Digital electropneumatic positioner for integrated mounting on process control valves

- Compact and robust stainless steel design
- Easy start-up with automatic X-Tune function
- Contact-free position sensor
- Integrated pilot air duct with spring chamber aeration
- EtherNet/IP, PROFINET, Modbus TCP, PROFIBUS DP-V1 or 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

Type 2300
Pneumatically operated 2-way angle seat control valve ELEMENT

Type 2103
2/2-way diaphragm valve with pneumatic stainless steel actuator (Type ELEMENT) for decentralised automation

Type description

The compact positioner device Type 8692 is optimised for integrated mounting on the pneumatic actuators in the process valve series Type 23xx/2103 and is specially designed for the requirements of a hygienic process environment. The pilot air duct is integrated into the actuator without external piping. The easy operation and the selection of additional software functions are carried out either on a big graphic display with backlight and keypad or via the COMMUNICATOR.

The positioner registers the valve position without deterioration via a contact-free, analogue position sensor. The integrated diagnostics function are used to monitor control valve operating conditions. Valve diagnostic messages via status signals are issued in accordance with NE107 (NAMUR) and recorded as historical entries.

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. 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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Visit product website

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1. General technical data

Product properties	
Dimensions	Further information can be found in chapter "4. Dimensions" on page 6.
Material	
Body	PPS, stainless steel
Seal	EPDM
Cover	PC
Operation	
Display	Graphic display with backlight and intuitive menu navigation
Operating keys	Membrane keypad with 4 keys
Service interface	Connection to PC via USB büS interface set
Configuration tool	Bürkert Communicator PACTware (only for device variants with PROFIBUS or analogue variant with serial interface)
Commissioning	
Initialisation of positioner	Automatically by X.TUNE function (automatically adjustment of positioner)
Manual operation of pilot valve	In manual mode via push-button on control panel
Status display	
Display of the device and valve status	LEDs (colours according to NAMUR), only for Ethernet and büS variants
Communication	
Fieldbus	EtherNet/IP, PROFINET, Modbus TCP, PROFIBUS DP-V1
Digital	Bürkert system bus (büS) (based on CANopen)
Performance data	
Position sensor	
Measurement principle	Linear: inductive Rotary: magnetic
Position detection module	Contactless analogue position sensor (wear-free)
Stroke range	
Valve spindle	Linear: 3...45 mm Rotary: 30...180°
Electrical data	
Operating voltage	24 V DC ± 10 % UL: NEC Class 2
Residual ripple	Max.10 %
Power consumption	≤ 5 W
Protection class	III according to DIN EN 61140 (VDE 0140 - 1)
Input/output	
Digital input	1 digital input, 0...5 V = log „0", 10...30 V = log „1"
Digital output	2 digital outputs (optional), galvanically isolated
Current limit per digital output	100 mA, in case of overload, the output is switched off and cyclically switched on again to check for still existing overload.
Analogue output	1 output (optional) 0/4...20 mA, 0...5/10 V
Set-point input data	
Set-point signal	
Set-point setting	0/4...20 mA 0...5/10 V
Input resistance	0/4...20 mA, 180 Ω 0...5/10 V, 19 kΩ
Electrical connection	
Multipole variant	M12, 8-pin or 4-pin or 5-pin according to device variant (see "5. Product connections" on page 9)
Cable gland variant	2x M16 × 1.5 (cable Ø 5...10 mm) with terminals for cable cross-sections 0.14...1.5 mm²

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/m³)
Pressure dew point	Class 3 (≤ - 20 °C or min. 10 °C below the lowest operating temperature)
Oil content	Class X (< 25 mg/m³)
Air intake filter	**Exchangeable**
Mesh size	Approx. 0.1 mm
Supply pressure	
Low air flow rate	0...7 bar [1.)]
High air flow rate	3...7 bar
Pilot air port	Threaded connection G ⅛, stainless steel
Positioning system	
Low air flow rate	
Single-acting and double-acting	7 l_N/min for aeration and venting (Q_{Nn} value according to definition with pressure drop from 7 to 6 bar abs)
Actuator series/size	Type 23xx, actuator Ø 70/90 mm
High air flow rate	
Single-acting	130 l_N/min for aeration and venting (Q_{Nn} value according to definition with pressure drop from 7 to 6 bar abs)
Actuator series/size	Type 23xx, actuator Ø 130/225 mm Type 27xx, actuator Ø 175/225 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 5.	
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 5.
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 5.
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 5.
Further information can be found in chapter "2. Approvals and conformities" on page 5.	
Environment and installation	
Operating conditions	
Ambient temperature	- 10...+ 55 °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	
Installation position	As required, preferably with actuator in upright position
Valve actuator (type, size)	ELEMENT Type 23xx (actuator size Ø 70/90/130/225 mm) CLASSIC Type 27xx (actuator size Ø 175/225 mm)
Attachment kit	Further information can be found in chapter "Attachment kits" on page 18.

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

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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 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.

