



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
- AS-Interface, IO-Link or Bürkert System bus (bUS)



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

Can be combined with

	Type 2300 ▶ Pneumatically operated 2 way angle seat control valve ELEMENT
	Type 2301 ▶ Pneumatically operated 2 way Globe Control Valve
	Type 2103 ▶ 2/2 way diaphragm valve with pneumatic stainless steel actuator (Type ELEMENT) for decentralised automation
	Hygienic process valves

Type description

Compact positioner for integrated mounting on pneumatically operated process valves. Remote setpoint adjustment via a 4...20 mA signal or through AS-Interface. A contact-free analogue position 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

Additional parametrisation options are possible through DTM devices. 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 8694

Product properties	
Dimensions	Detailed information can be found in chapter “3. Dimensions” on page 6.
Material	
Body	PPS, stainless steel
Seal	EPDM
Cover	PC
Operation	
Operating keys	2 keys
DIP switch	Integrated
Service interface	Connected to PC using USB connection
Configuration tool	Bürkert Communicator PACTware (only for device versions with AS-Interface or analogue version with serial interface)
Commissioning	
Initialization positioner	Automatic by X.TUNE function (automatic adjustment of the positioner)
Manual override of pilot valve	Mechanical
Status display	
Display of device and valve status	Multiple coloured LEDs
Communication	
Fieldbus	AS-Interface
Digital	IO-Link, Bürkert system bus (büS) - based on CANopen
Position sensor	
Measuring principle	Inductive
Position detection module	Contactless (wear-free) analogue position sensor
Stroke range	
Valve spindle	3...45 mm
Electrical data	
Operating voltage	24 V DC \pm 25 % UL: NEC Class 2
Residual ripple	Max. 10%
Protection class	3 acc. to DIN EN 61140
Power consumption	\leq 3.5 W
Electrical connection	
Multipole version	M12, 8 pin resp. 4-, or 5 pin acc. to device version (see “4. Device/Process connections” on page 7)
Cable gland version	M16 x 1.5 (cable \varnothing 5...10 mm) with terminals for cable cross-sections 0.14...1.5 mm ²
Pneumatic data	
Control medium	
Dust content	Neutral gases, air, quality class acc. to ISO 8573-1 Class 7 (<40 μ m 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)
Air supply filter	
Mesh size	Exchangeable ~0.1 mm
Supply pressure	
Low air capacity	0...7 bar ¹⁾
High air capacity	3...7 bar
Pilot air ports	Threaded connection G 1/8, stainless steel
Positioning system	
Low air capacity	
Single-acting	7 l _N /min for aeration and ventilation (Q _{Nn} - value acc. to definition at pressure drop from 7 to 6 bar absolute)
Actuator series/size	Type 23xx, \varnothing actuator 70/90 mm

High air capacity

Single-acting	130 l _N /min for aeration and ventilation (Q _{Nn} - value acc. to definition at pressure drop from 7 to 6 bar absolute)
Actuator series/size	Type 23xx, Ø actuator 130 mm Type 27xx, Ø actuator 175/225 mm

Approvals and certificates

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
CCC (China Compulsory Certificate)	For devices with Ex approval

Environment and installation**Operating conditions**

Ambient temperature	-1...+60 °C
Degree of protection	IP65/IP67 acc. to EN 60529, 4X acc. to NEMA 250 standard
Operating altitude	Up to 2000 m above sea level

Installation and mechanical data

Installation position	As required, preferably with actuator in upright position
Valve actuator (type, size)	ELEMENT Type 23xx, Ø actuator 70/90/130 mm CLASSIC Type 27xx (Ø actuator 175/225 mm)
Adapter kits	Detailed information can be found in chapter "Adapter kits" on page 13.

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

1.2. Without fieldbus communication**Electrical data**

Operating voltage	24 V DC ±25 % UL: NEC Class 2
Residual ripple	10 %
Power consumption	<3.5 W

Electrical connection

Multipole version	M12, 8 pin
Cable gland version	M16 x 1.5 (cable Ø 5...10 mm) with terminals for cable cross-sections 0.14...1.5 mm ²

Input/Output

Digital input	1 digital input
Analogue output	1 output (optional) 4...20 mA

Input data setpoint**Setpoint signal**

Default setpoint value setting	4...20 mA 0...20 mA (configurable via communication interface)
Input resistance	75 Ω

