SCHUBERT & SALZER CONTROL SYSTEMS

the valve designers

Sliding Gate Technology by Schubert & Salzer

The sliding gate valve principle by Schubert & Salzer

This is how easy control can be. Over 25 years ago, Schubert & Salzer Control Systems took a new approach in control valves. We developed the sliding gate control valve: a handy, light and highly accurate valve. It operates based on a principle that had already excited Leonardo Da Vinci. Even today, it satisfies the most exacting requirements that are placed on a control valve.

fast

accurate

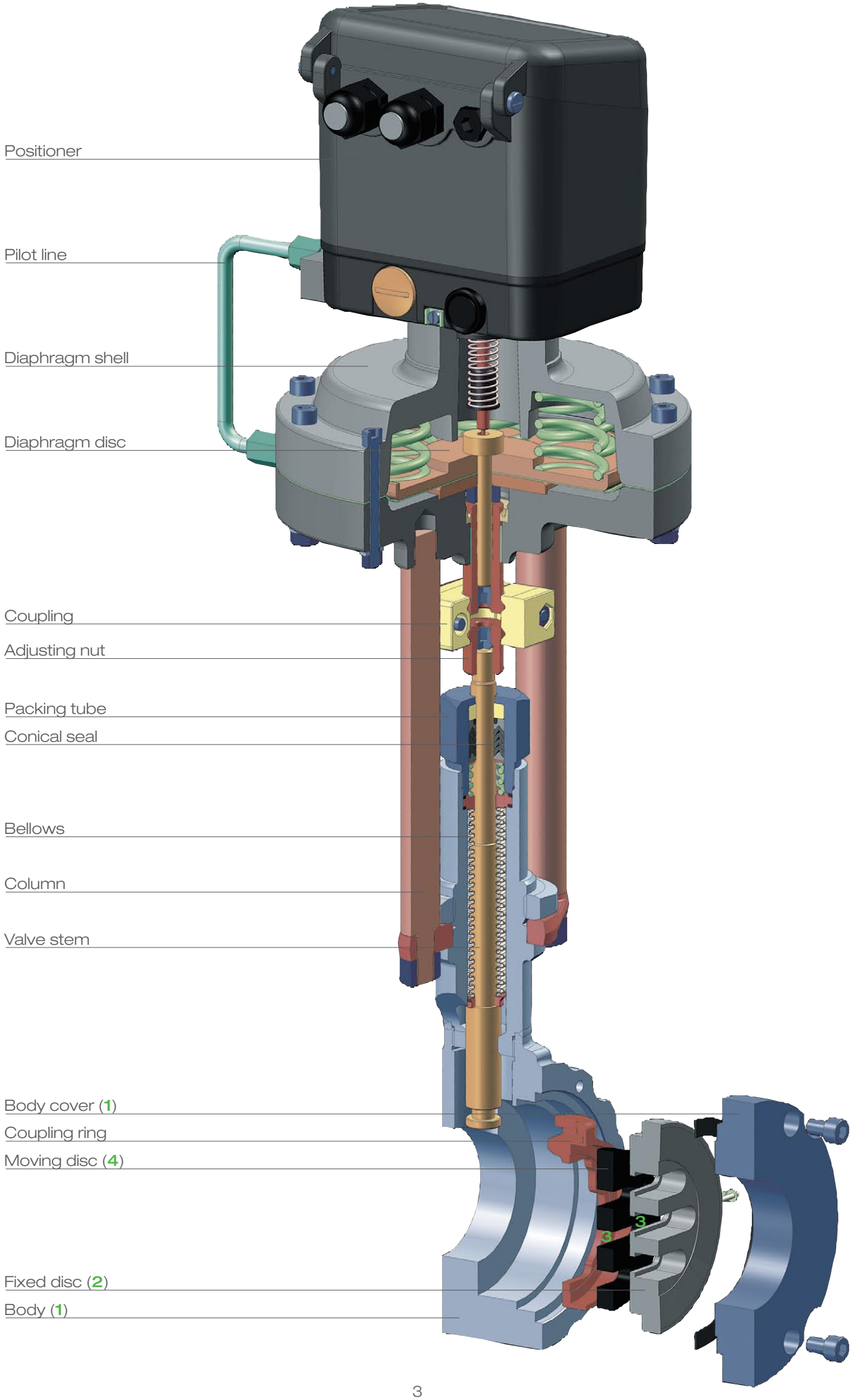
innovative

The alternative when the demands are high

The sliding gate valve series controls liquid, vapour and gaseous media precisely, quickly and economically. A sealing plate (**2**) fixed in the body (**1**) at right angles to the flow direction has a certain number of crossways slots (**3**) of equal height. A rotationally fixed disc (**4**) with the same arrangement of slots is moved at right angles to this, thereby changing the flow cross section. The prevailing differential pressure presses the moving disc (**4**) against the fixed disc (**2**) and seals it.

Sliding gate valves are used to control gases, vapours and liquids

- *Chemical and pharmaceutical industries*
- *Steel and aluminium plants*
- *Food and drinks industries*
- *Brewery fittings*
- *Textile manufacturing*
- *Car and truck tyre production*
- *Plastics production*
- *Test bench technology*
- *Polysilicon production*
- *etc.*


Positioner
Pilot line
Diaphragm shell
Diaphragm disc
Coupling
Adjusting nut
Packing tube
Conical seal
Bellows
Column
Valve stem
Body cover (1)
Coupling ring
