

Control Valve

BOA-CVP H

PN 16/25
DN 20-150

Type Series Booklet



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Type Series Booklet BOA-CVP H

KSB Aktiengesellschaft Pegnitz

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Balancing and Measurement Valves

Control Valves

BOA-CVP H



Main applications

- Hot-water heating systems
- Air-conditioning systems
- Boiler feed applications
- Boiler recirculation
- Chemical industry
- Process engineering
- Heat recovery systems
- Sugar industry

Fluids handled

- High-temperature hot water
- Saturated steam
- Liquids not chemically or mechanically aggressive to the valve materials.

Operating data

Operating properties

| Characteristic | Value |
|------------------------------|-----------|
| Nominal pressure | PN 16/25 |
| Nominal size | DN 20-150 |
| Max. permissible pressure | 25 bar |
| Max. permissible temperature | 350 °C |

Selection as per pressure/temperature ratings (⇒ Page 4)

Design details

Design

Control valve:

- Straight-way pattern with horizontal seat
- k_{vs} values: 2.5 to 340 m³/h
- Rangeability 50:1
- Parabolic plug with equal-percentage or linear characteristic
- Two-stage pressure reduction (parabolic plug combined with multi-hole cage)
- Reduced k_{vs} values
- PTFE V-rings with spring up to 250 °C
- Graphite gland packing up to 350 °C
- Flanges to DIN EN 1092-2 Type 21
- Leakage class IV (DIN EN 60534-4)
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Groups 1 and 2.

Pneumatic actuators:

- Mechanical position indicator
- Short actuating times
- Actuating forces of up to 11 kN (spring closes)
- Actuating forces of up to 26 kN (air closes)

Variants

Control valve:

- Seat with PTFE gasket up to 250 °C, leakage class VI
- Anti-cavitation design
- Very low k_{vs} values from 0.1 to 2.1 m³/h
- Balanced plug from DN 65 (up to 200 °C)
- Other flange designs
- High-temperature resistant paint (grey aluminium)
- Certification to customer specification

Pneumatic actuators:

- Electro-pneumatic positioner
- Pressure gauge block
- IY module
- Alarm module
- Limit switch (inductive, 3-wire)
- Limit switch (mechanical)
- 3/2-way solenoid valve
- Air filter/reducing station
- Emergency handwheel

Body materials

Overview of available materials

| Material | Material number | Temperature limit |
|------------------|-----------------|-------------------|
| EN-GJS-400-18-LT | JS 1025 | Up to 350 °C |

Product benefits

- Two-stage pressure reduction already integrated as a standard to reduce noise emission.
- Optional anti-cavitation design combines multi-hole cage and perforated plug.
- Easy to adjust to specific control tasks by selecting from various valve disc (equal-percentage or linear) / seat diameter combinations.

- Available with two types of stem seal: maintenance-free PTFE V-rings with spring (< 250 °C) or adjustable graphite gland packing (350 °C).
- Readily accessible actuator pillars accommodate various add-on options (positioner, solenoid valve, limit switches, etc.).
- Easy to service: The valve trim can be dismantled without any special tools by unscrewing the bonnet bolts.
- Internal parts made of high-grade stainless steel (1.4571) for long service life and high chemical resistance.
- Risk of leakage minimised by fully confined bonnet gasket.

Related documents

Other applicable documentation

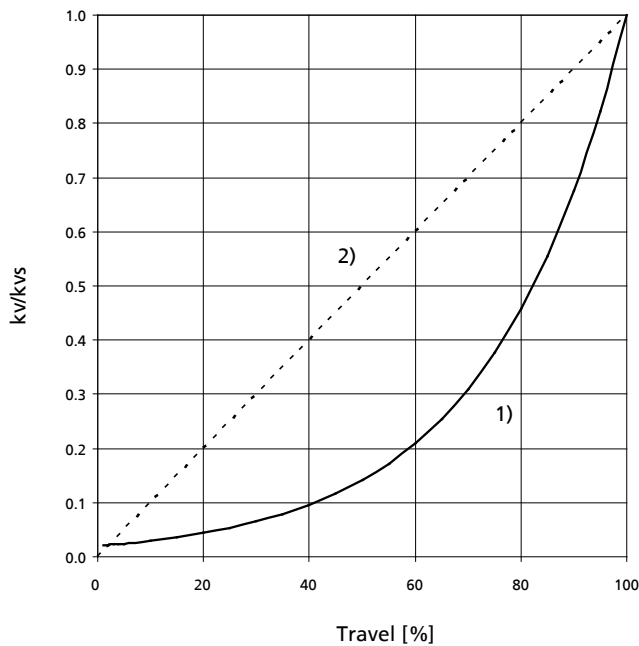
| Document | Reference No. |
|--|---------------|
| Flow characteristics | 7525.4 |
| BOA-CVP H operating manual | 7525.81 |
| Operating manual for pneumatic actuators | 7525.84 |

Pressure/temperature ratings

Test and operating pressures

| Nominal pressure | Material | Body pressure test | Seat tightness test | Permissible operating pressures in bar at temperatures in °C ¹⁾²⁾ | | | | |
|------------------|------------------|---------------------|---------------------|--|------|------|------|------|
| | | | | with water | | | | |
| | | | | P10, P11 | | | | |
| PN | | [bar] ³⁾ | [bar] ⁴⁾ | -10 to +120 | 200 | 250 | 300 | 350 |
| 16 | EN-GJS-400-18-LT | 24 | Δp | 16 | 14,7 | 13,9 | 12,8 | 11,2 |
| 25 | EN-GJS-400-18-LT | 37,5 | Δp | 25 | 23 | 21,8 | 20 | 17,5 |

Valve characteristics



| | | | |
|----|------------------|----|--------|
| 1) | Equal-percentage | 2) | Linear |
|----|------------------|----|--------|

- Intermediate temperatures can be derived by linear interpolation.
- Static load
- DIN EN 12266-1 (P10, P11)
- Test procedure 1 to DIN EN 60534-4