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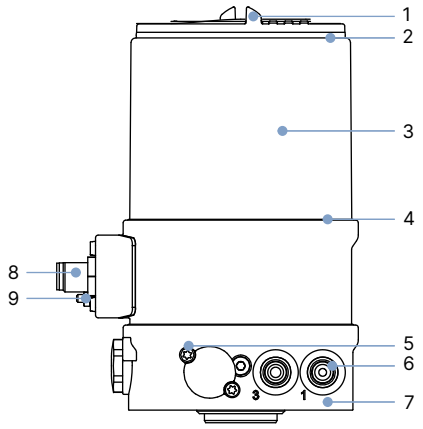
3. Materials

3.1. Material specifications

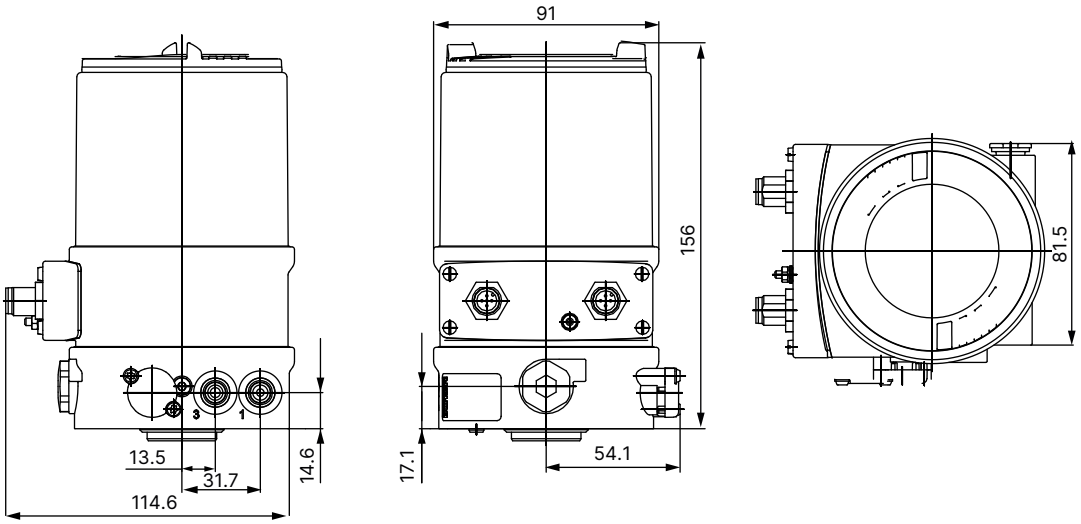


No.	Element	Material
1	Cover	PC
2	Seal	EPDM
3	Body casing	Stainless steel
4	Seal	EPDM
5	Screws	Stainless steel
6	Push-in connector Threaded connections G ⅛	POM/stainless steel Stainless steel
7	Basic housing	PPS
8	M12 plug connector	Stainless steel
9	Screws	Stainless steel

