



Control head for decentralised automation of ELEMENT process valves

- Contact-free inductive valve position registration (Teach function)
- Colour illuminated status display
- Integrated pilot air duct in the actuator
- Fieldbus interface AS-Interface, IO-Link or Bürkert system bus (bÜS)
- With ATEX II cat. 3G/D / IECEx approval

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

Can be combined with

	Type 2100 Pneumatically operated 2/2-way angle seat valve ELEMENT for decentralized automation	▶
	Type 2101 Pneumatically operated 2/2-way globe valve ELEMENT for decentralised automation	▶
	Type 2103 2/2-way diaphragm valve with pneumatic stainless steel actuator (Type ELEMENT) for decentralised automation	▶
	Type 2104 T-diaphragm valve with pneumatic actuator in stainless steel (Type ELEMENT) for decentralised automation	▶
	Type 2105 Tank bottom diaphragm valve with pneumatic actuator in stainless steel (Type ELEMENT) for decentralised automation	▶
	Type 2106 Pneumatically operated 3/2-way seat valve ELEMENT for decentralized automation	▶

Type description

The device Type 8691 control head is designed for decentralised automation of ELEMENT Type 21xx pneumatic process valves. The valve position is registered via a contact-free, analogue sensor element which automatically detects and saves the valve end position using the Teach function during start-up. The integrated pilot valve controls single or double-acting actuators. An optional communication interface, AS-Interface, IO-Link or bÜS (based on CANopen) can be selected.

The design of the control head and the actuator permits integrated pilot air duct without external piping. Besides the electrical position feedback, the device status is shown directly on the control head itself through coloured powerful LEDs, even in difficult ambient conditions.

The housing is easy to clean and features proven IP protection and chemically resistant materials for use in hygienic processing in the food, beverage and pharmaceutical industries. Focused on plant wash-down applications, the IP protection of the housing is supported by positive pressure inside the control head. Combined with Bürkert ELEMENT actuators, the pneumatic actuating system enables spring chamber aeration that avoids actuator chamber contamination from the environment.

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1. General technical data

1.1. Control head Type 8691

Product properties	
Dimensions	Further information can be found in chapter “4. Dimensions” on page 8.
Material	
Body	PPS, stainless steel
Seal	EPDM
Cover	PC
Operation	
Operating keys	2
Service interface	Connection to PC via USB bÜS interface set
Configuration tool	Bürkert Communicator
Commissioning	
Setting of valve end position	Through automatic or manual teach function
Manual operation of pilot valve	Yes
Status display	
Display of the device and valve status	High performance LEDs (colours individually adjustable)
Communication	
Fieldbus	AS-Interface, IO-Link
Digital	Bürkert system bus (bÜS) (based on CANopen)
Performance data	
Functional overview	Further information can be found in chapter “1.6. Functional overview Type 8691” on page 6.
Position sensor	
Analogue position sensor	Inductive (contactless) with self-adjusting switching points (PNP) (NPN on request)
Stroke range for linear actuator	
Valve spindle	2.5...45 mm
Electrical data	
Electrical connection	
Multipole variant	M12, 8-pin or 5-pin according to device variant (see “5. Product connections” on page 9)
Cable bushing variant	M16 × 1.5 (terminal range 5...10 mm) with screw-type terminals for cable cross sections 0.14...1.5 mm ²
Pneumatic data	
Control medium	
Neutral gases, air, quality class according to ISO 8573 - 1	
Dust content	Class 7 (particle size < 40 µm)
Particle density	Class 5 (< 10 mg/m ³)
Pressure dew point	Class 3 (≤ - 20 °C or min. 10 °C below the lowest operating temperature)
Oil content	Class X (< 25 mg/m ³)
Air intake filter	
Exchangeable	
Mesh size	Approx. 0.1 mm
Supply pressure	3...7 bar ¹⁾
Pilot air port	Threaded connection G 1/8, stainless steel
Positioning system	
Circuit function	Single-acting (3/2-way) and double-acting (5/2-way)
Air flow rate	250 l _N /min (for aeration and ventilation) (Q _{Nr} value according to definition with pressure drop from 7 to 6 bar abs)
Actuator series/size	Type 21xx, actuator Ø 70/90/130/225 mm