Possible combinations of nominal size and seat diameter

Possible combinations of nominal size and seat diameter

| DN | Seat diameter [mm] | | | | | | | | | | | | | |
|-----|--------------------|---|----|----|----|----|----|----|----|----|----|-----|-----|-----|
| | 4 | 8 | 12 | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | 100 | 125 | 150 |
| 20 | • | • | • | • | • | | | | | | | | | |
| 25 | • | • | • | • | • | • | | | | | | | | |
| 32 | * | * | * | * | • | • | • | | | | | | | |
| 40 | * | * | * | * | * | • | • | • | | | | | | |
| 50 | * | * | * | * | * | * | • | • | • | | | | | |
| 65 | * | * | * | * | * | * | * | • | • | • | | | | |
| 80 | * | * | * | * | * | * | * | * | • | • | • | | | |
| 100 | * | * | * | * | * | * | * | * | * | • | • | • | | |
| 125 | * | * | * | * | * | * | * | * | * | * | • | • | • | |
| 150 | * | * | * | * | * | * | * | * | * | * | * | • | • | • |

Key to the symbols

| Symbol | Description |
|--------|-------------------------|
| • | Standard model |
| * | Available upon request. |

Maximum permissible closing pressures
Spring closes
Actuator data

| Type | PA-N300 | | | | | | PA-N540 | | | | | |
|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Diaphragm area [cm ²] | 300 | 300 | 300 | 300 | 300 | 300 | 540 | 540 | 540 | 540 | 540 | 540 |
| Max. control pressure [bar] | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| Nominal stroke [mm] | 20 | 20 | 20 | 32 | 32 | 32 | 32 | 32 | 32 | 45 | 45 | 45 |
| Spring range [bar] | 0,5-0,8 | 1,1-1,6 | 1,6-2,4 | 0,5-0,9 | 1,1-1,8 | 1,6-2,8 | 0,7-1,0 | 1,4-2,1 | 2,0-3,2 | 0,7-1,2 | 1,4-2,4 | 2,0-3,7 |
| Control pressure required [bar] | 0,9 | 1,7 | 2,5 | 1,0 | 1,9 | 2,9 | 1,1 | 2,2 | 3,3 | 1,3 | 2,5 | 3,8 |
| Actuating force [N] | 1500 | 3300 | 4800 | 1500 | 3300 | 4800 | 3780 | 7560 | 10800 | 3780 | 7560 | 10800 |
| Maximum stroke ⁵⁾ (unmounted) [mm] | 32 | 32 | 32 | 32 | 32 | 32 | 60 | 60 | 60 | 60 | 60 | 60 |

Model with V-rings with spring

 Max. closing pressures in bar⁶⁾ if fluid flow is against the closing direction of the valve disc, and p₂ = 0 bar

| Seat diameter [mm] | | 4 | 8 | 12 | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | 100 | 125 | 150 | | | | | |
|--------------------|--------------------|---------------------------------|---------|-----|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|--|--|
| Stroke [mm] | | 20 | | | | | | 32 | | | | | | 45 | | | | | | |
| PA-N300 | Spring range [bar] | Control pressure required [bar] | 0,5-0,8 | 0,9 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 20,6 | | | | | | | | | | |
| | | | 1,1-1,6 | 1,7 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | | | | | | | | | | |
| | | | 1,6-2,4 | 2,5 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | | | | | | | | | | |
| | | | 0,5-0,9 | 1,0 | | | | | | | 12,4 | 7,7 | 4,7 | 2,4 | 1,4 | 0,7 | | | | |
| | | | 1,1-1,8 | 1,9 | | | | | | | 25,0 | 20,6 | 13,1 | 7,5 | 4,8 | 2,9 | | | | |
| | | | 1,6-2,8 | 2,9 | | | | | | | 25,0 | 25,0 | 20,1 | 11,7 | 7,6 | 4,7 | | | | |
| PA-N540 | Spring range [bar] | Control pressure required [bar] | 0,7-1,0 | 1,1 | | | | | | | 25,0 | 24,1 | 15,3 | 8,8 | 5,7 | 3,5 | | | | |
| | | | 1,4-2,1 | 2,2 | | | | | | | 25,0 | 25,0 | 25,0 | 19,5 | 12,8 | 8,1 | | | | |
| | | | 2,0-3,2 | 3,3 | | | | | | | 25,0 | 25,0 | 25,0 | 25,0 | 18,9 | 12,1 | | | | |
| | | | 0,7-1,2 | 1,3 | | | | | | | | | | | | | 2,1 | 1,3 | | |
| | | | 1,4-2,4 | 2,5 | | | | | | | | | | | | | 3,6 | 3,4 | | |
| | | | 2,0-3,7 | 3,8 | | | | | | | | | | | | | 7,6 | 5,2 | | |

Model with gland packing

 Max. closing pressures in bar⁶⁾⁸⁾ if fluid flow is against the closing direction of the valve disc, and p₂ = 0 bar

| Seat diameter [mm] | | 4 | 8 | 12 | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | 100 | 125 | 150 | | | | | |
|--------------------|--------------------|---------------------------------|---------|-----|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|--|--|
| Stroke [mm] | | 20 | | | | | | 32 | | | | | | 45 | | | | | | |
| PA-N300 | Spring range [bar] | Control pressure required [bar] | 0,5-0,8 | 0,9 | 25,0 | 25,0 | 25,0 | 25,0 | 22,8 | 14,5 | | | | | | | | | | |
| | | | 1,1-1,6 | 1,7 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | | | | | | | | | | |
| | | | 1,6-2,4 | 2,5 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | | | | | | | | | | |
| | | | 0,5-0,9 | 1,0 | | | | | | | 8,5 | 5,2 | 3,0 | 1,2 | 0,5 | 0,2 | | | | |
| | | | 1,1-1,8 | 1,9 | | | | | | | 25,0 | 18,1 | 11,4 | 6,2 | 3,9 | 2,4 | | | | |
| | | | 1,6-2,8 | 2,9 | | | | | | | 25,0 | 25,0 | 18,5 | 10,5 | 6,8 | 4,2 | | | | |
| PA-N540 | Spring range [bar] | Control pressure required [bar] | 0,7-1,0 | 1,1 | | | | | | | 25,0 | 21,5 | 13,7 | 7,6 | 4,9 | 2,9 | | | | |
| | | | 1,4-2,1 | 2,2 | | | | | | | 25,0 | 25,0 | 25,0 | 18,3 | 12,0 | 7,6 | | | | |
| | | | 2,0-3,2 | 3,3 | | | | | | | 25,0 | 25,0 | 25,0 | 25,0 | 18,1 | 11,5 | | | | |
| | | | 0,7-1,2 | 1,3 | | | | | | | | | | | | | 1,7 | 1,0 | | |
| | | | 1,4-2,4 | 2,5 | | | | | | | | | | | | | 3,2 | 3,1 | | |
| | | | 2,0-3,7 | 3,8 | | | | | | | | | | | | | 7,2 | 4,9 | | |

5) Replacement actuators must be pre-loaded to the above spring ranges prior to mounting on site.