4. Dimensions

4.1. Multipole variant

Note:
Dimensions in mm, unless otherwise stated



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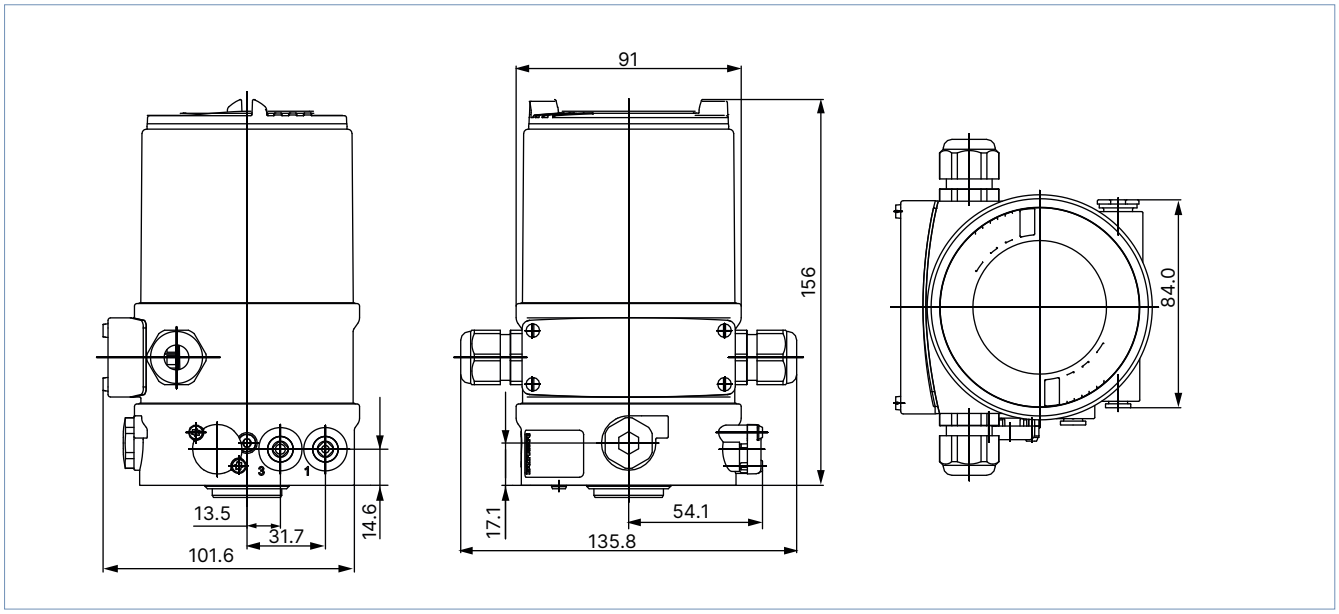
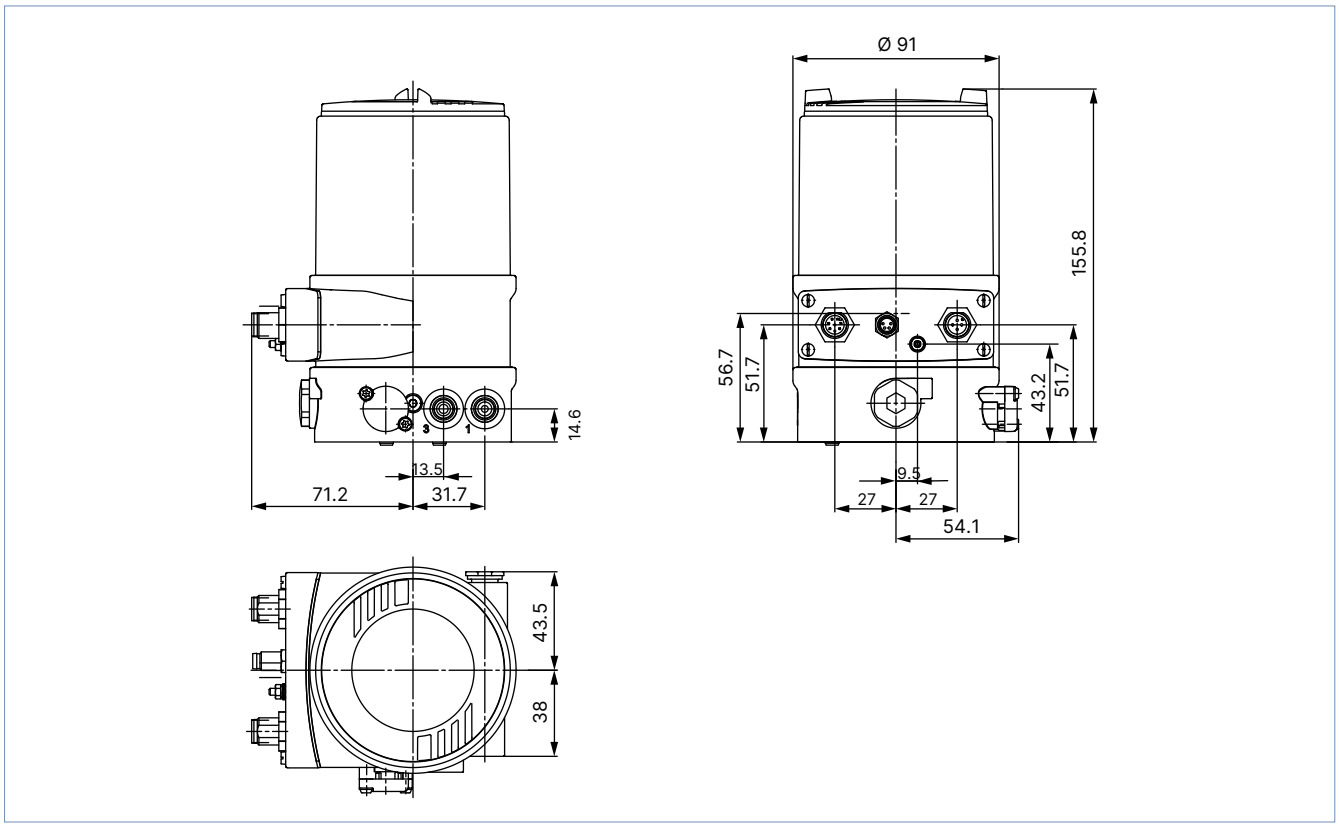
4.2. Cable gland variant

