



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)

Type 8693 can be combined with...



Type 2301
Globe control valve



Type 2300
Angle-seat control valve



Type 2103
Diaphragm control valve



Type 8202
ORP meter



Type 8045
Flowmeter



Hygienic
process valve

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 COMMUNICATOR. The positioner registers the valve position without deterioration through a contact-free, analog 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.

Technical data	
Material	Body Cover Sealing
	PPS, stainless steel PC EPDM
Power supply	24 V DC \pm 10 % UL: NEC Class 2
Ripple	10 %, no technical direct current!
Setpoint setting	0/4 to 20 mA and 0 to 5/10 V
Output resistance	0/4 to 20 mA: 180 Ω 0 to 5/10 V: 19 k Ω
Sensor input	4 to 20 mA (180 Ω input resistance) frequency 0 to 1000 Hz (17 k Ω input resistance) PT100-20 to +220 $^{\circ}$ C (resolution < 0.1 $^{\circ}$ C)
Control medium	neutral gases, air, quality classes acc. to ISO 8573-1 Class 7 (< 40 μ m particle size) Class 5 (< 10 mg/m 3) Class 3 (< -20 $^{\circ}$ C) Class X (< 25 mg/m 3)
Ambient temperature	- 10 to +55 $^{\circ}$ C
Pilot air ports	Threaded ports G 1/8 stainless steel
Supply pressure	Low air flow rate 0 to 7 bar ¹⁾ High air flow rate 3 to 7 bar
Air input filter	Exchangeable (mesh aperture=0.1 mm)
Actuator system	
Actuator series Type 23xx	Low air flow rate : \varnothing Actuator 70/90 mm High air flow rate: \varnothing Actuator 130 mm
Actuator series Type 27xx	High air flow rate: \varnothing Actuator 175/225 mm
Position detection module	Contact-free, wear-free
Stroke range valve spindle	3 to 45 mm
Installation	as required, preferably with actuator in upright position
Protection type	IP65/IP67 acc. to EN 60529, Type 4X acc. to NEMA 250 standard
Power consumption	<5 W
Electrical connection	
Multipole connection	M12, 8-pins or 4-pins
Cable gland	2xM16 x 1.5 (cable- \varnothing 5 - 10 mm) with connection terminals for cable cross-sections 0.14 - 1.5 mm 2
Bus communication	PROFIBUS DP-V1, DeviceNet, EtherNet/IP, PROFINET, Modbus TCP, bÜS - Bürkert System Bus (based on CANopen)

¹⁾ The supply pressure has to be 0.5-1 bar above the minimum required pilot pressure for the valve actuator.

Technical data, continued

Approvals	II 3D Ex tc IIIC T135 °C Dc / II 3G Ex ec IIC T4 Gc certificate; BVS 14 ATEX E 008 X Ex tc IIIC T135 °C Dc / Ex ec IIC T4 Gc certificate; IECEx BVS 14.0009 X cULus certificate; E238179
ATEX	
IECEX	
UL	
Ignition protection	II 3D Ex tc IIIC T135 °C Dc II 3G Ex ec IIC T4 Gc
Conformity	EMC directive 2014/30/EU

Ordering information for ELEMENT TopControl control valve systems

A TopControl control valve system consists of a **process controller Type 8693** and an **ELEMENT control valve Type 23xx/2103**.

The following information is necessary for the selection of a complete control valve:

- **Article no.** of the desired TopControl process controller **Type 8693** (see ordering chart on p. 3)
- **Article no.** of the selected control valve **Type 23xx/2103** (see separate datasheets, e.g. 2300, 2301 or 2103)

You order two components and receive a complete assembled and certified valve.

When you click on the orange box "More info." below, you will come to our website for the resp. product where you can download the datasheet.

Example of variations of control valve systems

Positioner Type 8693



Pneumatic process control valve



More info.

Globe control valve
Type 2301



More info.

Angle-seat control valve
Type 2300



More info.

Diaphragm control valve
Type 2103



Third party
hygienic
process
valves

Control valve system



ELEMENT control valve system
Type 8802-GD-J
2301 + 8693



ELEMENT control valve system
Type 8802-YG-J
2300 + 8693



ELEMENT control valve system
Type 8802-DF-J
2103 + 8693



Customised attachment to third party actuators*

More info.

*please see datasheet
Type KK01 adapter kits for
hygienic process valves or
contact your sales office for
related drawings or individual
engineering support

Ordering chart Type 8693 (other versions on request)

