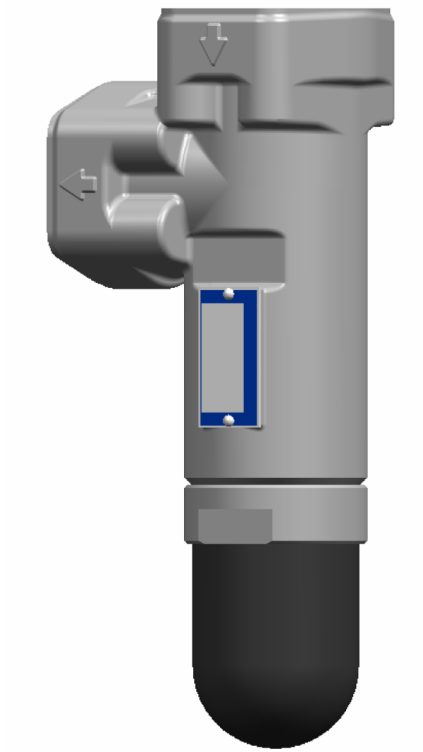


D.0024980002

Operating instructions (Translation)



Pressure relief valve SPV / SPVF

88024980002-18

Englisch

2019-07-29

KRACHT

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1 General

1.1 About the documentation

These operating instructions describe the installation, operation and maintenance of the following device:

Pressure relief valve SPV / SPVF

The device is manufactured in different versions. Information about the version concerned in the individual case can be found on the device's type plate.

These operating instructions are a component of the device and must be kept accessible for the personnel near the device at all times.

If you have any questions about these operating instructions, please contact the manufacturer.

1.2 Manufacturer's address

KRACHT GmbH
 Gewerbestraße 20
 DE 58791 Werdohl
 phone: +49 2392 935-0
 fax: +49 2392 935-209
 email: info@kracht.eu
 web: www.kracht.eu

1.3 Symbolism



Identification of an immediate hazard, which would result in death or severe bodily injury if not avoided.



Identification of a potential medium risk hazard, which would lead to death or severe bodily injury if not avoided.

 **CAUTION**

Identification of a low risk hazard, which could lead to minor or medium bodily injury if not avoided.

 **NOTICE**

Flagging of notices to prevent property damage.



Identification of basic safety instructions. Non-compliance can lead to hazards for people and the device.



Flagging of special user tips and other especially useful or important information.

2 Safety

2.1 Intended use

1. The device has been designed for operation with fluid. Dry operation is not permitted.
2. The device may be operated in filled condition only.
The medium must be compatible with the materials used in the device. The chemical competence is necessary for this. Be careful with ethylene oxide or other cathalytic or exothermic or self-decomposing materials. Please consult the manufacturer in cases of doubt.
3. The device may be operated only in usual industrial atmospheres. If there are any aggressive substances in the air, always ask the manufacturer.
4. Operation of the device is only permissible when complying with the operating instructions and applicable documents.
Deviating operating conditions require the express approval of the manufacturer.
5. In case of any use of the device not according to specification, any warranty is voided.

2.2 Personnel qualification and training

The staff designated to assemble, operate and service the device must be properly qualified. This can be through training or specific instruction. Personnel must be familiar with the contents of this operating instructions.



Read the operating instructions thoroughly before use.

2.3 Basic safety instructions



1. Comply with existing regulations on accident prevention and safety at work along with any possible internal operator regulations.
2. Pay attention to the greatest possible cleanliness.
3. Wear suitable personal protection equipment.
4. Do not remove, make illegible or obliterate type plates or other references on the device.
5. Do not make any technical changes on the device.
6. Maintain and clean the device regularly.
7. Use spare parts approved by the manufacturer only.

2.4 Basic hazards

 **DANGER****Hazardous fluids!**

Danger of death when handling hazardous fluids.

1. Comply with the safety data sheets and regulations on handling hazardous fluids.
2. Collect and dispose of hazardous fluids so that no hazards arise for people or the environment.

 **WARNING****Failure of load-carrying parts due to overload!**

Danger of injury from flying parts.

Danger of injury from spurting fluids.

1. Depressurise the device and all connection lines before doing any work.
2. Securely prevent the restoration of pressure while working on the device.

 **WARNING****Failure of load-carrying parts due to overload!**

Danger of injury from flying parts.

Danger of injury from spurting fluids.

1. Use only connections and lines approved for the expected pressure range.
2. Securely prevent exceeding the permissible pressure, e.g. by using pressure relief valves or rupture discs.
3. Design pipework so that no tensions, e.g. caused by changes in length due to fluctuations in temperature, are transmitted to the device.

 **WARNING****Failure of load-carrying parts due to overload!**

Danger of injury from flying parts.