Note:
Dimensions in mm, unless otherwise stated



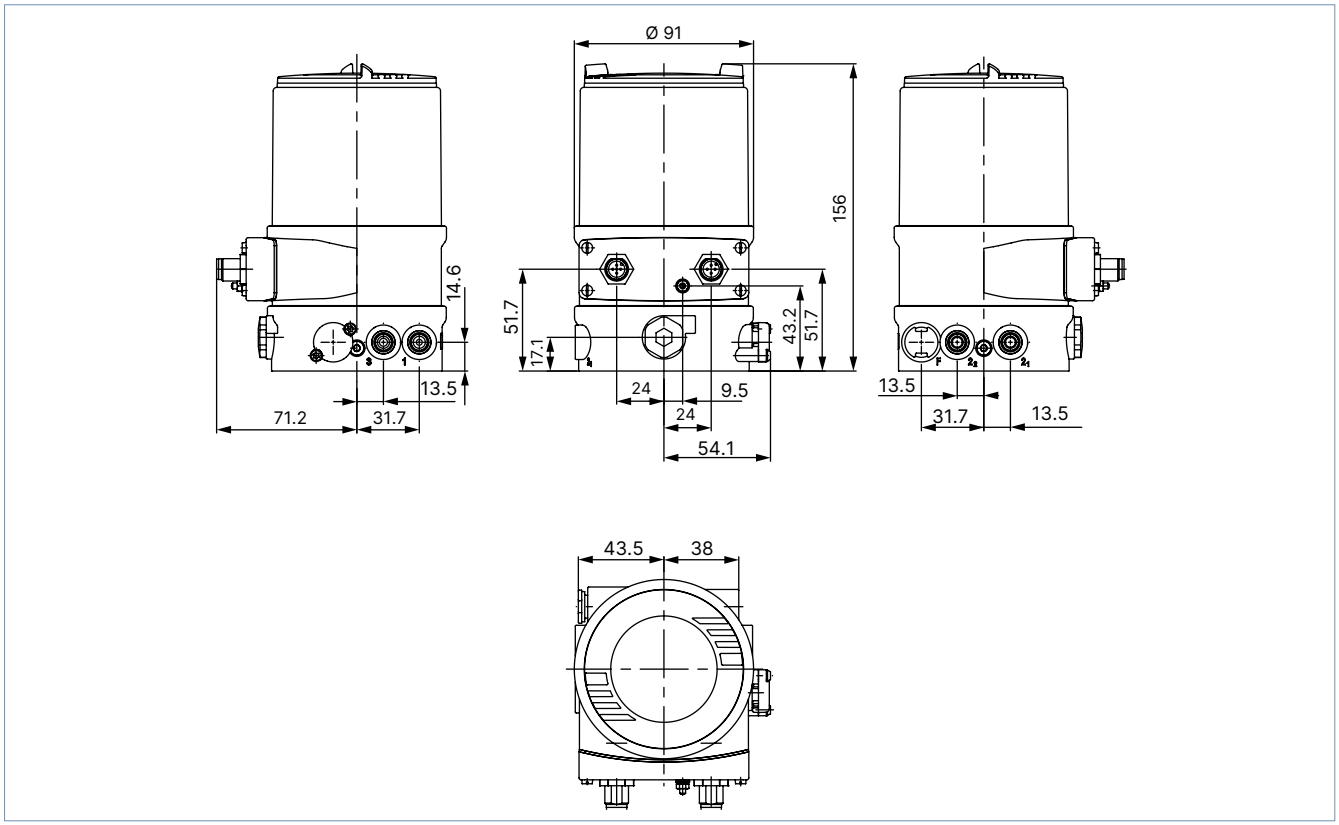
4.3. Mounting on control valves of Type 23xx actuator series, actuator size 70/90/130/225 mm

Note:
Dimensions in mm, unless otherwise stated



4.4. Mounting on control valves of Type 27xx actuator series, actuator size 175/225 mm

Note:
Dimensions in mm, unless otherwise stated



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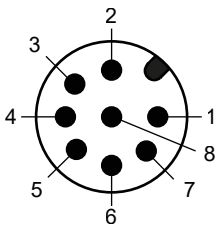
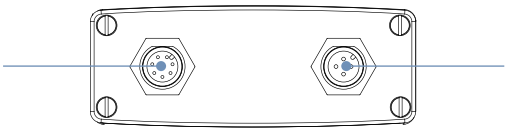
5. Product connections

5.1. Electrical connection

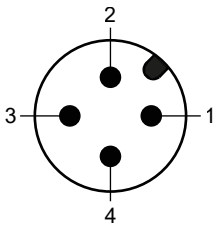
Multipole connection

M12 Circular connector, 8 pin (setpoint)





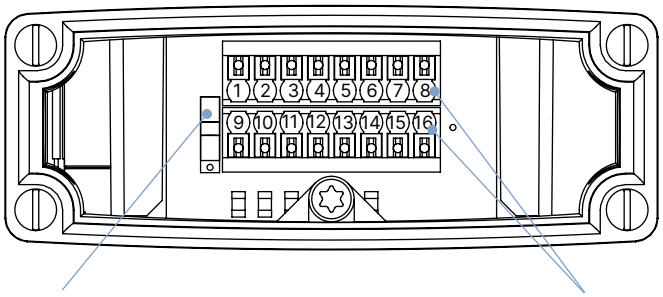
M12 Circular connector, 4 pin (operating voltage)



