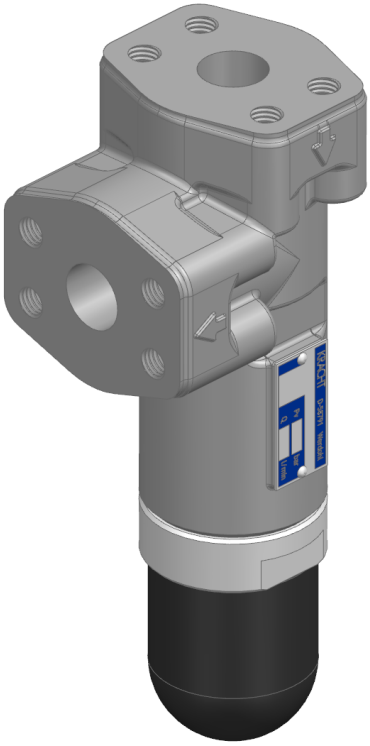
KRACHT

D.0024980002

Operating instructions (Translation)



Pressure relief valve SPV

English

19 • 02/04/2025

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1 General

1.1 About the documentation

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

Pressure relief valve SPV

These operating instructions are an integral part of the product and must be kept in the immediate vicinity of the

product and accessible to the personnel at all time.

Different versions of the product are produced. Which version is concerned

is stated on the device's type plate.

If you have any questions about this operating manual, please contact the manufacturer.

1.2 Manufacturer address

KRACHT GmbH
Gewerbestraße 20
D-58791 Werdohl
Tel: +49 2392 935-0
Fax: +49 2392 935-209
Email: info@kracht.eu
Web: www.kracht.eu

1.3 Other applicable documents

In addition to these instructions, also comply with the relevant instructions of plants or plant parts available or planned on site.

1.4 Symbols

⚠ DANGER

Identification of an immediate hazard, which can lead to death or severe bodily injury if not avoided.

⚠ WARNING

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

⚠ CAUTION

Identification of a possible low-risk hazard that can result in minor or moderate physical injury if not avoided.

⚠ ATTENTION

Identification of notes to prevent property damage.

NOTICE

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

TIP

Identification of special user tips and other particularly useful or important information

2 Safety

2.1 Intended use

1. The product has been designed for operation with fluids.
   Dry operation is not permitted.
2. The product may only be operated when completely filled.
3. The fluid must be compatible with the materials used in the product. Chemical expertise is required for that. Be careful with ethylene oxide or other catalytically or exothermically reacting or self-decomposing substances. Please consult the manufacturer in cases of doubt.
4. The product may only be used in normal industrial atmospheres. If there are any aggressive substances in the air, always consult the manufacturer.
5. The product may only be operated in compliance with these operating instructions and the applicable documents.
   Deviating operating conditions require the express approval of the manufacturer.
6. Use of the product for purposes other than those for which it is intended invalidates any warranty.

2.2 Personal qualification

The personnel charged with the assembly, operation and maintenance of the product must have the necessary qualifications.
This can be achieved through training or appropriate instruction.
The personnel must be familiar with the contents of these operating instructions.

NOTICE

Read the operating instructions in full before using the product.

2.3 Basic safety instructions

NOTICE

Basic safety instructions

Non-compliance can lead to hazards for people and the unit.

a) Follow existing regulations for accident prevention and safety at work as well as the internal regulations of the operating company.

b) Ensure the greatest possible cleanliness.

c) Wear suitable personal protective equipment.

d) Do not remove type plates or other information or make them illegible or unrecognisable.

e) Do not make any technical modifications.

f) Comply with maintenance intervals.

g) Only use spare parts approved by the manufacturer.

2.4 Fundamental hazards

⚠ DANGER

Hazardous fluids

Danger to life when handling hazardous fluids

a) Comply with the safety data sheets and regulations on handling the hazardous fluids.

b) Collect and dispose of hazardous fluids so that no hazard is created for persons or the environment.

⚠ WARNING

Failure of pressure bearing parts due to overload

Risk of injury from flying parts.

Risk of injury due to splashing fluids.

a) Before carrying out any work, depressurise the product and all connection pipes.

b) Securely prevent the pressure from being restored during work.

⚠ WARNING

Failure of pressure bearing parts due to overload

Risk of injury from flying parts.

Risk of injury due to splashing fluids.

a) Use only connections and lines approved for the expected pressure range.

b) Securely prevent the permissible pressures from being exceeded, e.g. by using pressure relief valves or bursting discs.

c) Pipelines must be designed in such a way that no tension e.g. caused by changes in length due to fluctuations in temperature can be transferred to the product.

⚠ WARNING

Failure of pressure bearing parts due to overload

Risk of injury from flying parts.

