Control head for decentralized automation of hygienic process valves

- Automatic commissioning
- Contactless high-resolution valve position detection
- Bright, colour-coded status indicator and diagnostics/NAMUR LED
- AS-Interface, IO-Link Port Class A/B
- Approved in accordance with ATEX/IECEx/cCSAus/CCC, Cat. 3GD/2GD, Cl I/II Div I/II

Product variants described in the data sheet may differ from the product presentation and description.
The German or English (EU) data sheet is the master version. Other language versions may be temporarily out of date and will be updated accordingly.

Can be combined with

Type 8683 ▸
Control head for decentralised automation of hygienic process valves

Type KK01 ▸
Adaptations for hygienic and non-hygienic process valves

Type description

The Type 8682 control head offers all the functions required for modern decentralised automation of pneumatically operated hygienic and aseptic process valves. It handles the entire pneumatic control unit, valve position detection, feedback and diagnostic functions, right through to bus communication.

Thanks to its universal design, the Type 8682 control head can be combined with all standard disk valves, ball valves and single-seat valves. Regardless of the valve manufacturer or model range, standardisation enables a consistent automation solution across the entire plant.

Depending on the valve function and automation requirements, the various versions of the Type 8682 always offer the right solution: from the intelligent, non-contact position sensor, which continuously detects both end positions and any intermediate positions with high resolution, to the control head with an integrated pilot valve for single- or double-acting actuators. Certifications in accordance with ATEX, IECEx and cCSAus allow for use in Ex zones 1/21 and 2/22, and Class I/II Division I/II respectively.

Thanks to several automatic teach functions, there is no need for any manual adjustments during commissioning. If necessary, the control head is commissioned during the ongoing process using the teach-in procedure.

For easy on-site process monitoring, the coloured light ring indicates the position of the process valve, whilst the diagnostics/NAMUR LED provides additional device information, such as maintenance required or fault conditions. For use in the food & beverage and pharmaceutical & biotech sectors, these products meet stringent requirements for hygienic design, maximum IP protection, and chemical and mechanical resistance, ensuring the highest levels of reliability and durability.

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1. General technical data

1.1. Control head Type 8682

Product properties	
Dimensions	Further information can be found in chapter "4. Dimensions" on page 9.
Material	
Body	PPE-PS, PPS, PC, stainless steel
Seal	External: EPDM Internal: EPDM, FKM, NBR
Operation	
Operating keys	For teaching the valve end positions, the electric manual operation and the setting of the LED colours for the valve status
Service interface	Connection to PC via USB-C service interface
Configuration tool	Bürkert Communicator
Commissioning	
Setting of valve end position	Through automatic or manual teach function
Pilot valve manual override	Yes
Electric manual override	
Pilot valve	Yes
Status display	
Display of device and valve status	High-performance LEDs (valve status colours are individually adjustable)
Communication	
Fieldbus	AS-Interface 3
Digital	24 V DC (PNP I/O, optional NPN), short-circuit proof output, with clocked short-circuit protection IO-Link
Fieldbus-specific data	
Bit configuration table	Further information can be found in the **operating instructions Type 8682** ▶.
Programming data table	Further information can be found in the **operating instructions Type 8682** ▶.
Performance data	
Functional overview	Further information can be found in chapter "1.2. Functional overview Type 8682" on page 6.
Position sensor	
Analogue position sensor	Contactless magnetic, 2 adjustable switching points Teach functions (manual teach function, automatic teach function, TEACH.IN.OP) (automatic teach-in during operation)
Position feedback	
Stroke range for linear actuator	
Valve spindle	0...86 mm
Resolution	≤ 0.03 mm
Rotation range for quarter-turn actuator	
Valve spindle	0...359°
Resolution	≤ 0.2°
Total error	± 0.5 mm (error refers to total stroke of 83 mm) ± 2° (for rotation range of 360°)
Target	Permanent magnet (use only the supplied target)
Pneumatic data	
Control medium	Neutral gases, air, quality class according to ISO 8573-1 (5 µm filter recommended)
Dust content	Class 7 (< 40 µm particle size)
Particle density	Class 7 (< 10 mg/m³)
Pressure dew point	Class 3 (≤ - 20 °C or min. 10 °C below the lowest operating temperature)
Oil content	Class X (< 25 mg/m³)
Supply pressure	3...8 bar
Pilot air port	
Medium temperature	- 10 °C...+ 50 °C
Air intake and exhaust air port	G ⅛
Working port	G ⅛

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Actuating system	
Circuit function	Single-acting and double-acting
Air performance 1.)	Q_{Nn} = 200 l/min (maximum flow rate for ventilation, unthrottled) 110 l/min (for venting, throttled delivery condition)
Approvals and conformities	
Explosion protection	
ATEX/IECEx	Dust: II 3 D Ex tc IIIC T135 °C Dc X Gas: II 3 G Ex ec IIC T4 Gc X Further information can be found in chapter "2.4. Explosion protection" on page 7.
North America (USA/Canada)	
CSA for the USA and Canada	cCSAus
HazLoc explosion protection	Intrinsically safe for Class I Division 1 (in preparation) Nonincendive for Class I/II, Division 2 (in preparation)
Further information can be found in chapter "2.5. North America (USA/Canada)" on page 7.	
Environment and installation	
Operating conditions	
Ambient temperature	-10 °C...+ 55 °C
Degree of protection	IP65/IP67/IP69k according to EN 60529 / IEC 60529 (IP67 is only achieved with a suitable exhaust connection, see the operating instructions **Type 8682** ▶)
Operating altitude	Up to 2000 m above sea level
Installation and mechanical data	
Installation position	As required, preferably with control head in upright position

