







## Digital electropneumatic positioner for the integrated mounting on process control valves

- Compact, robust stainless steel design
- Start-up by automatic TUNE-Function
- Contact-free position sensor
- Integrated control air routing
- Digital communication IO-Link, Bürkert system bus (bÜS)

Product variants described in the data sheet may differ from the product presentation and description.

### Can be combined with

	<b>Type 2301</b> ▶ Pneumatically operated 2 way Globe Control Valve ELEMENT
	<b>Type 2300</b> ▶ Pneumatically operated 2 way angle seat control valve ELEMENT
	<b>Type 2103</b> ▶ Pneumatically operated 2/2 way diaphragm valve ELEMENT for decentralized automation
	<b>Hygienic process control valves</b>

### Type description

Compact positioner for integrated mounting on pneumatically operated process valves. Remote setpoint adjustment via a 4...20 mA signal. A contact-free continuous sensor measures the position of the valve spindle. Simple installation through automatic tune function and setting through DIP-switch:

- Close tight function,
- Characteristic curves selection,
- Reversal of effective direction,
- Switching manual /automatic operation,
- Binary input.

A software interface can be used for, amongst others, linearisation of the operation characteristics by using free programmable fixed points. The valve position indication is shown through LED components. As an option an analogue position feedback can be integrated.

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## 1. General Technical Data

### 1.1. Digital electropneumatic positioner Type 8696

Product properties	
Dimensions	Detailed information can be found in chapter <a href="#">“4. Dimensions” on page 6.</a>
<b>Material</b>	
Body	PPS, Stainless steel
Seals	EPDM
Cover	PC
<b>Operation</b>	
Operating keys	2
DIP switch	Integrated (only for 24 V DC version without digital communication)
Service-interface	Connection with PC via USB connection
Configuration tool	Bürkert Communicator PACTware (only for 24 V DC device version with serial interface)
<b>Commissioning</b>	
Initialization positioner	Automatic by X.TUNE function (automatic adjustment of the positioner)
Manual override pilot valve	In manual mode via operating keys
<b>Status display</b>	
Display of device and valve status	Multicoloured LEDs
<b>Communication</b>	
Digital	IO-Link, Bürkert system bus (based on CANopen)
<b>Position sensor</b>	
Measuring principle	Inductive
Position detection module	Contactless (wear-free) analogue position sensor
Stroke range Valve spindle	3...32 mm
<b>Electrical data</b>	
Operating voltage	24 V DC $\pm$ 10 % UL: NEC Class 2
Protection class	3 acc. to DIN EN 61140
Residual ripple	10 %
Power consumption	<3.5 W
<b>Input/Output</b>	
Digital input	1 binary input
Analogue outputs	1 analogue output (optional) 4...20 mA, 0...20 mA
<b>Input data setpoint and actual value</b>	
<b>Setpoint signal</b>	
Setpoint value setting default	4...20 mA (set value)/0...20 mA
Input resistance	180 $\Omega$
<b>Electrical connection</b>	
Multipole	M12, 8- resp. 5 pin acc. to device version (see <a href="#">“5. Device/Process connections” on page 7</a> )
<b>Pneumatic data</b>	
<b>Control medium</b>	
Dust content	Neutral gases, air, quality class acc. to ISO 8573-1 Class 7 (< 40 $\mu$ m particle size)
Particle density	Class 5 (< 10 mg/m <sup>3</sup> )
Pressure dew point	Class 3 (< -20 °C)
Oil content	Class X (< 25 mg/ m <sup>3</sup> )
Supply pressure	0...7 bar <sup>1)</sup>
Pilot air ports	Threaded connection G 1/8, stainless steel
<b>Positioning system (control function and air capacity)</b>	
<b>Low air capacity</b>	
Single-acting	7 l <sub>N</sub> /min for aeration and ventilation (Q <sub>Nn</sub> value acc. to definition at pressure drop from 7 to 6 bar absolute)
Actuator series/size	Type 23xx, $\varnothing$ actuator 50 mm Type 2103, $\varnothing$ actuator 50 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 variants	Direct mounting
Installation position	As required, preferably with actuator in upright position
Valve actuator (type, size)	ELEMENT actuator series Type 23xx/2103, actuator size 50 mm and third-party actuators
Adapter kits	Detailed information can be found in chapter <a href="#">“Adapter kits” on page 12.</a>
Operating conditions	
Ambient temperature	-10...+55 °C
Degree of protection	IP65/IP67 acc. to EN 60529, 4X acc. to NEMA 250 Standard
Max. operating altitude	2000 m above sea level

