Rexroth
Bosch Group

Directional servo valve with mechanical position feedback

(Area of application according to the Explosion Protection Directive 2014/34/EU: **II 3G**)

Type 4WS2EM 6...XL...

Operating instructions
RE29564-XL-B/09.20

Replaces: 01.18
Document no.: RA87650084_AA
English

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FI: Tämän tuotteen saa ottaa käyttöön vasta kun olet saanut tämän käyttöohjeen ymmärtämälläsi EU-kielellä ja ymmärtänyt sen sisällön. Jos näin ei ole, ota yhteyttä Bosch Rexroth -yhteyshenkilöösi tai vastaavan palvelupisteeseen. Ne löytyvät myös osoitteesta www.boschrexroth.com.

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IT: La messa in servizio di questo prodotto può essere eseguita solo se si dispone del presente manuale d'uso in una lingua ufficiale della UE conosciuta e se ne è stato compreso il contenuto In caso contrario rivolgersi al referente Bosch Rexroth o al punto di assistenza competente. Questi sono anche riportati sul sito www.boschrexroth.com.

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The data specified serves to describe the product. If information on the use of the product is given, it is only to be regarded as application examples and recommendations. Catalog information does not constitute warranted properties. The information given does not release the user from the obligation of own judgment and verification. Our products are subject to a natural process of wear and aging.

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

The original operating instructions were prepared in German.

Contents

1 About this documentation

1.1 Validity of the documentation

This documentation applies to the following products:

- 4WS2EM 6...XL...

In the following sections, these operating instructions refer to the corresponding data sheet. Please check based on the designation on the name plate of the valve which valve type you are dealing with.

This documentation is intended for assemblers, operators, service engineers, system end-users, machine and system manufacturers.
This documentation contains important information on the safe and proper assembly, transport, commissioning, operation, use, maintenance, disassembly and simple troubleshooting of the product.

- ▶ You should 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 working with the product.

1.2 Required and amending documentation

- ▶ The product may 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
🕮	Directional servo valve with mechanical position feedback	29564-XL	Data sheet
🕮	Subplates	45100	Data sheet
🕮	Analog amplifier	29980	Data sheet
🕮	Analog amplifier module	29743	Data sheet
🕮	Service case with test device for servo valves without integrated electronics	29681	Data sheet
	Declaration of conformity 4WS2EM 6...XL...	Document	Refer to the operating instructions 29564-XL

1.3 Representation of information

Uniform safety instructions, symbols, terms and abbreviations are used to ensure quick and safe working with the 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 included in chapter 2.6 "Product-specific safety instructions" and in chapter 3 "General information on damage to property and damage to the product" and whenever a sequence of actions or instructions is explained which bear the danger of personal injury or damage to property. The hazard avoidance measures described must be observed.

Safety instructions are set out 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
⚠ DANGER	Indicates a dangerous situation which will cause death or severe injury if not avoided.
⚠ WARNING	Indicates a dangerous situation which may cause death or severe injury if not avoided.
⚠ CAUTION	Indicates a dangerous situation which may cause minor or moderate (personal) injury if not avoided.
NOTICE	Damage to property: The product or the environment could be damaged.

1.3.2 Symbols

The following symbols indicate notices 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 used and/or operated optimally.
▶	Individual, independent action
1. 2. 3.	Numbered instruction: The numbers indicate that the actions must be carried out one after the other.

1.3.3 Abbreviations

The following abbreviations are used in this documentation:

Table 4: Abbreviations

Abbreviation	Meaning
A, B	Hydraulic connections (actuator)
ANSI	American National Standards Institute
ATEX	EU Directive for Explosion Protection *(Atmosphère explosible)*
EN	European Standard
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
IP	Ingress protection class of electric operating equipment
P	Hydraulic connection (pump)
RE	Rexroth document in English language
T	Hydraulic connection (tank)
X, Y	Hydraulic connections (pilot oil)

2 Safety instructions

2.1 General information on this chapter

The product has been manufactured according to the generally accepted codes 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 product.
- 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 product on to third parties.