6) All values without balanced plug and based on leakage class IV (DIN EN 60534-4).

Air closes
Actuator data

| Type | | PA-N300 | | | | | | PA-N540 | | | | | | |
|---|------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------|
| Diaphragm area [cm ²] | | 300 | 300 | 300 | 300 | 300 | 300 | 540 | 540 | 540 | 540 | 540 | 540 | |
| Max. control pressure [bar] | | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | |
| Nominal stroke [mm] | | 20 | 20 | 20 | 32 | 32 | 32 | 32 | 32 | 32 | 45 | 45 | 45 | |
| Spring range [bar] | | 0,6-0,9 | 1,3-1,8 | 2,0-2,8 | 0,5-0,9 | 1,1-1,8 | 1,6-2,8 | 0,8-1,1 | 1,5-2,2 | 2,2-3,4 | 0,6-1,1 | 1,2-2,2 | 1,7-3,4 | |
| Control air pressure required [bar] | | 1,0 | 1,9 | 2,9 | 1,0 | 1,9 | 2,9 | 1,2 | 2,3 | 3,5 | 1,2 | 2,3 | 3,5 | |
| Actuating force [N] | Control pressure [bar] | 1,3 | 1200 | - | - | 1200 | - | - | 1080 | - | - | 1080 | - | - |
| | | 2 | 3300 | 600 | - | 3300 | 600 | - | 4860 | - | - | 4860 | - | - |
| | | 3 | 6300 | 3600 | 600 | 6300 | 3600 | 600 | 10260 | 4320 | - | 10260 | 4320 | - |
| | | 4 | 9300 | 6600 | 3600 | 9300 | 6600 | 3600 | 15660 | 9720 | 3240 | 15660 | 9720 | 3240 |
| | | 5 | 12300 | 9600 | 6600 | 12300 | 9600 | 6600 | 21060 | 15120 | 8640 | 21060 | 15120 | 7020 |
| | | 6 | 15300 | 12600 | 9600 | 15300 | 12600 | 9600 | 26460 | 20520 | 14040 | 26460 | 20520 | 12420 |
| Maximum stroke ⁷⁾ (unmounted) [mm] | | 32 | 32 | 32 | 32 | 32 | 32 | 60 | 60 | 60 | 60 | 60 | 60 | |

Model with V-rings with spring

 Max. closing pressures in bar⁸⁾ if fluid flow is against the closing direction of the valve disc, and p₂ = 0 bar

| Seat diameter [mm] | | 4 | 8 | 12 | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | 100 | 125 | 150 | |
|--------------------|-------------------------------------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Stroke [mm] | | 20 | | | | | | 32 | | | | | | 45 | | |
| PA-N300 | Control air pressure required [bar] | 1,3 | 25,0 | 25,0 | 25,0 | 25,0 | 24,2 | 15,4 | 9,1 | 5,5 | 3,2 | 1,5 | 0,8 | 0,3 | | |
| | | 2 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 20,6 | 13,1 | 7,5 | 4,8 | 2,9 | | |
| | | 3 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 16,0 | 10,4 | 6,6 | | |
| | | 4 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 24,4 | 16,1 | 10,2 | | |
| | | 5 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 21,8 | 13,9 | | |
| | | 6 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 17,6 | | |
| PA-N540 | Control air pressure required [bar] | 1,3 | | | | | | | 7,8 | 4,7 | 2,7 | 1,2 | 0,6 | 0,2 | - | - |
| | | 2 | | | | | | | 25,0 | 25,0 | 20,4 | 11,9 | 7,7 | 4,8 | 2,9 | 1,9 |
| | | 3 | | | | | | | 25,0 | 25,0 | 25,0 | 25,0 | 17,9 | 11,4 | 7,2 | 4,9 |
| | | 4 | | | | | | | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 18,0 | 11,4 | 7,9 |
| | | 5 | | | | | | | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 24,6 | 15,7 | 10,8 |
| | | 6 | | | | | | | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 19,9 | 13,8 |

Model with gland packing

 Max. closing pressures in bar⁸⁾ if fluid flow is against the closing direction of the valve disc, and p₂ = 0 bar

