



Digital electropneumatic process controller for the integrated mounting on process control valves

- Compact, robust stainless steel design
- Easy start-up by Tune function for position and process controller
- Contact-free position sensor
- Integrated control air routing with spring chamber aeration
- PROFIBUS DP-V1, DeviceNet, EtherNet/IP, PROFINET, Modbus TCP or bÜS (Bürkert System Bus)

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 8202 ▶ pH or redox potential measurement device
	Type 8400 ▶ Screw-in temperature threshold detector/transmitter with display
	Type 8045 ▶ Insertion magnetic inductive flowmeter
	Hygienic process valves

Type description

The compact process controller Type 8693 is optimized 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 actual value of the process factor is directly supplied to the device as 4...20 mA, PT100 or a frequency signal. The process controller calculates the setpoint for the subordinated positioner through the variance comparison. Due to the analogue feedback all analogue values on the controlling level can be transferred.

With integrated diagnostic functions operation conditions of the control valve can be monitored. Through status signals, valve diagnostic messages are transmitted according to NAMUR NE107 and recorded as history entries. The parameterization of process controller and positioner can be carried out automatically. The easy handling and the selection of additional software functions are done either on a big graphic display with backlight and keypad or over the COMMUNICATOR.

The positioner registers the valve position without deterioration through a contact-free, analogue position sensor. The control of single or double-acting actuators is done without internal air consumption. Communication interfaces such as PROFIBUS DP-V1, DeviceNet, EtherNet/IP, PROFINET, Modbus TCP, bÜS (based on CANopen) and analogue as well as binary feedback can also be chosen.

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1. General technical data

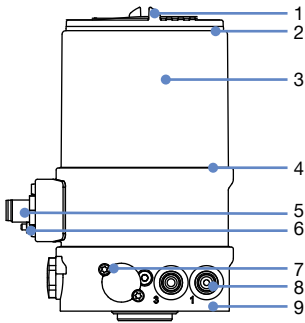
Product properties	
Dimensions	Detailed information can be found in chapter "3. Dimensions" on page 5
Material	
Body	PPS, stainless steel
Seal	EPDM
Cover	PC
Operation	
Display	Graphic display with backlighting and intuitive menu navigation
Operating keys	Membrane keypad with 4 keys
Service interface	Connected to PC via USB connection
Configuration tool	Bürkert Communicator PACTware (only for device versions with PROFIBUS, DeviceNet resp. analogue version with serial interface)
Commissioning	
Initialization positioner/process controller	Automatic by P.TUNE function (Self-optimization of the PID-Parameter)
Manual operation of pilot valve	In manual mode via push-button on control panel
Status display	
Display of device and valve status	LEDs (Colours acc. to NAMUR); Only valid for Ethernet and bÜS versions
Communication	
Fieldbus	EtherNet/IP, PROFINET, Modbus TCP, PROFIBUS DP-V1, DeviceNet
Digital	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 10 % UL: NEC Class 2
Protection class	3 acc. to DIN EN 61140 (VDE 0140-1)
Residual ripple	10 %, no technical DC voltage!
Power consumption	< 5 W
Input/Output	
Digital input	1 binary input, 0...5 V = log "0", 10...30 V = log "1"
Digital output	2 binary output (optional), galvanically isolated
Current limitation	100 mA, output will be synchronised when overloaded
Analogue output	1 output (optional) 0/4...20 mA, 0...5/10 V
Input data setpoint and actual value	
Setpoint signal	
Setpoint value setting default	0/4...20 mA 0...5/10 V
Input resistance	0/4...20 mA: 180 Ω 0...5/10 V: 19 k Ω
Setpoint signal	
Setting 4...20 mA	180 Ω Input resistance
Frequency setting	17 k Ω Input resistance, 0...1000 Hz
Setting Pt 100	-20...+220 $^{\circ}$ C, resolution < 0.1 $^{\circ}$ C
Electrical connection	
Multipole	M12, 8 pin resp. 4- or 5 pin acc. to device version (see "4. Device/Process connections" on page 8)
Cable gland	2xM16 \times 1.5 (cable \varnothing 5...10 mm) with terminals for cable cross-sections 0.14...1.5 mm ²

Pneumatic data	
Control medium	Neutral gases, air, quality class acc. to ISO 8573-1
Dust content	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)
Air intake filter	Exchangeable
Mesh size	~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 (control function and air capacity)	
Low air capacity	
Single and double-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, Ø 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 70/90 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
Environment and installation	
Installation and mechanical data	
Installation position	As required, preferably with actuator in upright position
Valve actuator (art and size)	ELEMENT Type 23xx (actuator size Ø70/90/130 mm) CLASSIC Type 27xx (actuator size Ø175/225 mm)
Adapter kits	Detailed information can be found in chapter “Adapter kits” on page 19.
Operating conditions	
Ambient temperature (max.)	- 10...+55 °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

