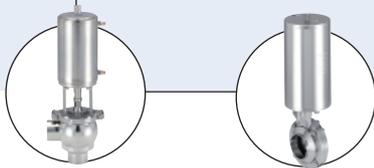


Control head for hygienic process valves



Type 8681 can be combined with...



Single seat valve
Double seat valve

Butterfly valve
Ball valve

- Universal attachment for hygienic process valves
- Contactless position measurement system with 3 switching points (Teach-In function)
- Coloured status display
- Manual override operative with closed housing
- Communication AS-Interface, DeviceNet (option)

The type 8681 control head is optimised for decentralised automation of hygienic process valves. Thanks to its universal adapter it can be combined with all normal commercial butterfly valves, ball valves, single and double seated valves. With a decentralised automation concept, the control head takes over all pneumatic actuation, feedback and diagnostic functions up to and including field bus communication. The housing is easy to clean and features proven electrical IP protection and chemically resistant materials for use in hygienic processing in food, beverage and pharmaceutical industries. Depending on the process valve type, up to 3 pneumatic actuator chambers can be controlled independently from each other. The switching speeds of both movement directions can be set separately. A built-in check valve prevents incorrect switching of process valve actuator chambers which could result from back-pressure.

The process valve switching positions are detected by an inductive, analogue position sensor and reported to the PLC system. Up to 3 switching points can be adjusted automatically by a Teach-In function. Additionally a fourth switching position can be read in and fed back via an external inductive proximity switch. The coloured status display signals the particular process valve switching position or indicates a diagnostic function such as maintenance required status or fault conditions.

The pilot valves are equipped with a manual override. If the device housing is closed, the patented magnetically encoded manual override tool can be used to open the process valve from the exterior. Bus communication is available with AS-interface or DeviceNet.

| Technical data | |
|---|---|
| Material | |
| Body | PA, PPO, VA |
| Cover | PC |
| Seal | CR, EPDM |
| Control medium | neutral gases, air DIN ISO 8573-1 (filter 5 µm recommended) |
| Dust concentration | Class 7 (<40 µm particle size) |
| Particle density | Class 7 (<10 mg/m ³) |
| Pressure condensation point | Class 3 (<-20°C) |
| Oil concentration | Class X (<25 mg/m ³) |
| Supply pressure | 2.5... 8 bar |
| Air capacity solenoid valve¹⁾ (supply and exhaust air per solenoid valve adjustable) | 110 l _N /min - for pressurization and exhaust, lifting device 110 l _N /min - delivery condition 200 l _N /min - max. typical flow rate (throttle) |
| Pilot air ports | |
| Air inlet and outlet | G 1/4 |
| Service ports | G 1/8 |
| Position sensor | non-contact position sensor, 3 self-regulated switching points PNP (Teach-In function) closer (normally open), PNP-output short-circuit proof, with clacking short-circuit protection |
| Outlet current | max. 100 mA per feedback signal |
| Stroke range | 0 to 80 mm |
| Resolution | ≤ 0.1 mm |
| Total error | ± 0.5 mm - when using a target for the dimensional drawing, material 1.4021 and a piston rod (Ø 22 mm, material 1.4301) (error refers to the reproducibility of the teach-position) |
| Ambient temperature | -10 to +55°C +5 to +55°C (ATEX II 3G Ex nA IIC T4; ATEX II 3G Ex tD A22 T135°C) |
| Installation | As required, preferably with actuator in upright position |

¹⁾ QNn-value acc. to the definition with decrease in pressure from 7 to 6 bar absolute with 20°C

Technical data, continued

| | |
|-------------------------------|---|
| Type of protection | IP 65/67 acc. to EN 60529 |
| Protection class | 3 (AS-Interface, 24 V DC, DeviceNet); 1 (120 V AC) acc. to DIN EN 61140 |
| Fieldbus communication | AS-Interface, DeviceNet |
| EG-Conformity | EMV2004/108/EG; ATEX 94/9/EG |
| Ignition protection | ATEX II 3G Ex nA IIC T4 ATEX II 3G Ex tD A22 T135°C |

Without fieldbus communication; 24 V DC

| | |
|---|---|
| Power supply | 12 to 28 V DC |
| Residual ripple with DC | max. 10% |
| Power consumption | < 5 W (acc. to version and operating status, see instruction manual) |
| Valve control input (Y1 - Y3) Signal level - active Signal level - inactive Impedance | U > 10 V, max. 24 V DC + 10% U < 5 V U > 30 kOhm |
| Outputs / binary feedback signals Design Switchable output current Output voltage - active Output voltage - inactive | S1 out - S4 out Normally open contact, PNP output short circuit proof, with self-locking short circuit protection max. 100 mA per feedback signal ≥ (operating voltage - 2 V) max. 1 V im in unloaded state |
| Input / proximity switch (external initiator: S4 in) Operating voltage Current carrying capacity, sensor power supply Design Input current 1 signal Input voltage 1 signal Input current 0 signal Input voltage 0 signal | Voltage present at control head - 10% max. 90 mA short-circuit protection DC 2- and 3-conductor, NO or NC (factory setting NO), PNP output $I_{\text{Sensor}} > 6.5 \text{ mA}$, limited internally to 10 mA $U_{\text{Sensor}} > 10 \text{ V}$ $I_{\text{Sensor}} < 4 \text{ mA}$ $U_{\text{Sensor}} < 5 \text{ V}$ |
| Electrical connection Multipole Cable gland | M12 12-pin with cable 8 cm, 1 x M16 x 1.5 cable glands for external initiator (clamping range 3... 6 mm) M16 x 1.5 (cable-Ø 5... 10 mm, screw terminals 0.14... 1.5 mm ²), 1 x M16 x 1.5 Kabelverschraubung für externen Initiator (Klemmbereich 3... 6 mm) |