Control function pilot valve system	Communication	Electrical connection	Analogue feedback 0/4 - 20 mA	Analogue feedback 0/4 - 20 mA + 2 binary outputs	Diagnostic function ¹⁾	Binary input	Pilot air ports threaded ports	Article no.	
Actuator series Type 23xx, size Ø 70/90 mm								Standard	ATEX II Kat. 3G/D, IECEx
Low air capacity single-acting	without fieldbus-communication	Cable gland				yes	G 1/8	306936	306990
			yes	yes	yes	G 1/8	306965	306991	
	PROFIBUS DP-V1 DeviceNet EtherNet/IP PROFINET Modbus TCP büS - Bürkert System Bus	M12 Multipole connector				yes	G 1/8	307082	307103
			yes	yes	yes	G 1/8	307105	307104	
			via Bus			G 1/8	311800	311801	
			via Bus			G 1/8	265092	265094	
			via Bus	yes	yes	G 1/8	306867	306865	
			via Bus	yes	yes	G 1/8	306871	306869	
via Bus	yes	yes	G 1/8	306876	306874				
via Bus		yes	G 1/8	306881	306878				
Low air capacity double-acting	without fieldbus-communication	Cable gland				yes	G 1/8	306931	306992
			yes	yes	yes	G 1/8	306994	306993	
	PROFIBUS DP-V1 DeviceNet	M12 Multipole connector				yes	G 1/8	307107	307109
			yes	yes	yes	G 1/8	307108	307110	
			via Bus			G 1/8	311802	311803	
via Bus			G 1/8	265104	265106				
Actuators series Type 23xx, size Ø 130 mm									
High air capacity single-acting	without fieldbus-communication	Cable gland				yes	G 1/8	306946	306995
			yes	yes	yes	G 1/8	306973	306997	
	PROFIBUS DP-V1 DeviceNet EtherNet/IP PROFINET Modbus TCP büS - Bürkert System Bus	M12 Multipole connector				yes	G 1/8	307112	307114
			yes	yes	yes	G 1/8	307113	307115	
			via Bus			G 1/8	311804	311805	
			via Bus			G 1/8	265113	265115	
			via Bus		yes	G 1/8	306868	306866	
			via Bus		yes	G 1/8	306872	306870	
via Bus		yes	G 1/8	306877	306875				
via Bus		yes	G 1/8	306882	306880				
Actuator series Type 27xx, size Ø 175 / 225 mm									
High air capacity single-acting	without fieldbus-communication	Cable gland				yes	G 1/8	306950	307003
			yes	yes	yes	G 1/8	306952	307004	
	PROFIBUS DP-V1 DeviceNet EtherNet/IP PROFINET Modbus TCP büS - Bürkert System Bus	M12 Multipole connector				yes	G 1/8	307068	307121
			yes	yes	yes	G 1/8	307070	307122	
			via Bus			G 1/8	233356	265138	
			via Bus			G 1/8	265141	265140	
			via Bus		yes	G 1/8	313276	313275	
			via Bus		yes	G 1/8	313269	313268	
			via Bus		yes	G 1/8	313271	313270	
via Bus		yes	G 1/8	313283	313282				



¹⁾ see additional software functions parametrisable diagnostic functions / binary outputs on page 13

Note: Standard versions are UL approved.

i Further versions on request













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

Ordering chart adapter kit (has to be ordered separately)

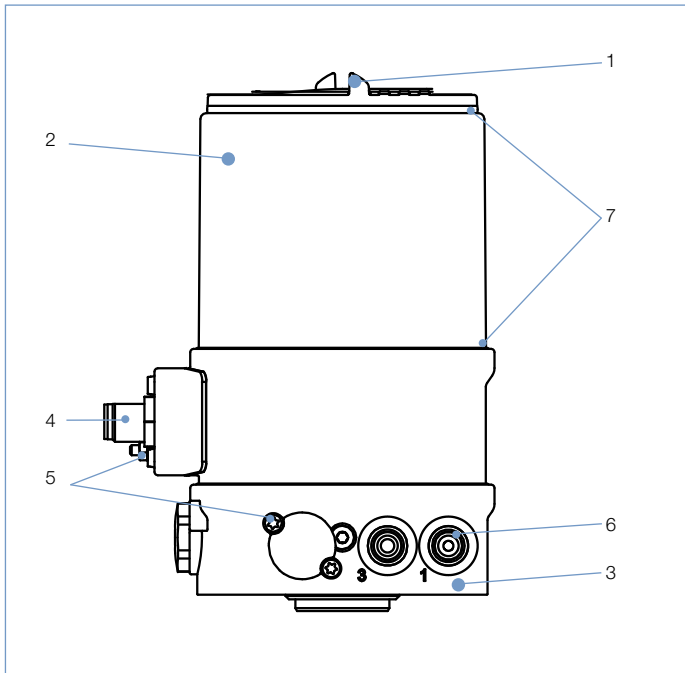
Description	Actuator size	Control function	Article no.
Adapter kit actuator series Type 23xx/2103	Ø 70 / 90 / 130 mm	universal	679917 
Adapter kit actuator series Type 27xx	Ø 175 / 225 mm	A (NO), B (NC)	679935 

For installation kits to 3rd party process valves please see datasheet datasheet [Type KK01](#) adapter kits for hygienic process valves or contact your sales office for related drawings or individual engineering support.

