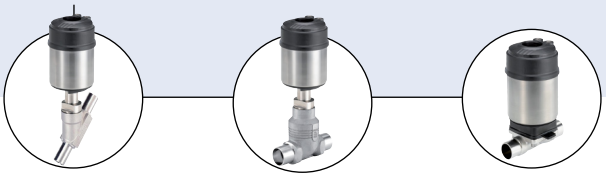
bürkert
FLUID CONTROL SYSTEMS

# Pneumatic control unit for decentralized automation of ELEMENT process valves

- Compact design
- Integrated pilot valve with manual override
- Internal control air routing
- Automatic end position adjustment
- With ATEX II cat. 3G/D and cat. 2D/G approval

Type 8697 can be combined with...



**Type 2100**
Angle seat valve

**Type 2101**
Globe seat valve

**Type 2103**
Diaphragm valve

The pneumatic control unit Type 8697 is designed for decentralized automation of process valves ELEMENT Type 21xx. Mechanical or inductive limit switches register the position of the valve. The integrated pilot valve controls single-acting actuators.

The design of the control unit and the actuator enables an internal control air routing without external tubings. Besides the electrical position feedback signal the status of the device is shown directly on the control unit itself via LEDs.

The housing is easy to clean and features proven IP protection and chemically resistant materials for use in hygienic processing, in food, beverage and pharmaceutical industries. Combined with Bürkert ELEMENT actuators the unique pilot valve system enables a compressed air recycling that avoids actuator chambers contamination from the environment.

| **Technical Data** | |
|---|---|
| **Material** - Body | PPS |
| Cover | PC |
| Sealing | EPDM |
| **Operating voltage *** | |
| Pilot valve | 24 V DC ±10 % - residual ripple 10 %, consumption 1 W |
| Micro switch | 0-48 V AC/DC, max. 2 A<br>230 V Version: 50 – 250 V AC/DC, max. 2 A |
| Initiator | 10 to 30 V DC - max. 100 mA per initiator |
| **Control medium** | neutral gases, air, quality classes acc. to ISO 8573-1 |
| Dust concentration | Class 7: max. particle size 40 µm |
| Particle density | Class 5: max. particle density 10 mg/m³ |
| Pressure condensation point | Class 3: max. -20 °C or min. 10 °C below the lowest operating temperature |
| Oil concentration | Class X: max. 25 mg/m³ |
| **Supply pressure** | 3 to 7 bar[1)] |
| **Pilot air ports** | Threaded ports G ⅛ or push-in connector (tube Ø 6 mm / ¼") |
| **Position feedback** | 2x micro switch (0 – 48 V AC/DC, max. 2 A)<br>2x micro switch (50 – 250 V AC/DC, max. 2 A)<br>2x initiator (24 V DC), PNP shutter 3-wire **with LEDs**<br>2x initiator NAMUR (8.2 V DC) (2-wire) **with LEDs**<br>2x initiator (24 V DC), shutter (2-wire) **with LEDs** |
| **Stroke range valve spindle** | 2 to 36 mm |
| **Ambient temperature** | |
| with/without pilot valve | 0 to +55 °C (II 3D Ex tc IIIC T135 °C Dc, II 3G Ex nA IIC T4 Gc) |
| with/without pilot valve | 0 to +55 °C (II 2D Ex ia IIIC T135 °C Db IP64, II 2G Ex ia IIC T4 Gb) |
| with pilot valve | -10 to +55 °C (without ATEX or for II 2G Ex ia IIC T4 Gb) |
| without pilot valve | -20 to +60 °C (without ATEX or for II 2G Ex ia IIC T4 Gb) |
| **Installation** | as required, preferably with actuator in upright position |
| **Protection type** | IP65 / IP67 acc. to EN 60529, 4X acc. to NEMA 250 Standard |
| **Protection class** | 3 acc. to DIN EN 61140 |
| **Conformity** | EMC directive 2014/30/EU |
| **Ignition protection** | II 3D Ex tc IIIC T135 °C Dc<br>II 3G Ex nA IIC T4 Gc<br>II 2D Ex ia IIIC T135 °C Db IP64<br>II 2G Ex ia IIC T4 Gb |
| **Approval** | cULus certificate no. E238179 |
| **Electrical connection** | |
| Multipole | M12, 8 pin |
| Cable gland | M16 × 1.5 SW22 (cable diameter 4-8 mm), terminal screws 0.14 to 1.5 mm² |

* Supply voltage according to UL NEC Class 2 for versions with cULus approval.