Approvals and conformities

Explosion protection

Ignition protection class	II 3D Ex tc IIIC T135 °C Dc II 3G Ex ec IIC T4 Gc
ATEX	BVS 14 ATEX E 008 X II 3D Ex tc IIIC T135 °C Dc II 3G Ex ec IIC T4 Gc
IECEX	IECEX BVS 14.0009 X Ex tc IIIC T135 °C Dc Ex ec IIC T4 Gc

Further information can be found in chapter [“2.4. Explosion protection” on page 7.](#)

North America (USA/Canada)

UL Listed for the USA and Canada	cULus certificate: E238179 Further information can be found in chapter “2.5. North America (USA/Canada)” on page 7.
FM Explosion Protection	Increased Safety for Class I, Zone 2, AEx ec IIC T4 Gc hazardous (classified) locations, indoors and outdoors (IP54). Alternatively marked as Class I Division 2 Groups A, B, C, and D; T4. Further information can be found in chapter “2.5. North America (USA/Canada)” on page 7.

Others

China Compulsory Certification (CCC)	The products with Ex approval are suitable for import and use for hazardous applications in China. Further information can be found in chapter “2.6. Others” on page 7.
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Further information can be found in chapter [“2. Approvals and conformities” on page 7.](#)

Environment and installation

Operating conditions

Ambient temperature

With pilot valve	-10...+55 °C
Without pilot valve	-20...+60 °C
Degree of protection	IP65/IP67 according to EN 60529, 4X according to NEMA 250 Standard
Operating altitude	Up to 2000 m above sea level

Installation and mechanical data

Mounting variant	Direct mounting
Installation position	As required, preferably with actuator in upright position
Valve actuator (type, size)	ELEMENT Type 21xx (actuator Ø 70/90/130/225 mm)
Attachment kit	Further information can be found in chapter “Attachment kits” on page 15.

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: 24 V DC

Electrical data

Operating voltage	24 V DC ± 25 % UL: NEC Class 2
Residual ripple	10 %
Power consumption	2 W or 5 W at maximum load on an active digital output
Protection class	III according to DIN EN 61140

Electrical connection

Multipole variant	M12, 8-pin
Cable bushing variant	M16 × 1.5 (cable Ø 5...10 mm) with terminals for cable cross-sections 0.14...1.5 mm²

Input/output

Output	Max. 100 mA per output
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1.3. With fieldbus communication: AS-Interface

Product properties	
Profile	S-B.A.E (AB slave, max. 62 slaves/master), certificate no. 136701 according to specification v3.0
Electrical data	
Operating voltage	Via ASi power supply 29.5...31.6 V DC (according to specification), UL: NEC Class 2
Protection class	III according to DIN EN 61140
Power consumption	
Max. current consumption	110 mA
Unit with additional actuator supply (AUX Power)	External power supply 24 V DC $\pm 10\%$ (the power supply unit must contain one secured disconnection according to IEC 364 - 4 - 41 (PELV or SELV))
System supply	Max. 110 mA without additional actuator supply (AUX Power), with pilot valve. Max. 60 mA with additional actuator supply or without pilot valve
Actuator supply	Max. 50 mA with additional actuator supply
Electrical connection	M12, 5-pin
Output	
Contact rating pilot valve	Approx. 0.8 W
Watchdog function	Integrated

1.4. With digital communication: IO-Link

Electrical data	
Electrical connection	M12 $\times$ 1, 5-pin, A-coded
IO-Link revision	1.1
SIO-Mode	No
VendorID	0x0078, 120
DeviceID	See IODD file (the IODD file can be downloaded from our website Type 8691 ►, see Software > Device Description Files)
Transmission rate	230.4 kbit/s
Data storage	Yes
Maximum cable length	20 m
Port class	A and B
Power supply	Via IO-Link
Port class A	
Operating voltage	24 V DC $\pm 25\%$ (according to specification)
System supply	Max. 150 mA with pilot valve Max. 100 mA without pilot valve
Port class B	
Operating voltage	
System supply (Pin 1 + 3)	24 V DC $\pm 25\%$ (according to specification)
Actuator supply (Pin 2 + 5)	24 V DC $\pm 25\%$ (according to specification)
Current consumption	
System supply (Pin 1 + 3)	Max. 100 mA
Actuator supply (Pin 2 + 5)	Max. 50 mA