M12 circular plug, 8-pin (set-point)		M12 circular plug, 8-pin (input/output signal) [1.)]		M12 circular plug, 4-pin (operating voltage)	
Pin	**Pin assignment**	**Pin**	**Pin assignment**	**Pin**	**Pin assignment**
7	Set-point GND	**1**	Digital input +	**1**	Operating voltage + 24 V DC
8	Set-point + (0/4...20 mA/0...5/10 V)	**2**	Digital output GND	**2**	Not assigned
		3	Digital output 2	**3**	Operating voltage GND
		4	Digital output 1	**4**	Not assigned
		5	Analogue feedback GND		
		6	Analogue feedback +		

1.) With the options analogue feedback or digital output

Cable gland



Switch

Connection terminals

Terminal	Pin assignment
1	Analogue feedback GND
2	Analogue feedback +
3	Digital output GND
4	Digital output 2
5	Digital output 1
6	Digital input +
7	Set-point GND
8	Set-point +
9	Not assigned
10	Not assigned
11	Not assigned
12	Not assigned
13	Not assigned
14	Digital input GND
15	Operating voltage GND
16	Operating voltage + 24 V

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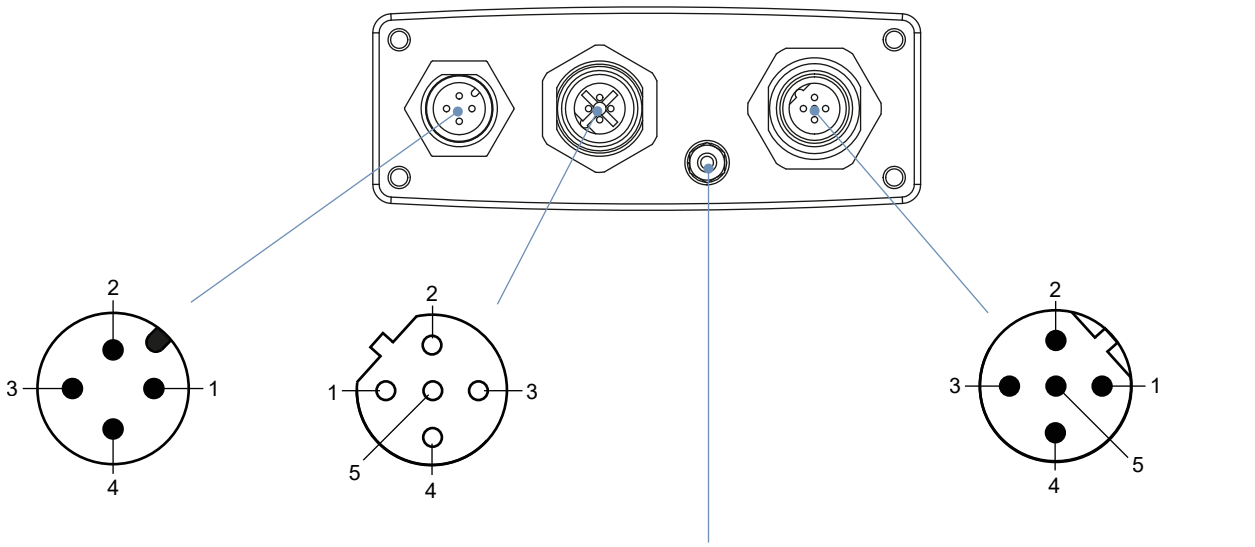
PROFIBUS DP connection



M12 circular plug, 4-pin
Operating voltage

M12 socket, 5-pin (B-coded)
(PROFIBUS DP)

Protective earth (PE)

M12 circular plug, 5-pin (B-coded)
(PROFIBUS DP)

Socket/M12 circular plug, 5-pin - fieldbus connection

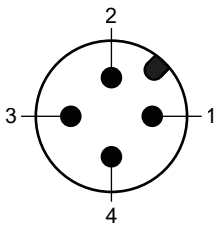
Pin	Pin assignment
1	VP+ 5
2	RxD/TxD-N
3	DGND
4	RxD/TxD-P
5	Not assigned
Thread	Shielding/protective earth

M12 circular plug, 4-pin - operating voltage

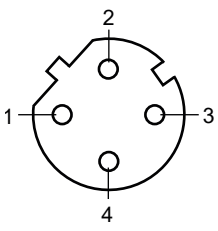
Pin	Wire colour [1.)]	Pin assignment
1	Brown	+ 24 V
2	–	Not assigned
3	Blue	GND
4	–	Not assigned

1.) The wire colours indicated refer to the connection cable available as an accessory with the Article no. 918038.