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

DTS 1000215412 EN Version: O Status: RL (released | freigegeben | validé) printed: 23.05.2018

## Ordering information for decentralized automation of On/Off ELEMENT valve systems

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

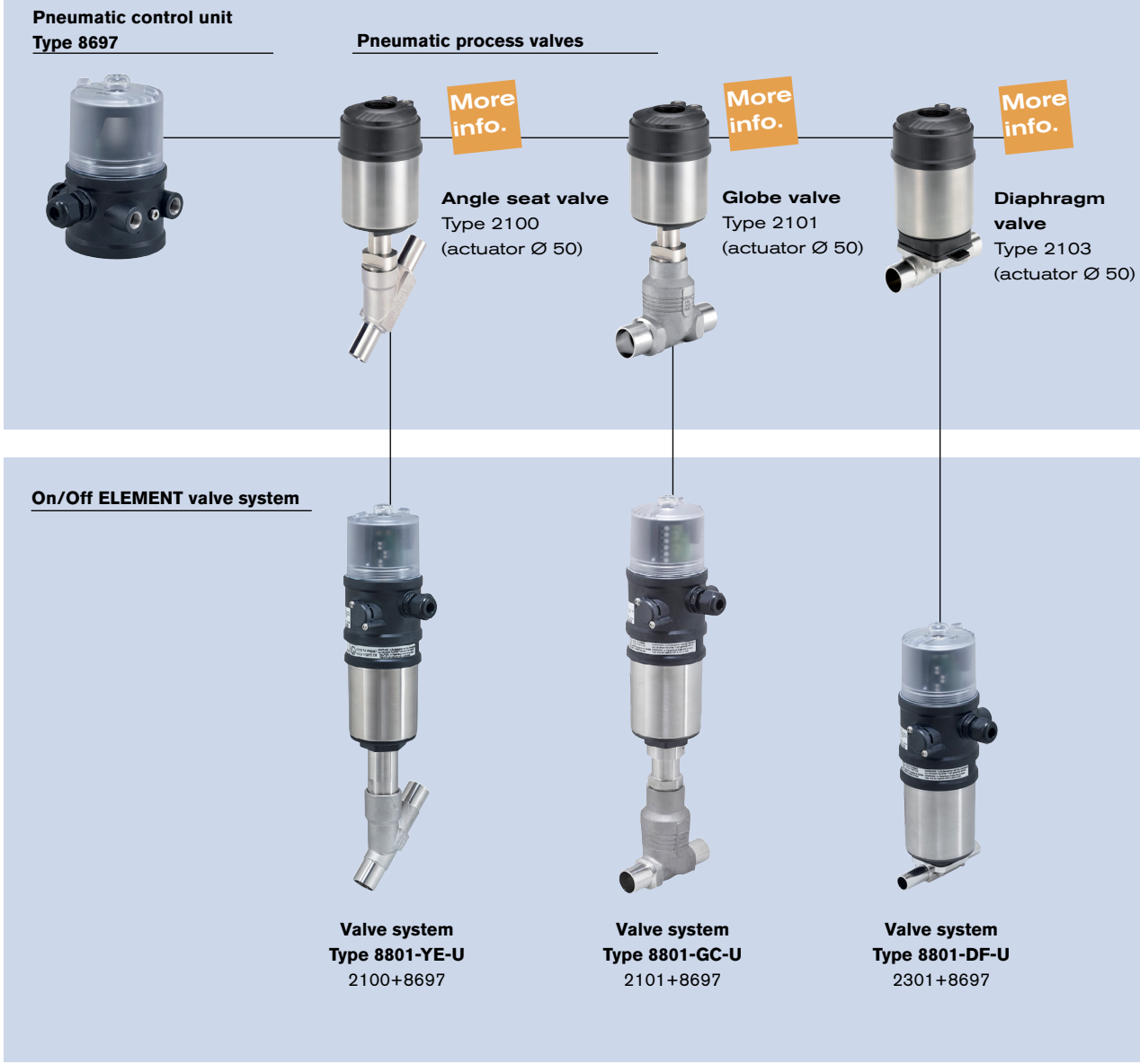
The following information is necessary for the selection of a complete system:

- **Article no.** of the desired pneumatic control unit **Type 8697** (see Ordering chart on page3)
- **Article no.** of the selected process valve **Type 21xx** (see datasheet Type 21xx)

If you order two components, you 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 for decentralized automation of On/Off ELEMENT valve systems




DTS 1000215412 EN Version: O Status: RL (released | freigegeben | validé) printed: 23.05.2018

## Ordering chart (other versions on request)

### Pneumatic control unit for decentralized automation of ELEMENT On/Off process valves Type 21xx

| End position feedback | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inductive Switch 3-wire PNP | Inductive Switch 2-wire NAMUR | Inductive Switch 2-wire 24 V DC | Micro Switch 24 V DC | Micro Switch 50-250 V AC/DC | Feedback status LEDs | Electrical connection | ATEX / IECEx Cat. 3D/G Zone 22/2 [2] | ATEX / IECEx Cat. 2D/G Zone 21/1 [3] | ATEX/ IECEX Cat. 2G Zone 1 [4] | cULus | Pilot air ports threaded ports | Article no. |
| **Pneumatic control unit (pilot valve 3/2 way, single acting NO/NC)** | | | | | | | | | | | | |
| 2 | | | | | yes | Cable gland | | | | yes | G ⅛ | 248816 |
| 2 | | | | | yes | | yes | | | | G ⅛ | 255847 |
| 2 | | | | | yes | M12 multipole | yes | | | | G ⅛ | 255849 |
| 2 | | | | | yes | | | | | yes | G ⅛ | 248818 |
| | 2 | | | | yes | Cable gland | | yes | | | G ⅛ | 248822 |
| | 2 | | | | yes | | | | yes | | G ⅛ | 255862 |
| | | 2 | | | yes | | | | | yes | G ⅛ | 248814 |
| | | 2 | | | yes | | yes | | | | G ⅛ | 255845 |
| Without end position feedback | | | | | | M12 multipole | | | | yes | G ⅛ | 260278 |
| | | | | | | Cable gland | | | | yes | G ⅛ | 260279 |
| | | | | | | | yes | | | | G ⅛ | 260280 |
| **Feedback (without pilot valve)** | | | | | | | | | | | | |
| 2 | | | | | yes | Cable gland | | | | yes | G ⅛ | 248812 |
| 2 | | | | | yes | | yes | | | | G ⅛ | 255843 |
| 2 | | | | | yes | M12 multipole | yes | | | | G ⅛ | 255857 |
| 2 | | | | | yes | | | | | yes | G ⅛ | 250471 |
| | 2 | | | | yes | Cable gland | | yes | | | G ⅛ | 248820 |
| | 2 | | | | yes | | | | yes | | G ⅛ | 255860 |
| | | 2 | | | yes | | | | | yes | G ⅛ | 248810 |
| | | 2 | | | yes | | yes | | | | G ⅛ | 255841 |
| | | | 2 | | | | | | | yes | G ⅛ | 248824 |
| | | | | 2 | | | | | | yes | G ⅛ | 248808 |

**Note**: cULus only valid for versions without ATEX approval

[2] II 3D Ex tc IIIC T135 / II 3G Ex nA IIC T4 Gc
[3] II 2D Ex ia IIIC T135 °C Db IP64 / II 2G Ex ia IIC T4 Gb
[4] II 2G Ex ia IIC T4 Gb

### Further versions on request

**Additional**
Feedback switchpoint NPN-coded
Push-in pilot air ports (tube Ø 6 mm; ¼")

## Ordering chart adapter kit for ELEMENT (has to be ordered separately)

| Description | Actuator size | Control function | Article no. |
|---|---|---|---|
| Adapter kit ELEMENT Types 21xx | Ø 50 mm | single acting / universal | 682259 |

