

# Bladder-type accumulator

## Type HAB..-6X



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The cover shows an example configuration. The product supplied may therefore differ from the figure shown.

The original operating instructions were prepared in German.

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# 1 About this documentation

## 1.1 Validity of the documentation

This documentation applies to the following products:


- Bladder-type accumulator type HAB..-6X

This documentation is intended for machine/system manufacturers, assemblers and service engineers.


This documentation contains important information on the safe and proper transport, assembly, commissioning, maintenance, disassembly and simple troubleshooting of the bladder-type accumulator type HAB..-6X.

- Read this documentation thoroughly, and in particular chapter 2 "Safety instructions" and chapter 3 "General information on damage to property and damage to product", before handling the bladder-type accumulator type HAB..-6X.

## 1.2 Required and amending documentation

- The product must not be commissioned until you have been provided with the documentation marked with the book symbol  and you have understood and observed it.

**Table 1: Required and amending documentation**

Title	Document number	Document type
 <b>Bladder-type accumulator, type HAB, component series 6X</b> Technical data, operating conditions, performance limits and project planning information concerning bladder-type accumulators type HAB..-6X	50171	Data sheet
<b>Charging and test device for accumulators</b> Describes the set-up and use of a charging and test device for accumulators	50144-B	Operating instructions
<b>Hydraulic fluids based on mineral oils and related hydrocarbons</b> Describes the requirements on hydraulic fluids on mineral oil basis and related hydrocarbons for operation with Rexroth hydraulic components and helps you to select a hydraulic fluid for your hydraulic system	90220	Data sheet
<b>Environmentally compatible hydraulic fluids</b> Contains application notes and requirements for Rexroth hydraulic products	90221	Data sheet
<b>Flame-resistant, water-free hydraulic fluids (HFDR/HFDU)</b> Contains application notes and requirements for Rexroth hydraulic products	90222	Data sheet
<b>Flame-resistant hydraulic fluids – containing water (HFAE, HFAS, HFB, HFC)</b> Contains application notes and requirements for Rexroth hydraulic products	90223	Data sheet
<b>General product information on hydraulic products</b> Contains general information on hydraulic products	07008	Operating instructions
<b>Assembly, commissioning and maintenance of hydraulic systems</b> Contains general information on the assembly, commissioning and maintenance of hydraulic systems	07900	Data sheet

The bladder-type accumulator type HAB..-6X is a system component.

- ▶ Also observe the instructions for the other system components and the system manufacturer’s documentation.

1.3 Representation of information

Uniform safety instructions, symbols, terms and abbreviations are used so that you can quickly and safely work with your product using this documentation. For a better understanding, they are explained in the following sections.

1.3.1 Safety instructions

In this documentation, safety instructions are indicated whenever sequences of actions are explained which bear the risk of personal injury or damage to property. The measures described for hazard avoidance must be observed. Safety instructions are structured as follows:

 **SIGNAL WORD**




**Type and source of danger**

Consequences in case of non-compliance

- ▶ Hazard avoidance measures
- ▶ <Enumeration>

- **Warning sign:** Draws attention to the danger
- **Signal word:** Identifies the degree of danger
- **Type and source of danger:** Specifies the type and source of danger
- **Consequences:** Describes the consequences of non-compliance
- **Precaution:** Specifies how the danger can be prevented

Table 2: Risk classes according to ANSI Z535.6-2006


Warning sign, signal word	Meaning
 <b>DANGER</b>	Indicates a dangerous situation which will cause death or severe injury if not avoided.
 <b>WARNING</b>	Indicates a dangerous situation which may cause death or severe injury if not avoided.
 <b>CAUTION</b>	Indicates a dangerous situation which may cause minor or medium (personal) injury if not avoided.
<b>NOTICE</b>	Damage to property: The product or the environment could be damaged.



### 1.3.2 Symbols

The following symbols indicate notes which are not safety-relevant but increase the comprehensibility of the documentation.

**Table 3: Meaning of the symbols**

Symbol	Meaning
	If this information is not observed, the product cannot be optimally used and/or operated.
►	Individual, independent action
1.	Numbered instruction: The numbers indicate that the actions must be carried out one after the other.
2.	
3.	

### 1.3.3 Designations

The following designations are used in this documentation:

**Table 4: Designations**

Designation	Meaning
P0	Gas filling pressure
PS	Maximum admissible pressure
TS	Admissible min./max. temperature

### 1.3.4 Abbreviations

The following abbreviations are used in this documentation:

**Table 5: Abbreviations**

Abbreviation	Meaning
Type HAB..-6X	Bladder-type accumulator HAB, component series 6X
RE	Rexroth document in the <b>E</b> nglish language

## 2 Safety instructions

### 2.1 About this chapter

The bladder-type accumulator type HAB..-6X was designed and manufactured according to the generally accepted code of practice. However, there is still the danger of personal injury and damage to property if you do not observe this chapter and the safety instructions in this documentation.

- ▶ Read this documentation completely and thoroughly before working with the bladder-type accumulator type HAB..-6X.
- ▶ Keep this documentation in a location where it is accessible to all users at all times.
- ▶ Always include the required documentation when you pass the bladder-type accumulator type HAB..-6X on to third parties.

### 2.2 Intended use

Bladder-type accumulators are hydraulic components intended for the installation into hydraulic drive systems for the purposes of energy storage, shock and vibration absorption, and leakage oil or volume compensation.

Bladder-type accumulators are pressure equipment in the sense of the Pressure Equipment Directive 2014/68/EU.

The bladder-type accumulator type HAB..-6X is exclusively intended for integration into a machine or system or to be assembled with other components to form a machine or system.

The bladder-type accumulator may only be commissioned if it has been integrated into the machine/system for which it is intended and after it was confirmed that the machine/system complies with the provisions of the Machinery Directive, the Pressure Equipment Directive and other provisions valid in your country.

The operating data stated on the type cap, such as the admissible min./max. temperature TS and the maximum admissible pressure PS may not be exceeded. Moreover, the gas filling pressure P0 intended according to the hydraulic circuit diagram or operating instructions of the system must be adhered to.

The bladder-type accumulator HAB..-6X is technical equipment and is not intended for private use.

Intended use includes having read and understood this documentation, especially chapters 2 "Safety instructions" and 3 "General information on damage to property and damage to product".

## 2.3 Improper use

Any use deviating from the intended use is improper and thus not admissible. Bosch Rexroth AG does not assume any liability for damage caused by improper use. The user assumes all risks involved with improper use.

Improper use of the bladder-type accumulator type HAB..-6X includes:

- Use outside the admissible operating data according to data sheet 50171, e.g. exceeding the maximum admissible pressure PS specified in the data sheet and indicated on the device
- Charging the bladder-type accumulator with a gas other than nitrogen 99.99 vol. %.
- Operation of the bladder-type accumulator using group 1 hydraulic fluids (potentially explosive, inflammable, fire-accelerating, toxic) or corrosive fluids.
- Performing welding or soldering works at the bladder-type accumulator
- Mechanical processing of the bladder-type accumulator
- Installation or attachment of spare parts which were not approved by the manufacturer

## 2.4 Qualification of personnel

The activities described in this documentation require basic knowledge of mechanics and hydraulics as well as knowledge of the appropriate technical terms. For transporting and handling the product, additional knowledge of how to handle lifting gear and the necessary attachment devices is required. In order to ensure safe use, these activities may only be carried out by an expert in the respective field or an instructed person under the direction and supervision of an expert.

Experts are those who can recognize potential dangers and apply the appropriate safety measures due to their professional training, knowledge and experience, as well as their understanding of the relevant conditions pertaining to the work to be undertaken. An expert must observe the relevant specific professional rules and have the necessary hydraulic expert knowledge.

Hydraulic expert knowledge means, among other things:

- Reading and completely understanding hydraulic schemes,
- in particular, completely understanding the correlations regarding the safety equipment and
- having knowledge of the function and set-up of hydraulic components.

The expert has to have successfully passed a training for qualified persons for pressure containers and regularly have attended further trainings.



Bosch Rexroth offers training measures in specific fields. An overview over the training contents can be found online at:  
[www.boschrexroth.com/de/de/academy/](http://www.boschrexroth.com/de/de/academy/).

## 2.5 General safety instructions

- Observe the valid regulations on accident prevention and environmental protection.
- Observe the safety regulations and provisions of the country in which the product is used/applied.
- Exclusively use Rexroth products in technically perfect condition.
- Observe all notes on the product.
- Persons who assemble, operate, disassemble or maintain Rexroth products must not consume any alcohol, drugs or pharmaceuticals that may affect their ability to react.
- Only use spare parts approved by the manufacturer in order to exclude any hazard to persons due to unsuitable spare parts.
- Comply with the technical data and environmental conditions indicated in the product documentation and on the type cap.
- The installation or use of inappropriate products in safety-relevant applications could result in unintended operating states when being used which in turn could cause personal injuries and/or damage to property. Therefore, only use a product for safety-relevant applications if this use is expressly specified and permitted in the documentation of the product, or if the safe suitability of the product in the application is confirmed by a separate conformity procedure for the end product, e.g. in explosion-protected areas or in safety-related parts of control systems (functional safety).
- Do not commission the product until you can be sure that the end product (for example a machine/system) where the Rexroth products are installed complies with the country-specific provisions, safety regulations and standards of the application.

## 2.6 Product and technology-dependent safety instructions

The following safety instructions apply to chapters 6 to 14.



### **WARNING**

#### **Pressurized bladder-type accumulator/pressurized machine/system!**

Danger to life, risk of injury, severe injury when working at machines/systems that have not been stopped! Damage to property!

- ▶ Ensure that all relevant components of the hydraulic system are depressurized. For doing so, observe the specifications of the machine/system manufacturer.
- ▶ Do not disconnect line connections, connections or components as long as the hydraulic system is pressurized.

#### **Leakage of (pressurized) hydraulic fluid and oil mist!**

Danger to life! Risk of injury! Explosion hazard, risk of fire, health hazard, environmental pollution! Damage to property!

- ▶ Switch the machine/system off immediately (emergency off switch).
- ▶ Identify and remedy the leakage.
- ▶ Never try to stop or seal the leakage or the oil jet using a cloth.
- ▶ Avoid direct contact with the leaking hydraulic fluid.
- ▶ Use your personal protective equipment, e.g. safety goggles.
- ▶ Keep open fire and ignition sources away from the bladder-type accumulator.
- ▶ When dealing with hydraulic fluids, you must be sure to observe the information of the hydraulic fluid manufacturer.