1.) Q_{Nn} value for pressure drop from 7 to 6 bar absolute at + 20 °C

Without fieldbus communication: 24 V DC

Electrical data	
Operating voltage	24 V DC ± 25 %
Residual ripple	Max. 10 %
Protection class	III according to DIN EN 61140
Power consumption	Including external load on an active digital output: Max. 2 W at 10 mA load on digital output Max. 4 W at 100 mA load on digital output
Digital input for valve control (DI1)	
Number, construction	1 × 24 V relative to GND operating voltage, PNP (standard, variant with NPN)
Input power	Max. 1 mA at 30 V
Input voltage	0 signal = 0...5 V 1 signal = 15...30 V
Digital output for feedback signal	
Number, construction	2 × 24 V relative to GND operating voltage, PNP (standard, variant with NPN)
Output power	Max. 100 mA per output, short-circuit proof
Output voltage	0 signal = ≤ GND + 1 V and 1 signal = ≥ operating voltage - 1 V
Electrical connection	
Multipole	M12, 5-pin with 10 cm cable
Cable gland	M16 × 1.5 SW22 (cable Ø 5...10 mm, screw-type terminals 0.14...1.5 mm²)

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With fieldbus communication: AS-Interface

Product properties	
Profile	S-7.A.E (A/B slave with 3 A/4E) S-7.A.7 (A/B slave with 4 A/4E)
Electrical data	
Operating voltage	
Via bus cable	21...31.6 V DC Optional with additional actuator power supply (AUX Power): 24 V ± 25 %, max. residual ripple 10 % The actuator power supply must be galvanically isolated from the system power supply according to IEC 60664 and, for electrical safety (SELV), according to IEC 61010-2-201.
Protection class	III according to DIN EN 61140 (VDE 0140-1)
Power consumption devices without external actuator supply	
Current consumption at 26.5 V DC	< 70 mA + 20 mA (pilot valve)
Power consumption devices with external actuator supply	
Bus-powered	< 70 mA at 26.5 V
Actuator supply (AUX power)	< 40 mA at 18 V DC
Watchdog function	Integrated
Electrical connection	
Multipole	M12, 4-pin, 80 cm cable (1.0 m total cable length for the theoretical design of the AS-Interface network in accordance with the specification)

With digital communication: IO-Link

Electrical data	
IO-Link revision	V1.1.3
SIO mode	No
VendorID	0×78, 120
DeviceID	See corresponding IODD file (port class A, resp. port class B) The IODD file can be downloaded from our **website Type 8682** ▶, see Software > Device Description Files A.04.
Transmission rate	230.4 kbit/s
Frame type in operate mode	TYPE_2_V
Minimum cycle time	12 ms
Data storage	Yes
Cable length	Max. 20 m
Port class	A resp. B
Operating voltage	18...30 V DC (according to specification)
Power supply	Via IO-Link
Protection class	III according to DIN EN 61140
Maximum current consumption	
Port class A	< 60 mA + 30 mA for pilot valve at 18 V DC
Port class B	Bus-powered: < 60 mA at 18 V Actuator supply: < 15 mA + 35 mA for pilot valve at 18 V DC
Electrical connection	
Multipole	M12, 4-pin (IO-Link, port class A), cable 80 cm (from the cable gland) M12, 5-pin (IO-Link, port class B), cable 80 cm (from the cable gland)

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1.2. Functional overview Type 8682

Function	Variant	
	Position feedback indicator (without pilot valve)	Control head (with pilot valve)
Basic functions		
TEACH.MANU: manual teach function for valve end positions	X	X
TEACH.AUTO: automatic teach function for valve end positions	–	X
TEACH.IN.OP: automatic learning of valve end positions during operation	–	X
Manual operation of pilot valves (mechanically)	–	X
Manual operation (electrically via internal keypad)	–	X
Position feedback of process valve	X	X
Visual position feedback of the taught points (S1, S2) [1.)]	X	X
SAFEPOS: parameters for safety position (select safety position and activate/deactivate in the event of a device error)	–	X
Safety positions are defined in the event of a power/compressed air failure	–	X
X.CONTROL: parameters for positioning (setting feedback signals and ranges, as well as assignment of end positions, LED colours and LED display modes)	X	X
Localisation function [2.)]	X	X
USB-C service interface	X	X
Diagnostic functions		
TEMP.MONITOR: temperature monitoring	X	X
VOLT.MONITOR: supply voltage monitoring	X	X
SWITCH.CHECK: switch monitoring	–	X
SWITCH.TIME: switching time monitoring	–	X
SEAL.MONITOR: monitoring of sealed closing position	X	X
RAPID.MOVE: monitoring of sudden movements	–	X
Service features		
SERVICE.TIME: totaliser for operating time	X	X
TRAVEL.ACCU: totaliser for travelled distance distance	X	X
CYCLE.COUNTER: totaliser for valve cycles	–	X
Parameterisation via PC tool Bürkert Communicator (USB-C service interface on electronics module)	X	X
Deactivation of on-site operation (lock function)	X	X
Reset functions (reset to factory settings, teach, diagnostic and maintenance reset)	X	X

1.) S1 – mostly lower valve position (valve completely closed)
S2 – mostly upper valve position (valve fully open)
2.) Only for AS-Interface 3, profile S- 7.A.7 and for IO-Link

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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 approvals or conformities indicated below.

2.2. Conformity

In accordance with the EU 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

<table>
<tr><th>Approval</th><th>Description</th></tr>
<tr><td> </td><td>Optional: Explosion protection

ATEX/IECEx:
<table><tr><th>Dust</th><th>Gas</th></tr><tr><td>II 3 D Ex tc IIIC T135 °C Dc X</td><td>II 3 G Ex ec IIC T4 Gc X</td></tr></table></td></tr>
</table>

2.5. North America (USA/Canada)

<table>
<tr><th>Approval</th><th>Description</th></tr>
<tr><td> </td><td>Optional: CSA for Canada and the USA
The products are CSA approved for Canada and the USA according to:
• UL 61010-1 (ELECTRICAL EQUIPMENT FOR MEASUREMENT, CONTROL, AND LABORATORY USE – Part 1: General Requirements)
• CAN/CSA-C22.2 No. 61010-1</td></tr>
<tr><td> </td><td>Optional: CSA for Canada and the USA (HazLoc)
• Intrinsically safe Class I, Division 1 Group A,B,C,D
or
• Increased safety Class I,II,III Division 2 Group A,B,C,D,F</td></tr>
</table>

