

Pressure relief valve  
**SPV, SPVF**  
directly operated



**KRACHT**®  
FLUID TECHNOLOGY AND SYSTEMS

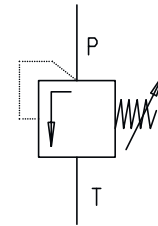
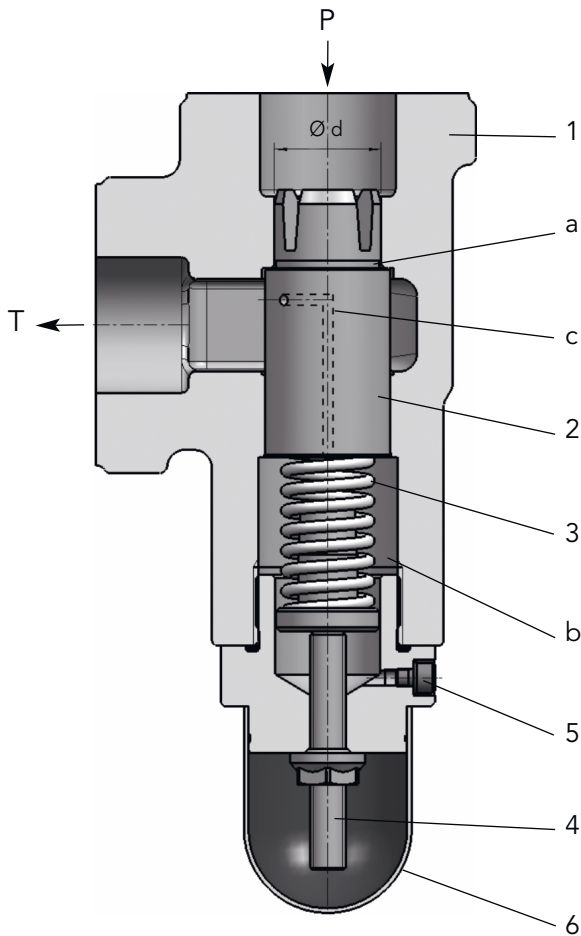
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## Description

### I 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 Balancing bore
- d Diameter
- P Pressure connection
- T Tank connection

### I Description

The pressure relief valve SPV/SPVF 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 (3000 psi) or by Whitworth pipe threads "G".

#### 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 ( $Q > 0$ ), as in this case the valve cannot be ventilated, possibly resulting in unwanted vibrations and noise. If this is unavoidable, the special solution (S33) provides an alternative.

### I Valve construction

The sliding piston **2** is pressed against the annulated area **a** by the compression spring **3**. Thus the pressure connection **P** is separated from the tank connection **T** by sealing the diameter **d**. As soon as the opening pressure **p** is achieved, adjusted by the set screw **4**, the sliding piston **2** releases the fluid flow to the tank connection. The spring chamber **b** is pressure compensated by the bore **c**. When starting-up the valve the spring chamber **b** must be bled by the bleeding screw **5**, (hex. socket width: **4**).

The pressure relief valves are available in different pressure setting ranges because, due to their spring rates, each of the compression springs can only cover a limited pressure setting range.

## Explosion protection version (ATEX / IECEx)

### I 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:

- a** In zone 2 (Gas-Ex, Category 3G) in the explosion groups IIA, IIB and IIC
- b** In zone 22 (Dust-Ex, Category 3D), in the explosion groups III A and III B at non-conductive dusts with a minimum ignition energy >1mJ
- c** In zone 1 (Gas-Ex, Category 2G) in explosion groups IIA, IIB and IIC
- d** In zone 21 (Dust-Ex, Category 2D) in the explosion groups III A and III B at non-conductive dusts with a minimum ignition energy >1mJ

The qualification for the surface temperature is T4; for all gases, vapours, mists with an ignition temperature >135 °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  
 $-20\text{ °C} \leq T_a \leq 60\text{ °C}$  (NBR, CR)  
 $-15\text{ °C} \leq T_a \leq 60\text{ °C}$  (FKM, HNBR)

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

No not allow any explosive mixture to be present inside the unit.

### Marking according to the Machine Directive 2014/34/EU

|                         |   |
|-------------------------|---|
| Manufacturer            | KRACHT GmbH<br>D-58791 Werdohl                      |
| Type designation        | SPV...  |
| Consignment no.,        |   |
| Year of manufacture     | xxxxxx/xx-xxx xx.xx                                 |
| Tech. File Ref.         | TRR: 04.02X   |
| Protection type marking | Ⓜ II 2 GD EEx c IIC (T4) or<br>Ⓜ II 2 GD EEx c (T4) |

## Description

### I Characteristics

|                               |   |
|-------------------------------|---|
| Product name / Nominal size   | SPV = NG 10<br>SPVF = NG 20 ... 80                                |
| Construction                  | Slide valve / directly operated<br>(Poppet valve on request)      |
| Mounting                      | Pipe connection / panel mounting                                  |
| Pipe connection               | Flange connection ISO 6162-1 (SAE J518)<br>Pipe thread ISO 228-1  |
| Dimensions                    | Pages 10, 12, 13, 14  |
| Weight                        | Pages 10 and 13   |
| Fitting position              | any, pressure setting screw below preferred (see page 4)          |
| Housing material              | EN-GJL-300 (EN-GJS-400-15)  |
| Type setting                  | Mechanical    Set screw<br>Knob                                   |
| Accessories                   | Welding flange SAE (3000 psi)<br>Page 14                          |
| $\Delta p$ -Q-Characteristics | Pages 7 and 8   |
| Hydraulic fluids              | Hydraulic oils acc. to DIN 51 524/25<br>(other fluids on request) |