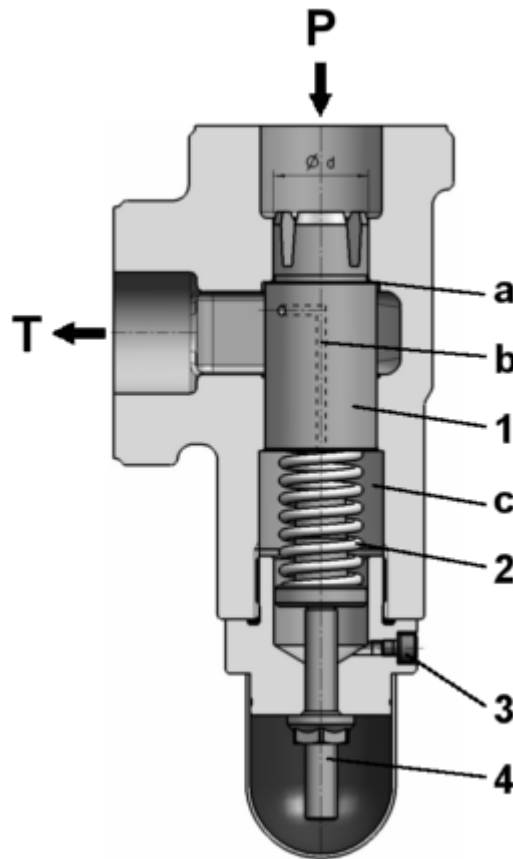
Danger of injury from spurting fluids.

1. Consider the permissible pressure setting range of the valve.
2. Check the pressure setting (the valve must not block).

3 Device description

3.1 Functional principle

Pressure relief valves of the SPV / SPVF series are directly operated slide valves or ball seat valves and are used to secure the low-pressure hydraulic circuits.



Explanation

P = Pressure connection

T = Tank connection

a - Ring surface

b - Balancing bore

c - Spring chamber

1. Valve piston

2. Compression spring

3. Venting screw

4. Adjustment screw

The slide valve is pressed through the compressed spring against the ring surface (a), thus blocking the pressure port (P) from the tank connection (T). When the opening is reached by adjusting with the adjustment screw, the valve piston releases flow of the fluid to the tank connection.

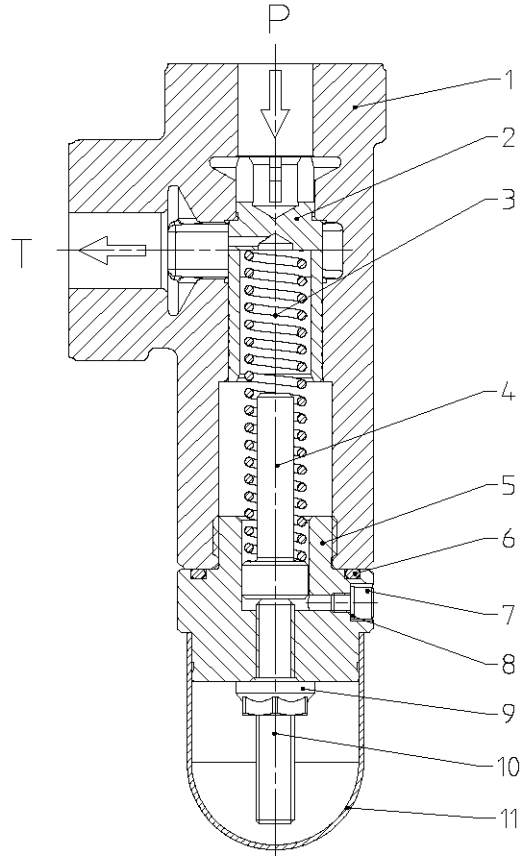
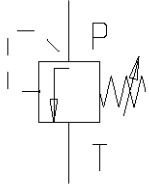
Balance the pressure in the spring chamber (c) through the balancing bore (b). When commissioning the valve, vent the spring chamber using the vent screw.

The valve should preferably be mounted vertical, with the adjustment screw facing down. In this case, venting is not required.

The flow direction is marked with an arrow on the unit housing. It is always implemented from the pressure port (P) to the tank connector (T).

3.2 Basic design

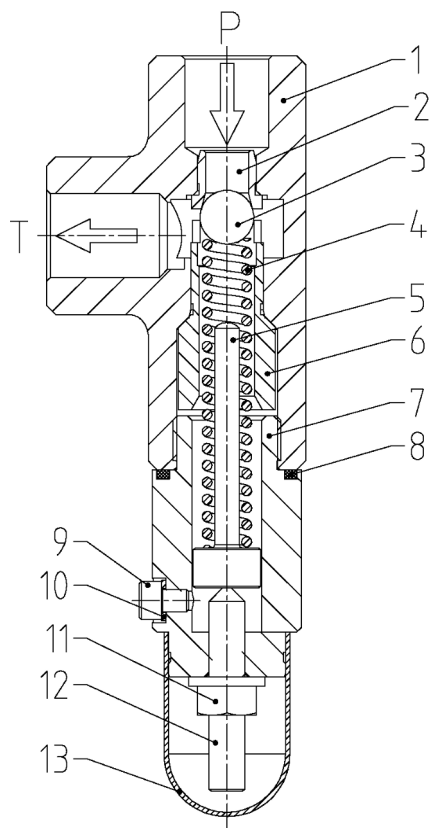
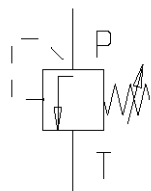
3.2.1 SPV / SPVF Sliding piston valve



Explanation

- | | |
|-----------------------|---------------------------|
| 1. Housing | 7. Venting screw |
| 2. Valve piston | 8. Sealing ring |
| 3. Compression spring | 9. Seal nut |
| 4. Spring guide | 10. Adjustment screw |
| 5. Cap screw | 11. Thread protective cap |
| 6. O-Ring | |

3.2.2 SPV Seat valve



Explanation

- | | |
|-----------------------|---------------------------|
| 1. Housing | 8. O-Ring |
| 2. Valve seat | 9. Venting screw |
| 3. Ball | 10. Sealing ring |
| 4. Compression spring | 11. Seal nut |
| 5. Spring guide | 12. Adjustment screw |
| 6. Guide bush | 13. Thread protective cap |
| 7. Cap screw | |

3.3 Type key

3.3.1 SPV

Ordering example SPV 10							
SPV	(M)	10	A	1G	1	A	12
1.	2.	3.	4.	5.	6.	7.	8.