Without Fieldbus communication; 120 V AC

| | |
|---|---|
| Power supply | 110 to 130 V AC / 50/60 Hz |
| Current consumption (stand by current) | 10 mA at 120 V AC |
| Valve control inputs (Y1 - Y3) Signal level - active Signal level - inactive Impedance | U > 60 V AC U < 20 V AC > 40 kOhm |
| Outputs / binary feedback signals Design Switchable output current Output voltage - active Output voltage - inactive | S1 out - S3 out Normally open contact, L switching, short-circuit protection via automatically resetting fuse max. 50 mA per feedback signal ≥ (operating voltage - 2 V) max. 1 V in unloaded state |
| Input / proximity switches (external initiator: S4 in) Operating voltage Current carrying capacity, sensor power supply Design Input current 1 signal | Voltage present at control head - $U_{\text{Nominal}} = 120 \text{ V AC}$, 50/60 Hz max. 0.7 A DC 2- and 3-conductor, NO contact, L switching $I_{\text{Sensor}} < 2 \text{ mA}$ |
| Electrical connection Cable gland | M16 x 1.5 (cable-Ø 5... 10 mm, screw terminals 0.4... 1.5 mm ²), 1 x M16 x 1.5 cable glands for external initiator (clamping range 3... 6 mm) |

| With Fieldbus communication; AS-Interface | |
|--|---|
| Profil | S-7.A.E (A/B slave max. 62 slaves/master) S-7.F.F (max. 31 slaves/master) |
| Power supply above bus line from bus signal separated | as Specification reversible (Jumper) |
| Power consumption equipment without external power supply Max. current consumption Current consumption in normal operation (acc. to reduction of electric current; Valve + 1 end position achieved) | 240 mA (incl. external initiator with 90 mA) ≤ 150 mA 3 valves activated, 1 position feedback with LED display, no external initiator |
| Power consumption equipment with external power supply The power supply unit must include a secure disconnect in accordance with IEC 364-4-41. It must conform to SELV standard. The ground potential may no have an earth connection. | 19.2 V DC to 31.6 V DC ≤ 110 mA 24 V DC ≤ 150 mA type |
| Output (from master perspective) / solenoid valves Max. switching capacity Typ. continuous output Watchdog function Pull-in current Holding current Operating mode Valve type | 0.9 W (per solenoid valve) 0.6 W (per solenoid valve) integrated 30 mA or 0.9 W / 200 ms (at 30.5 AS-i-voltage) 20 mA or 0.6 W / 200 ms (at 30.5 AS-i-voltage) Long-term operation (100% operation) 6524 |
| Input / proximity switches (external initiator: S4 in) Operating voltage Current carrying capacity, sensor power supply Design Input current 1 signal Input voltage 1 signal Input current 0 signal Input voltage 0 signal | AS interface voltage present at control head - 10 % max. 30 mA short-circuit protection DC 2- and 3-conductor, NO or NC (factory setting NO), PNP output $I_{\text{Sensor}} > 6.5 \text{ mA}$, limited internally to 10 mA $U_{\text{Sensor}} > 10 \text{ V}$ $I_{\text{Sensor}} < 4 \text{ mA}$ $U_{\text{Sensor}} < 5 \text{ V}$ |
| Electrical connection (ASI flat cable clip at cable 80 cm as standard) | M12 4-pin at cable 8 cm (acc. 0.3 m cable length acc. to AS-Interface Specification) 1 x M16 x 1.5 cable glands for external initiator (clamping range 3... 6 mm). M12 4-pin at cable 80 cm (acc. 1.0 m cable length acc. to AS-Interface Specification) 1 x M16 x 1.5 cable glands for external initiator (clamping range 3... 6 mm). |
| With Fieldbus communication; DeviceNet | |
| Power supply | 11 to 24 V DC (acc. to specification) |
| Max. current consumption | 200 mA at 24 V DC |
| Input / proximity switches (external initiator: S4 in) Operating voltage Current carrying capacity, sensor power supply Design Input current 1 signal Input voltage 1 signal Input current 0 signal Input voltage 0 signal | via DeviceNet power supply - 10 % Max. 30 mA DC 2- and 3-conductor, NO contact, PNP output $I_{\text{Sensor}} > 6,5 \text{ mA}$, limited internally to 10 mA $U_{\text{Sensor}} > 10 \text{ V}$ $I_{\text{Sensor}} < 4 \text{ mA}$ $U_{\text{Sensor}} < 5 \text{ V}$ |
| Output (from master perspective) / solenoid valves Max. switching capacity Typ. continuous output Output reduction Pull-in current Holding current Operating mode Valve type | 1.0 W 0.6 W integrated via DeviceNet interface electronics 120 mA typ. at 24 V DC (3 valves) 100 mA typ. at 24 V DC (3 valves) Long-term operation (100% operation) 6524 |
| Electrical connection Multipole | M12, 5-pin at cable 80 cm, 1 x M16 x 1.5 cable glands for external initiator (clamping range 3... 6 mm.) |

