

# Pressure gauge isolator valve

RE 50031-B/06.09

English

Type AF6

## Operating instructions

H6506  
AF6



### Applies to the following types:

AF6EA

AF6EP

The data specified above only serve to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of own judgment and verification. It must be remembered that our products are subject to a natural process of wear and aging.

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

The original operating instructions were prepared in German.

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# 1 About this document

These operating instructions apply to Rexroth pressure gauge isolator valves

- for subplate mounting
- for threaded connection

These instructions contain important information on the safe and appropriate assembly, transport, commissioning, operation, maintenance, disassembly and simple troubleshooting of the valve.

Read these instructions completely, especially chapter "2 General safety instructions" on page 5 before working with the valve.

## Target group of these operating instructions

The target group of these operating instructions comprises all groups of persons installing, operating, servicing, and maintaining the products or systems of Bosch Rexroth.

## Product scope

**Table 1: Main product features**

Valve type	Size	Component series	Max. operating pressure Input	Max. operating pressure Output
AF6E	6	4X	300 bar	10 bar

## 1.1 Related documents

The valve is a system component. Also observe the instructions for the other system components. Also observe the instructions in the following manuals:

- System documentation from the system manufacturer
- Technical data sheet, see table 2

**Table 2: Technical data sheet**

Valve type	Technical data sheet
AF6E	RE 50031



You will find the "Technical data sheet" for the valves on the Internet under <http://www.boschrexroth.com/Rexroth-IHD/>.

Also observe the generally applicable, legal or otherwise binding regulations of the European or national legislation and the rules on accident prevention and for environmental protection applicable in your country.

## 2 General safety instructions

The valve has been manufactured according to the accepted rules of current technology. There is, however, still a risk of personal injury or damage to property if the following general safety instructions and warnings before instructions contained in these operating instructions are not observed.

- ▶ Read these instructions completely and thoroughly before working with the valve.
- ▶ Keep these instructions in a location where they are accessible to all users at all times.
- ▶ Always include the operating instructions when you pass the valve on to third parties.

### 2.1 Intended use

The valve is exclusively intended for being integrated in a machine or system or for being assembled with other components to form a machine or system. The product may be commissioned only if it is integrated in the machine/system for which it is designed.

You should observe the operating conditions and performance limits specified in the technical data.

The valve is a work appliance and not designed for private use.

Intended use includes having read and understood these instructions, especially the chapter "2 General safety instructions".

### 2.2 Improper use

Any use of the valve other than described in section "2.1 Intended use" is considered as improper.

Conversions exceeding the extent described in these operating instructions are not permitted.

The valve is not suitable for being operated in explosive environments.

### 2.3 Qualification of personnel

Assembly, commissioning and operation, disassembly, service (including maintenance and repair) require basic mechanical and hydraulic knowledge, as well as knowledge of the appropriate technical terms. In order to ensure operational safety, these activities may only be carried out by corresponding experts or an instructed person under the direction and supervision of an expert.


Experts are those who can recognize potential hazards 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.

## General safety instructions

## 2.4 Safety instructions in these instructions

In these instructions, there are warnings before an instruction whenever there is a risk of personal injury or damage to property. The measures described for preventing these hazards must be observed.





Safety instructions are set out as follows:

SIGNAL WORD	Type of risk!
	Consequences ► Precautions

- Warning sign (warning triangle): Draws attention to the hazard
- Signal word: Identifies the degree of hazard
- Type of risk: Specifies the type or source of the hazard
- Consequences: Describes the consequences of non-compliance
- Precautions: Specifies how the hazard can be prevented

The signal words have the following meaning:

**Table 3: Signal words/warning signs**

Signal word	Application
<b>DANGER!</b> 	Indicates an imminently hazardous situation which, if not avoided, will certainly result in death or serious injury.
<b>WARNING!</b> 	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
<b>CAUTION!</b> 	Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury or damage to property.
	If this information is disregarded, the operating procedure may be impaired.

## 2.5 Adhere to the following instructions

### General notes

- Observe the regulations on accident prevention and environmental protection for the country where the product is used and at the workplace.
- Only use Rexroth valves in good technical order and condition.
- Check the valve for visible defects, for example cracks in the housing or missing lead seals, screws, covers or seals.
- Do not modify or retrofit the valve.
- Only use the valve within the performance range provided in the technical data.
- Persons who assemble, operate, disassemble or maintain Rexroth valves must not consume any alcohol, drugs or pharmaceuticals that may affect their ability to react.
- Make sure that all safety equipment belonging to the valve is present, has been installed properly and is fully functional. Do not displace, bypass or disable the safety devices.

- The valve is no safety equipment.
- Please comply with the specified cleanliness class 20/18/15 in accordance with ISO 4406 (c).
- If it is necessary to disable safety devices, for example for commissioning or maintenance works, always take the appropriate measures to ensure that no hazard to a person's life or health or to property may occur. Also observe the superordinate operating instructions for the machinery or system.

---

**CAUTION!****Risk of burning!**

During operation, the valve may even get so hot that you may burn yourself.