Explanation of type key SPV 10				
1.	Product name			
2.	Installation			
	No specification	Pipeline installation		
	M	Console integration		
3.	Nominal size			
	10	Q _{max.} = 40 l/min		
4.	Version			
	A	Sealing material NBR Housing material EN-GJL-300 (GG 30)	E	Sealing material NBR Housing material EN-GJS-400-15 (GGG 40)
	B	Sealing material C22/Cu Housing material EN-GJL-300 (GG 30)	F	Sealing material C22/Cu Housing material EN-GJS-400-15 (GGG 40)
	C	Sealing material FKM Housing material EN-GJL-300 (GG 30)	K	Sealing material FKM Housing material EN-GJS-400-15 (GGG 40)
	D	Sealing material Soft iron Housing material EN-GJL-300 (GG 30)	L	Sealing material FKM Housing material EN-GJL-300 (GG 30) Ball seat valve
5.	Housing connection			
	1G	Whitworth pipe thread		
6.	Design serial number (specified by manufacturer)			
7.	Actuation type			
	A	Adjustment screw		
	B	Twist grip		
8.	Pressure stage			
	07	0.5 - 7 bar	30	10 - 30 bar
	12	4 - 12 bar		

3.3.2 SPVF

Ordering example SPVF 20 - 80							
SPVF	(M)	25	A	2F	1	A	12
1.	2.	3.	4.	5.	6.	7.	8.

Explanation of type key SPVF 20 - 80				
1.	Product name			
2.	Installation			
	No specification	Pipeline installation		
	M	Console integration		
3.	Nominal size			
	20	$Q_{max.} = 90 \text{ l/min}$	40	$Q_{max.} = 450 \text{ l/min}$
	25	$Q_{max.} = 90 \text{ l/min}$	50	$Q_{max.} = 550 \text{ l/min}$
	32	$Q_{max.} = 450 \text{ l/min}$	80	$Q_{max.} = 800 \text{ l/min}$
4.	Version			
	A	Sealing material NBR Housing material EN-GJL-300 (GG 30)	E	Sealing material NBR Housing material EN-GJS-400-15 (GGG 40)
	B	Sealing material C22/Cu Housing material EN-GJL-300 (GG 30)	F	Sealing material C22/Cu Housing material EN-GJS-400-15 (GGG 40)
	C	Sealing material FKM Housing material EN-GJL-300 (GG 30)	G	Sealing material NBR Housing material EN-GJL-300 (GG 30) Sealing facility
	D	Sealing material Soft iron Housing material EN-GJL-300 (GG 30)	K	Sealing material FKM Housing material EN-GJS-400-15 (GGG 40)
5.	Housing connection			
	1G	Whitworth pipe thread		
	2F	SAE-Flange connection (3000 psi)		
6.	Design serial number (specified by manufacturer)			
7.	Actuation type			
	A	Adjustment screw		
	B	Twist grip		

Explanation of type key SPVF 20 - 80				
8.	Pressure stage			
	02	0.5 - 2.5 bar	20	10 - 20 bar
	05	2 - 5 bar	25	19 - 25 bar (only NG 20 - 50)
	07	2 - 7 bar (only NG 20 - 40)	30	20 - 40 bar (only NG 20; 25)
	12	4 - 12 bar		15 - 30 bar (only NG 32; 40)

4 Technical data

4.1 General information

General information SPV / SPVF		
Design		Sliding piston valve/Seat valve
Fixing type		Pipeline installation/Console integration
Housing connection ⁽¹⁾	SPV 10	Whitworth pipe thread G1/2
	SPVF 20	Whitworth pipe thread G3/4
		Flange connection SAE 3/4"
	SPVF 25	Whitworth pipe thread G1
		Flange connection SAE 1"
	SPVF 32	Whitworth pipe thread G1 1/4
		Flange connection SAE 1 1/4"
	SPVF 40	Whitworth pipe thread G1 1/2
Flange connection SAE 1 1/2"		
SPVF 50	Whitworth pipe thread G2	
	Flange connection SAE 2"	
SPVF 80	Whitworth pipe thread G3	
	Flange connection SAE 3"	
Mounting position		Any ⁽²⁾
Viscosity	v_{min}	1.2 mm ² /s
	Sliding piston valve v_{max}	1000 mm ² /s
	Seat valve v_{max}	10000 mm ² /s

