










Pneumatic control unit for decentralised automation of process valves ELEMENT

- Compact design
- Integrated pilot valve with manual override
- Integrated pilot air duct in the actuator
- Automatic end position feedback setting
- With ATEX II cat. 3G/D and cat. 2G/D approval

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

Can be combined with

	Type 2100 Pneumatically operated 2/2-way angle seat valve ELEMENT for decentralized automation	▶
	Type 2101 Pneumatically operated 2/2-way globe valve ELEMENT for decentralised automation	▶
	Type 2103 2/2-way diaphragm valve with pneumatic stainless steel actuator (Type ELEMENT) for decentralised automation	▶
	Type 2106 Pneumatically operated 3/2-way seat valve ELEMENT for decentralized automation	▶
	Type 2000 Pneumatically operated 2/2-way angle seat valve CLASSIC	▶
	Type 2012 Pneumatically operated 2/2-way globe valve CLASSIC	▶
	Type 2031 2/2-way diaphragm valve with pneumatic plastic actuator (Type CLASSIC)	▶

Type description

The Type 8697 pneumatic control unit is designed for decentralised automation of ELEMENT Type 21xx pneumatic process valves. Mechanical or inductive limit switches record the valve position. The integrated pilot valve controls single-acting actuators. The design of the control unit and the actuator permits an integrated pilot air duct without external piping. As well as the electrical position feedback, the device status is displayed by LEDs on the pneumatic control unit itself. 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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1. General technical data

Product properties	
Dimensions	Further information can be found in chapter "4. Dimensions" on page 7.
Material	
Body	PPS
Seal	EPDM
Cover	PC
Commissioning	
Setting valve end position	Automatic (mechanical)
Manual override of pilot valve	Yes
Status display	
Display of the device and valve status	Coloured LEDs
Optical position indicator (mechanical)	Yes
Performance data	
Position sensor	
Stroke range for linear actuator	
Valve spindle, initiator	2...36 mm
Valve spindle, micro switch	4...36 mm
Position feedback	
Micro switch	2x micro switch (0...48 V AC/DC, max. 2 A) 2x micro switch (50...250 V AC/DC, max. 2 A)
Initiator	2x inductive proximity switch (24 V DC), PNP shutter (3-wire) with LEDs 2x inductive proximity switch NAMUR (8.2 V DC) shutter (2-wire) with LEDs 2x inductive proximity switch (24 V DC), shutter (2-wire) with LEDs
Electrical data	
Operating voltage	
Pilot valve	24 V DC \pm 10 %, residual ripple 10 % DC, power consumption 1 W
Residual ripple	10 %
Power consumption	\leq 1 W
Micro switch	0...48 V AC/DC, max. 2 A 230 V variant: 50...250 V AC/DC, max. 2 A
Initiator	10...30 V DC, max. 100 mA per initiator
Protection class	III according to DIN EN 61140
Electrical connection	
Multipole variant	M12, 8-pin M12, 4-pin
Cable gland variant	M16 \times 1.5 (cable \varnothing 4...8 mm) with screw-type terminals for cable cross-sections 0.14...1.5 mm ²
Pneumatic data	
Control medium	
	Neutral gases, air, quality class according to ISO 8573 - 1
Dust content	Class 7 (< 40 μ m particle size)
Particle density	Class 5 (< 10 mg/m ³)
Pressure dew point	Class 3 (\leq - 20 °C or min. 10 °C below the lowest operating temperature)
Oil content	Class X (< 25 mg/m ³)
Supply pressure	3...7 bar ^{1) 2)}
Pilot air port	Threaded connection G 1/8, stainless steel
Positioning system	
Circuit function	Single-acting
Air capacity	7 l _N /min (for aeration and ventilation) (Q _{Nn} value according to definition at pressure drop from 7 to 6 bar abs)
Actuator series/size	
Pneumatic control unit / Position feedback indicator	Type 21xx, actuator \varnothing 50 mm
Position feedback	Type 20xx, actuator \varnothing 40...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 II 2D Ex ia IIIC T135 °C Db II 2G Ex ia IIC T4 Gb
ATEX	BVS 13 ATEX E 087 X II 3D Ex tc IIIC T135 °C Dc II 3G Ex ec IIC T4 Gc BVS 13 ATEX E104 X II 2D Ex ia IIIC T135 °C II 2G Ex ia IIC T4 Gb
IECEX	IECEX BVS 13.0097 X Ex tc IIIC T135 °C Dc Ex ec IIC T4 Gc IECEX BVS 13.0105X Ex ia IIIC T135 °C Db / Ex ia IIC T4 Gb
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 (Factory Mutual) – Explosion Protection	Increased Safety for Class I, Zone 2, AEx/Ex ec IIC T4 Gc; Zone 22, AEx/Ex tc IIIC T135 °C Dc hazardous (classified) locations, indoors and outdoors (IP54). Alternatively marked as Class I Division 2 Groups A, B, C and D T4; Class II, III Division 2 Groups F and G T135 °C. 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 6.
Further information can be found in chapter "2. Approvals and conformities" on page 5.	
Environment and installation	
Operating conditions	
Ambient temperature	
With/without pilot valve	0...+ 55 °C (II 3D Ex tc IIIC T135 °C Dc, II 3G Ex nA IIC T4 Gc) 0...+ 55 °C (II 2D Ex IIIC ia T135 °C Db, II 2G Ex ia IIC T4 Gb)
With pilot valve	- 10...+ 55 °C (without ATEX resp. for II 2G Ex ia IIC T4 Gb)
Without pilot valve	- 20...+ 60 °C (without ATEX resp. for II 2G Ex ia IIC T4 Gb)
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 21xx (actuator size Ø 50 mm) CLASSIC Type 20xx (actuator size Ø 40...225 mm) only in combination with position feedback indicator without pilot valve
Adapter kit	Further information can be found in chapter "Adapter kits ELEMENT" on page 17 and in chapter "Adapter kits CLASSIC" on page 17.

