SCHUBERT & SALZER
CONTROL SYSTEMS

# Ball Sector Technology by Schubert & Salzer

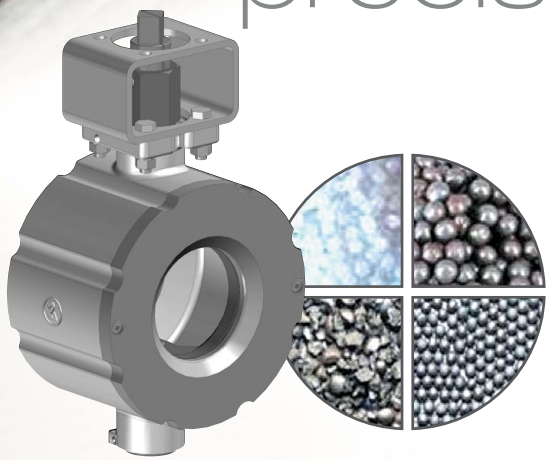
robust

# Ball Sector Valves

The Ball Sector Valve especially designed to handle arduous duties, slurries and viscous fluids is suitable for control and isolation.

With pneumatic and electrical actuators, it is the best choice for very precise control in for example the paper, steel, chemical, food and effluent industries.

precise



efficient

# Technical Information

| | | |
|---|---|---|
| Design | | Flangeless, wafertype (DN 300 flanged) |
| Nominal sizes | | DN 25 up to DN 300 |
| Body material | Cast parts<br>Turned parts | 1.4408 (CF8M)<br>1.4404 (316L) |
| Bearing material | | High temperature plain bearing |
| Cutting site to the actuator | | Mounting kit DIN/ISO 5211 |
| Nominal pressure | DN 25 - DN 50<br>DN 80 - DN 100<br>DN 150 - DN 300 | PN40 (for flanges PN 10 - PN 40), ANSI300, ANSI150<br>PN25 (for flanges PN 10 - PN 25), ANSI150<br>PN16 (for flanges PN 10 - PN 16), ANSI150<br>Other pressure ranges on request |
| Fluid temperature | | -60°C up to +230°C according to the sealing |
| Ambient temperature | | -40°C up to +100°C according to the actuator |
| Characteristic | | Modified equal percentage |
| Rangeability | | 300:1 |

# Valve Sizes, $K_{VS}$-Values, Torques

| DN | $K_{VS}$ | Hole mm | Rotation angle nominal | Pressure nominal DIN | Max. press. nominal ANSI | Req. torque (Nm) on/off-operation | Req. torque (Nm) control operation | Standard mounting kit DIN/ISO |
|---|---|---|---|---|---|---|---|---|
| 25 | 12,5 (50%) | 15 | 65° | PN40 | ANSI 300 | 15 | 25 | F05/SW14 |
| 25 | 21 (100%) | 19 | 90° | PN40 | ANSI 300 | 15 | 25 | F05/SW14 |
| 40 | 34 (50%) | 25 | 60° | PN40 | ANSI 300 | 30 | 50 | F05/SW14 |
| 40 | 64 (100%) | 32 | 90° | PN40 | ANSI 300 | 30 | 50 | F05/SW14 |
| 50 | 94 | 40 | 90° | PN40 | ANSI 300 | 30 | 50 | F05/SW14 |
| 80 | 255 | 64 | 90° | PN25 | ANSI 150 | 60 | 100 | F07/SW17 |
| 100 | 390 | 80 | 90° | PN25 | ANSI 150 | 90 | 150 | F07/SW17 |
| 150 | 810 | 120 | 90° | PN16 | ANSI 150 | 150 | 250 | F10/SW22 |
| 200 | 1365 | 155 | 90° | PN16 | ANSI 150 | 210 | 350 | F10/SW27 |
| 250 | 2220 | 195 | 90° | PN16 | ANSI 150 | 360 | 600 | F12/SW27 |
| 300 | 3840 | 250 | 90° | PN16 | ANSI 150 | 900 | 1500 | F14/SW36 |