EtherNet/IP, PROFINET, Modbus TCP connection

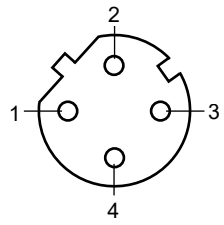


**M12 circular plug,
4-pin (operating voltage)**



**Fieldbus connection for Ethernet, M12 socket,
4-pin, D-coded (2 Port Ethernet Switch)**

Fieldbus connection for Ethernet, M12 socket, 4-pin, D-coded

Connection image	Pin	Pin assignment
	**1**	Transmit +
	2	Receive +
	3	Transmit -
	4	Receive -

M12 circular plug, 4-pin, operating voltage

Pin	Wire colour[1.)]	Pin assignment
1	Brown	Operating voltage + 24 V DC
2	–	Not assigned
3	Blue	Operating voltage GND
4	–	Not assigned

1.) The specified wire colours refer to the connection cable which is available as an accessory with Article no. 918038.

Bürkert system bus (büS) connection

M12 circular plug × 1, 5-pin, büS connection

Pin	Wire colour	Pin assignment
1	CAN shielding	CAN shielding
2	–	Not assigned
3	Black	GND/CAN_GND
4	White	CAN_H
5	Blue	CAN_L

M12 circular plug, 4-pin, operating voltage

Pin	Wire colour[1.)]	Pin assignment
1	Brown	Operating voltage + 24 V DC
2	–	Not assigned
3	Blue	Operating voltage GND
4	–	Not assigned

1.) The specified wire colours refer to the connection cable which is available as an accessory with article no. 918038.

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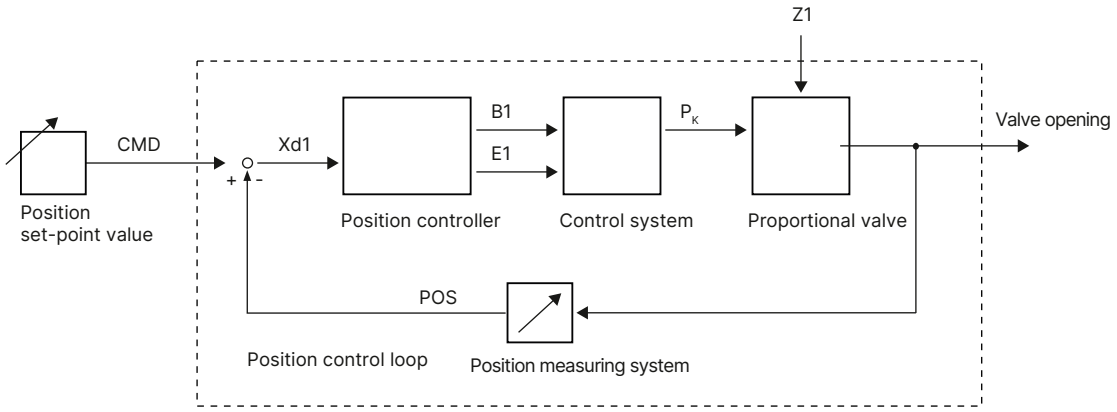
6. Performance specifications

6.1. Signal flow diagram

Position control loop



Additional software options of the TopControl Type 8692 (extract)

- Automatic commissioning of control valve system
- Automatic or manual characteristic curves selection
- Setting of seal and maximum stroke threshold, respectively
- Parameterisation of positioner
- Limitation of stroke range
- Limitation of positioning speed
- Setting direction of movement
- Configuration of digital input
- Signal range splitting on several controllers
- Configuration of 1 analogue or 2 digital outputs
- Signal fault detection
- Safety position
- Code protection
- Contrast inversion of display
- Parameterisable diagnostic functions [1.)]/digital output (option)
  - Operating hours counter
  - Path accumulator
  - Position monitoring
  - Graphical display of dwell time density and movement range
  - Monitoring of mechanical end positions in the armature
  - Direction-reversal counter
  - Temperature monitoring

1.) Further diagnostic functions with detailed description can be found in the **operating instructions Type 8692** ▸