General information SPV / SPVF			
Max. flow capacity	Q	SPV 10	40 l/min
		SPVF 20	90 l/min
		SPVF 25	
		SPVF 32	450 l/min
		SPVF 40	
		SPVF 50	550 l/min
		SPVF 80	800 l/min
Max. operating pressure	p _{max}	SPV 10	120 bar
		SPVF 20	
		SPVF 25	
		SPVF 32	
		SPVF 40	100 bar
		SPVF 50	
		SPVF 80	80 bar
Min. operating pressure Tank connection T	p _{min}	No negative pressure permissible (at Q > 0)	
Adjustment range, response pressure	p _o	See section 4.3 "Adjustment range, response pressure"	
Ambient temperature	ϑ _u	-20 °C ≤ T _a ≤ 60 °C	
Fluid temperature	ϑ _m	See section 4.4 "Fluid temperature"	
Material		See section 4.2 "Material data"	
Filtering		Filter porosity ≤ 60 μm	
Permissible media		Lubricating fluids without abrasive components. The medium must be compatible with the materials used in the device. (Petrols, solvents, etc. are not permissible.)	
⁽¹⁾ Pipe thread: ISO 228-1; Flange connection: ISO 6162-1 (SAE J518)			
⁽²⁾ Preferred fitting position adjustment screw faces down.			

4.2 Material data

Version	Material						
	Housing	Seal	Compression spring	Other materials	Thread protective cap	Cap nut	
A	EN-GJL-300 (GG30)	NBR	Spring steel	Steel	PP	-	
B		C22/Cu			-	Steel	
C		FKM			PP	-	
D		Soft iron			-	Steel	
E	EN-GJS-400-15 (GGG40)	NBR			PP	-	
F		C22/Cu			-	Steel	
G	EN-GJL-300 (GG30)	NBR			-	Steel	
K	EN-GJS-400-15 (GGG40)	FKM			PP	-	-
L							

4.3 Adjustment range, response pressure

Nominal size	Pressure stage							
	02	05	07	12	20	25	30	
	p_o [bar]	p_o [bar]	p_o [bar]	p_o [bar]	p_o [bar]	p_o [bar]	p_o [bar]	
10	-	-	0.5 - 7	4 - 12	-	-	10 - 30	
20	0.5 - 2.5	2 - 5	2 - 7		10 - 20	19 - 25	15 - 30	
25								-
32								
40			-				-	
50			-				-	
80			-				-	

4.4 Fluid temperature

Version	Sealing material	Fluid temperature ⁽¹⁾	
		$\vartheta_{m \min}$ [°C]	$\vartheta_{m \max}$ [°C]
A	NBR	-20	90
B	C22/Cu		220
C	FKM		150
D	Soft iron		350
E	NBR		90
F	C22/Cu		220
G	NBR		90
K	FKM		150
L			

⁽¹⁾ Comply with media-specific properties.

4.5 Weight

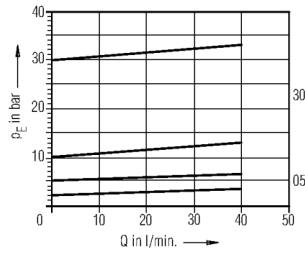
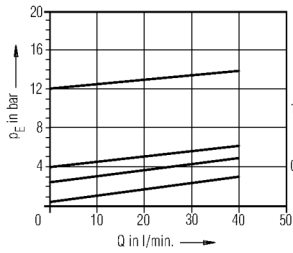
Nominal size	10	20	25	32	40	50	80
Weight [kg]	2.1	3.0	3.0	5.5	6.0	8.2	18.5

4.6 Dimensions

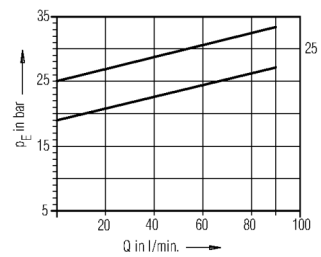
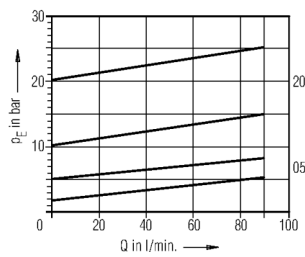
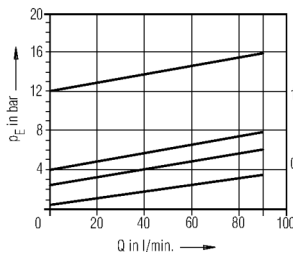
Dimensions of the device can be found in the relevant technical data sheets.

4.7 p_E - Q characteristic curves (at 34 mm²/s)

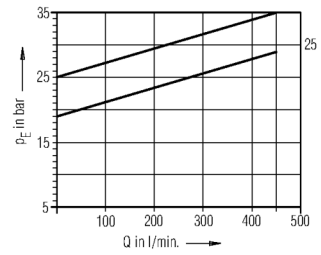
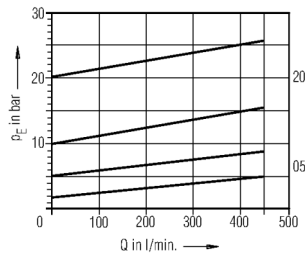
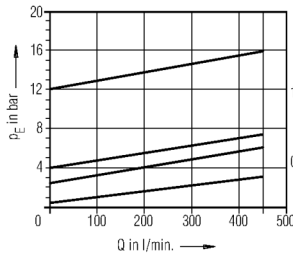
SPV 10



