

SPV

PRESSURE RELIEF VALVES



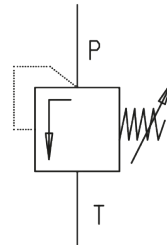
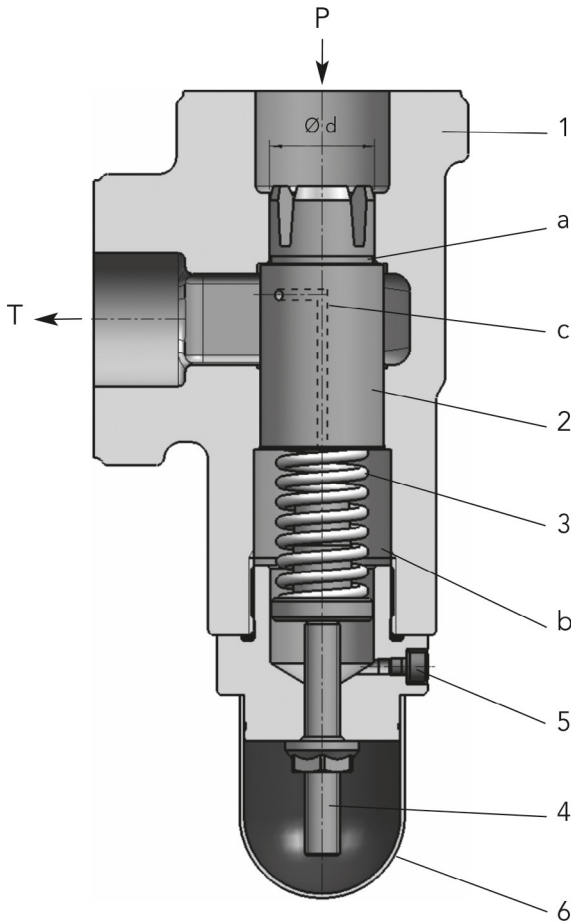
KRACHT®
FLUID TECHNOLOGY AND SYSTEMS

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General

Construction



- 1 Housing
- 2 Sliding piston
- 3 Compression spring
- 4 Set screw
- 5 Bleeding screw
- 6 Protective cap
- a Ring surface
- b Spring chamber
- c Bore hole
- d Diameter
- P Pressure connection
- T Tank connection

Description

The pressure relief valve SPV is a direct spring sliding piston valve. It is intended for mounting in pipelines and is suitable to safeguard low pressure hydraulic circuits.

The pipe connection is to be effected either by SAE mounting surfaces or by Whitworth pipe threads.

Notes

When using strongly aerated media, the valve should preferably be mounted vertical with the set screw facing down.

The tank connection T of the valve must not be exposed to underpressure when subject to flow, as in this case the valve cannot be ventilated, possibly resulting in unwanted vibrations and noise. If this cannot be avoided, version 3 „vibration-damped, with damping nozzle“ should be selected under item 10 in the type code.

Function

The sliding piston 2 is pressed against the annular surface a by the compression spring 3 and thus blocks the pressure connection P from the tank connection T via the diameter d. When the opening pressure, set by the adjusting screw 4, is reached, the sliding piston 2 releases the fluid flow to the tank connection. The spring chamber b is relieved through the hole c. When commissioning the valve, the spring chamber b must be vented using the bleeding screw 5. In order to achieve an optimum characteristic curve, the valves are available in several pressure stages for the respective pressure setting ranges.

Technical data

General characteristics

| | |
|----------------------------------|--|
| Nominal sizes | 10 · 20 · 25 · 32 · 40 · 50 · 80 |
| Types of construction | Slide valve – directly operated Seat valve Ball valve |
| Mounting types | Pipe installation Flange Panel installation |
| Hydraulic connections | Flange connection SAE (ISO 6162-1 / SAE J518) Pipe thread (ISO 228-1) |
| Mounting positions | Any, pressure adjustment screw at the bottom preferred |
| Pressure adjustment types | Mechanical, adjusting screw Mechanical, rotary handle |
| Pressure fluids | Hydraulic oils acc. to DIN 51 524/25 (other fluids on request) |