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

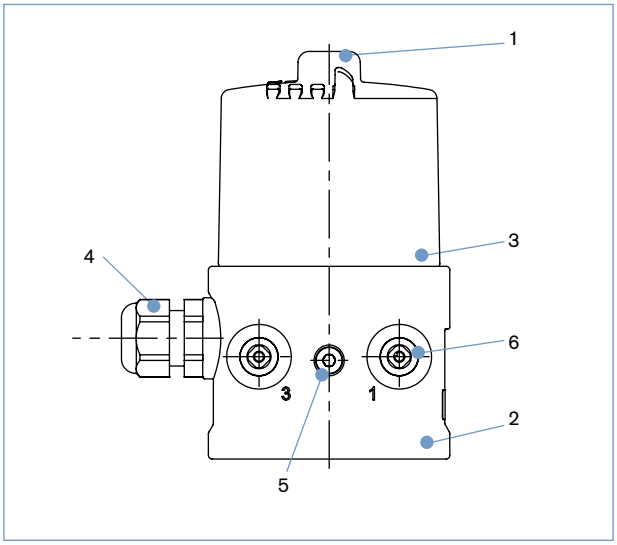
**Example ELEMENT valve system**

## Ordering chart accessories for ELEMENT

| Description | Article no. |
|---|---|
| M12 socket 8 pin with 5 m cable for power supply and input / output signals | 919267 |
| Silencer G ⅛ | 780779 |
| Silencer, push-in connector | 902662 |

DTS 1000215412 EN Version: O Status: RL (released | freigegeben | validé) printed: 23.05.2018