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

Electrical data	
Operating voltage	18...30 V DC (according to specification)
Electrical connection	M12 $\times$ 1, 5-pin, A-coded
Current consumption	Max. 120 mA

1.6. Functional overview Type 8691

Function	Variant				
	24 V	IO-Link	AS-Interface standard-slave	AS-Interface A/B-Slave	büS/CANopen
Basic functions					
Teach function of position sensor	X	X	X	X	X
Pilot valve manual override (mechanical)	X	X	X	X	X
Pilot valve manual override (electrical)	–	X	–	–	X
Process valve position feedback	X	X	X	X	X
Feedback signal on current valve position (intermediate position)	–	X	–	–	–
Visual position feedback/status display high-performance LEDs	X	X	X	X	X
Colour change of the visual position feedback possible (LED in 3 colours: green, yellow, red)	X	X	X	X	X
Selection of LED display modes	–	X	–	–	X
Diagnostic LEDs	–	X	X	X	X
Selection of different LED display modes	–	X	–	–	X
Date storage function	–	X	–	–	–
Locating function	–	X	–	–	X
büS communication interface (Bürkert system bus)	–	–	–	–	X
büS service interface (for Bürkert Communicator software)	–	X	–	–	X
Diagnosis					
Process valve switching cycles counter with definable limit value	–	X	–	–	X
Pilot valve switching cycles counter	–	X	–	–	X
Operating hours counter with definable limit value	–	X	–	–	X
Process valve counter for opening/closing timeout	–	X	–	–	X
Travel accumulator with definable limit value	–	X	–	–	X
Active diagnostic messages (feedback when limit values are exceeded)	–	X	–	–	X
Diagnosis reset command (to reset counter values)	–	X	–	–	X
Error feedback from position sensor	–	X	X	X	X
Self-monitoring control head with automatic error message	–	X	–	–	X
Teach error feedback	X	X	X	X	X
Overtemperature feedback	–	X	–	–	X
Communication error feedback	–	X	X	X	X
Feedback for opening/closing timeout	–	X	–	–	X
Tolerance for switching time overrun	–	X	–	–	X
Error detection if the set-point position is not reached (end positions not reached)	–	X	–	–	X
Tolerance band of end position detection	–	X	–	–	–
Detection of under-voltage and over-voltage of power supply	–	X	–	–	X
Log function for error cases	–	X	–	–	X
Parameterization					
Enable/disable safety position in case of set-point or bus error	–	X	–	–	X
Selecting and setting the SIO mode	–	X	–	–	–
Selection of digital outputs (end positions) PNP, NPN	X	X	–	–	–
Selection of digital outputs (end positions) PNP, NPN, PP	–	X	–	–	–
Deactivation of local operation (lock function)	–	X	–	–	X
Factory reset function (reset to factory setting)	–	X	–	–	X

2. Approvals and conformities

2.1. 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.

2.2. Conformity

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

2.3. 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.

2.4. Explosion protection

Approval	Description
 	Optional: Explosion protection ATEX: BVS 14 ATEX E 008 X II 3D Ex tc IIIC T135 °C Dc II 3G Ex ec IIC T4 Gc IECEx: IECEx BVS 14.0009 X Ex tc IIIC T135 °C Dc Ex ec IIC T4 Gc

2.5. North America (USA/Canada)

Approval	Description
	Optional: UL Listed for the USA and Canada The products are UL Listed for the USA and Canada according to: • UL 61010-1 (ELECTRICAL EQUIPMENT FOR MEASUREMENT, CONTROL, AND LABORATORY USE – Part 1: General Requirements) • CAN/CSA-C22.2 No. 61010-1
	Optional: FM (Factory Mutual) – Explosion Protection Increased Safety for Class I, Zone 2, AEx ec IIC T4 Gc hazardous (classified) locations, indoors and outdoors (IP54). Alternatively marked as Class I Division 2 Groups A, B, C, and D; T4.