Hydraulic characteristics

| Nominal sizes | 10 | 20 | 25 | 32 | 40 | 50 | 80 |
|-----------------------------------|---|---------------|---------------|---------------|---------------|---------------|---------------|
| Maximum flow rates | 40 l/min | 90 l/min | 90 l/min | 450 l/min | 450 l/min | 550 l/min | 800 l/min |
| Nominal pressures | 120 bar | 120 bar | 120 bar | 120 bar | 120 bar | 100 bar | 80 bar |
| Viscosities | 1.2 ... 1000 mm ² /s (higher viscosities on request) | | | | | | |
| Δp-Q characteristic curves | See the section „Technical data – Δp-Q characteristic curves“ | | | | | | |
| | Setting ranges / Set pressures | | | | | | |
| Pressure stage 002 | - | 0.5 ... 2.5 | 0.5 ... 2.5 | 0.5 ... 2.5 | 0.5 ... 2.5 | 0.5 ... 2.5 | 0.5 ... 2.5 |
| Pressure stage 005 | - | 2.0 ... 5.0 | 2.0 ... 5.0 | 2.0 ... 5.0 | 2.0 ... 5.0 | 2.0 ... 5.0 | 2.0 ... 5.0 |
| Pressure stage 007 | 0.5 ... 7.0 | 2.0 ... 7.0 | 2.0 ... 7.0 | 2.0 ... 7.0 | 2.0 ... 7.0 | - | - |
| Pressure stage 012 | 4.0 ... 12.0 | 4.0 ... 12.0 | 4.0 ... 12.0 | 4.0 ... 12.0 | 4.0 ... 12.0 | 4.0 ... 12.0 | 4.0 ... 12.0 |
| Pressure stage 020 | - | 10.0 ... 20.0 | 10.0 ... 20.0 | 10.0 ... 20.0 | 10.0 ... 20.0 | 10.0 ... 20.0 | 10.0 ... 20.0 |
| Pressure stage 025 | - | 19.0 ... 25.0 | 19.0 ... 25.0 | 19.0 ... 25.0 | 19.0 ... 25.0 | 19.0 ... 25.0 | - |
| Pressure stage 030 | 10.0 ... 30.0 | - | - | 10.0 ... 30.0 | 10.0 ... 30.0 | - | - |
| Pressure stage 040 | - | 20.0 ... 40.0 | 20.0 ... 40.0 | - | - | - | - |

Materials

| | | |
|----------------------------|---|-----------------------------|
| Housings | Grey cast iron Spheroidal graphite cast iron | EN-GJL-300 EN-GJS-400-15 |
| Sealings | FKM, NBR, Copper, Soft iron | |
| Compression springs | Spring steel | |
| Cap nuts | Polypropylene | |
| Other parts | Steel | |

Note:

Metal protective cap (cap nut) for Atex version

Temperatures

| | | |
|-----------------------------|-----------------------------------|---|
| Media temperatures | FKM NBR Copper Soft iron | -15 ... 150 °C -20 ... 90 °C -20 ... 220 °C -40 ... 220 °C |
| Ambient temperatures | FKM NBR Copper Soft iron | -15 ... 60 °C -20 ... 60 °C -20 ... 60 °C -40 ... 60 °C |

Weights

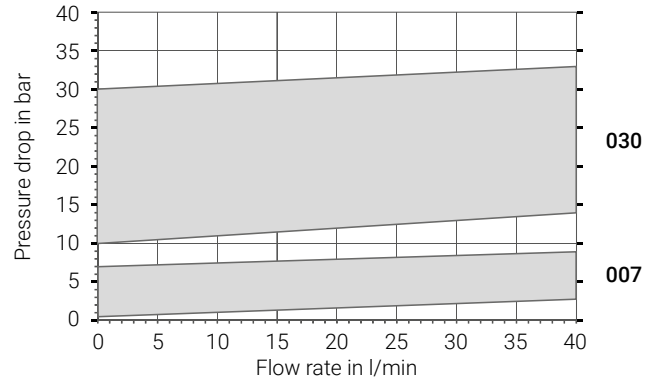
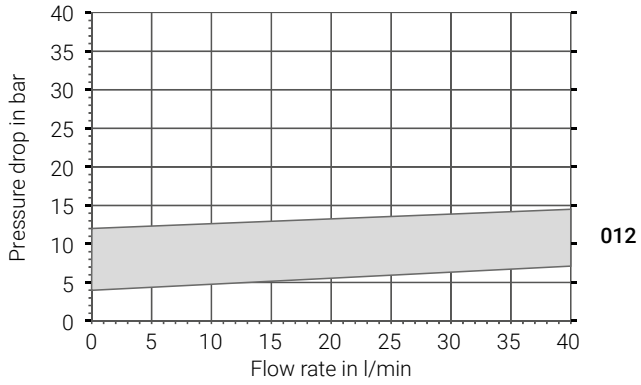
| Nominal sizes | | | | | | |
|---------------|--------|--------|--------|--------|--------|---------|
| 10 | 20 | 25 | 32 | 40 | 50 | 80 |
| 0.9 kg | 3.0 kg | 3.0 kg | 5.5 kg | 6.0 kg | 8.2 kg | 18.5 kg |