2.2 Intended use

The product is a hydraulic component.
You may use the product as follows:
- Directional servo valve with mechanical position feedback for the intended use in an explosive atmosphere.

The product is only intended for professional use and not for private use.
Intended use includes having read and understood this documentation completely, especially chapter 2 "Safety instructions".
The valve is designed and constructed for the control of oil flows. It complies with the requirements of the EU Explosion protection Directive 2014/34/EU.
For information on the device group, category and temperature class according to the Explosion protection Directive 2014/34/EU, please refer to *"Data sheet 29564-XL"* under *"Information on explosion protection"* and to the name plate of the valve.
The valve may only be operated in a technically perfect condition and used as described in these operating instructions. The connection conditions, application conditions and performance data defined in these operating instructions must not be changed.
If you intend to use the valve with other connection, application or performance data than defined by Bosch Rexroth AG in these operating instructions, please contact Bosch Rexroth AG beforehand. The valve must not be used with other connection, application and performance data than defined in these operating instructions without the written approval by Bosch Rexroth AG.

2.3 Improper use

Any use deviating from the intended use is improper and thus not admissible.
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 injury 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, e.g. in explosion-protected areas or in safety-related parts of control systems (functional safety).
Improper use of the product includes:
- Faulty assembly
- Incorrect transport
- Lack of cleanliness during storage and assembly
- Incorrect installation
- Use of inappropriate/non-admissible hydraulic fluids
- Non-compliance with the specified performance limits

Changes and/or modifications to the valve are not admissible, refer to chapter 13 "Extension and modification".
Bosch Rexroth AG does not assume any liability for damage caused by improper use. The user assumes all risks involved with improper use.

2.4 Qualification of personnel

The activities described in this documentation require basic knowledge of mechanics, electrics, hydraulics, pneumatics 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 a 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 are able to 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 expert knowledge.

For example, for hydraulic products, the term expert knowledge refers to the following:

- 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.

Qualification of personnel for the installation and commissioning of valves in potentially explosive atmospheres

Personnel shall be qualified as follows to the extent necessary to fulfill their tasks:

- Understanding of the general principles of explosion protection, protection classes and device labeling
- Understanding of the corresponding aspects affecting the protection concept
- General understanding of the testing, maintenance and repair requirements of EN 60079-17
- Understanding of the contents of certificates and relevant parts of this standard
- Familiarity with the specific methods to be used for selection and construction of devices referenced in this standard
- Understanding of the additional importance of work permit systems and safe electrical separation regarding explosion protection.

Bosch Rexroth offers measures supporting training in specific fields. Please find an overview of the training contents on the Internet at:
`http://www.boschrexroth.de/didactic`

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 notices on the product.
- Persons assembling, operating, disassembling or maintaining Rexroth products must not be under the influence of alcohol, other drugs or medication influencing the ability to react.
- Only use original Rexroth accessories and spare parts in order to exclude any hazard to persons due to unsuitable spare parts.
- Comply with the technical data and environmental conditions specified in the product documentation.
- 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 injury 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, e.g. in explosion protection zones 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 or system) in which the Rexroth product is installed complies with the country-specific provisions, safety regulations and standards of the application.

2.6 Product-specific safety instructions

The following safety instructions apply to chapters 6 to 14.

⚠ WARNING

Explosion hazard due to explosive atmosphere during assembly!
During the assembly, an explosive atmosphere must be avoided. During work at the valve, this condition could trigger an ignition, which may lead to an explosion.
- Before working with the valve, ensure that no explosive atmosphere can occur during the work.

Easily inflammable hydraulic fluid!
In connection with an explosive atmosphere or other hot heat sources, leaking hydraulic fluid mist due to defective or incompletely assembled valves and their connections may lead to explosions.
- Only use the valve in the intended explosion protection area.
- The ignition temperature of the hydraulic fluid used must be at least 150 °C.

Explosion hazard due to the exceedance of the maximum temperatures!
If the valve is used outside the approved temperature ranges, the explosion protection no longer applies!
- Only use the valve within the intended environmental and hydraulic fluid temperature range.

