

Medium Pressure Regulators

Type MR
Pressure Reducing Regulator

Type MS
Back Pressure Regulator

MADE 
SWISS



Description

Regulators for medium pressures up to 16 bar.

The ZÜRCHER-TECHNIK pressure regulators join knowledge, experience and know-how of more than 30 years pressure regulator production and marketing.

The high demands and needs by the chemical-pharmaceutical industry have led to develop precise and corrosion resistant pressure regulators.

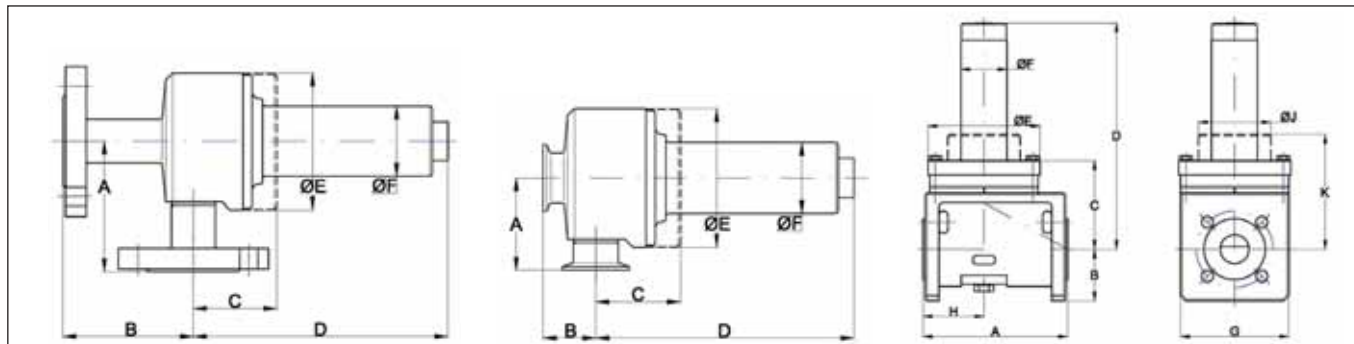


Pressure regulators in standard design are in use for all industrial applications. The sanitary design regulators are suitable for a variety of applications in the food & beverage, pharmaceutical and biotechnology industries.

Highlights

- Regulating range up to 16 bar / 300 psi
- Withstands full vacuum
- Self draining
- Soft seat capability for ANSI Class VI shutoff
- No guiding surface in the fluid
- Stainless steel regulators
- Nickel alloy regulators
- PVDF regulators
- Sanitary regulators
- Cleaning-in-Place (CIP)
- Steaming-in-Place (SIP)

Technical Data



Dimensions in mm

Angle Pattern

| Type | material | A | B | C | D | øE | øF | G | K | øJ | H | Weight in kg |
|-----------|----------|-----|-----|----|-----|-----|----|---|---|----|---|--------------|
| MR/MS 25e | Flange | 100 | 100 | 64 | 195 | 114 | 54 | — | — | — | — | 8,9 |
| MR/MS 25e | Clamp | 70 | 40 | 64 | 195 | 114 | 54 | — | — | — | — | 7,7 |

Inline Pattern

| Type | PVDF | A | B | C | D | øE | øF | G | K | øJ | H | Weight in kg |
|-----------|--------|-----|----|----|-----|-----|----|-----|-----|----|------|--------------|
| MR/MS 25i | Flange | 160 | 58 | 98 | 250 | 124 | 50 | 120 | 126 | 80 | 67,5 | 5,8 |

Flanges according DIN EN 1092-1-2201PN40/10

Clamp according ISO 1127-1

Technical Data

| | |
|-------------------------------|---|
| Max. inlet pressure | : 16 bar / 300 psi : (10 bar / 150 psi for PVDF regulators) |
| Max. vacuum | : Withstands full vacuum |
| Regulating range with springs | : 0 to 5 bar / 0 to 70 psi |
| Regulating range dome loaded | : 0 to 16 bar / 300 psi (0 to 10 bar / 150 psi for PVDF Regulators) |
| Max. temp. FFKM (Kalrez®) | : -20°C to +160°C / -4°F to +320°F |
| Max. temp. FPM (Viton®) | : -20°C to +120°C / -4°F to +248°F |
| Max. temp. PVDF | : -20°C to +130°C / -4°F to +260°F |