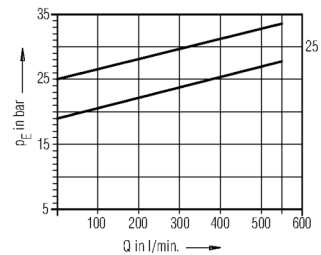
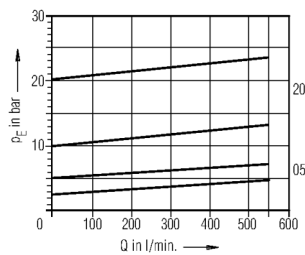
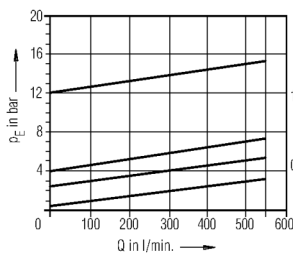
SPVF 20/25



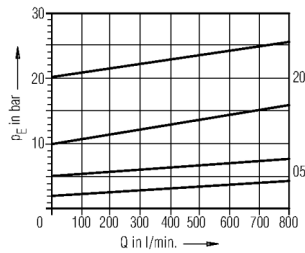
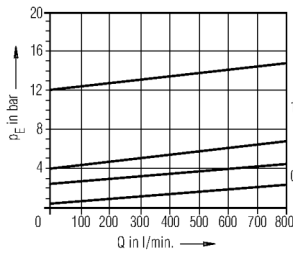
SPVF 32/40



SPVF 50



SPVF 80



5 Transport and storage

5.1 General

- After receipt, check the device for transport damages.
- If transport damage is noticed, report this immediately to the manufacturer and the carrier. The device must then be replaced or repaired.
- Dispose of packing material and used parts in accordance with the local stipulations.

5.2 Transport

**Falling or overturning loads!**

Danger of injury while transporting large and heavy loads.

1. Use only suitable means of conveyance and lifting tackle with sufficient load-bearing capacity.
2. Attach lifting tackle only to suitable load points.
3. Attach the lifting tackle in such a manner that it cannot slip.
4. Pay attention to the load balance point.
5. Always avoid jerks, impacts and strong vibrations during transportation.
6. Never walk under suspended loads, never work under suspended loads.



To transport the device, eyebolts can be screwed into the flange connections.

5.3 Storage

The device's function is tested in the plant with mineral hydraulic oil. Then all connections are closed. The remaining residual oil preserves the interior parts for up to 6 months.

Metallic exposed exterior parts are protected against corrosion by suitable conservation measures, also up to 6 months.

In case of storage, a dry, dust-free and low-vibration environment is to be ensured. The device is to be protected against influences from weather, moisture and strong fluctuations of temperature. The recommended storage conditions are to be adhered to.

Below the permissible ambient temperature ϑ_u elastomer seals lose their elasticity and mechanical loading capacity, since the glass transition temper-

ature is fallen below. This procedure is reversible. A force action on the device is to be avoided in case of storage below the permissible ambient temperature ϑ_u .

Devices with EPDM seals are not mineral-oil resistant and are not tested for their function. There is no preservation of the interior parts. If the device is not taken into operation immediately, all corrosion-prone surfaces are to be protected by suitable conservation measures. The same applies for devices which are not tested for other reasons.

When storing for a long period of time (> 6 months), treat all surfaces at risk of corrosion again with suitable preserving agents.

If high air humidity or aggressive atmospheres are expected, take additional corrosion-preventing measures.



Storage in corrosion protection bags (VCI) maximum of 6 months.



NOTICE

Corrosion/chemical impact

Improper storage can render the device useless.

1. Protect endangered surfaces by means of suitable conservation measures.
2. Comply with recommended storage conditions.



Recommended storage conditions

1. Storage temperature: 5 °C - 25 °C
2. Relative air humidity: < 70 %
3. Protect elastomer parts from light, especially direct sunlight.
4. Protect elastomer parts from oxygen and ozone.
5. Comply with maximum storage times of elastomeric parts:
 - 5 Years: AU (Polyurethane rubber)
 - 7 Years: NBR, HNBR, CR
 - 10 Years: EPM, EPDM, FEP/PTFE, FEP, FKM, FFKM, VMQ, FVMQ

6 Installation

6.1 Safety instructions for installation

DANGER

Hazardous fluids!

Danger of death when handling hazardous fluids.

1. Comply with the safety data sheets and regulations on handling hazardous fluids.
2. Collect and dispose of hazardous fluids so that no hazards arise for people or the environment.

WARNING

Failure of load-carrying parts due to overload!

Danger of injury from flying parts.

Danger of injury from spurting fluids.

1. Depressurise the device and all connection lines before doing any work.
2. Securely prevent the restoration of pressure while working on the device.

WARNING

Failure of load-carrying parts due to overload!

Danger of injury from flying parts.

Danger of injury from spurting fluids.

1. Use only connections and lines approved for the expected pressure range.
2. Securely prevent exceeding the permissible pressure, e.g. by using pressure relief valves or rupture discs.
3. Design pipework so that no tensions, e.g. caused by changes in length due to fluctuations in temperature, are transmitted to the device.