### I Hydraulic characteristics

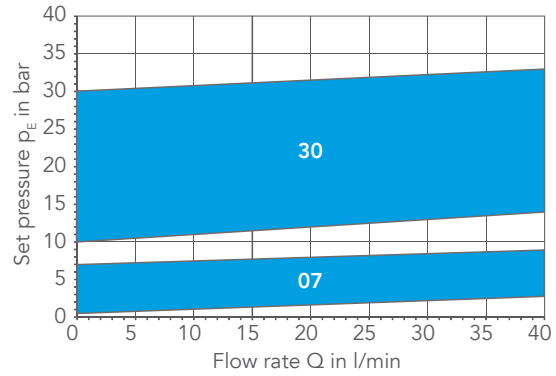
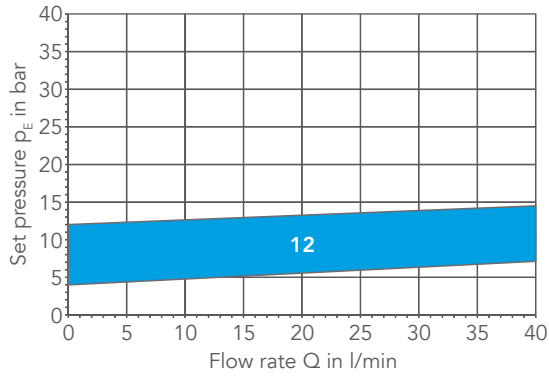
| Nominal size                       |                                  | 10  | 20/25 | 32/40 | 50  | 80  |
|------------------------------------|----------------------------------|---|-------|-------|-----|-----|
| Max. flow rate Q                   | Q in l/min                       | 40  | 90    | 450   | 550 | 800 |
| Nom. working pressure              | $p_n$ in bar                     | 30  | 30    | 25    | 25  | 20  |
| Setting range<br>response pressure | $p_{v \min}$ in bar              | 0.5   | 0.5   | 0.5   | 0.5 | 0.5 |
|                                    | $p_{v \max}$ in bar              | 30  | 40    | 25    | 25  | 20  |
| Media temperature                  | NBR                              | $\vartheta_m = -20 \text{ °C} \dots 90 \text{ °C}$ (Design A + E)           |       |       |     |     |
|                                    | FKM                              | $\vartheta_m = -15 \text{ °C} \dots 150 \text{ °C}$ (Design C + K)          |       |       |     |     |
|                                    | Copper                           | $\vartheta_m = -20 \text{ °C} \dots 220 \text{ °C}$ (Design B + F)          |       |       |     |     |
|                                    | Soft iron                        | $\vartheta_m = -40 \text{ °C} \dots 220 \text{ °C}$ (Design D)              |       |       |     |     |
| Ambient temperature                |                                  | $\vartheta_u = -20 \text{ °C} \dots 60 \text{ °C}$ (NBR, copper, soft iron) |       |       |     |     |
|                                    |                                  | $\vartheta_u = -15 \text{ °C} \dots 60 \text{ °C}$ (FKM)                    |       |       |     |     |
| Viscosity range                    | $v_{\min}$ in mm <sup>2</sup> /s | 1.2   |       |       |     |     |
|                                    | $v_{\max}$ in mm <sup>2</sup> /s | 1000 (standard)<br>higher viscosities on request                            |       |       |     |     |

**Note:**  
Metallic protective cap (cap nut) in ATEX version

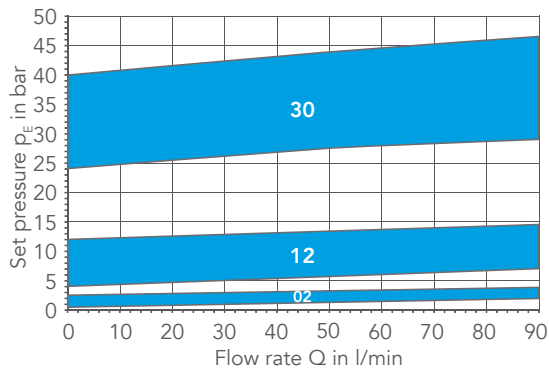
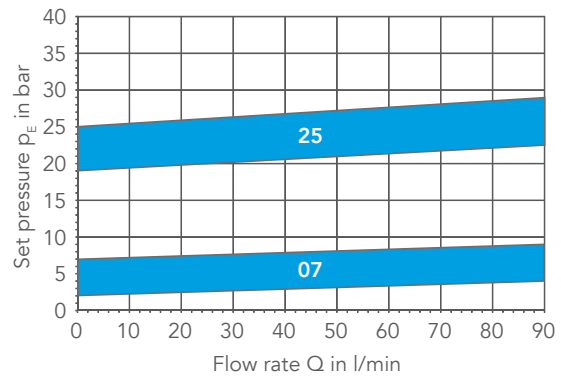
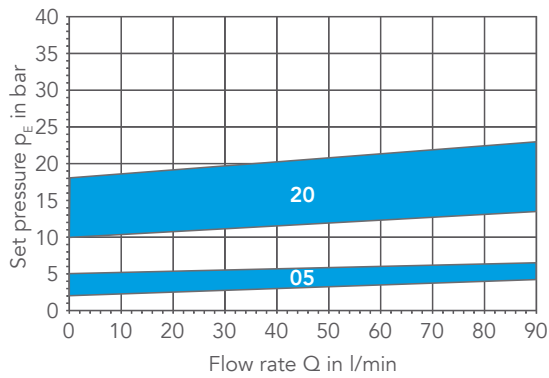
## Characteristic curves $p_E/Q$