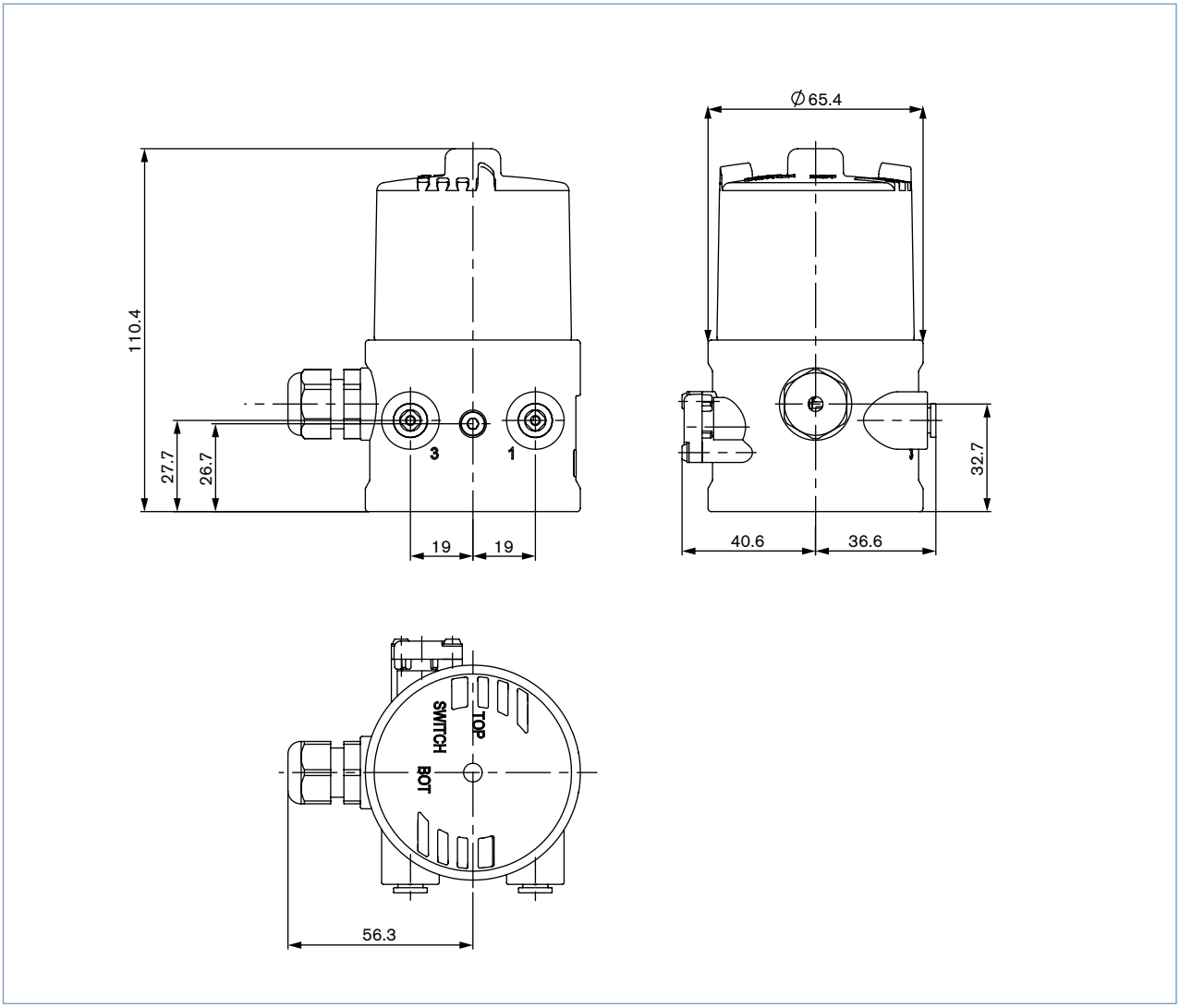
## Materials




| | | |
|---|---|---|
| **1** | Transparent cap | PC |
| **2** | BASIC body | PPS |
| **3** | Sealing | EPDM |
| **4** | Cable gland<br>Plug M12 | PA<br>Brass nickel plated |
| **5** | Screws | Stainless steel |
| **6** | Push-in connector<br>Threaded ports G ⅛ | POM / stainless steel<br>stainless steel |

## Dimensions [mm]

**Pneumatic control unit/feedback for mounting on process valve ELEMENT Types 21xx**






DTS 1000215412 EN Version: O Status: RL (released | freigegeben | validé) printed: 23.05.2018

## Ordering information for central automation of On/Off CLASSIC valve systems

A On/Off CLASSIC valve system consists of an **electrical position feedback Type 8697** and a **CLASSIC process valve Type 20xx**. The function of the position feedback 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 necessary for the selection of a complete system:

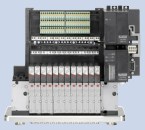
- **Article no.** of the desired pneumatic control unit **Type 8697** (see ordering chart on p. 6)
- **Article no.** of the selected process valve **Type 20xx** (see separate datasheet Type 20xx)