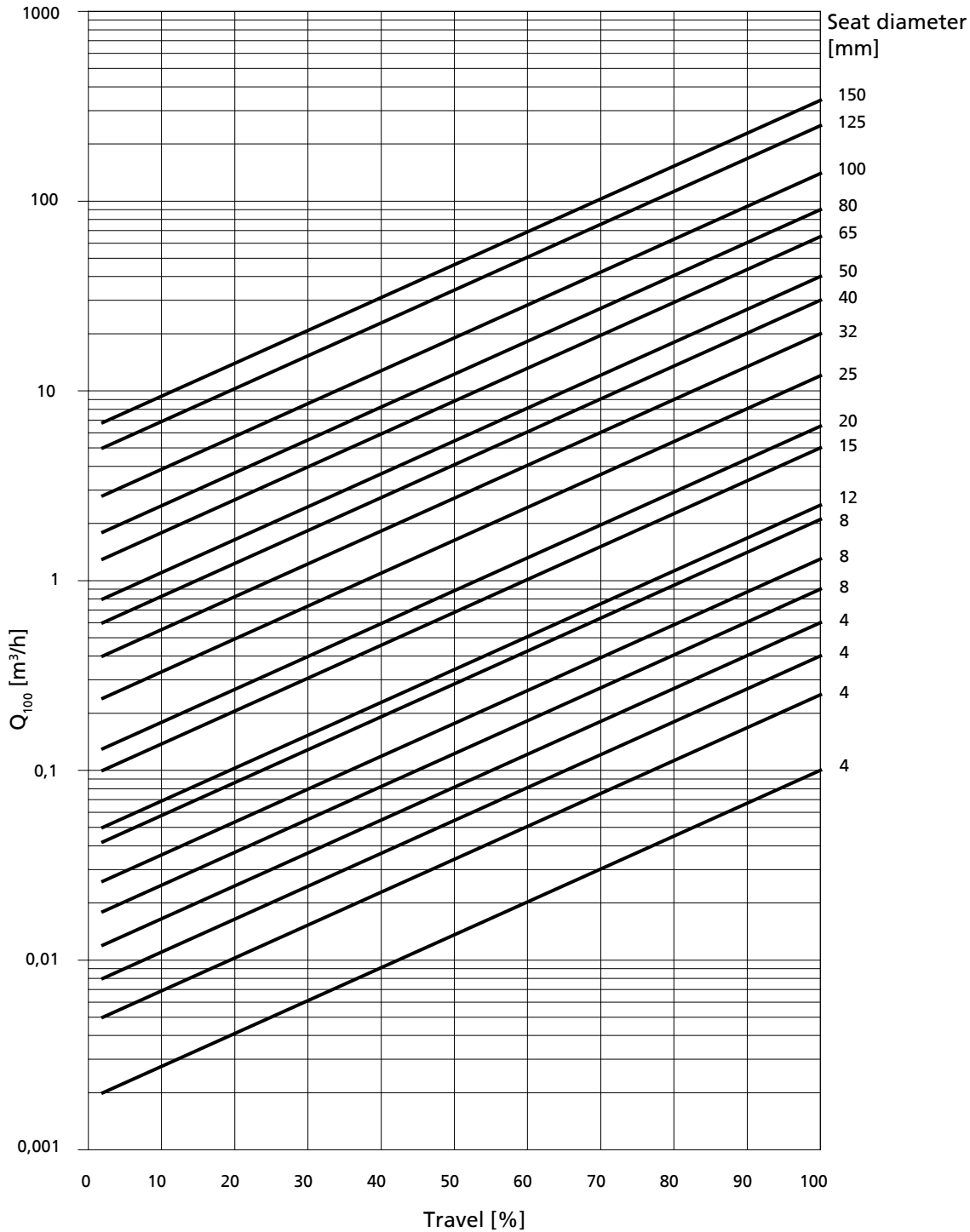
| Seat diameter [mm] | | 4 | 8 | 12 | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | 100 | 125 | 150 | |
|--------------------|-------------------------------------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Stroke [mm] | | 20 | | | | | | 32 | | | | | | 45 | | |
| PA-N300 | Control air pressure required [bar] | 1,3 | 25,0 | 25,0 | 25,0 | 25,0 | 15,0 | 9,3 | 5,3 | 3,0 | 1,6 | 0,3 | - | - | | |
| | | 2 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 18,1 | 11,4 | 6,2 | 3,9 | 2,4 | | |
| | | 3 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 14,7 | 9,6 | 6,0 | | |
| | | 4 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 23,2 | 15,3 | 9,7 | | |
| | | 5 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 21,0 | 13,4 | | |
| | | 6 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 17,0 | | |
| PA-N540 | Control air pressure required [bar] | 1,3 | | | | | | | 3,9 | 2,1 | 1,0 | - | - | - | - | - |
| | | 2 | | | | | | | 25,0 | 25,0 | 18,8 | 10,7 | 6,9 | 4,3 | 2,5 | 1,6 |
| | | 3 | | | | | | | 25,0 | 25,0 | 25,0 | 25,0 | 17,1 | 10,9 | 6,8 | 4,6 |
| | | 4 | | | | | | | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 17,5 | 11,0 | 7,6 |
| | | 5 | | | | | | | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 24,1 | 15,3 | 10,6 |
| | | 6 | | | | | | | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 25,0 | 19,5 | 13,5 |

7) Replacement actuators must be pre-loaded to the above spring ranges prior to mounting on site.

8) All values without balanced plug and based on leakage class IV (DIN EN 60534-4).

Flow characteristics

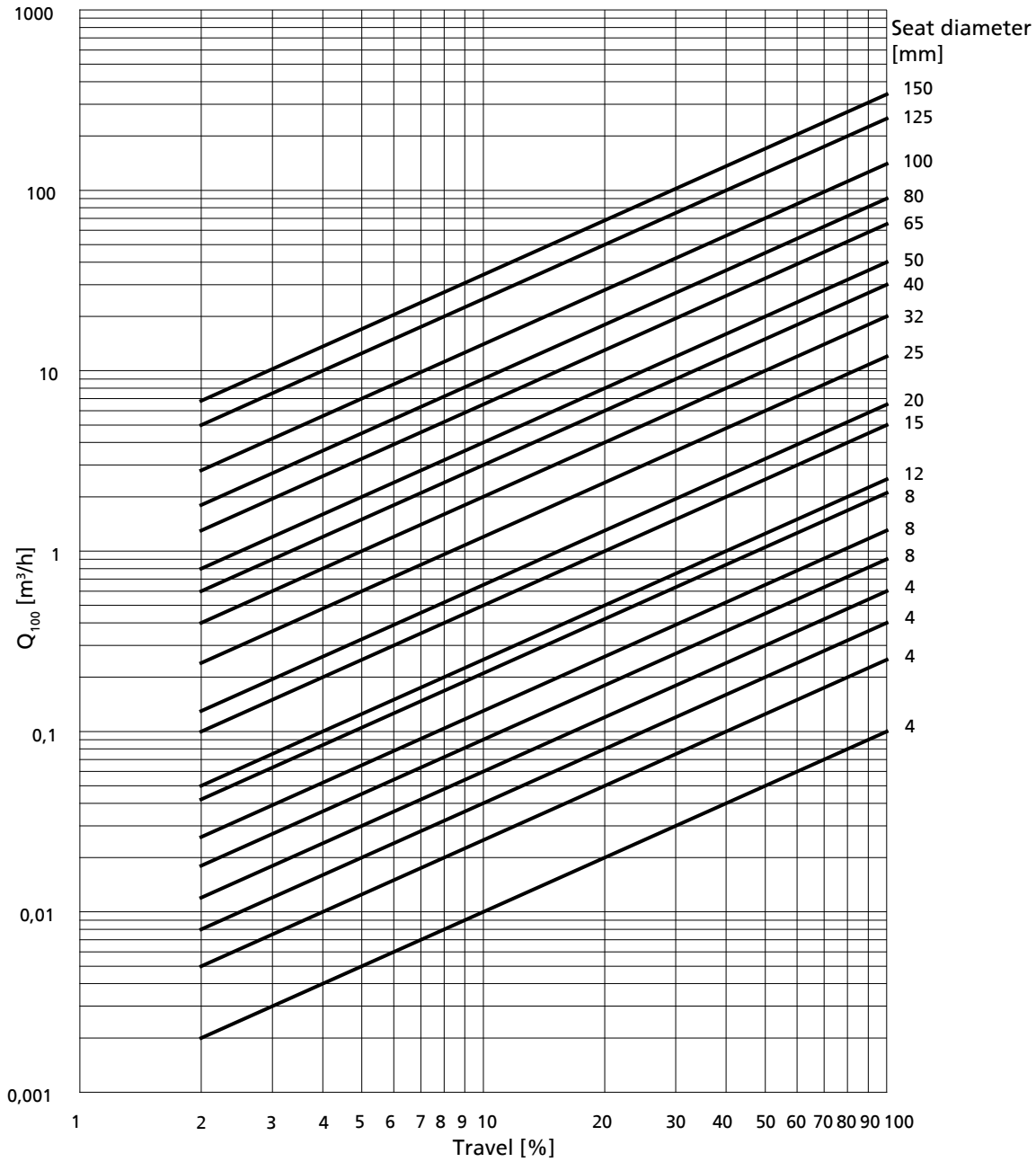
Equal-percentage characteristics, rangeability 50:1



