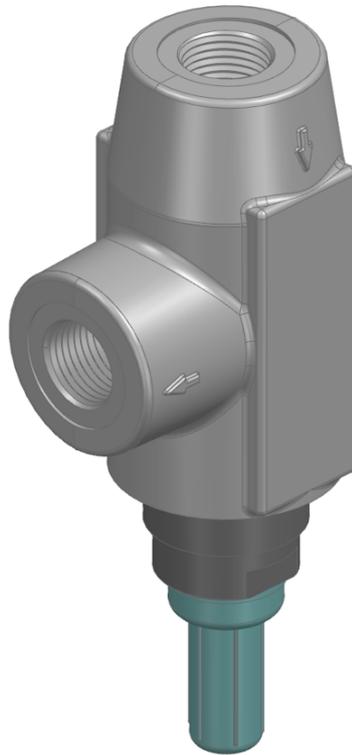


KRACHT

D.0025360002

Operating instructions (Translation)



Pressure relief valve DBD
English

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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 DBD

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.

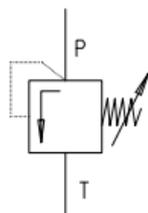
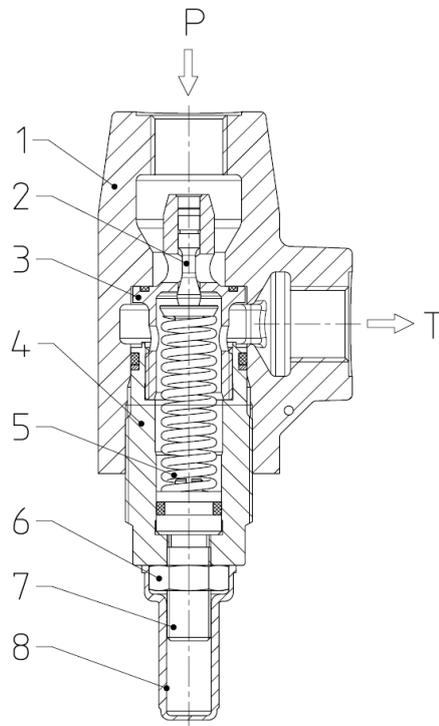
Risk of injury caused by splashing fluids.

- 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 this series are directly operated seat valves for installation in pipelines or as screw-in valves. The valve are used to safeguard hydraulic systems from excessive pressure.



- | | |
|----------------------|------------------|
| 1 Housing | 2 Valve cone |
| 3 Valve Seat | 4 Threaded bush |
| 5 Compression spring | 6 Hexagonal nut |
| 7 Adjustment screw | 8 Protective cap |

The valve cone is pressed by the compressed spring into the valve seat, which blocks Pressure connection (P) from Tank connection (T). When the response pressure is reached by adjusting with the setscrew, the valve cone releases the fluid flow to the tank connection.

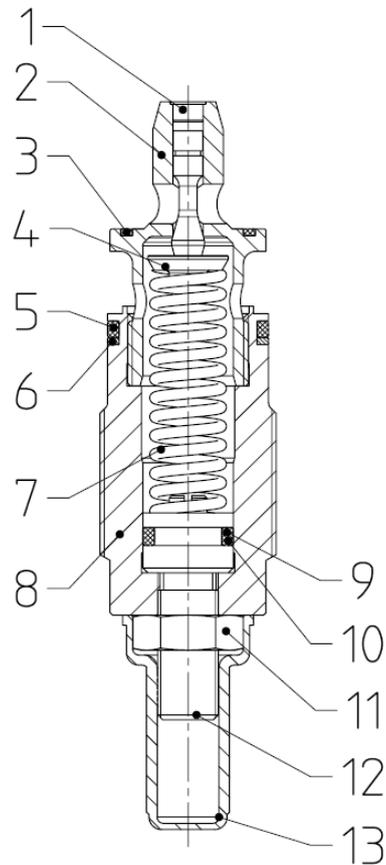
The response pressure is adjusted using the adjustment screw. To do this, the lock nut must be loosened and then tightened again after adjustment.

The valve should preferably be mounted vertical, with the adjustment screw facing down.

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).