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

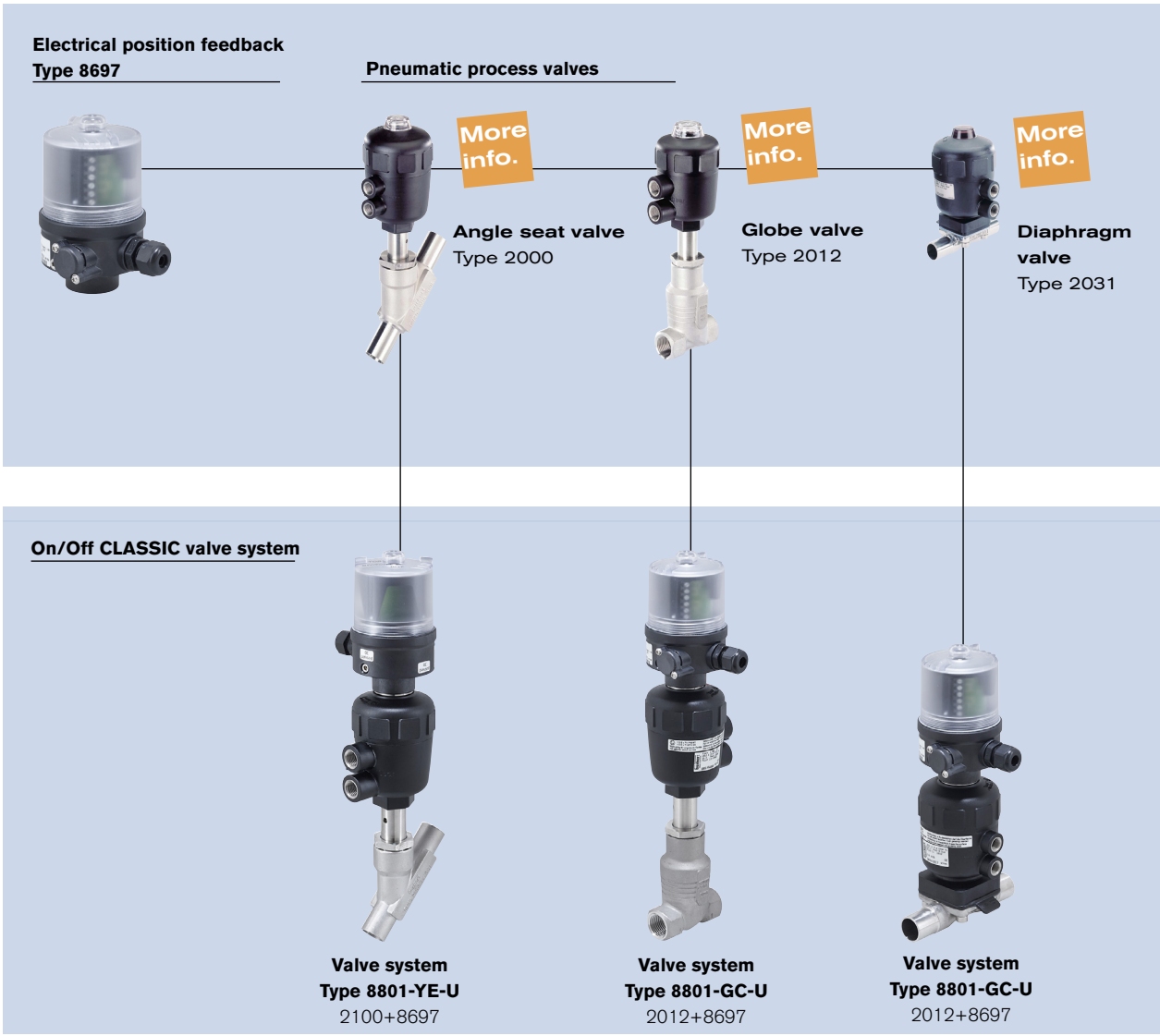
Click on the orange box "More info." below... you will come to our website for the resp. product where you can download the datasheet.

### Example for centralized/distributed automation of On/Off CLASSIC valve systems

The On/Off CLASSIC valve system can be combined with the **valve island Type 8640, 8644** or **8650**



More info.




DTS 1000215412 EN Version: O Status: RL (released | freigegeben | validé) printed: 23.05.2018

## Ordering chart (other versions on request)

**Electrical position feedback for combination for central automation of On/Off CLASSIC valve systems Type 20xx**

| End position feedback | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inductive switch 3-wire PNP | Inductive switch 2-wire NAMUR | Inductive switch 2-wire 24 V DC | Micro switch 24 V DC | Micro switch 50-250 V AC/DC | Feedback status LEDs | Electrical connection | ATEX / IECEx Cat. 3D/G Zone 22/2 [2] | ATEX / IECEx Cat. 2D/G Zone 21/1 [3] | ATEX/ IECEX Cat. 2G Zone 1 [4] | cULus | Pilot air ports threaded ports | Article no. |
| **Feedback (without pilot valve)** | | | | | | | | | | | | |
| 2 | | | | | yes | Cable gland | | | | yes | without | 248827 |
| 2 | | | | | yes | | yes | | | | without | 255851 |
| 2 | | | | | yes | M12 Multipole | yes | | | | without | 255858 |
| 2 | | | | | yes | | | | | yes | without | 250472 |
| | 2 | | | | yes | Cable gland | | yes | | | without | 248831 |
| | 2 | | | | yes | | | | yes | | without | 255863 |
| | | 2 | | | yes | | | | | yes | without | 248826 |
| | | 2 | | | yes | | yes | | | | without | 255850 |
| | | | 2 | | | | | | | yes | without | 248833 |
| | | | | 2 | | | | | | yes | without | 248825 |