1.) The supply pressure must be 0.5...1 bar above the minimum required pilot pressure of the valve actuator.
2.) Pressure data: overpressure to atmospheric pressure

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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
 	<p>Optional: Explosion protection</p> <p>ATEX: BVS 13 ATEX E 087 X II 3G Ex ec IIC T4 Gc II 3D Ex tc IIIC T135 °C Dc</p> <p>BVS 13 ATEX E104 X II 2G Ex ia IIC T4 Gb II 2D Ex ia IIIC T135 °C</p> <p>IECEX: IECEX BVS 13.0097 X Ex tc IIIC T135 °C Dc Ex ec IIC T4 Gc</p> <p>IECEX BVS 13.0105X Ex ia IIIC T135 °C Db Ex ia IIC T4 Gb</p>

2.5. North America (USA/Canada)

Approval	Description
	<p>Optional: UL Listed for the USA and Canada</p> <p>The products are UL Listed for the USA and Canada according to:</p> <ul style="list-style-type: none"> • UL 61010-1 (ELECTRICAL EQUIPMENT FOR MEASUREMENT, CONTROL, AND LABORATORY USE – Part 1: General Requirements) • CAN/CSA-C22.2 No. 61010-1
	<p>Optional: FM (Factory Mutual) – Explosion Protection</p> <p>Increased Safety for Class I, Zone 2, AEx/Ex ec IIC T4 Gc; Zone 22, AEx/Ex tc IIIC T135 °C Dc hazardous (classified) locations, indoors and outdoors (IP54). Alternatively marked as Class I Division 2 Groups A, B, C and D T4; Class II, III Division 2 Groups F and G T135 °C.</p>

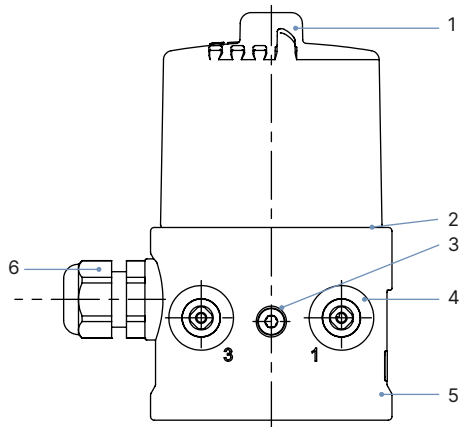
2.6. Others

China Compulsory Certification (CCC)

Conformity	Description
	<p>Optional: China Compulsory Certification (CCC) The products with Ex approval are suitable for import and use for hazardous applications in China.</p>