## 1.2. With digital communication: IO-Link

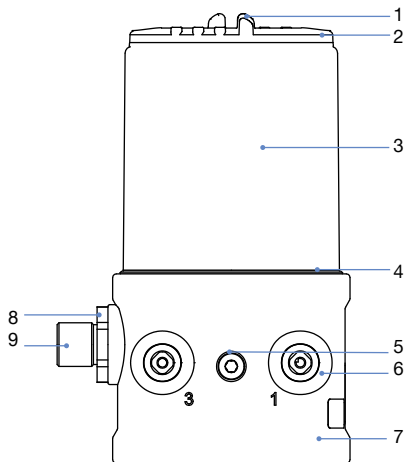
Electrical data	
IO-Link specification	V1.1.2
SIO-Mode	No
VendorID	0x0078, 120
DeviceID	See IODD file (The IODD file can be downloaded from our <a href="#">website</a> ►, see Software > Device Description Files A.04)
Transmission rate	230.4 kbit/s (COM 3)
Data storage	Yes
Max. cable length	20 m
Port class	B
Electrical connection	M12 × 1, 5 pin, A-coded
Power supply	Via IO-Link
Operating voltage	
System supply (Pin 1 + 3)	24 V DC ± 25 % (acc. to Specification)
Actuator supply (Pin 2 + 5)	24 V DC ± 25 % (acc. to Specification)
Current consumption	
System supply (Pin 1 + 3)	Max. 50 mA
Actuator supply (Pin 2 + 5)	Max. 100 mA

## 1.3. With digital communication: Bürkert system bus (bÜS)

Electrical data	
Operating voltage	18...30 V DC (acc. to Specification)
Electrical connection	M12 × 1, 5 pin, A-coded
Current consumption	Max. 150 mA

## 2. Materials

### 2.1. Material specifications



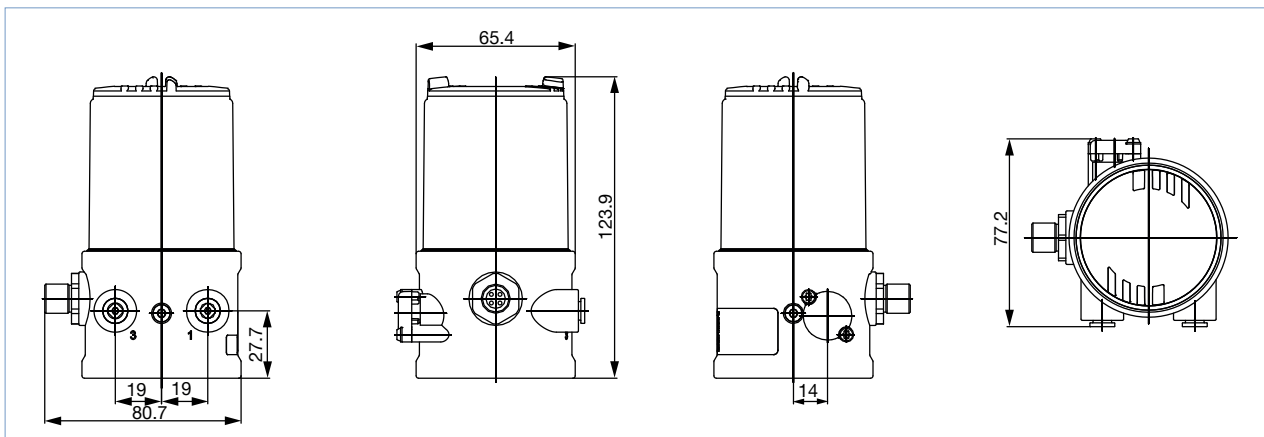
No.	Element	Material
1	Cover	PC
2	Seal	EPDM
3	Body casing	Stainless steel
4	Seal	EPDM
5	Screws	Stainless steel
6	Push-in connector Threaded ports G 1/8	POM/Stainless steel Stainless steel
7	Basic housing	PPS
8	Screws	Stainless steel
9	Plug connector M12	Stainless steel