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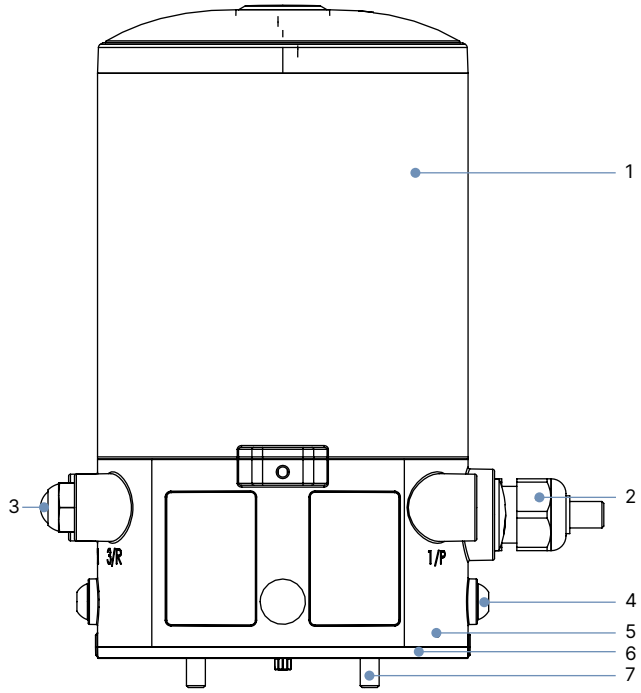
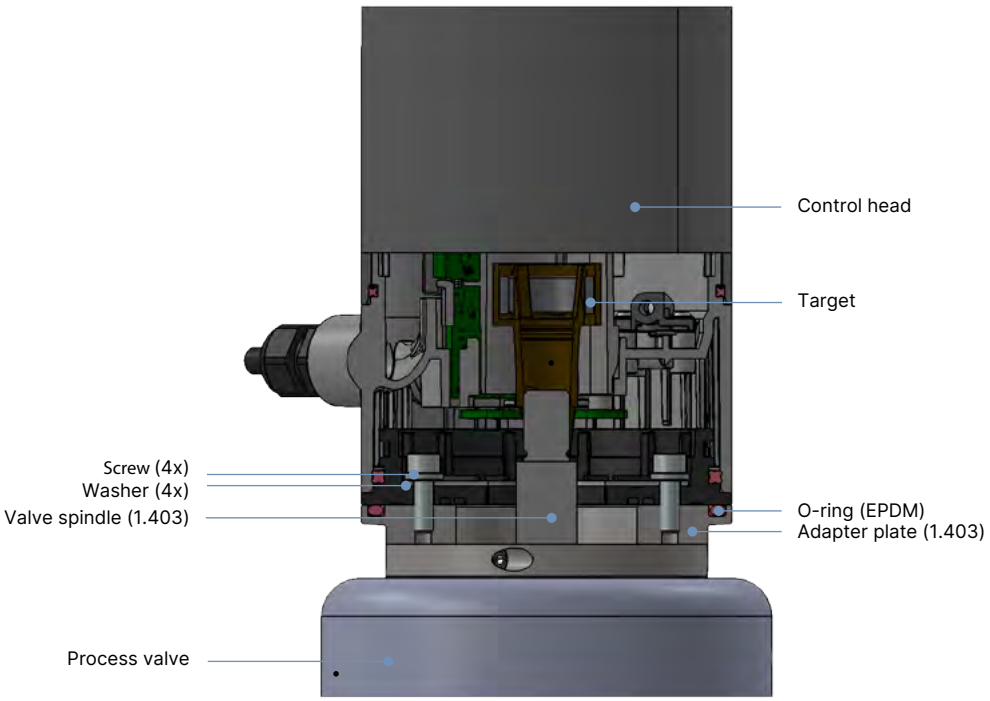
3. Materials

3.1. Material specifications



No.	Element	Material
1	Cover	PC
2	Cable glands	PA
3	Silencer	Stainless steel
4	Screws	Stainless steel
5	Fluid part	PPE/PS
6	Body section	PPS
7	Screws	Stainless steel

3.2. Adaptation interface Type KK01 for process valve



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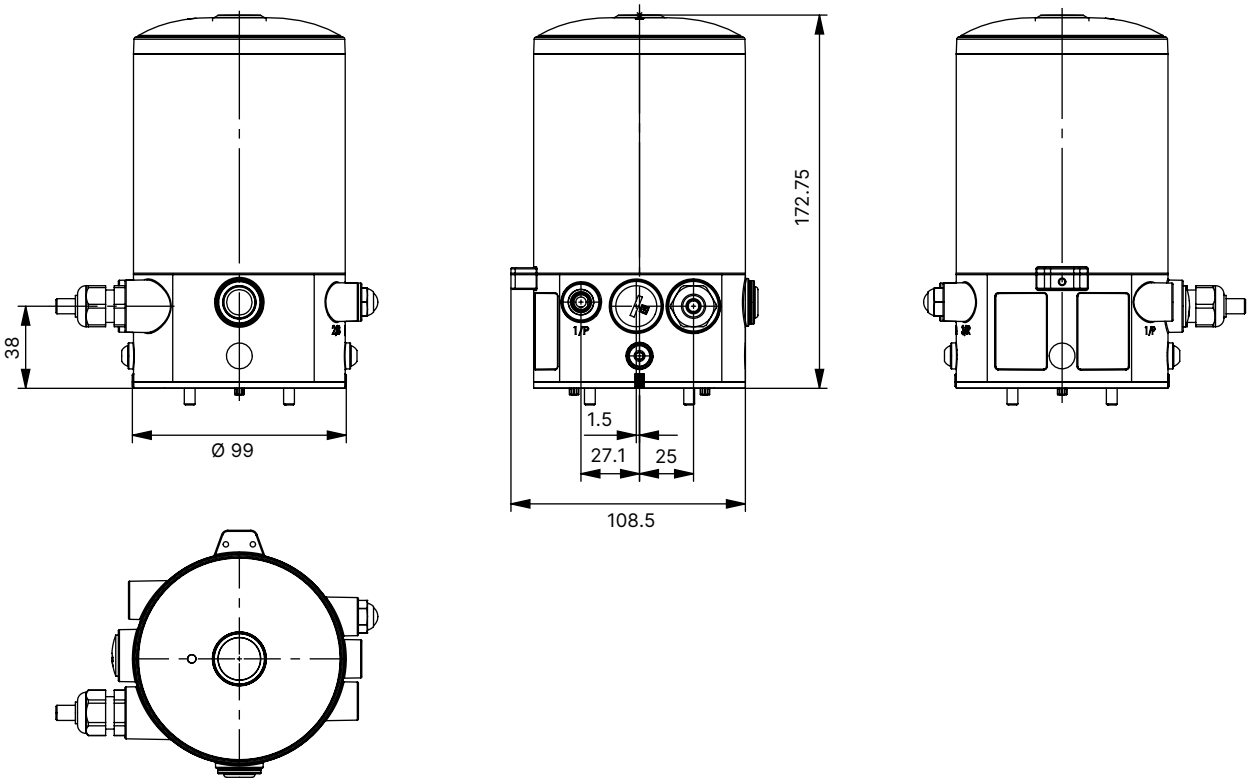
4. Dimensions