# Working Pressure max.

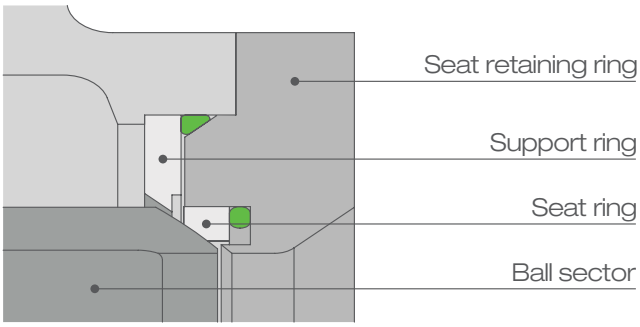
| Nominal size | Maximum differential pressure (Δp) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Seat ring PTFE | | | Seat ring PEEK | | | | Seat ring Stellite | | |
| DN | up to 80°C bar | 120°C bar | 170°C bar | up to 80°C bar | 120°C bar | 170°C bar | 220°C bar | up to 80°C bar | 170°C bar | 230°C bar |
| 25 - 50 | 25 | 16 | 6 | 40 | 40 | 25 | 16 | 40 | 40 | 25 |
| 80 - 100 | 16 | 12 | 5 | 25 | 25 | 16 | 10 | 25 | 25 | 16 |
| 150 - 300 | 16 | 12 | 4 | 16 | 16 | 12 | 8 | 16 | 16 | 12 |

# Shaft Seals (O-Ring)

| | Min. temp (°C) | Max. temp (°C) |
|---|---|---|
| Viton (standard) | -10 | 170 |
| EPDM | -20 | 135 |
| FEP-Viton | -20 | 200 |
| PFA-Silicone* | -60 | 230 |