Ordering chart 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 and bÜS - Bürkert System Bus	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 
SIM Card	291773 
Silencer G 1/8	780779 
Sensor puck (spare part)	682240 
USB interface for serial communication (only for device versions with PROFIBUS / DeviceNet or with fluid flow controller Type 8750)	227093 
Bürkert Communicator Software	http://www.buerkert.com/en/type/8920

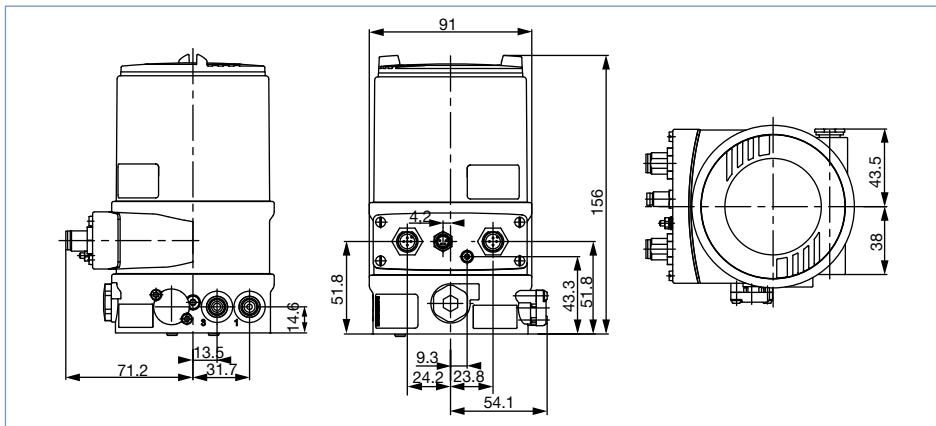
Materials



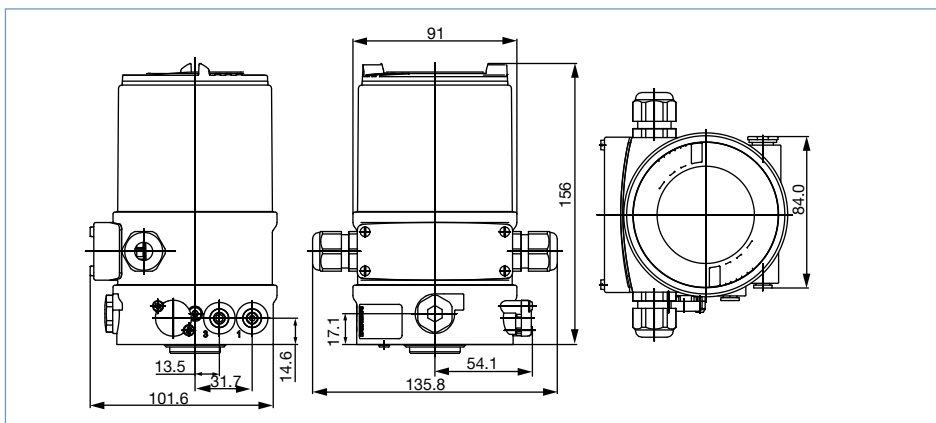
- | | | |
|----------|-----------------------------|---------------------|
| 1 | Cover | PC |
| 2 | Body casing | Stainless steel |
| 3 | BASIC body | PPS |
| 4 | Plug M12 | Stainless steel |
| 5 | Screws | Stainless steel |
| 6 | Push-in connector | POM/stainless steel |
| | Threaded ports G 1/8 | Stainless steel |
| 7 | Sealing | EPDM |