Technical data

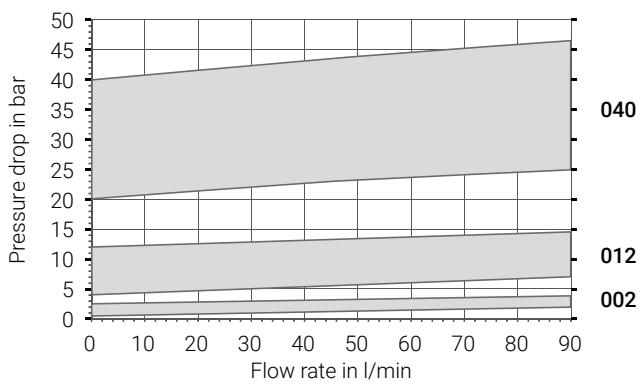
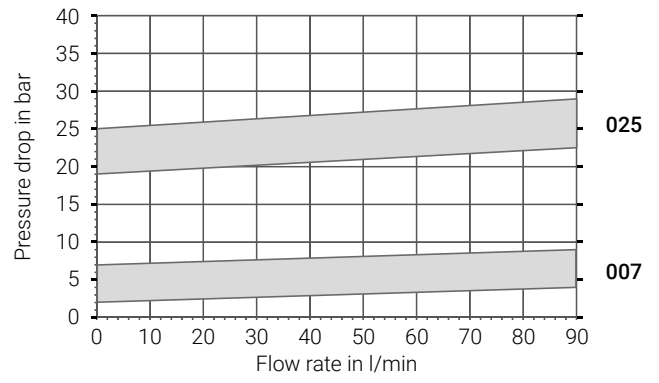
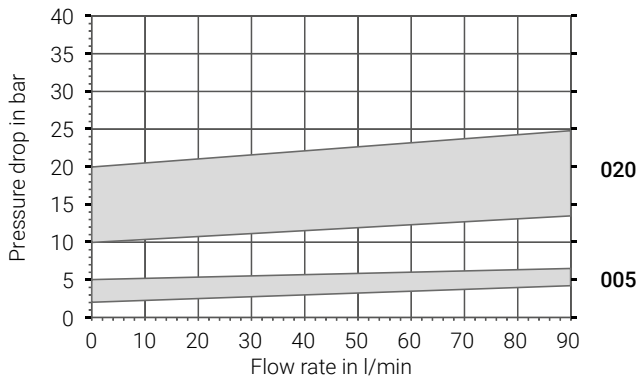
Δp -Q characteristic curves