### I Possible setting range of the pressure stage, viscosity = 34 mm<sup>2</sup>/s

#### SPV 10



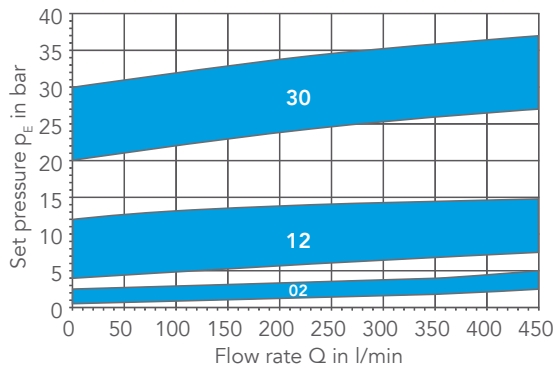
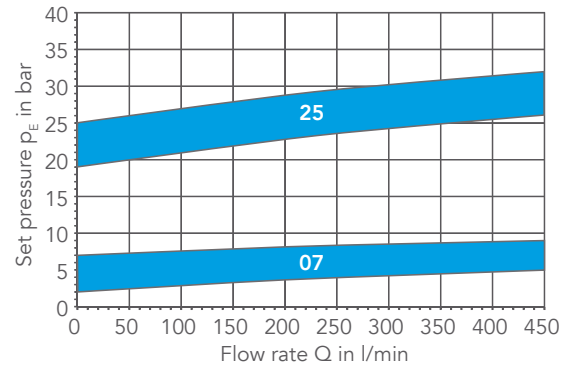
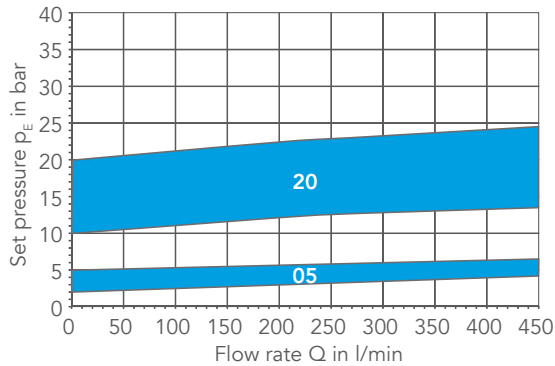
#### SPVF 20/25



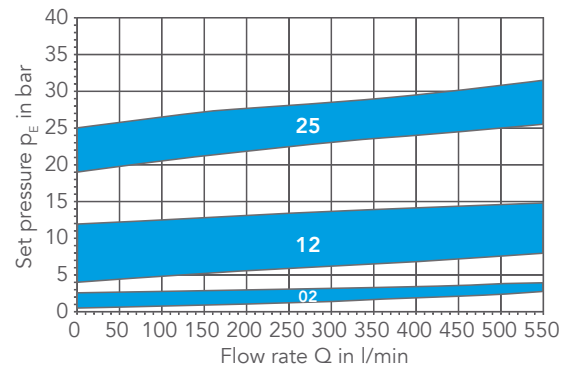
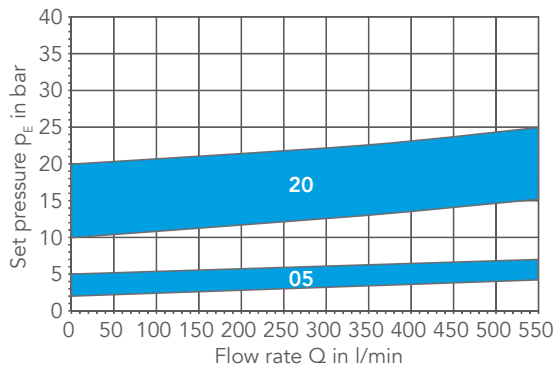
## Characteristic curves $p_E/Q$