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

2. Materials

2.1. Material specifications



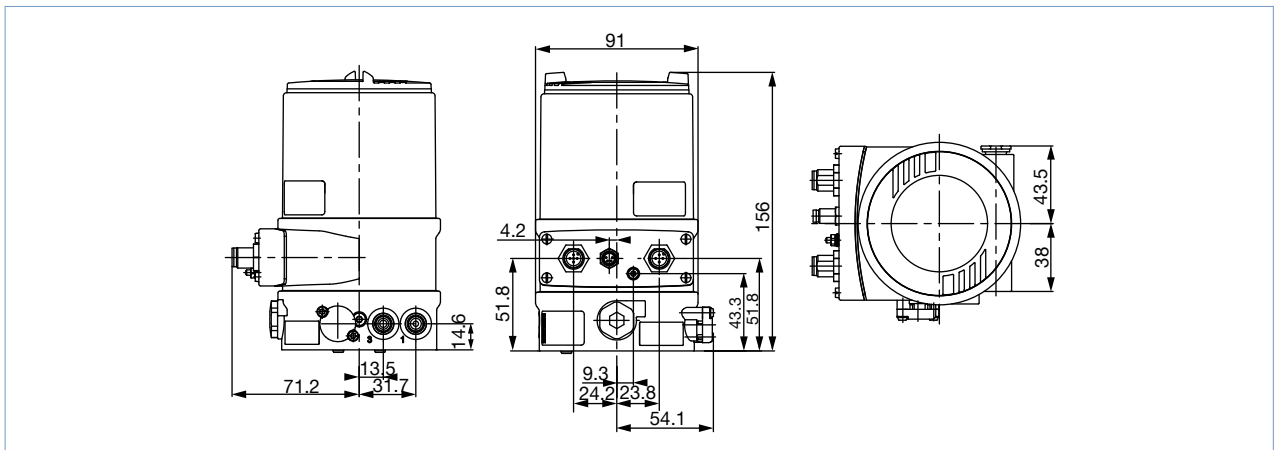
No.	Element	Material
1	Cover	PC
2	Seal	EPDM
3	Outer casing	Stainless steel
4	Seal	EPDM
5	M12 circular plug	Stainless steel
6	Screws	Stainless steel
7	Screws	Stainless steel
8	Push-in connector Threaded ports G 1/8	POM/Stainless steel Stainless steel
9	Basic housing	PPS

3. Dimensions

3.1. Multipole connection

Note:

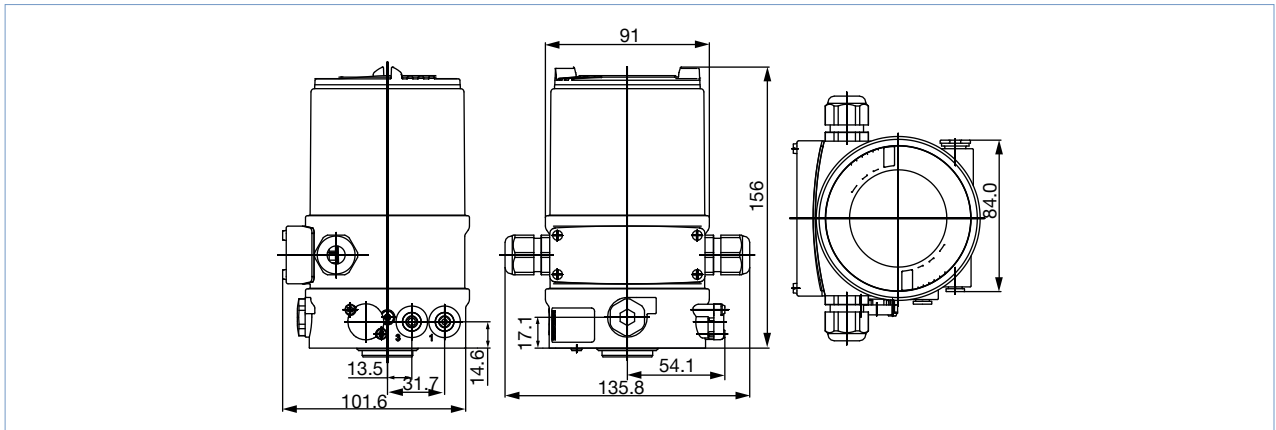
Dimensions in mm



3.2. Cable gland connection

Note:

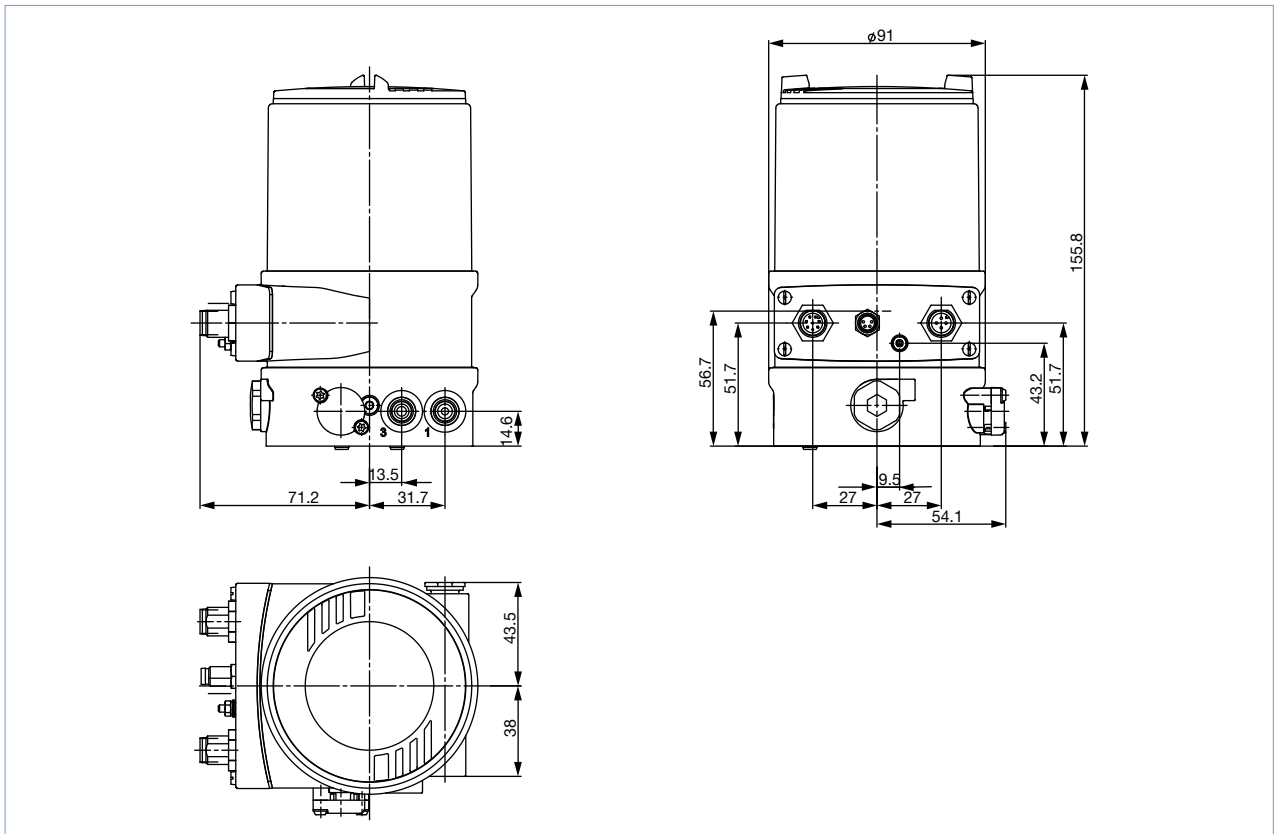
Dimensions in mm



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

Note:

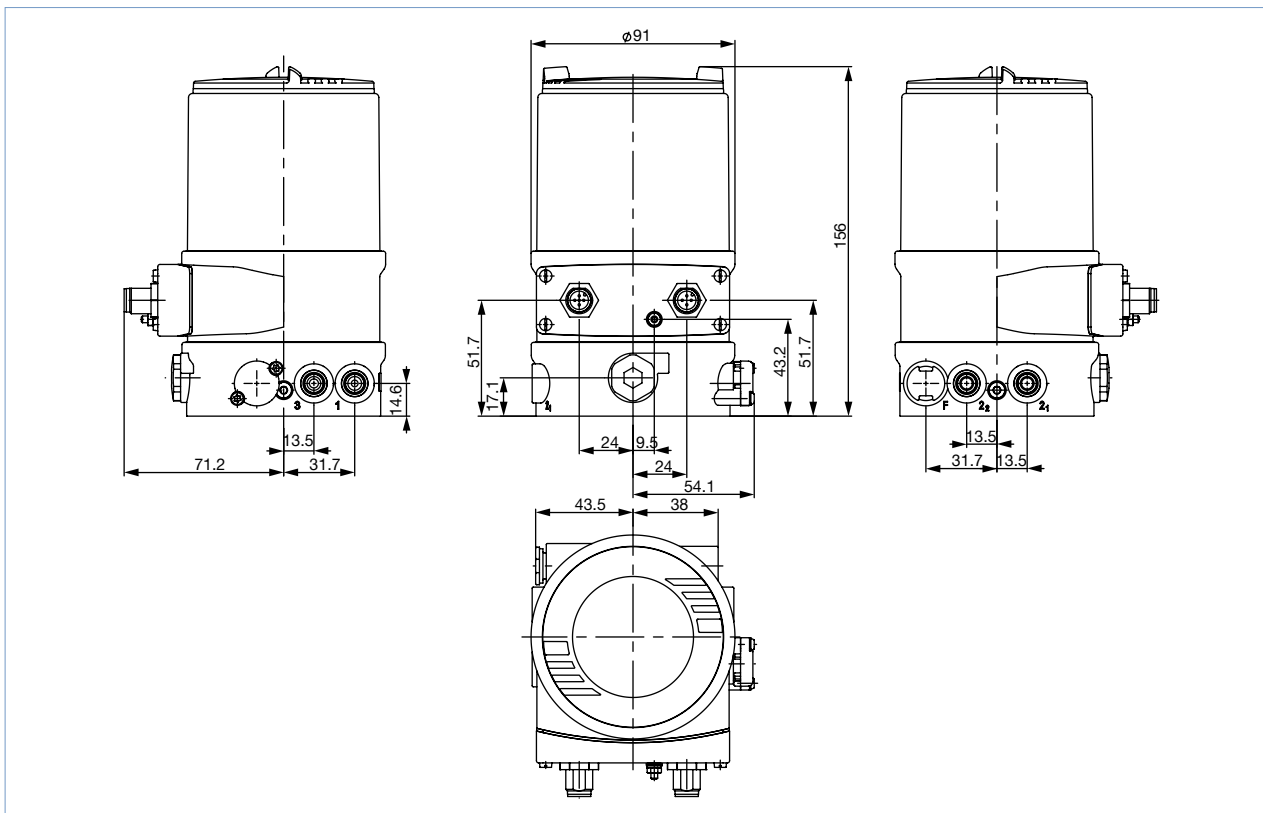
Dimensions in mm



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

Note:

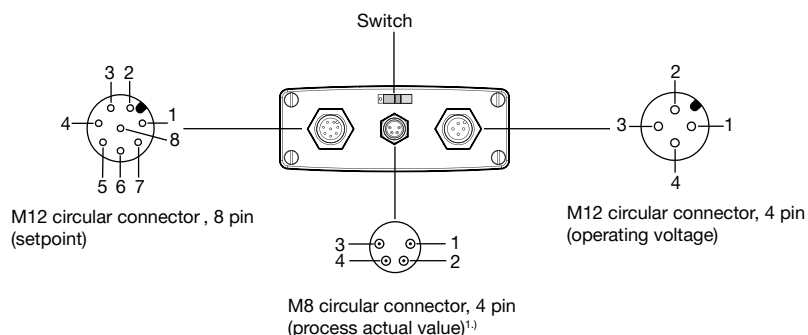
Dimensions in mm



4. Device/Process connections

4.1. Electrical connections

Multipole connection



M12 circular plug, 8 pin (setpoint)