Pressurized system parts and leaking hydraulic fluid!
When working on hydraulic systems with stored pressure energy (accumulators or cylinders working under gravity), the valve may even be pressurized after the pressure supply has been switched off. During assembly and disassembly work, the valve or parts may be ejected and cause personal injury and/or damage to property. There is moreover the danger of severe injury caused by a powerful leaking hydraulic fluid jet.
- Before working at the valve, ensure that the hydraulic system is depressurized and the electrical control is de-energized.
- Completely unload the pressure at machines and systems before working at the valve.

Non-compliance with functional safety!
The valve controls movements in machines or systems. In case of mechanical and electric faults, e.g. failure of the energy supply, persons may be caught by the system, kicked away or bruised.
- During set-up of your circuit, observe functional safety e.g. according to EN ISO 13849.

⚠ WARNING

Penetrating water and humidity!
In case of use in humid or wet environments, water or humidity may penetrate at electrical connections or the valve electronics. This may cause malfunctions at the valve and unexpected movements in the hydraulic system, which may result in personal injury and damage to property.

- Only use the valve within the intended IP protection class or lower.
- Ensure before the assembly that all seals are fitted and the electrical connections are intact.

⚠ CAUTION

Hot surface!
Risk of burning!

- Provide for a suitable touch guard.
- During operation, only touch the valve using heat-protective gloves. Allow the valve to cool down to room temperature before touching it directly with your hands during maintenance work.

Contaminated hydraulic fluid!
Contamination in the hydraulic fluid may cause functional failures e.g. jamming or blocking of nozzles of the valve. In the worst case, this may result in unexpected system movements and thus constitute a risk of injury for persons.

- Ensure an adequate hydraulic fluid cleanliness according to the cleanliness classes of the valve over the entire operating range.

Leakage in case of incorrect working temperatures!
The use of the valve outside the approved temperature ranges may lead to permanent leakage at the valves. Thus, hydraulic fluid in the form of a leaking hydraulic fluid jet may injure persons, lead to damage to property and endanger the environment.

- Only use the valve within the intended environmental and hydraulic fluid temperature range.
- In case of leakage, immediately exchange damaged seal rings or the valve.

Corrosion!
The valve described has surface protection (see *"Data sheet 29564-XL"*). If the valve is used in a damp environment, the valve and the valve mounting screws may corrode. This reduces the stability of the valve mounting screws so that the valve may become loose and constitute a risk of injury.

- Exchange valves with corrosion damage at an early stage.
- Regularly check the surface protection on the valve and the valve mounting screws.

Contact with salt water leads to increased corrosion on the valve. This may chemically corrode and damage individual valve mounting and plug screws. Therefore, take suitable corrosion protection measures.

2.7 Personal protective equipment

The machine end-user must provide the personal protective equipment (such as gloves, working shoes, safety goggles, working clothes, etc...).

2.8 Obligations of the machine end-user

The machine end-user is obliged to check in the order confirmation whether the supplied valve complies with the required category and the corresponding zone.
The machine end-user of the Bosch Rexroth valve is responsible that

- the valve is only being used according to the intended use as defined in these operating instructions.
- the valve is only stored, operated and maintained according to the technical data, operating and environmental conditions indicated in *"Data sheet 29564-XL"*, in particular that the limit values indicated in *"Data sheet 29564-XL"* are not exceeded.
- the applicable provisions, rules and directives on explosion protection are complied with.
- the operating personnel are instructed at regular intervals.
- a danger zone is marked, if required.
- the safety measures for their specific area of application of the valve are complied with.

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

The warranty only applies to the delivered configuration.

- The claim to warranty expires if the product is assembled, commissioned and operated incorrectly, not used as intended and/or handled improperly.
- The following safety instructions apply to chapters 6 to 14.

NOTICE

Inadmissible mechanical load!

Impact or shock forces on the valve may damage or even destroy it.

- Never use the valve as handle or step. Do not place/put any objects on top of it.

Dirt and foreign particles in the valve!

Penetrating dirt and foreign particles in the valve lead to wear and malfunctions. The safe function of the valve is therefore no longer ensured.