3. Materials

3.1. Material specifications



No.	Element	Material
1	Cover	PC
2	Seals	EPDM
3	Screws	Stainless steel
4	Push-in connector Threaded connection G 1/8	POM/Stainless steel Stainless steel
5	Basic housing	PPS
6	Cable gland M12 plug connector	PA Stainless steel

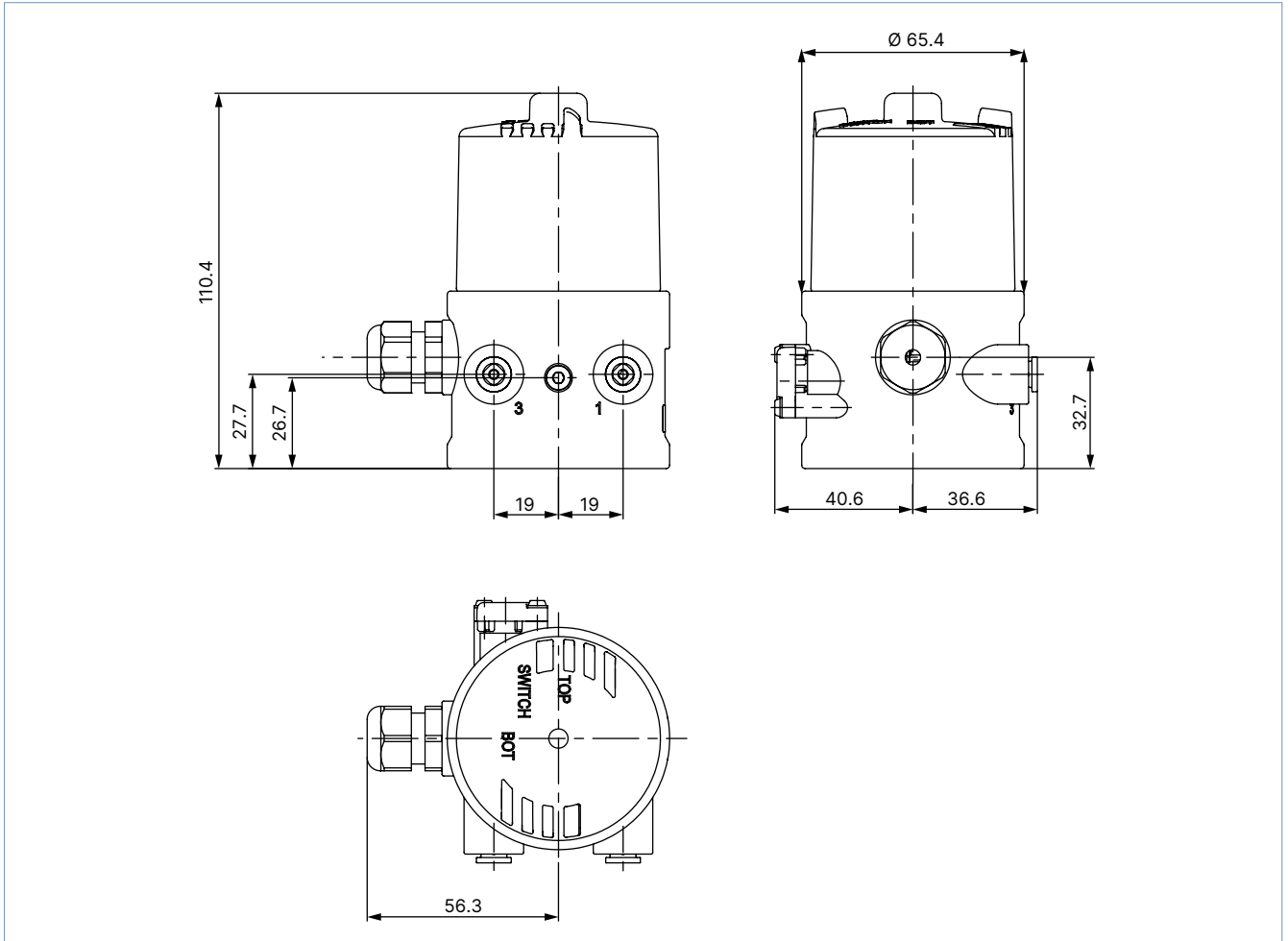
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4. Dimensions

4.1. Mounting on ELEMENT process valve Types 21xx

Note:

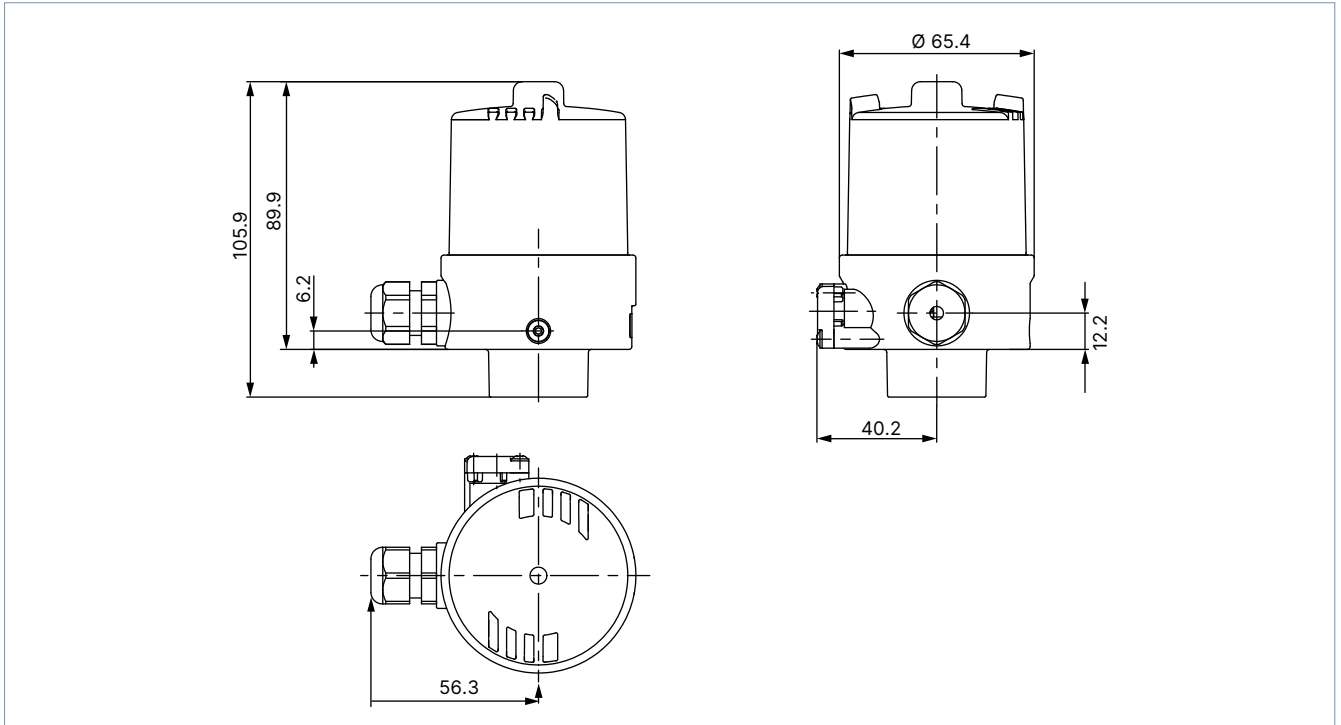
Dimensions in mm, unless otherwise stated



4.2. Mounting on CLASSIC process valves Type 20xx

Note:

Dimensions in mm, unless otherwise stated



5. Product connections

5.1. Electrical connection

Multipole connection

Circular plug M12, 8-pin		Plug configuration with inductive proximity switch 3-wire 24 V DC PNP		
Pin	Wire colour ^{1.)}	Configuration	External circuit	
1	White	INI Bottom OUT Output 1		Output 1(24 V)
2	Brown	INI Top OUT Output 2		Output 2 (24 V)
3	Green	INI - (GND) Supply		GND
4	Yellow	INI + (24 V DC) Supply		+ 24 V DC
5	Grey	Valve control 0/24 V		0/24 V DC ± 10 %
6	Pink	Valve control GND		Residual ripple 10%
7	-	Not assigned		-
8	-	Not assigned		-

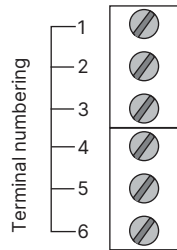
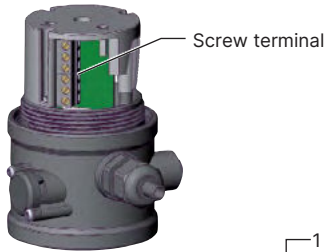
1.) The colours indicated refer to the connection cable available as an accessory (Article no. 919061).