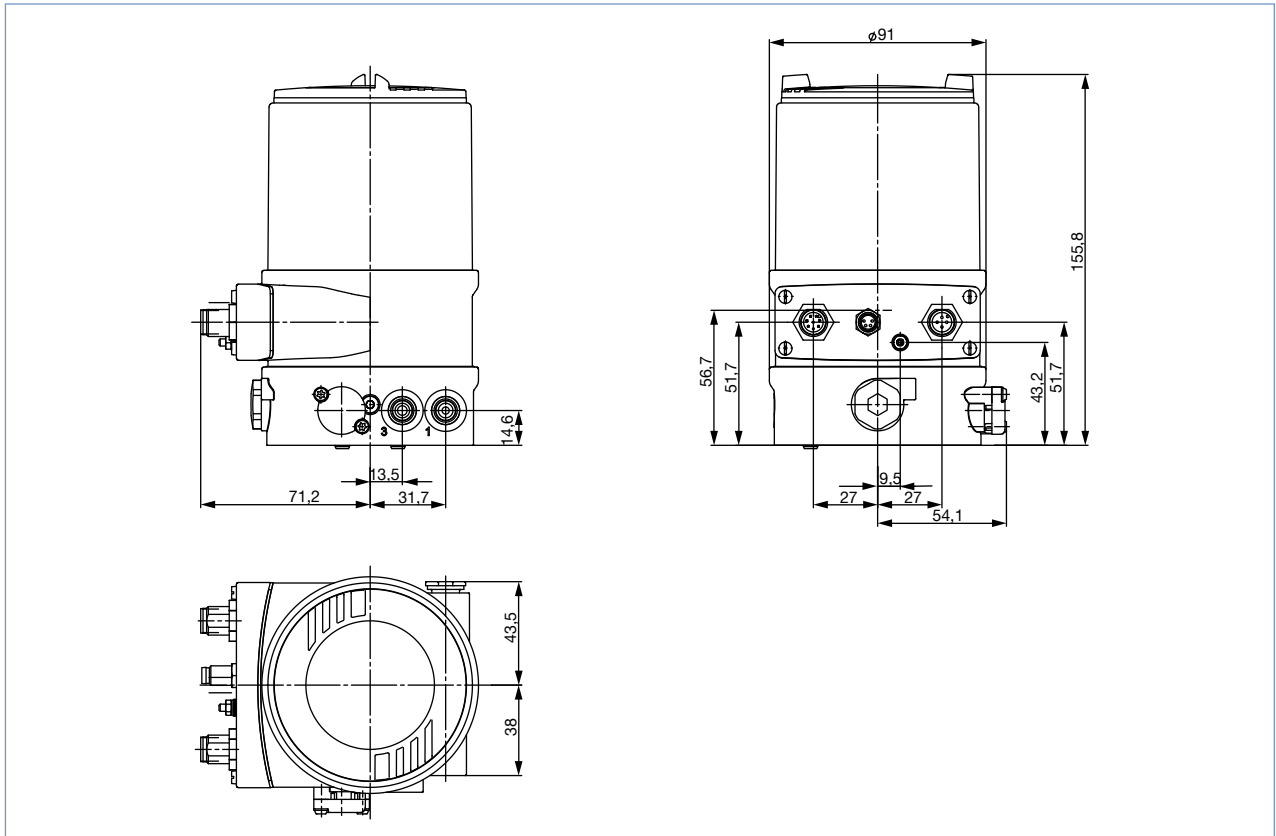
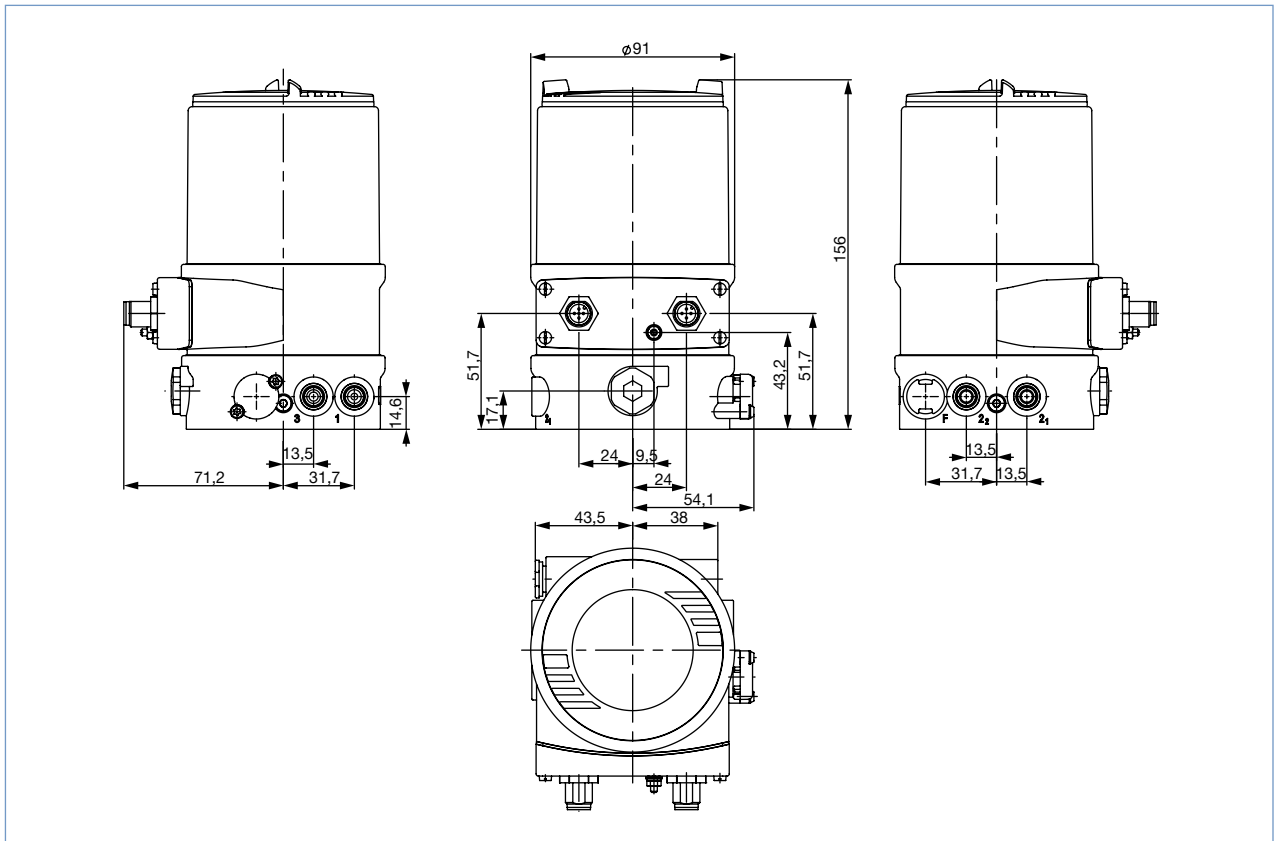
Dimensions [mm]

Version connection Multipole



Version connection cable glands



Dimensions [mm]**Mounting on process valves actuator series Type 23xx, actuator size 70/90/130 mm****Mounting on control valves of actuator series Type 27xx , actuator size 175/225 mm**

Mounting on third party hygienic process valves



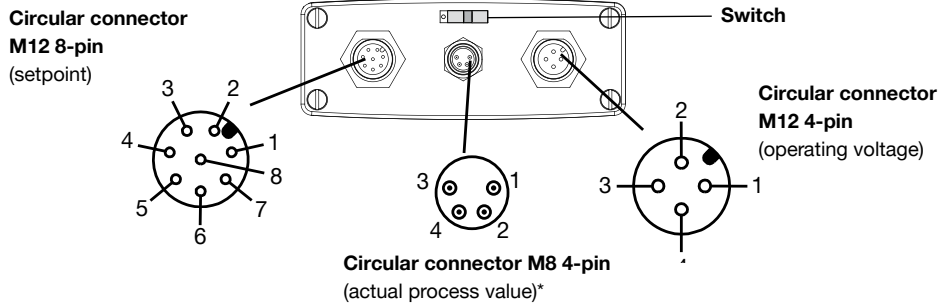
More
info.