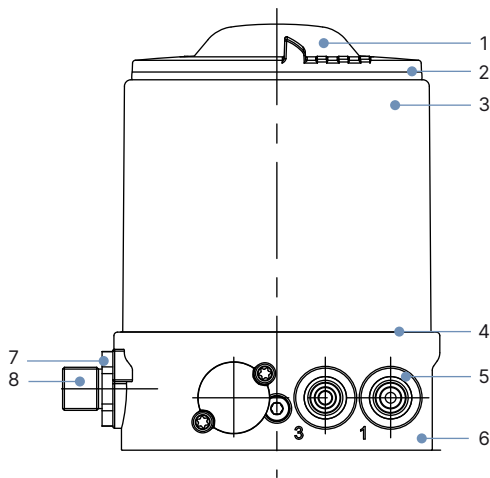
2.6. Others

China Compulsory Certification (CCC)

Conformity	Description
	Optional: China Compulsory Certification (CCC) The products with Ex approval are suitable for import and use for hazardous applications in China.

3. Materials

3.1. Material specifications

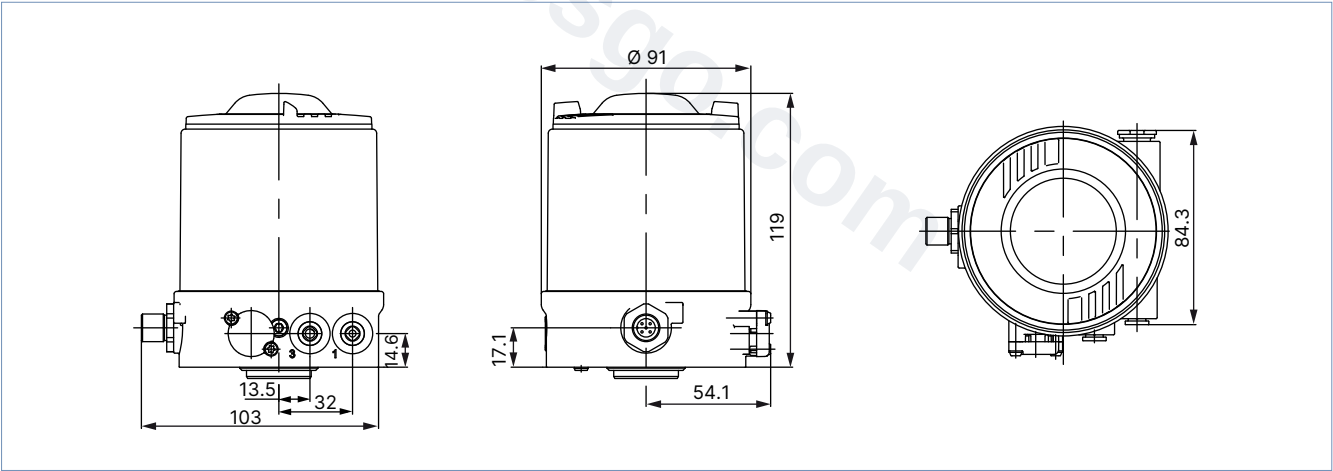


No.	Element	Material
1	Cover	PC
2	Seal	EPDM
3	Body casing	Stainless steel
4	Seal	EPDM
5	Push-in connector Threaded connections G 1/8	POM/stainless steel Stainless steel
6	Basic housing	PPS
7	Screws	Stainless steel
8	M12 plug connector	Stainless steel

4. Dimensions

4.1. Mounting on process valve ELEMENT Type 21xx

Note:
Dimensions in mm, unless otherwise stated



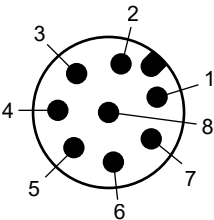
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5. Product connections

5.1. Electrical connection

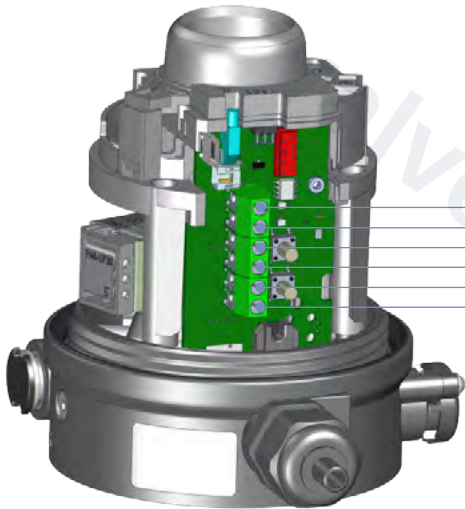
Without fieldbus communication 24 V DC

M12 circular plug, 8-pin



Pin	Description
1	Digital output (DO2+), end position with actuator activated
2	Digital output (DO1+), end position with actuator deactivated
3	Operating voltage GND
4	Operating voltage + 24 V DC
5	Digital input valve control +
6	Digital input valve control -
7	Not assigned
8	Not assigned