Circular plug M12, 4-pin		Pin assignment without control valve (feedback head) with inductive proximity switches 3-wire 24 V DC PNP		
Pin	Configuration	External circuit		
1	INI + (24 V DC) Supply		Output 1 (24 V)	
2	INI Top OUT Output 2		Output 2 (24 V)	
3	INI - (GND) Supply		GND	
4	INI Bottom OUT Output 1		+ 24 V DC	

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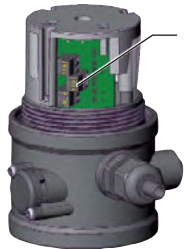
Cable gland

M16 × 1.5 (cable Ø 4...8 mm), screw terminal (1.5 mm²)

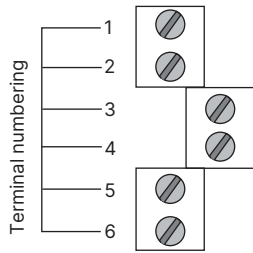


Terminal assignment with micro switch 0...48 V DC/50...250 V AC/DC			
Terminal	Configuration	External circuit	
1	Micro switch top	1	NO
2		2	NC
3		3	Joint connection
4	Micro switch bottom	4	NO
5		5	NC
6		6	Joint connection
Terminal assignment with inductive proximity switch 3-wire 24 V DC PNP			
Terminal	Configuration	External circuit	
1	INI + (24 V DC) Supply	1	+ 24 V DC
2	INI GND Supply	2	GND
3	INI Top OUT Output 1	3	Output 1
4	INI Bottom OUT Output 2	4	Output 2
5	Valve control 0/24 V DC	5	0/24 V DC ± 10 %
6	Valve control GND	6	Residual ripple 10 %

Cable gland M16 × 1.5 (cable Ø 4...8 mm), screw-type terminals (1.5 mm²)



Screw terminal



Port configuration with inductive proximity switch NAMUR

Terminal	Configuration	External circuit
1	INI Top +	Explosion protected area Non-hazardous area
2	INI Top -	
3	INI Bottom +	
4	INI Bottom -	
5	Valve control +	See footnote ¹⁾
6	Valve control GND	See footnote ²⁾

Terminal assignment with inductive proximity switch 2-wire 24 V DC

Terminal	Configuration	External circuit
1	INI Top +	
2	INI Top -	
3	INI Bottom +	
4	INI Bottom -	
5	Valve control +	
6	Valve control GND	

1.) According to NAMUR recommendation. Observe the Turck KEMA 02 ATEX 1090X-type examination certificate.
 2.) Barrier signal see PTB 07 ATEX 2048

6. Product installation

6.1. Combination options with pneumatic ELEMENT process valves

Note:

A decentralised, **automated valve system** consists of **pneumatic control unit Type 8697** and an **ELEMENT process valve Type 21xx**.

The following information is required to select a complete system:

- **Article no.** of the desired **pneumatic control unit Type 8697**, see [“Pneumatic control unit for decentralised automation of ELEMENT on/off process valves Type 21xx” on page 15](#)
- **Article no.** of the desired **process valve Type 21xx**, see [data sheet Type 2100](#) ▶, [Type 2101](#) ▶ and [Type 2103](#) ▶

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

Example for decentralised automation of on/off ELEMENT valve systems



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6.2. Combination options with pneumatic CLASSIC process valves

Note:

An **on/off CLASSIC valve system** consists of an **electrical position feedback indicator Type 8697** and a **process valve Type 20xx CLASSIC**. The function of the position feedback indicator is solely to transmit the valve end position signals to the control system. The pneumatic control of the process valve is done by the valve island in the control cabinet, either centralized or distributed depending on the system design.

The following information is required to select a complete system:

- **Article no.** of the desired **electrical position feedback indicator Type 8697**, see [“Electrical position feedback for combination with centrally automated CLASSIC on/off process valves Type 20xx” on page 15](#)
- **Article no.** of the selected **process valve Type 20xx**, see separate **data sheet Type 2000 ▶**, **Type 2012 ▶** and **Type 2031 ▶**

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

Example for centralized/distributed automation of on/off CLASSIC valve systems

The **on/off CLASSIC valve system** can be combined with the **valve terminal Type 8640 ▶**, **Type 8644 ▶** or **Type 8650 ▶**.