Seat tightness acc. to EN 12266-1,
leaking rate A, P12 / ANSI Class VI shutoff

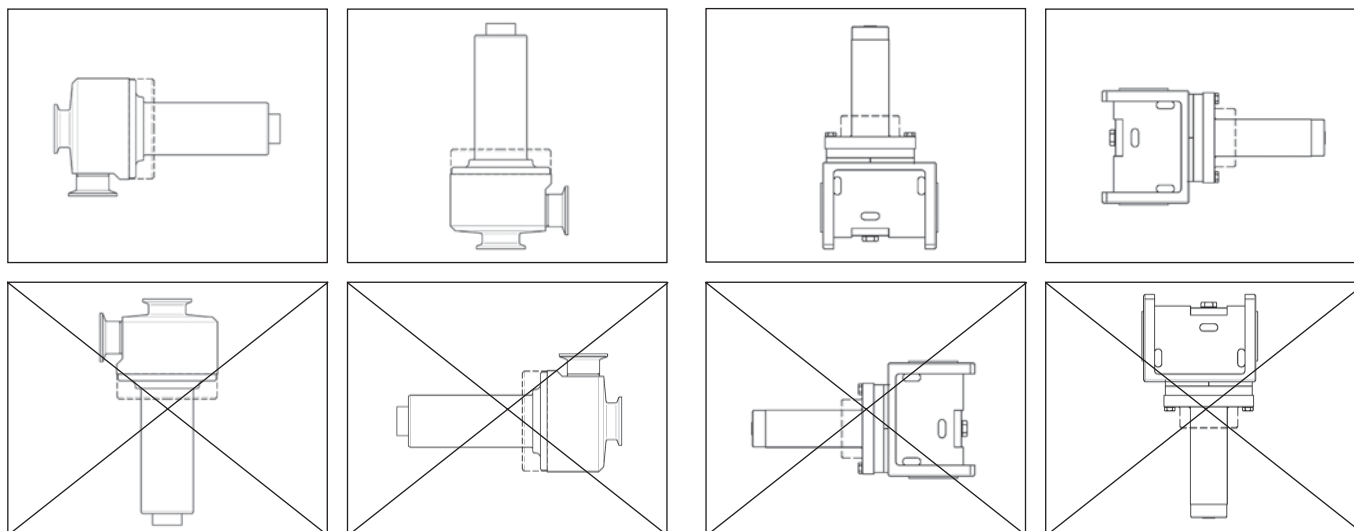
Flow capacity for adjustment : 1 Nm³/h

Certificates

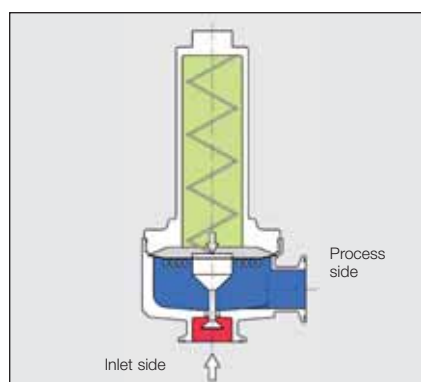
| | |
|---|-----------------|
| According to Pressure Equipment Directive | : PED 97/23/EG |
| Statement of Compliance | : US.FDA 21 CFR |
| Work Certificate | : EN10204 3.1 |

Installation

Basically the regulators may be installed in every mounting position as long as the flow direction will be as indicated on the body. To ensure selfdraining for angle pattern design regulators, they should be installed shown as follows. Inline design regulators (PVDF) are not selfdraining. The regulators should be installed, that the springhousing ventbore is protected from anything that might interfere with it.

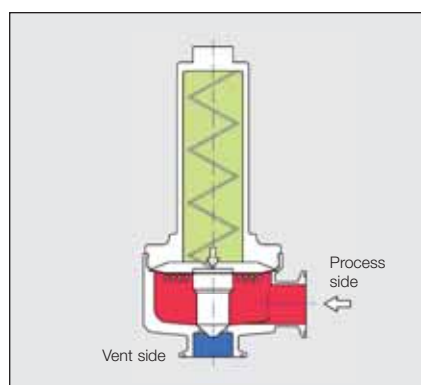


| Codification Mediumpressure Regulators | | | |
|---|--|----------------------------------|---|
| 1. Functions | 2. Connections | 3. Bodies | 4. Accessories |
| MR Reducer | A ANSI Flanges 150 lbs | S 316 L (1.4404) | H Heating Jacket |
| MRC Sanitary-Reducer | D DIN Flanges PN16 / PN10 | H Nickel alloy | P Adjusted and Sealed |
| ... P Pilot Pressure Design | C1 Clamp ISO 1127-1 | P PVDF | M Pressure Gauge |
| | C2 Clamp DIN 32676 | X Special | V Pressure Gauge Fitting |
| MS Back Pressure Regulator | C3 Clamp OD / ASME | | X Special |
| MSC Sanitary-Back Pressure Regulator | C4 Clamp SMS | Trim Parts | |
| ... P Pilot Pressure Design | C5 Food Union DIN 11851 | S 316 L (1.4404) | |
| | G BSP Thread fem | H Nickel alloy | |
| | N NPT Thread fem | P PVDF | |
| | S Flanges with slot DIN 2512 | X Special | |
| | X Special | | |
| | | | |
| Sizes | Seats Ø | Seats O-Ring | |
| 25 DN 25 (1") | (06,10,14)R Direct Action | K FFKM (Kalrez® 6375) | |
| | (14,21)S Relief Seat | V FPM (Viton®) | |
| | | C FFKM FDA (Kalrez® 6221) | |
| | | X Special | |
| | Springs | | |
| Patterns | L 0.04 to 0.25 bar / 0. to 0.15 psi | Diaphragms | |
| i Inline Pattern | A 0.15 to 1 bar / 1.5 to 15 psi | P PTFE | |
| e Angle Pattern | B 0.4 to 3 bar / 6 to 40 psi | V FPM | |
| | C 0.6 to 5 bar / 12 to 70 psi | E EPDM white FDA | |
| | J Dome Loaded | X Special | |
| | X Special | | |
| Examples: | | | |
| 1 | 2 | 3 | 4 |
| MR25e | D06RA | SSV | P |
| | | | 1 Reducer DN 25, angle pattern |
| | | | 2 DIN flanges PN 40, seat diameter 6 mm, direct action, spring range 0.15 to 1 bar |
| | | | 3 Body stainless steel, trim parts stainless steel, seat o-ring material FPM, diaphragm FPM |
| | | | 4 Adjusted and lead sealed |