Technical data, continued

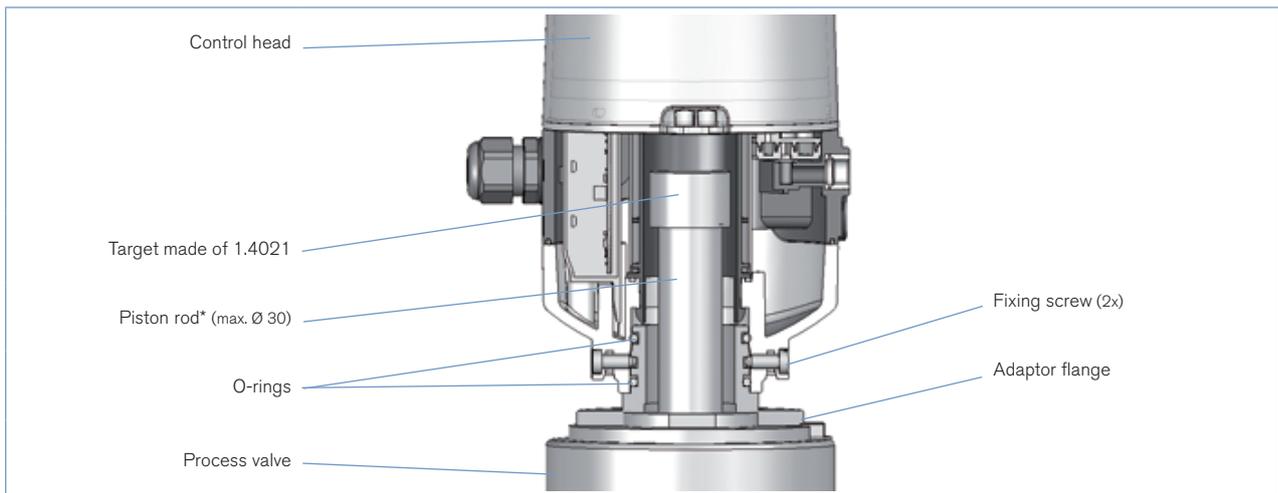
Bit configuration chart

| Databit | D3 | D2 | D1 | D0 |
|--------------|-----------------------|------------------|------------------|------------------|
| Input | External initiator S4 | Position 3 | Position 2 | Position 1 |
| Output | not configured | solenoid valve 3 | solenoid valve 2 | solenoid valve 1 |
| Parameterbit | D3 | D2 | D1 | D0 |
| Output | not configured | not configured | not configured | not configured |

Programming data

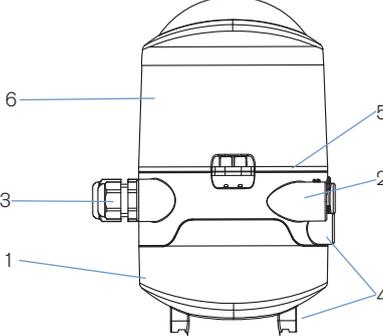
| Databit | Programming data with 62 slaves AS-Interface - Device for A/B-Slave- addressing (Standard device) | Programming data with 31 Slaves AS-Interface (optional) |
|-----------------------|---|---|
| E/A - configuration | 7 hex (4 Inputs / 4 Outputs) see bit configuration chart | 7 hex (4 Inputs / 4 Outputs) see bit configuration chart |
| ID-Code | A hex | F hex |
| combinative ID-code 1 | 7 hex | (F hex) |
| combinative ID-code 2 | E hex | (F hex) |
| Profil | S-7.A.E | S-7.F.F |

Flange for process valve



* Target and piston should not be made of ferromagnetic or material with high electrical conductivity (e.g. copper, aluminium). Stainless steel without ferromagnetic properties such as 1.4404 are suitable (if necessary verify after handling).

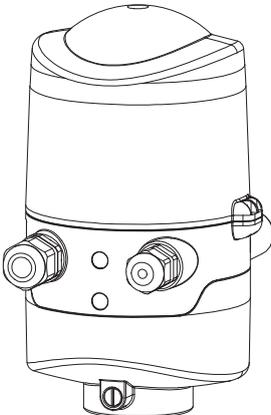
Materials

| | | | |
|---|---|-----------------------|-----------------|
|  | 1 | Housing lower part | PPO |
| | 2 | Fluid part | PPO |
| | 3 | Cable glands | PA |
| | 4 | Screws/threaded ports | Stainless steel |
| | 5 | Seal | EPDM, CR |
| | 6 | Cover | PC |

