



Type 8693 can be combined with...



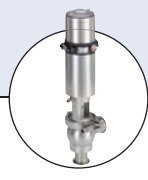
Type 2301
Globe control valve



Type 2300
Angle-seat control valve



Type 2103
Control diaphragm valve



Hygienic Prozess Valves

Digital electropneumatic Process Controller for the integrated mounting on process control valves

- Compact stainless steel design
- Easy start-up using tune function of the process controller.
- Internal control air channel
- Integrated diagnostic functions for valve monitoring (optional)
- Profibus DPV1 or DeviceNet (optional)
- With ATEX II cat. 3G/D approval.

The compact Process Controller Type 8693 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 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 a PC interface.

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 DPV1 or DeviceNet and analogue as well as binary feedback can also be chosen.

¹⁾ The supply pressure has to be 0,5 - 1 bar above the minimum required pilot pressure for the valve actuator.

Technical data		
Material	Body	PPS, stainless steel
	Cover	PC
	Sealing	EPDM
Power supply		24 VDC +/- 10% UL: NEC Class 2
Ripple		10%, no technical direct current!
Setpoint setting		0/4 to 20mA 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 kΩ input resistance) PT100 -20 to +220 °C (resolution < 0.1 °C)
Control medium		neutral gases, air DIN ISO 8573-1
Dust concentration		Class 5 (<40µm particle size)
Particle density		Class 5 (<10mg/m ³)
Pressure condensation point		Class 3 (<-20 °C)
Oil concentration		Class 5 (<25mg/m ³)
Ambient temperature		-10 to +55 °C
Pilot air ports		Threaded ports G1/8 stainless steel or push-in connector (tube Ø 6mm / 1/4")
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 ~0.1mm)
Actuator system		Low air flow rate: ø Actuator 70 / 90 mm High air flow rate: ø Actuator 130 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 class		IP 65/67 according to EN 60529, Type 4X
Power consumption		< 5 W
Electrical connection		M12, 8-pins or 4-pins 2xM16x1,5 (cable-ø10mm) on terminal screws (1,5 mm ²)
Bus communication		Profibus DPV1, DeviceNet
Approvals		ATEX II cat. 3G/D cULus Cert. No. 238179
Ignition protection		II 3D Ex tc III C T135 °C Dc II 3G Ex nA IIC T4 Gc
Protection class		3 according to VDE 0580
Conformity		CE acc. to EMV2004/108/EG

Ordering information for TopControl-Control valve systems

A complete TopControl-Control valve system consists of a TopControl Type 8693 and a process valve Type 23XX/2103. The following information is necessary for the selection of a complete control valve:

- **Item no.** of the process controller **Type 8693** without process valve, see ordering chart on p. 3
- **Item no.** of the selected process 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 valves

**8693 Process Controller
TopControl**



Required process valve, example



More info.

2301
Globe Control
Valve



More info.

2300
Angle-Seat
Control Valve



More info.

2103
Control
Diaphragm
Valve

**Complete control valve
with required body and
port connection**



**Valve system
Continuous ELEMENT
Type 8802-GD-J
2301 + 8693**



**Valve system
Continuous ELEMENT
Type 8802-YG-J
2300 + 8693**



**Valve system
Continuous ELEMENT
Type 8802-DF-J
2103 + 8693**

Ordering chart Type 8693 (other versions on request)