* from DN 80

Special material on request

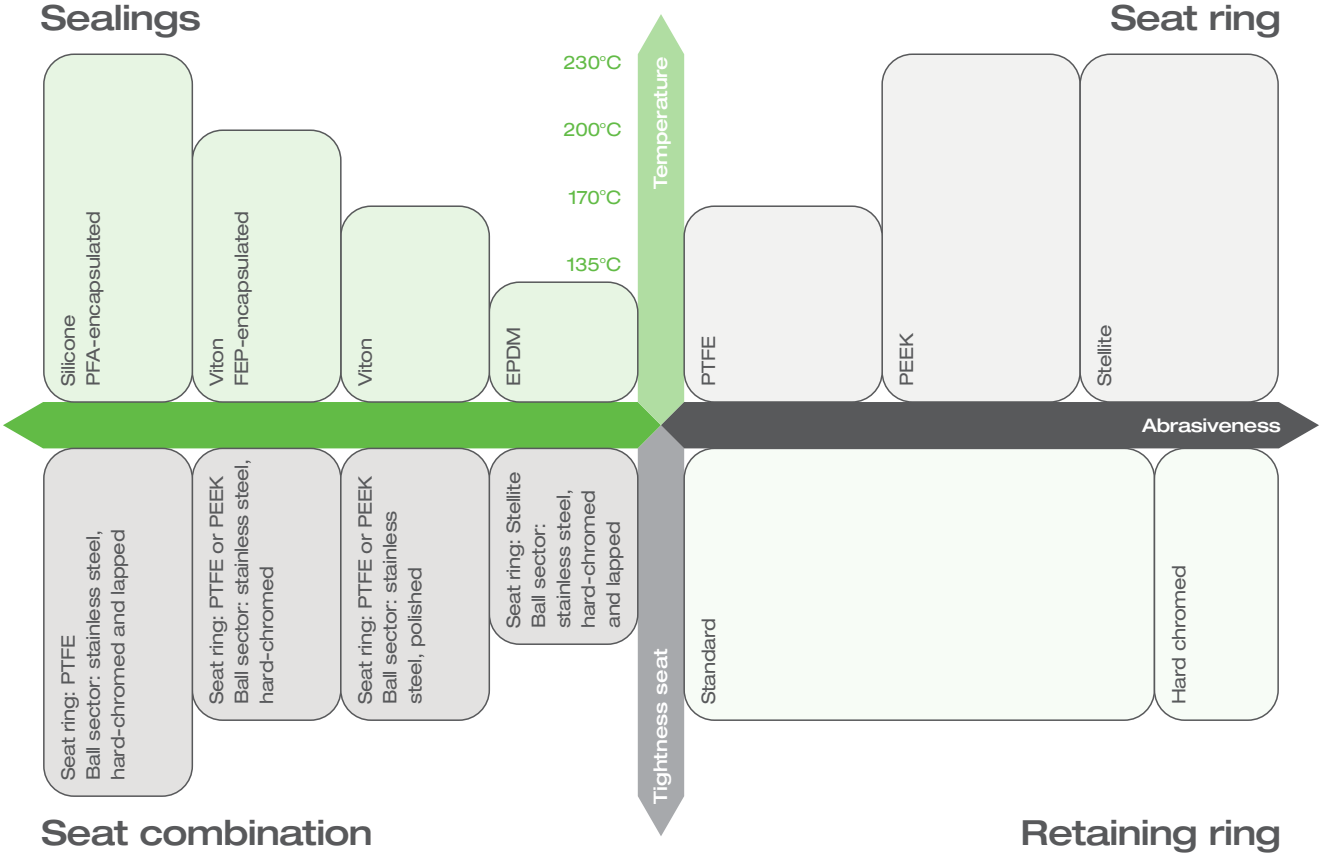



# Valve Seat Combinations

| Seat ring | Ball sector | Leakage | Min. temp (°C)* |
|---|---|---|---|
| PTFE | Stainless steel polished | $5 \times 10^{-7}$ from max. $K_{VS}$ | -60 up to +170°C |
| PEEK | Stainless steel polished | $5 \times 10^{-7}$ from max. $K_{VS}$ | -60 up to +220°C |
| PTFE | Stainless steel, hard chrome plated | $5 \times 10^{-7}$ from max. $K_{VS}$ | -60 up to +170°C |
| PEEK | Stainless steel, hard chrome plated | $5 \times 10^{-7}$ from max. $K_{VS}$ | -60 up to +220°C |
| Stellite | Stainless steel, hard chrome plated and lapped | Class IV-S1 acc. EN 1349 (IEC 534-4)<br>$5 \times 10^{-6}$ from max. $K_{VS}$ | -60 up to +230°C |
| PTFE | Stainless steel, hard chrome plated and lapped | Class VI acc. EN 1349 (IEC 534-4) | -60 up to +170°C |

* Please note the restrictions of the o-ring material!

# Material Selection Matrix



# The Details That Matter

Compact top mount Schubert & Salzer digital positioner with close toleranced coupling

Visual position indication

Wide range of accessories available, mounting to NAMUR standard

PA or stainless steel tubing

Pneumatic actuator (double or single acting) or motor actuator mounting to DIN/ISO 5211

Adjustable travel stops


Mounting kit according to DIN/ISO 5211

Close toleranced coupling to ensure precise positioning and repeatability

Wafer body designed to suit ANSI or DIN standards up to DN 250 (DN 300 with flanges)