Risk of injury caused by splashing fluids.

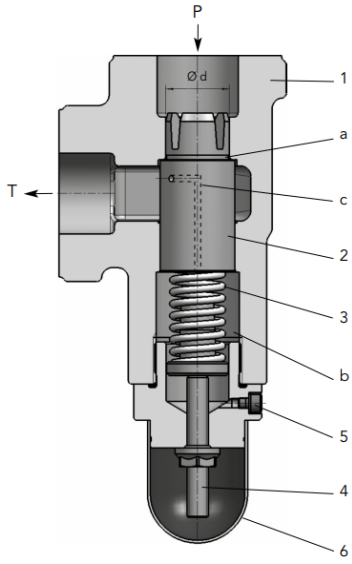
a) Note the permissible pressure setting range of the valve.

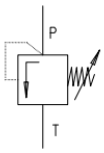
b) Check the pressure setting (the valve must not block).

3 Device description

3.1 Functional principle

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





1	Housing	2	Valve gate
3	Compression spring	4	Adjustment screw
5	Venting screw	6	Protective cap
a	Ring surface	b	Spring chamber
c	bore hole	d	Diameter
P	Pressure connection	T	Tank connection

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.

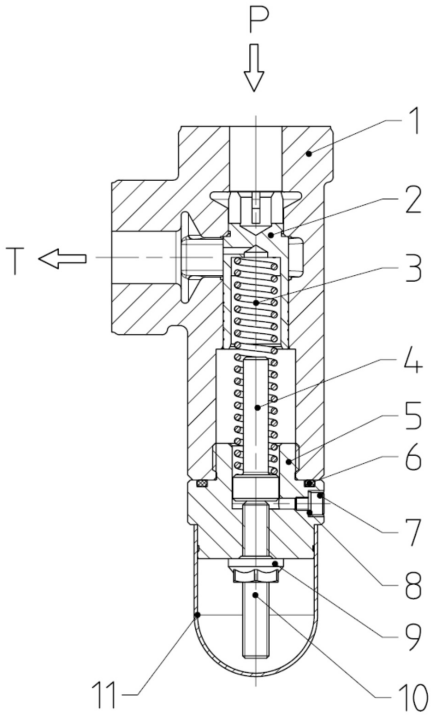
Balance the pressure in the spring chamber (c) through the balancing bore (b) When commissioning the valve, vent the spring chamber using the vent screw.

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).

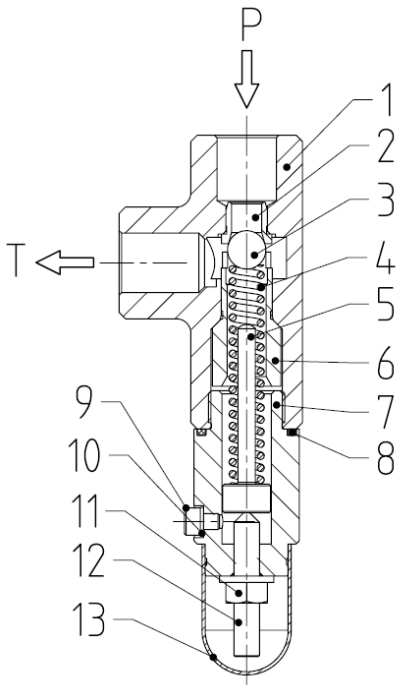
3.2 Variants

Slide valve



1	Housing	2	Valve gate
3	Compression spring	4	Spring guide
5	Cap screw	6	O-ring
7	Venting screw	8	Sealing ring
9	Collar nut	10	Adjustment screw
11	Protective cap		

Ball valve



1	Housing	2	Valve Seat
3	Sphere	4	Compression spring
5	Spring guide	6	Guide bush
7	Cap screw	8	O-ring
9	Venting screw	10	Sealing ring
11	Collar nut	12	Adjustment screw
13	Protective cap		

3.3 Type key

Ordering example																				
SPV		**10**		**V**	**1**		**N**	**1**		**R**		**012**		**S**	**1**		**A**		**/001**	
1.		2.		3.	4.		5.	6.		7.		8.		9.	10.		11.		12.	