Control function Pilot valve system	Communi- cation	Electrical connection	Analogue feedback 0/4-20 mA	Analogue feedback 0/4-20 mA + 2 binary outputs	Diagnostic function*	Binary input	Pilot air ports threaded ports	Item no.		
Actuator series ELEMENT Type 23xx, size Ø70/90 mm								Standard	ATEX II cat. 3G/D	
Low air capacity single-acting		Cable gland				yes	G1/8	227 352	265 086	
				yes	yes	yes	G1/8	227 804	265 087	
		M12 multipole					yes	G1/8	242 019	265 088
				yes	yes	yes	G1/8	265 090	265 089	
			Profibus DPV1	via Bus			G1/8	233 354	265 091	
			DeviceNet	via Bus			G1/8	265 092	265 094	
low air capacity double-acting		Cable gland				yes	G1/8	227 339	265 096	
				yes	yes	yes	G1/8	265 098	265 097	
		M12 multipole					yes	G1/8	265 099	265 101
				yes	yes	yes	G1/8	265 100	265 102	
			Profibus DPV1	via Bus			G1/8	265 103	265 105	
			DeviceNet	via Bus			G1/8	265 104	265 106	
Actuators series ELEMENT Type 23xx, size Ø130 mm										
High air capacity single-acting		Cable gland				yes	G1/8	227 375	265 107	
				yes	yes	yes	G1/8	244 380	265 108	
		M12 multipole					yes	G1/8	265 109	265 111
				yes	yes	yes	G1/8	265 110	265 112	
			Profibus DPV1	via Bus			G1/8	233 355	265 114	
			DeviceNet	via Bus			G1/8	265 113	265 115	
Actuator series CLASSIC Type 27xx, size Ø80/100 mm										
Low air capacity single-acting		Cable gland				yes	G1/8	227 360	265 116	
				yes	yes	yes	G1/8	227 362	265 117	
		M12 multipole					yes	G1/8	227 367	265 118
				yes	yes	yes	G1/8	227 369	265 119	
			Profibus DPV1	via Bus			G1/8	240 628	265 121	
			DeviceNet	via Bus			G1/8	265 123	265 122	
low air capacity double-acting		Cable gland				yes	G1/8	227 346	265 124	
				yes	yes	yes	G1/8	265 126	265 125	
		M12 multipole					yes	G1/8	227 348	265 127
				yes	yes	yes	G1/8	265 129	265 128	
			Profibus DPV1	via Bus			G1/8	265 130	265 131	
			DeviceNet	via Bus			G1/8	265 133	265 132	
Actuator series CLASSIC Type 27xx, size Ø125/175/225 mm										
High air capacity single-acting		Cable gland				yes	G1/8	227 383	265 134	
				yes	yes	yes	G1/8	227 386	265 135	
		M12 multipole					yes	G1/8	227 390	265 136
				yes	yes	yes	G1/8	227 392	265 137	
			Profibus DPV1	via Bus			G1/8	233 356	265 138	
			DeviceNet	via Bus			G1/8	265 141	265 140	

*see additional software functions parametrisable diagnostic functions / binary outputs on page 9

Note: All non-ATEX versions are UL approved.

i Further versions on request

 **Approvals**
FM

 **Additional**
push-in pilot air ports (tube Ø 6mm / 1/4")

Ordering chart adapter kit (has to be ordered separately)

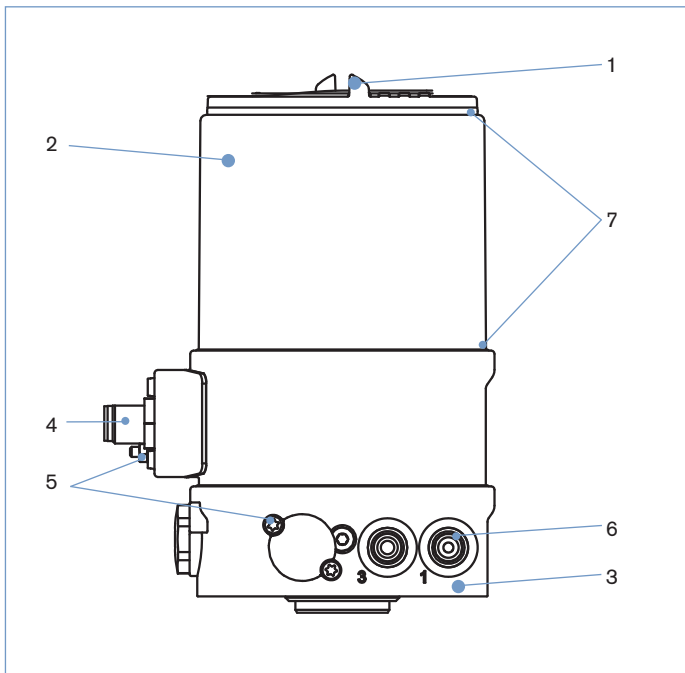
Description	Actuator size	Control function	Item no.
Adapter kit ELEMENT types 23xx	Ø70 / 90 / 130 mm	universal	679 917
Adapter kit CLASSIC types 27xx	Ø80 mm	universal	679 931
	Ø100 mm	universal	679 932
	Ø125 mm	A (NO), B (NC)	679 934
	Ø175/225 mm	A (NO), B (NC)	679 935