6.2 General

- Check the device for transport damage and dirt.
- Check the device for freedom of movement.
- Remove existing preservatives.
 - Use only those cleaning agents that are compatible with the materials used in the device.
 - Do not use cleaning wool.
- Compare the environmental and ambient conditions at the place of installation to the permissible conditions.
 - Expose the device only to small vibrations, see IEC 60034-14.
 - Secure sufficient access for maintenance and repair.

6.3 Mechanical installation

6.3.1 Pressure relief valve

- Install the device preferably vertical with the pressure adjustment screw facing down.
- Take measures against accidental touching of hot surfaces (> 60 °C).

6.4 Connection lines

6.4.1 General



WARNING

Failure of load-carrying parts due to overload!

Danger of injury from flying parts.

Danger of injury from spurting fluids.

1. Use only connections and lines approved for the expected pressure range.
2. Securely prevent exceeding the permissible pressure, e.g. by using pressure relief valves or rupture discs.
3. Design pipework so that no tensions, e.g. caused by changes in length due to fluctuations in temperature, are transmitted to the device.

**Additional connections**

1. Provide measurement connections for pressure and temperature as close as possible to device.
2. If necessary, provide a facility to fill or empty the device and the line system.
3. If necessary, provide a facility to vent the device and the line system.

6.4.2 Mounting Connection lines



Position of the device connections: See [chapter 3 “Device description”](#)

- Clean all lines.
 - Do not use cleaning wool.
 - Pickle and flush welded pipes.
- Remove the protective plugs.
- Mount the lines.
 - Comply with the manufacturer's information.
 - Do not use any sealing materials such as hemp, Teflon tape or putty.

7 Operation start-up

7.1 Safety instructions for start-up

DANGER

Hazardous fluids!

Danger of death when handling hazardous fluids.

1. Comply with the safety data sheets and regulations on handling hazardous fluids.
2. Collect and dispose of hazardous fluids so that no hazards arise for people or the environment.

WARNING

Failure of load-carrying parts due to overload!

Danger of injury from flying parts.

Danger of injury from spurting fluids.

1. Consider the permissible pressure setting range of the valve.
2. Check the pressure setting (the valve must not block).

CAUTION

Hot surfaces!

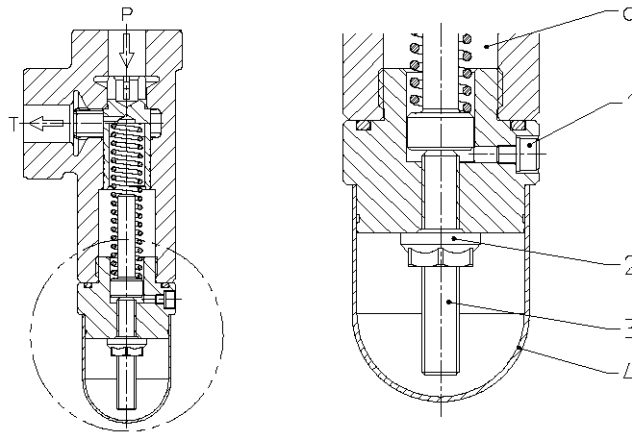
Burn injury to skin if touched.

1. Wear protective gloves at temperatures $\geq 48^{\circ}\text{C}$.

7.2 Adjustment and venting pressure relief valve

The response pressure of the device is factory set to the mean value of each pressure stage. If applicable, the pressure setting must be adapted during commissioning.

Pressure setting for actuation type: A Version: A; C; E; K; L



Explanation

- | | | |
|----|----------------|-----------------------|
| a. | Spring chamber | |
| 1. | Venting screw | 3. |
| 2. | Seal nut | 4. |
| | | Adjustment screw |
| | | Thread protective cap |

Pressure setting:

- Remove the thread protective cap [4]
- Loosen the seal nut [2]
- Set the response pressure using the adjusting screw [3]
 - clockwise - Higher response pressure
 - counterclockwise - Lower response pressure
- Secure adjustment screw with seal nut [3; 2]
(Tightening torque $M_A = 25 \text{ Nm}$)
- Attach the thread protective cap [4]



WARNING

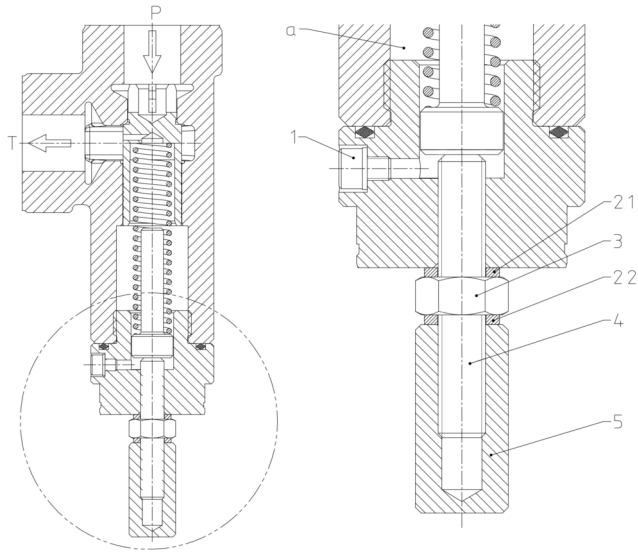
Failure of load-carrying parts due to overload!

Danger of injury from flying parts.

Danger of injury from spurting fluids.

1. Consider the permissible pressure setting range of the valve.
2. Check the pressure setting (the valve must not block).