#### **Bursting of the bladder-type accumulator due to welding, soldering or other mechanical work!**

Danger to life! Danger of bursting! Damage to property!

- ▶ Do not carry out any mechanical work such as welding or soldering works on the bladder-type accumulator.

#### **Loud hissing when gas is drained!**

Danger of hearing damage!

- ▶ Drain the gas slowly.

#### **Uncontrolled release of a significant amount of gas!**

Danger to life! Risk of suffocation!

- ▶ Make sure that the workplace is sufficiently ventilated.
- ▶ Always use a suitable charging and test device when checking the gas filling pressure.

**CAUTION****Hot/cold surfaces at the bladder-type accumulator!**

Risk of burning! Danger of frostbite!

The bladder-type accumulator may considerably heat up/cool down during operation.

- ▶ Only touch the surfaces of the bladder-type accumulator with heat-/cold-resistant protective clothing, e.g. gloves, or do not work at hot/cold surfaces.
- ▶ Allow the bladder-type accumulator to cool down/heat up sufficiently before touching it.
- ▶ Observe the protective measures of the system manufacturer.

**Contact with hydraulic fluid!**

Health hazard/impairment of health, e.g. eye injuries, skin lesions, poisoning due to inhalation!

- ▶ Avoid contact with hydraulic fluids.
- ▶ When dealing with hydraulic fluids, you must imperatively observe the safety instructions of the hydraulic fluid manufacturer.
- ▶ Use your personal protective equipment, e.g. safety goggles.
- ▶ If hydraulic fluid comes into contact with the eyes or enters the bloodstream or is swallowed nevertheless, consult a doctor immediately.

**Slip hazard due to oily surfaces!**

Risk of injury!

- ▶ Protect and mark the danger zone.
- ▶ Immediately remove leaked hydraulic fluid.
- ▶ Use an oil binding agent in order to bind the leaked hydraulic fluid.
- ▶ Remove and dispose of the contaminated oil binding agent, see chapter 12 "Disposal".
- ▶ Wear the protective equipment, e.g. safety shoes, prescribed for your activity.

## **2.7 Personal protective equipment**

During operation and maintenance work as well as during installation and removal of the bladder-type accumulator, always wear the following personal protective equipment:

- Heat- or cold-resistant protective gloves
- Ear protection
- Safety shoes
- Perfectly fitting safety goggles
- Protective helmet

## **2.8 Obligations of the machine end-user**

The bladder-type accumulator is primed when supplied ex plant. The machine end-user is responsible for assuring a sufficient corrosion protection corresponding to the environmental conditions and requirements.

In order to ensure safety when handling the bladder-type accumulator and its components, the machine end-user of the system must:

- Guarantee the intended use of the bladder-type accumulator and its components according to chapter 2.2 "Intended use".
- Instruct the operating personnel regularly in all items of the operating instructions and make sure that they are observed.
- Ensure compliance with the instructions on occupational safety and with the operating instructions.
- Ensure adherence to the operating data stated on the type cap, such as the admissible min./max. temperature TS and the maximum admissible pressure PS, as well as adherence to the gas filling pressure P0 intended according to the hydraulic circuit diagram or operating instructions of the system.

### 3 General information on damage to property and damage to product

The following information applies to chapters 6 to 14:

#### **NOTICE**

##### **Danger due to improper handling!**

Damage to property!

- ▶ Do not expose the bladder-type accumulator to any inadmissible mechanical load.
- ▶ Do not place any objects on top of the bladder-type accumulator.
- ▶ Never use the bladder-type accumulator as a handle or step.
- ▶ Do not apply further loads/forces.
- ▶ Leave the protective covers (e.g. cover cap of gas valve, protective cap of oil valve) at the bladder-type accumulator until shortly before connection of the lines.

##### **Contamination of the hydraulic fluid!**

Early wear and malfunctions!

- ▶ It is imperative that the working environment at the site of installation is free of dust and foreign substances in order to prevent foreign particles (e.g. welding beads or metal chips) from getting into the hydraulic lines and causing wear or malfunctions of the bladder-type accumulator. The bladder-type accumulator must be protected from dirt during installation.
- ▶ Make sure that all connections, hydraulic lines and attachment parts (e.g. measuring devices) are clean and free of chips.
- ▶ For removing lubricants or any other contamination, use industrial residue-free wipes.
- ▶ No contamination must enter when closing the connections.
- ▶ Before commissioning, ensure that all hydraulic connections are tight and that all seals and caps of the plug-in connections are correctly installed and undamaged in order to prevent fluids and foreign particles from penetrating the bladder-type accumulator.

##### **Environmental pollution caused by incorrect disposal!**

Environmental pollution! Damage to property!

- ▶ Dispose of the bladder-type accumulator, the hydraulic fluid and the packaging in accordance with the applicable national regulations in your country.
- ▶ Dispose of the hydraulic fluid according to the applicable safety data sheet of the hydraulic fluid.



## ***NOTICE***

### **Leaking or spilled hydraulic fluid!**

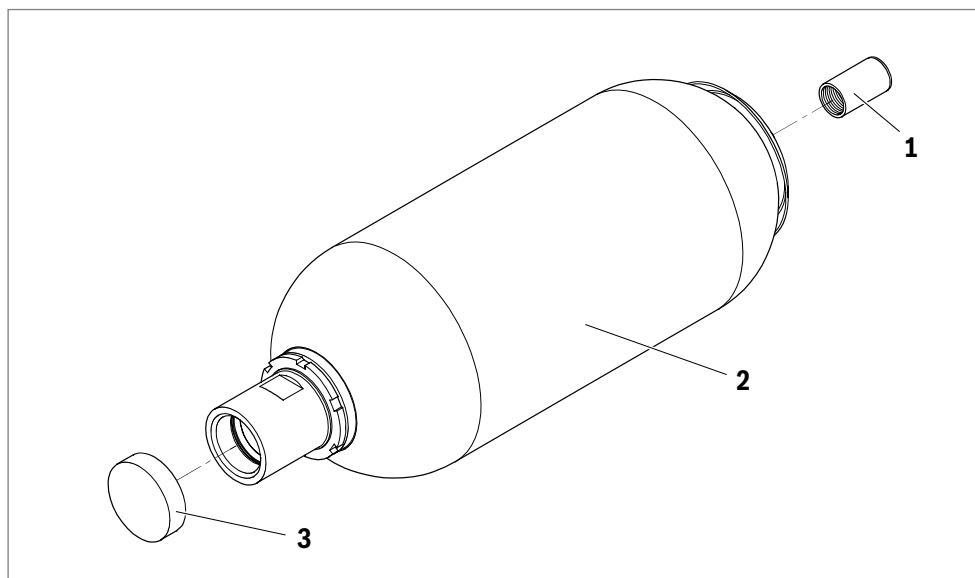
Environmental pollution and contamination of the ground water!

- ▶ Immediately remedy possible leakage.
- ▶ If hydraulic fluid is spilled, use an oil binding agent.
- ▶ Observe the information in the safety data sheet of the hydraulic fluid and the system manufacturer's provisions.



The warranty only applies to the delivered configuration. The claim to warranty expires if the product is incorrectly assembled, commissioned and operated, not used as intended and/or handled improperly.

## 4 Scope of delivery



**Fig. 1: Scope of delivery of the bladder-type accumulator type HAB..-6X**

- |                                     |                                      |
|-------------------------------------|--------------------------------------|
| <b>1</b> Cover cap at the gas valve | <b>3</b> Protective cap at oil valve |
| <b>2</b> Bladder-type accumulator   |                                      |

The scope of delivery includes:

- 1 bladder-type accumulator type HAB..-6X (2)
- 1 operating instructions
- 1 declaration of conformity (only for bladder-type accumulators with a capacity above 1 l)

Upon delivery, the following parts are also mounted:

- Cover cap at the gas valve (1)
- Protective cap at the oil port (3)

The bladder-type accumulator is primed when supplied.

## 5 Product information

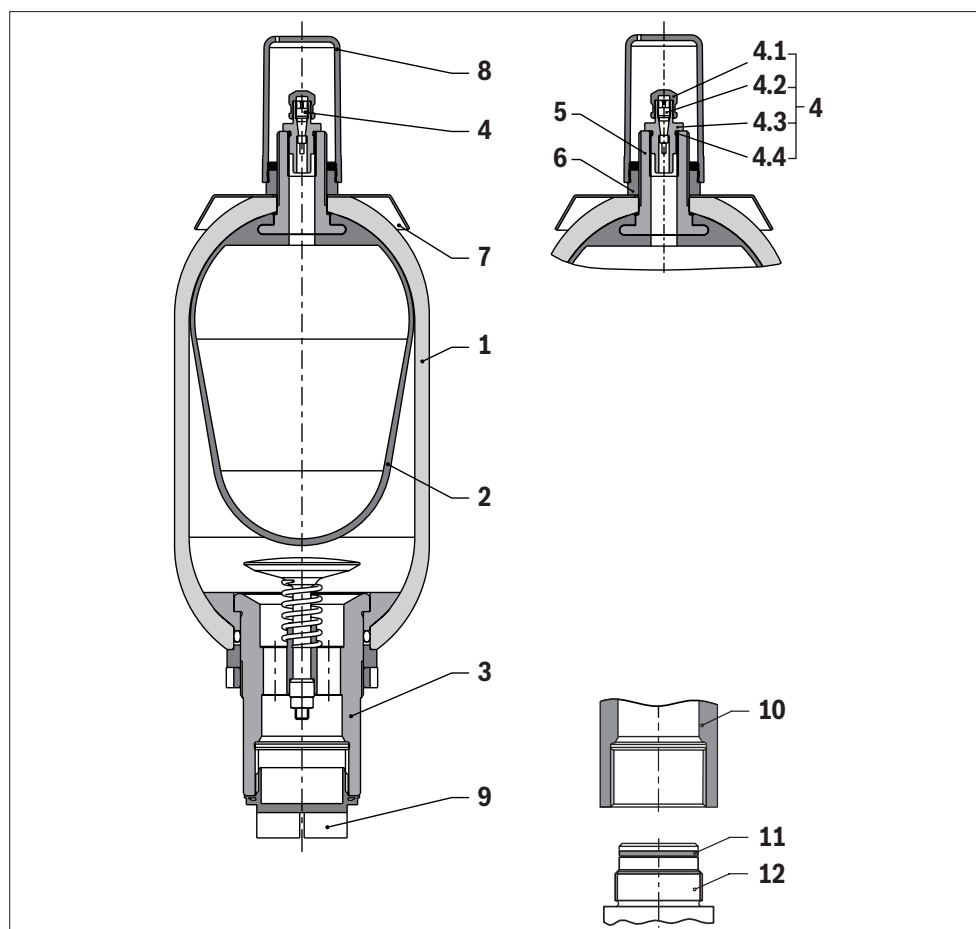
### 5.1 Product description

Bladder-type accumulators are intended for the use in hydraulic systems.