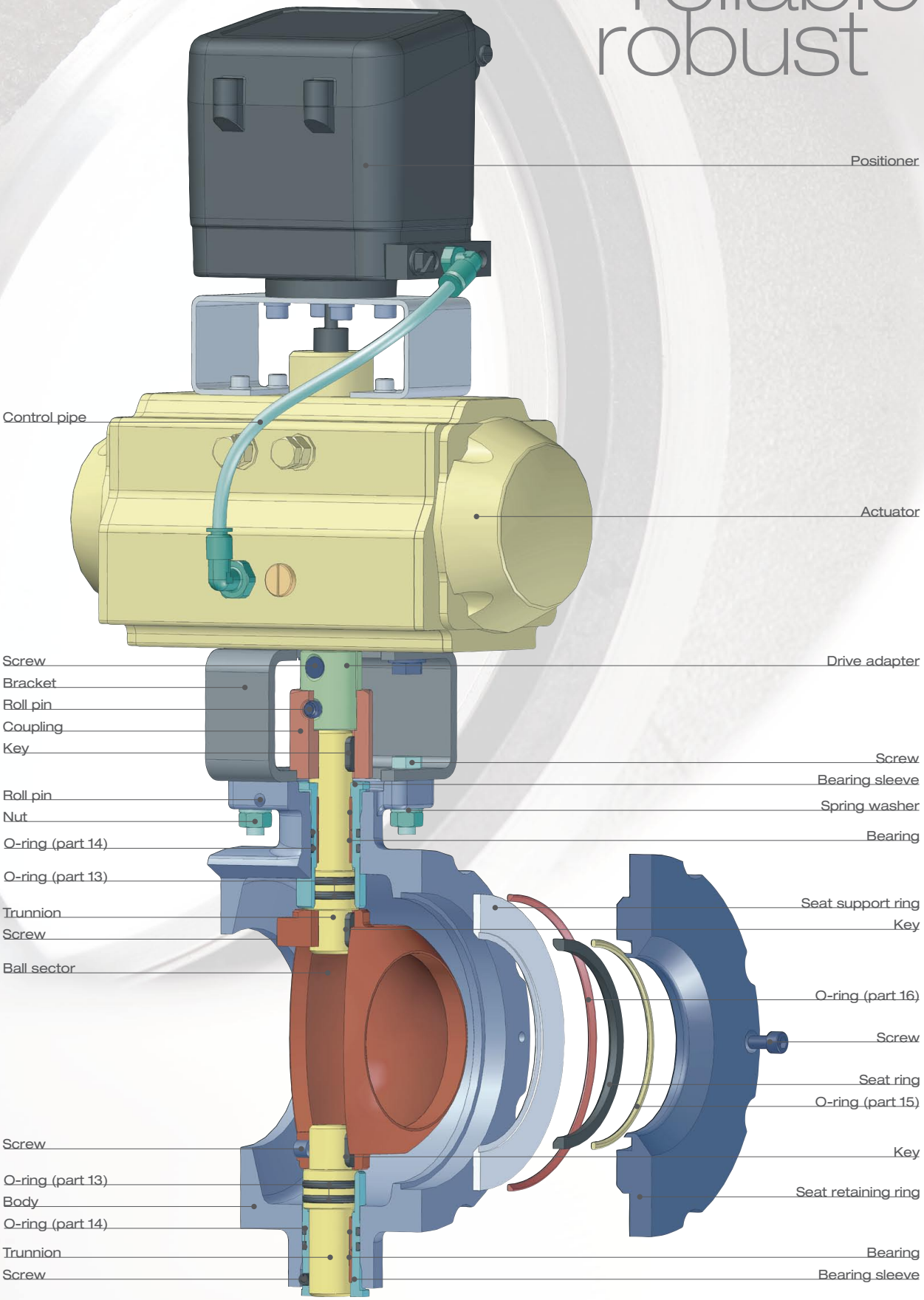
Ball sector optional with hardened surface treatments for demanding media and equal percentage flow characteristic with rangeability of 300:1

Centric and maintenance-free, high temperature bearings

Seat retaining ring and valve seat available in various material combinations; easy to install and maintain

# Ball Sector Valve 4040 - Sectional Drawing

precise
reliable
robust

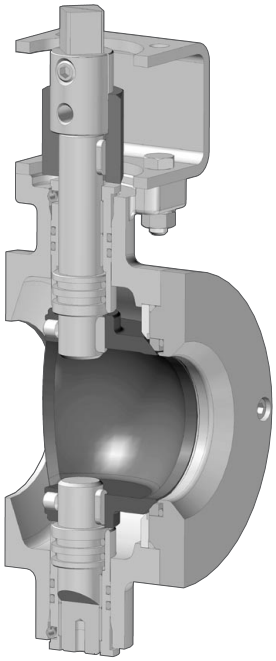


# Construction and Benefits

### General Construction

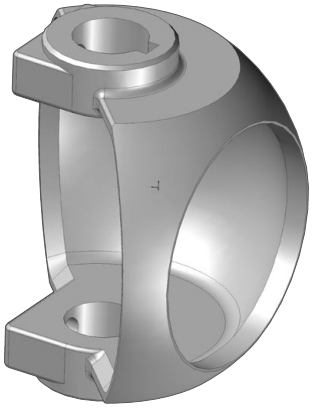
Ball Sector Valves type **4040** and **4030** provide outstanding performance in challenging applications.