### 3. Dimensions

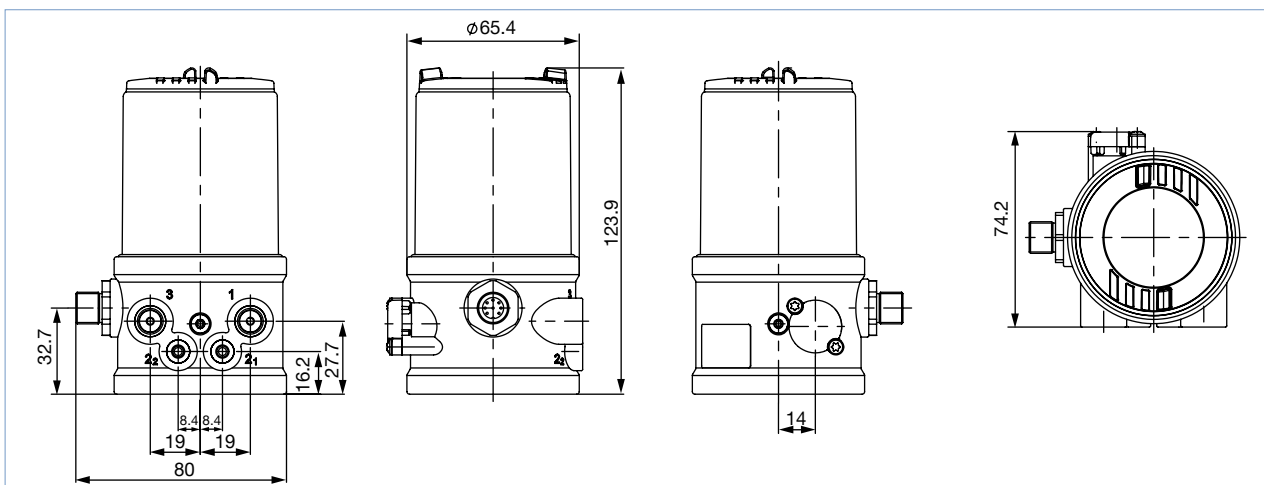
#### 3.1. Mounting on process valve ELEMENT Type 23xx / 2103

**Note:**

- Internal control air supply to the actuator
- Dimensions in mm



#### 3.2. Mounting on hygienic process valves of third party suppliers

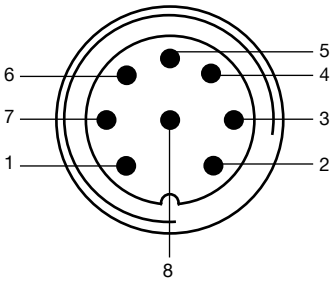


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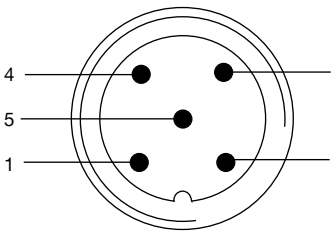
## 4. Device/Process connections

### 4.1. Electrical connections

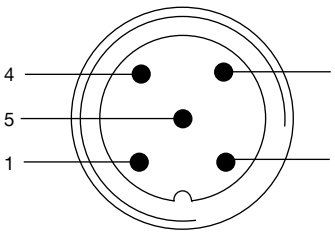
Without fieldbus communication 24 V DC

Circular plug M12, 8 pin																			
	<table border="1"> <thead> <tr> <th>Pin</th> <th>Pin assignment</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Setpoint + (0/4...20 mA / 0...5/10 V)</td> </tr> <tr> <td>2</td> <td>Setpoint GND</td> </tr> <tr> <td>3</td> <td>Operating voltage GND</td> </tr> <tr> <td>4</td> <td>Operating voltage +24 V DC</td> </tr> <tr> <td>5</td> <td>Binary input +</td> </tr> <tr> <td>6</td> <td>Binary input GND</td> </tr> <tr> <td>7</td> <td>Analogue position feedback GND</td> </tr> <tr> <td>8</td> <td>Analogue position feedback +</td> </tr> </tbody> </table>	Pin	Pin assignment	1	Setpoint + (0/4...20 mA / 0...5/10 V)	2	Setpoint GND	3	Operating voltage GND	4	Operating voltage +24 V DC	5	Binary input +	6	Binary input GND	7	Analogue position feedback GND	8	Analogue position feedback +
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7	Analogue position feedback GND																		
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### IO-Link connection