Flow coefficients

| Seat diameter [mm] | 4 | | | | 8 | | | 12 | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | 100 | 125 | 150 |
|--------------------|------|------|------|------|------|------|------|------|----|-----|----|----|----|----|----|----|-----|-----|-----|
| Kvs value [m³/h] | 0,10 | 0,25 | 0,40 | 0,60 | 0,90 | 1,30 | 2,10 | 2,50 | 5 | 6,5 | 12 | 20 | 30 | 40 | 65 | 90 | 140 | 250 | 340 |

Linear characteristics, rangeability 50:1



Flow coefficients

| Seat diameter [mm] | 4 | | | | 8 | | | 12 | 15 | 20 | 25 | 32 | 40 | 50 | 65 | 80 | 100 | 125 | 150 |
|-------------------------------|------|------|------|------|------|------|------|------|----|-----|----|----|----|----|----|----|-----|-----|-----|
| Kvs value [m ³ /h] | 0,10 | 0,25 | 0,40 | 0,60 | 0,90 | 1,30 | 2,10 | 2,50 | 5 | 6,5 | 12 | 20 | 30 | 40 | 65 | 90 | 140 | 250 | 340 |

Technical data
Technical data - control valve

BOA-CVP H

| | |
|----------------------|--|
| Nominal pressure | PN 16, PN 25 |
| Valve characteristic | Equal-percentage, linear |
| Leakage class | IV: 0.01 % of k_{vs} value to DIN EN 60534-4 VI (optional): to DIN EN 60534-4 |
| Permissible pressure | 16 bar, 25 bar |
| Flanged ends | PN 16 and PN 25 to DIN EN 1092-2 |
| Fluid temperature | -10 to +350 °C |

Technical data - actuators

Actuators

| Type | PA-N300 | PA-N540 |
|-----------------------------------|---|---------|
| Diaphragm area [cm ²] | 300 | 540 |
| Max. control pressure [bar] | 6 | 6 |
| Total volume [l] | 1,0 | 3,7 |
| Stroke volume [l] | 0,6 | 2,2 |
| Air connection | NPT 1/4 | NPT 1/2 |
| Weight without handwheel [kg] | 13 | 32 |
| Weight with handwheel [kg] | 16 | 51 |
| Ambient temperature | -30 to +80 °C ⁹⁾ | |
| Working principle | Spring closes or spring opens (as required) | |

The maximum operating pressure of the actuators is 6 bar.

For trouble-free operation, the control air (6 bar max.) required for actuation should meet the following requirements:

- Instrument air quality to DIN ISO 8573.1 with a maximum particle size of 5 µm, a max. particulate concentration of 5 mg/m³ and Quality Class 3.
- Water content: max. dew point 2 °C (Quality Class 4); a different dew point applies if the actuator is operated at a high-altitude site or at low ambient temperatures.
- Oil content: max. 25 mg of oil in 1 m³ of air (Quality Class 5) to DIN ISO 8573.1. If the actuator is operated at temperatures below 0 °C, dry control air must be used.

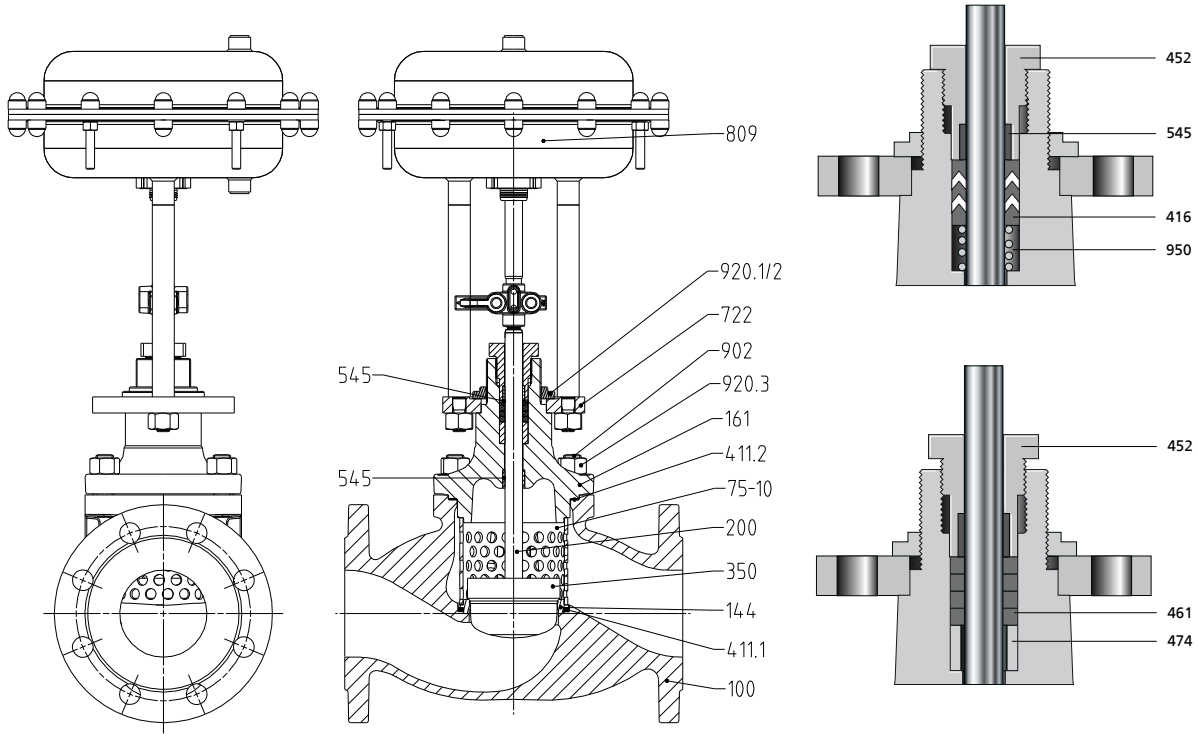
Contact the manufacturer if other control air qualities or special control media are to be used.