Connections

Without fieldbus communication 24 V DC

Cable glands

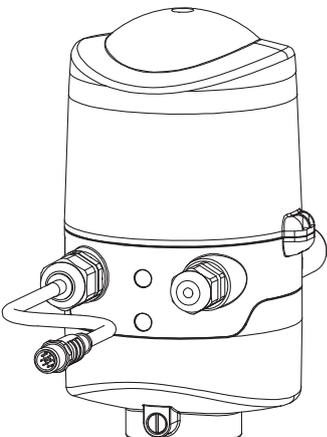


Connection left:
Voltage, signals

Connection right:
external initiator

Cable glands

Version with 12 pin plug (for 24 V)¹⁾



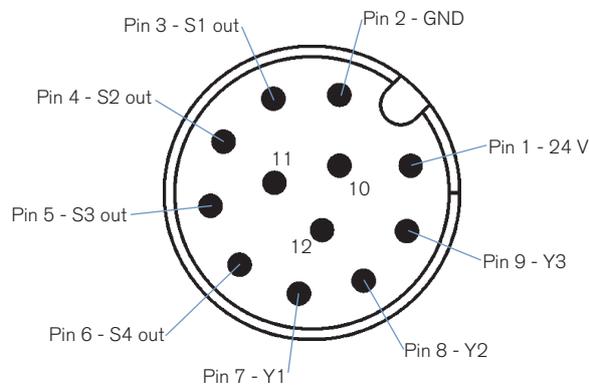
Connection left:
Voltage, signals

Connection right:
external initiator

¹⁾ M12-plug acc. to IEC 61076-2-101, 12-pin with cable 8 cm

Multipol connection M12, 12-pin
In- and Output signal for superordinated control (SPS):

12-pin reound plug M12 x 1,0 (acc. to IEC 61076-2-101)



| Pin | Description | Configuration |
|-----|-------------|------------------------------|
| 1 | 24 V | Power supply 24 V |
| 2 | GND | GND |
| 3 | S1 out | Output position S1 |
| 4 | S2 out | Output position S2 |
| 5 | S3 out | Output position S3 |
| 6 | S4 out | Output external initiator S4 |
| 7 | Y1 | Input solenoid valve 1 |
| 8 | Y2 | Input solenoid valve 2 |
| 9 | Y3 | Input solenoid valve 3 |
| 10 | | not configured |
| 11 | | not configured |
| 12 | | not configured |

Connections, Continued

Without Fieldbus communication 24 V DC cable glands

| Description terminal strip | Configuration |
|----------------------------|---------------------------|
| 24 V | Power supply 24 V |
| GND | GND |
| S1 out | Output position 1 |
| S2 out | Output position 2 |
| S3 OUT | Output position 3 |
| S4 OUT | Output external initiator |
| Y1 | Input solenoid valve 1 |
| Y2 | Input solenoid valve 2 |
| Y3 | Input solenoid valve 3 |

| Description terminal strip | Configuration |
|----------------------------|--|
| 24 V | Power supply 24 V for external initiator |
| S4 IN | Input external initiator |
| GND | GND external initiator |

Without fieldbus communication 120 V AC

| Description terminal strip 1 | Configuration |
|------------------------------|---|
| PE | Protection earth - protective conductor |
| L | Power supply live conductor |
| N | 120 V AC neutral conductor |
| S1 out | Output position 1 |
| S2 out | Output position 2 |
| S3 out | Output position 3 |
| S4 out | Output external initiator |
| Y1 | Input solenoid valve 1 |
| Y2 | Input solenoid valve 2 |
| Y3 | Input solenoid valve 3 |
| Description terminal strip 2 | Configuration (external initiator) |
| L | Power supply - live conductor |
| S4 IN | Input external initiator |
| N | Power supply - neutral conductor |

Connection left: Voltage, signals

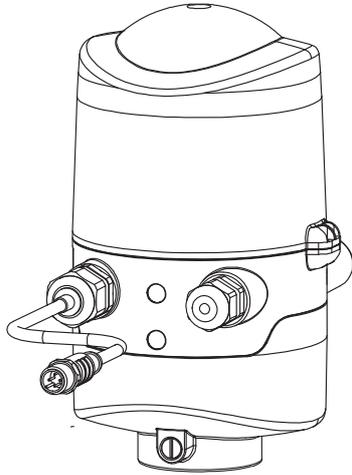
Connection right: external initiator

Connections, continued

With fieldbus communication AS-Interface

with Multipol connection¹⁾

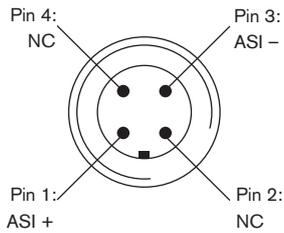
(M12-plug acc. to IEC 61076-2-101, 4-pin) at cable 8 cm



Connection left:
AS-Interface

Connection right:
external initiator

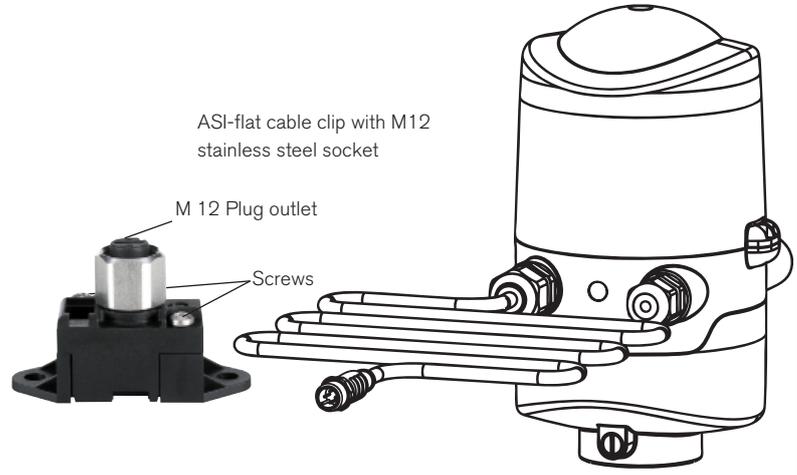
¹⁾ on request



Fieldbus connector
Power supply over
Fieldbus

with Multipol connection

(M12-plug acc. to IEC 61076-2-101, 4-pin) with mounted ASI-flat cable clip at cable 80 cm