Circular plug M12, 5 pin																			
	<table border="1"> <thead> <tr> <th>Pin</th> <th>Description</th> <th>Pin assignment</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>L +</td> <td>24 V DC</td> </tr> <tr> <td>2</td> <td>P24</td> <td>24 V DC</td> </tr> <tr> <td>3</td> <td>L -</td> <td>0 V (GND)</td> </tr> <tr> <td>4</td> <td>Q/C</td> <td>IO-Link</td> </tr> <tr> <td>5</td> <td>M24</td> <td>0 V (GND)</td> </tr> </tbody> </table>	Pin	Description	Pin assignment	1	L +	24 V DC	2	P24	24 V DC	3	L -	0 V (GND)	4	Q/C	IO-Link	5	M24	0 V (GND)
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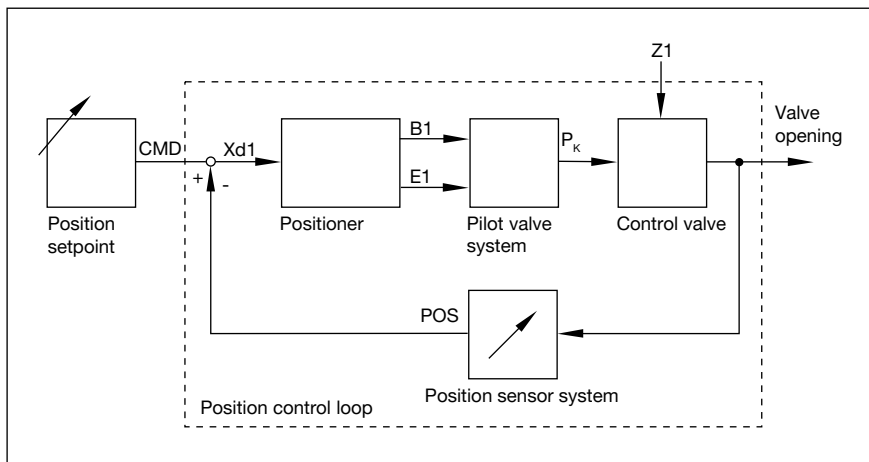
### Bürkert system bus (büS) connection

Circular plug M12, 5 pin																			
	<table border="1"> <thead> <tr> <th>Pin</th> <th>Description</th> <th>Cable colour</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>CAN Shield/Shielding</td> <td>CAN Shield/Shielding</td> </tr> <tr> <td>2</td> <td>+24 V DC <math>\pm 25\%</math>, max. residual ripple 10 %</td> <td>Red</td> </tr> <tr> <td>3</td> <td>GND / CAN_GND</td> <td>Black</td> </tr> <tr> <td>4</td> <td>CAN_H</td> <td>White</td> </tr> <tr> <td>5</td> <td>CAN_L</td> <td>Blue</td> </tr> </tbody> </table>	Pin	Description	Cable colour	1	CAN Shield/Shielding	CAN Shield/Shielding	2	+24 V DC $\pm 25\%$ , max. residual ripple 10 %	Red	3	GND / CAN_GND	Black	4	CAN_H	White	5	CAN_L	Blue
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5	CAN_L	Blue																	

## 5. Performance specifications

### 5.1. Signal flow diagram

#### Position control loop



#### Additional software functions of the TopControl Type 8696

##### TopControl BASIC functions

- Automatic start of the control system
- Binary input (safety position)
- Analogue position feedback (optional)

##### DIP-Switch activated device

- Close-tight function
- Inversion of the operating direction of the setpoint signal
- Linear characteristic curves selection or customised programming (software interface)
- Manual and automatic operation

##### Communications software with activatable and parameter driven functions

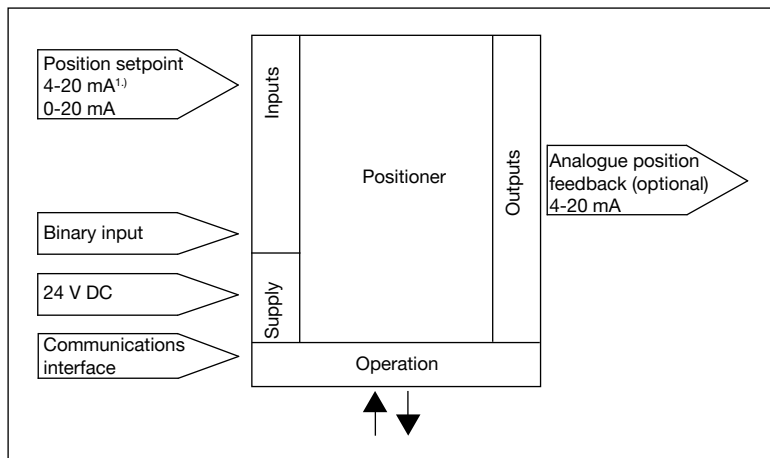
- Customised programming transmission characteristics
- Choices of setpoint signal
- Range splitting setpoint signal
- Limitation of the valve stroke
- Limitation of the operation speed.
- Definition of the safety position
- Signal failure detection