Pin	Pin assignment
8	Setpoint + (0/4...20 mA / 0...5/10 V)
7	Setpoint GND

M12 circular plug, 8 pin (in/output signal)¹)

Pin	Pin assignment
6	Analogue feedback +
5	Analogue feedback GND
4	Digital output 1
3	Digital output 2
2	Digital output GND
1	Digital input +

M12 circular plug, 4 pin (operating voltage)

Pin	Pin assignment
1	Operating voltage +24 V DC
3	Operating voltage GND

1.) With the option analogue feedback or binary output

M8 circular plug, 4 pin (process actual value)

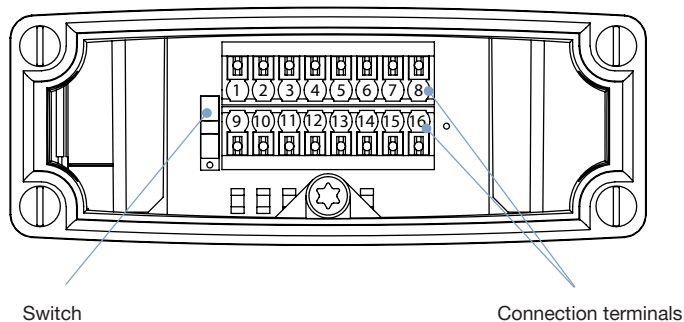
Note:

For reasons of wire compensation connect the Pt 100 sensor via 3 wires. Always bridge Pin 3 and Pin 4 on the sensor.

Input type ^{1.)}	Pin	Pin assignment	Switch
4...20 mA - internally supplied	1	+24 V Transmitter supply	 Switch on left
	2	Output from transmitter	
	3	GND	
	4	Bridge acc. to GND	
4...20 mA - externally supplied	1	Not assigned	 Switch on right
	2	Process actual value +	
	3	Not assigned	
	4	Process actual value -	
Frequency - internally supplied	1	+24 V Sensor supply	 Switch on left
	2	Clock input +	
	3	Clock input - (GND)	
	4	Not assigned	
Frequency - externally supplied	1	Not assigned	 Switch on right
	2	Clock input +	
	3	Clock input -	
	4	Not assigned	
Pt 100 (see note above)	1	Not assigned	 Switch on right
	2	Process actual value 1 (power supply)	
	3	Process actual value 2 (GND)	
	4	Process actual value 3 (compensation)	

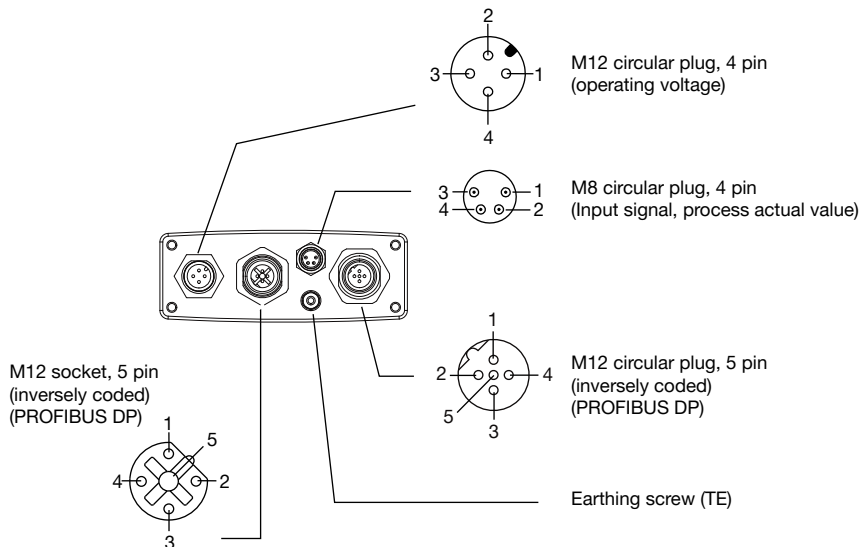
1.) With the option analogue feedback or binary output

Cable gland connection



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	Setpoint GND
8	Setpoint +
9	Process actual value: Assignment depends on sensor type: Details see operating instructions
10	
11	
12	
13	Not assigned
14	Digital input GND
15	Operating voltage GND
16	Operating voltage + 24 V

PROFIBUS DP connection



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	Operating voltage + 24 V
3	Blue	Operating voltage GND

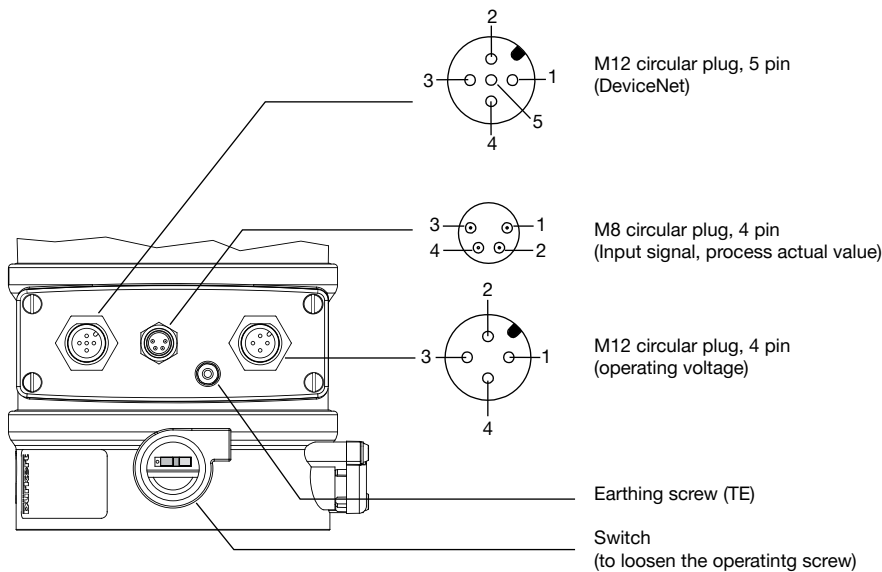
1.) The indicated wire colours refer to the optional connector cable with ID no. 918038.