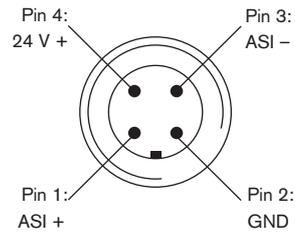
Connection left:
AS-Interface

Connection right:
external initiator

ASI-flat cable clip with M12
stainless steel socket

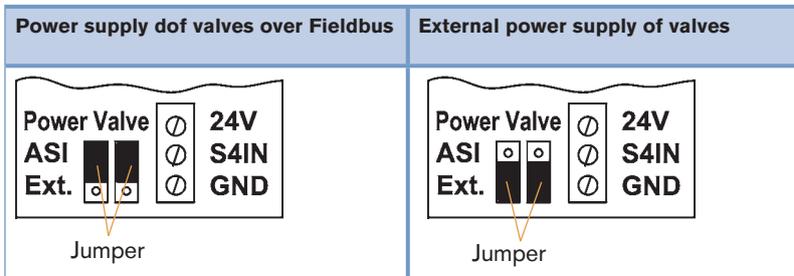
M 12 Plug outlet

Screws



Fieldbus connector
with external power supply

| Pin | Configuration (Power supply over Fieldbus) | Configuration (external power supply) | Wire colour |
|-----|---|--|-------------|
| 1 | AS-Interface - ASI + | AS-Interface - ASI + | brown |
| 2 | not configured | GND | white |
| 3 | AS-Interface - ASI - | AS-Interface - ASI - | blue |
| 4 | not configured | 24 V + | black |



Connections, continued

With fieldbus communication DeviceNet

View of plug from the front onto the pins

Pin 4: CAN_H Pin 3: V-

Pin 5: CAN_L

Pin 1: Drain Pin 2: V+

| Pin | Signal | Wire colour |
|-----|--------|-------------|
| 1 | Drain | shield |
| 2 | V+ | red |
| 3 | V | black |
| 4 | CAN_H | white |
| 5 | CAN_L | blue |

Connection left: DeviceNet Connection right: external initiator

Pneumatic connection

Exhaust air connection (3/R)
(Silencer has to be mounted)

Solenoid valve 3 (2/A3)

Solenoid valve 2 (2/A2)

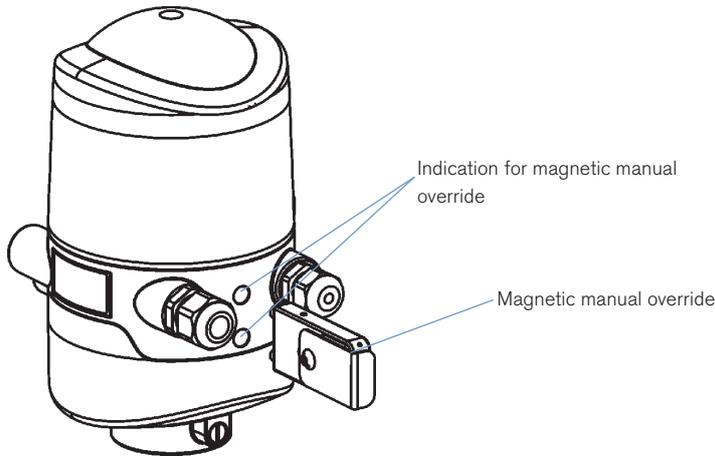
Solenoid valve 1 (2/A1)

Supply-pressure connection (1/P)

Supply connection (2/A 1-3)

Magnetic manual override

Activation / De-Activation solenoid valve 1 (process valve maintenance)



| Version | Item no. |
|--------------------------|----------|
| Magnetic manual override | 196 490 |

Ordering chart control head Type 8681 (other versions on request)