- ▶ Allow the valve to cool down sufficiently before touching it.
- ▶ Wear heat-resistant protective clothing, e.g. gloves.
- ▶ Provide for a suitable touch guard.
- ▶ Please also observe ISO 13732-1 and EN 982.

- 
- The warranty only applies to the delivered configuration.
  - The warranty will not apply if the product is incorrectly assembled.
  - Do not expose the valve to any mechanical loads under any circumstances. Never use the valve as a handle or step. Do not place any objects on top of it.

**During assembly**

- Always depressurize the corresponding part of the system before installing the valve. Protect the system component against being switched on.
- When assembling, provide for absolute cleanliness in order to prevent welding beads or metal cuttings from getting into the hydraulic lines and causing valve wear or malfunctions.

**During commissioning**

- Let the valve acclimate itself for several hours before commissioning, otherwise water may condense in the housing.
- Make sure that all hydraulic connections are either used or covered. Commission the valve only if it is installed completely.

**During cleaning**

- Cover all openings with the appropriate protective devices in order to prevent cleaning agents from penetrating the system.
- Never use solvents or aggressive detergents. Only clean the valve using slightly damp, non-linting fabric. Only use water and a mild cleaning agent, if necessary, to do so.
- Do not use pressure washers for cleaning.

## General safety instructions

**During maintenance**

- Perform the prescribed maintenance works at the intervals specified in the operating instructions.
- Make sure that no ports and components are disconnected as long as the system is under pressure and voltage. Protect the system against being switched on.

**During disposal**

- Dispose of the valve in accordance with the currently applicable national regulations in your country.
- Dispose of the hydraulic fluid in accordance with the currently applicable national regulations in your country.
- Dispose of hydraulic fluid residues according to the applicable safety data sheets for hydraulic fluids.

**2.6 Obligations of the operator**

The operator of the Bosch Rexroth valve is bound to provide for personnel training on a regular basis regarding the following subjects:


- Observation and use of the operating instructions as well as the legal stipulations
- Intended use and operation of the Bosch Rexroth valve
- Observation of the instructions from the factory security offices and of the work instructions from the operator
- What to do in an emergency



Bosch Rexroth offers training support in specific fields. You can find an overview of the training contents in the Internet under <http://www.boschrexroth.com/didactic>.

**2.7 Safety labels**

Table 4: Warning sign

Warning sign	Meaning
	Hot surface warning



Due to the valve's surface temperature, the warning sign "Hot surface warning" must be applied to the end product by the machine/system manufacturer.

## 2.8 Safety equipment

### Personal protective equipment

The operator must provide personal safety equipment (e.g. gloves, safety shoes, eye protectors, overall, etc.).

### Touch guard

As protection against the hot valve surfaces, Bosch Rexroth recommends the installation of a touch guard so that unwanted contact with the hot surface can be avoided.

## 3 Scope of delivery

The scope of delivery includes:

- Valve in accordance with "Technical data sheet" and "Order specification"



Check the delivery contents for completeness, particularly the seal rings at the valve connection surfaces.

Check the delivery contents for possible transport damage, also see chapter "5 Transportation and storage" on page 12.

Check whether the operating instructions are suitable for the valve.

## 4 Product description

### 4.1 Performance description

See "Technical data sheet"



The assignment of the valves to the technical data sheets is contained in table 2 on page 4.

### 4.2 Device description

See "Technical data sheet"



The assignment of the valves to the technical data sheets is contained in table 2 on page 4.

### 4.3 Product identification

#### Information on the name plate

The meaning of the details on the nameplate can be found on the basis of the enumerated fields from the following figure and the table.