M8 circular plug, 4 pin (Input signal, process actual value)

Input type ^{1.)}	Pin	Aderfarbe ^{2.)}	Pin assignment	Switch
4...20 mA - internally supplied	1	Brown	+24 V Transmitter supply	
	2	White	Output from transmitter	
	3	Blue	GND	
	4	Black	Bridge acc. to GND	
4...20 mA - externally supplied	1	Brown	Not assigned	
	2	White	Process actual value +	
	3	Blue	Not assigned	
	4	Black	Process actual value -	
Frequency - internally supplied	1	Brown	+24 V Sensor supply	
	2	White	Clock input +	
	3	Blue	Clock input - (GND)	
	4	Black	Not assigned	
Frequency - externally supplied	1	Brown	Not assigned	
	2	White	Clock input +	
	3	Blue	Clock input -	
	4	Black	Not assigned	
Pt 100	1	Brown	Not assigned	
	2	White	Process actual value 1 (power supply)	
	3	Blue	Process actual value 3 (GND)	
	4	Black	Process actual value 2 (compensation)	

1.) Can be adjusted via software (see operating instructions Type 8692/8693 "Setting up the process controller").
 2.) The indicated colours refer to the connection cable available as an accessory with the article no. 264602.

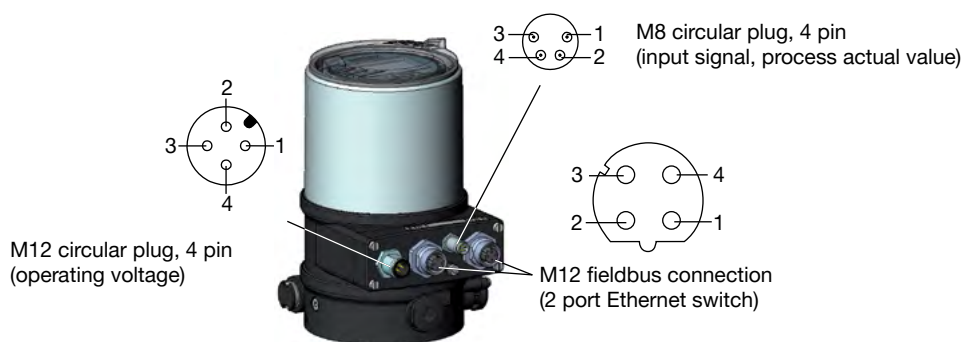
DeviceNet connection



M12 circular plug, 5 pin (fieldbus connection)

Pin	Pin assignment	Colour	Connector diagram
1	Shielding	Not assigned	
2	V+	Not assigned	
3	V-	Not assigned	
4	CAN H	White	
5	CAN L	Blue	

EtherNet/IP, PROFINET, Modbus TCP connection



M12 circular plug, 4 pin (operating voltage)

Pin	Wire colour ^{1.)}	Pin assignment
1	Brown	Operating voltage +24 V
3	Blue	Operating voltage GND

1.) The indicated wire colours refer to the optional connector cable with article no. 918038.

M12 fieldbus connection, D coded

Pin	Pin assignment	Connector diagram
1	Transmit +	
2	Receive +	
3	Transmit -	
4	Receive -	

M8 Circular plug, 4 pin (input signal for process actual value)

Note:

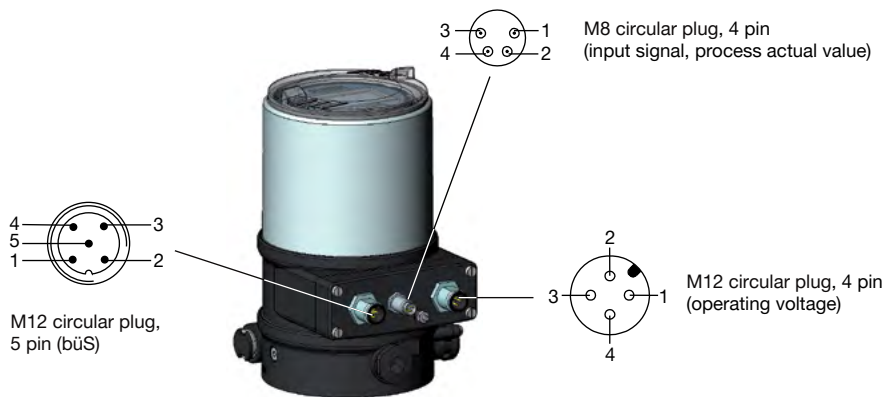
For reasons of wire compensation connect the Pt 100 sensor via 3 wires. Always bridge Pin 3 and Pin 4 on the sensor.

Input type ^{1.)}	Pin	Wire colour ^{2.)}	Pin assignment	Switch	Outer circuitry
4...20 mA - internally supplied	1	Brown	+24 V Transmitter supply	<p>Switch on left</p>	
	2	White	Output from transmitter		
	3	Blue	GND (identical to GND operating voltage)		
	4	Black	Bridge acc. to GND (GND from 3 guide transmitter)		
4...20 mA - externally supplied	1	Brown	Not assigned	<p>Switch on right</p>	
	2	White	Process actual value +		
	3	Blue	Not assigned		
	4	Black	Process actual value -		
Frequency - internally supplied	1	Brown	+24 V sensor supply	<p>Switch on left</p>	
	2	White	Clock input +		
	3	Blue	Clock input - (GND)		
	4	Black	Not assigned		
Frequency - externally supplied	1	Brown	Not assigned	<p>Switch on right</p>	
	2	White	Clock input +		
	3	Blue	Clock input -		
	4	Black	Not assigned		
Pt 100 (see note above)	1	Brown	Not assigned	<p>Switch on right</p>	
	2	White	Process actual value 1 (power supply)		
	3	Blue	Process actual value 3 (GND)		
	4	Black	Process actual value 2 (compensation)		

1.) Can be adjusted via software (see operating manual Type 8692/8693 "24.2.1 PV-INPUT – Setting up the process controller").