### I Possible setting range of the pressure stage, viscosity = 34 mm<sup>2</sup>/s

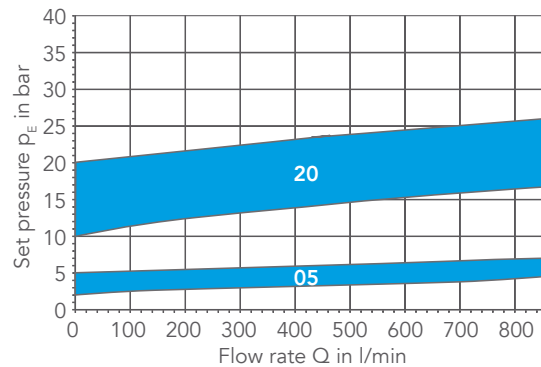
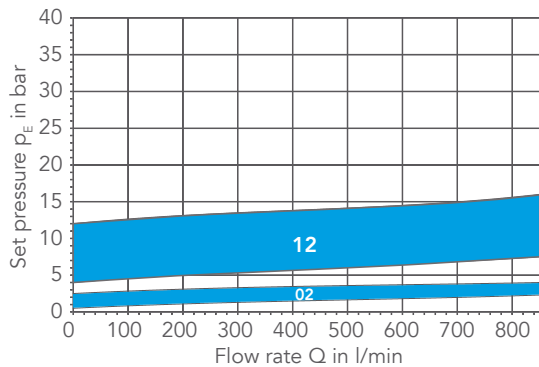
#### SPVF 32/40



#### SPVF 50



#### SPVF 80





## Type key

|            |          |           |          |           |          |          |           |             |
|------------|----------|-----------|----------|-----------|----------|----------|-----------|-------------|
| <b>SPV</b> | <b>M</b> | <b>10</b> | <b>A</b> | <b>1G</b> | <b>1</b> | <b>A</b> | <b>12</b> | <b>ATEX</b> |
| 1          | 2        | 3         | 4        | 5         | 6        | 7        | 8         | 9           |

|                               |  |
|-------------------------------|--|
| <b>1 Product</b>              |  |
| <b>2 Mounting</b>             |  |
|                               | Pipeline installation                      |
| <b>M</b>                      | Panel mounting                             |
| <b>3 Nominal size</b>         |  |
| <b>10</b>                     | Q <sub>max</sub> 40 l/min                  |
| <b>4 Versions</b>             |  |
| <b>A</b>                      | Standard version NBR                       |
| <b>B</b>                      | High temperature version C22/Cu            |
| <b>C</b>                      | FKM version                                |
| <b>D</b>                      | Soft iron seal                             |
| <b>E</b>                      | GJS housing NBR                            |
| <b>F</b>                      | GJS high temperature version C22/Cu        |
| <b>K</b>                      | GJS housing with FKM seal                  |
| <b>L</b>                      | GJS housing with FKM seal, ball seat valve |
| <b>5 Pipe connection</b>      |  |
| <b>1G</b>                     | Threaded connection G 1/2"                 |
| <b>6 Construction code</b>    |  |
|                               | (Specified by KRACHT)                      |
| <b>7 Type of setting</b>      |  |
| <b>A</b>                      | Set screw                                  |
| <b>B</b>                      | Knob                                       |
| <b>8 Pressure stage</b>       |  |
| <b>07</b>                     | 0.5 ... 7 bar                              |
| <b>12</b>                     | 4 ... 12 bar                               |
| <b>30</b>                     | 10 ... 30 bar                              |
| <b>9 Explosion protection</b> |  |
| <b>ATEX</b>                   | ATEX design                                |

### Ordering example: SPV 10 B 1G 1 A 12

- > Pressure relief valve, directly spring operated
- > Nominal size 10 (Q<sub>max</sub> 40 l/min)
- > High temperature version (... 220 °C)
- > Threaded connection G 1/2"
- > Pressure setting by set screw
- > Pressure setting range 4 ... 12 bar

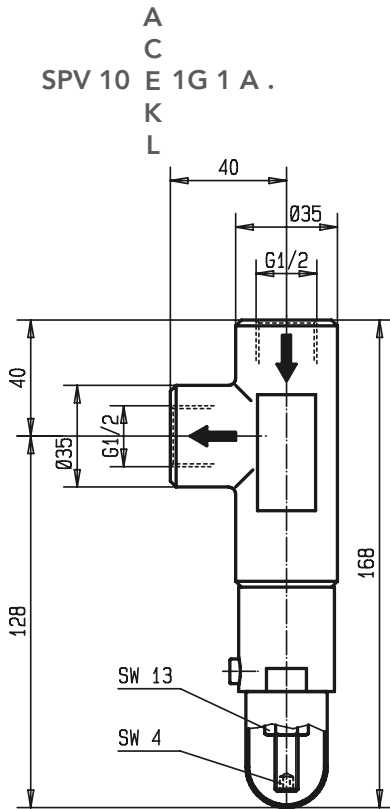
### Ordering example: SPVM 10 A 1G 1 B 30

- > Pressure relief valve, directly spring operated
- > Panel mounting
- > Nominal size 10 (Q<sub>max</sub> 40 l/min),
- > Standard version
- > Threaded connection G1/2"
- > Knob
- > Pressure setting range 10...30 bar