Explanation of type key			
1. Product name			
SPV	Pressure relief valve		
2. Nominal			
10; 20; 25; 32; 40; 50; 80			
3. Design			
V	Slide valve	**S**	Seat valve
L	Ball valve		
4. Housing material			
1	EN-GJL-300	**2**	EN-GJS-400-15
5	EN-GJL-300; Zinc flake coating		
5. Seal material			
F	FKM	**E**	EPDM
N	NBR	**K**	Copper
W	Soft iron	**T**	FKM - Low temperature
6. Actuation type			
1	Adjustment screw, manual	**4**	rotary handle, manual , Console installation
2	rotary handle, manual	**5**	Adjustment screw, sealed
3	Adjustment screw, manual , Console installation		
7. Hydraulic connection			
S	Flange connection SAE (ISO 6162-1 / SAE J518)	**P**	Plate structure, Flangeable
R	Pipe thread (ISO 228-1)	**B**	Flange connection SAE + Pipe thread
8. Pressure stage (Pressure setting ranges)			
002	0.5...2.5 bar	**025**	19...25 bar
005	2...5 bar	**030**	10...30 bar
007	2...7 bar	**040**	10...40 bar
012	4...12 bar	**000**	Pressure stage (Special)
020	10...20 bar		
9. Fluid temperature			
S	Standard	**X**	ATEX
H	High temperature		

Explanation of type key			
10. Viscosity / Damping			
1	Standard	**3**	Vibration-damped, Damping nozzle
2	High viscosity		
11. Hydraulic control			
A	Standard (not present)	**E**	External spring space relief G 1/4
12. Special number			
Special numbers [▷ 13]			

3.4 Special numbers

Special number	Description
001	Hydraulically actuated pressure build-up valve
002	Fixed pressure setting with seal (Underwater version)
003	Pressure setting ranges 2...12 bar
004	for vacuum operation Without venting screw
005	Pressure setting ranges 0.9...1.0 bar
006	Pressure setting ranges 4...10 bar
007	Pressure setting ranges 0.9...1.05 bar

4 Technical data

4.1 General

General information			
Design		Slide valve / Seat valve	
Fixing type		Pipeline installation / Console installation	
Housing connection [1]		SPV 10	Whitworth pipe thread G 1/2
		SPV 20	Whitworth pipe thread G 3/4
			Flange connection SAE 3/4"
		SPV 25	Whitworth pipe thread G 1
			Flange connection SAE 1"
		SPV 32	Whitworth pipe thread G 1 1/4
			Flange connection SAE 1 1/4"
		SPV 40	Whitworth pipe thread G 1 1/2
			Flange connection SAE 1 1/2"
		SPV 50	Whitworth pipe thread G 2
			Flange connection SAE 2"
		SPV 80	Whitworth pipe thread G 3
			Flange connection SAE 3"
Mounting position		Any	
Viscosity	ν_{min}	1.2 mm²/s	
	ν_{max}	Slide valve 1000 mm²/s	
	ν_{max}	Seat valve 10000 mm²/s	
Max. Flow rate	**Q**	SPV 10	40 l/min
		SPV 20-25	90 l/min
		SPV 32-40	450 l/min
		SPV 50	550 l/min
		SPV 80	800 l/min
Design pressure	p_{max}	SPV 10-40	120 bar
		SPV 50	100 bar
		SPV 80	80 bar
Operating pressure tank connection (T)	p_{min}	No negative pressure permissible (at Q > 0)	
Response pressure	p_O	**Adjustment range, response pressure [▷ 15]**	
Fluid temperature	ϑ_m	**Permissible temperature range [▷ 17]**	
Ambient temperature	ϑ_u		
Filtering		≤ 60 µm	
Materials		**Material data [▷ 18]**	

General information	
Permissible media	Lubricating fluids without abrasive components ((Petrols, solvents, etc. are not permissible))
[(1)] Pipe thread : DIN EN ISO 228-1; Flange connection : DIN ISO 6162-1 (SAE J518)	

TIP

Preferred fitting position

Install the device preferably vertical with the pressure adjustment screw facing down.

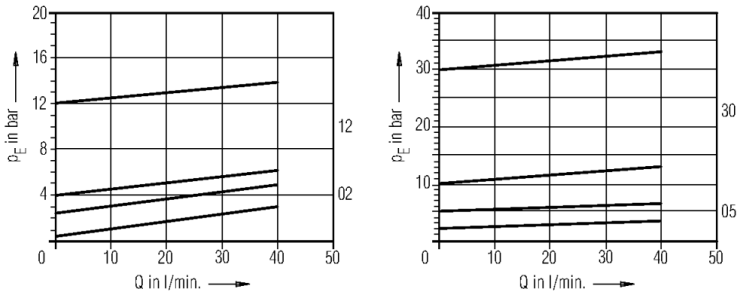
4.2 Adjustment range, response pressure

Nominal	Pressure stage							
	002	005	007	012	020	025	030	040
	p_o [bar]							
10	-	-	0.5 – 7	4 – 12	-	-	10 - 30	-
20	0.5 – 2.5	2 – 5	2 - 7		10 - 20	19 - 25	-	10 - 40
25								
32							15 - 30	-
40								
50			-				-	
80						-		