They are used for energy storage, shock and vibration absorption, and leakage oil compensation or volume compensation.

The high compressibility of gases is used for the bladder-type accumulator.

Bladder-type accumulators of type HAB..-6X basically comprise the following components:



**Fig. 2: Set-up the bladder-type accumulator and the gas valve**

- |  |  |
|--|--|
| <b>1</b> Pressure container            | <b>6</b> Holding nut                     |
| <b>2</b> Bladder                       | <b>7</b> Type cap                        |
| <b>3</b> Oil valve                     | <b>8</b> Cover cap of gas valve          |
| <b>4</b> 1. Gas valve with sealing cap | <b>9</b> Protective cap of oil valve     |
| <b>2.</b> Gas valve insert             | <b>10</b> Sealing surface on accumulator |
| <b>3.</b> Gas valve body               | <b>11</b> O-ring on accumulator adapter  |
| <b>4.</b> O-ring                       | <b>12</b> Example of accumulator adapter |
| <b>5</b> Gas valve support             |  |

Bladder-type accumulators consist of a seamless cylindrical pressure container (1) made of high-strength steel.

An elastic bladder (2) mounted inside the container separates the interior of the accumulator into a gas side and a fluid side.

Via the gas valve (4), the bladder is filled with nitrogen up to the intended gas filling pressure  $p_0$ . It consists of sealing cap (4.1), gas valve insert (4.2), gas valve body (4.3), O-ring (4.4) and gas valve support (5). The gas valve support is inseparably integrated into the gas bladder.

When the operating pressure is increased, fluid is flowing into the bladder-type accumulator and compresses the gas in the bladder until the gas pressure is identical to the fluid pressure. When the operating pressure is reduced, the gas expands again and feeds the hydraulic system with fluid.

An oil valve (3) which is open in the operating state is located inside the oil port of the bladder-type accumulator. In order to protect the oil valve during transport, a protective cap (9) is provided on the oil port. If the bladder-type accumulator is drained completely, the expanding bladder pushes the valve in the closed position. This prevents the bladder from entering the oil channel and being destroyed.

The type cap (7) includes the technical data and features of the bladder-type accumulator.

Using the holding nut (6), bladder and type cap are fixed. In order to protect the gas valve during transport, a cover cap (8) is provided on the gas port.



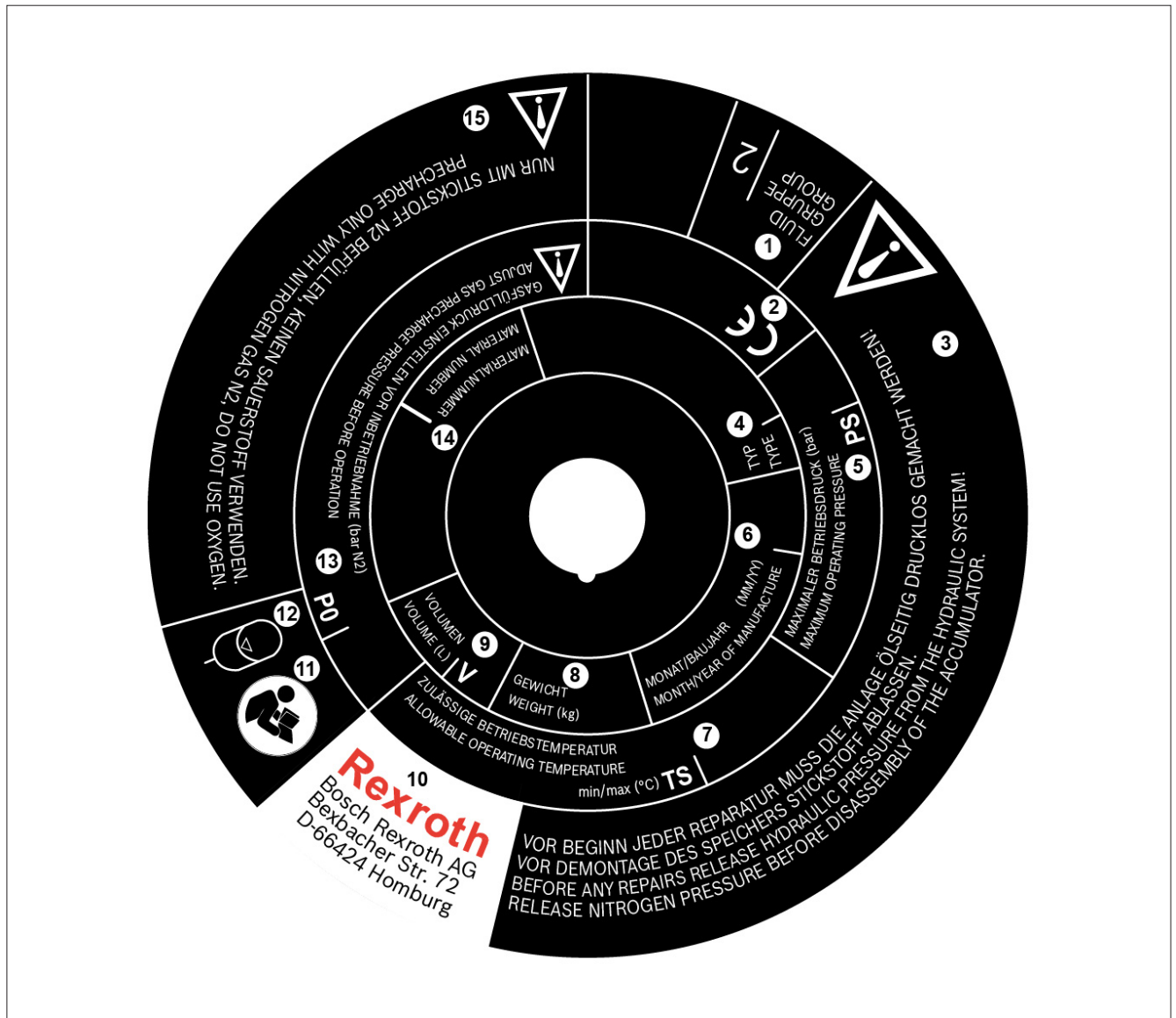
For more detailed information on operating conditions, connection dimensions and performance limits of the bladder-type accumulator are provided in data sheet 50171, see chapter 1.2 "Required and amending documentation".

## 5.2 Product identification

The bladder-type accumulator is to be identified based on its type cap.



The operation of the bladder-type accumulator is only admissible, when the type cap is present and fully legible.



**Fig. 3: Example for the type cap of a bladder-type accumulator**

- |   |   |
|---|---|
| <b>1</b> Fluid group  | <b>8</b> Weight                                 |
| <b>2</b> CE mark  | <b>9</b> Volume                                 |
| (Information not applicable to accumulators with a capacity of 1 l) | <b>10</b> Company address                       |
| <b>3</b> Warning 1  | <b>11</b> Information in operating instructions |
| <b>4</b> Type   | <b>12</b> Symbol for bladder-type accumulator   |
| <b>5</b> Maximum admissible pressure PS                             | <b>13</b> Gas filling pressure P0               |
| <b>6</b> Date of production (month/year)                            | <b>14</b> Material number                       |
| <b>7</b> Admissible min./max. temperature TS                        | <b>15</b> Warning 2                             |

## 6 Transport and storage

- Always comply with the required environmental conditions with regards to transport and storage, see chapter 6.3 "Storage of the bladder-type accumulator".



For notes on unpacking, refer to chapter 7.1 "Unpacking".

### 6.1 Transport of the bladder-type accumulator



#### **WARNING**

##### **Falling of the bladder-type accumulator due to improper transport!**

Risk of injury! Danger of crushing! Danger of bone fractures! Damage to property!

- Use lifting gear with sufficient lifting capacity to lift bladder-type accumulators with a weight > 15 kg.
- Use lifting straps or lifting slings as attachment devices.
- Never step or reach below suspended loads.
- Provide for a stable center of gravity position during transport.
- Use your personal protective equipment, e.g. safety shoes.
- Place the bladder-type accumulator carefully onto the contact surface to prevent damage.

##### **Uncontrolled rolling away, overturning or falling of the bladder-type accumulator!**

Risk of injury! Damage to property!

- Make sure that the bladder-type accumulator is positioned safely and secured against unintended rolling away, overturning or falling.

#### **NOTICE**

##### **Impact or similar forces during transport!**

Risk of damage! Damage to property! Risk of corrosion!

- For further transport, package the bladder-type accumulator in stable packaging, e.g. a wooden crate and/or strap it securely to a pallet.
- Ensure that the packaging offers sufficient protection to the gas valve.
- In the case of sea freight, protect the bladder-type accumulator against salty air with plastic film, for example.
- Allow the bladder-type accumulator to come up to the ambient temperature before packaging.

**Close openings** ► Before transport, close all openings using the supplied protective caps/cover caps in order to prevent dirt or humidity from penetrating the bladder-type accumulator, and any oil residues within the bladder-type accumulator due to oil-wetted surfaces.

**Transport** Depending on the weight and transport duration, there are the following transport possibilities:

- Transport by hand
- Transport using a forklift
- Transport using lifting gear (e.g. lifting strap, lifting sling)

**Weight** **Table 6: Weights**

Nominal volume [l]	1	2.5	4	6	10	20	24	32	50
Weight [kg]	7	10	16.5	20	32	53	61	85	123



The weight indicated only refers to the bladder-type accumulator; the weight of any attachments is not taken into account.  
Further details on the weight and the dimensions of the bladder-type accumulator can be found on the type cap at the bladder-type accumulator and in data sheet 50171, see chapter 1.2 "Required and amending documentation".

### 6.1.1 Transport by hand

**CAUTION!** Risk of injury due to heavy loads (weight > 15 kg)!  
When carrying bladder-type accumulators, there is a danger of health hazards.

- Use a suitable lifting, putting down and moving technique.
- Use your personal protective equipment, e.g. safety shoes.



Bladder-type accumulators with a weight of up to 15 kg can be transported by hand for a short time, if necessary.

### 6.1.2 Transport using a forklift

**WARNING!** Falling of the bladder-type accumulator during transport!

Risk of injury! Damage to property!