Cable gland



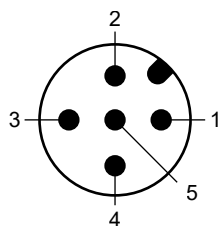
DO2+
DO1+
24 V+
24 V-
DI+
DI-

Input signal

Pin	Description
DO2+	Digital output end position with actuator activated
DO1+	Digital output end position with actuator deactivated
24 V+	Operating voltage + 24 V DC
24 V-	Operating voltage GND
DI+	Digital input valve control +
DI-	Digital input valve control -

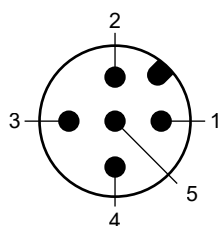
AS-Interface connection

M12 circular plug, 5-pin, without external power supply



Pin	Description	Pin assignment
1	Bus +	Bus cable AS-Interface +
2	NC	Not assigned
3	Bus -	Bus cable AS-Interface -
4	NC	Not assigned
5	NC	Not assigned

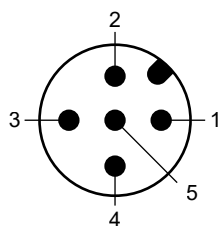
M12 circular plug, 5-pin, with external power supply (on request)



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
5	NC	Not assigned

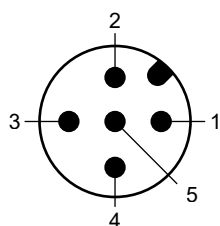
IO-Link connection

M12 circular plug, 5-pin, port class A



Pin	Description	Pin assignment	
1	L +	24 V DC	System supply
2	I/Q	NC	Not connected
3	L -	0 V (GND)	System supply
4	C/Q	IO-Link	Communication
5	NC	NC	Not connected

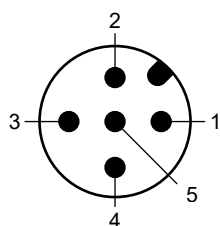
M12 circular plug, 5-pin, port class B



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	C/Q	IO-Link	Communication
5	N24	0 V (GND)	Actuator supply

Bürkert system bus (büS) connection

M12 circular plug, 5-pin



Pin	Description	Cable colour
Supply voltage: 18...30 V DC (büS)		
2	V +	Red
3	V -	Black
Data lines		
1	Drain/shielding	-
4	CAN_H	White
5	CAN_L	Blue

6. Product installation

6.1. Combination options with pneumatic process valves

Note:

A complete **TopControl control valve system** consists of a **positioner Type 8691** and an **ELEMENT process valve Type 21xx**.

The following information is required to select a complete system:

- **Article no.** of the desired **control head**, see **data sheet Type 8691**
- **Article no.** of the desired **process valve Type 21xx**, see **data sheets Type 2100 ▶, Type 2101 ▶ and Type 2103 ▶**

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

Example of decentralised automation of On/Off ELEMENT valve systems



1.) See data sheet **adaptations for third-party actuators Type KK01 ▶** or contact the relevant Bürkert sales office.

7. Ordering information

7.1. 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](#)

7.2. 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](#)

7.3. Ordering chart

Linear displacement sensor/integrated pilot air duct

ELEMENT Type 21xx actuator series and third-party actuators (for required adaptation see Type KK01 or on request)

Note:

All standard variants are UL-approved (UL approval for IO-Link).