Moving disc (4)
Fixed disc (2)
Body (1)
3
3

The advantages of sliding gate valves

Fits into tight spaces
Compact construction for minimum use of space and ease of installation

Variable K_{VS} values
A simple exchange of the operating unit is all that's needed to change the K_{VS} value at any time - Possible range of K_{VS} = 0.04 to 910

Excellent leak tightness
due to pressure from the media against the sealing disc, even as temperatures > 200°C, using a surface seal instead of an annular seal

Extremely low leakage rate
< 0.0001% of the K_{VS} value due to the self-lapping action of the moving disc

Outstanding positioning ratio
40:1 to 80:1

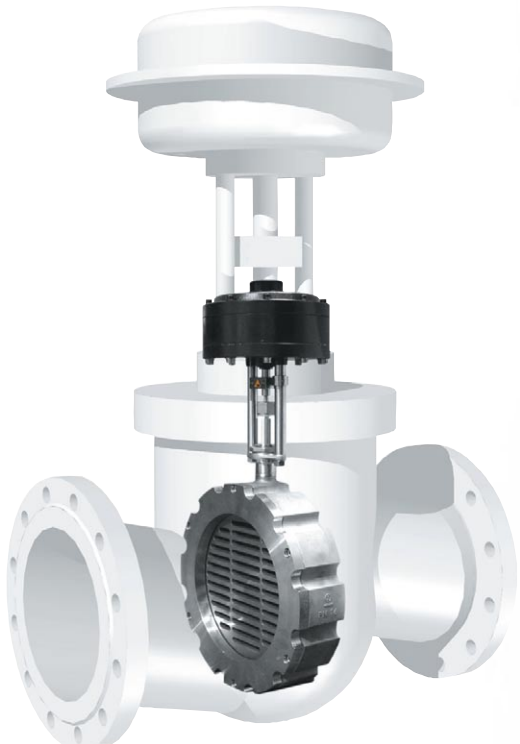
Significantly reduced energy consumption
Short stroke requires very little actuation energy

Optimal flow control
Avoids cavitation problems in the valve and operates quietly by lowering turbulence

Easy to install and maintain
Thanks to the compact construction, the low weight (e.g. DN 150 with actuation a mere 14.2kg) and the clever seal disc design make light work of installation and maintenance

Minimal wear
Related to the effect of the force which is applied at 90° to the direction of flow and minimised by the highly effective pairing of the materials used for the moving and fixed discs

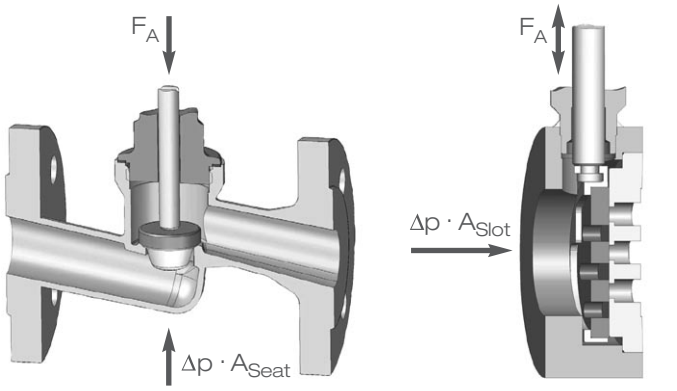
Maximum differential pressures
Using its unique compact design and low energy consumption, the GS valve gives accurate control of high differential pressures up to 160 bar



Size comparison between a normal seat valve and a Schubert & Salzer sliding gate valve.
In the example, the nominal size of both is identical.