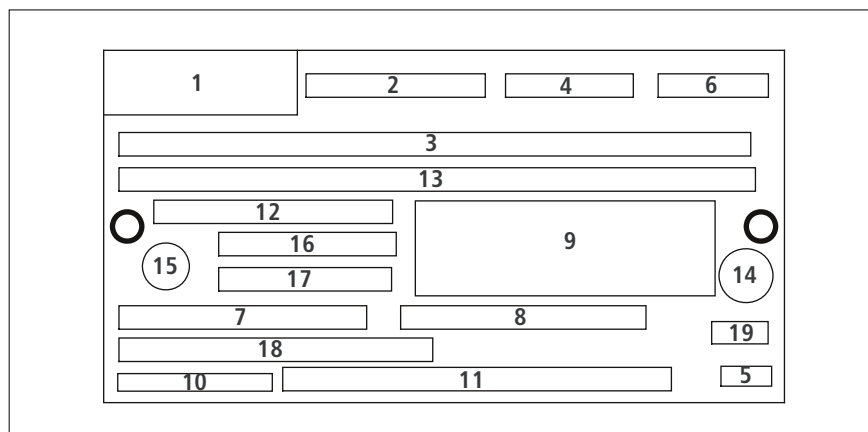


Fig. 1: Name plate

Table 5: About the name plate

No.	Type of information	Information or example
1	Manufacturer's logo	<b>Rexroth</b>
2	Material no. of the valve (= order no.)	e.g.: <b>R9012345678</b>
3	Type designation complete valve	e.g.: <b>AF6...<sup>1)</sup></b>
4	---	---
5	Manufacturer's factory number	e.g.: <b>7081</b>
6	Date of manufacture (year and week)	e.g.: <b>FD: 03W01</b>
7	Maximum operating pressure	e.g.: <b>Pmax = 300 bar</b>
8	Ambient temperature range	<b>-20 °C ≤ Ta ≤ +50 °C</b>
9	Hydraulic symbol according to ISO 1219	Graphic
10	Designation of origin	<b>Made in Germany</b>
11	Name and address of the manufacturer	<b>BOSCH REXROTH AG D-97816 LOHR</b>
12	Customer or fabrication order number	e.g.: <b>1234567890 12345678</b>
13	Customer material number or additional information	e.g.: <b>CNR: 1234567890</b>
14	---	---
15	---	---
16	---	---
17	---	---
18	---	---
19	---	---

<sup>1)</sup> For the meaning of the individual details of the type designation please refer to the "technical data sheet" of the corresponding valve.

## 5 Transport and storage

**DANGER!****Risk of personal injury and damage to property!**

In case of improper transport, the valve may fall down and cause damage to the valve and/or injuries as the components may be sharp-edged, oily, unstable, loose and bulky.

- ▶ Provide for a stable position during transport to the place of installation.
- ▶ Use personal protective equipment (like e.g. gloves, working shoes, safety goggles, working clothes, etc.).
- ▶ Comply with the national laws and regulations regarding occupational health and safety and transport.



Transport damage must be reported within one week to Bosch Rexroth to the following address:

Bosch Rexroth AG  
Service Industriehydraulik [Industrial hydraulics]  
Bürgermeister-Dr.-Nebel-Straße 8  
97816 Lohr am Main  
Germany

Phone +49 (93 52) 18-46 66

Fax +49 (93 52) 18-33 63

For transporting and storing the product always observe the environmental conditions specified in the technical data (see "Technical data sheet").

### 5.1 Transport by hand

**DANGER!****Risk of personal injury and damage to property!**

In case of improper transport, the valve may fall down and cause damage to the valve and/or injuries.

- ▶ Use personal protective equipment (like e.g. gloves, working shoes, safety goggles, working clothes, etc.).

In case of transport by hand, the following points are to be observed:

- ▶ Use personal protective equipment (like e.g. gloves, working shoes, safety goggles, working clothes, etc.).
- ▶ Put the valve carefully onto the contact surface in order not to damage it.

## 5.2 Storage

Coming from the works, the valve is suitable for being stored up to six months according to the following criteria:

- Do not store outside, but only under a roof or in a well-ventilated room.
- Protect against soil humidity: Store in shelves or on a wood pallet.
- Cover with foil as protection against dust and dirt.
- All connections at the valve must be covered with plugs.
- At all contact surfaces and blank parts, there must be preservative protection. If there is no or insufficient preservative protection, they are to be preserved using Bran-O-Rost protective oil.
- After opening the transport packaging, it must be closed properly again for the storage.



In case of storage of more than six months or in case of sea transport, coordination with Bosch Rexroth is required.

## 6 Assembly

### 6.1 Unpacking

Dispose of the packaging in accordance with the national regulations of your country.

**DANGER!**



#### **Risk of personal injury and damage to property!**

In case of improper opening of the packaging, components of the valve may fall out and cause damage to the components or even injuries as the components may be sharp-edged, oily, unstable, loose and bulky.

- ▶ Put the packaging on a level ground with sufficient load carrying capacity.
- ▶ Take the device out and provide for a stable position during transport to the place of installation.
- ▶ Use personal protective equipment (like e.g. gloves, working shoes, safety goggles, working clothes, etc.).

### 6.2 Coating the valve before installation

If the valve is to be coated before being assembled, please observe the following:

- ▶ Protect the hydraulic ports against paint application by screwing-in plastic threaded plugs completely beforehand.
- ▶ Protect the mounting bores against paint application.
- ▶ Mask the valve connection surfaces carefully before coating so that no dirt or paint may enter.
- ▶ Protect the name plate against paint application.
- ▶ Protect the pressure gauge display against paint application if there is no removable foil on the display, not with type **AF6E.X**.



When removing the coating protection and the plastic threaded plugs make sure that no paint chips or other foreign bodies enter the valve. The name plate must be readable after coating.



If you want to coat the valve after the assembly, the same points as when coating the valve before the assembly have to be observed.

### 6.3 Installation conditions

For installing the product always observe the environmental conditions specified in the technical data (see "Technical data sheet").

#### Installation position

See "Technical data sheet"



The assignment of the valves to the technical data sheets is contained in table 2 on page 4.

#### Requirements on the valve contact surface

For the recommended valve contact surface as well as installation and attachment dimensions refer to the Technical data sheet.

### 6.4 Required tools

In order to install the valve, you need standard tools only.