1.3. With fieldbus communication: AS-Interface

Product properties	
Profile	S-7.3.4 output: 16 Bit setpoint/certificate no. 87301 acc. to version 3.0 S-7.A.5 output: 16 Bit setpoint; input: 16 Bit setpoint/certificate no. 95401 acc. to version 3.0
Electrical data	
Operating voltage	
Via Bus cable	29.5...31.6 V DC acc. to specification UL: NEC Class 2
Power consumption	
Max. current consumption	Device without external power supply 150 mA
Electrical connection	M12, 4 pin stainless steel plug, ready to use up to 80 cm cable and flat cable terminal

1.4. With digital communication: IO-Link

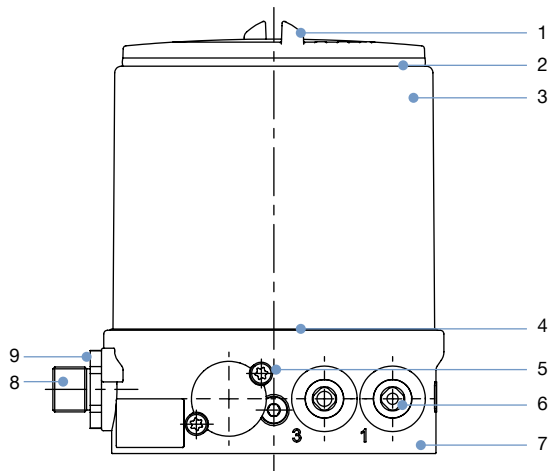
Electrical data	
Electrical connection	M12 × 1, 5 pin, A-coded
IO-Link specification	V1.1.2
SIO-Mode	No
VendorID	0x0078, 120
DeviceID	See IODD file (The IODD file can be downloaded from our website ►, see Software > Device Description Files A.04)
Transmission rate	230.4 kbit/s (COM 3)
Data storage	Yes
Max. cable length	20 m
Port Class	B
Power supply	Via IO-Link
Operating voltage	
System supply (Pin 1 + 3)	24 V DC ± 25 % (acc. to specification)
Actuator supply (Pin 2 + 5) galvanically isolated	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
Power consumption overall	Max. 3.5 W

1.5. With digital communication: Bürkert system bus (bÜS)

Electrical data	
Operating voltage	24 V DC ± 25 % (acc. to Specification)
Electrical connection	M12 × 1, 5 pin, A-coded
Current consumption	Max. 150 mA
Power consumption overall	Max. 3.5 W

2. Materials

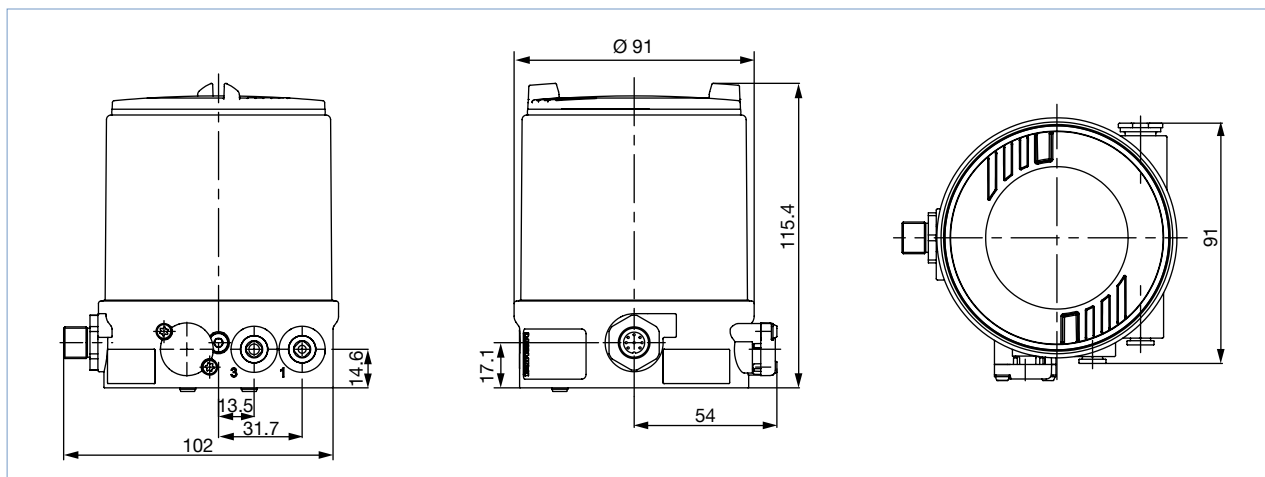
2.1. Material specifications



No.	Element	Material
1	Cover	PC
2	Seal	EPDM
3	Outer casing	Stainless steel
4	Seal	EPDM
5	Screws	Stainless steel
6	Push-in connector, Threaded port G 1/8	POM/stainless steel Stainless steel
7	Basic housing	PPS
8	Plug connector M12	Stainless steel
9	Screws	Stainless steel