Efficiency

$$\frac{F_{a,\text{Sliding gate valve}}}{F_{a,\text{Seat valve}}} = \frac{\Delta p \cdot \mu \cdot A_{Slot}}{\Delta p \cdot A_{Seat}} \approx 10\%$$



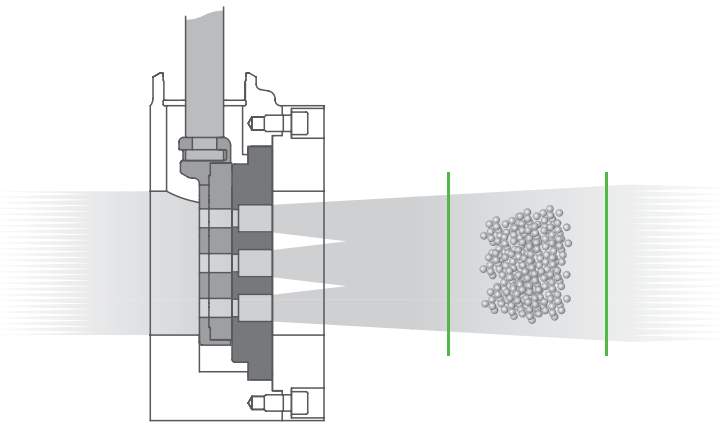
$F_A = \Delta p \cdot A_{Seat}$

$F_A = \Delta p \cdot \mu \cdot A_{Slot}$

The outstanding feature of the sliding gate valve is the actuating force which is about just 10% of that needed to actuate a seat globe valve of the same nominal size and the same differential pressure. This permits the use of much smaller actuators even though both designs of the same nominal size have about the same flow rate!

This beneficial feature stems from the fact that, in the sliding gate valve, closure is transverse to the direction of flow and not against it, as with the seat globe unit.

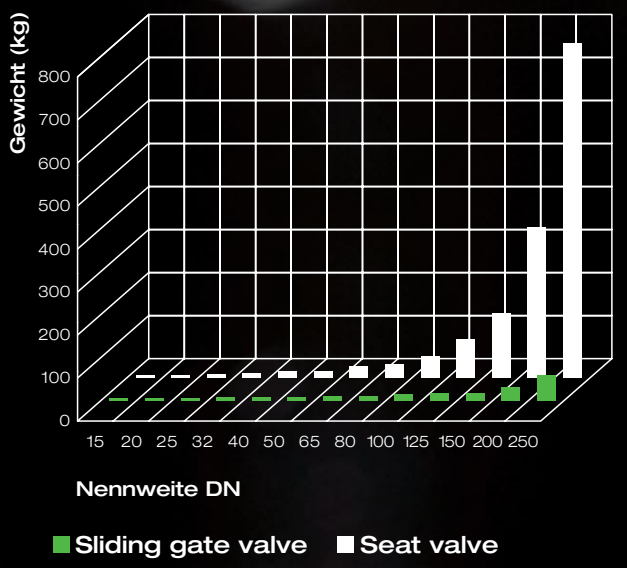
Cavitation



A high rate of flow through the narrowest cross section of a valve will lower the local pressure below the vapour pressure of the liquid. Vapour bubbles form which then break in the regions of higher pressure. When they come into contact with solid boundaries (valve body), the imploding bubbles can cause damage. In the case of a sliding gate valve, these dangerous cavitation zones are external, or more accurately, they are located about **1-2 m** beyond the valve. The cavitation bubbles then collapse around the centre of the pipeline where they can cause no harm.