Requirements on ambient air:

- The actuators comply with category C2 to DIN EN 12944-2.
- Contact the manufacturer if the actuators are to be used in an aggressive ambient atmosphere.

⁹⁾ The temperature is limited by the materials of the diaphragm and sealing elements.

Materials

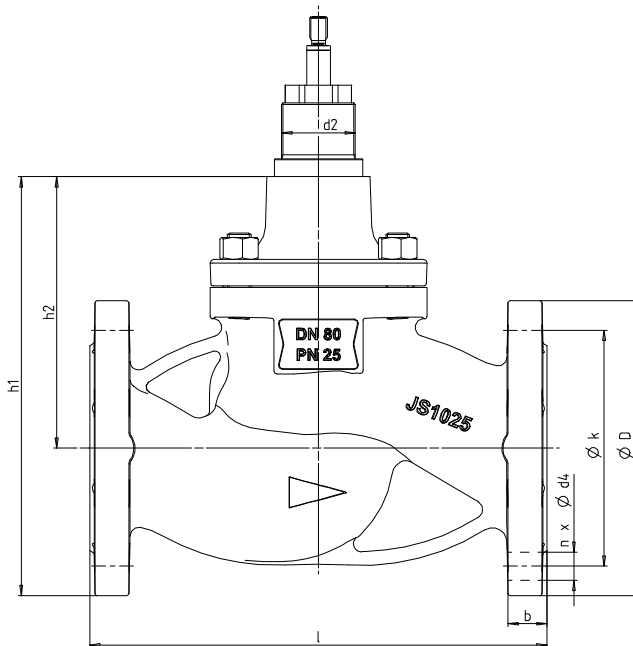


Overview of available materials

| Part No. | Description | Material | Material number |
|----------|---------------------|-------------------|-----------------|
| 100 | Body | EN-GJS-400-18-LT | JS 1025 |
| 144 | Seat | X6CrNiMoTi17-12-2 | 1.4571 |
| 161 | Bonnet | EN-GJS-400-18-LT | JS 1025 |
| 200 | Stem | X6CrNiMoTi17-12-2 | 1.4571 |
| 350 | Valve disc | X6CrNiMoTi17-12-2 | 1.4571 |
| 411.1 | Seat gasket | Pure graphite | |
| 411.2 | Bonnet gasket | CrNiSt/graphite | |
| 416 | V-rings with spring | Carbon PTFE | |
| 452 | Gland follower | X5CrNi18-10 | 1.4301 |
| 461 | Gland packing | Graphite | |
| 474 | Thrust ring | X5CrNi18-10 | 1.4301 |
| 545 | Bearing bush | Sint A50 | |
| 75-10 | Multi-hole cage | X5CrNi18-10 | 1.4301 |
| 722 | Top flange | Steel | |
| 809 | Actuator | | |
| 902 | Stud | 21CrMoV5-7 | 1.7709 |
| 920.1 | Hexagon nut | Galvanised steel | |
| 920.2 | Keywayed nut | Galvanised steel | |
| 920.3 | Hexagon nut | 25CrMo4 | 1.7218+QT+A2D |
| 950 | Spring | X5CrNi18-10 | 1.4301 |

Dimensions

Dimensions of BOA-CVP H control valve



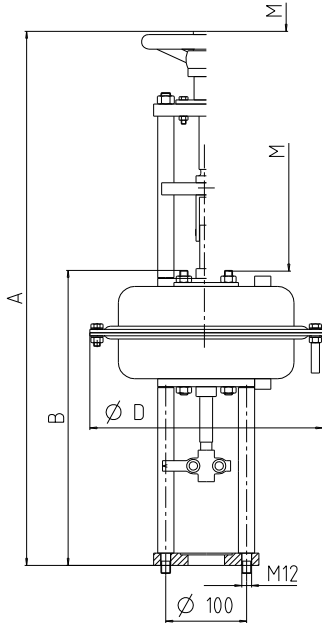
Dimensions in mm

| PN | DN | l | h ₁ | h ₂ | d ₂ | D | b | k | n | d ₆ | [kg] |
|-----|-----|-------|----------------|----------------|----------------|-----|-----|-----|----|----------------|------|
| 16 | 20 | 150 | 153,5 | 101,0 | M39 | 105 | 16 | 75 | 4 | 14 | 6,3 |
| | 25 | 160 | 164,5 | 107,0 | M39 | 115 | 16 | 85 | 4 | 14 | 6,9 |
| | 32 | 180 | 216,0 | 146,0 | M39 | 140 | 18 | 100 | 4 | 19 | 10,4 |
| | 40 | 200 | 226,0 | 151,0 | M39 | 150 | 18 | 110 | 4 | 19 | 11,6 |
| | 50 | 230 | 227,0 | 144,5 | M39 | 165 | 20 | 125 | 4 | 19 | 13,8 |
| | 65 | 290 | 272,5 | 180,0 | M50 | 185 | 20 | 145 | 4 | 19 | 22,3 |
| | 80 | 310 | 284,0 | 184,0 | M50 | 200 | 22 | 160 | 8 | 19 | 28,4 |
| | 100 | 350 | 328,0 | 218,0 | M50 | 220 | 24 | 180 | 8 | 19 | 38,4 |
| | 125 | 400 | 384,5 | 259,5 | M50 | 250 | 26 | 210 | 8 | 19 | 60,5 |
| 25 | 150 | 480 | 403,5 | 261,0 | M50 | 285 | 26 | 240 | 8 | 23 | 83,0 |
| | 20 | 150 | 153,5 | 101,0 | M39 | 105 | 16 | 75 | 4 | 14 | 6,3 |
| | 25 | 160 | 164,5 | 107,0 | M39 | 115 | 16 | 85 | 4 | 14 | 6,9 |
| | 32 | 180 | 216,0 | 146,0 | M39 | 140 | 18 | 100 | 4 | 19 | 10,4 |
| | 40 | 200 | 226,0 | 151,0 | M39 | 150 | 18 | 110 | 4 | 19 | 11,6 |
| | 50 | 230 | 227,0 | 144,5 | M39 | 165 | 20 | 125 | 4 | 19 | 13,8 |
| | 65 | 290 | 272,5 | 180,0 | M50 | 185 | 20 | 145 | 8 | 19 | 22,3 |
| | 80 | 310 | 284,0 | 184,0 | M50 | 200 | 22 | 160 | 8 | 19 | 32,4 |
| | 100 | 350 | 335,5 | 218,0 | M50 | 235 | 24 | 190 | 8 | 23 | 42,4 |
| 125 | 400 | 394,5 | 259,5 | M50 | 270 | 26 | 220 | 8 | 23 | 67,5 | |
| 150 | 480 | 411,0 | 261,0 | M50 | 300 | 26 | 250 | 8 | 23 | 91,5 | |