3. Dimensions

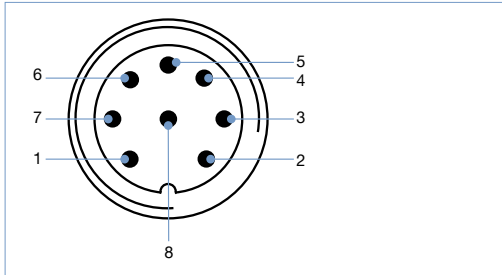
3.1. Mounting on ELEMENT control valve Type 23xx / 2103



4. Device/Process connections

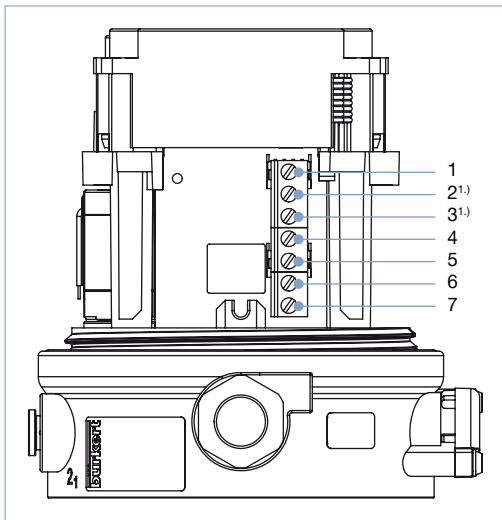
4.1. Electrical connections

Without fieldbus communication 24 V DC



Pin	Pin assignment
1	Setpoint + (0/4...20 mA)
2	Setpoint GND
3	Operating voltage GND
4	Operating voltage +24 V DC
5	Digital input +
6	Digital input GND
7	Analogue Position feedback GND
8	Analogue Position feedback +

Cable gland



1.) Only as option

Input signal

Pin	Pin assignment
4	Setpoint +
5	Setpoint GND
1	Digital input +
6	Power supply +
7	Power supply GND

Output signal with analogue feedback option

Pin	Pin assignment
2	Analogue feedback +
3	Analogue feedback GND

AS-Interface connection

Circular plug M12, 4 pin, without external power supply																
	<table border="1"> <thead> <tr> <th>Pin</th> <th>Description</th> <th>Pin assignment</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Bus +</td> <td>Bus cable AS-Interface +</td> </tr> <tr> <td>2</td> <td>NC (optional)</td> <td>Not assigned</td> </tr> <tr> <td>3</td> <td>Bus -</td> <td>Bus cable AS-Interface -</td> </tr> <tr> <td>4</td> <td>NC (optional)</td> <td>Not assigned</td> </tr> </tbody> </table>	Pin	Description	Pin assignment	1	Bus +	Bus cable AS-Interface +	2	NC (optional)	Not assigned	3	Bus -	Bus cable AS-Interface -	4	NC (optional)	Not assigned
	Pin	Description	Pin assignment													
	1	Bus +	Bus cable AS-Interface +													
	2	NC (optional)	Not assigned													
3	Bus -	Bus cable AS-Interface -														
4	NC (optional)	Not assigned														

Circular plug M12, 4 pin, with external power supply (on request)																
	<table border="1"> <thead> <tr> <th>Pin</th> <th>Description</th> <th>Pin assignment</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Bus +</td> <td>Bus cable AS-Interface +</td> </tr> <tr> <td>2</td> <td>GND (optional)</td> <td>External power supply</td> </tr> <tr> <td>3</td> <td>Bus -</td> <td>Bus cable AS-Interface -</td> </tr> <tr> <td>4</td> <td>24 V + (optional)</td> <td>External power supply</td> </tr> </tbody> </table>	Pin	Description	Pin assignment	1	Bus +	Bus cable AS-Interface +	2	GND (optional)	External power supply	3	Bus -	Bus cable AS-Interface -	4	24 V + (optional)	External power supply
	Pin	Description	Pin assignment													
	1	Bus +	Bus cable AS-Interface +													
	2	GND (optional)	External power supply													
3	Bus -	Bus cable AS-Interface -														
4	24 V + (optional)	External power supply														