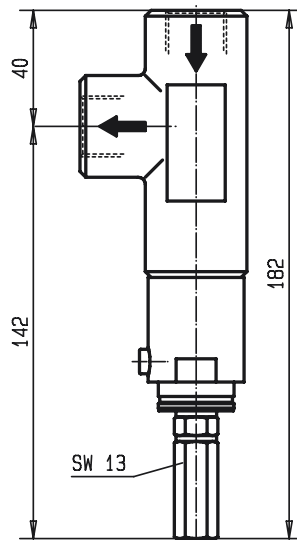
## Dimensions

### I SPV 10/SPVM 10

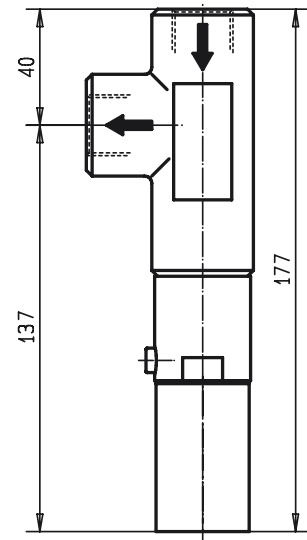
#### Ordering codes



B  
SPV 10 D 1G 1 A.  
F

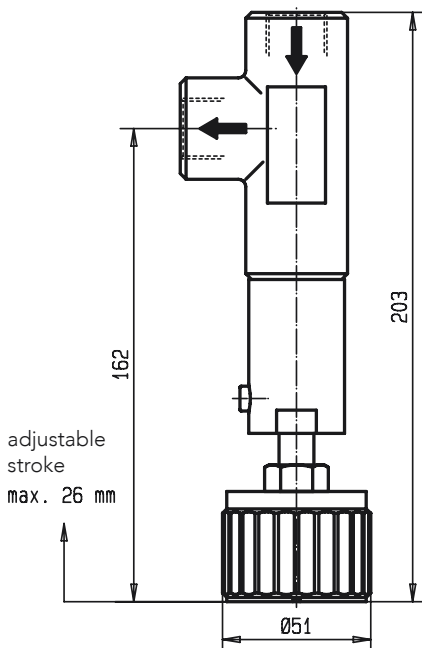


A  
C  
SPV 10 E 1G 1 A. ATEX  
K  
L

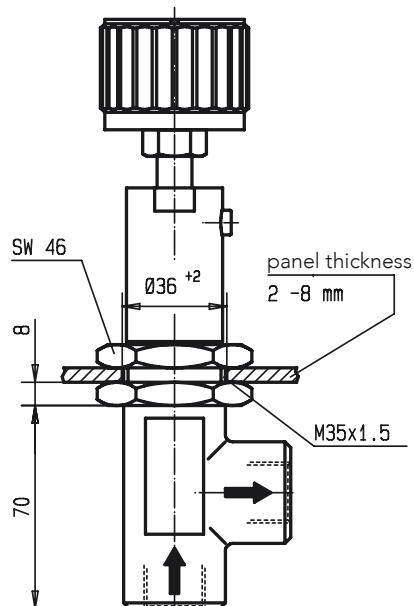


#### Ordering codes

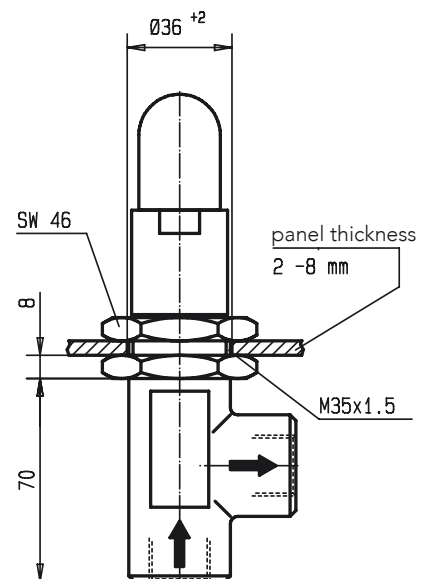
A  
C  
SPV 10 E 1G 1 B.  
K  
L



A  
C  
SPV M 10 E 1G 1 B.  
K  
L



A  
C  
SPV M 10 E 1G 1 A.  
K  
L



Dimensions in mm

Weight SPV: 0.9 kg

## Type key

|             |          |           |          |           |          |          |           |             |
|-------------|----------|-----------|----------|-----------|----------|----------|-----------|-------------|
| <b>SPVF</b> | <b>M</b> | <b>25</b> | <b>A</b> | <b>2F</b> | <b>1</b> | <b>A</b> | <b>12</b> | <b>ATEX</b> |
| 1           | 2        | 3         | 4        | 5         | 6        | 7        | 8         | 9           |

### 1 Product

### 2 Mounting

|          |                       |
|----------|-----------------------|
|          | Pipeline installation |
| <b>M</b> | Panel mounting        |

### 3 Nominal size

|           |                            |
|-----------|----------------------------|
| <b>20</b> | Q <sub>max</sub> 90 l/min  |
| <b>25</b> | Q <sub>max</sub> 90 l/min  |
| <b>32</b> | Q <sub>max</sub> 450 l/min |
| <b>40</b> | Q <sub>max</sub> 450 l/min |
| <b>50</b> | Q <sub>max</sub> 550 l/min |
| <b>80</b> | Q <sub>max</sub> 800 l/min |