Reducing Regulator Function

Spring-loaded pressure reducing regulators are “relative pressure regulators”, designed to keep the process pressure at a constant level. The nominal pressure is set by means of the setscrew, located at the spring housing. When at rest, the regulator remains in an open position. When the pressure rises, pressure is released through the open valve seat to the process side of the valve underneath the diaphragm. This will continue, until the diaphragm force exceeds the spring force, while the process pressure rises. The diaphragm is lifted and the valve seat closes. In the event that the process pressure drops below the preadjusted nominal pressure, the spring force presses the diaphragm downwards, so that the valve seat opens and admits gas until pressure equalization is reached again.



Back Pressure Regulator Function

Spring-loaded back pressure valves are “relative pressure regulators”, designed to keep the process pressure at a constant level. The nominal pressure is set by means of the setscrew, located at the spring housing. When at rest, the regulator remains in a closed position. If the process pressure increases, the force underneath the diaphragm increases as well. If the diaphragm force exceeds the spring force, the valve seat opens and the over pressure is discharged to the vent side. If the process pressure drops, the diaphragm force is lower compared to the spring force and the valve seat closes. The pressure in the vent line can be atmospheric or vacuum. With vacuum in the vent line the flow capacity of the regulator is increased.

Performance Data

Pressure Reducing Regulator

| Inlet pressure P1 in bar g | 1 | 2 | 3 | 4 | 6 | 10 | Seat Ø | Kv | DN |
|---------------------------------|----|-----|-----|-----|-----|-----|--------|-----|----|
| Outlet pressure P2 0.5 bar g | 22 | 48 | 64 | 80 | 112 | 176 | 6 mm | 1.2 | 25 |
| | 40 | 120 | 160 | 200 | 270 | 400 | 10 mm | 3 | |
| | 96 | 200 | 270 | 335 | 470 | 740 | 14 mm | 5 | |
| Outlet pressure P2 1 bar g | - | 45 | 64 | 80 | 112 | 176 | 6 mm | 1.2 | 25 |
| | - | 113 | 160 | 200 | 270 | 400 | 10 mm | 3 | |
| | - | 190 | 270 | 335 | 470 | 740 | 14 mm | 5 | |
| Outlet pressure P2 2 bar g | - | - | 53 | 80 | 112 | 176 | 6 mm | 1.2 | 25 |
| | - | - | 135 | 200 | 270 | 400 | 10 mm | 3 | |
| | - | - | 230 | 335 | 470 | 740 | 14 mm | 5 | |
| Outlet pressure P2 4 bar g | - | - | - | - | 100 | 176 | 6 mm | 1.2 | 25 |
| | - | - | - | - | 250 | 400 | 10 mm | 3 | |
| | - | - | - | - | 425 | 740 | 14 mm | 5 | |

Q = Air in Nm³/h at 20 °C

| Inlet pressure P1 in bar g | 1 | 2 | 3 | 4 | 6 | 10 | Seat Ø | Kv | DN |
|---------------------------------|------|-----|-----|-----|------|------|--------|-----|----|
| Outlet pressure P2 0.5 bar g | 0.85 | 1.5 | 1.9 | 2.2 | 2.8 | 3.7 | 6 mm | 1.2 | 25 |
| | 2.1 | 3.6 | 4.7 | 5.6 | 7 | 9.2 | 10 mm | 3 | |
| | 3.5 | 6.1 | 7.9 | 9.3 | 11.7 | 15.4 | 14 mm | 5 | |
| Outlet pressure P2 1 bar g | - | 1.2 | 1.7 | 2 | 2.6 | 3.6 | 6 mm | 1.2 | 25 |
| | - | 3 | 4.2 | 5.2 | 6.7 | 9 | 10 mm | 3 | |
| | - | 5 | 7 | 8.6 | 11.1 | 15 | 14 mm | 5 | |
| Outlet pressure P2 2 bar g | - | - | - | 1.7 | 2.4 | 3.4 | 6 mm | 1.2 | 25 |
| | - | - | - | 4.2 | 6 | 8.4 | 10 mm | 3 | |
| | - | - | - | 7.1 | 10 | 14.1 | 14 mm | 5 | |
| Outlet pressure P2 4 bar g | - | - | - | - | 1.7 | 2.9 | 6 mm | 1.2 | 25 |
| | - | - | - | - | 4.2 | 7.3 | 10 mm | 3 | |
| | - | - | - | - | 7.1 | 12.2 | 14 mm | 5 | |