In a closed position conventional butterfly and ball segment valves expose their critical sealing components to the highest wear in the valve (see picture below). In order to avoid abrasion caused leakage the Ball Sector Valve facilitates sealing through less exposed areas of the ball sector. The design of the valve opening protects the sealing areas from wear by reduced exposure to flow velocities and thus increases life span. Twin sealed trunnion shafts protect the bearing against intrusion of media particles.



### Wear Resistance

Generally ball segment or rotary globe valves use excentric shaft, which cause the ball or plug to lift up from the valve seat when starting to open. Thus, sealing areas are instantly exposed to permanent wear. Moreover, particles get between seal ring and ball/plug, where they cause damage leading to leakage. The Ball Sector Valve has centric and robust trunnions which allows the ball sector to maintain constant contact with the valve seat, eliminating contamination by the media. The permanent actuation torque is not affected by changes in the differential pressure.

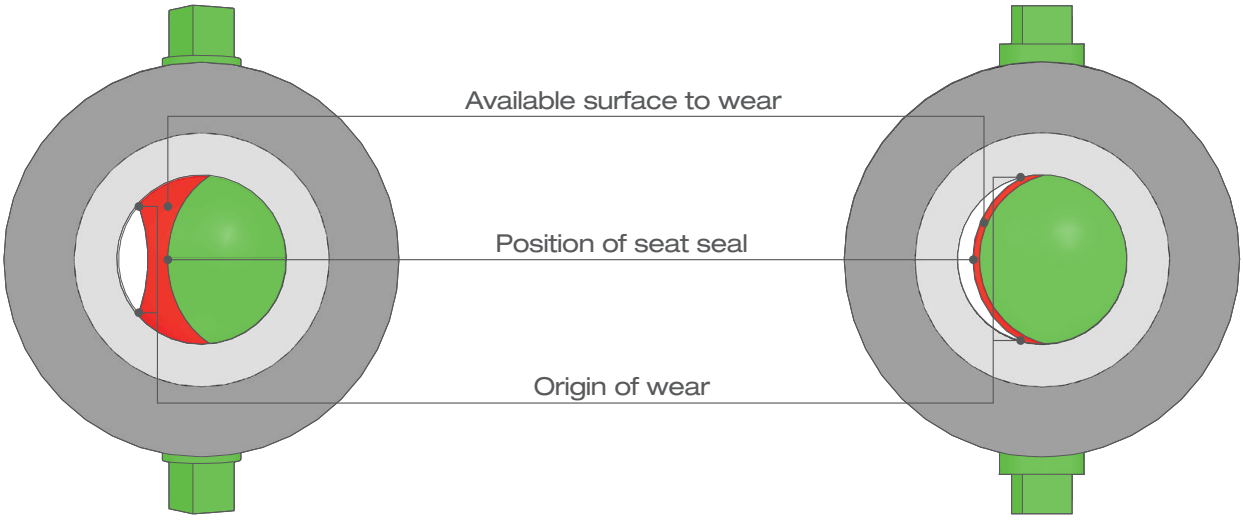


### Life Span

This smart seal design, combined with a variety of finishing degrees for ball sector and valve seat increases the life span of the valve substantially over butterfly valves or alike. It is therefore particularly suitable for abrasive, high viscosity or fiber containing media.