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7. Ordering information

7.1. Bürkert eShop



Bürkert eShop – Easy ordering and quick delivery

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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

Pneumatic control unit for decentralised automation of ELEMENT on/off process valves Type 21xx

End position feedback						Electrical connection	Article no.				
Inductive proximity switch			Micro switch		Feedback status LEDs		Standard / cULus	ATEX II Cat. 3G/D, IECEx ¹⁾	ATEX II Cat. 2G/D, IECEx ¹⁾	ATEX II Cat. 2G, IECEx ¹⁾	cFMus Class I Div. 2, ... ³⁾
3-wire	2-wire	24 V DC	0...48 V AC/DC	50...250 V AC/DC							
PNP	NAMUR										
Pneumatic control (pilot valve 3/2-way, single-acting NO/NC)											
2	-	-	-	-	Yes	Cable gland	248816	255847	-	-	20127648
2	-	-	-	-	Yes	Circular plug M12, 8-pin	248818	255849	-	-	-
-	2	-	-	-	Yes	Cable gland	-	-	248822	255862	-
-	-	2	-	-	Yes		248814	255845	-	-	20127657
Without end position feedback						Cable gland	260279	260280	-	-	20127658
						Circular plug M12, 8-pin	260278	-	-	-	-
Electric feedback device (without pilot valve)											
2	-	-	-	-	Yes	Cable gland	248812	255843	-	-	20127647
2	-	-	-	-	Yes	Circular plug M12, 8-pin	250471	255857	-	-	-
2	-	-	-	-	Yes	Circular plug M12, 4-pin	363443	-	-	-	-
-	2	-	-	-	Yes	Cable gland	-	-	248820	255860	-
-	-	2	-	-	Yes		248810	255841	-	-	20127656
-	-	-	2	-	-		248824	-	-	-	-
-	-	-	-	2	-		248808	-	-	-	-

- 1.) CCC (China Compulsory Certificate) for device variants with Ex approval
- 2.) Without UL
- 3.) Further information can be found in chapter "2.5. North America (USA/Canada)" on page 5.

Further variants on request

>

Additional
 Feedback switch-point NPN coded

Electrical position feedback for combination with centrally automated CLASSIC on/off process valves Type 20xx

End position feedback						Electrical connection	Article no.				
Inductive proximity switch			Micro switch		Feedback status LEDs		Standard / cULus	ATEX II Cat. 3G/D, IECEx ¹⁾	ATEX II Cat. 2G/D, IECEx ¹⁾	ATEX II Cat. 2G, IECEx ¹⁾	cFMus Class I Div. 2, ... ³⁾
3-wire	2-wire	24 V DC	0...48 V AC/DC	50...250 V AC/DC							
PNP	NAMUR										
End position feedback											
2	-	-	-	-	Yes	Cable gland	248827	255851	-	-	20121837
2	-	-	-	-	Yes	Circular plug M12, 8-pin	250472	255858	-	-	-
2	-	-	-	-	Yes	Circular plug M12, 4-pin	280169	-	-	-	-
-	2	-	-	-	Yes	Cable gland	-	-	248831	255863	-
-	-	2	-	-	Yes		248826	255850	-	-	20127654
-	-	-	2	-	-		248833	-	-	-	-
-	-	-	-	2	-		248825	-	-	-	-

- 1.) CCC (China Compulsory Certificate) for device variants with Ex approval
- 2.) Without UL
- 3.) Further information can be found in chapter "2.5. North America (USA/Canada)" on page 5.




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7.4. Ordering chart accessories

Standard accessories ELEMENT

Note:







Must be ordered separately.

Description	Article no.
M12 circular socket with cable, 4-pin, A-coded, cable length: 5 m	918038 
M12 circular socket with cable, 8-pin, cable length: 5 m, for input and output signals	919267 
Silencer G 1/8"	780779 

Standard accessories CLASSIC

Note:

Must be ordered separately.