### 6.5 Required accessories

In order to be able to assemble the valve, you need the following accessories, which are not included in the delivery and can be ordered from Bosch Rexroth:

- Valve mounting screws  
Due to reasons of stability, only the following valve mounting screws have to be used.

**Table 6: Valve mounting screws for subplate mounting**

Valve type	Hexagon socket head cap screws	Quantity	Tightening torque <sup>1)</sup>	Material no.
AF6EP	ISO 4762 - M6 × 65 – 10.9	4	15.5 Nm ± 10 % <sup>2)</sup>	R913000127

<sup>1)</sup> Please use a torque power screwdriver with a tolerance of ≤ 10 % for tightening purposes.

<sup>2)</sup> Friction coefficient  $\mu_{\text{total}}$  0.09 - 0.14 according to VDA 235-101

**Table 7: Valve mounting screws for threaded connection**

Valve type	Hexagon socket head cap screws	Quantity	Tightening torque <sup>1)</sup>	Material no.
AF6EA	ISO 4762 - M6 × 65 – 10.9	4	15.5 Nm ± 10 % <sup>2)</sup>	R913000127

<sup>1)</sup> Please use a torque power screwdriver with a tolerance of ≤ 10 % for tightening purposes.

<sup>2)</sup> Friction coefficient  $\mu_{\text{total}}$  0.09 - 0.14 according to VDA 235-101

**Table 8: Valve mounting screws for panel mounting**

Valve type	Hexagon socket head cap screws	Quantity	Tightening torque <sup>1)</sup>	Material no.
AF6EA	ISO 4762 - M6 – 10.9 <sup>2)</sup>	4	15.5 Nm ± 10 % <sup>3)</sup>	Self procurement

<sup>1)</sup> Please use a torque power screwdriver with a tolerance of ≤ 10 % for tightening purposes.

<sup>2)</sup> The length of the valve mounting screw depends on the front plate thickness, the maximum screw-in depth into the valve is 9 mm.

<sup>3)</sup> Friction coefficient  $\mu_{\text{total}}$  0.09 - 0.14 according to VDA 235-101

### Address for ordering accessories and valves

The addresses of our responsible sales companies can be found on the Internet at <http://www.boschrexroth.com> and in section "16.2 Address directory" on page 31.

## 6.6 Assembling the valve



Have sufficiently dimensioned collection containers, enough cleaning cloths and medium-binding materials ready in order to collect or bind leaking medium.

### DANGER!



#### Risk of personal injury and damage to property!

Incorrectly assembled valves can cause substantial material damage and personal injuries. An improperly attached valve may move in an uncontrolled manner and damage other system components and also cause errors in the hydraulic circuit or may lose oil and pollute the environment.

- ▶ Before any work such as assembly or disassembly is carried out at the valve, the hydraulic system must be depressurized.
- ▶ Assembly of the valve requires basic mechanical and hydraulic knowledge. Only qualified personnel (see section "2.3 Qualification of personnel" on page 5) are authorized to assemble the valve.
- ▶ Ensure that the valve is attached securely.

### CAUTION!



#### Wear, tear and malfunctions!

The cleanliness of the hydraulic fluid has a considerable impact on the service life of the hydraulic system. Any pollution/contamination of the hydraulic fluid will result in wear and malfunctions. Particularly foreign bodies like e.g. welding beads or metal cuttings in the hydraulic lines may damage the valve.

- ▶ Always ensure absolute cleanliness.
- ▶ Assemble the valve free from any pollution.
- ▶ Make sure that all connections, hydraulic lines and attachment parts (e.g. measuring devices) are clean.
- ▶ Ensure that also when sealing the connections, no pollutants are able to penetrate.
- ▶ Ensure that no cleaning agents are able to penetrate the hydraulic system.
- ▶ Do not use cotton waste or linting cloths for cleaning.
- ▶ Do not under any circumstances use hemp as a sealant.

## Installing the valve for subplate mounting in the system



The following description applies to the following valve types:  
AF6EP...

### CAUTION!



#### Risk due to the use of an improper valve

Installing an improper valve may result in uncontrolled activities and in personal injuries or damage to other system components.

- ▶ Check based on the type designation on the name plate of the valve whether there is the correct valve type.
- ▶ Check the delivery contents for completeness, particularly the seal rings at the valve connection surfaces.
- ▶ Check the scope of delivery for possible transport damage.
- ▶ Check if the operating instructions are suitable for the valve.
- ▶ Please observe all safety instructions.

1. Before any assembly and disassembly work starts, the surroundings must be cleaned so that no dirt can get into the oil circuit. Only non-linting fabric or special paper may be used for cleaning.
2. Remove existing preservative agent.
3. Check valve mounting face for required surface quality (see Technical data sheet, unit dimensions). Remove the protective plate from the valve and keep it safe for returns in case any repairs become necessary later.
4. Dry the valve connection surface using suitable cleaning materials.
5. Check the seal rings at the valve connection surface for completeness. Other sealants are inadmissible.
6. Check whether at the subplate, the pressure connection line is connected with P and the return line with T.



Confusing P and T can lead to damage at the valve when the system is pressurized.