Q = Water in m³/h at 20 °C

bar

| Inlet pressure P1 in bar g | 1 | 2 | 3 | 4 | 6 | 10 | Seat Ø | Kv | DN |
|---------------------------------|----|-----|-----|-----|-----|-----|--------|-----|----|
| Outlet pressure P2 0.5 bar g | 24 | 40 | 50 | 62 | 70 | 78 | 6 mm | 1.2 | 25 |
| | 58 | 100 | 120 | 152 | 175 | 190 | 10 mm | 3 | |
| | 98 | 170 | 210 | 255 | 290 | 320 | 14 mm | 5 | |
| Outlet pressure P2 1 bar g | - | 38 | 54 | 67 | 76 | 85 | 6 mm | 1.2 | 25 |
| | - | 95 | 135 | 165 | 190 | 210 | 10 mm | 3 | |
| | - | 155 | 225 | 270 | 310 | 350 | 14 mm | 5 | |
| Outlet pressure P2 2 bar g | - | - | 46 | 66 | 80 | 92 | 6 mm | 1.2 | 25 |
| | - | - | 92 | 165 | 200 | 230 | 10 mm | 3 | |
| | - | - | 115 | 270 | 335 | 380 | 14 mm | 5 | |
| Outlet pressure P2 3 bar g | - | - | - | 54 | 66 | 80 | 6 mm | 1.2 | 25 |
| | - | - | - | 135 | 170 | 200 | 10 mm | 3 | |
| | - | - | - | 225 | 270 | 335 | 14 mm | 5 | |
| Outlet pressure P2 4 bar g | - | - | - | - | 60 | 185 | 6 mm | 1.2 | 25 |
| | - | - | - | - | 135 | 210 | 10 mm | 3 | |
| | - | - | - | - | 250 | 350 | 14 mm | 5 | |

Q = Steam in kg/h

Back Pressure Regulator

| Set pressure P1 in bar g | 1 | 2 | 3 | 4 | 6 | 10 | Seat Ø | Kv | DN |
|-----------------------------------|----|-----|-----|-----|-----|------|--------|----|----|
| Outlet pressure P2 atmospheric | 80 | 360 | 480 | 600 | 810 | 1200 | 21 mm | 9 | 25 |

Q = Air in Nm³/h bei 20 °C

| Set pressure P1 in bar g | 1 | 2 | 3 | 4 | 6 | 10 | Seat Ø | Kv | DN |
|-----------------------------------|---|------|------|----|----|------|--------|----|----|
| Outlet pressure P2 atmospheric | 9 | 12.7 | 15.3 | 18 | 22 | 28.5 | 21 mm | 9 | 25 |

Q = Water in m³/h at 20 °C

Pressure Reducing Regulator

| Inlet pressure P1 in psi g | 15 | 29 | 44 | 58 | 87 | 145 | Seat Ø | Cv | DN |
|--------------------------------|----|-----|-----|-----|-----|-----|--------|-----|----|
| Outlet pressure P2 7 psi g | 22 | 48 | 64 | 80 | 112 | 176 | 6 mm | 1.4 | 25 |
| | 40 | 120 | 160 | 200 | 270 | 400 | 10 mm | 3.5 | |
| | 96 | 200 | 270 | 335 | 470 | 740 | 14 mm | 5.8 | |
| Outlet pressure P2 15 psi g | - | 45 | 64 | 80 | 112 | 176 | 6 mm | 1.4 | 25 |
| | - | 113 | 160 | 200 | 270 | 400 | 10 mm | 3.5 | |
| | - | 190 | 270 | 335 | 470 | 740 | 14 mm | 5.8 | |
| Outlet pressure P2 29 psi g | - | - | 53 | 80 | 112 | 176 | 6 mm | 1.4 | 25 |
| | - | - | 135 | 200 | 270 | 400 | 10 mm | 3.5 | |
| | - | - | 230 | 335 | 470 | 740 | 14 mm | 5.8 | |
| Outlet pressure P2 58 psi g | - | - | - | - | 100 | 176 | 6 mm | 1.4 | 25 |
| | - | - | - | - | 250 | 400 | 10 mm | 3.5 | |
| | - | - | - | - | 425 | 740 | 14 mm | 5.8 | |

Q = Air in Nm³/h at 20 °C

| Inlet pressure P1 in psi g | 15 | 29 | 44 | 58 | 87 | 145 | Seat Ø | Cv | DN |
|--------------------------------|------|-----|-----|-----|------|------|--------|-----|----|
| Outlet pressure P2 7 psi g | 0.85 | 1.5 | 1.9 | 2.2 | 2.8 | 3.7 | 6 mm | 1.4 | 25 |
| | 2.1 | 3.6 | 4.7 | 5.6 | 7 | 9.2 | 10 mm | 3.5 | |
| | 3.5 | 6.1 | 7.9 | 9.3 | 11.7 | 15.4 | 14 mm | 5.8 | |
| Outlet pressure P2 15 psi g | - | 1.2 | 1.7 | 2 | 2.6 | 3.6 | 6 mm | 1.4 | 25 |
| | - | 3 | 4.2 | 5.2 | 6.7 | 9 | 10 mm | 3.5 | |
| | - | 5 | 7 | 8.6 | 11.1 | 15 | 14 mm | 5.8 | |
| Outlet pressure P2 29 psi g | - | - | - | 1.7 | 2.4 | 3.4 | 6 mm | 1.4 | 25 |
| | - | - | - | 4.2 | 6 | 8.4 | 10 mm | 3.5 | |
| | - | - | - | 7.1 | 10 | 14.1 | 14 mm | 5.8 | |
| Outlet pressure P2 58 psi g | - | - | - | - | 1.7 | 2.9 | 6 mm | 1.4 | 25 |
| | - | - | - | - | 4.2 | 7.3 | 10 mm | 3.5 | |
| | - | - | - | - | 7.1 | 12.2 | 14 mm | 5.8 | |