Description	Article no.
M12 circular socket with cable, 4-pin, A-coded, cable length: 5 m	918038 
M12 circular socket with cable, 8-pin, cable length: 5 m, for input and output signals	919267 
Silencer G 1/8"	780779 
Stroke limitation: CLASSIC actuator Ø 50/63 mm	689353 
Stroke limitation: CLASSIC actuator Ø 80 mm	689354 
Stroke limitation: CLASSIC actuator Ø 100/125 mm	689355 

Adapter kits ELEMENT

Note:

Must be ordered separately.

Adapter 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.
Adapter kit for ELEMENT Type 21xx	Ø 50 mm	Universal	682259

Adapter kits CLASSIC

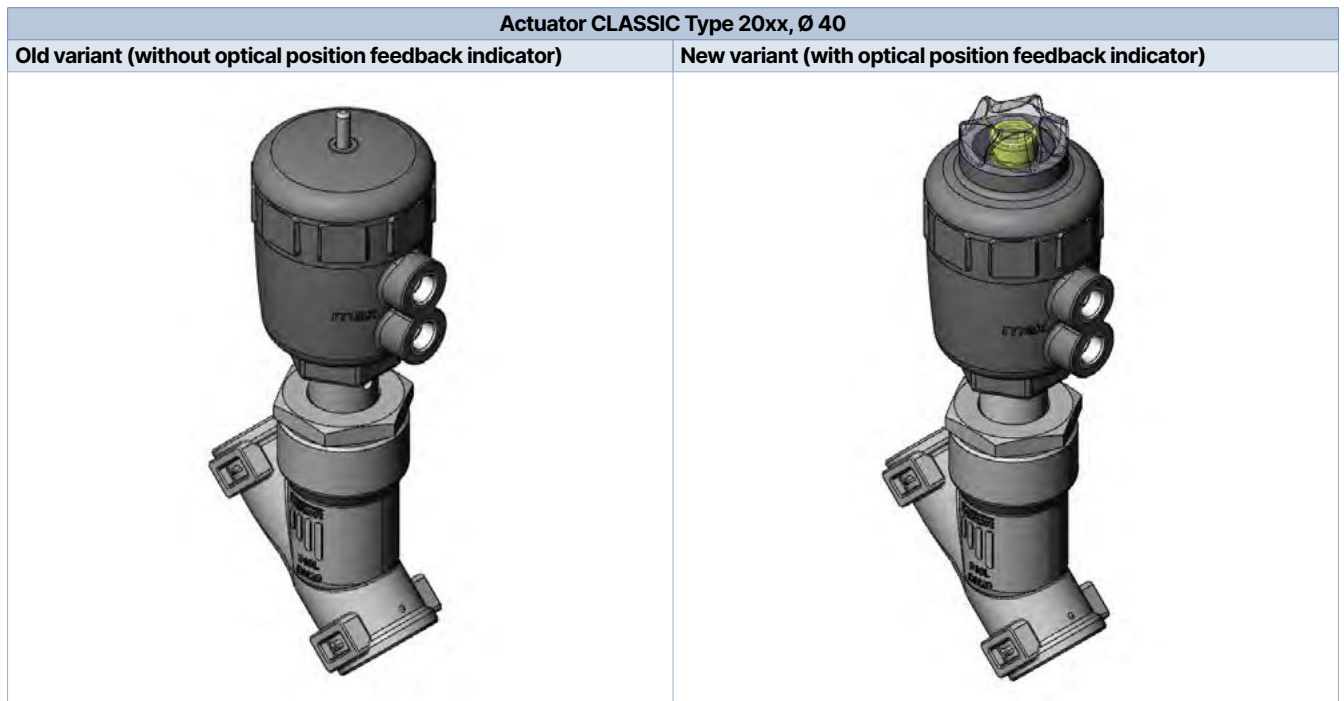
Note:

Must be ordered separately.

Adapter 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.
Adapter kit CLASSIC Type 20xx	Ø 40 mm	Universal	682263
	Ø 50/63/80 mm	Universal	682264
	Ø 100/125 mm	Universal	682265
	Ø 175/225 mm	Universal	684944
Retrofit kit ¹⁾ CLASSIC Type 20xx	Ø 40 mm	Universal	698573

1.) Adapter kit for retrofitting old CLASSIC actuators (without optical position indicator on the actuator cover) or as a replacement adapter kit for the discontinued position feedback **Type 1062** ▶. Please observe the general installation instructions in the **operating instructions Type 8697** ▶.



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