- Only transport the bladder-type accumulator using a forklift if it is securely strapped to a pallet or in stable packaging and secured against rolling away.

To transport the bladder-type accumulator using a forklift proceed as follows:

- Move the fork of the forklift under the pallet/packaging of the bladder-type accumulator.
- Only lift the bladder-type accumulator as far off the floor as necessary for the transport.

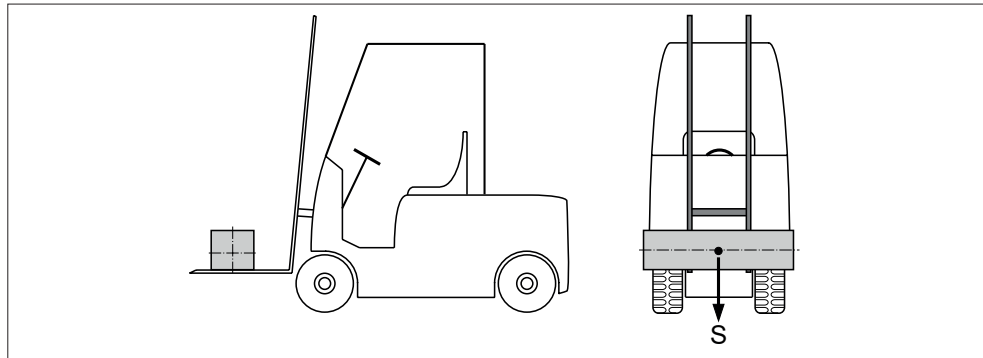


Fig. 4: Transport using a forklift

### 6.1.3 Transport using lifting gear

For the transport, the bladder-type accumulator can be connected to lifting gear.

- Always use a lifting strap/lifting sling to lift the bladder-type accumulator.

#### Transport in horizontal position

- To transport the bladder-type accumulator in horizontal position using lifting gear proceed as follows:

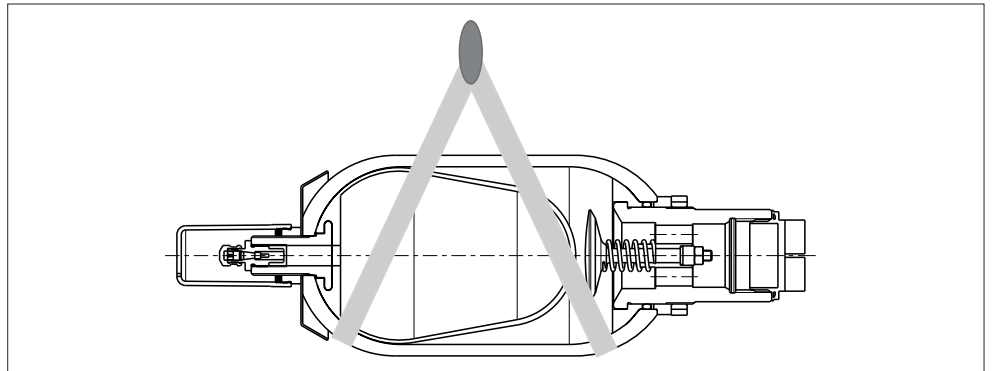
**WARNING!** During transport using a lifting strap/lifting sling, the bladder-type accumulator may tilt out of the loop!

Risk of injury! Damage to property!

- Use lifting slings, lifting straps and lifting gear with sufficient lifting capacity.
- Make sure that the bladder-type accumulator is safely fixed using the lifting strap/lifting sling.
- Guide the bladder-type accumulator by hand for fine positioning.



1. Fasten the lifting strap/lifting sling/lifting gear by making loops in the area of the basic body of the accumulator.
2. Carefully lift the bladder-type accumulator to check the center of gravity position. Ensure a stable center of gravity position.
3. Make sure that the bladder-type accumulator cannot move out of the intended position and the lifting straps/lifting slings do not move during lifting.
4. Only lift the bladder-type accumulator as far off the floor as necessary for the transport.



**Fig. 5: Transport using lifting gear in horizontal position**

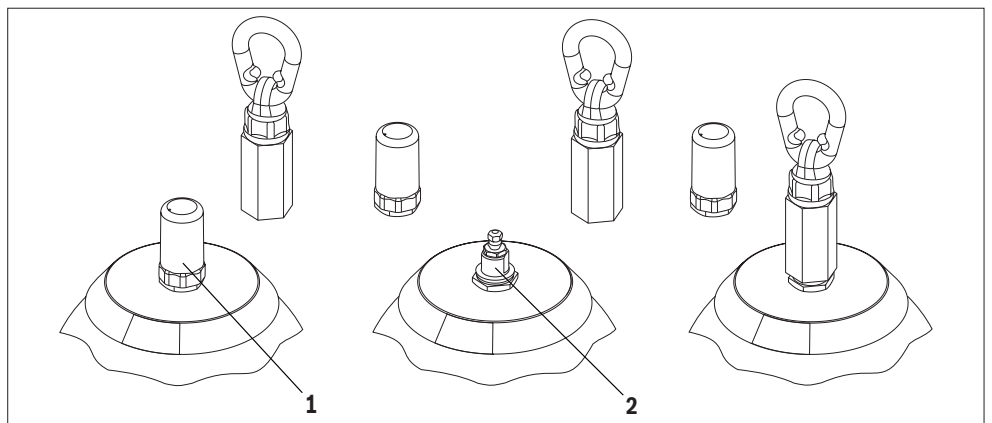
#### **Transport in vertical position**

To transport the bladder-type accumulator in vertical position using lifting gear proceed as follows:

1. Screw a lifting device onto the thread 7/8" 14 UNF-1A, see item 2 in Fig. 6. To do this, take off the gas valve cover cap, see item 1 in Fig. 6.



Bosch Rexroth offers lifting device HE0272, material number: R913066081.



**Fig. 6: Connecting a lifting device**

**1** Cover cap of gas valve

**2** Thread 7/8" 14 UNF-1a

2. Attach the lifting gear to the lifting device.

**WARNING!** Falling of the bladder-type accumulator due to uncontrolled loosening of the lifting device/lifting gear!

Risk of injury! Damage to property!

- ▶ Use a lifting device and lifting gear with sufficient lifting capacity.
- ▶ Ensure that the bladder-type accumulator is securely fixed at the lifting device and the lifting gear.

**NOTICE!** Damage to the gas valve support and the bladder due to vibrations of the bladder-type accumulator during transport!

Damage to property!

- ▶ Move the bladder-type accumulator slowly and evenly in the intended position.
- ▶ Guide the bladder-type accumulator by hand for fine positioning.

3. Lift the bladder-type accumulator carefully using the lifting gear and move it slowly to the intended position.

## 6.2 Shipping the bladder-type accumulator

If the bladder-type accumulator is shipped with a gas filling pressure of 2 bar and more, it must be declared as UN number 3164 (Article under pneumatic pressure containing non-flammable gas). Depending on the type of dispatch, the relevant directives must be observed.

Bladder-type accumulators are only shipped depressurized for air freight ex works. Gas filling pressures indicated according to the type key are also depressurized ex works. The draining of pressure is shown on a certificate which is enclosed with the accumulator.

## 6.3 Storage of the bladder-type accumulator

The bladder-type accumulator is primed when supplied. The machine end-user must ensure sufficient corrosion protection during storage.

### Requirements

- ▶ Ensure that the storage facilities are free from etching substances and gases.
- ▶ Ensure a constant temperature, if possible.  
Optimum storage temperature: +5 °C to +20 °C
- ▶ Protect the bladder-type accumulator against impacts during storage.
- ▶ Ensure that the cover cap at the gas valve and the protective cap at the oil valve are attached.

### Maximum storage time

The maximum storage time of the bladder-type accumulator amounts to 5 years.

**Commissioning  
after storage**

Procedure after expiration of maximum storage time:

- ▶ Carry out a visual inspection of the bladder-type accumulator and check for any damage and corrosion.
- ▶ After the expiration of the maximum storage time, have the complete bladder-type accumulator checked by an expert, see chapter 2.4 "Qualification of personnel".
- ▶ After the expiration of the maximum storage time, have the bladder, seals and gas valve insert exchanged by an expert, see chapter 2.4 "Qualification of personnel".



Please note that the warranty period is not prolonged by the storage time. The claim to warranty expires in case of non-compliance with the requirements and the storage conditions or after expiry of the maximum storage time.



Please note that, according to the provisions and ordinances valid in your country, the test intervals mostly refer to the date of manufacture and are also not prolonged by the storage time.

## 7 Assembly

Prior to assembly, make sure the following documents are at hand:

- Hydraulic circuit diagram of the machine/system (available from the machine/system manufacturer)
- Data sheet 50171 of the bladder-type accumulator (contains the admissible technical data), see chapter 1.2 "Required and amending documentation"

### 7.1 Unpacking

**CAUTION!** Danger due to falling parts or rolling of the bladder-type accumulator!  
Risk of injury! Damage to property!

- ▶ Put the pallet/packaging on level, bearing ground.
- ▶ Only open the packaging from the top.
- ▶ Before opening the packaging and/or loosening the tension belts, make sure that the bladder-type accumulator cannot roll away.
- ▶ Open the packaging of the bladder-type accumulator or loosen the tension belts.
- ▶ Remove the bladder-type accumulator manually or using lifting gear - depending on its weight.
- ▶ Check the bladder-type accumulator for transport damage and completeness, see chapter 4 "Scope of delivery".
- ▶ Dispose of the packaging in accordance with the currently applicable national provisions in your country.

### 7.2 Installation conditions

- Fastening**
- ▶ Fasten the bladder-type accumulator so that any forces, such as the ones created by vibrations or acceleration specific to that application, are absorbed safely.
  - ▶ When using several mounting points, avoid stress caused by operational, elastic deformations or temperature expansions.



Bosch Rexroth offers suitable holding devices in the form of mounting clamps and consoles as accessories.

For further information on the accessories, refer to data sheet 50171, see chapter 1.2 "Required and amending documentation".

**Installation position** The bladder-type accumulator should preferably be installed vertically. Above the gas valve, a clearance area of 200 mm must be provided for the charging and test device.



Bosch Rexroth offers the charging and test device or bladder-type accumulators (HAB), material number: 0538103011 and the charging and test device for bladder and diaphragm type accumulators (HAB/HAD), material number: 0538103014. For further information on the accessories, refer to data sheet 50171, see chapter 1.2 "Required and amending documentation".

**Fuse protection** The bladder-type accumulator has to be secured against operation outside of the admissible limits according to the Pressure Equipment Directive 2014/68/EU.