Q = Water in m³/h at 20 °C

psi

| Inlet pressure P1 in psi g | 15 | 29 | 44 | 58 | 87 | 145 | Seat Ø | Cv | DN |
|--------------------------------|----|-----|-----|-----|-----|-----|--------|-----|----|
| Outlet pressure P2 7 psi g | 24 | 40 | 50 | 62 | 70 | 78 | 6 mm | 1.4 | 25 |
| | 58 | 100 | 120 | 152 | 175 | 190 | 10 mm | 3.5 | |
| | 98 | 170 | 210 | 255 | 290 | 320 | 14 mm | 5.8 | |
| Outlet pressure P2 15 psi g | - | 38 | 54 | 67 | 76 | 85 | 6 mm | 1.4 | 25 |
| | - | 95 | 135 | 165 | 190 | 210 | 10 mm | 3.5 | |
| | - | 155 | 225 | 270 | 310 | 350 | 14 mm | 5.8 | |
| Outlet pressure P2 29 psi g | - | - | 46 | 66 | 80 | 92 | 6 mm | 1.4 | 25 |
| | - | - | 92 | 165 | 200 | 230 | 10 mm | 3.5 | |
| | - | - | 115 | 270 | 335 | 380 | 14 mm | 5.8 | |
| Outlet pressure P2 44 psi g | - | - | - | 54 | 66 | 80 | 6 mm | 1.4 | 25 |
| | - | - | - | 135 | 170 | 200 | 10 mm | 3.5 | |
| | - | - | - | 225 | 270 | 335 | 14 mm | 5.8 | |
| Outlet pressure P2 58 psi g | - | - | - | - | 60 | 185 | 6 mm | 1.4 | 25 |
| | - | - | - | - | 135 | 210 | 10 mm | 3.5 | |
| | - | - | - | - | 250 | 350 | 14 mm | 5.8 | |