Possible setting ranges of the pressure stages, viscosity = 34 mm²/s

SPV 10



SPV 20/25

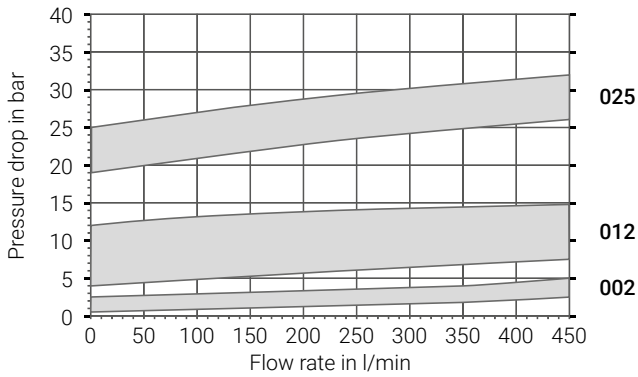
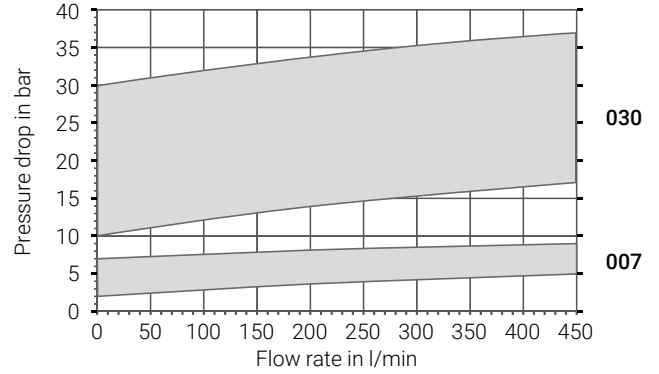
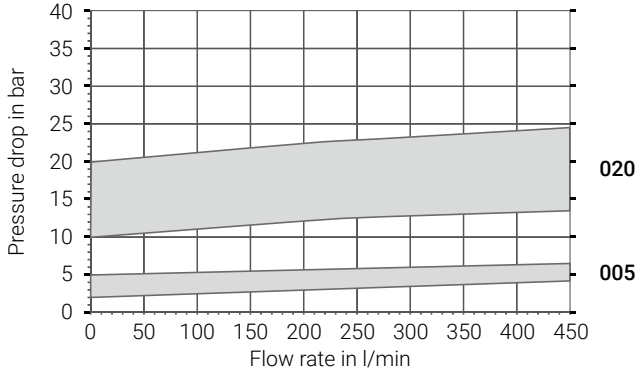


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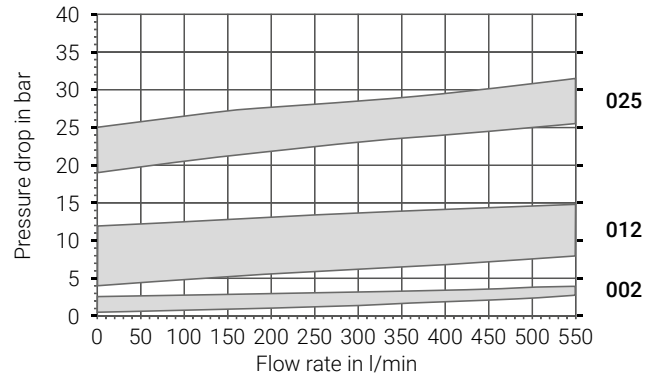
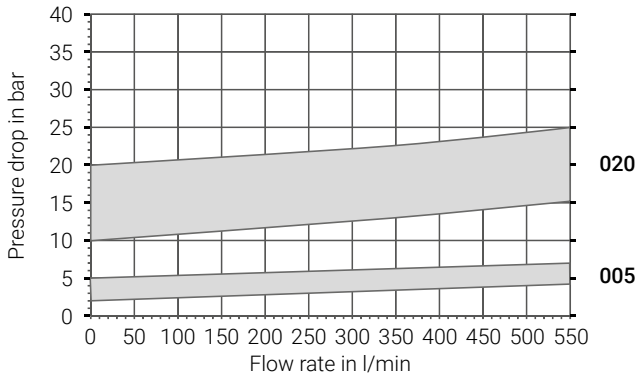
Δp -Q characteristic curves

Possible setting ranges of the pressure stages, viscosity = 34 mm²/s

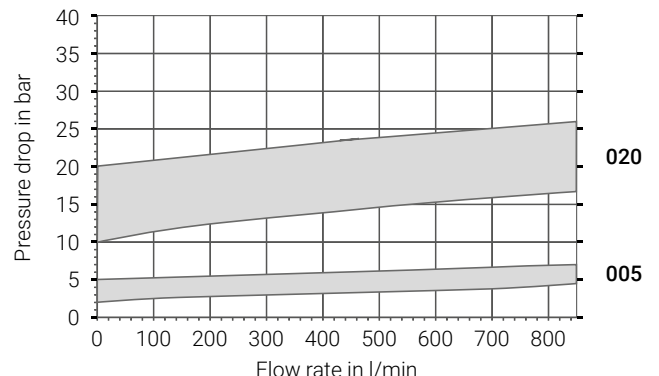
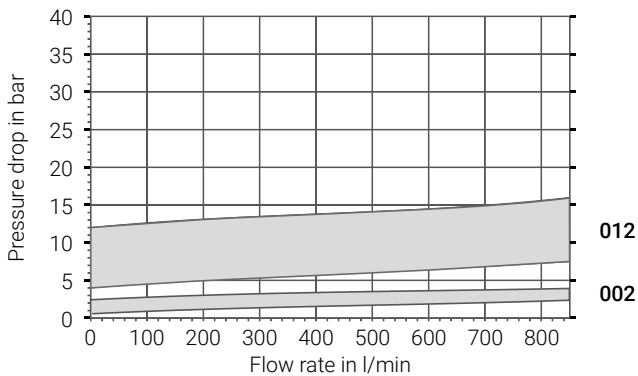
SPV 32/40