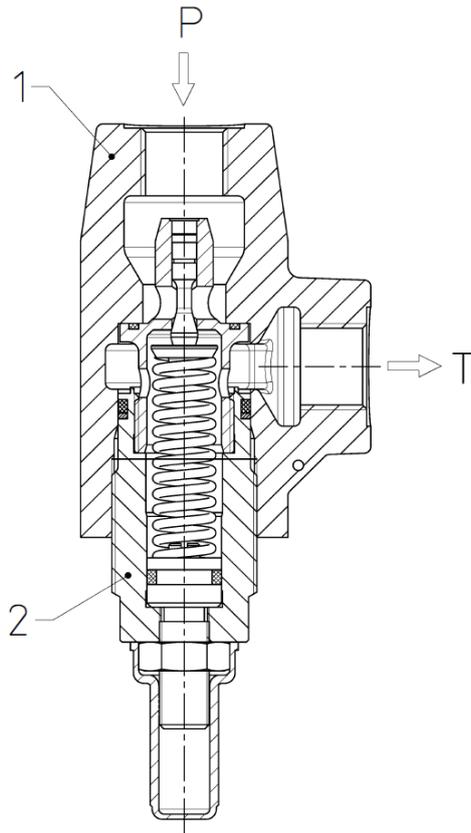
3.2 Variants

Screw-in valve (Valve cartridge)



- | | | | |
|----|--------------------|----|------------------|
| 1 | Damping plug | 2 | Valve Seat |
| 3 | O-ring | 4 | Valve cone |
| 5 | O-ring | 6 | Support ring |
| 7 | Compression spring | 8 | Threaded bush |
| 9 | O-ring | 10 | Support ring |
| 11 | Hexagonal nut | 12 | Adjustment screw |
| 13 | Protective cap | | |

Pipe construction



1 Housing

2 Screw-in valve (Valve cartridge)

3.3 Type key

Ordering example																	
DBD		20		K	3		N	1		E		063		S	2		/001
1.		2.		3.	4.		5.	6.		7.		8.		9.	10.		11.

Explanation of type key				
1. Product name				
DBD	Pressure relief valve			
2. Nominal				
06; 10; 20				
3. Design				
B	Conical operated seat valve for low-viscosity, abrasive media		D DED 213	
K	Conical operated seat			
4. Housing material				
1	EN-GJL-300		3 Steel (St) (only Valve cartridge)	
4	EN-GJS-400-18-LT		5 Aluminium (Al) (only Housing KP 1)	
5. Seal material				
F	FKM		N NBR	
6. Actuation type				
1	Adjustment screw, manual		2 rotary handle, manual	
3	Adjustment screw, manual , Console installation		4 rotary handle, manual , Console installation	
7. Hydraulic connection				
D	Housing (KP 1)	Whitworth pipe thread	G 1/2 (Tank connection)	
E	Valve cartridge			
G	Pipe thread (enlarged connection)	Whitworth pipe thread	G 3/4	
R	Pipe thread		G 1/4	DBD 06
			G 1/2	DBD 10
		G 1	DBD 20	
Pipe thread: DIN EN ISO 228-1				
8. Pressure stage (Pressure setting ranges)				
016	...16 bar		020 ...20 bar	
030	...30 bar		040 ...40 bar	
060	...60 bar		063 ...63 bar	
085	...85 bar		110 ...110 bar	
125	...125 bar		130 ...130 bar	
150	...150 bar		200 ...200 bar	
300	...300 bar		315 ...315 bar	
400	...400 bar			

Explanation of type key			
9. Fluid temperature			
S	Standard	X	ATEX
10. Viscosity / Damping			
1	Standard	3	Vibration-damped , Damping nozzle
2	High viscosity		
11. Special number			
Special numbers [▶ 13]			

3.4 Special numbers

Special number	Description
001	Optimised characteristic curve for pressures from 90 bar
002	Optimised characteristic curve for pressures from 16 bar
003	Hard chrome-plated, spring made of stainless steel, electro-galvanised