Q = Steam in kg/h

Back Pressure Regulator

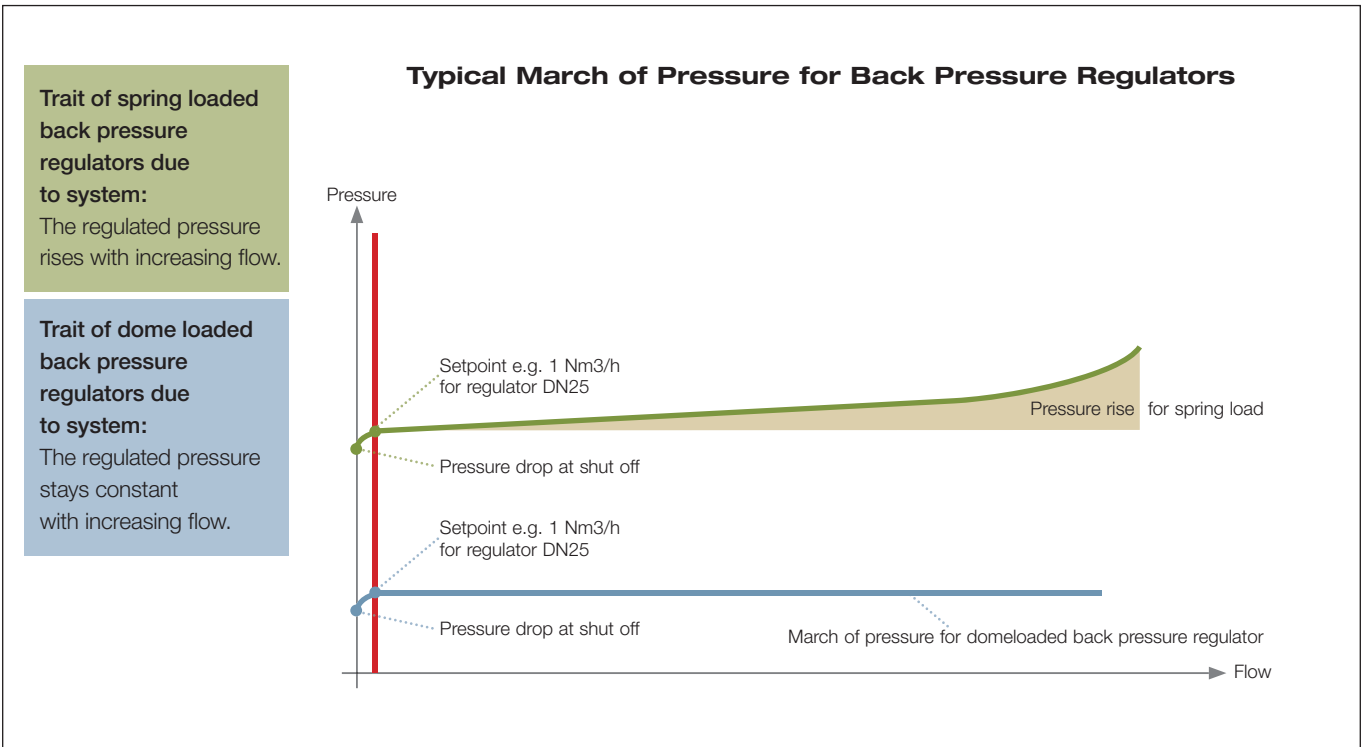
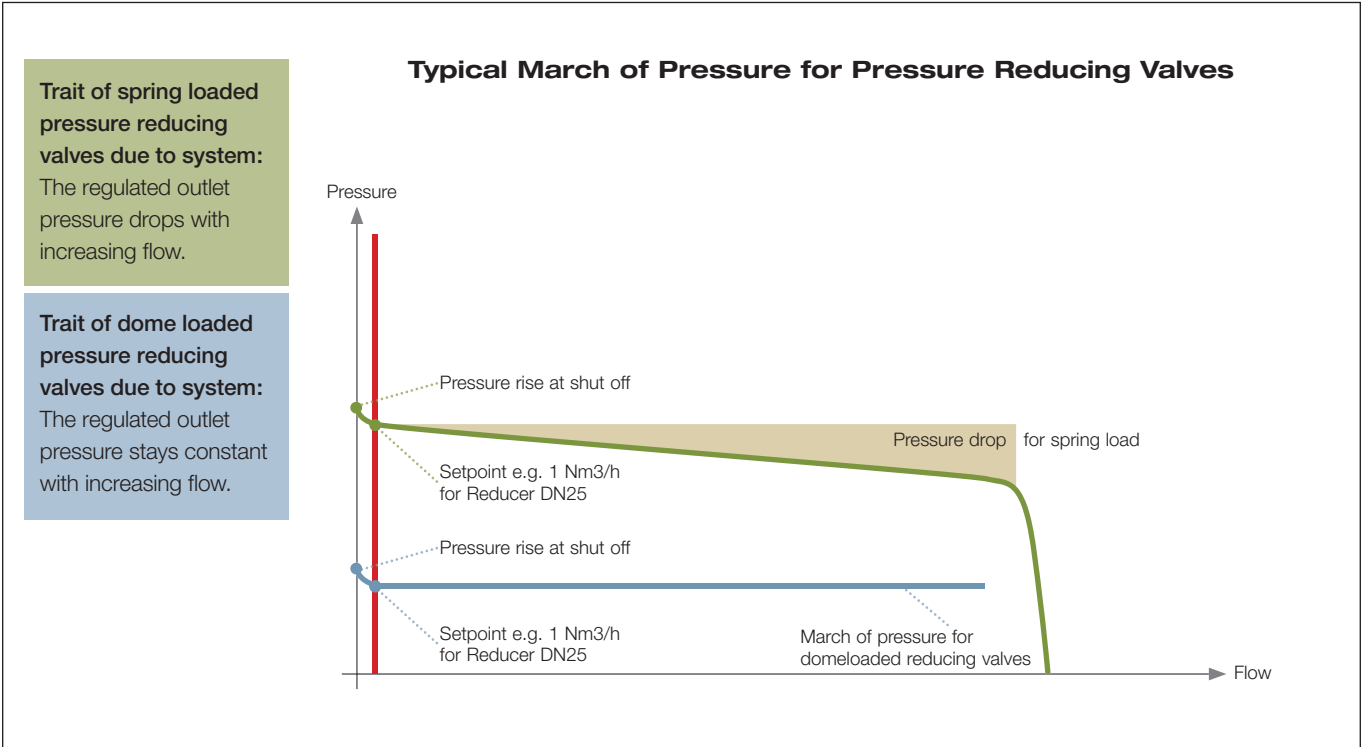
| Set pressure P1 in psi g | 15 | 29 | 44 | 58 | 87 | 145 | Seat Ø | Cv | DN |
|-----------------------------------|----|-----|-----|-----|-----|------|--------|------|----|
| Outlet pressure P2 atmospheric | 80 | 360 | 480 | 600 | 810 | 1200 | 21 mm | 10.5 | 25 |

Q = Air in Nm³/h bei 20 °C

| Set pressure P1 in psi g | 15 | 29 | 44 | 58 | 87 | 145 | Seat Ø | Cv | DN |
|-----------------------------------|----|------|------|----|----|------|--------|------|----|
| Outlet pressure P2 atmospheric | 9 | 12.7 | 15.3 | 18 | 22 | 28.5 | 21 mm | 10.5 | 25 |