- During installation, ensure utmost cleanliness in order to prevent foreign particles, such as welding beads or metal chips, from getting into the hydraulic lines.
- Do not use linting cleaning fabric for cleaning.
- Ensure that no cleaning agents are able to penetrate the hydraulic system.

Environmentally harmful hydraulic fluid!

Leaking hydraulic fluid leads to environmental pollution.

- Immediately remedy possible leakage.
- Dispose of the hydraulic fluid in accordance with the currently applicable national regulations in your country.

4 Scope of delivery

The scope of delivery includes:
- Directional servo valve with mechanical position feedback, type 4WS2EM 6...XL...
- Operating instructions including declaration of conformity and data sheet

- ▶ Check the scope of delivery for completeness.
- ▶ Check the scope of delivery for possible transport damage, see chapter 6 "Transport and storage".

In case of complaints, please contact Bosch Rexroth AG, see chapter 16.1 "List of addresses".

Accessories such as valve subplates are not included in the scope of delivery and must be ordered separately. See chapter 7.6 "Required accessories".

5 Product information

For information on the performance and product description please refer to *"Data sheet 29564-XL"* of your valve.

5.1 Product identification

5.1.1 Information on the name plate

The meaning of the information on the name plate can be read in the correspondingly numbered fields of the following table.

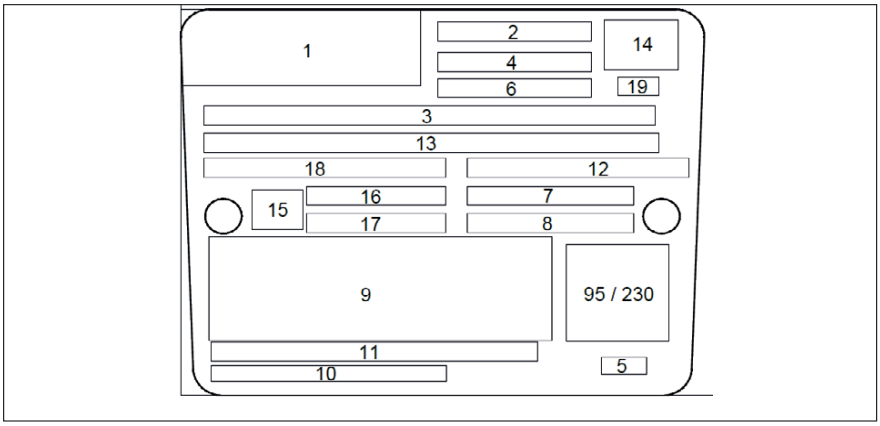

Fig. 1: Name plate of the valve

Table 5: Information on the name plate

No.	Type of information	Information or example
1	Manufacturer's logo	**Rexroth**
2	Material no. of the valve	e.g. MNR: **R901234567**
3	Type designation complete valve	**4WS2EM6-2X/...**
4	Serial number of the valve	e.g. **SN: 0002111**
5	Manufacturer's factory number	e.g. **7087**
6	Date of manufacture (year and week)	e.g. **FD: 03W01**
7	Maximum operating pressure	e. g. **pmax 315 bar**
8	Ambient temperature range	**-30 °C ≤ Ta ≤ +80 °C**
9	Hydraulic symbol according to ISO 1219	**Graphic**
10	Designation of origin	**Made in Germany**
11	Name and address of the manufacturer	**Bosch Rexroth AG D-97816 LOHR**
12	Customer's or production order number	e.g. **123456789012345678**
13	Customer material number or additional information	e.g. **CNR: 1234567890**
14	CE mark	**CE**
15	Explosion protection mark	**Ex**
16	Mark for the protection class according to EU Explosion Protection Directive 2014/34/EU	**II 3G**
17	Mark for the protection type according to EN IEC 60079-0 / EN 60079-11 and IEC 60079-0 / IEC 60079-11	**Ex ic IIC T4 Gc**
18	IECEx Certificate of Conformity	**IECEx BVS 18.0045X**
19	---	**---**
230	Rexroth QR code	**QR code**

5.1.2 Explosion protection marking

Zones, device groups and categories

The user/machine end-user has to classify potentially explosive atmospheres according to EU directive 1999/92/EC into zones. The table below lists zones with device groups and categories.
The valve may only be used in the areas and zones which correspond to the device group and category. During use, also observe the other information on explosion protection in *"Data sheet 29564-XL"*.