Pressure setting for actuation type: A Version: B; D



Explanation

- | | | | |
|----|----------------|----|------------------|
| a. | Spring chamber | 3. | Hexagonal nut |
| 1. | Venting screw | 4. | Adjustment screw |
| 2. | Sealing ring | 5. | Cap nut |

Pressure setting:

- Unscrew cap nut [5]
- Remove sealing ring [2.2]
- Remove hexagon nut [3]
- Set the response pressure using the adjusting screw [4]
 - clockwise - Higher response pressure
 - counterclockwise - Lower response pressure
- Use the hexagon nut to fasten the setscrew to the sealing ring [4; 3; 2.1] (Tightening torque $M_A = 25 \text{ Nm}$)
- Place sealing ring on cap nut [2.2, 5]
- Screw on the cap nut with the sealing ring [5, 2.2]



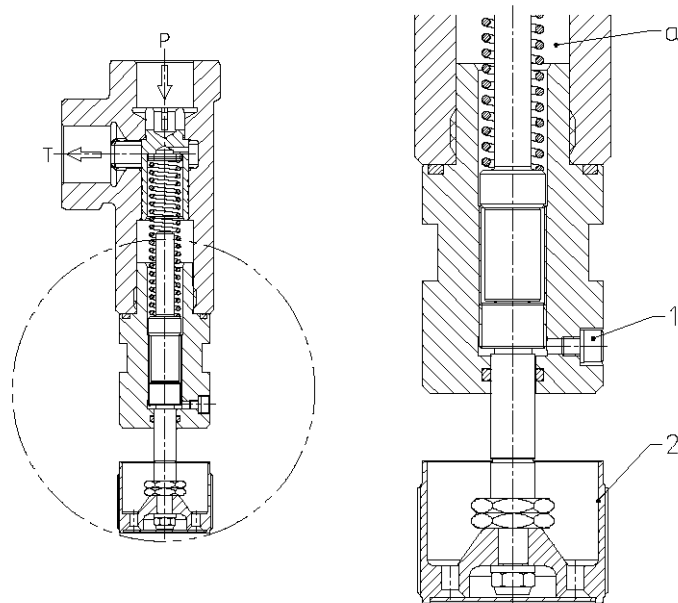
WARNING

Failure of load-carrying parts due to overload!

Danger of injury from flying parts.
 Danger of injury from spurting fluids.

1. Consider the permissible pressure setting range of the valve.
2. Check the pressure setting (the valve must not block).

Pressure setting for actuation type: B



Explanation

- | | | | |
|----|----------------|----|---------------|
| a. | Spring chamber | 1. | Venting screw |
| | | 2. | Twist grip |

Pressure setting:

- Set the response pressure with the adjusting screw [2]
 - clockwise - Higher response pressure
 - counterclockwise - Lower response pressure



The twist grip is not secured against accidental maladjustment.

! WARNING

Failure of load-carrying parts due to overload!

Danger of injury from flying parts.

Danger of injury from spurting fluids.

1. Consider the permissible pressure setting range of the valve.
2. Check the pressure setting (the valve must not block).

Venting

When commissioning the valve, vent the spring chamber using the vent screw.

Vent at low pressure.

- Screw out venting screw one revolution.

- Collect and dispose of discharging medium so that no hazard arises for persons or environment.

The venting procedure is ended when the liquid escapes bubble-free.

- Retighten the venting screw



If the pressure relief valve was installed vertically, with the set-screw facing down, venting is not necessary.



No negative pressure may be generated at the tank port T of the valve in the flow-through state ($Q > 0$), as otherwise no venting of the valve is possible and undesirable vibrations and noises can occur as a result. If this is unavoidable, the special solution (S33) is available.

7.3 Further operation start-up

- Open existing shut-off elements upstream and downstream of the device.
- Vent the system at the highest possible point.
- Check the operating data such as:
 - Response pressure
 - System pressure (as close as possible to device)
 - Fluid temperature (as close as possible to device)
 - ...
- Check the device for leaks.
- Check all threaded connections for leaks and retighten if necessary.



Existing venting and drain plugs must always be closed during operation according to specification.

8 Removal

8.1 Safety instructions for removal

DANGER

Hazardous fluids!

Danger of death when handling hazardous fluids.

1. Comply with the safety data sheets and regulations on handling hazardous fluids.
2. Collect and dispose of hazardous fluids so that no hazards arise for people or the environment.

WARNING

Failure of load-carrying parts due to overload!

Danger of injury from flying parts.

Danger of injury from spurting fluids.

1. Depressurise the device and all connection lines before doing any work.
2. Securely prevent the restoration of pressure while working on the device.

CAUTION

Hot surfaces!

Burn injury to skin if touched.

1. At temperatures $\geq 48^{\circ}\text{C}$ the device must be allowed to cool down first.

8.2 General

- Depressurise and de-energize the system.
- Close existing shut-off elements upstream and downstream of the device.
- Open existing drain elements and loosen connection lines. Collect and dispose of discharging medium so that no hazard arises for persons or environment.
- Dismantle the device.
- Clean the device.
- Close the device connections and lines to prevent dirt penetration.

9 Maintenance

9.1 Safety instructions for maintenance

DANGER

Hazardous fluids!

Danger of death when handling hazardous fluids.