4.1. Control head

Note:
Dimensions in mm, unless otherwise stated



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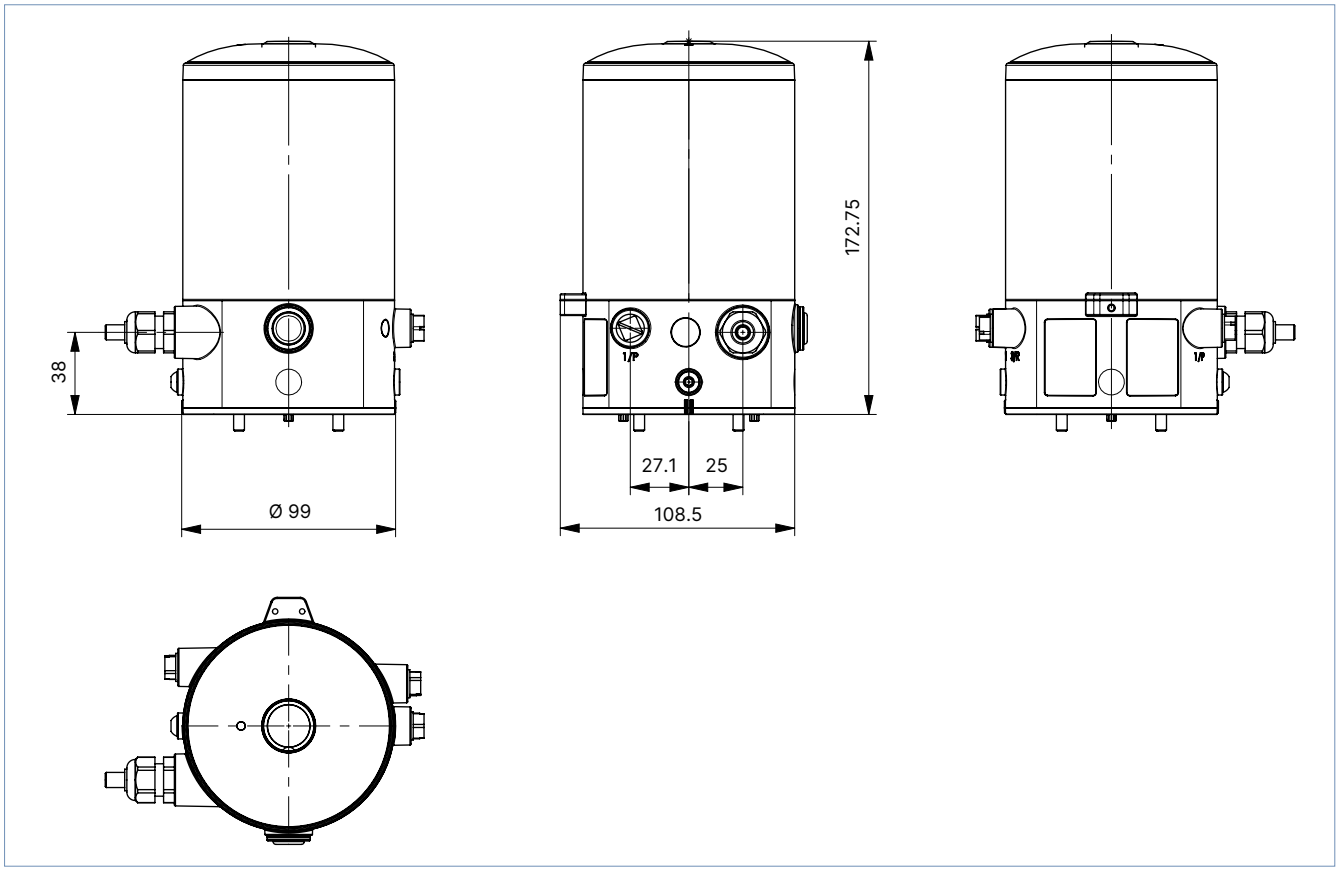
4.2. Feedback variant (without pilot valves)