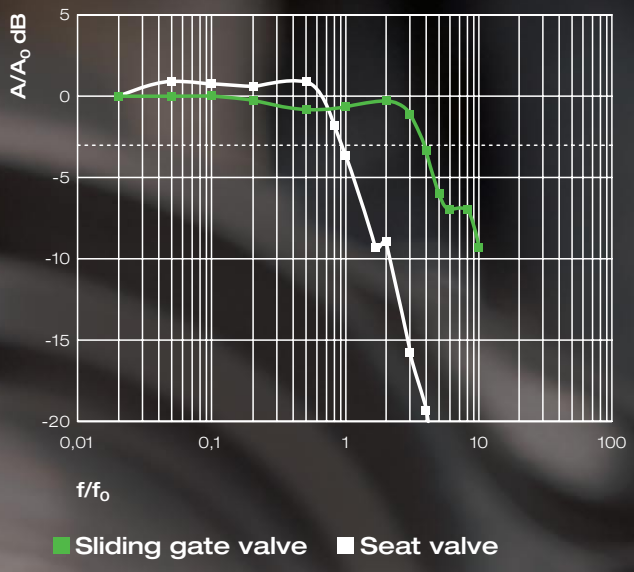
Weight

The low actuating force and short stroke allow the use of smaller actuation drives. Coupled with the space-saving by installing between flanges, weight and installation dimensions are minimised, particularly in the mid to large nominal sizes. This translates into about 150 kg for a seat globe valve, whereas a sliding gate valve of the same nominal size weighs a mere 14 kg!



Vitality

Sliding gate valves are significantly "faster" than conventional control valves. This can be shown using the frequency response when the set point value to an installed positioner is taken as the input value and the resulting stroke amplitude as the output value. The progression of the frequency response affects the standard of control of the entire control circuit.



Our choice for your process...

Sliding gate control valve 8021
Nominal size: DN 15 - 250
Nominal pressure: PN 10 - 100,
ANSI # 150 - 600
Media temperature: -60°C to +350°C,
optional -196°C to +530°C
Material: carbon steel, stainless steel,
Hastelloy
Positioner: pneumatic, analogue electro-
pneumatic, digital electro-pneumatic,
Ex-i version, AS-i bus connection

Sliding gate control valve 8020
Nominal size: DN 15 - 250
Nominal pressure: PN 10 - 100,
ANSI # 150 - 600
Media temperature: -60°C to +350°C,
optional -60°C to +530°C
Material: carbon steel, stainless steel
Obtainable with or without positioner
Positioner: pneumatic,
analogue electro-pneumatic,
digital electro-pneumatic,
Ex-Version
Special versions available!

Sliding gate motor valve 8230
Nominal size: DN 15 - 50
Nominal pressure: PN 10 - 40,
ANSI # 150 - 300
Media temperature: -60°C to +350°C,
optional -196°C to +530°C
Material: carbon steel, stainless steel
Actuation: On/off and control actuation,
optional positioning control and
position feedback plus limit switch

Sliding gate control valve 8043/44
Nominal size: DN 15 - 100
Nominal pressure: PN 10 - 40,
ANSI # 150 - 300
Media temperature: -60°C to +350°C
Material: carbon steel, stainless steel
Positioner: pneumatic,
analogue electro-pneumatic,
digital electro-pneumatic,
Ex-i version, AS-i bus connection