| Communication | Power supply | Connection | ATEX zone 2/22 cat. 3 | Number of solenoid valves | Feedback | Item no. |
|--------------------------|-------------------|--|-----------------------|---------------------------|-----------------|----------|
| Without | 12... 28 V DC | Cable glands | without | 0 | 3 int. + 1 ext. | 196 410 |
| | | | without | 1 | 3 int. + 1 ext. | 196 411 |
| | | | without | 2 | 3 int. + 1 ext. | 196 412 |
| | | | without | 3 | 3 int. + 1 ext. | 196 413 |
| | | | with | 1 | 3 int. + 1 ext. | 196 415 |
| | 12... 28 V DC | M12, 12-pin, cable 8 cm | without | 0 | 3 int. + 1 ext. | 196 420 |
| | | | without | 1 | 3 int. + 1 ext. | 196 421 |
| | | | without | 2 | 3 int. + 1 ext. | 196 422 |
| | | | without | 3 | 3 int. + 1 ext. | 196 423 |
| | | | with | 1 | 3 int. + 1 ext. | 196 425 |
| | 120 V AC | Cable glands | without | 0 | 3 int. + 1 ext. | 196 470 |
| | | | without | 1 | 3 int. + 1 ext. | 196 471 |
| | | | without | 2 | 3 int. + 1 ext. | 196 472 |
| | | | without | 3 | 3 int. + 1 ext. | 196 473 |
| | | | with | 1 | 3 int. + 1 ext. | 196 475 |
| AS-Interface (62 slaves) | 29.5... 31.6 V DC | Version with ASI flat cable clip and cable 80 cm | without | 0 | 3 int. + 1 ext. | 196 430 |
| | | | without | 1 | 3 int. + 1 ext. | 196 431 |
| | | | without | 2 | 3 int. + 1 ext. | 196 432 |
| | | | without | 3 | 3 int. + 1 ext. | 196 433 |
| | | | with | 1 | 3 int. + 1 ext. | 196 435 |
| DeviceNet | via Bus | M12, 5-pin, cable 80 cm | without | 0 | 3 int. + 1 ext. | 196 450 |
| | | | without | 1 | 3 int. + 1 ext. | 196 451 |
| | | | without | 2 | 3 int. + 1 ext. | 196 452 |
| | | | without | 3 | 3 int. + 1 ext. | 196 453 |
| | | | with | 1 | 3 int. + 1 ext. | 196 455 |

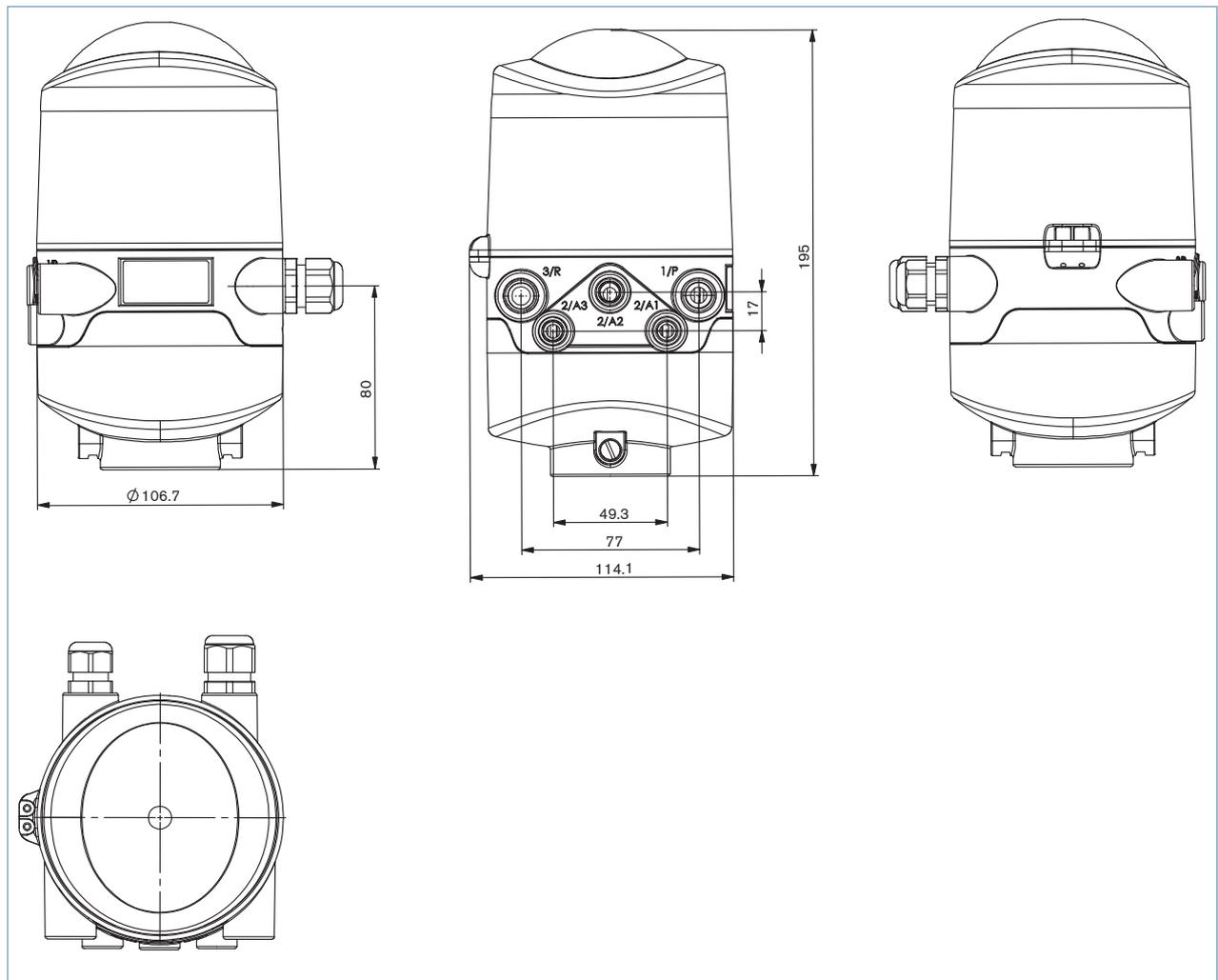
i Further versions on request

- > Additional**
- AS-Interface: connection M12 4-pin cable 8 cm
- AS-Interface (31 slaves)