SPV 50



SPV 80



Type key

| | | | | | | | | | | | | |
|------------|-----------|----------|----------|----------|----------|----------|------------|----------|----------|----------|---|------------|
| SPV | 20 | V | 1 | F | 1 | S | 007 | S | 1 | A | / | 00. |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | | 12 |

| 1 Product | |
|------------|-----------------------|
| SPV | Pressure relief valve |

| 2 Nominal sizes | |
|----------------------------------|--|
| 10 · 20 · 25 · 32 · 40 · 50 · 80 | |

| 3 Types of construction | | Nominal sizes |
|-------------------------|-------------|------------------------|
| V | Slide valve | 20 · 25 · 32 · 40 · 80 |
| S | Seat valve | 20 · 25 · 32 · 40 · 80 |
| L | Ball valve | 10 |

| 4 Housing materials | | |
|---------------------|-------------------------------|---------------|
| 1 | Grey cast iron | EN-GJL-300 |
| 2 | Spheroidal graphite cast iron | EN-GJS-400-15 |

| 5 Sealing materials | |
|---------------------|-----------|
| F | FKM |
| N | NBR |
| K | Copper |
| W | Soft iron |

| 6 Pressure adjustment types | | Nominal sizes |
|-----------------------------|---|------------------------|
| 1 | Adjusting screw, manual | 10 ... 80 |
| 2 | Manual rotary handle | 10 · 20 · 25 · 32 · 40 |
| 3 | Adjusting screw, manual, panel installation | 10 · 20 · 25 |
| 4 | Rotary handle, manual, panel installation | 10 · 20 · 25 |
| 5 | Adjusting screw, sealed | 10 ... 80 |

| 7 Hydraulic connections | | Nominal sizes |
|-------------------------|------------------------------------|---------------|
| S | Flange connection SAE (ISO 6162-1) | 20 ... 80 |
| R | Pipe thread (ISO 228-1) | 10 ... 80 |

| 8 Pressure stages (Pressure setting ranges) | | Nominal sizes |
|---|------------------------|----------------|
| 002 | 0.5 ... 2.5 bar | 20 ... 80 |
| 005 | 2 ... 5 bar | 20 ... 80 |
| 007 | 0.5 ... 7 bar | 10 |
| | 2 ... 7 bar | 20 ... 40 |
| 012 | 4 ... 12 bar | 10 ... 80 |
| 020 | 10 ... 20 bar | 20 ... 80 |
| 025 | 19 ... 25 bar | 20 ... 50 |
| 030 | 10 ... 30 bar | 10 · 32 ... 40 |
| 040 | 20 ... 40 bar | 20 ... 25 |
| 000 | Special pressure level | On request |

| 9 Media temperatures | | |
|----------------------|------------------|------------|
| S | Standard | ... 150 °C |
| H | High temperature | ... 220 °C |
| X | Atex | ... 80 °C |

| 10 Viscosities / damping | | |
|--------------------------|----------------------------------|-----------------------------|
| 1 | Standard | ... 1000 mm ² /s |
| 2 | High viscosity | on request |
| 3 | Vibration-damped, damping nozzle | |

| 11 Hydraulic controls | |
|-----------------------|------------------------------|
| A | Without hydraulic control |
| E | External spring space relief |

| 12 Special numbers | |
|--------------------|------------|
| 00. | On request |

Explosion protection version (Atex)

Explosion protection – field of application for the pressure relief valves

The valve is used to secure low pressure hydraulic circuits with various flammable and non-flammable fluids.