### 4 Versions

|          |  |
|----------|--|
| <b>A</b> | Standard version NBR                       |
| <b>B</b> | High temperature version up to +220 °C     |
| <b>C</b> | FKM version up to +150 °C                  |
| <b>D</b> | Soft iron seal                             |
| <b>E</b> | GJS housing NBR                            |
| <b>F</b> | GJS high temperature version up to +220 °C |
| <b>G</b> | NBR version, lead seal possible            |
| <b>K</b> | GJS housing with FKM seal                  |

### 5 Pipe connection

|           |                           |
|-----------|---------------------------|
| <b>2F</b> | SAE-Flansch 3000 psi      |
| <b>1G</b> | Threaded connection G ... |

### 6 Construction code

|  |                       |
|--|-----------------------|
|  | (Specified by KRACHT) |
|--|-----------------------|

### 7 Type of setting

|          |                   |
|----------|-------------------|
| <b>A</b> | Set screw         |
| <b>B</b> | Knob (on request) |

### 8 Pressure stage

|           |                                 |
|-----------|---------------------------------|
| <b>02</b> | 0.5 ... 2.5 bar                 |
| <b>05</b> | 2 ... 5 bar                     |
| <b>07</b> | 2 ... 7 bar (only NG 20...40)   |
| <b>12</b> | 4 ... 12 bar                    |
| <b>20</b> | 10 ... 20 bar                   |
| <b>25</b> | 19 ... 25 bar (only NG 20...50) |
| <b>30</b> | 20 ... 40 bar (only NG 20/25)   |
| <b>30</b> | 15 ... 30 bar (only NG 32...40) |

### 9 Explosion protection

|             |             |
|-------------|-------------|
| <b>ATEX</b> | ATEX design |
|-------------|-------------|

#### Ordering example: SPVF 80 A1G 1 A 12

- > Pressure relief valve, directly spring operated
- > Flange version
- > Nominal size 80 (Q<sub>max</sub> 800 l/min)
- > Threaded connection G3
- > Pressure setting by set screw
- > Pressure setting range 4...12 bar

#### Ordering example: SPVF 40 B2F 1 A 20

- > Pressure relief valve, directly spring operated
- > Flange version
- > Nominal size 40 (Q<sub>max</sub> 450 l/min)
- > High temperature version (... +220 °C)
- > SAE-Flansch (3000 psi)
- > Pressure setting by set screw
- > Pressure setting range 10...20 bar

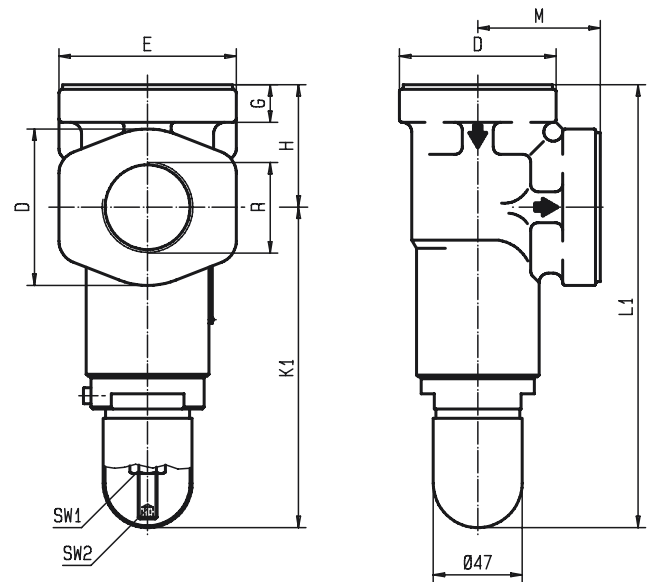
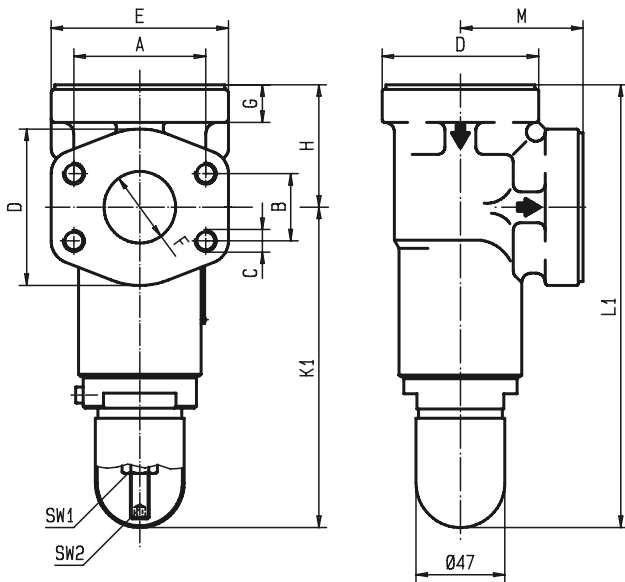
## Dimensions

### I SPVF

#### Ordering codes

SPVF .  $\begin{matrix} A \\ C \\ E \\ K \end{matrix}$  2F 1 A .