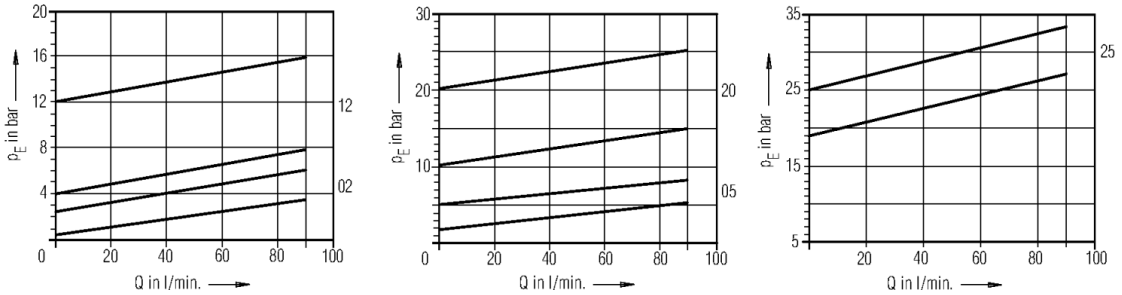
4.3 Characteristic curves

Δp-Q- Characteristic curves (at 34 mm²/s)

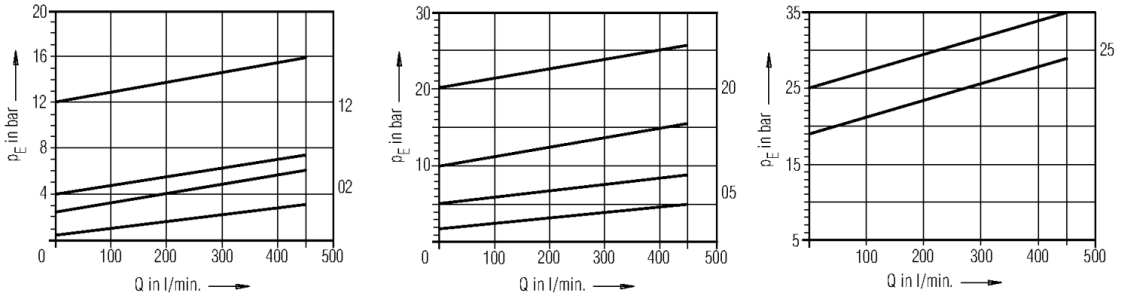
SPV 10



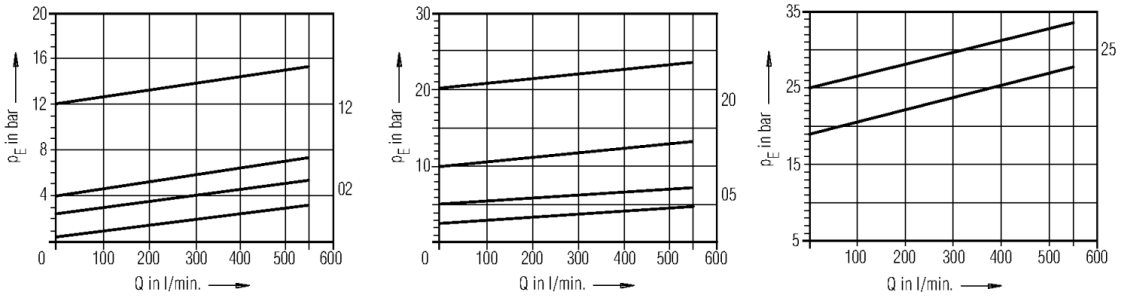
SPV 20-25



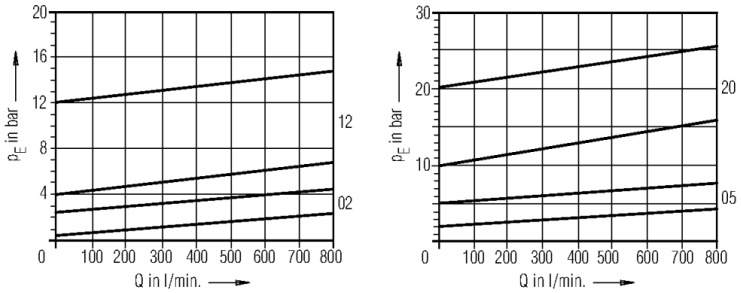
SPV 32-40



SPV 50



SPV 80



4.4 Permissible temperature range

Seal material	Fluid temperature	
	$\vartheta_{m\ min}$ [°C]	$\vartheta_{m\ max}$ [°C]
FKM	-15	150
NBR	-20	90
Copper	-20	220
EPDM	-20	80
Soft iron	-40	220
FKM - Low temperature		150

Seal material	Ambient temperature	
	$\vartheta_{u\ min}$ [°C]	$\vartheta_{u\ max}$ [°C]
FKM	-15	60
NBR	-20	
Copper		
EPDM		
Soft iron	-40	
FKM - Low temperature		

NOTICE

Note media-specific properties.