**Cleanliness** It is imperative to ensure absolute cleanliness. The bladder-type accumulator and all other parts used must be installed free from dirt. Contamination of the hydraulic fluid may considerably reduce the life cycle of the bladder-type accumulator.

**Temperature** The temperature of the bladder-type accumulator must correspond to the ambient temperature of the site of installation. Allow the bladder-type accumulator to acclimatize sufficiently in order to adapt to the temperature conditions.

### 7.3 Required tools

For the assembly of the bladder-type accumulator, you need:

- Charging and test device for bladder-type accumulators (HAB), material number: 0538103011 or for bladder and diaphragm accumulators (HAB/HAD), material number: 0538103014, according to data sheet 50171/operating instructions 50144-B, see chapter 1.2 "Required and amending documentation".
- Open-end wrench
- Lifting gear

**Table 7: Required wrench sizes of the open-end wrench**

Bladder-type accumulator: Volume in liters	Open-end wrench: Wrench size
1-6	50 mm
10-50	70 mm

## 7.4 Assembly of the bladder-type accumulator

### NOTICE

#### Leakage at the bladder-type accumulator!

Damage to property!

- ▶ Before the assembly, check that the seal, see Fig. 2, item 11, and the sealing surface of the bladder-type accumulator, see Fig. 2, item 10 are intact.
- ▶ Assembly of the bladder-type accumulator should only be carried out by qualified personnel, see chapter 2.4 "Qualification of personnel".

To assess the necessity and design of suitable holding devices, the application and installation conditions must be examined more closely.



Bosch Rexroth offers suitable holding devices in the form of mounting clamps and consoles as accessories and recommends that these are integrated for static applications.

For further information on the accessories, refer to data sheet 50171, see chapter 1.2 "Required and amending documentation".

### 7.4.1 Assembly of the bladder-type accumulator in vertical installation position

**Mounting with clamp(s)** The bladder-type accumulator may be attached using one or two clamps:

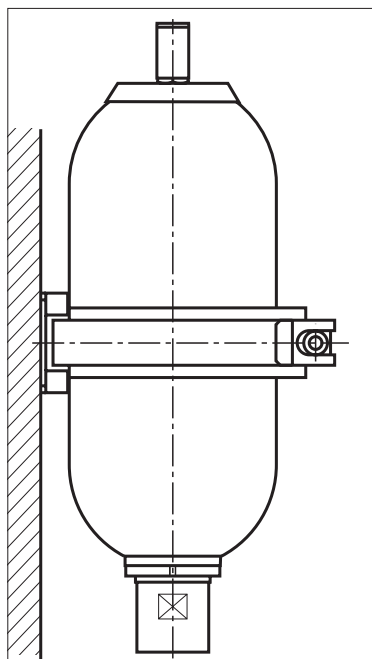
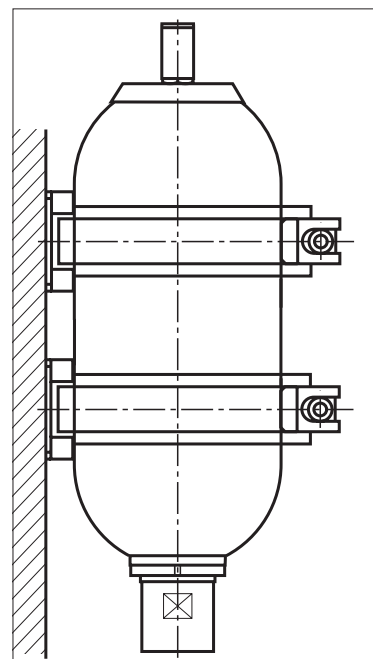


Fig. 7: Mounting with one clamp



Mounting with two clamps

To install the bladder-type accumulator using one or two clamps proceed as follows:

**CAUTION!** Leaking residual oil when removing the protective cap at the oil port!  
Slip hazard! Health hazard! Environmental pollution!

- ▶ Remove leaking residual oil immediately.
- ▶ Use your personal protective equipment, e.g. safety goggles.
- ▶ If hydraulic fluid comes into contact with the eyes or enters the bloodstream or is swallowed nevertheless, consult a doctor immediately.
  
- ▶ Remove the protective cap at the oil port of the bladder-type accumulator.
- ▶ Make sure that the oil port of the bladder-type accumulator and the hydraulic system is clean and free from foreign particles.
- ▶ Check whether the seal and sealing surface of the oil port and the connection thread are intact.

**WARNING!** Falling of the bladder-type accumulator during assembly  
Danger to life! Risk of injury! Damage to property!

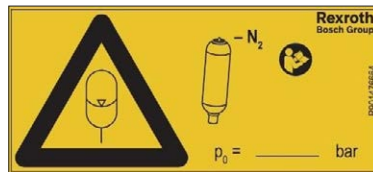
- ▶ Use lifting gear with sufficient lifting capacity to lift bladder-type accumulators with a weight > 15 kg.
- ▶ Use lifting straps or lifting slings as attachment devices.
  
- ▶ The bladder-type accumulator is to be attached to suitable lifting gear in such a way that safe support is guaranteed.
- ▶ Move the bladder-type accumulator to the intended position using suitable lifting gear.
- ▶ Place the bladder-type accumulator on the oil port.
  - The bladder-type accumulator has to be securely held in vertical position by the lifting device.
- ▶ Manually screw the bladder-type accumulator into the thread of the oil port.
  - Make sure that the thread interlocks after one rotation at the latest.
  - If need be, lower the bladder-type accumulator and manually screw it into the thread until the stop of the thread is reached. The end face of the port must fit completely to the counterpart.
- ▶ Continue lowering the lifting device and make sure that the bladder-type accumulator is firmly seated on the oil port.
- ▶ Check the vertical mounting position of the bladder-type accumulator.
- ▶ Tighten the bladder-type accumulator at the oil valve by means of an open-end wrench until it fits tightly.
- ▶ Install the mounting clamp(s) at the provided point(s).
- ▶ Align the mounting clamp(s) at the bladder-type accumulator so that an installation without tension stress is guaranteed.
- ▶ Remove the lifting device.

The bladder-type accumulator is now mounted.

- Affix a warning sign with the symbol of a bladder-type accumulator in a visible and accessible place.

Bosch Rexroth offers the following warning signs for bladder-type accumulators:

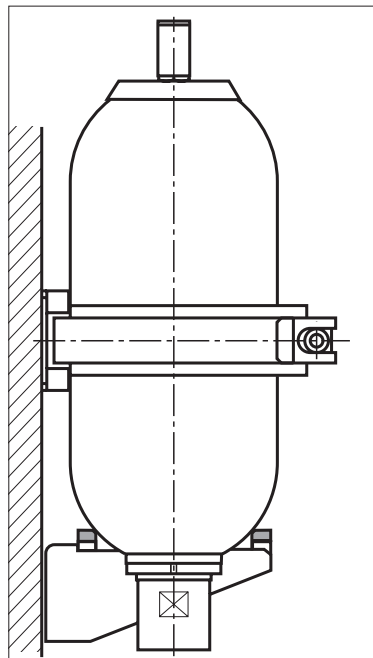
Accumulator volume in liters:	1-2.5	4-50
Size:	100 mm x 45 mm	200 mm x 90 mm
Material number:	R901476664	R901440344



**Fig. 8: Example of warning sign**

### Mounting on a console using one/two clamps

The bladder-type accumulator can also be attached to a console:



**Fig. 9: Mounting on a console**

To install the bladder-type accumulator on a console using one/two clamps proceed as follows:

- Install the console at the designated position.
- Install the mounting clamp(s) at the designated position.

**WARNING!** Falling of the bladder-type accumulator during assembly  
Danger to life! Risk of injury! Damage to property!

- Use lifting gear with sufficient lifting capacity to lift bladder-type accumulators with a weight > 15 kg.
- Use lifting straps or lifting slings as attachment devices.



- ▶ The bladder-type accumulator is to be attached to suitable lifting gear in such a way that safe support is guaranteed.
- ▶ Move the bladder-type accumulator to the intended position using suitable lifting gear.
- ▶ Set the bladder-type accumulator down on the console.
  - The bladder-type accumulator has to be securely held in vertical position by the lifting device.
- ▶ Check the vertical mounting position of the bladder-type accumulator.
- ▶ Install the mounting clamp(s) at the designated position.
- ▶ Remove the lifting device.

**CAUTION!** Leaking residual oil when removing the protective cap at the oil port!  
Slip hazard! Health hazard! Environmental pollution!

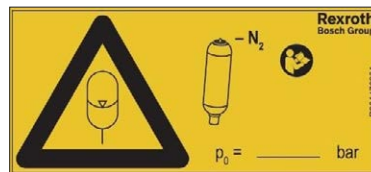
- ▶ Remove leaking residual oil immediately.
- ▶ Use your personal protective equipment, e.g. safety goggles.
- ▶ If hydraulic fluid comes into contact with the eyes or enters the bloodstream or is swallowed nevertheless, consult a doctor immediately.
- ▶ Remove the protective cap at the oil port of the bladder-type accumulator.
- ▶ Connect the hydraulic lines to the oil port of the bladder-type accumulator.
  - Use an open-end wrench to hold the oil valve in place.
  - Assemble the hydraulic lines at the bladder-type accumulator without tension stress. The screw connections should move smoothly.
- ▶ Tighten the bladder-type accumulator at the oil valve by means of an open-end wrench until it fits tightly.

The bladder-type accumulator is now mounted.

- ▶ Affix a warning sign with the symbol of a bladder-type accumulator in a visible and accessible place.

Bosch Rexroth offers the following warning signs for bladder-type accumulators:

Accumulator volume in liters:	1-2.5	4-50
Size:	100 mm x 45 mm	200 mm x 90 mm
Material number:	R901476664	R901440344



**Fig. 10: Example of warning sign**

### 7.4.2 Assembly of the bladder-type accumulator in horizontal installation position

To install the bladder-type accumulator in horizontal position, proceed as follows:

- ▶ Attach the holding device of the bladder-type accumulator to the designated positions.

**WARNING!** Falling of the bladder-type accumulator during assembly  
Danger to life! Risk of injury! Damage to property!

- ▶ Use lifting gear with sufficient lifting capacity to lift bladder-type accumulators with a weight > 15 kg.
- ▶ Use lifting straps or lifting slings as attachment devices.
- ▶ Put two suitable lifting straps around the bladder-type accumulator so that they do not run over attachment parts (e.g. valves) and so that the bladder-type accumulator is not suspended at attachment parts.
- ▶ Lift the bladder-type accumulator using suitable lifting gear.
- ▶ Check the exactly horizontal position of the bladder-type accumulator.
- ▶ Fasten the mounting clamps at the provided points.
- ▶ Remove the lifting device.