4 Technical data

4.1 General

General information		
Design	Seat valve, direct operated	
Fixing type	Screw-in valve / Pipeline installation	
Dämpfungsart	Valve cone with damping	
Mounting position	Any	
Viscosity	v_{\min}	10 mm ² /s 2 mm ² /s Cooling lubricant as per DIN 51521
	v_{\max}	600 mm ² /s
Max. Flow rate	Q_{\max}	Allowable pressures [▶ 15]
Operating pressure	p	
Nominal pressure	p_N	
Pressure setting ranges	$p_{v \min}$	
	$p_{v \max}$	
Fluid temperature	ϑ_m	Permissible temperature range [▶ 17]
Ambient temperature	ϑ_u	
Oil cleanliness		NAS 1638 Class 9 ISO 4406:1999 Code 20/18/15
Materials		Material data [▶ 18]
Permissible media		Hydraulic oil DIN 51524/25 Lubricating fluids without abrasive components (Petrols, solvents, etc. are not permissible)



TIP

Preferred fitting position

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

4.2 Allowable pressures

4.2.1 Operating pressure

Nominal	Nominal pressure	Inlet pressure		Outlet pressure
	p_N [bar]	$p_{e\ min}$ [bar]	$p_{e\ max}$ [bar]	$p_{R\ max}$ [bar]
06	400	20	410	210
10		15		
10 B for low-viscosity media	120	10	110	10
20	315	20	325	210

4.2.2 Setting pressure range

DBD 06				
Pressure stage	Pressure setting ranges [bar]		Flow rate [l/min]	
	$p_{v\ min}$	$p_{v\ max}$	$Q_{max\ p_{v\ min}}$	$Q_{max\ p_{v\ max}}$
063	10	63	5	10
125	20	125	5	15
200	35	200	8	25
315	60	315	10	30
400	80	400	15	40

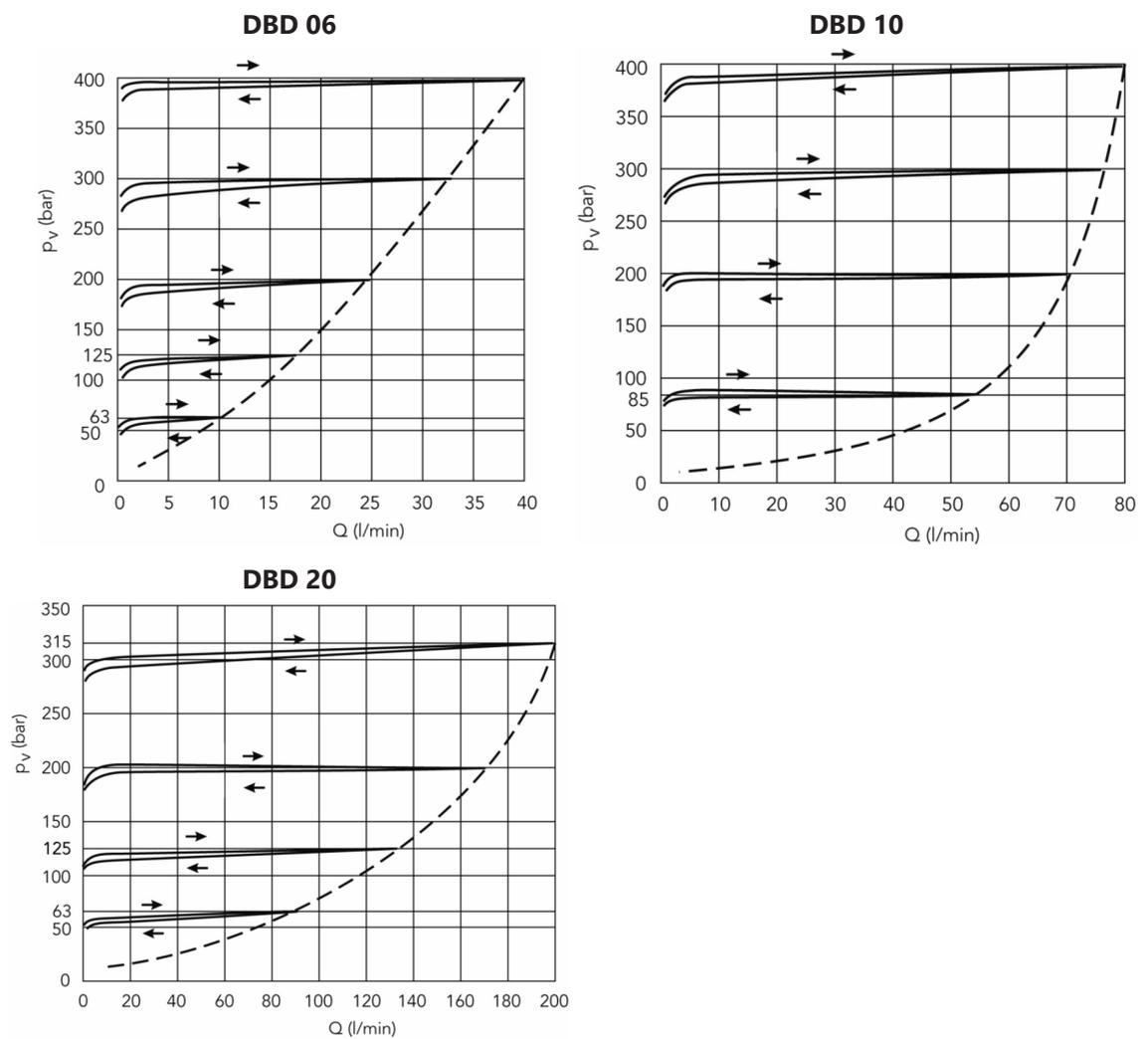
DBD 10				
Pressure stage	Pressure setting ranges [bar]		Flow rate [l/min]	
	$p_{v\ min}$	$p_{v\ max}$	$Q_{max\ p_{v\ min}}$	$Q_{max\ p_{v\ max}}$
016	5	16	5	20
040	10	40	10	30
085	10	85		45
150		150	55	
200		200	15	70
300	300	75		
400	60	400	55	80