Ordering chart for accessories

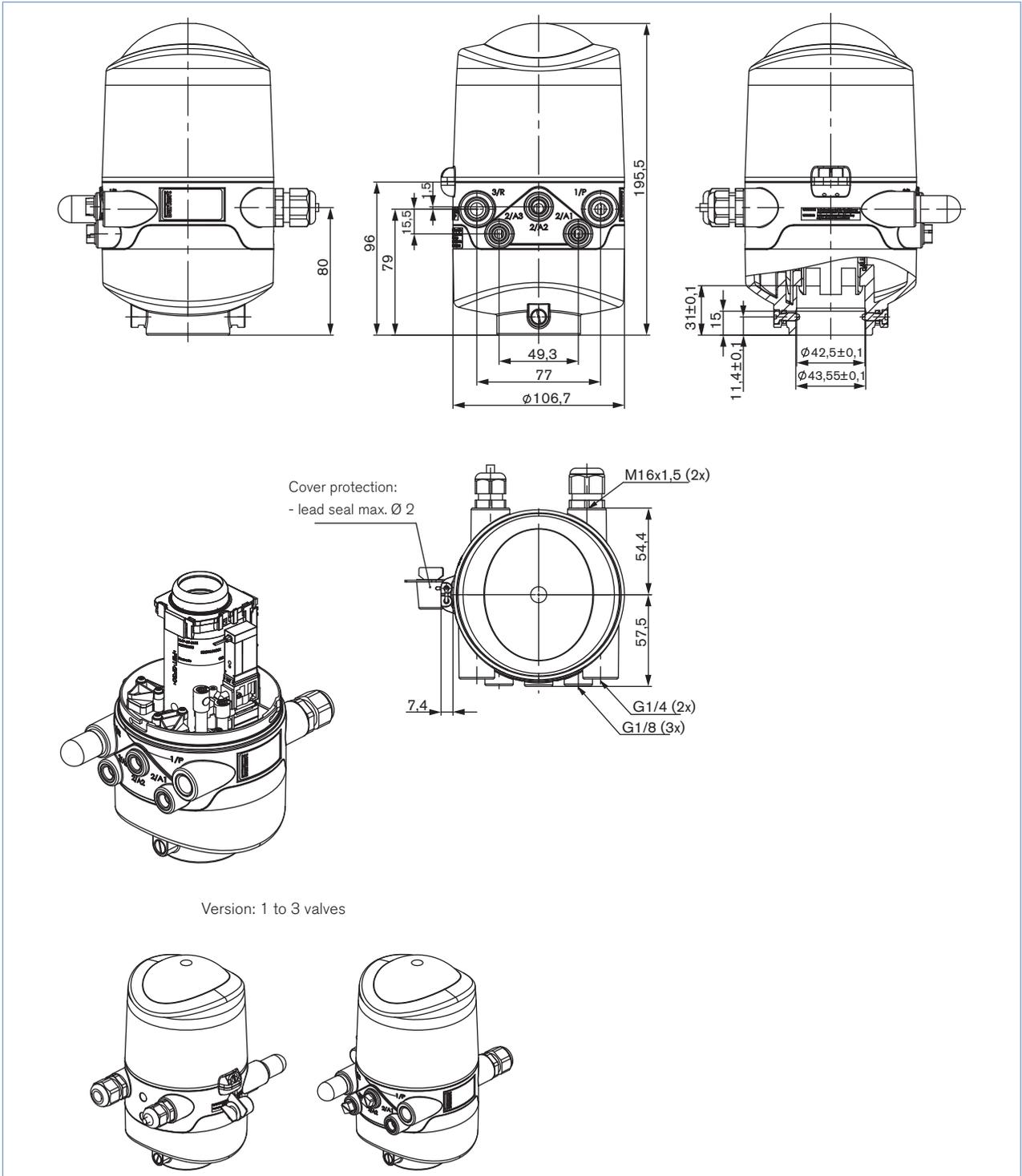
| Version | Item no. |
|--|----------|
| Silencer PE G 1/4 (spare part) | 780 780 |
| Blind plug PP G 1/8 (spare part) | 770 901 |
| Rotary push-in fitting, brass nickel-plated G 1/4 for Ø tube 8/6 | 780 084 |
| Rotary push-in fitting, brass nickel-plated G 1/8 for Ø tube 6/4 | 780 082 |
| Universal Adaptor with O-ring | 196 495 |
| Position sensor target, stainless steel 1.4021 | 196 494 |
| Magnetic tool for manual override | 196 490 |
| Cable 8 cm with M12-plug, 12-pin for 24 V DC (spare part) | 217 574 |
| Cable 80 cm with M12-plug, 4-pin for ASi (spare part) | 217 572 |
| Cable 8 cm with M12-plug, 4-pin for ASi (spare part) | 217 573 |
| ASi flat cable clip with M12 female stainless steel plug | 799 646 |
| Cable 80 cm with M12-plug, 5-pin for DeviceNet (spare part) | 218 187 |
| USB Adaptor Kit PC communication | 227 093 |
| Set with 20 lead seals, to avoid tool-free opening of the cover (spare part) | 257 100 |

Dimensions [mm]