Table 6: Device groups and categories

Device group according to 2014/34/EU	Category according to 2014/34/EU	Area of application, properties (excerpt from the directives)	Usable in zone according to 1999/92/EC
I	M1	Firedamp areas (= device group I), i.e. underground parts of mines and their overground systems. In case of an explosive atmosphere, further operation is possible. Very high safety level.	-
I	M2	Firedamp areas (= device group I), i.e. underground parts of mines and their overground systems. In case of an explosive atmosphere, it must be possible to deactivate the device. High safety level.	-
II	1G	Potentially explosive atmospheres in which explosive gases, mists or vapors (= device group II) occur permanently or for a long time or frequently. Corresponds to zone 0 according to Directive 1999/92/EC. Very high safety level.	0, 1, 2
II	2G	Potentially explosive atmospheres in which explosive gases, mists or vapors (= device group II) are occasionally present. Corresponds to zone 1 according to Directive 1999/92/EC. High safety level.	1, 2
II	3G	Potentially explosive atmospheres in which explosive gases, mists or vapors (= device group II) do not normally occur or only rarely or for a short time. Corresponds to zone 2 according to Directive 1999/92/EC. Normal safety level.	2
II	1D	Potentially explosive atmospheres in which explosive dust/air mixtures (= device group II) are continually, long-term or often present. Corresponds to zone 20 according to Directive 1999/92/EC. Very high safety level.	20, 21, 22
II	2D	Potentially explosive atmospheres in which explosive dust/air mixtures (= device group II) are occasionally present. Corresponds to zone 21 according to Directive 1999/92/EC. High safety level.	21, 22
II	3D	Potentially explosive atmospheres in which an explosive atmosphere due to stirred dust (= device group II) is normally not present or occurs only rarely or only for a short period of time. Corresponds to zone 22 according to Directive 1999/92/EC. Normal safety level.	22

Classification of gases, mists and vapors into explosion groups

The classification (see table 7) is based on the maximum gap width determined in experiments or on the minimum ignition current ratio for the explosive atmosphere in which a device may be installed (see ISO/IEC 80079-20-1). The explosion group IIA includes less hazardous substances, explosion group IIC includes the most hazardous substances. Products for a certain explosion group may always be used in areas with a lower hazardousness.

Table 7: Examples for the classification of gasses, mists and steams into explosion groups

Explosion group	Examples for gases, mists and vapors	Dangerousness
IIA	Acetone, ammonia, gasoline, benzene, carbon dioxide, ethanol, methane, hydrogen sulfide, propane	medium
IIB	Ethylene, city gas, acetaldehyde	high
IIC	Hydrogen, carbon disulfide, acetylene	very high

Temperature classes for device group II

Please note that in areas which are potentially explosive due to explosive gases, mists or vapors (zone 0, 1, 2 for which device group II, categories 1G, 2G and 3G are intended), the maximum surface temperature of the valve must in addition be below the ignition temperature of the surrounding explosive gas, mist or vapor.
Based on their maximum surface temperature, these hydraulic products are classified according to EN ISO 80079-36 and EN IEC 60079-0 into temperature classes T1 to T6. With hydraulic products in device group II and in categories 1G, 2G and 3G, the temperature class is part of the explosion protection mark, see *"Data sheet 29564-XL"*. It provides information on the suitability of the hydraulic product for the use in a particular potentially explosive atmosphere due to explosive gasses, mists or vapors.

Table 8: Temperature classes for device group II

Temperature class	Maximum permissible surface temperature
T1	450 °C
T2	300 °C
T3	200 °C
T4	135 °C
T5	100 °C
T6	85 °C

Type of protection

The type of protection describes the kind of measures taken to prevent the ignition of a surrounding explosive atmosphere.