Q = Water in m³/h at 20 °C

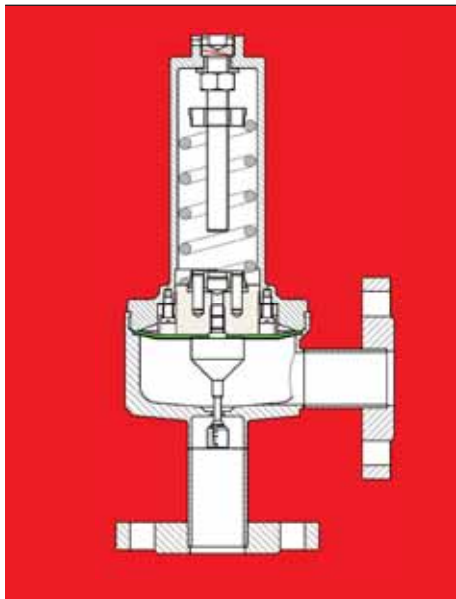
Every regulator will be tested and adjusted on our testing bay.
 The adjustment is usually done with a flow rate of 1 Nm³/h (marked by the red line). The following diagrams show the normal characteristics of pressure regulators due to system.



All data in this literature are subject to change without notice.

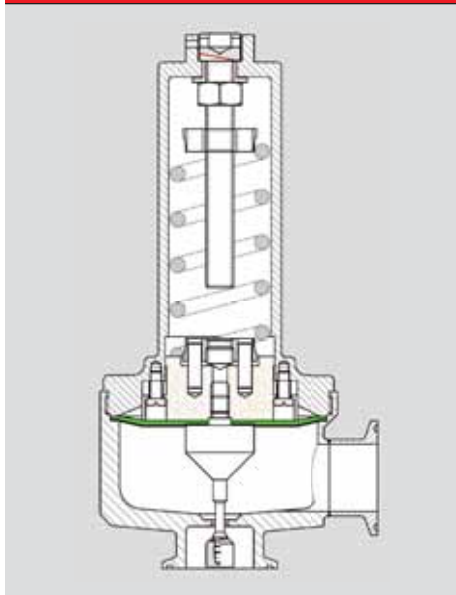
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Technical Data



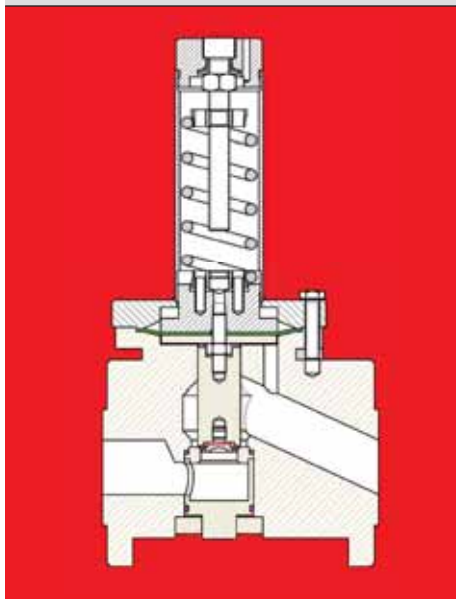
Standard Design

| | |
|------------------------|--|
| Application | For processes in the chemical-pharmaceutical industries, without increased requirement. |
| Example of uses | Regulating processes for liquids, steam and gases without special requirements concerning cleaning and dead space. |
| Design | Angle pattern |
| Surfaces | Metallic regulators inside $Ra\ 3.2\ \mu m$ |
| Complete drain | Yes |



Sanitary Design

| | |
|------------------------|--|
| Application | For procedures in the pharmaceutical, biotechnology and food industries with increased requirements concerning surface treatment, dead space and cleaning. |
| Example of uses | A typical use of those regulators is the pressure regulation of clean steam. |
| Design | Angle pattern |
| Specials | No edges, no dead space |
| Surfaces | Areas in contact with media $Ra\ 0.8\ \mu m$ or better, internal and external electropolishing as option. |
| Complete drain | Yes |



Chemical Design

| | |
|------------------------|--|
| Application | For processes in the chemical-pharmaceutical industries, with increased requirement concerning corrosion resistance. |
| Example of uses | Regulating processes for aggressive fluids and gases without special requirements concerning cleaning and dead spaces. |
| Design | Inline pattern |
| Surfaces | PVDF regulators inside $Ra\ 6.4\ \mu m$ |
| Complete drain | No |

| | |
|-------------------------|---|
| Size: | DN25 (1") |
| Seat: | 6 mm, 10 mm, 14 mm (Reducer Seat) 14 mm, 21 mm (Relief Seat) |
| Standard Finish: | Areas in contact with medium < Ra 3.2 µm |
| Material: | Body: 316L (1.4404) or nickel alloy Spring housing: 316 (1.4408) Inner parts: 316L (1.4404) or nickel alloy Diaphragm: FPM (-20°C to +120°C / -4°F to +248°F) PTFE (-20°C to +160°C / -4°F to +320°F) Seat O-Ring: FPM (-20°C to +120°C / -4°F to +248°F) FFKM (-20°C to +160°C / -4°F to +320°F) |
| Connection: | Flanges ANSI 300lbs / DIN PN16 Thread fem. BSP / NPT or other connections |
| Inlet-Pressure: | max. 16 bar / 300 psi |
| Range: | Spring loaded: max. 5 bar / 70 psi Dome loaded: max. 16 bar / 300 psi |

MR and MS (Standard Design)