IO-Link connection

Circular plug M12, 5 pin																									
	<table border="1"> <thead> <tr> <th>Pin</th> <th>Description</th> <th colspan="2">Pin assignment</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>L +</td> <td>24 V DC</td> <td>System supply</td> </tr> <tr> <td>2</td> <td>P24</td> <td>24 V DC</td> <td>Actuator supply</td> </tr> <tr> <td>3</td> <td>L -</td> <td>0 V (GND)</td> <td>System supply</td> </tr> <tr> <td>4</td> <td>Q/C</td> <td>IO-Link</td> <td>-</td> </tr> <tr> <td>5</td> <td>M24</td> <td>0 V (GND)</td> <td>Actuator supply</td> </tr> </tbody> </table>	Pin	Description	Pin assignment		1	L +	24 V DC	System supply	2	P24	24 V DC	Actuator supply	3	L -	0 V (GND)	System supply	4	Q/C	IO-Link	-	5	M24	0 V (GND)	Actuator supply
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	2	P24	24 V DC	Actuator supply																					
	3	L -	0 V (GND)	System supply																					
4	Q/C	IO-Link	-																						
5	M24	0 V (GND)	Actuator supply																						

Bürkert system bus (bÜS connection)

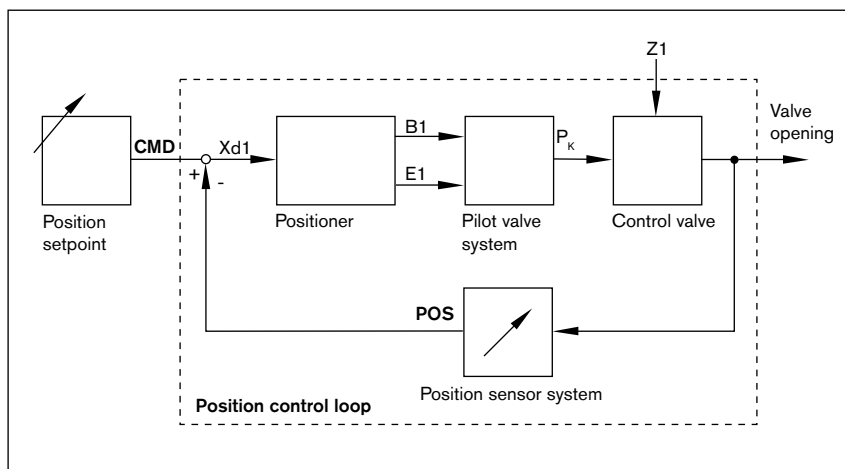
Circular plug M12, 5 pin																			
	<table border="1"> <thead> <tr> <th>Pin</th> <th>Description</th> <th>Cable colour</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>CAN Shield/Shielding</td> <td>CAN Shield/Shielding</td> </tr> <tr> <td>2</td> <td>+24 V DC ±25 %, max. residual ripple 10 %</td>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

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5. Performance specifications

5.1. Signal flow diagram

Position control loop

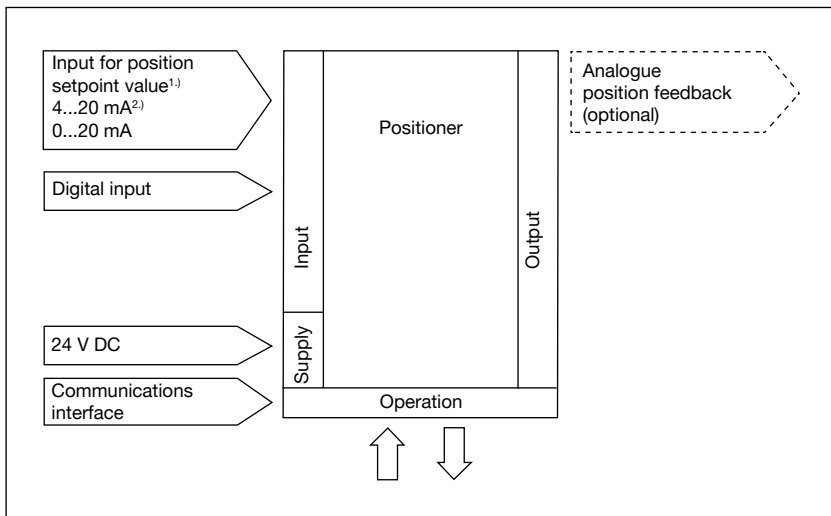


Additional software options of the TopControl BASIC positioner Type 8694 (extract)

- X.Tune function for automatic start-up
- Linear
- Close-tight function
- Reversal
- Switching
- Digital input
- Parametrisation of the device through PACTware/DTM main functions
- Device operation via service büS interface and communicator
- Setpoint value selection (0/4...20 mA)
- Position controller parametrisation
- Programmable stroke range limit
- Limitation of opening/closing time
- Safety position definition
- Signal error detection
- Digital input configuration
- Analogue output configuration position setpoint/feedback
- Setting setpoint/actuator direction (rise/fall)
- Reset device