Customised attachment to 3rd party actuators*

*: please see datasheet Type KK01
Adapter kits for hygienic process
valves or contact your sales office
for related drawings or individual
engineering support]

Connection options

Connection Multipole



Circular connector M12 8-pin (setpoint)

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

Circular connector M12 8-pin (in / output signal)*

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

Pin	Configuration
1	Operating voltages +24 V DC
3	Operating voltage GND

* with the option analogue feedback or binary output

Circular connector M8 - 4-pins (actual process value)

Input type*	Pin	Configuration	Switch
4 - 20 mA - internally supplied	1	+24 V transwithter supply	Switch on left
	2	Output from transwithter	
	3	GND	
	4	Bridge after GND	
4 - 20 mA - externally supplied	1	not assigned	Switch on right
	2	Actual value +	
	3	not assigned	
	4	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 notes to the right)	1	not assigned	Switch on right
	2	Process actual 1 (current feed)	
	3	Process actual 2 (GND)	
	4	Process actual 3 (compensation)	

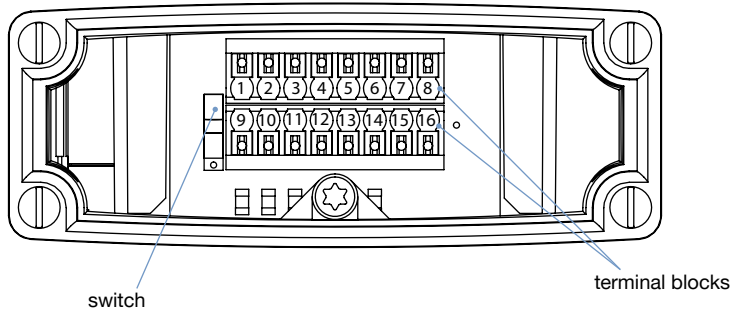
* with the option analogue feedback or binary output

IMPORTANT!

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

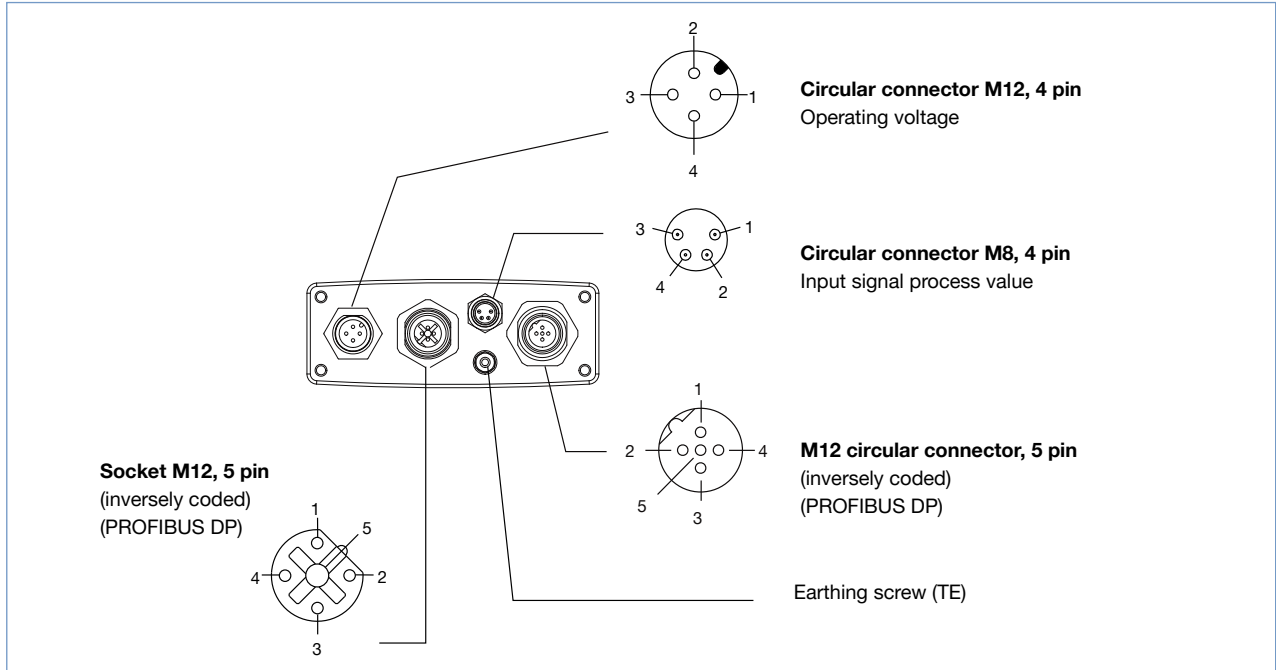
Connection options, continued

Connection cable glands



Clamp	Configuration
1	Analogue position feedback GND
2	Analogue position 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	nicht belegt
13	Digital input GND
14	Operating voltage GND
15	Operating voltage +24 V
16	