## 5.2. Interface diagram

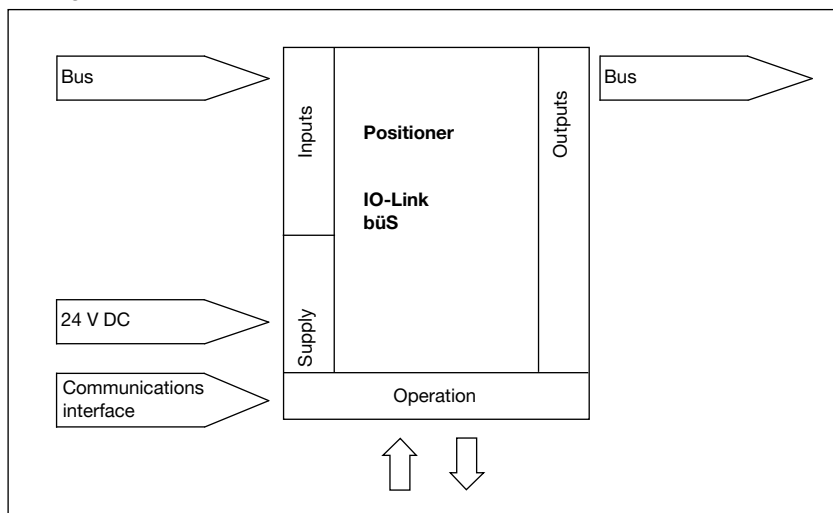
### TopControl Positioner BASIC

#### Without fieldbus communication 24 V DC



1.) Default setting

#### With digital communication IO-Link, Bürkert system bus (büs)



## 6. Product installation

### 6.1. Combination options with pneumatic process valves

**Note:**

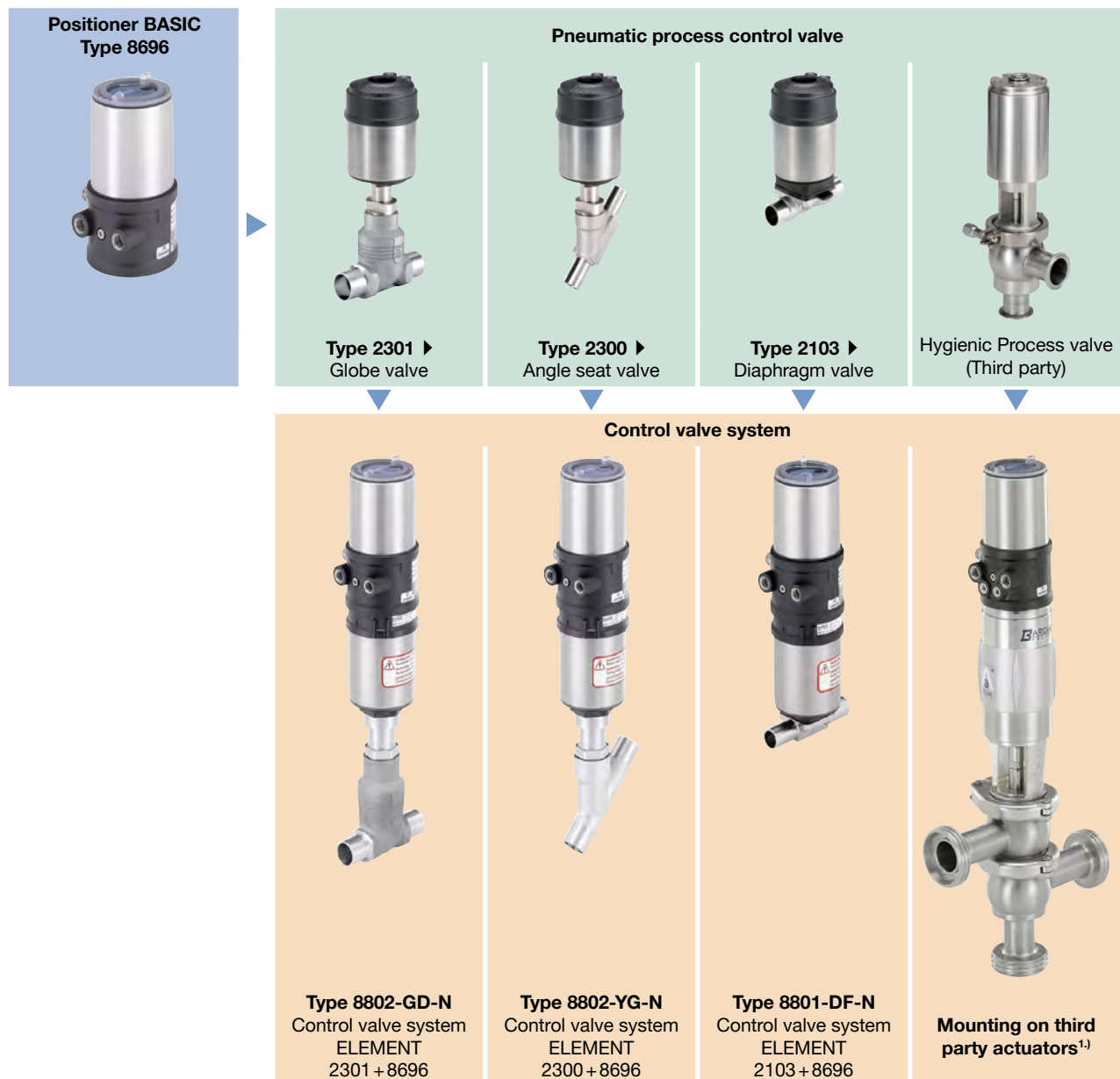
A TopControl control valve system consists of a **Positioner BASIC Type 8691** and a **Control valve ELEMENT Type 23xx** respectively **2103**, actuator size 50 mm.