4.5 Material data

Housing	Seal	Compression spring	Other materials	Thread protective cap	Cap nut
EN-GJL-300 - - - EN-GJS-400-15	NBR	Spring steel	Steel (St)	Polypropylen (PP)	-
	Copper			-	Steel (St)
	FKM			Polypropylen (PP)	-
	Soft iron			-	Steel (St)
	FKM - Low temperature				
	EPDM				

4.6 Weight

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

4.7 Dimensions

The dimensions of the product are given in the technical data sheets.

5 Transport and storage

5.1 General

a) After receiving the delivery, check the product for transport damage.

b) If transport damage is found, the manufacturer and the transport company must be notified immediately. The product must then be replaced or repaired.

c) Dispose of packaging materials and used parts according to local regulations.

5.2 Transport

⚠ WARNING

Falling or toppling loads

Risk of injury during transport of large and heavy loads.

a) Use only suitable means of transport and lifting gear with sufficient load-bearing capacity.

b) Attach lifting gear only to suitable places on the load.

c) Attach the lifting gear so that it cannot slip.

d) Note the centre of gravity of the load.

e) Avoid sudden, jerky movements, impacts and strong vibrations during transport.

f) Do not step under overhead loads, do not work under overhead loads.

NOTICE

Eyebolts can be screwed into the thread of the flanged connections to transport the product.

5.3 Storage

The product's function is tested in the factory with mineral hydraulic oil. The connections are then closed. The remaining residual oil preserves the internal parts for up to 6 months.

Bright metallic external parts are also protected against corrosion by suitable preservation measures for up to 6 months.

During storage, ensure a dry, dust-free and low-vibration environment. The product must be protected from weather, moisture and large temperature fluctuations. Comply with the recommended storage conditions.

Below the permissible ambient temperature ϑ_U, elastomer seals lose their elasticity and mechanical loading capacity, as the temperature is below the glass transition temperature. This process is reversible. Avoid the application of force on the product during storage below the permissible ambient temperature ϑ_U.

Products with EPDM seals are not mineral oil resistant and their function is not tested. The internal parts are not preserved. If the product is not put into operation immediately, all surfaces exposed to corrosion must be protected by suitable preservation measures. The same applies to products that are not tested for other reasons.

In case of storage for a longer period (> 6 months), all surfaces exposed to corrosion must be retreated with suitable preservatives.

If high humidity or an aggressive atmosphere is to be expected, additional suitable corrosion prevention measures must be taken.

NOTICE

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

⚠ ATTENTION

Corrosion/chemical attack

Improper storage can make the product unusable.

a) Use suitable preservation measures to protect exposed surfaces.

b) Comply with the recommended storage conditions.

5.4 Storage conditions

TIP

Recommended storage conditions

a) Storage temperature: 5 °C – 25 °C

b) Relative humidity: < 70 %

c) Protect elastomer parts from light, particularly direct sunlight.

d) Protect elastomer parts from oxygen and ozone.

e) Note the maximum storage period of elastomer parts:

⇨ 5 years: AU (polyurethane rubber)

⇨ 7 years: NBR, HNBR, CR

⇨ 10 years: EPM, EPDM, FEP/PFTE, FEPM, FKM, FFKM, VMQ, FVMQ

6 Installation

6.1 Safety instructions for installation

⚠ DANGER

Hazardous fluids

Danger to life when handling hazardous fluids

a) Comply with the safety data sheets and regulations on handling the hazardous fluids.

b) Collect and dispose of hazardous fluids so that no hazard is created for persons or the environment.

⚠ WARNING

Failure of pressure bearing parts due to overload

Risk of injury from flying parts.

Risk of injury due to splashing fluids.

a) Before carrying out any work, depressurise the product and all connection pipes.

b) Securely prevent the pressure from being restored during work.

⚠ WARNING

Failure of pressure bearing parts due to overload

Risk of injury from flying parts.

Risk of injury due to splashing fluids.

a) Use only connections and lines approved for the expected pressure range.

b) Securely prevent the permissible pressures from being exceeded, e.g. by using pressure relief valves or bursting discs.

c) Pipelines must be designed in such a way that no tension e.g. caused by changes in length due to fluctuations in temperature can be transferred to the product.

6.2 Mechanical installation

6.2.1 Preparation

a) Check the product for transport damage and contamination.

b) Remove any preservative present.