**CAUTION!** Leaking residual oil when removing the protective cap at the oil port!  
Slip hazard! Health hazard! Environmental pollution!

- ▶ Remove leaking residual oil immediately.
- ▶ Use your personal protective equipment, e.g. safety goggles.
- ▶ If hydraulic fluid comes into contact with the eyes or enters the bloodstream or is swallowed nevertheless, consult a doctor immediately.
- ▶ Remove the protective cap at the oil port of the bladder-type accumulator.
- ▶ Connect the hydraulic lines to the oil port of the bladder-type accumulator.
  - Use an open-end wrench to hold the oil valve in place.
  - Assemble the hydraulic lines at the bladder-type accumulator without tension stress. The screw connections should move smoothly.
  - Tighten the bladder-type accumulator at the oil valve by means of an open-end wrench until it fits tightly.

The bladder-type accumulator is now mounted.

- ▶ Affix a warning sign with the symbol of a bladder-type accumulator in a visible and accessible place.

Bosch Rexroth offers the following warning signs for bladder-type accumulators:

Accumulator volume in liters:	1-2.5	4-50
Size:	100 mm x 45 mm	200 mm x 90 mm
Material number:	R901476664	R901440344

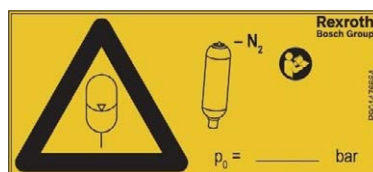


Fig. 11: Example of warning sign

## 8 Commissioning



### **WARNING**

**Reduction of wall thickness of the pressure container when operated using corrosive hydraulic fluids! Load of the pressure container and the elastic elements (sealing devices) during operation with abrasive hydraulic fluids!**

Danger to life! Danger of bursting! Damage to property!

- ▶ Only use the hydraulic fluids recommended in data sheet 50171, see chapter 1.2 "Required and amending documentation".

**Bursting of the bladder-type accumulator due to the maximum admissible pressure PS being exceeded!**

Danger to life! Risk of injury! Damage to property!

- ▶ Adhere to the maximum admissible pressure PS indicated on the type cap.



### **CAUTION**

**Leakage of hydraulic fluid under high pressure due to faulty assembly of the bladder-type accumulator!**

Risk of injury! Damage to property!

- ▶ Ensure that the bladder-type accumulator has been mounted by an expert, see chapter 2.4 "Qualification of personnel", completely and without tension stress before commissioning the bladder-type accumulator.
- ▶ Ensure that the tightening torques on the system side have been observed.

### **NOTICE**

**Wear or cracks in the bladder due to the gas filling pressure being too low or too high! Sudden gas losses into the system!**

Damage to property!

- ▶ Adhere to the gas filling pressure indicated on the hydraulic circuit diagram.



For commissioning of the bladder-type accumulator, always observe the operating instructions of the overall system.

For commissioning the bladder-type accumulator, use the charging and test device for bladder-type accumulators (HAB), material number: 0538103011 or for bladder and diaphragm accumulators (HAB/HAD), material number: 0538103014, according to data sheet 50171/operating instructions 50144-B, see chapter 1.2 "Required and amending documentation".

## 8.1 Preparing for commissioning



The examination of the bladder-type accumulator prior to commissioning as well as the recurring tests are to be performed according to national rules.

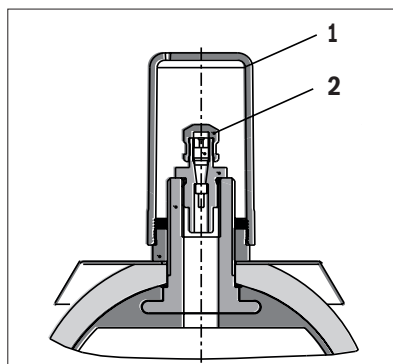
- ▶ Make sure that the bladder-type accumulator is intact.
- ▶ Ensure based on the information on the type cap that the bladder-type accumulator corresponds to the specifications provided in the hydraulic circuit diagram or in the system parts list.
- ▶ Cover the bladder-type accumulator with a final coating, if required for corrosion protection due to environmental conditions. In the condition as supplied, the product is only primed.
- ▶ Check whether the hydraulic fluid used in the hydraulic system corresponds to the specifications provided in data sheet 50171 and on the type cap of the bladder-type accumulator.
- ▶ Make sure that the maximum admissible pressure PS of the bladder-type accumulator is equal to or greater than the maximum operating pressure of the hydraulic circuit.
- ▶ Check whether the operating temperatures are within the limits mentioned on the type cap.
- ▶ Make sure that the bladder-type accumulator has been installed completely and without tension stress.
- ▶ Prepare the charging and test device for bladder-type accumulators (HAB), material number: 0538103011 or for bladder and diaphragm accumulators (HAB/HAD), material number: 0538103014 and their operating instructions 50144-B.

## 8.2 First commissioning

- ▶ Set the bladder-type accumulator to the specified gas filling pressure according to the hydraulic circuit diagram prior to any commissioning.

Proceed as follows to set the gas filling pressure:

- ▶ Make sure that the system is depressurized.
- ▶ Remove the cover cap and the sealing cap from the gas side of the bladder-type accumulator.



**Fig. 12: Removing the cover cap and sealing cap**

**1** Cover cap

**2** Sealing cap

- ▶ Screw the charging and test valve of the charging and test device, material number: 0538103011 or 0538103014, onto the gas valve of the bladder-type accumulator.



Additionally, please observe the operating instructions 50144-B, see chapter 1.2 "Required and amending documentation".

**WARNING!** Explosion of the bladder-type accumulator when charged with unapproved gas, e.g. oxygen!

Danger to life! Risk of injury!

- ▶ Only charge the bladder-type accumulator with nitrogen 99.99 vol.%.

**WARNING!** Uncontrolled release of a significant amount of gas!

Danger to life! Risk of suffocation!

- ▶ Make sure that the workplace is sufficiently ventilated.
- ▶ For checking the gas filling pressure, always use suitable charging and test device, material number: 0538103011 or 0538103014.

**WARNING!** Loud bang due to exploding bladder during filling with gas!

Danger of hearing damage!

- ▶ Only fill the bladder-type accumulator using a pressure reducing valve.

**CAUTION!** High surface temperature during filling of the bladder-type accumulator with gas!

Risk of burning!

- ▶ Only touch the surfaces of the bladder-type accumulator with heat-resistant protective clothing, e.g. gloves, or do not work at hot surfaces.
- ▶ Allow the bladder-type accumulator to cool down sufficiently before touching it.
- ▶ Observe the protective measures of the system manufacturer.
- ▶ Connect the nitrogen bottle with pressure reducing valve to the gas valve of the bladder-type accumulator using the hose of the charging and test device.
- ▶ The prescribed gas filling pressure P0 is indicated in the hydraulic circuit diagram.
- ▶ Slowly open the shut-off cock of the gas bottle to make sure that the bladder evenly touches the interior wall.
- ▶ Leave the shut-off cock open until the specified gas filling pressure P0 is displayed at the pressure gauge of the charging and test device.
- ▶ Always keep an eye on the pressure gauge during the charging process.
- ▶ Close the shut-off cock of the gas bottle.
- ▶ The gas filling pressure is temperature-dependent. During charging, the bladder-type accumulator heats up. Wait until the bladder-type accumulator has cooled down.
- ▶ Check the gas filling pressure P0 and correct it if necessary.
- ▶ Remove the charging and test valve of the charging and test device.

- ▶ Screw the sealing cap and the cover cap back on the gas valve of the bladder-type accumulator.
- ▶ Note down the set gas filling pressure P0 on the warning sign and/or the type cap in the intended field.

The gas filling pressure is now checked and set.

**Commissioning the bladder-type accumulator**

- ▶ Commission the bladder-type accumulator together with the system according to the operating instructions of the overall system.

### **8.3 Re-commissioning after standstill**

- ▶ Check whether the gas filling pressure corresponds to the value P0 indicated on the type cap. Proceed as described in chapter 10.1 "Maintenance".
- ▶ Check the oil valve for leak-tightness.
- ▶ Make sure that the accumulator does not show any signs of corrosion and that the coating is intact.
- ▶ Commission the bladder-type accumulator together with the system according to the operating instructions of the overall system.

## 9 Operation



### **WARNING**

**Uncontrolled loosening of the bladder-type accumulator due to mechanical stress caused by relative motions or due to dynamic loads caused by vibrations transmitted from the environment!**

Danger to life! Risk of injury! Damage to property!

- ▶ Use suitable holding devices to fix the bladder-type accumulator in place, e.g. mounting clamps and an additional console, if required.
- ▶ Ensure installation without tension stress.
- ▶ Observe the tightening torques specified on the system side.

**Cracking of the bladder-type accumulator due to stability reduction caused by extreme ambient temperature!**

Danger to life! Damage to property!

- ▶ Make sure that the ambient temperature of the bladder-type accumulator does not exceed or fall below the ambient temperature indicated in data sheet 50171, see chapter 1.2 "Required and amending documentation".
- ▶ Observe the operating temperature and consider the ambient temperature.

**Reduction of wall thickness of the pressure container when operated using corrosive hydraulic fluids! Wear of the pressure container and the elastic elements (sealing devices) during operation with abrasive hydraulic fluids!**

Danger to life! Danger of bursting! Damage to property!

- ▶ Only use the hydraulic fluids recommended in data sheet 50171, see chapter 1.2 "Required and amending documentation".
- ▶ Check the bladder-type accumulator for abrasive wear regularly.

**Bursting of the bladder-type accumulator due to the maximum admissible pressure PS being exceeded!**

Danger to life! Risk of injury! Damage to property!

- ▶ Adhere to the maximum admissible pressure PS indicated on the type cap.

**Cracking of the bladder-type accumulator due to wall thickness caused by corrosion!**

Danger to life! Risk of injury! Damage to property!

- ▶ Check the bladder-type accumulator for external corrosion regularly – depending on the application.
- ▶ Determine the frequency of the corrosion checks according to the application.
- ▶ Check which provisions or ordinances are to be complied with in your country and/or for your application.



## CAUTION

### **Leakage of hydraulic fluid under high pressure due to faulty assembly of the bladder-type accumulator!**

Risk of injury! Damage to property!