They can be used:

1. In zone 2 (Gas-Ex, Category 3G)
in the explosion groups IIA, IIB and IIC
2. In zone 22 (Dust-Ex, Category 3D)
in the explosion groups IIIA and IIIB
3. In zone 1 (Gas-Ex, Category 2G)
in explosion groups IIA, IIB and IIC
4. In zone 21 (Dust-Ex, Category 2D)
in the explosion groups IIIA and IIIB

The qualification for the surface temperature is T4; for all gases, vapours, mists with an ignition temperature $>135\text{ °C}$, the operating materials are not an ignition source.

In the Dust-Ex area, 135 °C is the reference temperature for further considerations regarding the safety margin to the glow temperature, etc. (can only be decided by the operating company).

The permissible ambient temperature ranges from
 $-20\text{ ... }+60\text{ °C}$ (NBR, Copper, Soft iron)
 $-15\text{ ... }+60\text{ °C}$ (FKM)

Flashpoint, minimum ignition temperature and mediaspecific attributes must be complied with by the operating organisation.

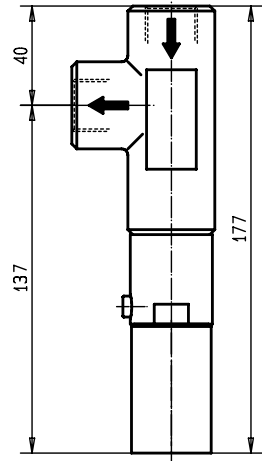
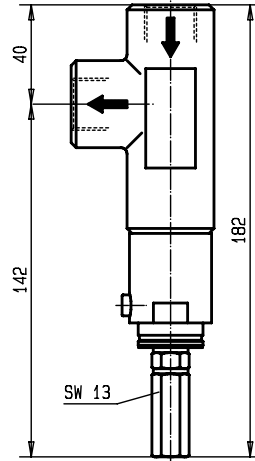
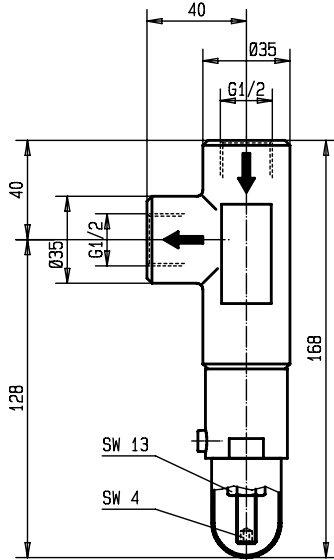
Not allow any explosive mixture to be present inside the unit.

The permissible media temperature ranges from
 $-20\text{ ... }+80\text{ °C}$ (NBR, Copper, Soft iron)
 $-15\text{ ... }+80\text{ °C}$ (FKM)

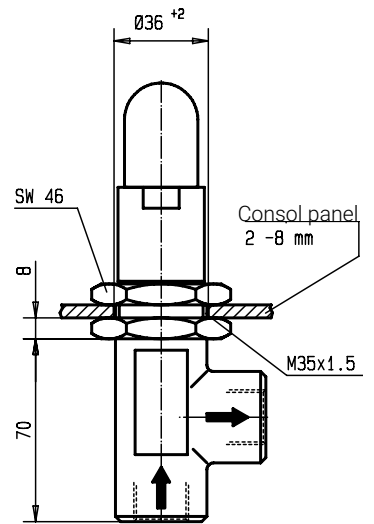
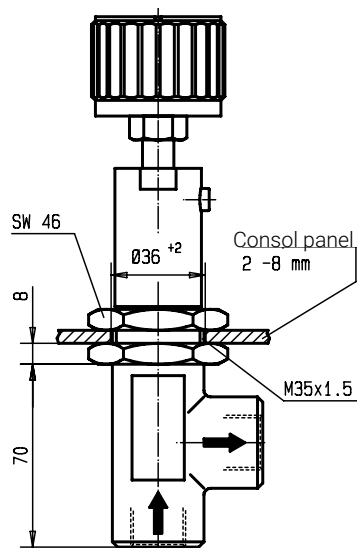
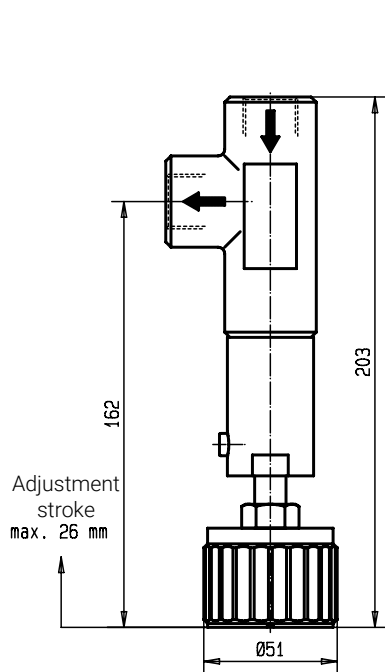
Technical drawings