**Schubert & Salzer Ball Sector Valve**

**Ball Segment, Rotary Globe and Butterfly Valve**



# Ordering System Ball Sector Valve 4040

| Ordering number: | 4040/ | | | | | | | | M | | | | | Z | ... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Size**

| | |
|---|---|
| e.g. DN 25 = 025 | xxx |

**Article**

| | |
|---|---|
| Valve | V |
| Repair-kit | R |
| Seat kit | D |

**Connection**

| | |
|---|---|
| Flangeless design according DIN EN 1092-1 | 1 |
| Flangeless design according ASME B 16.5, ANSI 150 | E |
| Flangeless design according ASME B 16.5, ANSI 300 | F |

**Body material**

| | |
|---|---|
| Stainless steel 1.4408 (CF8M) / 1.4404 | 1 |

**Material combination**

| | |
|---|---|
| Seat ring: PTFE; ball sector: 1.4408, polished | 1 |
| Seat ring: PTFE; ball sector: 1.4408, hard chrome plated | A |
| Seat ring: Stellite; ball sector: 1.4408, hard chrome plated and lapped | B |
| Seat ring: Stellite; ball sector: 1.4408, hard chrome plated and lapped; holding ring: hard chromed | C |
| Seat ring: PTFE; ball sector: 1.4408, hard chrome plated and lapped | E |
| Seat ring: TECAPEEK; ball sector: 1.4408, hard chrome plated | P |

**Seal combination**

| | |
|---|---|
| FV3: dynamic seals (part 13): VITON, FEP-coated; static seals (parts 14-16): VITON | 0 |
| FE3: dynamic seals (part 13): VITON, FEP-coated; static seals (parts 14-16): EPDM | E |
| F4: all seals (parts 13-16): VITON, FEP-coated | F |
| P4: all seals (parts 13-16): in PFA-coated silicone | P |

**Actuator**

| | |
|---|---|
| Without mounting kit, without actuator | 0 |
| Without actuator, with standard mounting kit according DIN/ISO 5211 | 1 |
| Pneumatic quarter-turn actuator with mounting kit according DIN/ISO 5211 | T |
| Hand lever | H |

**Safety position**

| | |
|---|---|
| Without | 0 |
| Single acting, spring to close | 1 |
| Double acting, without safety position | 2 |
| Single acting, spring to open | 3 |

**Positioner**

| | |
|---|---|
| Without | - |
| Without positioner, with mounting kit according VDI/VDE 3845 for positioners | 0 |
| Digital positioner Schubert & Salzer Type 8049, 4-wire | L |
| Digital positioner Schubert & Salzer Type 8049, 2-wire | R |
| i/p-positioner SIPART PS2 | 2 |
| i/p-positioner PMV Type EP5 | 8 |

**Additional specifications for the positioner**

| | |
|---|---|
| Without | - |
| Positioner single acting | 1 |
| Positioner double acting | 2 |
| Positioner single acting with gauge | 3 |
| Positioner double acting with gauge | 4 |