5.2. Interface diagram

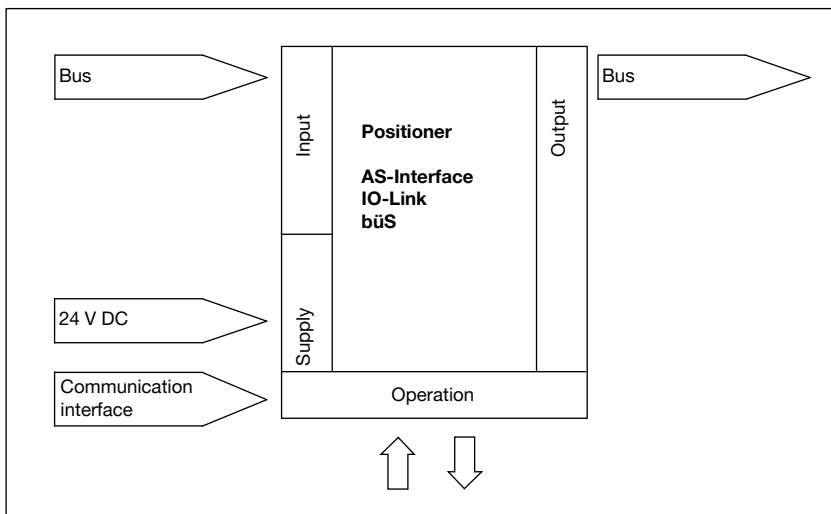
Version without fieldbus interface



- 1.) Or optional bus connection AS interface
- 2.) Default setting

Version with fieldbus interface

With AS-Interface, IO-Link and Bürkert system bus (büS)



6. Product installation

6.1. Combination options with pneumatic process valves

Note:

A TopControl control valve system consists of a **BASIC Positioner Type 8694** and an **ELEMENT control Type 23xx resp. 2103**.

The following information is required to select a complete system:

- **Article no.** of the desired TopControl BASIC positioner **Type 8694**.
- **Article no.** of the desired control valve **Type 23xx/2103** (see separate data sheet **Type 2300 ▶**, **2301 ▶** and **2103 ▶**)

You order two components and receive a completely assembled and tested valve.

Example for variations of the control valve system:



1.) See data sheet **adaptations for third-party drives, 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:












Standard versions are UL approved

Circuit function Pilot valve system	Communi- cation	Electrical connection	Feedback signal	Pilot air ports threaded con- nection	Article no.	
					Standard	ATEX II Cat. 3G/D, IECEX, CCC ^{1.)}
Actuator series ELEMENT Type 23xx Actuator size Ø 70/90 mm						
Low air capacity single-acting	-	M12 plug connector	-	G 1/8	323240	389216
			Analogue	G 1/8	323256	389217
	AS-Interface S-7.A.5	M12 plug connector/flat cable terminal/80 cm cable	-	G 1/8	323248	389214
			Analogue	G 1/8	323266	389215
			Digital	G 1/8	239615	265043
			Digital	G 1/8	323232	389233
büS	M12 multipole	Digital	G 1/8	323236	389237	
Actuator series ELEMENT Type 23xx Actuator size Ø 130 mm						
High air capacity single-acting	-	M12 plug connector	-	G 1/8	323241	389225
			Analogue	G 1/8	323258	389226
	AS-Interface S-7.A.5	M12 plug connector/flat cable terminal/80 cm cable	-	G 1/8	323249	389223
			Analogue	G 1/8	323267	389224
			Digital	G 1/8	239616	265056
			Digital	G 1/8	323233	389234
büS	M12 multipole	Digital	G 1/8	323237	389238	


1.) CCC (China Compulsory Certificate) for device versions with Ex approval.


7.4. Ordering chart accessories

Standard accessories

Description	Article no.
M12 socket, 8 pin with 5 m cable for input and output signals	919267 
ASI flat cable terminal with stainless steel socket M12 (spare part)	799646 
Silencer G 1/8	780779 
USB Interface for serial communication (only for device versions with AS-Interface resp. analogue version with serial interface)	227093 
USB bÜS interface set (bÜS stick + connecting cable with M12 plug + connection cable M12 to micro USB bÜS service interface) for connecting to PC-Tool Bürkert Communicator (only for device versions with IO-Link, Bürkert system bus resp. analogue version with bÜS service interface)	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 
Sensor-Puck (spare part)	682240 
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 for actuator series Type 23xx/2103	Ø 70/90/130 mm	Universal	679917 

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