DBD 20				
Pressure stage	Pressure setting ranges [bar]		Flow rate [l/min]	
	$p_{v\ min}$	$p_{v\ max}$	$Q_{max\ p_{v\ min}}$	$Q_{max\ p_{v\ max}}$
063	10	63	40	90
125	30	125		130
200	50	200	50	170
315	70	315	60	200

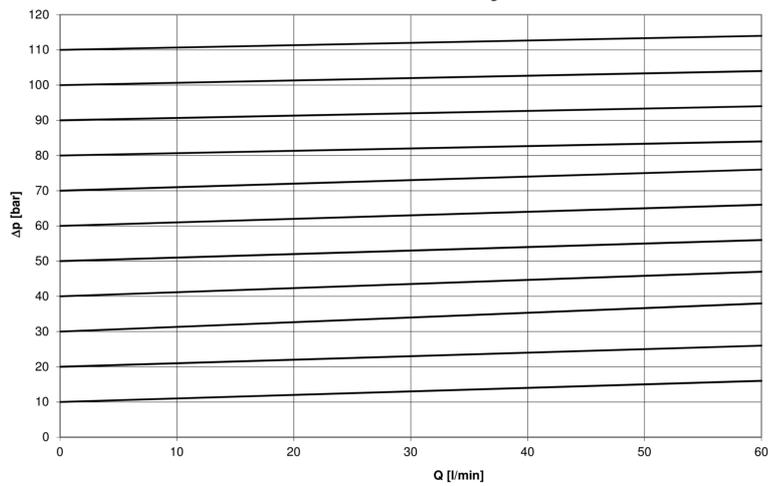
DBD 10 for low-viscosity media					
Pressure stage		Pressure setting ranges [bar]		Flow rate [l/min]	
		$p_{v \text{ min}}$	$p_{v \text{ max}}$	$Q_{\text{max } p_{v \text{ min}}}$	$Q_{\text{max } p_{v \text{ max}}}$
016		10	20	60	60
040			30		
050			50		
085		20	60		
130	Adjustment screw	50	110		
130	rotary handle	51	90		

4.3 Characteristic curves

$\Delta p - Q$ Characteristic curves (at 34 mm²/s)



**$\Delta p - Q$ Characteristic curves (at 34 mm²/s)
DBD 10 for low-viscosity media**



4.4 Permissible temperature range

Sealing material	Fluid temperature ϑ_m	
	$\vartheta_{m \min}$ [°C]	$\vartheta_{m \max}$ [°C]
FKM	-15	80
NBR	-20	
FKM for low-viscosity media	-20	150

Sealing material	Ambient temperature ϑ_u	
	$\vartheta_{u \min}$ [°C]	$\vartheta_{u \max}$ [°C]
FKM	-15	60
NBR	-20	
FKM for low-viscosity media		



NOTICE

Note media-specific properties.