2.) The indicated colours refer to the connection cable available as an accessory with the article no. 264602.

Bürkert system bus (būS) connection



M12 circular plug × 1, 5 pin (būS connection)

Pin	Wire colour	Pin assignment
1	CAN-Shield/Shield- ing	CAN-Shield/Shielding
2	Not assigned	
3	Black	GND / CAN_GND
4	White	CAN_H
5	Blue	CAN_L

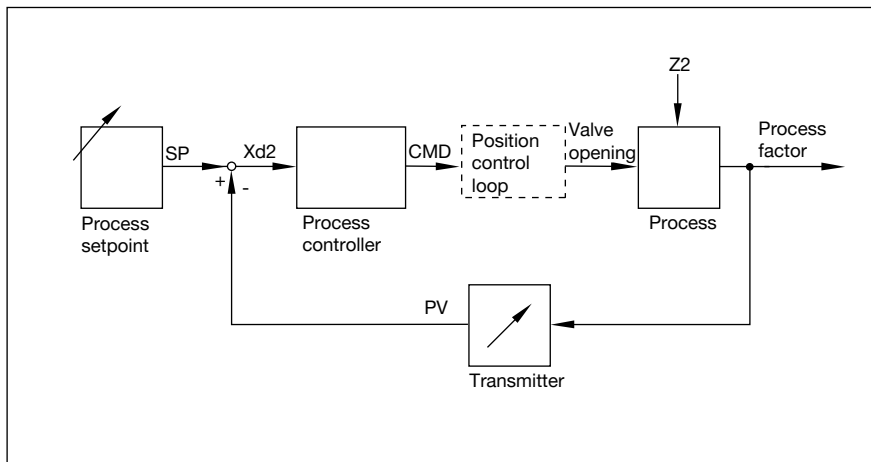
M12 circular plug, 4 pin (operating voltage)

Pin	Wire colour ^{1.)}	Pin assignment
1	Brown	Operating voltage +24 V DC
2	Not assigned	
3	Blue	Operating voltage GND

1.) The indicated wire colours refer to the optional connector cable with article no. 918038.

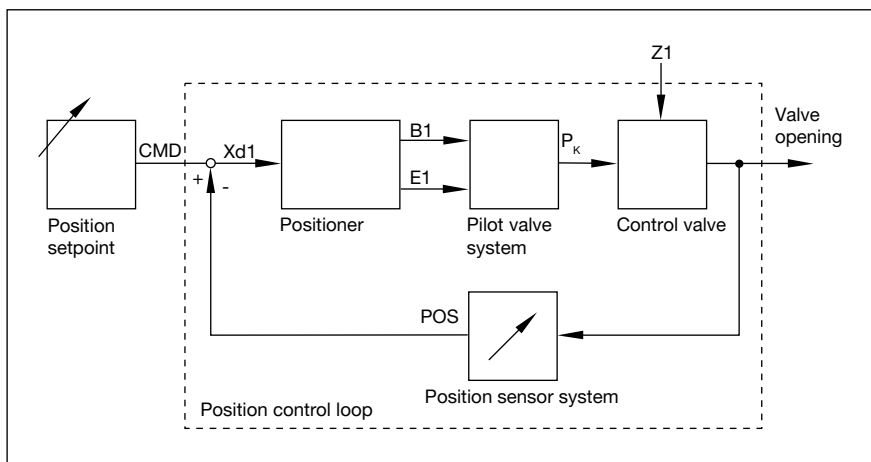
5. Performance specifications

5.1. Process control circuit



5.2. Signal flow diagram

Position control loop



Additional software options of the TopControl process controller Type 8693

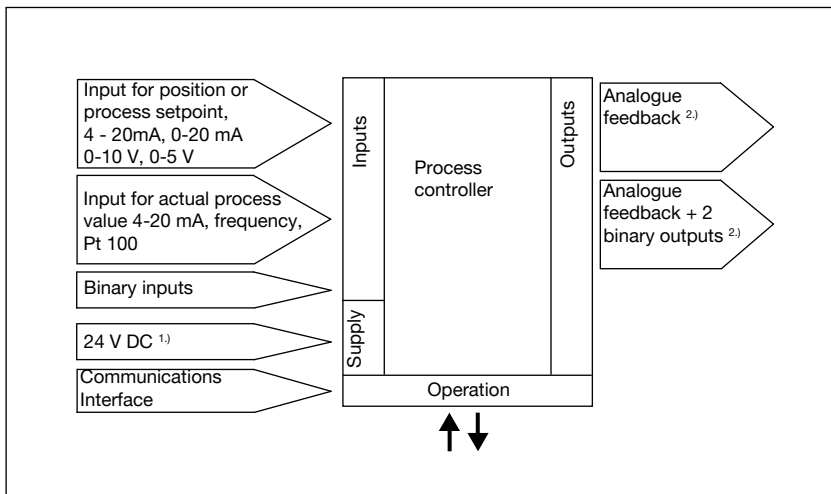
- Automatic start of the control valve systems
- Automatic parameterization of the process control circuit
- Automatic or manual characteristic curves selection
- Setting of the seal and the maximum stroke threshold respectively
- Parameterization of the positioner
- Manual parameterization of the process controller
- Liwithation of the stroke range
- Liwithation of the manipulating speed
- Setting of the moving direction
- Configuration of the binary input
- Signal range splitting on several controllers
- Configuration of an analogue or double binary outputs
- Signal fault detection
- Safety position