Communication	Electrical connection	Circuit function Pilot valve system	Article no.		
			Standard / cULus	ATEX II Cat. 3G/D, IECEx, CCC	cFMus CL I ZN 2/CL I DIV 2 (with ATEX/ IECEx II 3G/D)
AS-Interface Slave profile: S-B.A.E (AB-Slave, max. 62 slaves)	M12 circular plug connector	Single-acting	20024895 	20024910 	–
		Double-acting	20024918 	20024926 	–
		Position feedback indicator / without	20024891 	o. r.	–
	M12 circular plug connector/80 cm cable	Single-acting	20024901 	20024911 	–
		Double-acting	20024924 	20024928 	–
		Position feedback indicator / without	20024893 	o. r.	–
IO-Link	M12 circular plug connector port class A	Single-acting	20024938 	20024942 	–
		Double-acting	20024954 	20024958 	–
		Position feedback indicator / without	20024930 	20024934 	–
	M12 circular plug connector port class B	Single-acting	20024946 	20024950 	–
		Double-acting	20024960 	20024964 	–
		Position feedback indicator / without	20024966 	20024970 	–
Bürkert system bus (bÜS)	M12 circular plug connector	Single-acting	20024974 	20024978 	–
		Double-acting	20024982 	20024986 	–
		Position feedback indicator / without	20024966 	20024970 	–
Without fieldbus communication	M12 circular plug connector	Single-acting	20024842 	20024855 	–
		Double-acting	20024875 	20024888 	–
		Position feedback indicator / without	20024819 	20024827 	–
	Cable bushing	Single-acting	20024840 	20024853 	20054406 
		Double-acting	20024873 	20024886 	20054404 
		Position feedback indicator / without	20024817 	20024825 	20054399 

o. r. = on request

Rotary position sensor/integrated pilot air duct
External actuators (required adaptation see Type KK01 or on request)

Communication	Electrical connection	Circuit function Pilot valve system	Article no.		
			Standard / cULus	ATEX II Cat. 3G/D, IECEx, CCC	cFMus CL I ZN 2/CL I DIV 2 (with ATEX/ IECEx II 3G/D)
AS-Interface Slave Profile: S-B.A.E (AB-Slave, max. 62 slaves)	M12 circular plug connector	Single-acting	20024897	20062089	–
		Double-acting	20024920	o. r.	–
		Position feedback indicator / without	o. r.	o. r.	–
	M12 circular plug connector/80 cm cable	Single-acting	20111304	20111318	–
		Double-acting	20111327	o. r.	–
		Position feedback indicator / without	20024894	o. r.	–
IO-Link	M12 circular plug connector port class A	Single-acting	20024940	20024944	–
		Double-acting	20024956	o. r.	–
		Position feedback indicator / without	20024932	20024936	–
	M12 circular plug connector port class B	Single-acting	20024948	20024952	–
		Double-acting	20024962	o. r.	–
		Position feedback indicator / without	20024976	20024980	–
Bürkert system bus (bÜS)	M12 circular plug connector	Single-acting	20024976	20024980	–
		Double-acting	20024984	o. r.	–
		Position feedback indicator / without	20024968	20024972	–
Without fieldbus communication	M12 circular plug connector	Single-acting	20024850	20024859	–
		Double-acting	20024884	o. r.	–
		Position feedback indicator / without	20024823	20024831	–
	Cable bushing	Single-acting	20024848	20024857	20054408
		Double-acting	20024881	o. r.	o. r.
		Position feedback indicator / without	20024821	20024829	20054402

o. r. = on request

Further variants on request

	Additional bÜS/CANopen
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7.4. Ordering chart accessories

Standard accessories

Note:

Must be ordered separately.

Description	Article no.
M12 circular socket with cable, 8-pin, cable length: 5 m, for input and output signals	919267 
AS-Interface flat cable terminal, M12 outlet, stainless steel outlet	799646 
USB bÜS interface set 2 (Type 8923) for connection to the Bürkert Communicator software: including bÜS stick, connection cable to M12 plug, M12 connection cable on micro USB for the bÜS service interface and Y distributor, cable length: 0.7 m	772551 
bÜS cable extension, M12, cable length: 1 m	772404 
bÜS cable extension, M12, cable length: 3 m	772405 
bÜS cable extension, M12, cable length: 5 m	772406 
bÜS cable extension, M12, cable length: 10 m	772407 
Silencer G 1/8	780779 
Sensor puck (spare part)	682240 
Software Bürkert Communicator	Type 8920 

Attachment kits

Note:

Must be ordered separately.

Attachment kits for third-party actuators can be found in the **data sheet Adaptations for third-party actuators Type KK01**  or contact the appropriate Bürkert sales office.

Description	Actuator size	Control function	Article no.
Attachment kit for Type 21xx/23xx actuator series	Ø 70/90/130 mm	Universal	679917 
Attachment kit for Type 21xx/23xx actuator series	Ø 225 mm	Universal	60025906 