The following information is required to select a complete system:

- **Article no.** of the desired positioners TopControl BASIC **Type 8696**
- **Article no.** of the desired control valves **Type 23xx/2103** (see separate data sheets, **Type 2301 ▶**, **Type 2300 ▶**, **Type 2103 ▶**)

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


#### Example for decentralised automation of On/Off ELEMENT valve systems



1.) See data sheet **adaptations for third-party actuators, KK01 ▶** or contact the appropriate Bürkert sales office.

## 7. Ordering information

### 7.1. Bürkert eShop – Easy ordering and quick delivery




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### 7.2. Bürkert product filter



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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:**











- Adapter kits must be ordered separately - see **“Adapter kits” on page 12.**
- All standard versions are UL approved (UL approval for IO-Link and büS in preparation).
- ATEX/IECEx for IO-Link and büS is in preparation.
- Other versions are available on request.

Circuit function pilot valve system	Electrical connection	Communication	Analogue feedback	1 binary input	Pilot air ports threaded connection	Article no.	
<b>Actuator series ELEMENT Type 23xx/2103 with actuator size Ø 50 mm (internal control air routing)</b>						<b>Standard</b>	<b>ATEX II Cat. 3G/D, IECEx</b>
Single-acting	M12 plug connector	IO-Link	–	–	G 1/8	326447	In prepara- tion
		Bürkert system bus (büS)	–	–	G 1/8	326445	In prepara- tion
		Without fieldbus communication	–	Yes	G 1/8	227448	265082
Yes	Yes		G 1/8	227449	265083		
<b>Mounting on external drives (external control air routing)</b>							
Single-acting	M12 plug connector	IO-Link	–	–	G 1/8	326446	In prepara- tion
		Bürkert system bus (büS)	–	–	G 1/8	326444	In prepara- tion
		Without fieldbus communication	–	Yes	G 1/8	223897	265084
Yes	Yes		G 1/8	223898	265085		


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#### 7.4. Ordering chart Accessories

##### Accessories

Description	Article no.
M12 socket, 8 pin with 5 m cable for input and output signals	919267 
Silencer G 1/8	780779 
Silencer, push-in connector	902662 
USB interface for serial communication (only for 24 V DC version with serial interface without digital communication)	227093 
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	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 
Software Bürkert Communicator	<b>Link</b> 

##### Adapter kits

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 ELEMENT Types 23xx/2100	Ø 50 mm	Universal	679918 

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