- Code protection
- Contrast inversion of the display
- Language selection
- Parametrisable diagnostic functions^{1.)} / Binary output (Option)
 - Operating-hours counter
 - Path accumulator
 - Position monitoring
 - Process actual value monitoring
 - Monitoring of the mechanical end positions in the armature
 - Graphical display of the dwell time density and movement range
 - Direction reversal counter
 - Temperature monitoring

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

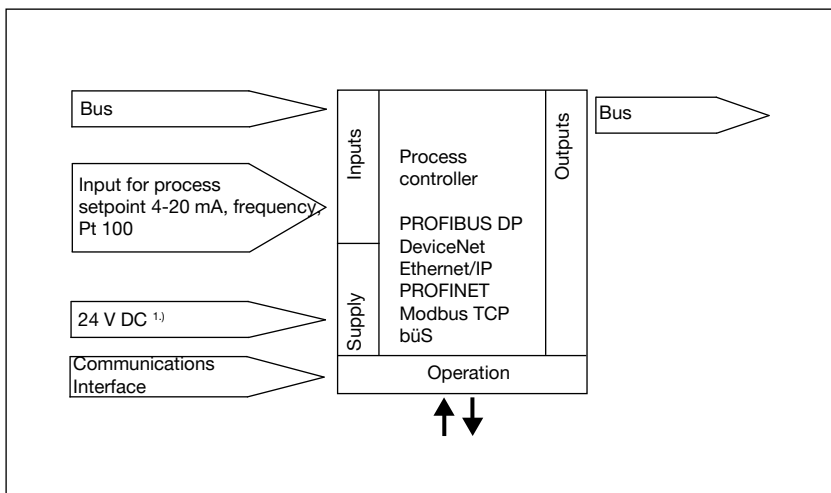
5.3. Interface diagram

Version without fieldbus interface



Version with fieldbus interface

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



1.) The operating voltage is supplied with a 3-wire unit independent from the setpoint signal

2.) Alternative options

6. Product installation

6.1. Combination options with pneumatic process valves

Note:

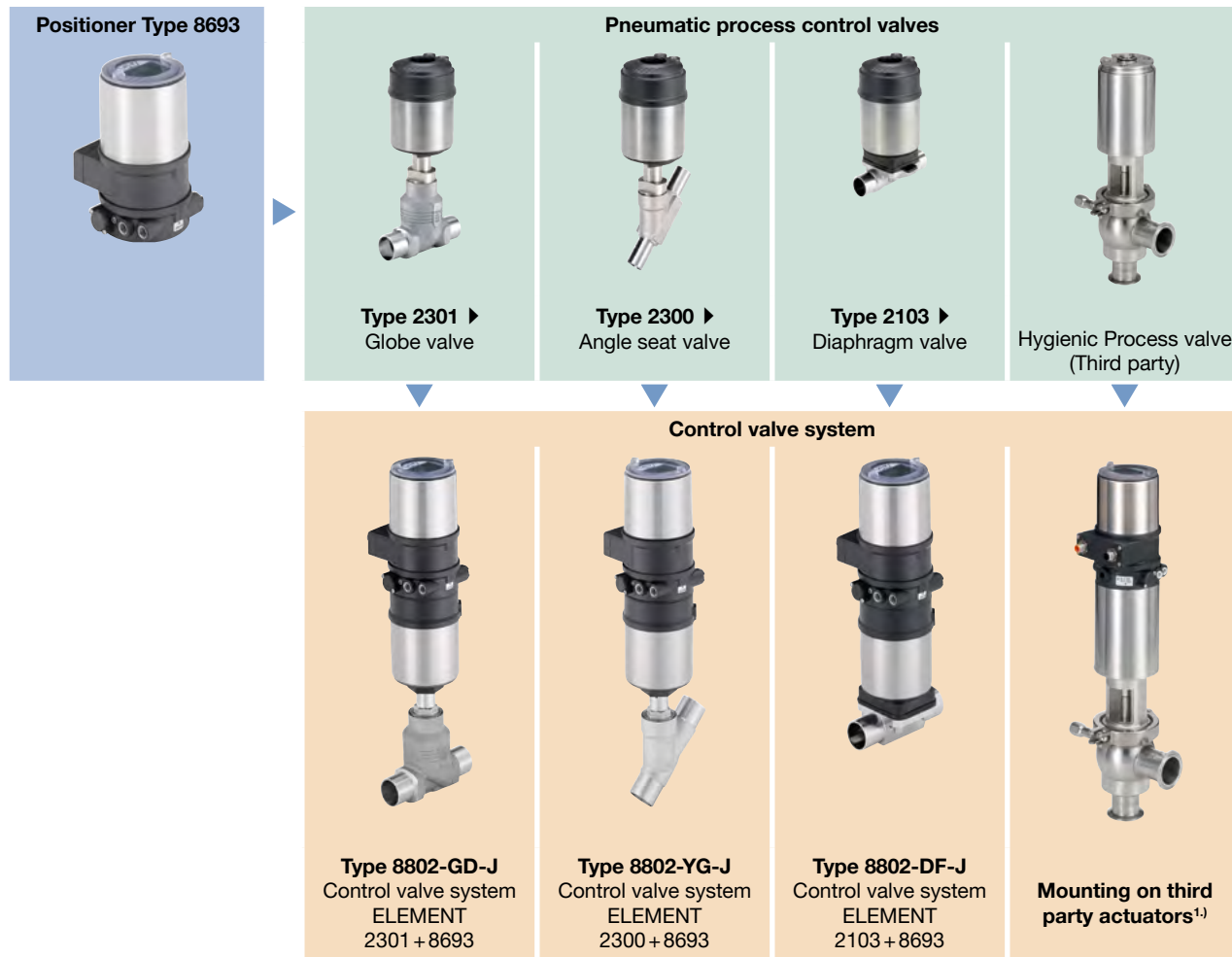
TopControl Control valve system consists of a **process controller Type 8693** and an **ELEMENT control Type 23xx**, resp. 2103.