Table 9: Types of protection

Type of protection	Meaning	Relevant for non-electrical devices	Electrical operating equipment
b	Ignition source monitoring	X	-
c	Structural safety	X	-
d	Flameproof enclosure	X	X
e	Increased safety	-	X
fr	Flow restricting enclosure	X	-
g	Intrinsic safety	-	X
k	Liquid immersion	X	-
o	Oil immersion	-	X
p	Pressurized enclosure	X	X
q	Powder filling	-	X
m	Encapsulation	-	X
i	Intrinsic safety	-	X

6 Transport and storage

6.1 Valve transport

⚠ CAUTION

Danger of damage to property and personal injury!
With improper transport, the valve can fall and lead to damage and/or injury since the parts are e.g. sharp-edged, oily, instable, loose or bulky.
- Use the original packaging for transport.
- Use personal protective equipment (such as gloves, working shoes, safety goggles, working clothes, etc.).
- Comply with the national laws and regulations regarding occupational health and safety and transport.
- Do not transport the valve using components with little stability, e.g. cables.

Sharp edges!
Danger of cut injury!
- Wear suitable protective equipment for the transport of the safety valve.

Further information regarding the transport is available from Bosch Rexroth, see chapter 16.1 "List of addresses".

Report any transport damage to your responsible sales contact person within one week. The addresses of the sales subsidiaries can be found on the Internet on:
`http:/www.boschrexroth.com/adressen`

6.2 Storing the hydraulic valve

Hydraulic valves are delivered in an unobjectionable state.

For the transportation and storage of the product, always observe the environmental conditions specified in *"Data sheet 29564-XL"*. Improper storage may damage the valve.

Hydraulic valves can be stored for up to 12 months under the following conditions:
- Ensure a storage temperature range of +5...+40 °C.
- The relative air humidity must not exceed 65%.
- The storage rooms must provide 100% UV protection.
- No ozone formation may occur near the storage facility.
- Do not store the valve outdoors but in a well-ventilated room.
- The storage facilities must be free from etching substances and gases.
- Protect the valve against humidity, particularly ground humidity. Store the valve on a shelf or on a pallet.
- Store the valve protected against impacts and sliding and do not stack it.

- Store the valve in the original packaging or similar packaging in order to protect it from dust and dirt.
- All connections on the hydraulic valve must be closed with closing elements.
- After opening the transport packaging, it must be closed properly again for storage. Use the original packaging for storage.

Procedure after expiry of the maximum storage time of 12 months

1. Check the complete valve for damage and corrosion prior to installation.
2. In a test run, check the valve for correct function and leak-tightness.

After expiry of the maximum storage time, we recommend having the valve checked by your competent Rexroth service. In case of questions regarding spare parts, please contact the Rexroth service responsible for your valve, see chapter 10.7 "Spare parts".

Following disassembly

If a dismounted valve is to be stored, it has to be preserved for protection against corrosion for the duration of storage.
Rexroth recommends the following procedure:

1. Clean the valve, see chapter 10.1 "Cleaning and care".
2. Close all connections so that they are airtight.
3. Moisten the unpainted external metal surfaces of the valve using an appropriate corrosion protection agent.
4. Pack the valve with a desiccant air-tightly in corrosion protection film.
5. Store the valve protected against impacts.

- In each case, please observe any applicable provisions and laws regarding the handling of substances hazardous to water or to health.

7 Installation

⚠ CAUTION

High pressure!
Risk of injury due to parts shooting out during works at hydraulic accumulators which have not been unloaded.
- Only work on the valve after the system has been depressurized.
- Unload accumulators which may have been mounted at the system.
- Check the system with test pressure according to ISO 4413.
- Assembly and commissioning may only be carried out by specialists.

7.1 Unpacking

⚠ CAUTION

Falling parts!
Risk of injury! If the packaging is opened improperly, parts may fall out and cause injury or damage to the parts.
- Put the packaging on level, bearing ground.
- Only open the packaging from the top.