[2] II 3D Ex tc IIIC T135 / II 3G Ex nA IIC T4 Gc
[3] II 2D Ex ia IIIC T135 °C Db IP64 / II 2G Ex ia IIC T4 Gb
[4] II 2G Ex ia IIC T4 Gb

## Ordering chart adapter kit for CLASSIC (has to be ordered separately)

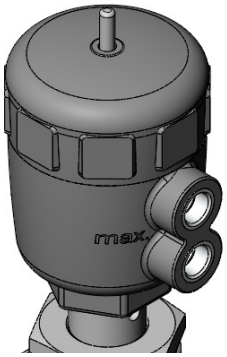
| Description | Actuator size | Control function | Article no. |
|---|---|---|---|
| Adapter kit CLASSIC Types 20xx | Ø 40 mm | universal | 682263 |
| | Ø 50/63/80 mm | universal | 682264 |
| | Ø 100/125 mm | universal | 682265 |
| | Ø 175/225 mm | universal | 684944 |
| Retrofit kit CLASSIC Type 20xx | Ø 40 mm | universal | 698573* |

**Example CLASSIC valve system**

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

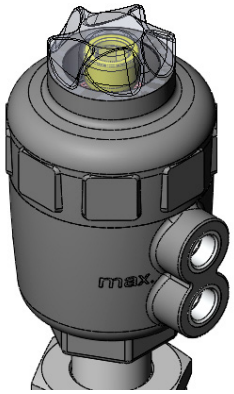
* Retrofit kit for retrofitting old CLASSIC drives without clear hood on the drive cover or as a replacement for Type 1062 (phase out). Please note the general installation instructions in the manual.

**Old version**



**CLASSIC Actuator 40 mm**
without transparent cover

**New version**



**CLASSIC Actuator 40 mm**
with transparent cover

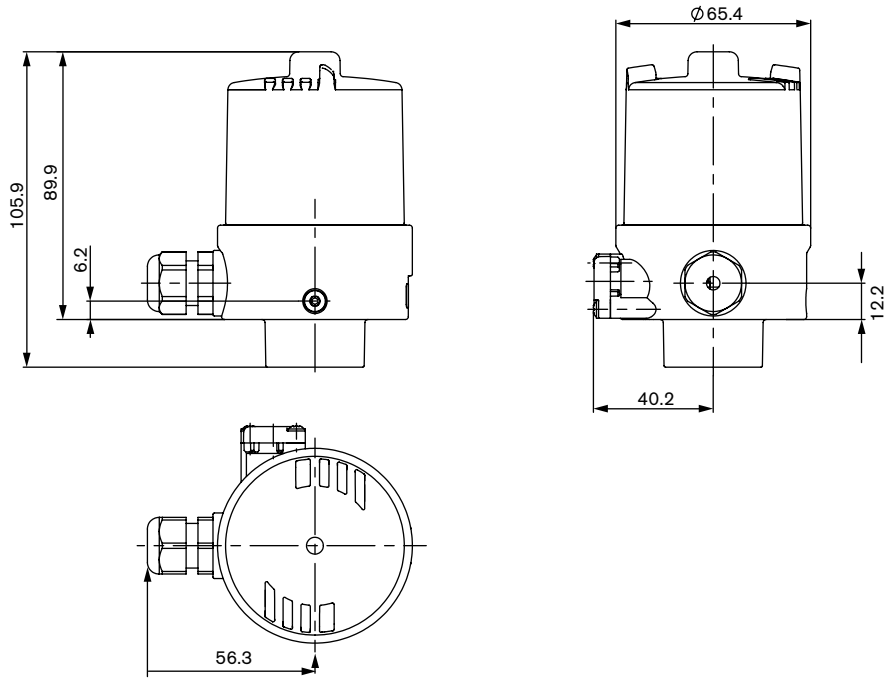
DTS 1000215412 EN Version: O Status: RL (released | freigegeben | validé) printed: 23.05.2018

## Ordering chart accessories for CLASSIC

| Description | Article no. |
|---|---|
| M12 socket 8 pin with 5 m cable for power supply and input / output signals | 919267 |
| Silencer G ⅛ | 780779 |
| Stroke limitation actuator CLASSIC Ø 50/63 mm | 689353 |
| Stroke limitation actuator CLASSIC Ø 80 mm | 689354 |
| Stroke limitation actuator CLASSIC Ø 100/125 mm | 689355 |