The following information is required to select a complete system:

- **Article no.** of the desired process controller TopControl **Type 8693**
- **Article no.** of the desired control valve **Type 23xx/ 2103** (see separate data sheets **Type 2301** ▶, **Type 2300** ▶, **Type 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.

DTS 1000110929 EN Version: Y Status: RL (released | freigegeben | validé) printed: 03.02.2021

7. Ordering information

7.1. Bürkert eShop – Easy ordering and quick delivery




Bürkert eShop – Easy ordering and fast 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.

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7.3. Ordering chart

Note:

- Standard versions are UL approved
- The following applies to all variants listed below: Pilot air ports threaded connection G 1/8

Circuit function Pilot valve system	Communication	Electrical connections	Analogue feedback 0/4...20 mA	Analogue feedback 0/4...20 mA + 2 binary output	Diag-nos-tics ¹⁾	Binary input	Article no.		
							Standard	ATEX II Cat. 3G/D, IECEX	
Actuator series Type 23xx Actuator size Ø 70/90 mm									
Low air capacity, single-acting	Without fieldbus communication	Cable gland	–	–	–	Yes	306936	306990	
			–	Yes	Yes	Yes	306965	306991	
	PROFIBUS DP-V1 DeviceNet EtherNet/IP PROFINET Modbus TCP Bürkert system bus (bùS)	M12 circular plug	–	–	–	Yes	Yes	307082	307103
			Via Bus	–	–	–	–	311800	311801
			Via Bus	–	–	–	–	265092	265094
			Via Bus	Yes	Yes	Yes	–	306867	306865
			Via Bus	Yes	Yes	Yes	–	306871	306869
			Via Bus	Yes	Yes	Yes	–	306876	306874
Via Bus	–	–	Yes	–	306881	306878			
Low air capacity, double-acting	Without fieldbus communication	Cable gland	–	–	–	Yes	306931	306992	
			–	Yes	Yes	Yes	306994	306993	
	PROFIBUS DP-V1 DeviceNet	M12 circular plug	–	–	–	Yes	Yes	307107	307109
			–	Yes	Yes	Yes	307108	307110	
			Via Bus	–	–	–	–	311802	311803
			Via Bus	–	–	–	–	265104	265106

Circuit function Pilot valve system	Communication	Electrical connections	Analogue feedback 0/4...20 mA	Analogue feedback 0/4...20 mA + 2 binary output	Diag- nos- tics ^{1.)}	Binary input	Article no.		
							Standard	ATEX II Cat. 3G/D, IECEX	
Actuator series Type 23xx Actuator size Ø 130 mm									
High air capacity, single- acting	Without fieldbus communication	Cable gland	–	–		Yes	306946	306995	
			–	Yes	Yes	Yes	306973	306997	
	PROFIBUS DP-V1 DeviceNet EtherNet/IP PROFINET Modbus TCP Bürkert system bus (bÜS)	M12 circular plug	–	–		Yes	307112	307114	
			–	Yes	Yes	Yes	307113	307115	
			Via Bus	–	–	–	–	311804	311805
			Via Bus	–	–	–	–	265113	265115
			Via Bus	–	–	Yes	–	306868	306866
			Via Bus	–	–	Yes	–	306872	306870
			Via Bus	–	–	Yes	–	306877	306875
Via Bus	–	–	Yes	–	306882	306880			
Actuator series Type 27xx Actuator size Ø 175/225 mm									
High air capacity, single- acting	Without fieldbus communication	Cable gland	–	–		Yes	306950	307003	
			–	Yes	Yes	Yes	306952	307004	
	PROFIBUS DP-V1 DeviceNet EtherNet/IP PROFINET Modbus TCP Bürkert system bus (bÜS)	M12 circular plug	–	–		Yes	307068	307121	
			–	Yes	Yes	Yes	307070	307122	
			Via Bus	–	–	–	–	233356	265138
			Via Bus	–	–	–	–	265141	265140
			Via Bus	–	–	Yes	–	313276	313275
			Via Bus	–	–	Yes	–	313269	313268
			Via Bus	–	–	Yes	–	313271	313270
Via Bus	–	–	Yes		313283	313282			

1.) See "Additional software options of the TopControl process controller Type 8693" on page 13

Further versions on request















Additional

EtherNet/IP, PROFINET, Modbus TCP and bÜS (Bürkert System Bus): double-acting versions with low air capacity

7.4. Ordering chart accessories


Standard Accessories



Description	Article no.
M12 socket, 8 pin with 5 m cable for input and output signals	919267 
M12 socket, 4 pin with 5 m cable for power supply	918038 
M8 socket, 4 pin with 5 m cable for process actual value from sensor	264602 
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 (only for device versions with EtherNet/IP, PROFINET, Modbus TCP Bürkert system bus (bÜS) resp. analogue version with service bÜS 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 
Silencer G 1/8	780779 
Sensor puck (spare part)	682240 
USB interface for serial communication (only for device versions with PROFIBUS, DeviceNet resp. analogue version with serial interface / fluid volume controller Type 8750)	227093 
Bürkert Communicator Software	LINK 

Adapter kits

Note:

The accessories for adapter kits must be ordered separately

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 
Adapter kit for actuator series Type 27xx	Ø 175/225 mm	A (NO), B (NC)	679935 

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