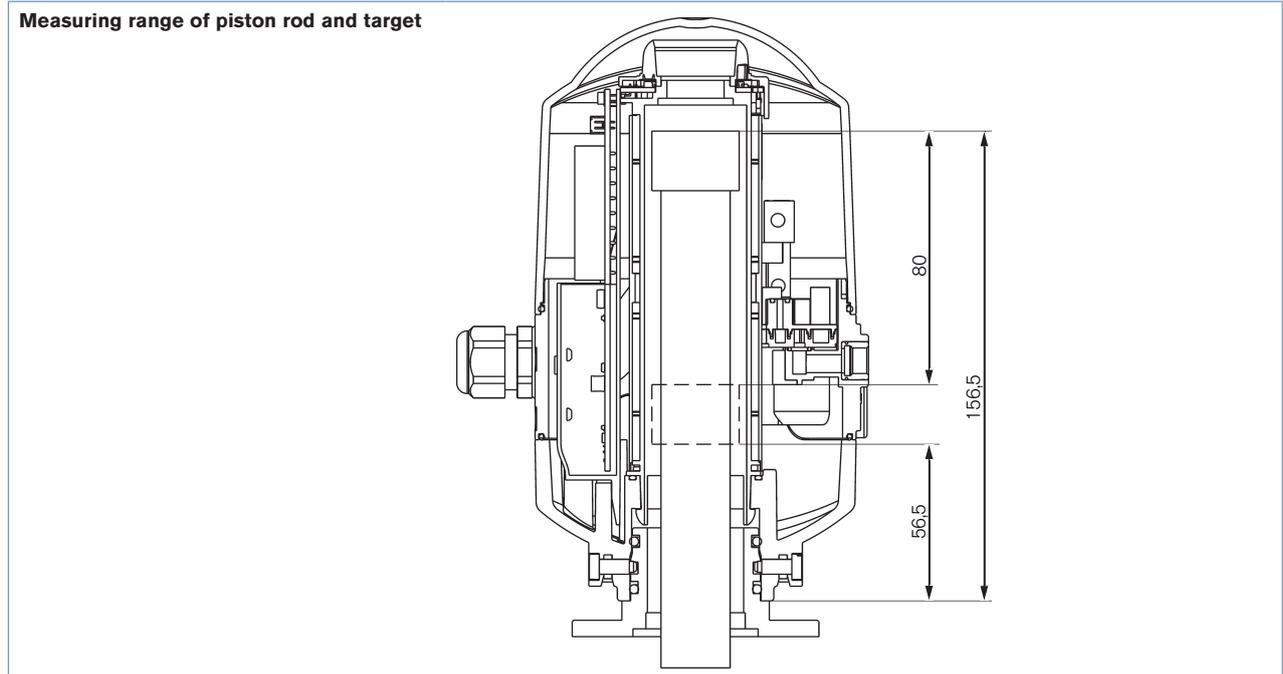


Dimensions [mm], continued

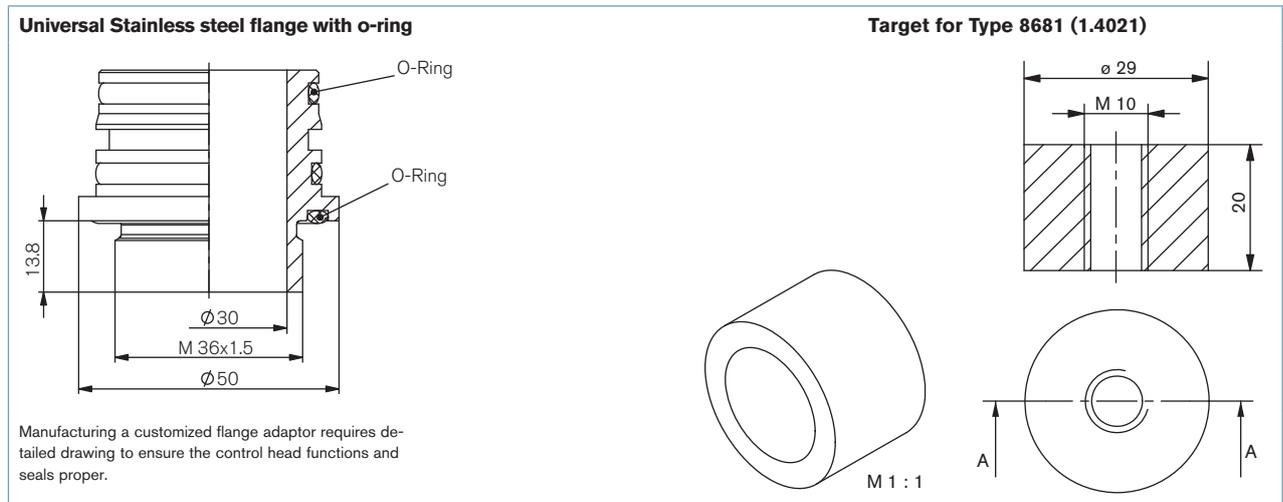
Feedback version (without pilot valves)



Dimensions [mm], continued



Accessories dimensions [mm]



| Version | Item no. |
|---|----------|
| Universal Stainless steel flangewith O-ring | 196 495 |
| Target for Type 8681 made of 1.4021 | 196 494 |

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