**Positioner settings**

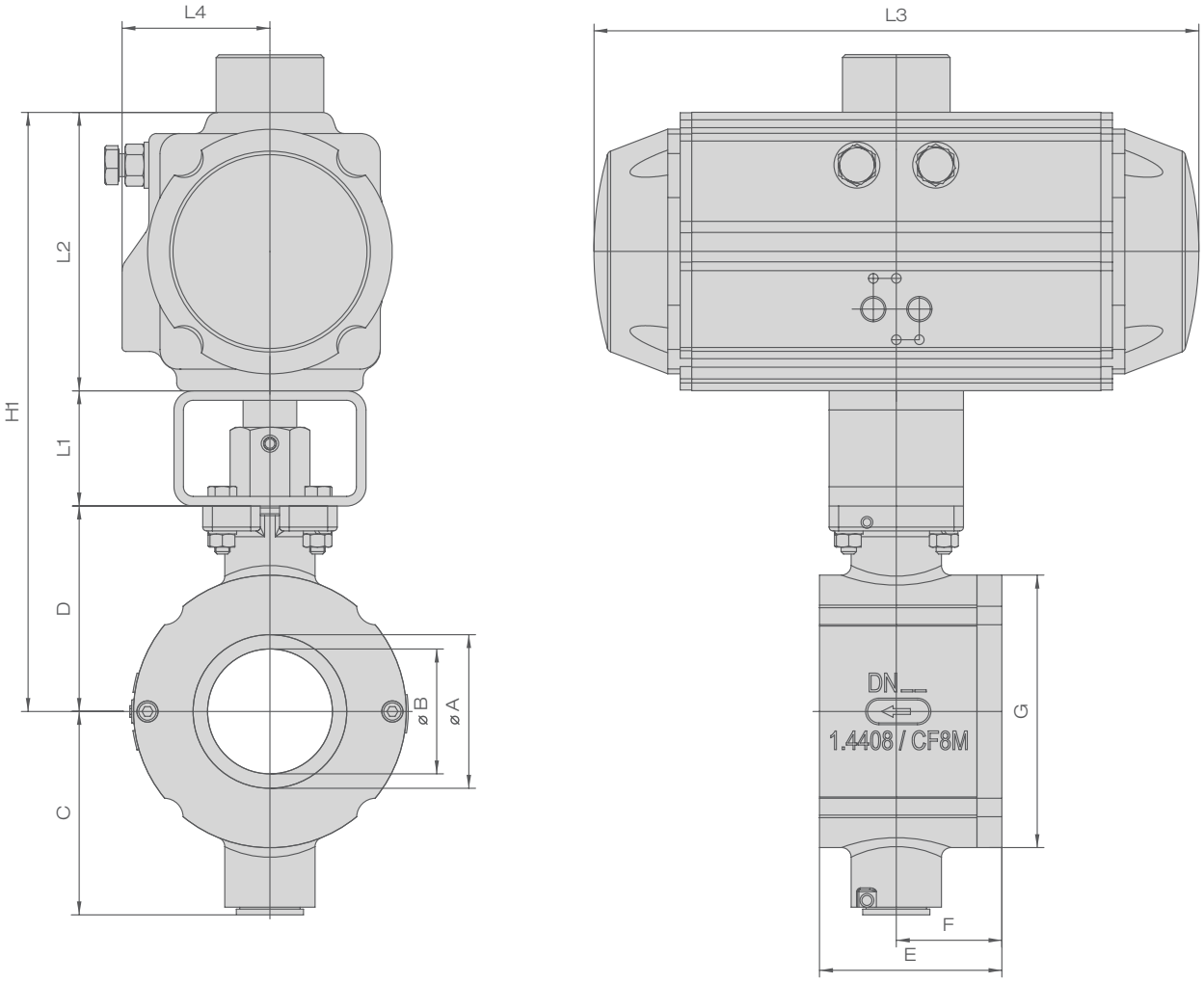
| | |
|---|---|
| Standard | - |
| Double acting 20 - 4 mA (20 mA closed, 4 mA open) | 1 |
| Single acting 20 - 4 mA (inverse function, safety position at 20 mA) | 2 |