⇨ Only use cleaning agents that are compatible with the materials used.

⇨ Do not use cleaning wool.

c) Compare the environmental and ambient conditions at the place of use with the permissible conditions.

⇨ Expose the product only to low vibrations, see IEC 60034-14.

⇨ Ensure sufficient accessibility for maintenance and repair.

6.2.2 General

⚠ CAUTION

Hot surfaces

Burns of the skin on contact.

a) Take measures to prevent accidental touching of hot surfaces (< 60 °C).

TIP

Preferred fitting position

Install the device preferably vertical with the pressure adjustment screw facing down.

6.3 Connection lines

6.3.1 General

⚠ WARNING

Failure of pressure bearing parts due to overload

Risk of injury from flying parts.

Risk of injury due to splashing fluids.

a) Use only connections and lines approved for the expected pressure range.

b) Securely prevent the permissible pressures from being exceeded, e.g. by using pressure relief valves or bursting discs.

c) Pipelines must be designed in such a way that no tension e.g. caused by changes in length due to fluctuations in temperature can be transferred to the product.

NOTICE

Additional connections

a) Provide measurement connections for pressure and temperature as near as possible on the device.

b) If necessary, provide an option for filling and draining the device and line system.

c) If necessary, provide an option for venting the device and line system.

6.3.2 Connection line installation

a) Clean all lines.

⇨ Do not use cleaning wool.

⇨ Pickle and rinse welded pipes.

b) Remove existing protective plugs.

c) Install the lines.

⇨ Comply with the manufacturer's instructions.

⇨ Do not use any sealing materials such as hemp, Teflon tape or putty.

7 Commissioning

7.1 Safety instructions for start-up

⚠ DANGER

Hazardous fluids

Danger to life when handling hazardous fluids

a) Comply with the safety data sheets and regulations on handling the hazardous fluids.

b) Collect and dispose of hazardous fluids so that no hazard is created for persons or the environment.

⚠ WARNING

Failure of pressure bearing parts due to overload

Risk of injury from flying parts.

Risk of injury caused by splashing fluids.

a) Note the permissible pressure setting range of the valve.

b) Check the pressure setting (the valve must not block).

⚠ WARNING

Failure of pressure bearing parts due to overload

Risk of injury from flying parts.

Risk of injury due to splashing fluids.

a) Use only connections and lines approved for the expected pressure range.

b) Securely prevent the permissible pressures from being exceeded, e.g. by using pressure relief valves or bursting discs.

c) Pipelines must be designed in such a way that no tension e.g. caused by changes in length due to fluctuations in temperature can be transferred to the product.

⚠ CAUTION

Hot surfaces

Burns of the skin on contact.

a) Wear protective gloves at temperatures ≥48°C.

7.2 General

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.

⚠ WARNING

Failure of pressure bearing parts due to overload

Risk of injury from flying parts.

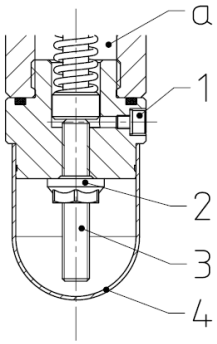
Risk of injury caused by splashing fluids.

a) Note the permissible pressure setting range of the valve.

b) Check the pressure setting (the valve must not block).

7.3 Druckeinstellung

7.3.1 SPV with protective cap



1 Venting screw
2 Collar nut
3 Adjustment screw
4 Protective cap
a Spring chamber

a) Schutzkappe entfernen.

b) Unscrew flange nut.

c) Use the adjusting screw to set the set pressure.

⇨ Clockwise rotation = Pressure increase

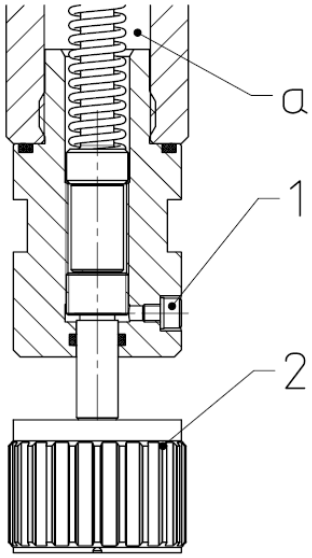
⇨ Counter-clockwise rotation = Pressure decrease

d) Secure setscrew with union nut.

⇨ Anziehdrehmoment M_A = 25 Nm

e) Put on the protective cap.

7.3.2 SPV with twist grip



1 Venting screw
2 rotary handle
a Spring chamber

a) Set the response pressure with the adjusting screw.
   ⇨ Clockwise rotation = Pressure increase
   ⇨ Counter-clockwise rotation = Pressure decrease

⚠ ATTENTION

The twist grip is not secured against accidental maladjustment.