Pressure regulators in standard design to regulate pressures from 0.15 bar / 1.5 psi up to 5 bar / 70 psi in spring loaded version and up to 16 bar / 300 psi in dome loaded version.



| | |
|-------------------------|---|
| Size: | DN25 (1") |
| Seat: | 6 mm, 10 mm, 14 mm (Reduce Seat) 14 mm, 21 mm (Relief Seat) |
| Standard Finish: | Areas in contact with medium < Ra 0.8 µm. Internal and external electropolishing as option |
| Material: | Body: 316L (1.4404) or nickel alloy Spring housing: 316 (1.4408) Inner parts: 316L (1.4404) or nickel alloy Diaphragm: EPDM white FDA (-20°C to +120°C / -4°F to +248°F) Seat O-Ring: FFKM (-20°C to +160°C / -4°F to +320°F) |
| Connection: | Quick disconnect fittings as example Clamp fittings Food Union DIN 11851 or other connections |
| Inlet-Pressure: | max. 16 bar / 300 psi |
| Range: | Spring loaded: max. 5 bar / 70 psi Dome loaded: max. 16 bar / 300 psi |

MRC and MSC (Sanitary Design)

Stainless steel sanitary regulators are used in a variety of pharmaceutical and food and beverage applications. No guiding surfaces in the fluid. This regulators are all self draining. The internal space is designed for sanitary conditions.



| | |
|-------------------------|--|
| Size: | DN25 (1") |
| Seat: | 6 mm, 10 mm, 14 mm (Reduce Seat) 14 mm, 21 mm (Relief Seat) |
| Standard Finish: | Areas in contact with medium < Ra 6.4 µm. |
| Material: | Body: PVDF (-20°C to +130°C / -4°F to +260°F) Spring housing: 316 (1.4408) Inner parts: PVDF Diaphragm: PTFE Seat O-Ring: FFKM |
| Connection: | DIN Flanges PN10 |
| Inlet-Pressure: | max. 10 bar g |
| Range: | Spring loaded: max. 5 bar / 70 psi Dome loaded: max. 10 bar / 150 psi |

MR and MS (Chemical Design)

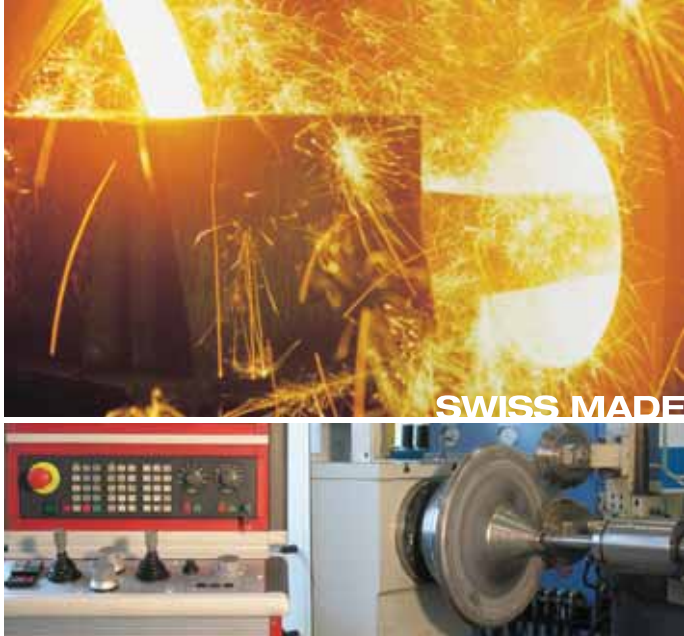
Pressure regulators in chemical design for use in chemical and pharmaceutical industries, specially in processes with aggressive media.



Quality commitment "Made in Switzerland"



For more than 50 years, the Swiss quality logo "Made in Switzerland" stands for precision and Top quality. The ZÜRCHER-TECHNIK pressure Regulators have been developed and are being manufactured in Switzerland. We do believe in the manufacturing location Switzerland, its competitive and know-how leadership.



The Zürcher-Technik pressure regulator knowledge, experience and know-how is a result of more than 30 years pressure regulator production and marketing.

Zürcher-Technik develops, designs and produces pressure regulators in Switzerland for global marketing and distribution.

The high demands and needs by the chemical-pharmaceutical industry have led to the development of precise, corrosion resistant and FDA conforming pressure regulators. Special attention hereby was given to the range of blanketing applications (mixers, tanks, centrifuges, containers, etc.)

Zürcher-Technik welcomes competition and is happy to meet their challenge. Our mission statement: In the long run, a company's survival and well being depends on its capability to come up with more innovative solutions than its competitors. Quality of our service, highest level of product reliability, dependable performance and customer satisfaction represent the key portion of our daily challenge.

Our product range in Tank Blanketing Regulators

Tank blanketing, or padding, is the process and practice of covering a stored commodity, usually a liquid, with a gas. It is the best prevention of and protection against explosions. If the commodity is volatile or toxic, tank blanketing can prevent it from harming workers, equipment and the environment. When the commodity is a food or other substance, blanketing protects it from oxidation or contamination through exposure to air or moisture.



All data in this literature are subject to change without notice.

2001/05.08/E

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