Note:
Dimensions in mm, unless otherwise stated



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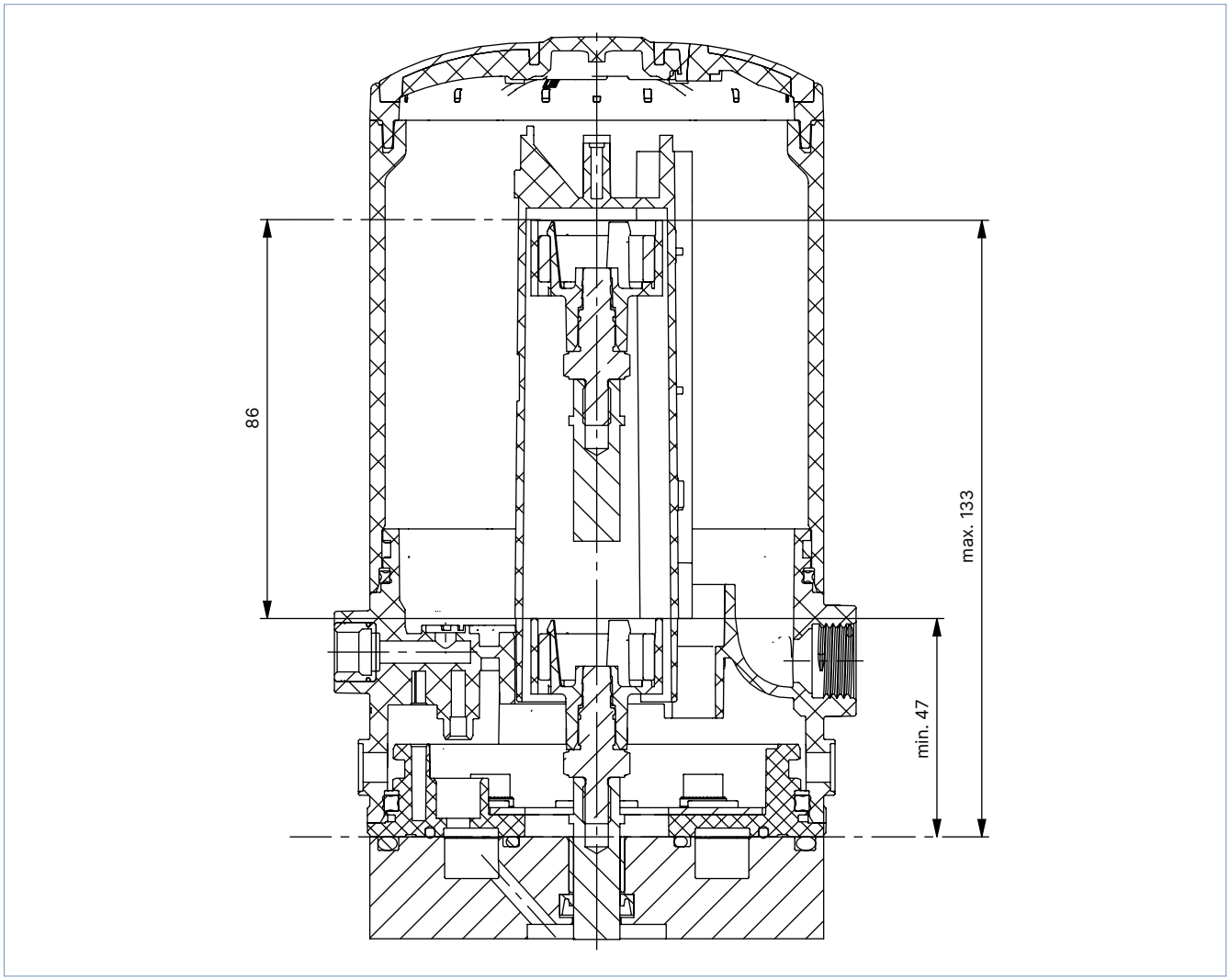
4.3. Stroke range of piston rod with linear target

Note:
Dimensions in mm, unless otherwise stated



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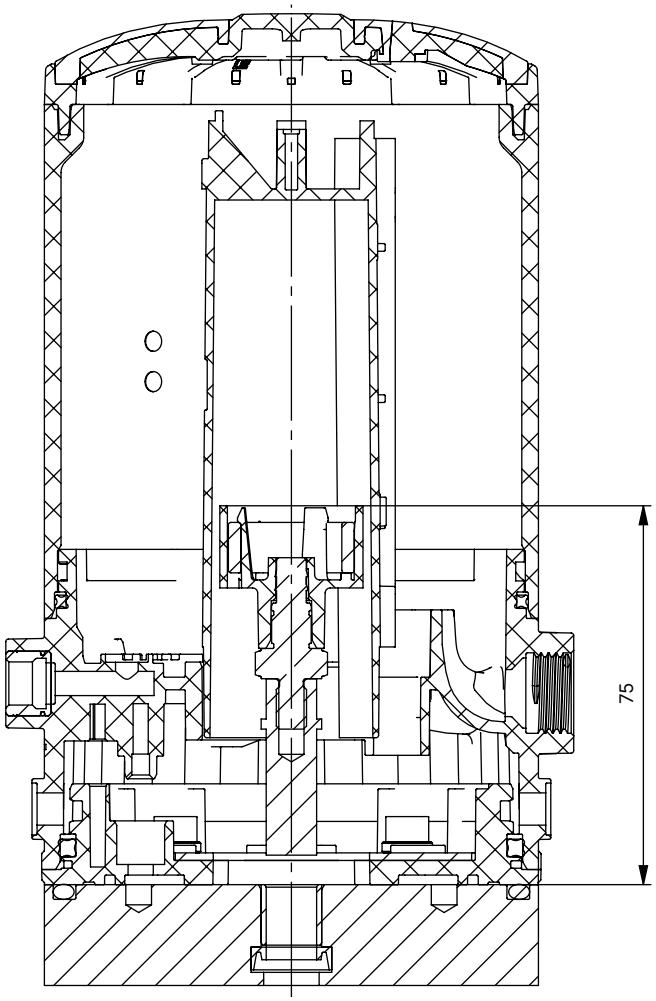
4.4. Angular range of piston rod with rotary target