PROFIBUS DP connection



Socket M12, 5 pin - Fieldbus connection

Pin	Configuration
1	VP+5
2	RxD/TxD-N
3	DGND
4	RxD/TxD-P
5	not used
Thread	Shielding / Earthing

Circular connector M12, 4 pin - Operating voltage

Pin	Wire colour*	Configuration
1	brown	+ 24 V
3	blue	GND

* The indicated wire colors refer to the optional connector cable with ID no. 918 038.

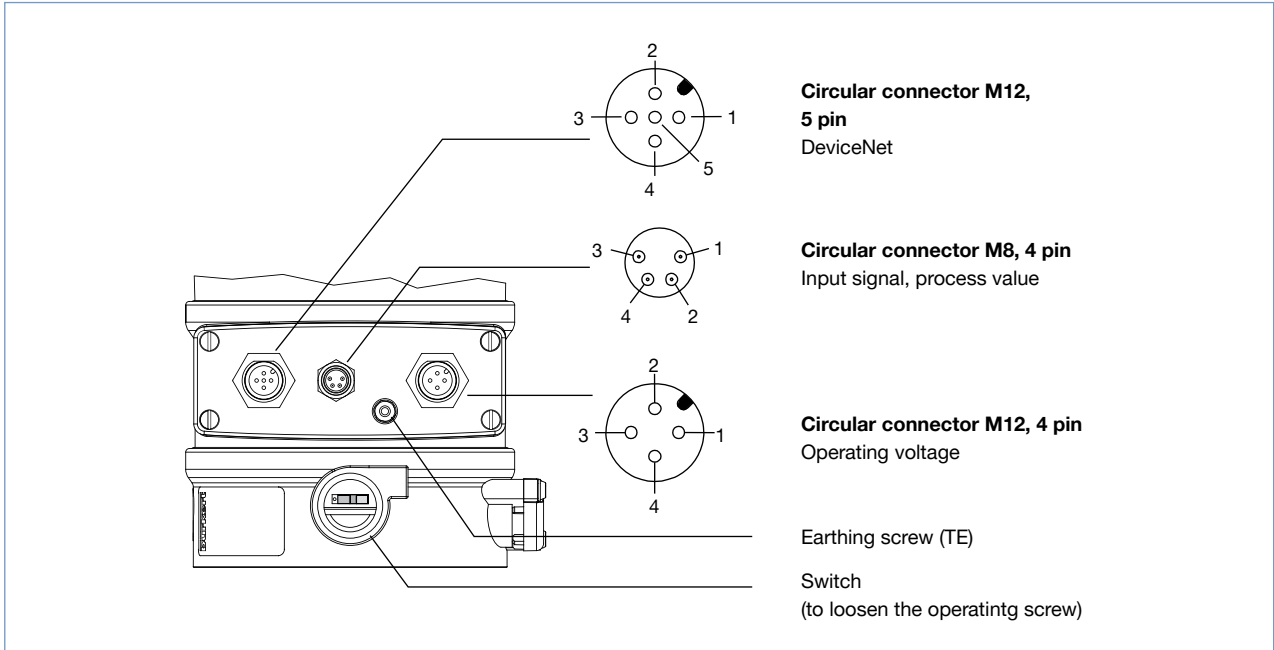
Rundstecker M8, 4 pin - Input signal, process actual

Input type*	Pin	Wire colour**	Configuration	Schalter
4... 20 mA - internally supplied	1	brown	+ 24 V Supply transmitter Output form transmitter GND Bridge to GND	
	2	white		
	3	blue		
	4	black		
4... 20 mA - externally supplied	1	brown	not used Process actual + not used Process actual -	
	2	white		
	3	blue		
	4	black		
Frequenz - internally supplied	1	brown	+ 24 V Suplly sensor Clock input + Clock input - (GND) not used	
	2	white		
	3	blue		
	4	black		
Frequenz - externally supplied	1	brown	not used Clock input + Clock input - not used	
	2	white		
	3	blue		
	4	black		
Pt 100 (see note below)	1	brown	not used Process actual 1 (current feed) Process actual 3 (GND) Process actual 2 (compensation)	
	2	white		
	3	blue		
	4	black		

* Can be adjusted via software (see operating instructions Type 8692/8693"Setting up the process controller").