7. Put the valve on the valve mounting face.
8. Tighten all four mounting screws with a torque power screwdriver and the specified tightening torque, see table 6 on page 14.

This tightening torque refers to the maximum admissible operating pressure.

If the valve is to be used with reduced maximum pressure and installed on valve contact surfaces made of another material, a lower tightening torque has to be used to rule out damage, if necessary.

**WARNING!****Risk of material damage and personal injuries due to improper installation!**

The use of mounting material not approved of by Bosch Rexroth and erroneous installation may result in damage to the valve, adjacent components, as well as personal injuries due to escaping pressurized hydraulic oil.

- ▶ Always fasten the valve with all mounting screws as otherwise, leak-proofness is not guaranteed. See "Technical data sheet".
- ▶ Due to reasons of stability, only use the valve mounting screws mentioned in table 6 on page 14!
- ▶ Check the structure of the hydraulic product using the circuit diagrams, device lists and assembly plans.
- ▶ Clarify possible discrepancies with the responsible persons.



With valve types **AF6EP...X...**, a pressure gauge can be connected as option, see section "13.1 Pressure gauge connection, with valve design ...X..." on page 28.

**Installing the valve for threaded connection in the system**

The following description applies to the following valve types:  
**AF6EA...**

**CAUTION!****Risk due to the use of an improper valve**

Installing an improper valve may result in uncontrolled activities and in personal injuries or damage to other system components.

- ▶ Check based on the type designation on the name plate of the valve whether there is the correct valve type.
- ▶ Check the scope of delivery for completeness, particularly the seal rings at the valve connection bores.
- ▶ Check the scope of delivery for possible transport damage.
- ▶ Check whether the operating instructions for the valve are suitable and complete.
- ▶ Please observe all safety instructions.

1. Before any assembly and disassembly work starts, the surroundings must be cleaned so that no dirt can get into the oil circuit. Only non-linting fabric or special paper may be used for cleaning.
2. Remove existing preservative agent.
3. Check whether at port P, the pressure to be limited and at port T, the discharge line is connected.



Confusing P and T can lead to damage at the valve when the system is pressurized.

## Assembly

**WARNING!****Risk of material damage and personal injuries due to improper installation!**

The use of mounting material not approved of by Bosch Rexroth and erroneous installation may result in damage to the valve, adjacent components, as well as personal injuries due to escaping pressurized hydraulic oil.

- ▶ Always fasten the valve using all mounting screws, see "Technical data sheet".
- ▶ Due to reasons of stability, only use the valve mounting screws mentioned in table 7 on page 14 and/or table 8 on page 15!
- ▶ Check the structure of the hydraulic product using the circuit diagrams, device lists and assembly plans.
- ▶ Clarify possible discrepancies with the responsible persons.

4. Tighten all four mounting screws with a torque power screwdriver and the specified tightening torque depending on the installation, see table 7 on page 14 (threaded connection) or table 8 on page 15 (panel mounting).
5. Tighten connection lines applying the specified tightening torque, see table 9.

**Table 9: Pipe fitting**

Thread	Tightening torque
G1/4	40 Nm



With valve type **AF6EA...X...**, a pressure gauge can be connected as option, see section "13.1 Pressure gauge connection, with valve design ...X..." on page 28.

**Hydraulic connection of the valve**

1. Depressurize the relevant part of the system.

**CAUTION!****Risk of injury when assembling under pressure!**

If you fail to depressurize the product before starting the assembly, you may suffer injury and also damage the unit or system components.

- ▶ Depressurize the corresponding part of the system before installing the valve.

**CAUTION!****Damage to the valve!**

When assembling hydraulic lines and hoses under mechanical stress, they are exposed to additional mechanical forces during operation which reduce the service life of the valve and the overall machine or system.

- ▶ Assemble lines and hoses without mechanical stress.

2. Establish all connections; in this connection, observe the operating instructions of the system.
3. Make sure that pipes and/or hoses are connected to all ports and/or that the ports are sealed with screw plugs.

4. Carry out a special check to make sure that the cap nuts and flanges are correctly tightened at the pipe connections and flanges.



Mark all checked fittings, e.g. with permanent markers.

5. Make sure that all pipes and hose assemblies and every combination of connection pieces, couplings or connection points with hoses or pipes are checked for their operational safety by someone who has the appropriate knowledge and experience.

## 6.7 Installing the touch guard

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**CAUTION!****Risk of burning!**

The valve considerably heats up during operation. The valve gets so hot during operation that you may burn yourself.

- ▶ Install a touch guard.

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As protection against the hot valve surfaces, Bosch Rexroth recommends the installation of a touch guard so that unwanted contact with the hot surfaces can be avoided.

## 7 Commissioning

**CAUTION!****Risk of personal injury and damage to property!**

Commissioning of the valve requires basic hydraulic knowledge.

- ▶ Only qualified personnel (see section "2.3 Qualification of personnel" on page 5) are authorized to commission the valve.

### 7.1 First commissioning; re-commissioning after extended standstill

Proceed as follows to commission the valve:

#### Bleeding the hydraulic system



Observe the operating instructions of the unit or system in which the valve is used.