Note:
Dimensions in mm, unless otherwise stated



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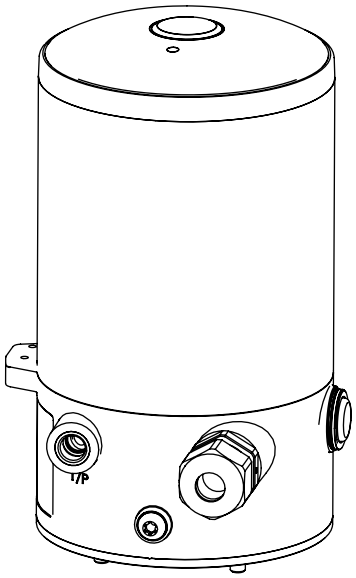
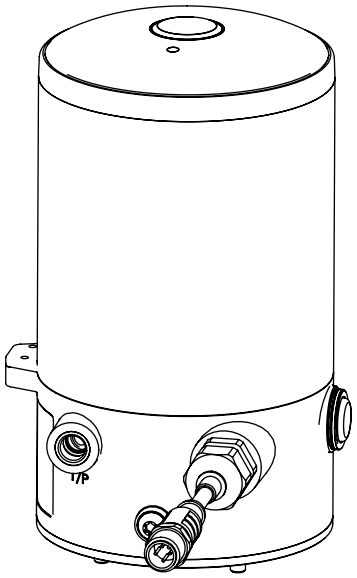
5. Product connections

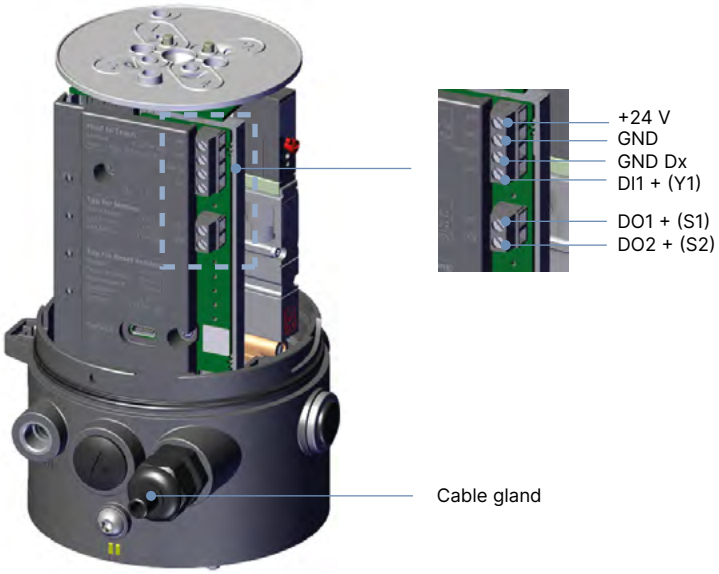
5.1. Electrical connection

Without fieldbus communication: 24 V DC

Variant with cable glands	Variant with 5-pin M12 plug 1.)
	

1.) M12 plug according to IEC 61076 - 2 - 101, M12 5-pin with 10 cm cable

Connection terminals



Terminal	Description
+ 24 V	Operating voltage + 24 V DC
GND	Operating voltage GND
GND Dx	If required: GND signals for control

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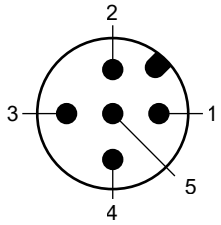
Control signals

Terminal	Description
DI1+ (Y1)	Digital input 1, control of pilot valve V1 (relative to GND)
DO1+ (S1)	Digital output 1, feedback valve position S1 (relative to GND)
DO2+ (S2)	Digital output 2, valve position feedback S2 (relative to GND)

M12 plug, 5-pin



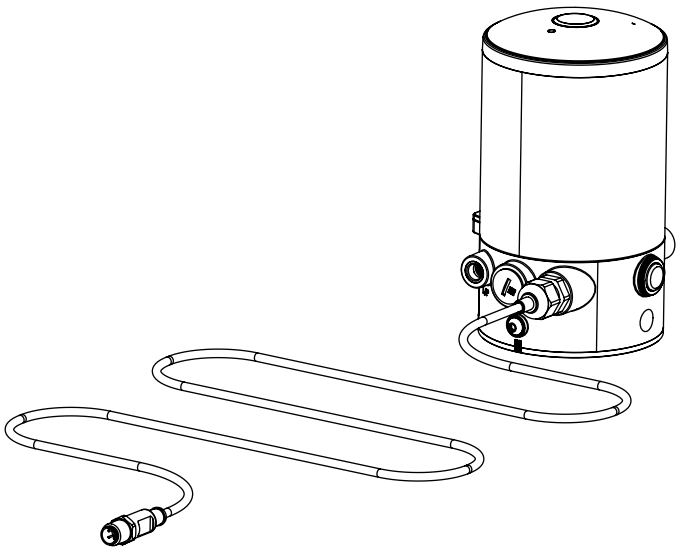
Pin	Description	Pin assignment	Wire colour
1	Operating voltage +	+ 24 V DC	Brown
2	Digital output 2, valve position feedback S2 (relative to GND)	DO2+ (S2)	White
3	Operating voltage GN	GND	Blue
4	Digital output 1, valve position feedback S1 (relative to GND)	DO1+ (S1)	Black
5	Digital input 1, control of pilot valve V1 (relative to GND) [1.]	DI1+ (Y1)	Grey

1.) Pin 5 not assigned on feedback device

AS-Interface connection

With multipole connection

M12 plug according to IEC 61076 - 2 - 101, 4-pin, 80 cm cable (from the cable gland)



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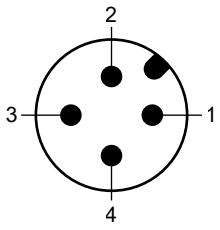
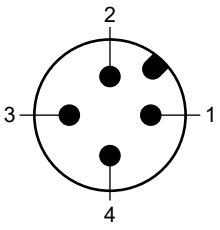
M12 circular plug, 4-pin							
Bus connection operating voltage via bus				**Bus connection with additional actuator supply (AUX Power)**			
							