Nominal size 10

| | | | |
|----------------------------------|-----------------|------------------|-----------------|
| Media temperatures | Standard | High temperature | Atex |
| Pressure adjustment types | Adjusting screw | Adjusting screw | Adjusting screw |
| Hydraulic connections | Pipe thread | Pipe thread | Pipe thread |



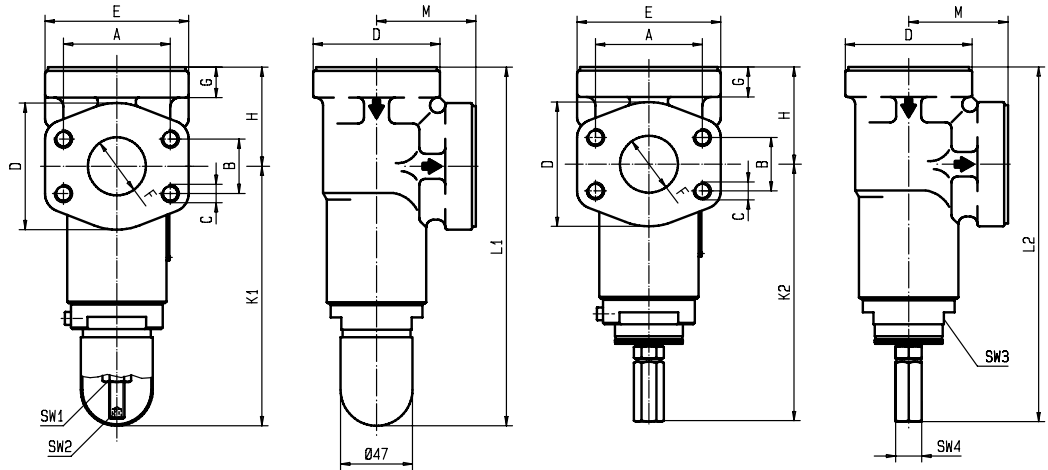
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| Media temperatures | Standard | Standard | Standard |
| Pressure adjustment types | Rotary handle | Rotary handle, panel installation | Adjusting screw, panel installation |
| Hydraulic connections | Pipe thread | Pipe thread | Pipe thread |



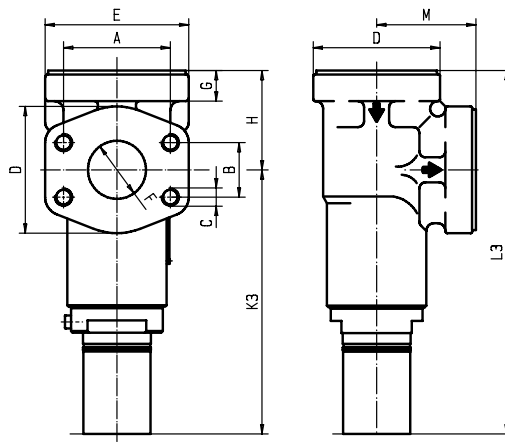
Technical drawings

Nominal sizes 20 ... 80

| | | |
|---------------------------|-----------------------|-----------------------|
| Media temperatures | Standard | High temperature |
| Pressure adjustment types | Adjusting screw | Adjusting screw |
| Hydraulic connections | Flange connection SAE | Flange connection SAE |