For installation kits to 3rd party process valves please see datasheet installation kits for hygienic process valves or contact your sales office for related drawings or individual engineering support

Ordering chart accessories

Description	Item no.
M12 socket, 8-pins, 5 m assembled cable	919 267
M12 socket, 5-pins, 5 m assembled cable	264 606
M12 socket, 4-pins, 5 m assembled cable	918 038
M8 socket, 4-pins, 5 m cable, actual process value	264 602
M8 connector, 4-pins, Initiator	917 131
Silencer G1/8	780 779
Silencer, push-in connector	902 662
Sensor puck (spare part)	682 240
USB interface for serial communication	227 093

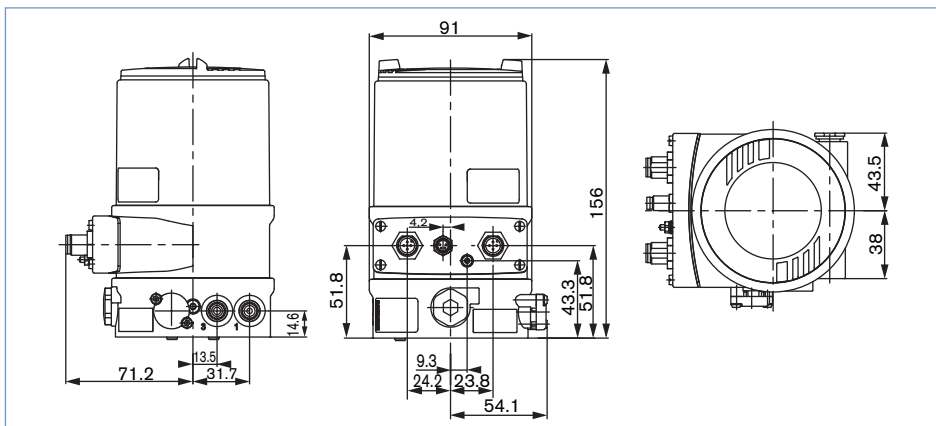
Materials



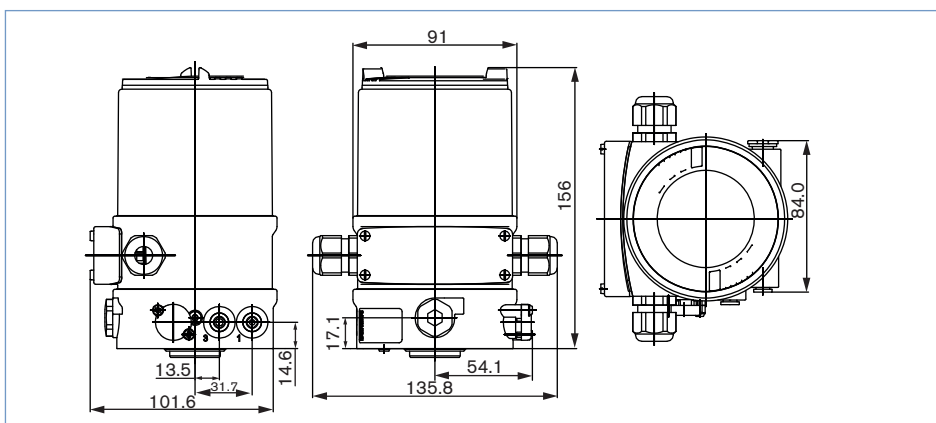
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|----------------------------|---------------------|
| 1 Cover | PC |
| 2 Body casing | Stainless steel |
| 3 Basic body | PPS |
| 4 Plug M12 | Stainless steel |
| 5 Screws | Stainless steel |
| 6 Push-in connector | POM/stainless steel |
| Threaded ports G1/8 | Stainless steel |
| 7 Sealing | EPDM |