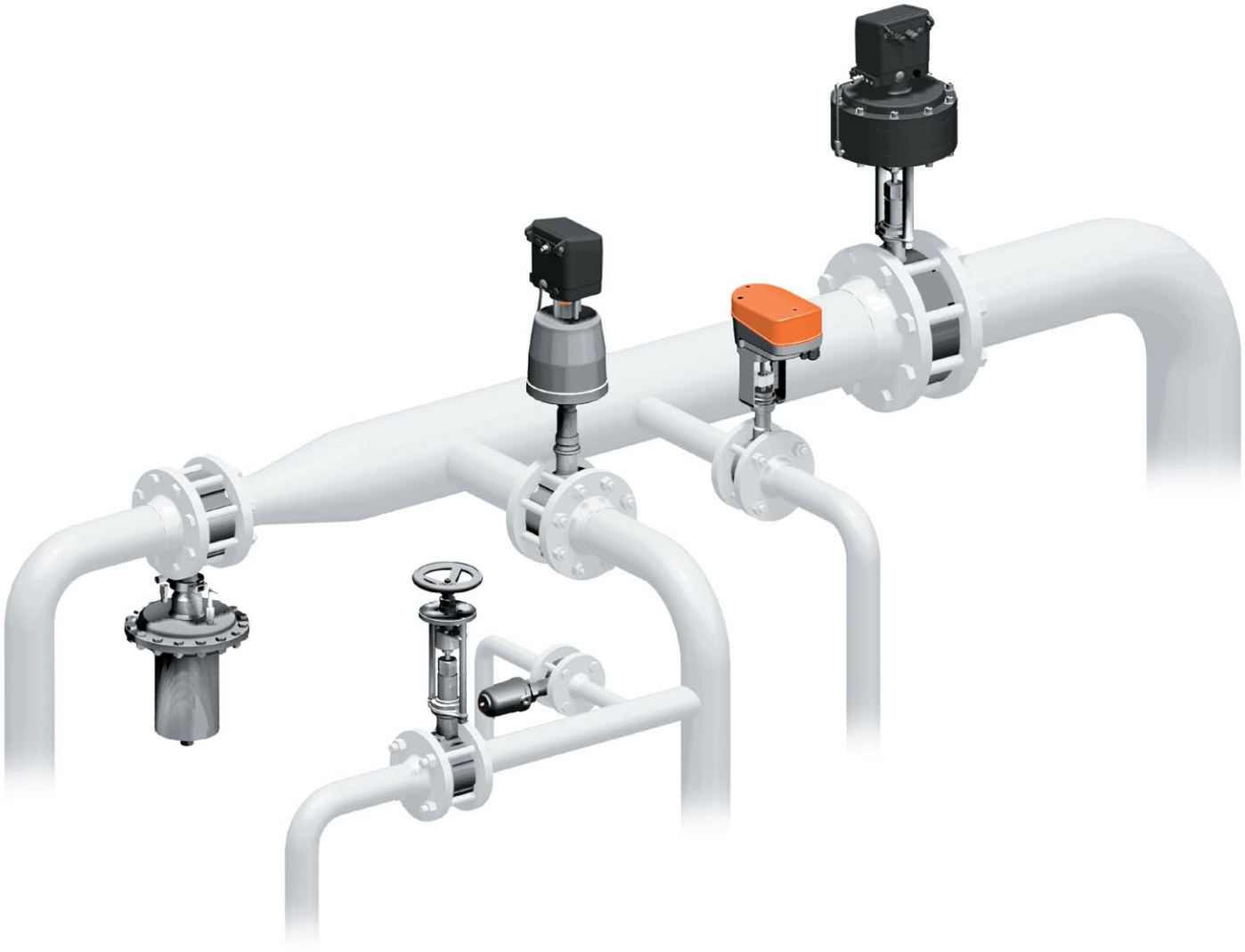
Sliding gate motor valve 8036
Nominal size: DN 15 - 250
Nominal pressure: PN 10 - 100,
ANSI # 150 - 600
Media temperature: -60°C to +350°C
Material: carbon steel, stainless steel
Actuation: On/off and control actuation,
optional positioning control and
position feedback plus limit switch

Sliding gate pressure controller 8011
Nominal size: DN 15 - 150
Nominal pressure: PN 10 - 40
Media temperature: -60°C to +300°C
Pressure ranges: 0.5 to 10 bar
Material: Stainless steel
Self-operated pressure controller
Enclosed spring housing

Our choice for your process...

Sliding gate motor valve 8037
Nominal size: DN 15 - 250
Nominal pressure: PN 10 - 100,
ANSI # 150 - 600
Media temperature: -60°C to +350°C
Power supply: 24 ... 230 V AC/DC
(Multi-zone power pack)
Explosion-protected (gas version):
II 2G Ex de [ia] IIC T6/T5
Protection class: IP 66
Actuation optionally also with 3-point
control + position electronics obtainable

Sliding gate stop valve 8040/41
Nominal size: DN 15 - 200
Nominal pressure: PN 10 - 40
Media temperature: -60°C to +350°C
Control pressure: maximal 10 bar
Material: carbon steel, stainless steel
Accessories: metal bellows, pilot valve,
limit switch, stroke limit



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