## Dimensions [mm]

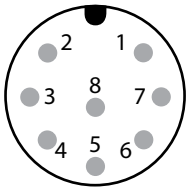
### Feedback for mounting on process valve CLASSIC Types 20xx




DTS 1000215412 EN Version: O Status: RL (released | freigegeben | validé) printed: 23.05.2018

## Connection options

**Multipole,** plug M12 8-pins

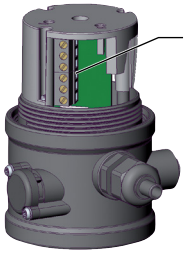


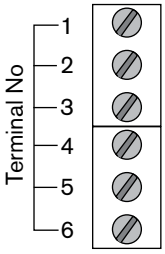

**Plug configuration with 3-wire inductive switch, 24 V DC**

| Pin no. | Wire colour[6)] | Configuration | External circuit |
|---|---|---|---|
| 1 | white | INI Bottom OUT Output 1 | 1 Output 1(24 V) |
| 2 | brown | INI Top OUT Output 2 | 2 Output 2 (24 V) |
| 3 | green | INI - (GND) Supply | 3 GND |
| 4 | yellow | INI + (24 V DC) Supply | 4 +24 V DC |
| 5 | grey | Valve control 0/24 V | 5 0/24 V DC ±10% |
| 6 | pink | Valve control GND | 6 Residual ripple 10% |

[6)] The indicated colours refer to the connecting cable available as an accessory (919 061)

**Cable gland ,** M16 × 1.5 (cable-Ø 10 mm), terminal screws (1.5 mm²)




**Port configuration with micro switch, 24 V DC / 250 V AC/DC**

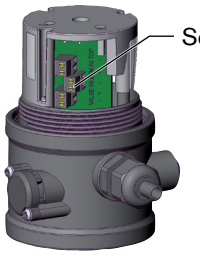
| Terminal | Configuration | External circuit |
|---|---|---|
| 1 | Micro switch top | 1 NO |
| 2 | | 2 NC |
| 3 | | 3 Joint connection |
| 4 | Micro switch bottom | 4 NO |
| 5 | | 5 NC |
| 6 | | 6 Joint connection |

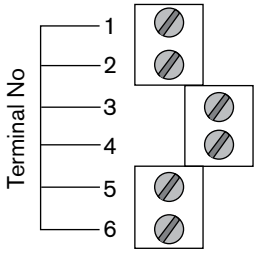
**Port configuration with 3-wire inductive switch, 24 V DC**

| 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% |

DTS 1000215412 EN Version: O Status: RL (released | freigegeben | validé) printed: 23.05.2018

## Port configuration with 2-wire inductive proximity switches




**2-wire inductive proximity switches (NAMUR)**

| Terminal | Configuration | External circuit |
|---|---|---|
| 1 | INI Top + | Explosion protected area / Non-hazardous area; 1 / 3; +8,2 V DC; 2 / 4; NAMUR-Sensor; R; 0 V — 7) |
| 2 | INI Top - | |
| 3 | INI Bottom + | |
| 4 | INI Bottom - | |
| 5 | Valve control + | 5; 6 — 8) |
| 6 | Valve control GND | |

**2-wire inductive proximity switches, 24 V**

| Terminal | Configuration | External circuit |
|---|---|---|
| 1 | INI Top + | 1 / 3; 2 / 4; +; –; load |
| 2 | INI Top - | |
| 3 | INI Bottom + | |
| 4 | INI Bottom - | |
| 5 | Valve control + | 5; 6 |
| 6 | Valve control GND | |

[7] (Acc. to NAMUR recommendation). Please note the prototype test certificate from Turck KEMA 02 ATEX 1090X
[8] Barrier signal, see PTB 07 ATEX 2048

DTS 1000215412 EN Version: O Status: RL (released | freigegeben | validé) printed: 23.05.2018



In case of special application conditions, please consult for advice.
Subject to alteration.
© Christian Bürkert GmbH & Co. KG
1805/14_EU-en_00895243