1. Comply with the safety data sheets and regulations on handling hazardous fluids.
2. Collect and dispose of hazardous fluids so that no hazards arise for people or the environment.

WARNING

Failure of load-carrying parts due to overload!

Danger of injury from flying parts.

Danger of injury from spurting fluids.

1. Depressurise the device and all connection lines before doing any work.
2. Securely prevent the restoration of pressure while working on the device.

CAUTION

Hot surfaces!

Burn injury to skin if touched.

1. At temperatures $\geq 48^{\circ}\text{C}$ the device must be allowed to cool down first.

9.2 Maintenance work



Checking and documentation of the operating data

Regular checking and documentation of all operating data such as pressure, temperature, current consumption, degree of filter soiling, etc. contributes to early problem detection.

- Perform maintenance according to specification.
- Replace defective and worn components.
- If required, request spare parts lists and assembly drawings from the manufacturer.
- Document the type and scope of the maintenance work along with the operating data.
- Compare the operating data with the values of the first commissioning. Determine the cause in case of major non-compliances (> 10 %).
- Dispose of packing material and used parts in accordance with the local stipulations.



Barriers and instructions

All barriers and warning signs removed during this must be attached to their original position on completing maintenance and/or repairs.

9.3 Maintenance instructions

The following information provides recommendations on maintenance work and maintenance intervals for the device being used.

Depending on the actually occurring loads in operation, the type, scope and interval of the maintenance work can deviate from the recommendations. The equipment builder/operator shall write an obligatory maintenance plan.



Within the framework of preventive maintenance, it is appropriate to replace wear parts before reaching the wear limit.

With corresponding expertise and sufficient equipment, the replacement can be carried out by the equipment builder/operator. Please consult the manufacturer about this.



Warranty

In case of improper implementation, any warranty is voided.

Maintenance recommendations Pressure relief valve			
Interval	Maintenance work	Employees	Duration approx. [h]
Firstly: after max. 24 h	Inspection: Valve function	1	1
	Inspection: Response pressure		
	Inspection: System pressure		
	Inspection: Fluid temperature		
	Inspection: Device temperature		
	Inspection: Check potential equalisation for firm seating and functionality (if existing)		
	Inspection: Condition of operating fluid		
Daily	Audiometric monitoring: Unusual noise	1	0.1
	Cleaning: Remove dust deposits and dirt with a moist, clean cloth		
	Visual inspection: Leakages		
2000 Operating hours - - - Rotational direction monitoring of the motor, e.g. with a rotating field instrument. After 12 months	Inspection: Valve function	1	1
	Inspection: Response pressure		
	Inspection: System pressure		
	Inspection: Fluid temperature		
	Inspection: Device temperature		
	Inspection: Condition of operating fluid		
As required	Replace: Seals	1	1

10 Repairs

10.1 Safety instructions for repair

DANGER

Hazardous fluids!

Danger of death when handling hazardous fluids.

1. Comply with the safety data sheets and regulations on handling hazardous fluids.
2. Collect and dispose of hazardous fluids so that no hazards arise for people or the environment.

WARNING

Failure of load-carrying parts due to overload!

Danger of injury from flying parts.

Danger of injury from spurting fluids.

1. Depressurise the device and all connection lines before doing any work.
2. Securely prevent the restoration of pressure while working on the device.

CAUTION

Hot surfaces!

Burn injury to skin if touched.

1. At temperatures $\geq 48^{\circ}\text{C}$ the device must be allowed to cool down first.

10.2 General

The repairs covers:

1. Troubleshooting
Determination of damage, pinpointing and localisation of the damage cause.
2. Elimination of damage
Elimination of the primary causes and replacement or repair of defective components. The repair is generally made by the manufacturer.

Repairs by manufacturer

- Before returning the device, fill in the *return notification* form. The form can be filled in online and is available as a pdf file download.



Device contains hazardous material

If the device was operated with dangerous liquids, it must be cleaned before the return. If this should not be possible, the safety data sheet of the hazardous material is to be provided beforehand.

Repair by equipment builder/operator

If corresponding expertise and sufficient equipment is available, the equipment builder/operator can also make the repairs. Please consult the manufacturer about this.

- If required, request spare parts lists and assembly drawings from the manufacturer.
- Use spare parts approved by the manufacturer only.
- Dispose of packing material and used parts in accordance with the local stipulations.



Warranty

In case of improper implementation, any warranty is voided.



Barriers and instructions

All barriers and warning signs removed during this must be attached to their original position on completing maintenance and/or repairs.

10.3 Detecting and eliminating failures

Failure	Potential causes	Possible measures
1 Increased noise <i>Mechanical vibrations</i>	Wobbling pressure relief valve	Increase valve opening pressure
	Air in the spring chamber	Vent the device
	Air in the spring chamber due to negative pressure at tank connection T	Adapt installation situation
2 Response pressure too high	Slide valve stiff (Contaminated medium)	Clean the device
		Replace the device
		Provide filtration
3 Leakages <i>Seal failure</i>	Poor maintenance	Comply with maintenance plan Replace seals
	Mechanical damage	Replace seals
	Thermal overload	Check the operating datas Replace seals
	Corrosion/chemical impact	Check the material compatibility Replace seals
Consult the manufacturer for all unidentifiable failures.		