** The indicated colors refer to the connection cable available as an accessory (92903474).

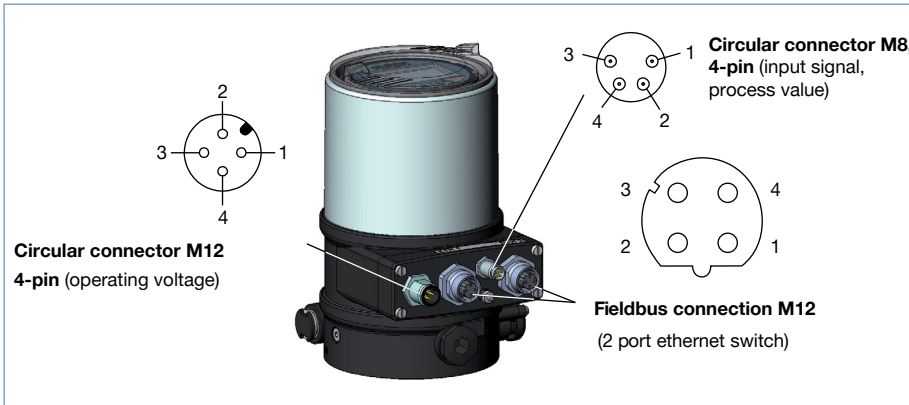
DeviceNet connection



Circular connector M12, 5 pin - Fieldbus connection

Pin	Configuration	Colour	Connector diagram
1	Shield	not used	
2	V+	not used	
3	V-	not used	
4	CAN H	white	
5	CAN L	blue	

EtherNet/IP, PROFINET, Modbus TCP connection



Fieldbus connection M12 D-coded


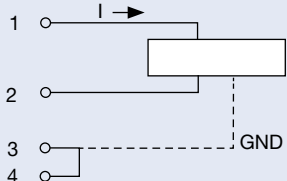

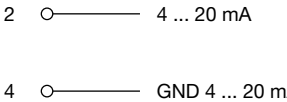

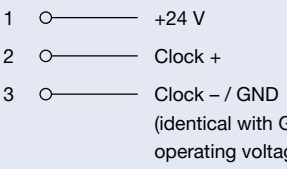

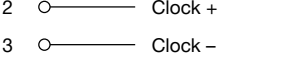

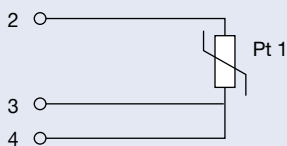
Pin	Configuration	Connector diagram
1	Transmit +	
2	Receive +	
3	Transmit -	
4	Receive -	

Circular connector M12, 4 pin - operating voltage

Pin	Wire colour*	Configuration
1	brown	Operating voltage +24 V DC
3	blue	Operating voltage GND

* The indicated colors refer to the accessory connector cable (918 038)

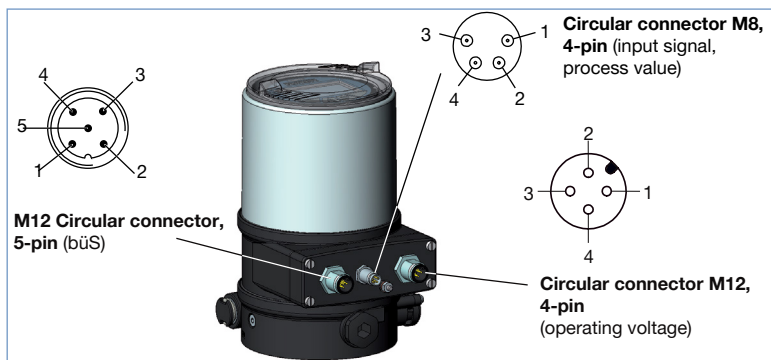
Circular connector M8, 4 pin - Input signal for process value

Input type*	Pin	Wire colour**	Configuration	Switch	Device side	External wiring
4 ... 20 mA- internally supplied	1 2 3 4	brown white blue black	+24 V Supply transmitter Output form transmitter GND (identical with GND operating voltage) Bridge to GND (GND from 3 guide transmitter)	 Switch left		
4 ... 20 mA - externally supplied	1 2 3 4	brown white blue black	not used Process actual + not used Process actual -	 Switch right		
Frequenz - internally supplied	1 2 3 4	brown white blue black	+24 V Supply sensor Clock input + Clock input - (GND) not used	 Switch left		
Frequenz - externally supplied	1 2 3 4	brown white blue black	not used Clock input + Clock input - not used	 Switch right		
Pt 100 (see note below)	1 2 3 4	brown white blue black	not used Process actual 1 (current feed) Process actual 3 (GND) Process actual 2 (compensation)	 Switch right		

* Adjustable via software (see manual).

** The indicated wire colours refer to the optional connector cable with ID no. 92903474

büS - Bürkert System Bus connection



Circular connector M12 x 1, 5 pin - büS connection

Pin	Wire colour	Configuration
1	CAN-Label /Shielding	CAN-Label /Shielding
2	not used	
3	black	GND / CAN_GND
4	white	CAN_H
5	blue	CAN_L