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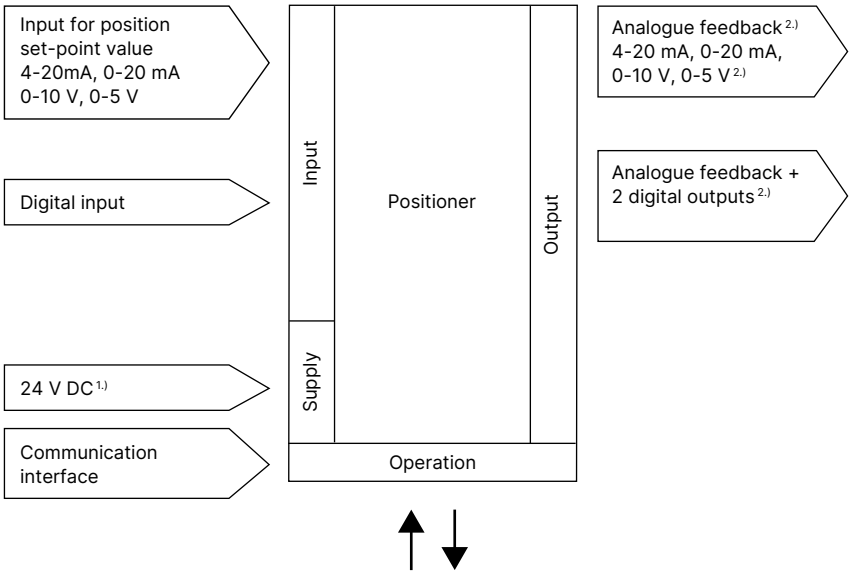
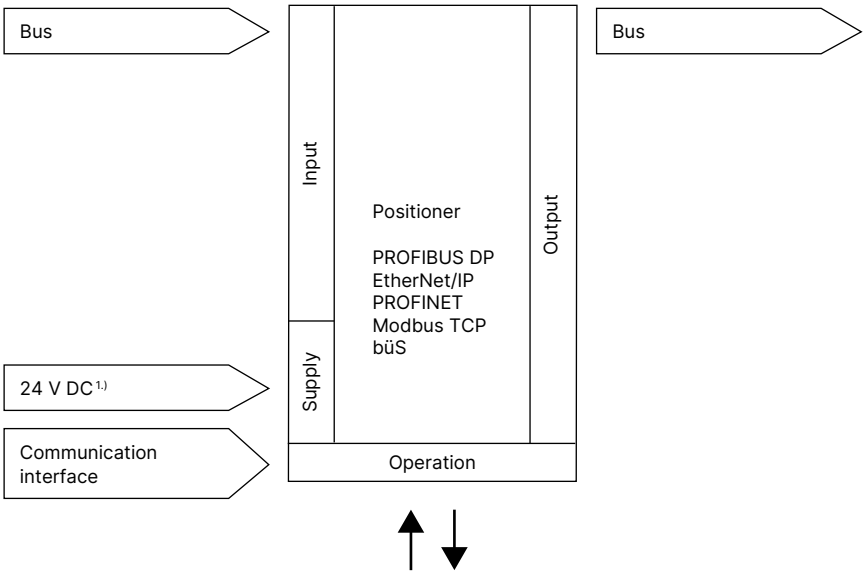
6.2. Interface diagram

Variant without fieldbus communication



Variant with fieldbus communication

With PROFIBUS DP, EtherNet/IP, PROFINET, Modbus TCP and Bürkert system bus (büS)



1.) The operating voltage is supplied with a 3-wire unit independent from the set-point signal
2.) Alternative options

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7. Product installation

7.1. Combination options with pneumatic process valves

Note:
A complete **TopControl control** valve system consists of a positioner Type **8692** and an **ELEMENT control valve Type 23xx** or **Type 2103.**

The following information is required to select a complete system:

- **Article no.** of the desired **positioner TopControl,** see **data sheet Type 8692**
- **Article no.** of the desired **control valve Type 23xx/2103,** see **data sheets Type 2301 ▸, Type 2300 ▸** and **Type 2103 ▸**

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

Example of variations of the control valve system

Positioner	Pneumatic process control valves			
Type 8692	**Type 2301 ▸** Globe valve	**Type 2300 ▸** Angle seat valve	**Type 2103 ▸** Diaphragm valve	**Hygienic process valve (third-party)**
	Control valve system			
	Type 8802-GD-I Control valve system ELEMENT Type 2301 + Type 8692	**Type 8802-YG-I** Control valve system ELEMENT Type 2300 + Type 8692	**Type 8802-DF-I** Control valve system ELEMENT Type 2103 + Type 8692	**Mounting on third-party actuators** [1.)]

1.) See data sheet **Adaptations for third-party actuators Type KK01 ▸** or contact the appropriate Bürkert sales office.

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8. Ordering information

8.1. 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

8.2. 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

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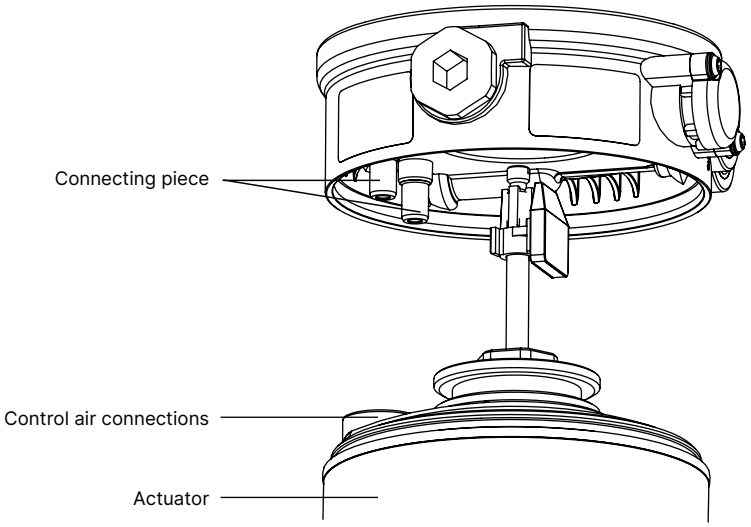
8.3. Ordering chart

Linear displacement sensor/integrated pilot air duct

Note:
All standard variants are UL-approved.