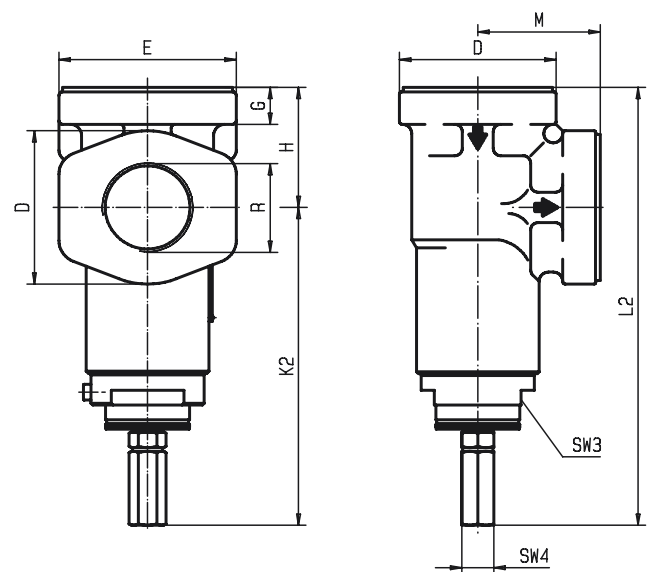
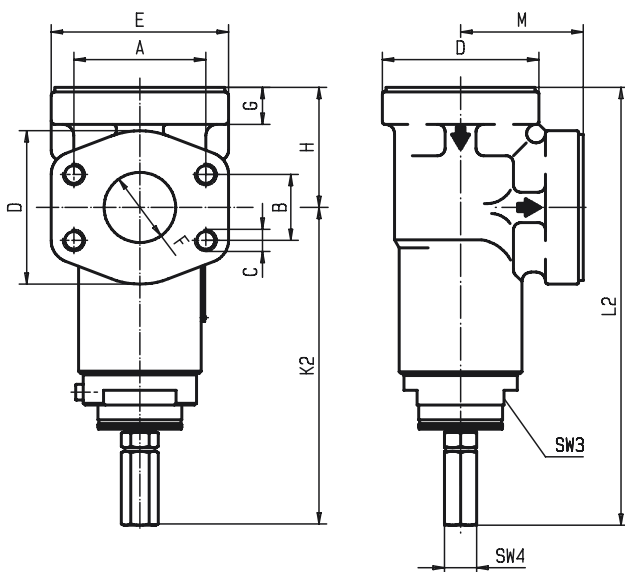
SPVF .  $\begin{matrix} A \\ C \\ E \\ K \end{matrix}$  1G 1 A .



#### Ordering codes

SPVF .  $\begin{matrix} B \\ D \\ F \end{matrix}$  2F 1 A .

SPVF .  $\begin{matrix} B \\ D \\ F \end{matrix}$  1G 1 A .