Pin	**Description**	**Pin assignment**	**Wire colour**	**Pin**	**Description**	**Pin assignment**	**Wire colour**
1	ASI +	AS-Interface, AS-i +	Brown	**1**	ASI +	AS-Interface, AS-i +	Brown
2	NC	Not assigned	White	**2**	GND	GND	White
3	ASI -	AS-Interface, AS-i -	Blue	**3**	ASI -	AS-Interface, AS-i -	Blue
4	NC	Not assigned	Black	**4**	24 V +	24 V +	Black

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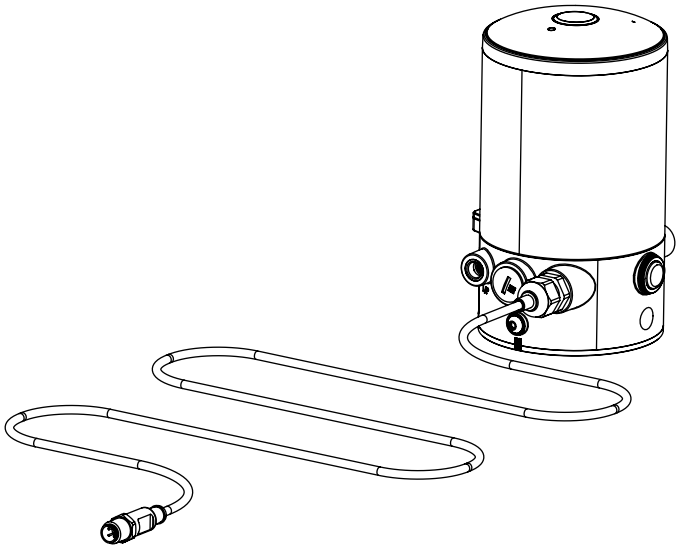
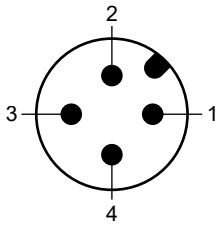
IO-Link connection

Multipole connection
M12 plug according to IEC 61076 - 2 - 101, 4-pin (port class A) or 5-pin (port class B) on a 80 cm cable (from the cable gland)

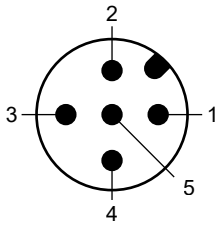


M12 circular plug, 4-pin, port class A



Pin	Description	Pin assignment	Wire colour
1	L +	24 V DC	Brown
2	DIO/2L +	Not assigned	(White)
3	L -	0 V (GND)	Blue
4	C/Q	IO-Link	Black

M12 circular plug, 5-pin, port class B



Pin	Description	Pin assignment	Wire colour
1	L +	24 V DC (Power 1)	Brown
2	DIO/2L +	24 V DC (Power 2)	White
3	L -	0 V (GND, Power 1)	Blue
4	C/Q	IO-Link	Black
5	2M	0 V (GND, Power 2)	Grey or yellow/green

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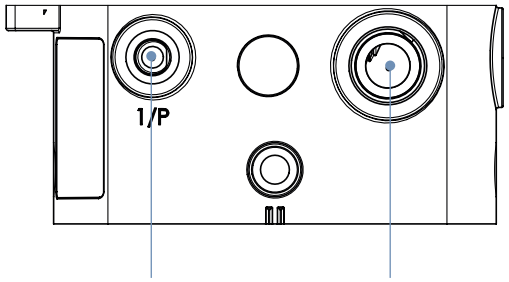
Pneumatic connection

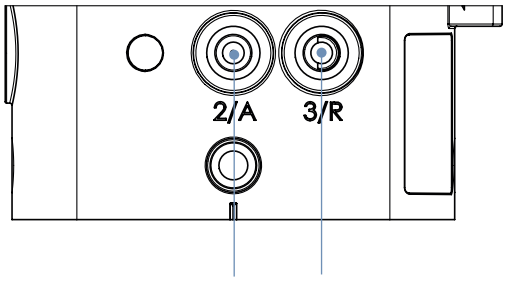
Supply connections



Compressed air connection (1/P)

Electrical connection

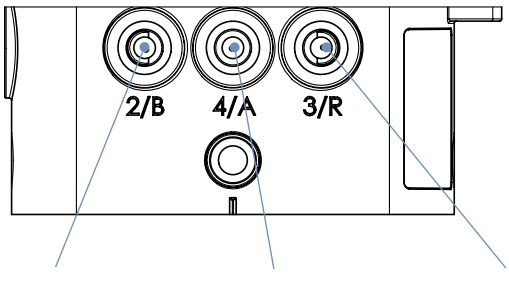
Working connections for single-acting



Working port 2/A

Exhaust air port (3/R)

Working connections for double-acting



Working port 2/B

Working port 4/A

Exhaust air port (3/R)

