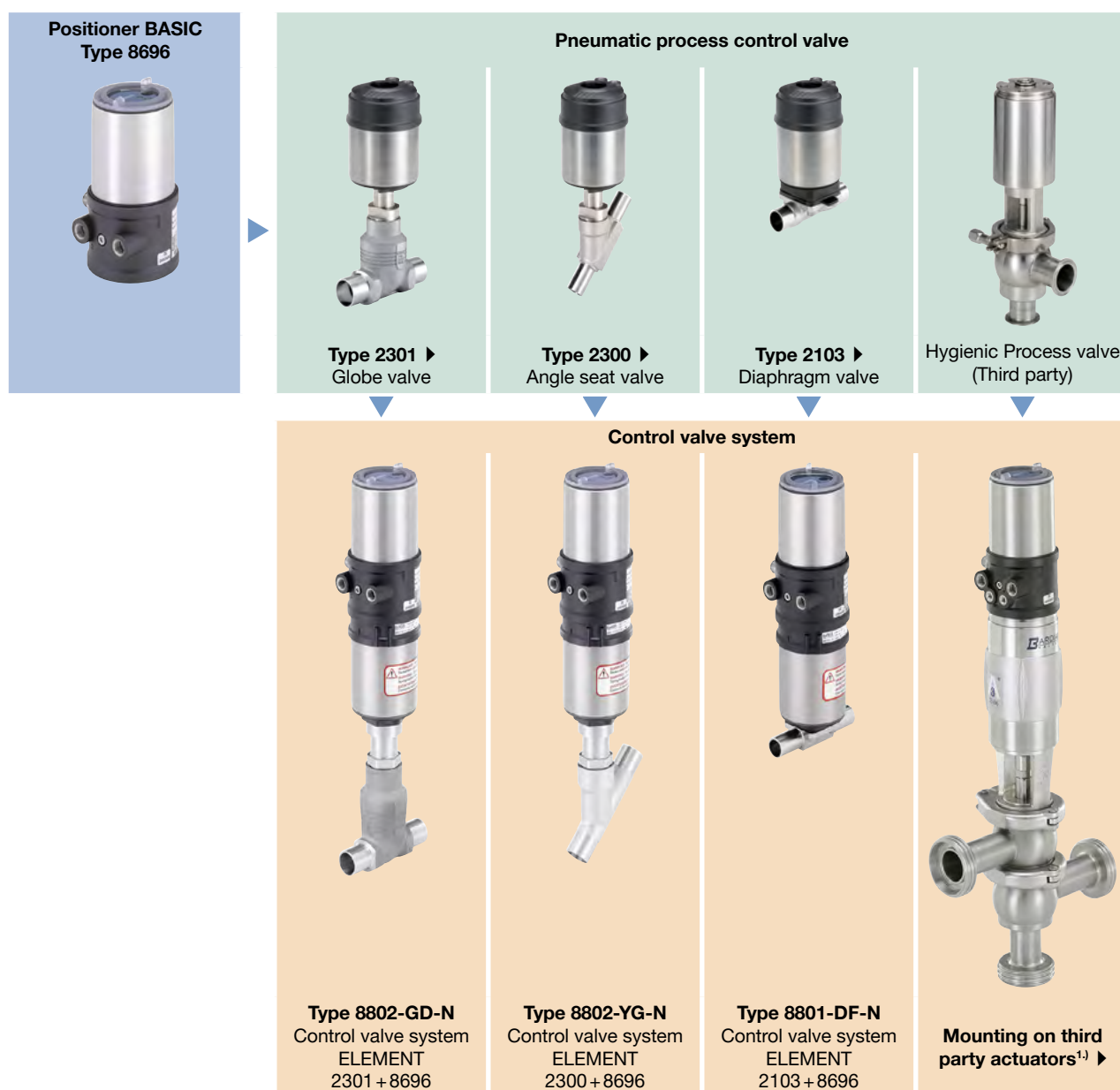
A TopControl control valve system consists of a **Positioner BASIC Type 8691** and a **Control valve ELEMENT Type 23xx** respectively 2103, actuator size 50 mm.

The following information is required to select a complete system:

- **Article no.** of the desired positioners TopControl BASIC **Type 8696** (see “7.3. Ordering chart” on page 11)
- **Article no.** of the desired control valves **Type 23xx/2103** (see separate data sheets, **Type 2301** ▶, **Type 2300** ▶, **Type 2103** ▶)

You order two components and receive a complete assembled and certified valve.

Example for decentralised automation of On/Off ELEMENT valve systems



1.) See data sheet [adaptations for third-party actuators, KK01](#) or contact the appropriate Bürkert sales office.

7. Ordering information

7.1. Bürkert eShop – Easy ordering and quick delivery



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7.2. Bürkert product filter



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7.3. Ordering chart

Note:

- Adapter kits must be ordered separately - see [“Adapter kits” on page 12](#).
- All standard versions are UL approved (UL approval for IO-Link und büS in preparation).
- ATEX/IECEX for IO-Link and büS is in preparation.
- Other versions are available on request.

Circuit function pilot valve system	Electrical connection	Communication	Analogue feedback	1 binary input	Pilot air ports threaded connection	Article no.	
Actuator series ELEMENT Type 23xx with actuator size Ø 50 mm (internal control air routing)						Standard	ATEX II Kat. 3G/D, IECEX
Single-acting	M12 plug connector	IO-Link	–	–	G 1⁄8	326447 	In prepara- tion
		Bürkert system bus (büS)	–	–	G 1⁄8	326445 	In prepara- tion
		Without fieldbus communication	–	Yes	G 1⁄8	227448 	265082 
		Yes	Yes	G 1⁄8	227449 	265083 	
Mounting on external drives (external control air routing)							
Single-acting	M12 plug connector	IO-Link	–	–	G 1⁄8	326446 	In prepara- tion
		Bürkert system bus (büS)	–	–	G 1⁄8	326444 	In prepara- tion
		Without fieldbus communication	–	Yes	G 1⁄8	223897 	265084 
			Yes	Yes	G 1⁄8	223898 	265085 

7.4. Ordering chart Accessories

Accessories

Description	Article no.
M12 socket, 8 pin with 5 m cable for input and output signals	919267 
Silencer G 1/8	780779 
Silencer, push-in connector	902662 
USB interface for serial communication (only for 24 V DC version without fieldbus communication)	227093 
USB bÜS interface set (bÜS stick + connecting cable with M12 connector + connecting cable M12 to micro USB for bÜS service interface) for connecting to the PC tool Bürkert Communicator	772551 
bÜS cable extension M12, length 1 m	772404 
bÜS cable extension M12, length 3 m	772405 
bÜS cable extension M12, length 5 m	772406 
bÜS cable extension M12, length 10 m	772407 
Software Bürkert Communicator	Link ►

Adapter kits

Adapter kits for third-party actuators can be found in the data sheet [Adaptation for third-party actuators, KK01](#) or contact the appropriate Bürkert sales office.

Description	Actuator size	Control function	Article no.
Adapter kit ELEMENT Types 23xx	Ø 50 mm	Universal	679918 

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