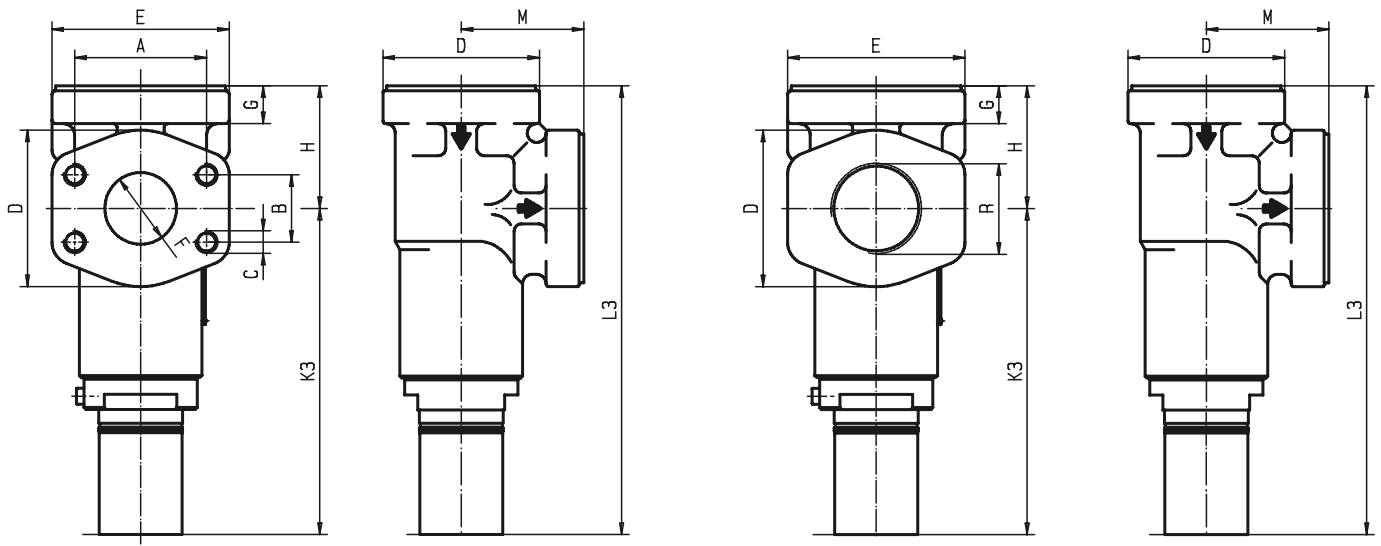
## Dimensions

### I SPVF ATEX versions

#### Ordering codes

A  
C  
E  
K
SPVF .
2F 1 A . ATEX

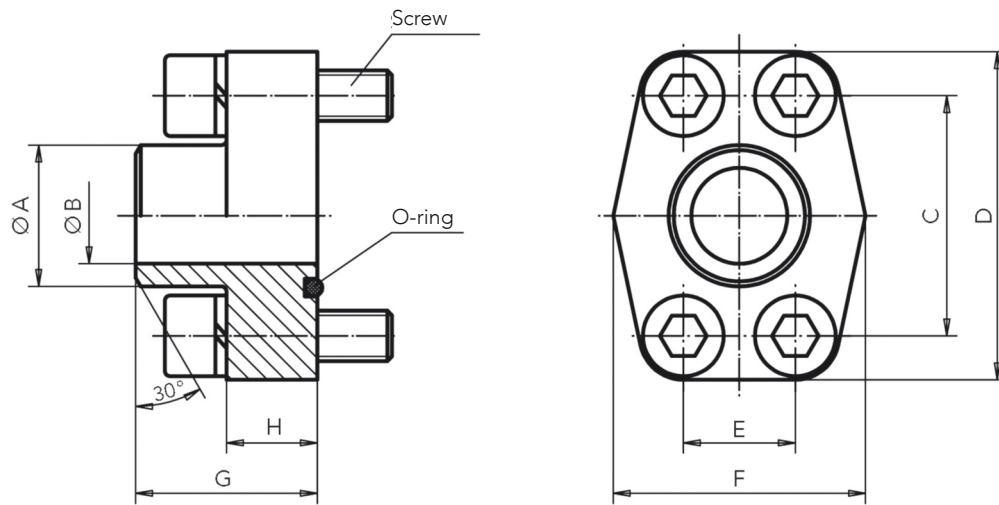
A  
C  
E  
K
SPVF .
1G 1 A . ATEX



| Nom. size | SAE flange | Thread R | A     | B    | C   | D   | E   | F    | G  | H   | K1  | K2  | K3  | L1  | L2  | L3  | M   | SW1 | SW2 | SW3 | SW4 | Weight in kg |
|-----------|------------|----------|-------|------|-----|-----|-----|------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------------|
| 20        | ¾"         | G ¾      | 47.6  | 22.2 | M10 | 59  | 70  | 24   | 20 | 50  | 160 | 167 | 169 | 210 | 217 | 227 | 50  | 17  | 5   | 46  | 17  | 3.0          |
| 25        | 1"         | G 1      | 52.4  | 26.2 | M10 | 59  | 70  | 24   | 20 | 50  | 160 | 167 | 169 | 210 | 217 | 227 | 55  | 17  | 5   | 46  | 17  | 3.0          |
| 32        | 1¼"        | G 1¼     | 58.7  | 30.2 | M10 | 72  | 79  | 32   | 20 | 65  | 170 | 172 | 174 | 235 | 237 | 247 | 65  | 17  | 5   | 46  | 17  | 5.5          |
| 40        | 1½"        | G 1½     | 69.9  | 35.7 | M12 | 83  | 94  | 38   | 20 | 65  | 170 | 172 | 174 | 235 | 237 | 247 | 65  | 17  | 5   | 46  | 17  | 6.0          |
| 50        | 2"         | G 2      | 77.8  | 42.9 | M12 | 97  | 102 | 50.5 | 20 | 75  | 192 | 209 | 212 | 267 | 284 | 284 | 75  | 19  | 6   | 46  | 19  | 8.2          |
| 80        | 3"         | G 3      | 106.4 | 61.9 | M16 | 131 | 135 | 79   | 25 | 110 | 190 | 207 | 208 | 300 | 317 | 315 | 110 | 19  | 6   | -   | 19  | 18.5         |

## Dimensions

### I Accessoires welding flange SAE (3000 psi)



| SAE flange | A    | B    | C      | D   | E     | F   | G   | H  | Screws 10.9 | O-ring       | max. working pressure in bar | Weight in kg |
|------------|------|------|--------|-----|-------|-----|-----|----|-------------|--------------|------------------------------|--------------|
| 3/4"       | 28.0 | 19.0 | 47.63  | 65  | 22.23 | 50  | 36  | 18 | M10 x 35    | 24.99 x 3.53 | 350                          | 0.46         |
| 1"         | 34.0 | 25.0 | 52.37  | 70  | 26.19 | 55  | 38  | 18 | M10 x 35    | 32.92 x 3.53 | 315                          | 0.54         |
| 1 1/4"     | 42.8 | 32.0 | 58.72  | 79  | 30.18 | 68  | 68  | 21 | M10 x 40    | 37.69 x 3.53 | 250                          | 0.78         |
| 1 1/2"     | 48.6 | 38.0 | 69.85  | 93  | 35.71 | 78  | 78  | 25 | M12 x 45    | 47.22 x 3.53 | 200                          | 1.24         |
| 2"         | 61.0 | 51.0 | 77.77  | 102 | 42.88 | 90  | 90  | 25 | M12 x 45    | 56.74 x 3.53 | 200                          | 1.40         |
| 3"         | 92.0 | 73.0 | 106.38 | 134 | 61.93 | 124 | 124 | 27 | M16 x 50    | 85.32 x 3.53 | 138                          | 2.54         |

## Notes

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