Dimensions [mm]

Version connection Multipole



Version connection cable glands



Connection options

Connection Multipole

Circular connector M12 - 8-pins (setpoint)

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

Circular connector M12 - 4-pins (supply)

Circular connector M12 - 8-pins (setpoint)

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

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

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

Circular connector M12 - 4-pins (supply)

Pin	Configuration
1	Operating voltages + 24 VDC
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 transmitter supply	Switch on left
	2	Output from transmitter	
	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)	

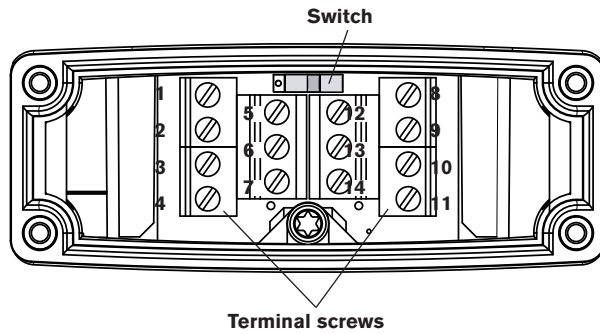
* with the option analogue feedback or binary output

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
11	Setpoint + (0/4 - 20 mA / 0 - 5/10 V)
10	Setpoint GND
14	Operating voltages + 24 VDC
13	Operating voltage GND
12	Binary input +
13	Binary input GND
9*	Analogue position feedback +
8*	Analogue position feedback GND
5*	Binary output 1
6*	Binary output GND
7*	Binary output 2

Actual process value

Input type*	Pin	Configuration	Switch
4-20 mA - internally supplied	1	+24 V transmitter supply	 Switch on left
	2	Output from transmitter	
	3	Bridge after GND	
	4	GND	
4-20 mA - externally supplied	1	not assigned	 Switch on right
	2	Process actual +	
	3	Process actual -	
	4	not assigned	
Frequency - internally supplied	1	+24 V sensor supply	 Switch on left
	2	Clock input +	
	3	not assigned	
	4	Clock input - (GND)	
Frequency - externally supplied	1	not assigned	 Switch on right
	2	Clock input +	
	3	not assigned	
	4	Clock input -	
Pt 100 (see note to the right)	1	not assigned	 Switch on right
	2	Process actual 1 (current feed)	
	3	Process actual 2 (compensation)	
	4	Process actual 3 (GND)	

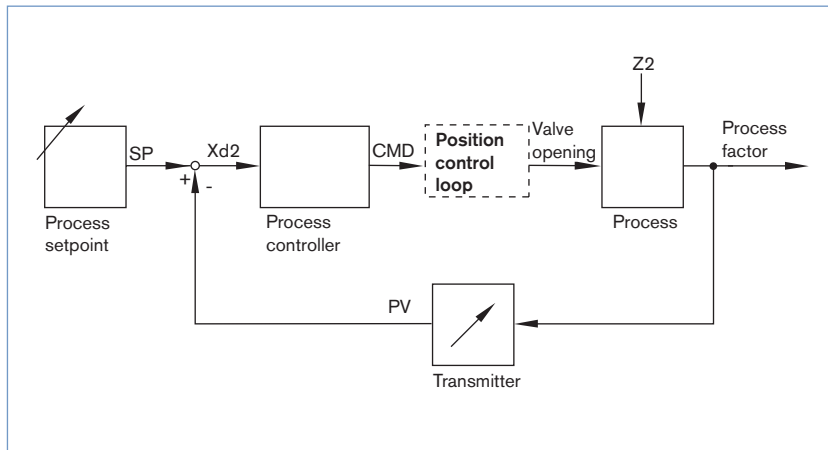
IMPORTANT!