**$K_{VS}$-value**

| | |
|---|---|
| 100% | - |
| 50% (DN 25 and DN 40 only) | 1 |

Further options and type 4030 with electrical actuator on request

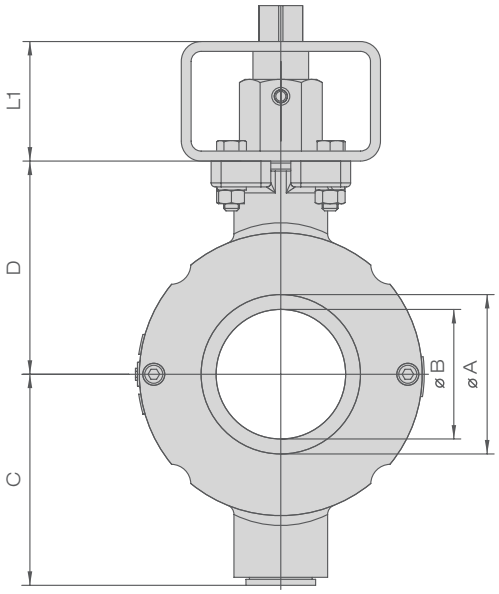
# Dimensions with Pneumatic Actuator

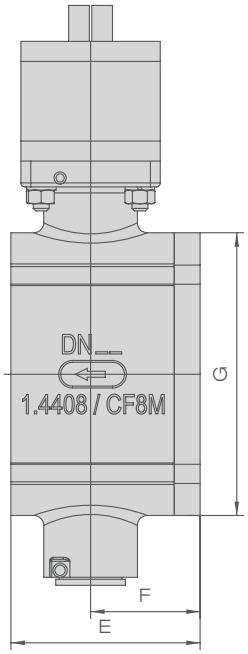


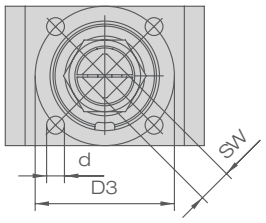

| | | | | | | | | | Single acting | | | | Double acting | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DN | A | B | C | D | E | F | G | L1 | L2 | L3 | L4 | H1 | L2 | L3 | L4 | H1 |
| 25 | 25 | 20(15) | 73 | 74 | 50 | 26 | 73 | 60 | 102 | 210,5 | 52 | 236 | 85 | 158,5 | 47 | 219 |
| 40 | 41 | 32(25) | 79 | 80 | 58 | 31 | 94 | 60 | 115 | 247,5 | 56,8 | 255 | 102 | 210,5 | 52 | 242 |
| 50 | 53 | 40 | 82 | 83 | 71 | 38 | 112 | 60 | 115 | 247,5 | 56,8 | 258 | 102 | 210,5 | 52 | 245 |
| 80 | 80 | 65 | 106 | 107 | 95 | 55 | 142 | 60 | 145 | 315 | 77 | 312 | 115 | 247,5 | 56,8 | 282 |
| 100 | 100 | 80 | 117 | 118 | 112 | 62 | 174 | 60 | 157 | 345 | 82 | 335 | 127 | 268,5 | 67 | 305 |
| 150 | 150 | 120 | 155 | 156 | 170 | 95 | 220 | 80 | 177 | 408,5 | 91,5 | 413 | 157 | 345 | 82 | 393 |
| 200 | 200 | 155 | 184 | 185 | 210 | 120 | 280 | 80 | 220,5 | 487 | 105 | 485,5 | 177 | 408,5 | 91,5 | 442 |
| 250 | 250 | 195 | 228 | 229 | 270 | 145 | 338 | 80 | 245 | 543 | 112 | 554 | 196 | 437,5 | 99 | 505 |
| Dimensions for DN 300 and for motorized versions on request | | | | | | | | | | | | | | | | |

Dimension in mm

# Dimensions without Actuator (with Mounting Kit ISO 5211)




| DN | A | B | C | D | E | F | G | L1 | d | D3 | SW | DIN/ISO 5211 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | 25 | 20(15) | 73 | 74 | 50 | 26 | 73 | 60 | 6,6 | 50 | 14 | F 05 |
| 40 | 41 | 32(25) | 79 | 80 | 58 | 31 | 94 | 60 | 6,6 | 50 | 14 | F 05 |
| 50 | 53 | 40 | 82 | 83 | 71 | 38 | 112 | 60 | 6,6 | 50 | 14 | F 05 |
| 80 | 80 | 65 | 106 | 107 | 95 | 55 | 142 | 60 | 9 | 70 | 17 | F 07 |
| 100 | 100 | 80 | 117 | 118 | 112 | 62 | 174 | 60 | 9 | 70 | 17 | F 07 |
| 150 | 150 | 120 | 155 | 156 | 170 | 95 | 220 | 80 | 11 | 102 | 22 | F 10 |
| 200 | 200 | 155 | 184 | 185 | 210 | 120 | 280 | 80 | 13,5 | 125 | 27 | F 12 |
| 250 | 250 | 195 | 228 | 229 | 270 | 145 | 338 | 80 | 13,5 | 125 | 27 | F 12 |
| Dimensions for DN 300 on request | | | | | | | | | | | | |

Dimension in mm

SCHUBERT & SALZER CONTROL SYSTEMS

**Schubert & Salzer**
**Control Systems GmbH**
Bunsenstraße 38
85053 Ingolstadt
Germany

Phone: +49 (0) 841 96 54-0
Fax: +49 (0) 841 96 54-5 90

info.cs@schubert-salzer.com