- ▶ Before the actual operation, switch the valve several times with reduced pressure (50 % operating pressure). This will expel any remaining air from the valve. Mechanical damage due to inadmissibly high acceleration of the fluid and the valve spool is thus avoided and the valve's service life is extended.

#### Performing a leakage test

- ▶ Check whether during operation, hydraulic medium leaks at the valve and at the connections.
- ▶ Check whether there is an internal leakage. This has to be done according to the possibilities offered by the hydraulic system.



There may be an internal leakage due to the specific valve. This has, however, no influence on the valve's functionality.

For information regarding this topic, please contact Bosch Rexroth.

#### Performing a functional test

- ▶ If possible, firstly check hydraulic functions in a controlled form and with low pressure; observe the operating instructions of the hydraulic system into which the valve has been installed.

## 8 Operation



See operating instructions of the hydraulic system into which the valve has been installed.

### 8.1 Checking the operating pressure

The system's operating pressure can be checked if a pressure gauge is connected to the valve at which the operating pressure can be read off.

#### Short-time display

- ▶ Press the pushbutton at constant operating pressure until the deflection of the pressure gauge pointer remains constant.  
In case of operating pressure fluctuations, you should utilize the possibility of the permanent display, see section "Permanent display".

#### Permanent display

- ▶ Press the pushbutton and rotate it by 45° in order to engage it; now, the operating pressure is permanently displayed at the pressure gauge.  
When rotating the pushbutton back by 45°, the function is deactivated.

## 9 Maintenance

### 9.1 Term definition

In accordance with DIN 31051:2003-6, the term maintenance means the combination of all technical and administrative measures and measures taken by the management during the life cycle of an item in order to maintain the functional condition or to return to the same, so that the item is able to meet the required function.

These measures can be classified into:

- **Maintenance** (measures to delay the decrease of the existing wear reserve)
- **Inspection** (measures to determine and assess the actual condition of an item, including the determination of the cause of wear and the derivation of the required consequences for a future use)
- **Repair** (measures to return an item to the functional state, except for improvements)
- **Improvement** (combination of all technical and administrative measures and measures taken by the management to increase the functional safety of an item, without modifying the function required)

## 9.2 Cleaning and care

### CAUTION!



#### Penetrating dirt and liquids will cause faults!

Safe function of the valve is no longer ensured.

- ▶ Always provide for absolute cleanness when working on the valve.
- ▶ Do not use a pressure washer.

### CAUTION!



#### Damage to the surface from solvents and aggressive cleaning agents!

Aggressive detergents may damage the seals and the surface of the valve and let them age faster.

- ▶ Never use solvents or aggressive detergents.
- ▶ Do not use pressure washers for cleaning.

### CAUTION!



#### Damage to the hydraulic system and seals!

A pressure washer's water pressure could damage the hydraulic system and the seals of the valve. The water displaces the oil from the hydraulic system and seals.

- ▶ Do not use pressure washers for cleaning.

- ▶ Cover all openings with appropriate protective caps.
- ▶ Only clean the valve using a damp, lint-free cloth. Only use water and a mild cleaning agent, if necessary, to do so.
- ▶ Flush the hydraulic system if necessary. Replace the fluid filter or the hydraulic medium.

## 9.3 Inspection and maintenance



Dust accumulations on the valve have to be removed at regular intervals.

The following inspection, testing and maintenance works are to be carried out regularly. Also considering the operating conditions, the corresponding intervals are to be chosen so that defects that can reasonably be expected are dealt with in good time. However, the inspection has to be implemented at least every three years counting from the manufacturing date of the valve. The manufacturing date of the valve can be found on the name plate, see section "4.3 Product identification" on page 10.



The inspection must also be carried out if the valve is only stored but not used! Ordering details for seal kits can be found in section "9.5 Spare parts" on page 24.



Have sufficiently dimensioned collection containers, enough cleaning cloths and medium-binding materials ready in order to collect or bind leaking medium.

1. Depressurize the connection line.
2. Remove external coarse dirt.
3. Check all external fittings for completeness.

4. Check all screws and connections for a tight seat.
5. Check the valve for external leakage, replace seals if applicable, see section "Remedying leakage".
6. Check the connection line for damage. If damage is visible, replace the connection line.



Information regarding the identification of the internal leakage is available from Bosch Rexroth.

## 9.4 Repair

Bosch Rexroth offers a wide range of repair services for the valve.

- ▶ Only use genuine spare parts from Bosch Rexroth for repairing the Rexroth product.
- ▶ Tested and pre-assembled original Rexroth assemblies allow for successful repair requiring only little time.

### Safety instructions regarding repairs

For repair works, the valve may only be disassembled to the extent described in the operating instructions.

Defective parts may only be replaced by new, interchangeable, tested components in original equipment quality.

- ▶ Clean the external environment of fittings and devices before the disassembly. Do not use cotton waste for the cleaning.
- ▶ Close all openings using protective caps.

### Remedying leakage

External leakage at the valve connection surface can be remedied on site, see section "Remedying leakage at the valve connection surface".