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

7.2 Changes to the surface protection of the valve

⚠ WARNING

Explosion hazard due to modifications to the valve!
Any change in the surface protection of the valve may lead to a loss of the explosion protection!
- The valve must not be painted or otherwise coated with non-conductive substances.

7.3 Installation conditions

- For the installation of the product, always observe the environmental conditions specified in the *"Data sheet 29564-XL"*.
- It is imperative to ensure absolute cleanliness. The valve must be protected from dirt during installation. Contamination of the hydraulic fluid may considerably reduce the life cycle of the valve.
- Observe the installation position specified in the *"Data sheet 29564-XL"*.

7.4 Prior to assembly

⚠ WARNING

Explosion hazard due to wrong area of application!
A valve which is not approved for the area of application may cause an explosion!
- Check whether the explosion protection marks on the name plate of the valve comply with the information in these operating instructions.
- Please check if you have the right valve type by means of the type designation on the name plate of the valve.
- Check whether the zone assignment and the temperature class correspond to the area of application of the valve.

- Check the scope of delivery for completeness and possible transport damage.
- Also observe the safety instructions in chapter 2.6 "Product-specific safety instructions".

7.5 Required tools

You only require standard tools to assemble the valve.

7.6 Required accessories

The following accessories are recommended for the connection of the valve.
These accessories can be ordered separately from Bosch Rexroth:

Subplates

Subplates with dimensions for valves with porting pattern according to ISO 4401 are listed in the *"Data sheet 45100"*.

Flushing plate

Table 10: Flushing plate

	Material number
HSA 06 A012-4X/V00-J3	**R901541300**

Test device

⚠ WARNING

Explosion hazard!
The test device is **not** approved according to the EU Explosion Protection Directive 2014/34/EU. The use of the test device in an explosive atmosphere may cause an explosion!
- Only use the test device if the occurrence of an explosive atmosphere during the test can be excluded with certainty.

Table 11: Test device

	Documentation to be carried
Test device VT-SVTSY, battery-operated, can optionally be operated with power supply unit	Data sheet 29681

Servo amplifier (external)

⚠ WARNING

Explosion hazard!
The servo amplifier is **not** approved according to the EU Explosion Protection Directive 2014/34/EU. The use of the servo amplifier in an explosive atmosphere may cause an explosion!
- Only use the servo amplifier outside the explosive environment.

Table 12: Servo amplifier in modular design

	Type	Documentation to be carried
Servo amplifier in modular design	VT11021	Data sheet 29743

Mating connector

Table 13: Mating connector

	Material number
Mating connector	**R901043330**

Ordering address for accessories and valves

The addresses of our responsible sales organizations can be found online under `www.boschrexroth.com`
and in appendix 16.1 "List of addresses".

7.7 Assembling the valve

7.7.1 Flushing the system

⚠ WARNING

Faulty mounting!
Fastening the flushing plate using mounting screws of reduced stability may cause the flushing plate to become loose. Consequently, hydraulic fluid may leak and lead to personal injury and/or damage to property.
- Completely assemble the flushing plate according to the assembly specifications using suitable assembly aids.
- Observe the tightening torques, screw stabilities and the minimum length of the mounting screws.
- Always fasten the flushing plate with all 4 mounting screws.
- Only assemble the flushing plate using the mounting screws intended for that purpose and included in the scope of delivery.

Before installing the valve into a device or system, the system must be flushed. Only then is the unobjectionable functioning of the valve guaranteed. With an external pilot oil supply make sure that it is flushed, as well. Also observe the operating instructions of the device and/or system into which the valve is installed.

For flushing the system into which the valve is to be installed, flushing plates with FKM seals and porting pattern according to ISO 4401-03-02-0-05 are available.
For a dimensional drawing of the flushing plate, refer to the *"Data sheet 29564-XL"*.
Within the flushing plate, ports P and T are connected with each other.