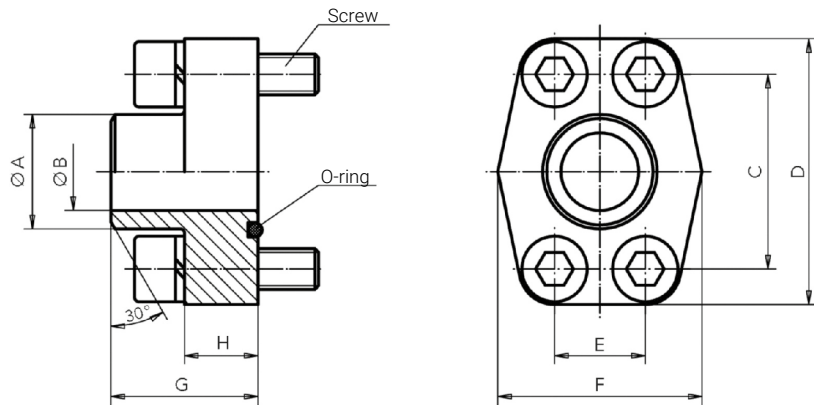
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|---------------------------|-----------------------|
| Media temperatures | Atex |
| Pressure adjustment types | Adjusting screw |
| Hydraulic connections | Flange connection SAE |



| Nominal sizes | SAE flanges | Thread R | A | B | C | D | E | F | G | H | K1 | K2 | K3 | L1 | L2 | L3 | M | Spanner sizes | | | |
|---------------|-------------|----------|-------|------|-----|-----|-----|------|----|-----|-----|-----|-----|-----|-----|-----|-----|---------------|-----|-----|-----|
| | | | | | | | | | | | | | | | | | | SW1 | SW2 | SW3 | SW4 |
| 20 | 3/4" | G3/4 | 47.6 | 22.2 | M10 | 59 | 70 | 24 | 20 | 50 | 160 | 167 | 169 | 210 | 217 | 227 | 50 | 17 | 5 | 46 | 17 |
| 25 | 1" | G1 | 52.4 | 26.2 | M10 | 59 | 70 | 24 | 20 | 50 | 160 | 167 | 169 | 210 | 217 | 227 | 55 | 17 | 5 | 46 | 17 |
| 32 | 1 1/4" | G1 1/4 | 58.7 | 30.2 | M10 | 72 | 79 | 32 | 20 | 65 | 165 | 172 | 174 | 230 | 237 | 247 | 65 | 17 | 5 | 46 | 17 |
| 40 | 1 1/2" | G1 1/2 | 69.9 | 35.7 | M12 | 83 | 94 | 38 | 20 | 65 | 165 | 172 | 174 | 230 | 237 | 247 | 65 | 17 | 5 | 46 | 17 |
| 50 | 2" | G2 | 77.8 | 42.9 | M12 | 97 | 102 | 50.5 | 20 | 75 | 192 | 209 | 212 | 267 | 284 | 284 | 75 | 19 | 6 | 46 | 19 |
| 80 | 3" | G3 | 106.4 | 61.9 | M16 | 131 | 135 | 79 | 25 | 110 | 190 | 207 | 208 | 300 | 317 | 315 | 110 | 19 | 6 | - | 19 |

Technical drawings / Technical specifications

Accessories – Weld-on flanges SAE (ISO 6162-1)



| SAE flanges | A | B | C | D | E | F | G | H | Screws 10.9 | O-rings | Maximum pressures in bar | Weights |
|-------------|------|------|--------|-----|-------|-----|----|----|-------------|--------------|--------------------------|---------|
| 3/4" | 28.0 | 19.0 | 47.63 | 65 | 22.23 | 50 | 36 | 18 | M10x35 | 24.99 x 3.53 | 350 | 0.46 |
| 1" | 34.0 | 25.0 | 52.37 | 70 | 26.19 | 55 | 38 | 18 | M10x35 | 32.92 x 3.53 | 315 | 0.54 |
| 1 1/4" | 42.8 | 32.0 | 58.72 | 79 | 30.18 | 68 | 41 | 21 | M10x40 | 37.69 x 3.53 | 250 | 0.78 |
| 1 1/2" | 48.6 | 38.0 | 69.85 | 93 | 35.71 | 78 | 44 | 25 | M12x45 | 47.22 x 3.53 | 200 | 1.24 |
| 2" | 61.0 | 51.0 | 77.77 | 102 | 42.88 | 90 | 45 | 25 | M12x45 | 56.74 x 3.53 | 200 | 1.40 |
| 3" | 92.0 | 73.0 | 106.38 | 134 | 61.93 | 124 | 50 | 27 | M16x50 | 85.32 x 3.53 | 138 | 2.54 |

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