In case of internal leakage, the valve must be replaced completely.

### Remedying leakage at the valve connection surface

- ▶ Remove the valve, see chapter "11 Removal and replacement" on page 26.
- ▶ Check the seal recesses on the valve connection surface for cleanliness and damage.
- ▶ Dry the valve connection surface and the valve mounting face using suitable cleaning materials.
- ▶ Fit the new seals.
- ▶ Re-install the valve at the valve contract surface, see chapter "6 Assembly" on page 13.

## 9.5 Spare parts

### CAUTION!



#### Damage to property and personal injuries due to faulty spare parts!

Spare parts that do not meet the technical requirements specified by Bosch Rexroth may cause personal injuries and damage to property.

- ▶ Only use genuine spare parts from Bosch Rexroth.

- ▶ Order spare parts in writing. In urgent cases you can also order by phone, but you are kindly requested to confirm your order in writing e.g. by fax.
- ▶ Please send your spare parts order to the Bosch Rexroth service next to you or directly to the headquarters (see section "16.2 Address directory" on page 31).
- ▶ When ordering spare parts, please indicate the following information from the product's name plate:
  - The serial number
- ▶ Please indicate the following details from the parts list:
  - The Material number
- ▶ Additionally indicate:
  - The desired number of spare parts
  - The required type of dispatch (e.g. as parcel, freight, air freight, by courier etc.).

The following spare parts are available for the valve:

- Seals



When selecting the seals, observe the information on the nameplate.

**Table 10: FKM seals (O ring)**

Valve type	Material no.
AF6...	R900004458



Please observe the suitability of the sealing materials for the hydraulic medium used! See "Technical data sheet".

For the addresses of our foreign subsidiaries, please refer to the Internet at <http://www.boschrexroth.com/service> and section "16.2 Address directory" on page 31.

## 10 Decommissioning

The valve is a component that does not require decommissioning. As a result, this chapter of the instructions does not contain any information.

For details about how to disassemble or replace the valve, please refer to chapter "11 Disassembly and replacement" on page 26.

### 10.1 Preparing the components for storage/further use

- ▶ Clean the valve as specified in section "9.2 Cleaning and care" on page 22.
- ▶ Please observe the notes in the "Technical data sheet".

## 11 Disassembly and replacement

### DANGER!



#### Risk of personal injuries and material damage due to pressurized system components.

Works on pressurized system components entail the risk of injuries caused by escaping hydraulic oil.

- ▶ Ensure before the disassembly that the hydraulic system is depressurized.



Have sufficiently dimensioned collection containers, enough cleaning cloths and medium-binding materials ready in order to collect or bind leaking medium.

### Subplate mounting



The following description applies to the following valve types:  
**AF6EP...**

Proceed as follows to disassemble the valve:

1. Depressurize the relevant part of the system.
2. Have a container ready for collecting the escaping hydraulic fluid.
3. If necessary, loosen the pipe fittings to the pressure gauge.
4. Only loosen the valve mounting screws using a suitable tool.
5. Remove the mounting screws and take off the valve from the valve mounting face.
6. Collect the escaping hydraulic fluid in the provided container and dispose of it properly.
7. If the valve is to be returned to the manufacturer for repair, close the valve connection surface using the supplied protective plate or protect it using equivalent packaging in order to avoid pollution and damage.
8. Seal the subplate in order to avoid pollution.

When exchanging the valve, the following steps are analog to the assembly, see chapter "6 Assembly" on page 13.

### Threaded connection



The following description applies to the following valve types:  
**AF6EA...**

1. Depressurize the relevant part of the system.
2. Have a container ready for collecting the escaping hydraulic fluid.
3. Loosen the pipe fittings at the P and T channel and if necessary the pipe fitting to the pressure gauge.
4. Only loosen the valve mounting screws using a suitable tool.
5. Collect the escaping hydraulic fluid in the provided container and dispose of it properly.

6. If the valve is to be returned to the manufacturer for repair, close the threaded connections in order to avoid pollution and damage.

When exchanging the valve, the following steps are analog to the assembly, see chapter "6 Assembly" on page 13.

## 12 Disposal

### 12.1 Environmental protection

Careless disposal of the valve and the hydraulic fluid could lead to pollution of the environment.

- ▶ Thus, dispose of the valve and the hydraulic fluid in accordance with the currently applicable national regulations in your country.
- ▶ Dispose of hydraulic fluid residues according to the respective safety data sheets valid for these hydraulic fluids.
- ▶ Please observe the following supplied notes for the environmentally-friendly disposal of the valve.

### 12.2 Return to Bosch Rexroth AG

The products manufactured by us can be returned to us for disposal purposes at no costs. However, the precondition is that there are no spurious adherences or any other contamination. The hydraulic products have to be discharged before the same are returned. Furthermore, there must be no inappropriate foreign matter or third party components when products are returned.

The products have to be sent free to the door to the following address:

Bosch Rexroth AG  
Service Industriehydraulik [Industrial hydraulics]  
Bürgermeister-Dr.-Nebel-Straße 8  
97816 Lohr am Main  
Germany

### 12.3 Packagings

Upon request, reusable systems can be used for regular deliveries.