- ▶ Ensure that the bladder-type accumulator has been mounted by an expert, see chapter 2.4 "Qualification of personnel", completely and without tension stress before commissioning the bladder-type accumulator.
- ▶ Ensure that the tightening torques on the system side have been observed.

## NOTICE

### **Wear or cracks in the bladder due to the gas filling pressure being too low or too high! Sudden gas losses into the system!**

Damage to property!

- ▶ Adhere to the gas filling pressure indicated on the hydraulic circuit diagram.

### **Gas or oil leakage due to loss of preload / elasticity of the sealing devices due to too high/low temperature! Cracking of the bladder due to material embrittlement in too low a temperature!**

Damage to property!

- ▶ Make sure that the temperature of the bladder-type accumulator does not exceed or fall below the ambient temperature indicated in data sheet 50171, see chapter 1.2 "Required and amending documentation".
- ▶ Observe the operating temperature and consider the ambient temperature.

During operation of the bladder-type accumulator, observe the following points:

- ▶ Make sure that the type cap is always present and legible.  
Otherwise, further operation is not allowed.
- ▶ Make sure that no loads/forces, e.g. temperature expansions or vibrations, occur and are transferred to the bladder-type accumulator. The effects of external forces may lead to damage of the oil port and the uncontrolled release of pressurized hydraulic fluid.
- ▶ Ensure that the bladder-type accumulator type HAB..-6X is only operated within the performance limits specified in data sheet 50171, see chapter 1.2 "Required and amending documentation", in particular regarding the admissible min./max temperature TS and the maximum admissible pressure PS according to the type cap.
- ▶ Make sure that the bladder-type accumulator is only operated in impeccable condition.



Changes in operating speeds, temperatures, increasing noises or power consumption are an indication of wear or damage at the bladder-type accumulator/the system.

In order to guarantee a high operational safety and availability of the system, it is recommended to permanently monitor these values.



## 10 Maintenance and repair



### **WARNING**

#### **Cracking of the bladder-type accumulator due to wall thickness caused by corrosion!**

Danger to life! Risk of injury! Damage to property!

- ▶ Check the bladder-type accumulator for external corrosion regularly – depending on the application.
- ▶ Determine the frequency of the corrosion checks according to the application.
- ▶ Check which provisions or ordinances are to be complied with in your country and/or for your application.

#### **Inspection**

- ▶ Check the hydraulic lines, line connections and seals for leak-tightness and check the bladder-type accumulator for external corrosion.
- ▶ To do so, follow the system manufacturer's instructions.

#### **Maintenance**

- ▶ Perform the prescribed maintenance work at the intervals specified in the operating instructions of the overall system.



If no other instructions are available, Bosch Rexroth recommends maintenance intervals according to chapter 10.1 "Maintenance".

Only experts may perform maintenance and repair work at the bladder-type accumulator, see chapter 2.4 "Qualification of personnel".

#### **Replacing wear parts**

Only use spare parts approved by the manufacturer to replace wear parts.

#### **Close openings**

- ▶ Before transport, close all openings using the supplied protective caps/cover caps in order to prevent dirt or humidity from penetrating the bladder-type accumulator.

### 10.1 Maintenance

#### **10.1.1 Required tests/maintenance activities**

After having been charged with gas, Rexroth bladder-type accumulators are virtually maintenance-free. In order to guarantee a fault-free operation and a long life cycle, however, the following tasks are to be carried out:

- Checking the gas filling pressure
- Inspection of the safety equipment, fittings
- Inspection of the line connections
- Inspection of accumulator fixation



During maintenance work for which the accumulator has to be removed (e.g. replacement of bladder), the bladder-type accumulator/system has to be depressurized.

For disassembly, assembly and commissioning, proceed as described in the corresponding chapters.

**Checking the gas filling pressure**

To check the gas filling pressure of the bladder-type accumulator, proceed as follows:

- ▶ Make sure that the system is depressurized.
- ▶ For the specified gas filling pressure P0, refer to the type cap of the bladder-type accumulator.

**WARNING!** Uncontrolled release of a significant amount of gas!

Danger to life! Risk of suffocation!

- ▶ Make sure that the workplace is sufficiently ventilated.
- ▶ For checking the gas filling pressure, always use the suitable charging and test device for bladder-type accumulators (HAB), material number: 0538103011 or for bladder and diaphragm type accumulators (HAB/HAD), material number: 0538103014.
- ▶ Remove the cover cap and the sealing cap from the gas side of the bladder-type accumulator.
- ▶ Screw the charging and test valve of the charging and test device for accumulators onto the bladder-type accumulator gas valve.



Additionally, please observe the operating instructions 50144-B of the charging and test device, material number: 0538103011 or 0538103014, see chapter 1.2 "Required and amending documentation".

- ▶ Check whether the gas filling pressure indicated on the pressure gauge of the charging and test device corresponds to the value P0 on the type cap. If the two values differ, set the gas filling pressure as described in chapter 8.2 "Re-commissioning after standstill".
- ▶ Remove the charging and test valve of the charging and test device for accumulators from the bladder-type accumulator gas valve.
- ▶ Screw the sealing cap and the cover cap back on the bladder-type accumulator.

The gas filling pressure is now checked and set.

### 10.1.2 Test intervals of the bladder-type accumulator

**Table 8: Test intervals of the bladder-type accumulator**

Test	Interval	Maintenance activity
Checking of the gas filling pressure with external visual inspection	<b>Test 1:</b> Within one week as of commissioning	<ul style="list-style-type: none"> <li>▶ Check the gas filling pressure.</li> <li>▶ Check the oil valve for leak-tightness.</li> <li>▶ Carry out a visual inspection for corrosion protection.</li> </ul>
	<b>Test 2:</b> Within 3 months after commissioning, if no gas losses during test 1	
	<b>Test 3:</b> Annual test, if no gas losses during test 2	
Internal visual inspection	Every 10 years	<ul style="list-style-type: none"> <li>▶ Check the pressure container according to national provisions.</li> <li>▶ Carry out a visual inspection of the pressure container for internal corrosion.</li> </ul>

### **10.1.3 Maintenance schedule of the system**

For a safe operation and a long life cycle of the bladder-type accumulator, a maintenance schedule is to be drawn up for the unit, machine or system. The maintenance schedule must guarantee that the operating conditions of the bladder-type accumulator stay within the prescribed limits during the entire period of use.

In particular, compliance with the following operating parameters has to be ensured:

- Operating pressure
- Operating temperature range
- Surface temperature
- External pressure
- Leak-tightness

Changes made to these parameters increase the wear of the bladder-type accumulator. The cause must be identified and remedied immediately.

In order to achieve high operational safety of the bladder-type accumulator in the machine/system, Bosch Rexroth recommends checking the parameters mentioned above continuously and automatically and shutting the system off automatically in case of modifications which exceed the usual fluctuations in the intended operating range.



Further information on the maintenance is provided in the operating instructions of the overall system.

## **10.2 Repair**

Only experts may perform repair works at the bladder-type accumulator type HAB..-6X, see chapter 2.4 "Qualification of personnel".

If you have any questions regarding spare parts and repair, please contact your local Bosch Rexroth service or the service department of the bladder-type accumulator manufacturer's factory:

Bosch Rexroth AG  
Service  
Bgm.-Dr.-Nebel-Str. 8  
97816 Lohr am Main  
Phone: +49 (0) 9352 - 40 - 50 60  
service@boschrexroth.de

For the addresses of our sales and service network, please refer to [www.boschrexroth.com](http://www.boschrexroth.com)

# 11 Disassembly and replacement



## WARNING

**Parts flying around due to the residual pressure that is still present after draining!**

Danger to life! Risk of injury!

- ▶ Check the residual pressure in the bladder-type accumulator using the charging and test device.

### 11.1 Required tools

For the disassembly of the bladder-type accumulator, you need:

- Charging and test device for bladder-type accumulators (HAB), material number: 0538103011 or for bladder and diaphragm accumulators (HAB/HAD), material number: 0538103014, according to data sheet 50171/Operating instructions 50144-B, see chapter 1.2 "Required and amending documentation".
- Open-end wrench
- Lifting gear



For further details on the wrench sizes, refer to chapter 7 "Assembly", Table 7.

### 11.2 Preparing for disassembly

- Overall system** ▶ Decommission the overall system as described in the operating instructions of the system.

Afterwards, prepare the disassembly of the bladder-type accumulator as follows:

- ▶ Depressurize the hydraulic system.
- ▶ Make sure that the relevant system parts are depressurized and de-energized.

- Bladder-type accumulator** ▶ Discharge the bladder-type accumulator via the discharge device of the system.
- ▶ Please note that the gas filling pressure still exists on the gas side after hydraulic unloading.

### 11.3 Disassembly process

To disassemble the bladder-type accumulator, proceed as follows:

- ▶ Ensure that the hydraulic system is depressurized and the bladder-type accumulator is hydraulically unloaded.
- ▶ Remove the sealing cap and the cover cap from the gas side of the bladder-type accumulator.
- ▶ Screw the charging and test valve of the charging and test device for accumulators onto the bladder-type accumulator gas valve.

**WARNING!** Increased nitrogen concentration in the environment when draining the gas filling pressure of many large bladder-type accumulators!

Danger to life! Risk of suffocation!

- ▶ Make sure that the workplace is sufficiently ventilated.

**WARNING!** Loud hissing when gas is drained!

Danger of hearing damage!

- ▶ Drain the gas slowly.

**CAUTION!** Low surface temperature when draining the gas!

Danger of frostbite!

- ▶ Only touch the surfaces of the bladder-type accumulator with cold-resistant protective clothing, e.g. gloves, or do not work at cold surfaces.
- ▶ Allow the bladder-type accumulator to warm up sufficiently before touching it.
- ▶ Observe the protective measures of the system manufacturer.
- ▶ Relief the gas filling pressure in the bladder.



Additionally, please observe the operating instructions 50144-B of the charging and test device, material number: 0538103011 or 0538103014.

- ▶ The gas filling pressure is temperature-dependent. During draining, the bladder-type accumulator cools down. Wait until the bladder-type accumulator has heated up to ambient temperature again.
- ▶ Relief the gas filling pressure generated in the bladder during heating up.



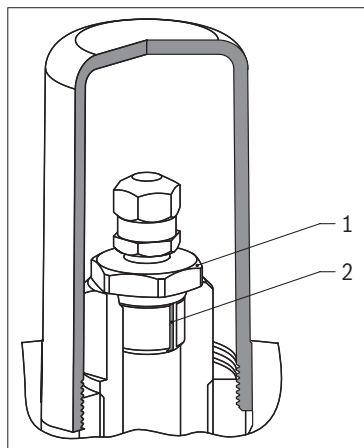
Additionally, please observe the operating instructions 50144-B of the charging and test device, material number: 0538103011 or 0538103014.