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Note:
All standard variants are UL-approved.

Circuit function Pilot valve system	Communication	Electrical connection	Analogue feedback 0/4...20 mA	Analogue feedback 0/4...20 mA + 2 digital outputs	Diagnostic function [1]	Digital input	Article no.		
							Standard	ATEX II Cat. 3G/ D, IECEx, CCC [2]	ATEX II Cat. 3G/D, IECEx, cFMus Cl. I Div. II
Actuator series Type 23xx, actuator size Ø 70/90 mm									
Low air flow rate, single-acting	Without fieldbus communication	Cable gland	–	–	–	Yes	306913	306982	20054529
			–	Yes	Yes	Yes	307005	306983	20051651
		M12 plug connector	–	–	–	Yes	307012	307095	–
			–	Yes	Yes	Yes	307123	307096	–
	PROFIBUS DP-V1		Via bus	–	–	–	233348	265019	–
	EtherNet/IP		Via bus	–	Yes	–	306849	306847	–
	PROFINET		Via bus	–	Yes	–	306854	306851	–
	Modbus TCP		Via bus	–	Yes	–	306859	306856	–
	Bürkert system bus (büS)		Via bus	–	Yes	–	306863	306861	–
Low air flow rate, double-acting	Without fieldbus communication	Cable gland	–	–	–	Yes	306905	306977	20054524
			–	Yes	Yes	Yes	307006	306978	20054525
		M12 plug connector	–	–	–	Yes	307124	307091	–
			–	Yes	Yes	Yes	307125	307092	–
	PROFIBUS DP-V1		Via bus	–	–	–	265172	265004	–
Actuator series Type 23xx, actuator size Ø 130/225 mm									
High air flow rate, single-acting	Without fieldbus communication	Cable gland	–	–	–	Yes	306922	306986	20137980
			–	Yes	Yes	Yes	307007	306987	20054533
		M12 plug connector	–	–	–	Yes	307084	307099	–
			–	Yes	Yes	Yes	307126	307100	–
	PROFIBUS DP-V1		Via bus	–	–	–	233349	265033	–
	EtherNet/IP		Via bus	–	Yes	–	306850	306848	–
	PROFINET		Via bus	–	Yes	–	306855	306853	–
	Modbus TCP		Via bus	–	Yes	–	306860	306857	–
	Bürkert system bus (büS)		Via bus	–	Yes	–	306864	306862	–
Actuator series Type 27xx, actuator size Ø 175/225 mm									
High air flow rate, single-acting	Without fieldbus communication	Cable gland	–	–	–	Yes	306925	306988	20054535
			–	Yes	Yes	Yes	306927	306989	20054536
		M12 plug connector	–	–	–	Yes	307041	307101	–
			–	Yes	Yes	Yes	307043	307102	–
	PROFIBUS DP-V1		Via bus	–	–	–	233350	265041	–
	EtherNet/IP		Via bus	–	Yes	–	313266	313265	–
	PROFINET		Via bus	–	Yes	–	313269	313268	–
	Modbus TCP		Via bus	–	Yes	–	313271	313270	–
	Bürkert system bus (büS)		Via bus	–	Yes	–	313274	313272	–

1.) See "Additional software options of the TopControl Type 8692 (extract)" on page 12
2.) CCC (China Compulsory Certificate) for device variants with Ex approval

Further variants on request

Additional
EtherNet/IP, PROFINET, Modbus TCP and Bürkert system bus (büS): double-acting variants with low air flow rate.

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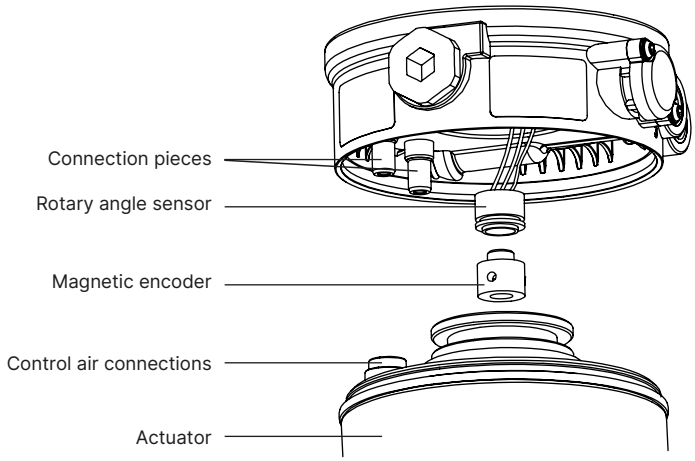
Rotary displacement sensor/integrated pilot air duct

Note:
All standard variants are UL-approved.



8.4. 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
M12 circular socket with cable, 4-pin, cable length: 5 m, for power supply (without communication)	918038
Silencer G ⅛	780779
USB interface for serial communication	227093
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
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
Attachment kit for Type 27xx actuator series	Ø 175/225 mm	A (NO), B (NC)	679935

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