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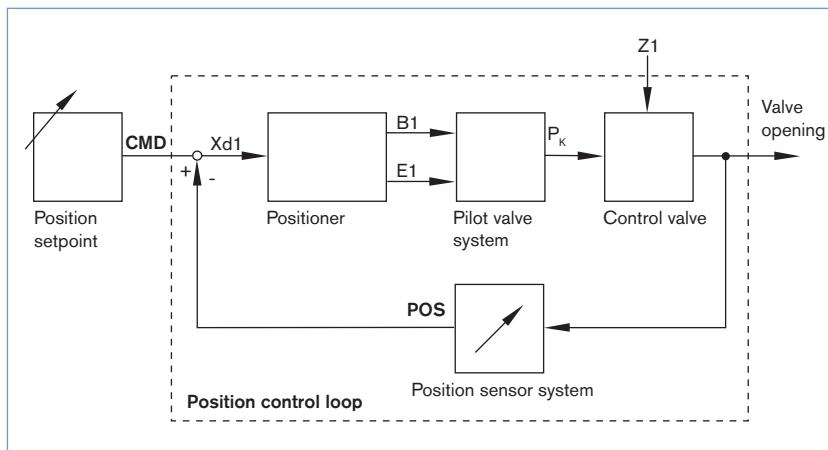
* with the option analogue feedback or binary output

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
- Limitation of the stroke range
- Limitation 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

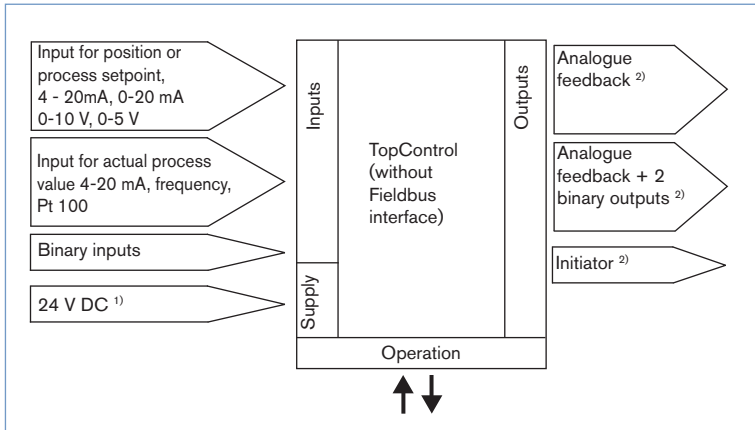
- Parametrisable diagnostic functions* / Binary outputs (option)

- 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

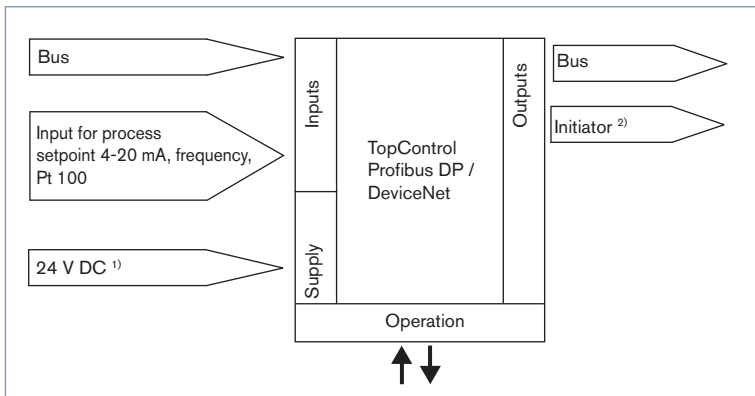
* You will find a more detailed description for every diagnostic function in the operating manual of Type 8792, page 148 - 167

Schematic diagram of the Type 8693

Without fieldbus interface



With Profibus DP / DeviceNet



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

²⁾ Alternative options

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