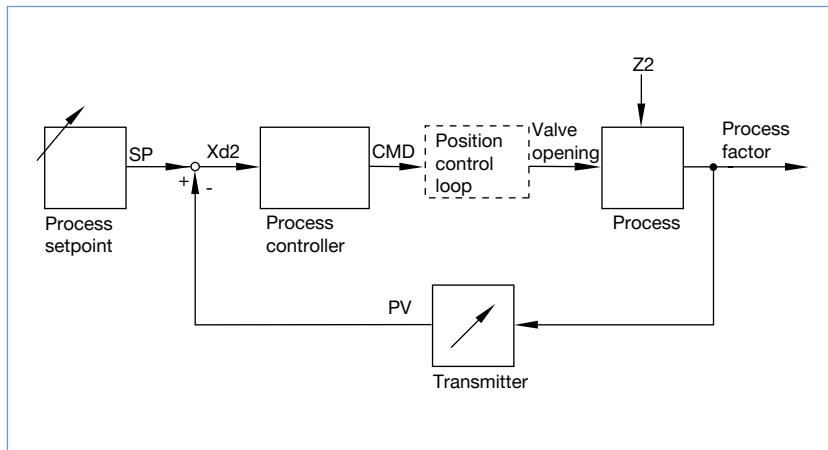
Circular connector M12, 4 pin - Operating voltage

Pin	Wire colour*	Configuration
1	brown	Operating voltage +24 V DC
2	not used	
3	blue	Operating voltage GND

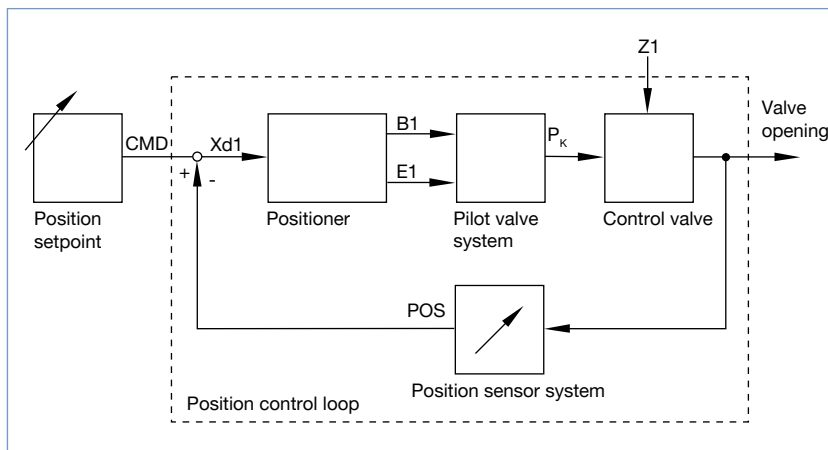
* The indicated colors refer to the accessory connector cable (918 038)

Signal flow diagram

Process control circuit



Position control loop



Additional software functions of the TopControl Type 8693

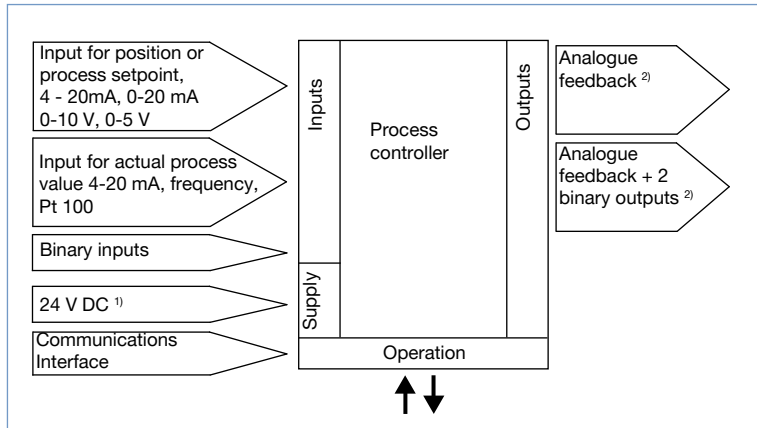
- Automatic start of the control valve systems
- Automatic parameterization of the process control circuit
- Automatic or manual characteristic curves selection
- Setting of the seal and the maximum stroke threshold respectively
- Parameterization of the positioner
- Manual parameterization of the process 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* / Binary outputs (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

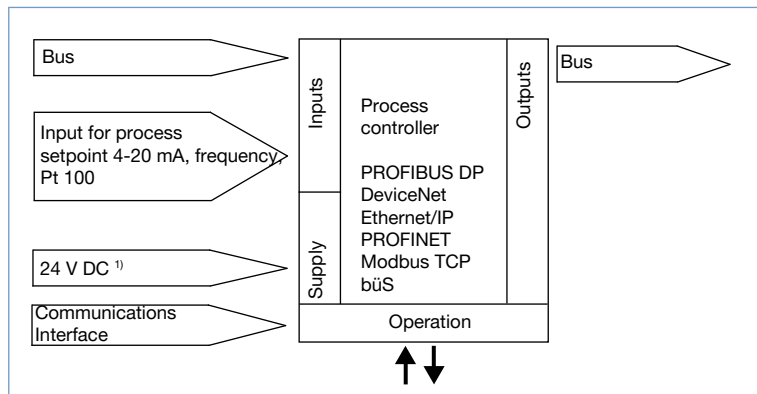
* For installation kits to 3rd party process valves please see data-sheet installation kits for hygienic process valves or contact your sales office for related drawings or individual engineering support. You will find a more detailed description for every diagnostic function in the operating manual.

Schematic diagram of the Type 8693

Without fieldbus interface



With PROFIBUS DP, DeviceNet, EtherNet/IP, PROFINET, Modbus TCP and bÜS - Bürkert System Bus



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

²⁾ Alternative options

To find your nearest Bürkert facility, click on the orange box →

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