4.5 Material data

Nominal	Housing	Seal	Compression spring	Other materials
06	Steel (St)	NBR - - - FKM	Spring steel	Steel (St)
	EN-GJL-300			
10	Steel (St)			
	EN-GJS-400-18LT			
	AlCuMg1			
20	Steel (St)			
	EN-GJS-400-18LT			

4.6 Weight

Nominal	Hydraulic connection	Weight [kg]	
		Actuation type	
		Permanently adjustable	rotary handle
06	Valve cartridge	0.3	-
10		0.5	0.8
20		1.0	1.3
06	Pipe construction	0.8	-
10		1.4	1.7
20		2.9	3.2

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.

6.2.3 Screw-in valve

- Screw the screw-in valve into the designated housing with the specified torque.
- Do not damage seals during assembly.

Tightening torques [Nm]		
Nominal	Pressure stage [bar]	
	≤ 200	≤ 400
06	50 ±5	80 ±5
10	100 ±5	150 ±10
20	150 ±10	300 ±15



NOTICE

Select the material and dimensions of the planned housing to ensure sufficient safety for all conceivable operating conditions.

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 $\geq 48^{\circ}\text{C}$.

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

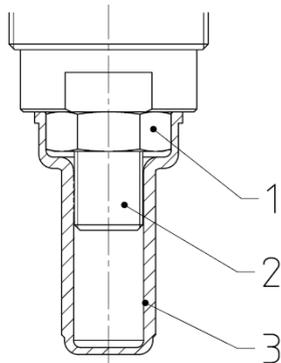
Risk of injury from flying parts.

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 Pressure setting

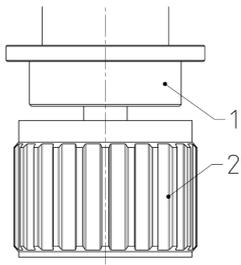
7.3.1 DBD with protective cap



- | | |
|---|--|
| <ol style="list-style-type: none"> 1 Hexagonal nut 3 Protective cap | <ol style="list-style-type: none"> 2 Adjustment screw |
|---|--|

- a) Schutzkappe entfernen.
- b) Loosen the hexagon nut.
- c) Use the adjusting screw to set the set pressure.
 - ⇒ Clockwise rotation = Pressure increase
 - ⇒ Counter-clockwise rotation = Pressure decrease
- d) Secure the adjusting screw with a hexagon nut.
- e) Put on the protective cap.

7.3.2 DBD 06; 10 with twist grip

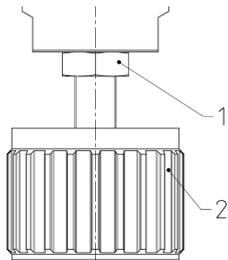


1 Lock nut

2 rotary handle

-
- a) Loosen the lock nut.
 - b) Set the response pressure with the adjusting screw.
 - ⇒ Clockwise rotation = Pressure increase
 - ⇒ Counter-clockwise rotation = Pressure decrease
 - c) Secure the twist grip with a lock nut.
-

7.3.3 DBD 20 with twist grip



1 Hexagonal nut

2 rotary handle

-
- a) Loosen the hexagon nut.
 - b) Set the response pressure with the adjusting screw.
 - ⇒ Clockwise rotation = Pressure increase
 - ⇒ Counter-clockwise rotation = Pressure decrease
 - c) Secure twist grip with hexagon nut.
-

7.4 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**

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

**TIP**

In order to ensure a constant and reliable function of the product, an initial maintenance of the product is recommended after several hours warm-up time (max. 24 h). This allows faults to be detected at an early stage.

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

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.

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
Leakage		
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 (Contaminated medium)	Clean the device
		Replace the device
		Provide filtration
Consult the manufacturer in the event of unidentifiable faults		