7.4 Venting

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

a) Vent at low pressure.
b) Screw out venting screw one revolution.
c) Collect and dispose of discharging medium so that no hazard arises for persons or environment.
d) The venting procedure is ended when the liquid escapes bubble-free.
e) Retighten the venting screw.

TIP

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

TIP

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.

7.5 Additional commissioning

a) Open existing shut-off elements in front of and behind the product.

b) Vent the system at the highest possible point.

c) Check the operating data.

d) Document the operating data of the initial commissioning for later comparison.

e) Check all fittings for leaks and retighten if necessary.

TIP

Vorhandene Entlüftungs- bzw. Ablassschrauben müssen bei bestimmungsgemäßen Betrieb immer geschlossen sein.

8 Removal

8.1 Safety instructions for disassembly

⚠ DANGER

Hazardous fluids

Danger to life when handling hazardous fluids

a) Comply with the safety data sheets and regulations on handling the hazardous fluids.

b) Collect and dispose of hazardous fluids so that no hazard is created for persons or the environment.

⚠ WARNING

Failure of pressure bearing parts due to overload

Risk of injury from flying parts.

Risk of injury due to splashing fluids.

a) Before carrying out any work, depressurise the product and all connection pipes.

b) Securely prevent the pressure from being restored during work.

⚠ CAUTION

Hot surfaces

Burns of the skin on contact.

a) At temperatures ≥ 48 °C allow the product to cool first.

8.2 General

a) Depressurise and de-energise the system.

b) Close existing shut-off elements in front of and behind the product.

c) Open existing drain elements and undo connection lines. Collect and dispose of leaking media so that no hazard is created for persons or the environment.

d) Dismantle the product.

e) Clean the product.

f) Seal the process connections and lines to prevent the ingress of dirt.

NOTICE

The concrete procedure for cleaning depends on the media being used.

a) See the safety data sheet of the media in use.

9 Maintenance

9.1 Safety instructions for maintenance

⚠ DANGER

Hazardous fluids

Danger to life when handling hazardous fluids

a) Comply with the safety data sheets and regulations on handling the hazardous fluids.

b) Collect and dispose of hazardous fluids so that no hazard is created for persons or the environment.

⚠ WARNING

Failure of pressure bearing parts due to overload

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b) Securely prevent the pressure from being restored during work.

⚠ CAUTION

Hot surfaces

Burns of the skin on contact.

a) At temperatures ≥ 48 °C allow the product to cool first.

9.2 Maintenance work

TIP

Checking and documentation of the operating data

Regular checking and documentation of all operating data helps to detect faults at an early stage.

- Perform the maintenance work according to specifications.
- Replace defective or worn components.
- If necessary, 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 initial commissioning.
  In case of large deviations (> 10 %) determine the cause.
- Dispose of packaging materials and used parts according to local regulations.

NOTICE

Protective devices and notes

After maintenance and/or repair, reattach all protective devices and notices removed in the process to their original position.

9.3 Maintenance instructions

The following information provides recommendations for maintenance work and maintenance intervals for the product in use.
Depending on the actual loads occurring during operation, the type, scope and interval of the maintenance work may deviate from the recommendations. A mandatory maintenance plan must be drawn up by the installer/operating company.

TIP

In the course of preventive maintenance, it is advisable to replace wearing parts before the wear limit is reached.

With the appropriate know-how and sufficient equipment, the repair can also be carried out by the installer/operating company.
If necessary, request spare parts lists and assembly drawings from the manufacturer.
Please consult the manufacturer for this purpose.

NOTICE

Warranty

Any warranty will be void if not executed properly.

9.4 Maintenance table

9.4.1 Maintenance table

		First time after max. 24h	Daily	3000 operating hours	6000 operating hours	If necessary	Additional information
9.4.2	**Check the operating pressure**	2					
9.4.3	**Check the media temperature**	2					
9.4.4	**Inspection valve function**	2					
9.4.5	**Check the condition of the operating fluid**	2					
9.4.6	**Check the equipotential bonding**	2					
9.4.7	**Noise test unusual noises**		1				
9.4.8	**Cleaning**		1				
9.4.9	**Visual inspection of leakage**		1				
9.4.2	**Check the operating pressure**			2			
9.4.3	**Check the media temperature**			2			
9.4.4	**Inspection valve function**			2			
9.4.5	**Check the condition of the operating fluid**			2			
9.4.6	**Check the equipotential bonding**			2			
9.4.10	**Visual inspection of valve condition**				3		
9.4.11	**Replacement valves**					4	
9.4.12	**Replace Other seals**					5	

1 - 0,1 h; 2 - 0,2 h; 3 - 0,75 h; 4 - 0,5 h; 5 - 1 h

9.4.2 Check the operating pressure

The operating pressure is indicated by the pressure gauges.