Mating dimensions - Standards

Face-to-face lengths: EN 558-1/1, ISO 5752/1
 Flanges: DIN EN 1092-2, flange type 21-2
 Flange facing: DIN EN 1092-2, type B

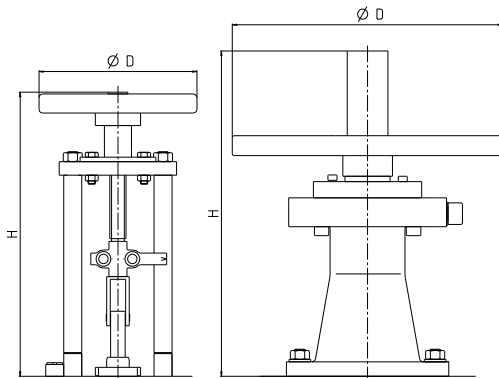
Dimensions of PA-N300 and PA-N540 pneumatic actuators



Dimensions in mm

| Type | A | B | D | M ¹⁰⁾ |
|---------|-----|-----|-----|------------------|
| PA-N300 | 656 | 347 | 284 | 600 |
| PA-N540 | 865 | 534 | 380 | 600 |

Dimensions of emergency handwheel



Dimensions in mm

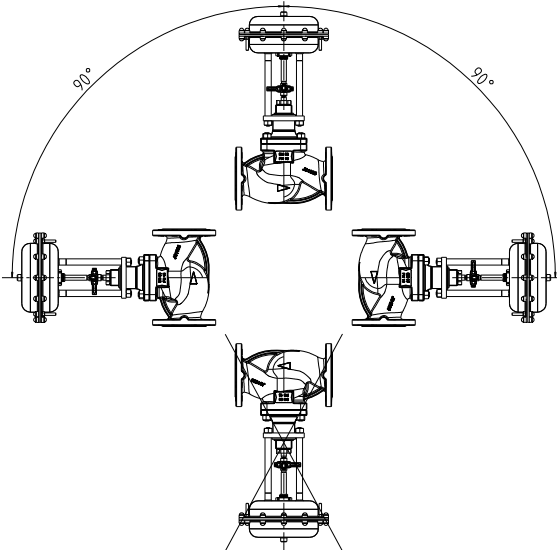
| Actuator type | PA-N300 | PA-N540 |
|---------------|---------|---------|
| H | 315 | 361 |
| D | 175 | 300 |
| [kg] | 3 | 19 |

¹⁰⁾ Min. clearance for removal

Installation instructions

- Flow through BOA-CVP H control valves must comply with the flow direction arrow. An alternating direction of flow is permissible; however, if fluid flow does not comply with the flow direction arrow on the valve body, the actual throughflow will be lower than the maximum throughflow indicated on the name plate.
- Recommendation: A strainer fitted upstream of the valve will further enhance the valve's functional reliability.

Installation positions:



If the valve is installed in inclined position, the actuator must be mounted with the actuator pillars positioned to offer the maximum moment of resistance. If the valve is installed 30° or more off the vertical it is recommended to support the actuator's weight. This is particularly important if piping-induced vibrations are to be expected.

Further installation instructions

Electrical connection must be effected in accordance with the applicable local regulations for electrical installations and the equipment wiring and/or terminal plans.

The safety instructions and requirements for the protection of persons and equipment must always be complied with.

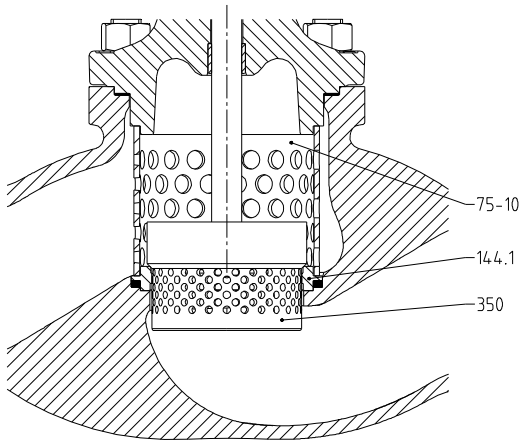
The permissible temperatures must be complied with (⇒ Page 10).

Service work on the actuator:

Switch off the pump and disconnect the power supply. Close the pipeline's shut-off valve, release the pressure in the piping and let the system cool down. Disconnect the electrical connections from the terminals.