The materials for one-way packagings are mostly cardboard, wood, and styro-foam. They can be disposed of without any problems. Due to ecological reasons, one-way packagings should not be used for returning products to us.

## 12.4 Materials used

Our products do not contain any hazardous materials that could be released during intended use. Normally, no adverse effects on human beings and on the environment have to be expected.

The products essentially consist of:

- Cast iron
- Steel
- Plastic materials
- Elastomers

## 12.5 Recycling

Due to the high share of metal, the products can mainly be recycled. In order to achieve an ideal metal recovery, disassembly into individual assemblies is required.

# 13 Extension and conversion

Do not retrofit the valve.

## 13.1 Pressure gauge connection, with valve design ...X...



With valve design ...X..., no pressure gauge is included in the delivery. In the attachment, you must therefore observe the operating instructions of the pressure gauge that you want to install.

1. Remove the plug screw for the pressure gauge at the valve.
2. Screw-in the pressure gauge or connection line into the valve.
3. For the remaining working steps, please refer to the pressure gauge operating instructions.

## 14 Troubleshooting

### 14.1 How to proceed for troubleshooting

- ▶ Always work systematically and focused, even when under time pressure. Random and imprudent disassembly and readjustment of settings can, in the worst-case scenario, result in the inability to determine the original cause of the fault.
- ▶ First get a general idea of how your valve works in conjunction with the overall system.
- ▶ Try to find out whether the valve has worked properly in conjunction with the overall system before the troubles occurred first.
- ▶ Try to determine any changes of the overall system in which the valve is integrated:
  - Were there any changes to the valve's operating conditions or operating range?
  - Were there any changes or repair works on the overall system (machine/system, electrics, control) or on the valve? If so: What were they?
  - Was the valve or machine used as intended?
  - How did the malfunction become apparent?
- ▶ Try to get a clear idea of the cause of the fault. Ask the direct (machine) operator, if necessary.

#### Fault table

The valve is not susceptible to faults as long as the specified operating conditions are complied with, in particular the oil quality.

**Table 11: Fault table**

Fault	Possible cause	Remedy
External leakage	Seal damaged.	Remove the valve and replace it by a new one or send it to Bosch Rexroth for repair.
	<b>With AF6EA...</b> The valve leaks between housing and sub-plate. The seal ring in the housing connection surface is damaged.	Order a new seal kit according to the spare parts list (see "9.5 Spare parts" on page 24) and replace the seal rings. Screw in the valve mounting screws and tighten them applying the specified tightening torque, see section "6.6 Assembling the valve" on page 15.
	<b>With AF6EP...</b> The valve leaks between housing and pipe fitting. The seal ring in the housing connection surface is damaged.	Order a new seal kit according to the spare parts list (see 9.5 Spare parts on page 24) and replace the seal rings. Screw in the pipe fitting and tighten it applying the specified tightening torque, see section "6.6 Assembling the valve" on page 15.
Pushbutton is damaged	Transport damage, improper handling!	Return the valve to Bosch Rexroth for repair.
Name plate is missing or cannot be completely read		Replace the valve.

Following faults due to pollution, it is - in addition to the repair - essential to check the oil quality and improve it, if necessary, by suitable means such as flushing or the additional installation of filters.

If you could not remedy the occurred fault, please contact one of the addresses you find on the internet at <http://www.boschrexroth.com> or in section "16.2 Address directory" on page 31.

## 15 Technical data

For details about the technical data of your valve please refer to the "Technical data sheet".



The assignment of the valves to the technical data sheets is contained in table 2 on page 4.

## 16 Appendix

### 16.1 Project/installation drawings

See "Technical data sheet"



The assignment of the valves to the technical data sheets is contained in table 2 on page 4.

### 16.2 Address directory

Please refer to

<http://www.boschrexroth.com> for addresses of foreign subsidiaries.

#### Contacts for repairs and spare parts

Bosch Rexroth AG

Service Industriehydraulik [Industrial hydraulics]

Bürgermeister-Dr.-Nebel-Straße 8

97816 Lohr am Main

Germany

Phone +49 (93 52) 18-46 66

Fax +49 (93 52) 18-33 63

<http://www.boschrexroth.com/service>

#### Address for ordering accessories and valves

Headquarters:

Bosch Rexroth AG

Hydraulics

Zum Eisengießer 1

97816 Lohr am Main

Germany

Phone +49 (93 52) 18-0

Fax +49 (93 52) 18-40

or the respectively competent sales organizations.

You can find the addresses in the Internet on:

<http://www.boschrexroth.com>

Bosch Rexroth AG  
Industrial Hydraulics  
Zum Eisengießer 1  
97816 Lohr am Main  
Germany

Phone +49 (9352) 18-0  
Fax +49 (9352) 18-40

[documentation@boschrexroth.de](mailto:documentation@boschrexroth.de)  
[www.boschrexroth.de](http://www.boschrexroth.de)