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6. Product installation

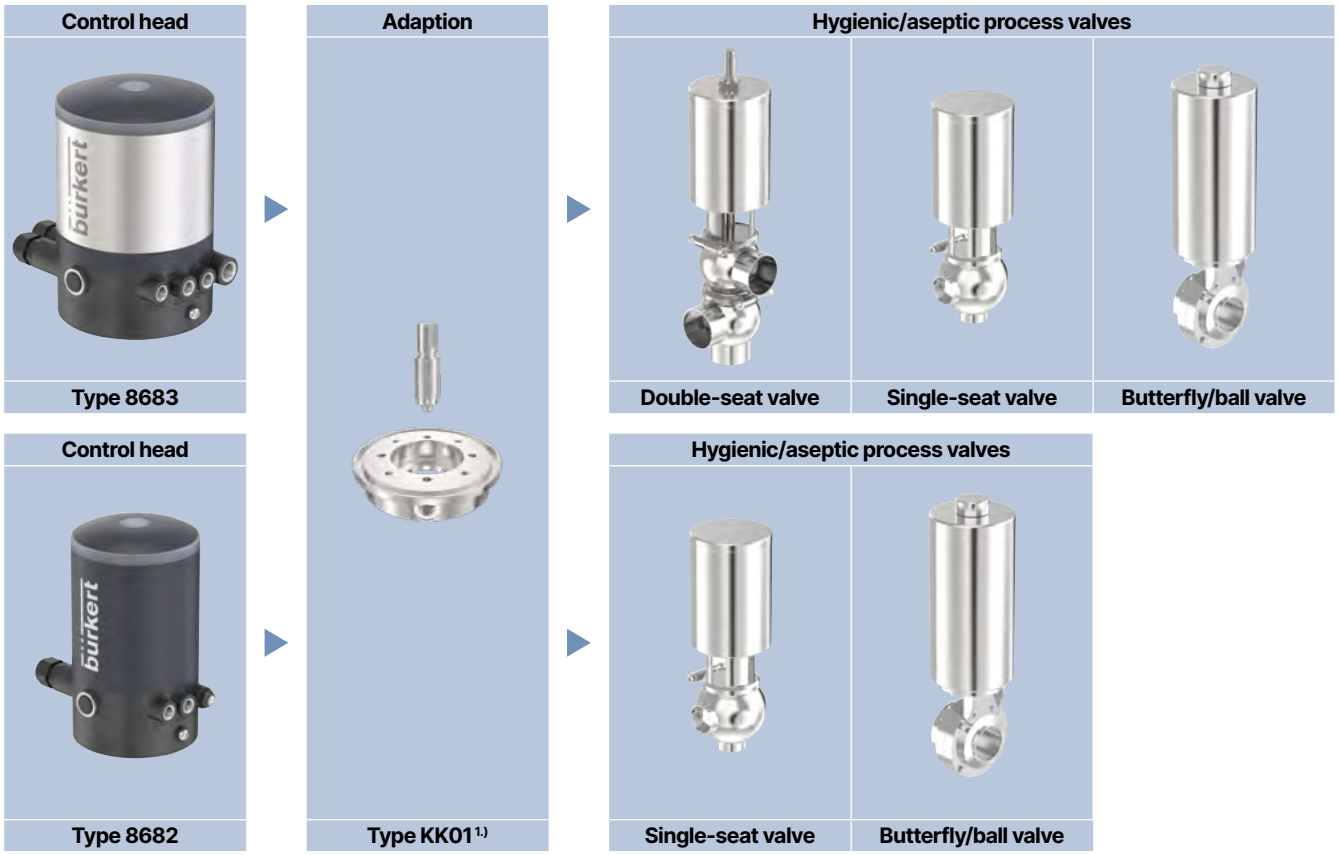
6.1. Combination options with hygienic/aseptic third-party valves

Note:
The following is required to mount Type 8682 and 8683 control heads on pneumatically actuated process valves:

- Article no. of the desired control head, see data sheet Type 8682 or Type 8683
- Article no. of the appropriate adapter, see data sheet Type KK01 or on request
- In these cases, select the appropriate variant for both the steering head and the adapter.

Depending on the design of the pneumatic actuator, an integrated pilot air duct can be implemented.

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.

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7. Ordering information

7.1. Bürkert eShop

Bürkert eShop – Easy ordering and quick delivery

Want to find the Bürkert product or spare part you need 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 – Find the right product quickly

Want to select products conveniently 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

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7.3. Ordering chart

Note:
Further variants are available on request.

Communication	Connection	Pneumatic function	Number of solenoid valves	Pilot air duct	Feedback signals	Article no.	
						Linear sensor	Rotary sensor
Without fieldbus communication	Cable gland	without	0	External	2	20115324	20115326
		3/2-way	1	External	2	20115330	20115332
			1	Integrated	2	20115337	20115339
		5/2-way	1	External	2	20115343	20115345
			1	Integrated	2	o. r.	o. r.
	M12, 4-pin, 10 cm cable	without	0	External	2	20115328	20115329
	M12, 5-pin, 10 cm cable	3/2-way	1	External	2	20115334	20115335
			1	Integrated	2	20015341	20015342
		5/2-way	1	External	2	20115347	20115348
			1	Integrated	2	o. r.	o. r.
AS-Interface (62 Slaves) S- 7.A.E	M12, 4-pin, 80 cm cable	without	0	External	2	20115349	20115350
			0	External	Position	o. r.	o. r.
		3/2-way	1	External	2	20115351	20115353
			1	Integrated	2	20115355	20115357
		5/2-way	1	External	2	20115359	20115361
			1	Integrated	2	o. r.	o. r.
IO-Link Port class A	M12, 4-pin, 80 cm cable	without	0	External	2 + position	20115363	20115364
		3/2-way	1	External	2 + position	20115365	20115367
			1	Integrated	2 + position	20115369	20115371
		5/2-way	1	External	2 + position	20115373	20115375
			1	Integrated	2 + position	o. r.	o. r.
IO-Link Port class B	M12, 4-pin, 80 cm cable	3/2-way	1	External	2 + position	20115366	20115368
			1	Integrated	2 + position	20115370	20115372
		5/2-way	1	External	2 + position	20115374	20115376
			1	Integrated	2 + position	o. r.	o. r.

o. r. = on request
Position = Position value 0...100 %

Further variants on request

Additionally
- Digital outputs NPN-coded
- AS-Interface with separate power supply AUX Power
- AS-Interface (62 slaves) S- 7.A.7
- Integrated pilot air duct

Further variants in preparation

ATEX / IECEx / CSA / CCC Cat. 2GD / 3GD, Class I / II Div.1 / Div.2

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7.4. Ordering chart accessories

Standard accessories

Note:
Must be ordered separately.

Variant	Article no.
Set with 20 steel seals to avoid tool-free opening of the cover	257100
Rotary push-in fitting, nickel-plated brass G ⅛ for tube Ø 6/4	780082
AS-Interface flat cable terminal, M12 outlet, stainless steel outlet	799646
Software Bürkert Communicator	**Type 8920** ▶
Adaptations for hygienic and non-hygienic process valves	**Type KK01** ▶

7.5. Spare parts

Note:
For spare parts, see **service manual Type 8682** ▶.

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