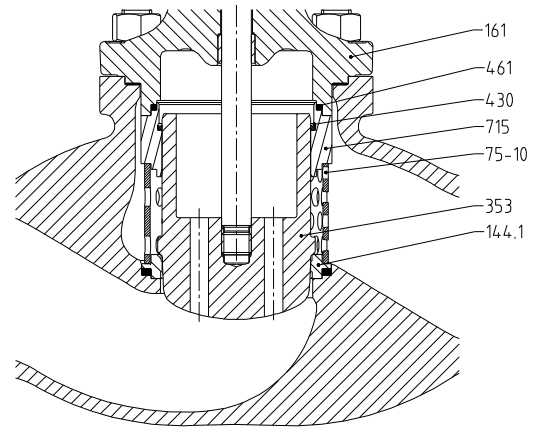
Variants

Anti-cavitation design



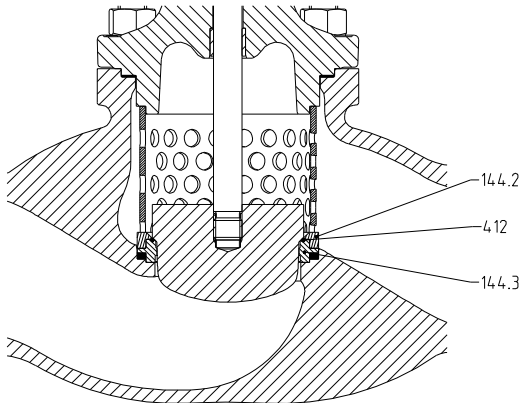
On this design variant, the fluid flow approaches the valve disc in closing direction. The perforated plug (350), which defines the required characteristic curve, is guided in the seat (144.1). The bubbles implode inside the perforated plug (350), so that cavitation damage is avoided. This design variant is mainly used for liquid fluids and high differential pressures.

Balanced plug



A balanced plug (353) is required if the differential closing pressures are exceeded on globe valves of DN65 or higher. The balanced plug is guided like a piston in the guide tube (715). Owing to the holes in the base of the balanced plug, the pressure also acts on the rear side of the plug, which minimises the forces acting on the plug. Sealing in the guide tube is effected by a U-ring (430) and packing ring (461).

Seat with PTFE ring



On valves designed for leakage class VI, sealing of the seat/disc interface is effected by means of a PTFE O-ring (412) held in its recess by the lower seat component (144.3) and the upper seat component (144.2).

Overview of actuator models

The pneumatic actuators are directly mounted on the control valves. They are particularly suitable for regulating systems in the chemical industry. They provide high actuating forces at short actuating times. The springs will also move the actuator to a fail-safe position in the event of a control pressure failure.

Function and working principle

By means of the pneumatic actuator, pneumatic control signals are converted into a linear stem movement. The return force

required is provided by the compression springs arranged on the diaphragm plate. If the air supply should fail, the spring force will return the actuator to its original position.

The actuator's working principle - spring opens/air closes (NO) or spring closes/air opens (NC) - is determined by the way the springs are fitted. The working principle can also be changed on actuators already in situ, with simple tools and without any additional parts.

Actuator variants and accessories

- Electro-pneumatic positioner
- Pressure gauge block
- IY module
- Alarm module
- Limit switch (inductive, 3-wire)
- Limit switch (mechanical)
- 3/2-way solenoid valve, G 1/2"
- 3/2-way solenoid valve, G 1/4"
- Air filter/reducing station without pressure gauge G 1/2"
- Air filter/reducing station without pressure gauge G 1/4"
- Emergency handwheel

| | |
|---------------------|----------------------------------|
| Siemens SIPART-PS 2 | Input signal 4-20 mA |
| Siemens | 2 pressure gauges |
| Siemens | Output signal 4-20 mA |
| Siemens | 3 alarm outputs / 1 binary input |
| Schneider Electric | XS4P12PA340 |
| Schneider Electric | XCKP2102P16 |
| Hecomatic | 230 VAC, 50 Hz |
| Hecomatic | 24 VAC, 50 Hz |
| Hecomatic | FR 14 S |
| Hecomatic | FR 12 S |

Specification sheet for valve selection
Operating data

| | | | | | |
|---------------------------------------|--------------|--------|--|---|--|
| Point of control | Control task | | | Potentially explosive atmosphere (zone) | |
| Ambient temperature | [°C] | Max. | | Min. | |
| Max. permissible sound pressure level | [dB(A)] | | | | |
| Pipe | - | DN | | PN | |
| Fluid handled | - | | | | |
| State when entering valve | - | Liquid | | Steam | |
| | - | Gas | | | |

Process data

| | | Min. | Normal | Max. |
|-----------------------------------|---------|------|--------|------|
| Volume flow rate (liquid) | [m³/h] | | | |
| Mass flow rate (gas/steam) | [kg/h] | | | |
| Inlet temperature | [°C] | | | |
| Inlet pressure (a) p1 | [bar] | | | |
| Outlet pressure (a) p2 | [bar] | | | |
| Inlet density | [kg/m³] | | | |
| Kinematic viscosity | [cSt] | | | |

Valve data

| | | | | | |
|---------------------------------------|-----------------|---|--|-------------------|--|
| Flow direction | - | Δp opens | | Δp closes | |
| Nominal size, nominal pressure | - | DN | | PN | |
| Line connection/Pattern | - | Straight-way pattern, raised-face flange, type B (DIN 1092-2) | | | |
| Body/bonnet material | - | Nodular cast iron EN-GJS-400-18-LT | | | |
| Characteristic | - | Linear | | Equal-percentage | |
| Selected flow coefficient | k_{v_3} value | | | | |
| Seat/disc diameter | [mm] | | | | |
| Packing material | - | PTFE | | Graphite | |
| Leakage class (DIN EN 60534-4) | - | IV | | VI | |

Actuator data

| | | | | | |
|--|-------|--|-----|--------------------|--|
| Δp closes (actuator selection) | [bar] | | | | |
| Working principle | | Spring opens (NO) | | Spring closes (NC) | |
| Control pressure | [bar] | | | | |
| Electro-pneumatic positioner | | <input type="checkbox"/> Sipart PS2 2-wire 4-20 mA | | | |
| Additional modules integrated in the unit | | <input type="checkbox"/> IY module for actual-position feedback, 4-20 mA | | | |
| | | <input type="checkbox"/> Alarm module for 3 alarm outputs and 1 binary input | | | |
| Supplementary equipment | | <input type="checkbox"/> Pressure gauge block (with two pressure gauges) | | | |
| | | <input type="checkbox"/> Filter/reducing station | | | |
| | | 3/2-way solenoid valve | | | |
| | | 230 V | | 24 V | |
| | | Mechanical limit switch | | | |
| | | 1 x | | 2 x | |
| | | Inductive limit switch | | | |
| | 1 x | | 2 x | | |

The pneumatic actuators are standard-supplied with tubing.
Piping and add-on parts from specific manufacturers on request.

The data in bold is mandatory in all RFQs.



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