- ▶ Remove the charging and test valve of the charging and test device for accumulators from the gas valve.

**WARNING!** Uncontrolled loosening of the gas valve/gas valve assembly/bladder-type accumulator due to residual pressure!

Danger to life! Risk of injury!

- ▶ Loosen the gas valve insert, see Fig. 13, item 1, slowly using an open-end wrench SW 17, until the residual pressure is audibly released via the relieving nut, see Fig. 13, item 2, in the thread of the gas valve insert.



**Fig. 13: Relieving nut**

**1** Gas valve insert

**2** Relieving nut

- ▶ Completely release the residual pressure.
- ▶ Manually unscrew the gas valve insert.
- ▶ Remove the gas valve insert, to keep the bladder-type accumulator depressurized for an extended period.
- ▶ Screw the sealing cap and the cover cap back on the gas side of the bladder-type accumulator.
- ▶ Attach the bladder-type accumulator to the lifting device.

**WARNING!** Falling of the bladder-type accumulator during disassembly!

Danger to life! Risk of injury! Damage to property!

- ▶ Use lifting gear with sufficient lifting capacity to lift bladder-type accumulators with a weight > 15 kg.
- ▶ Use lifting straps or lifting slings as attachment devices.

**CAUTION!** Leaking residual oil during disassembly of the oil port!

Slip hazard! Health hazard! Environmental pollution!

- ▶ Remove leaking residual oil immediately.
- ▶ Wear protective gloves and safety goggles.
- ▶ If nevertheless hydraulic fluid comes into contact with the eyes or penetrates the skin, please consult a doctor immediately.
- ▶ Disconnect the bladder-type accumulator from the system.
- ▶ Attach the protective cap to the oil port.
- ▶ Loosen the holding devices of the bladder-type accumulator.

The bladder-type accumulator is now dismantled.

**WARNING!** Uncontrolled rolling away, overturning or falling of the bladder-type accumulator!

Risk of injury! Damage to property!

- ▶ Make sure that the bladder-type accumulator is positioned safely and secured against unintended rolling away, overturning or falling.
- ▶ Put down the bladder-type accumulator safely using the lifting device and secure it against unintended rolling away or falling.

## 12 Disposal

### **WARNING**

**Bursting of the container due to excessive thermal pressure in a bladder-type accumulator which is preloaded with gas!**

Risk of injury! Risk of fire!

- ▶ Before disposal, ensure that the gas filling pressure in the bladder has been released.

- ▶ Permanently mark a bladder-type accumulator which should no longer to be used, to prevent reuse as a pressure container.



The gas filling pressure in the bladder-type accumulator may increase due to heating.

- ▶ This means you should check the bladder-type accumulator for residual pressure once more before detaching the oil valve.
- ▶ If necessary, release the gas filling pressure again before dismantling.

For the disposal of the bladder-type accumulator, comply with the following instructions:

- ▶ Completely drain the bladder-type accumulator.
- ▶ Disassemble the bladder-type accumulator into its individual components in order to recycle them.
- ▶ Dispose of the bladder and the steel parts separately.

### **12.1 Environmental protection**

Careless disposal of the bladder-type accumulator, the contained hydraulic fluid and the packaging material can pollute the environment.

- ▶ Dispose of the bladder-type accumulator and the packaging material in accordance with the applicable national regulations in your country.
- ▶ Dispose of the hydraulic fluid in accordance with the currently applicable national regulations in your country. Also observe the valid safety data sheet of the hydraulic fluid.



## 13 Extension and modification



### **WARNING**

**Bursting of the container or oil leakage due to structural changes, machining or welding at pressurized parts!**

Danger to life! Risk of injury! Damage to property!

- Install the bladder-type accumulator without structural changes into the machine/system.

You will be considered responsible for any extensions to or modifications of the product.

**Any declarations  
shall become invalid**

If you undertake any extensions to or modifications of the product marketed by Bosch Rexroth, this means you are changing the condition as supplied. Any statements made by Bosch Rexroth regarding this product will then become invalid.



The Bosch Rexroth warranty applies only to the configuration supplied.  
Following an extension or a modification, the claim to warranty expires.

## 14 Troubleshooting



Table 8 may assist you when troubleshooting. This table is not exhaustive. In practice, there may be problems that are not included here.

### 14.1 How to proceed for troubleshooting

- ▶ Always work systematically and purposefully, even when under time pressure. Random, thoughtless disassembly and changing of settings might result in the inability to restore the original error cause.
- ▶ First get a general idea of the function of the bladder-type accumulator in conjunction with the overall system.
- ▶ Try to establish whether the bladder-type accumulator functioned properly in conjunction with the overall system before the error first occurred.
- ▶ Try to determine any changes of the overall system in which the bladder-type accumulator is integrated.
  - Were there any changes to the application conditions or area of application of the bladder-type accumulator?
  - Has any maintenance work been performed recently? Is there an inspection or maintenance record?
  - Have modifications (e.g. refittings) or repair works been performed at the overall system (machine/system, electrical system, control) or at the bladder-type accumulator? If yes: What were they?
  - Was the hydraulic fluid changed?
  - Was the bladder-type accumulator or machine used as intended?
  - How did the fault become apparent?
- ▶ Try to get a clear idea of the cause of error. If necessary, ask the actual (machine) operator.
- ▶ Document all work done.
- ▶ If you could not remedy the occurred error, please contact one of the contact addresses you find at [www.boschrexroth.com](http://www.boschrexroth.com) or:

Bosch Rexroth AG  
 Service  
 Bgm.-Dr.-Nebel-Str. 8  
 97816 Lohr am Main  
 Phone: +49 (0) 9352 - 40 - 50 60  
[service@boschrexroth.de](mailto:service@boschrexroth.de)

**Table 9: Fault table of bladder-type accumulator type HAB..-6X**

<b>Fault</b>	<b>Possible cause</b>	<b>Remedy</b>
Initial gas tension changes during operation	Leakage/gas valve leaks	<ul style="list-style-type: none"> <li>▶ Perform a visual inspection.</li> <li>▶ Perform a leak test with leak spray during final assembly.</li> </ul>
	Gas valve broken/damaged	<ul style="list-style-type: none"> <li>▶ Have the gas valve with sealing cap replaced by an expert.</li> <li>▶ Always use the charging and test device for filling with gas and draining, material number: 0538103011 or 0538103014, according to data sheet 50171 / operating instructions 50144-B (see chapter 1.2 "Required and amending documentation")</li> </ul>
	Gas valve function impaired due to contamination	<ul style="list-style-type: none"> <li>▶ Have the gas valve with sealing cap replaced by an expert.</li> </ul>
	System-related change of pressure dependent on the temperature	<p>Temperature-dependent changes to the gas filling pressure cannot be avoided.</p> <ul style="list-style-type: none"> <li>▶ The gas filling pressure must therefore be chosen in accordance with the expected operating temperatures.</li> </ul>
	Reduction due to permeation	<ul style="list-style-type: none"> <li>▶ Refill gas.</li> </ul>
Cracks on the container	Application out of specification	<ul style="list-style-type: none"> <li>▶ Stop the system immediately.</li> <li>▶ Exchange the bladder-type accumulator.</li> <li>▶ The bladder-type accumulator must not be put into operation again, but must be disposed of, see chapter 12 "Disposal".</li> </ul>
	Operation outside the prescribed temperature range	<ul style="list-style-type: none"> <li>▶ Stop the system immediately.</li> <li>▶ Exchange the bladder-type accumulator.</li> <li>▶ The bladder-type accumulator must not be put into operation again, but must be disposed of, see chapter 12 "Disposal".</li> <li>▶ After commissioning, check the operating temperature.</li> </ul>
Internal corrosion	Use of inappropriate hydraulic fluid	<ul style="list-style-type: none"> <li>▶ Stop the system immediately.</li> <li>▶ Exchange the bladder-type accumulator.</li> <li>The bladder-type accumulator must not be put into operation again, but must be disposed of, see chapter 12 "Disposal".</li> <li>▶ Use suitable hydraulic fluid.</li> </ul>
	Residual humidity in the container due to inappropriate storage conditions	<ul style="list-style-type: none"> <li>▶ Stop the system immediately.</li> <li>▶ Exchange the bladder-type accumulator.</li> <li>The bladder-type accumulator must not be put into operation again, but must be disposed of, see chapter 12 "Disposal".</li> <li>▶ Observe the prescribed storage conditions.</li> </ul>
Abrasion and reduction of the wall thickness.	Use of inappropriate hydraulic fluid	<ul style="list-style-type: none"> <li>▶ Stop the system immediately.</li> <li>▶ Exchange the bladder-type accumulator.</li> <li>The bladder-type accumulator must not be put into operation again, but must be disposed of, see chapter 12 "Disposal".</li> <li>▶ Use suitable hydraulic fluid.</li> <li>▶ Ensure cleanliness.</li> </ul>

**Table 9: Fault table of bladder-type accumulator type HAB..-6X**

<b>Fault</b>	<b>Possible cause</b>	<b>Remedy</b>
Oil losses at interfaces to the outside	Incorrect order of assembly in service case	► Have the service performed by an expert only.
	O-ring of the sealing is damaged and/or hardened due to excessive oil temperature	► Have the gas valve replaced by an expert. ► Check the oil temperature.
	oil valve broken due to assembly of the bladder-type accumulator with tension stress.	► Exchange the oil valve.
	Inadmissible environmental force effect	► Obtain approval from Bosch Rexroth.
	Damage to the oil valve during transport	► Perform a visual inspection after transport.
	Inadmissible force effects by mobile applications	► Obtain approval from Bosch Rexroth.
Impossible to assemble	Wrong thread	► Replace the affected parts.
	Thread damaged	► Replace the affected parts.
Commissioning is not possible when the storage time has been exceeded	Insufficient corrosion protection	► Replace the bladder-type accumulator.

## 15 Technical data



For the admissible technical data of the bladder-type accumulator, refer to data sheet 50171, see chapter 1.2 "Required and amending documentation".

The data sheet can be found on the internet at

[www.boschrexroth.com/mediadirectory](http://www.boschrexroth.com/mediadirectory)

For further information, refer to the online product catalog

[www.boschrexroth.com](http://www.boschrexroth.com)

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