- If there is no operating pressure, check the individual components of the product.
- Comply with the product-specific data sheets/operating instructions.

9.4.3 Check the media temperature

The media temperature is measured through the temperature sensor.

The values are displayed by the built-in controller in the electrical control system.

- If the media temperature is too high or too low, check the product components.
- Comply with the product-specific data sheets/operating instructions.

9.4.4 Inspection valve function

Attachment valves and valve cartridges must be actuated at regular intervals.

This is the only way to ensure proper function.

9.4.5 Check the condition of the operating fluid

Pay attention to colour (dark colouring), odour and milky turbidity.

- Replace operating fluid if necessary.

9.4.6 Check the equipotential bonding

Check the equipotential bonding for tight fit and proper functioning.

9.4.7 Noise test unusual noises

In this case, attention must be paid to increased noise or uneven operation (pump unit).

- In case of unusual noises, examine the individual components of the product and line fixings and check the operating medium for foaming.
- Comply with the product-specific data sheets/operating instructions.

9.4.8 Cleaning

Remove dust deposits and dirt with a damp, clean cloth.

9.4.9 Visual inspection of leakage

Care must be taken here to ensure that there is no leakage from the connections.

- In the event of leaks in the connections, the glands must be tightened and, if necessary, the seals replaced.

9.4.10 Visual inspection of valve condition

Valve cartridges and assembled valves are wearing parts. The components must be replaced if they are excessively worn. Important control points are the valve pistons and their housing with the mating surfaces.

9.4.11 Replacement valves

With the appropriate know-how and adequate equipment, the repair can also be carried out by the installer/operating company.

To this end, if necessary, request spare parts and assembly drawings from the manufacturer.

Only use spare parts approved by the manufacturer.

9.4.12 Replace Other seals

Repairs by manufacturer.

Consult the manufacturer.

10 Repair

10.1 Safety instructions for repairs

⚠ DANGER

Hazardous fluids

Danger to life when handling hazardous fluids

a) Comply with the safety data sheets and regulations on handling the hazardous fluids.

b) Collect and dispose of hazardous fluids so that no hazard is created for persons or the environment.

⚠ WARNING

Failure of pressure bearing parts due to overload

Risk of injury from flying parts.

Risk of injury due to splashing fluids.

a) Before carrying out any work, depressurise the product and all connection pipes.

b) Securely prevent the pressure from being restored during work.

⚠ CAUTION

Hot surfaces

Burns of the skin on contact.

a) At temperatures ≥ 48 °C allow the product to cool first.

10.2 General

Corrective maintenance includes:

1. Troubleshooting
   Finding damage, determining and localising the cause of the damage.
2. Damage repair
   Removing the primary causes and replacing or repairing defective components. Repairs are generally carried out by the manufacturer.

Repair by the manufacturer

Before returning the product, fill out the return form. The form can be filled out online and is available to download as a pdf file or can be requested from the manufacturer.

NOTICE

Device contains hazardous substances

If the device has been operated with hazardous fluids it must be cleaned before it is returned. If this is not possible, the safety data sheet of the hazardous material must be provided in advance.

Repair by the installer/operating company

With the appropriate know-how and sufficient equipment, the repair can also be carried out by the installer/operating company. Please consult the manufacturer for this purpose.

a) If necessary, request spare parts lists and assembly drawings from the manufacturer.

b) Only use spare parts approved by the manufacturer.

c) Dispose of packaging materials and used parts according to local regulations.

NOTICE

Warranty

Any warranty will be void if not executed properly.

NOTICE

Protective devices and notes

After maintenance and/or repair, reattach all protective devices and notices removed in the process to their original position.

10.3 Fault table

Fault	Potential causes	Possible measures
Increased noise		
Mechanical vibrations	Wobbling pressure relief valve	Increase valve opening pressure
	Air in the spring chamber	Vent the system
	Air in the spring chamber due to negative pressure at tank connection	Adapt installation situation
Leckage		
Seal failure	Lack of maintenance	Comply with maintenance intervals
		Replace seals
	Mechanical damage	Replace seals
	Thermal overload	Check operating data
		Replace seals
	Corrosion/chemical degradation	Check material compatibility
		Replace seals
	Flange faces broken	Replace the product and/or flanges
Valve does not respond		
	Valve blocked	Adjust valve
		Comply with the adjustment
Response pressure too high		
	Valve slide/valve seat/valve cone tight or jammed	Clean the device
		Replace the device
	(Contaminated medium)	Provide filtration
Consult the manufacturer in the event of unidentifiable faults		