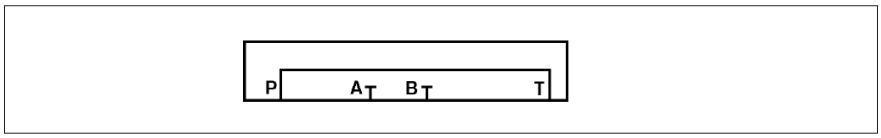

Fig. 2: Flushing plate, representation of the inner connections

Install this flushing plate into the system instead of the valve and subsequently flush it.

When using the subplates mentioned under chapter 7.6 "Required accessories" or in case of assembly on comparable cast iron installation surfaces, tighten all four mounting screws with a tightening torque of 7 Nm ± 0.7 Nm (with a friction coefficient of µtotal = 0.09...0.14). This tightening torque refers to the maximum admissible operating pressure.

The use of a directional valve with port in accordance with ISO 4401-03-02-0-05 is suited better than a flushing plate.
This valve can also be used for flushing the actuator ports.
The following is a guideline for the necessary flushing time t in hours:

$$t \geq \frac{V}{q_v} - 5$$

V Tank capacity in liters
q_v Pump flow in liters / minute

The degree of contamination of the hydraulic fluid that can be monitored by a continuous measurement using a particle counter is decisive for the flushing time. Install a pressure differential-resistant pressure filter without bypass, if possible with integrated clogging indicator, directly in front of the valve. During the flushing procedure, check all filters in short intervals and exchange the contaminated filter elements, if necessary.

7.7.2 Installing the valve in the system

⚠ WARNING

Faulty installation of plug screws and lines!
Improperly fastened plug screws and lines may become loose during subsequent operation, be ejected due to the pressure and thus cause serious injury!

- Only pressurize your system after all plug screws and lines have been completely and properly mounted according to the specifications.

Faulty mounting!
Mounting of the valve with valve mounting screws of reduced stability, insufficient mounting or fastening at blocks and plates with insufficient stability may lead to the valve becoming loose and falling down. Consequently, hydraulic fluid may leak and lead to personal injury and/or damage to property. Particular caution applies to valves with suspended installation.

- Completely assemble the valve according to the assembly specifications by means of suitable assembly aids.
- Only assemble the valve at blocks or plates suitable for the weight of the valve.
- Observe the tightening torques, screw stability and the minimum length of the valve mounting screws.

⚠ CAUTION

Insufficient installation space!
Insufficient installation space may lead to jamming or abrasions in case of work at the valve.

- Provide for sufficient installation space.
- Ensure that there is enough space so that the valve itself does not have to be disassembled to remove the mating connector from the valve, if required.

Leaking hydraulic fluid!
Hydraulic fluid may leak during the assembly and disassembly of the valve. Consequently, persons may slip or fall.

- After the disassembly, provide the bores containing the hydraulic fluid with suitable closing elements.
- Immediately remove any hydraulic fluid that has leaked out.

NOTICE

Wear, tear and malfunctions!
The cleanliness of the hydraulic fluid has a considerable impact on the cleanliness and life cycle of the valve. Any contamination of the hydraulic fluid will result in wear and malfunctions. Particularly foreign particles may damage the valve.

- Always ensure absolute cleanliness.
- Install the valve in a clean condition.
- Make sure that all connections, hydraulic lines and attachment parts are clean.
- Ensure that no cleaning agents are able to penetrate the hydraulic system.
- Do not use hemp as a sealant under any circumstances.

If the valve is directly attached to a moveable actuator, the installation of the valve control spool in parallel to the direction of acceleration of the actuator has to be avoided.

1. Before any assembly and disassembly work starts, the surroundings must be cleaned so that no dirt can get into the oil circuit.
2. Check the valve contact surface for the required surface quality (see *"Data sheet 29564-XL"*). Remove the protective plate from the valve and keep it safe for returns in case any repairs become necessary later.
3. Dry the valve connection surface using suitable cleaning materials.
4. Check the seal rings at the valve connection surface for completeness. Other sealants are not admissible.
5. Remove existing preservative agent.
6. Check whether at the subplate, the pressure connecting line is connected to P, and the return line to T.

Swapping P and T may cause damage at the valve when pressurized.

7. Place the valve on the contact surface.

For reasons of stability, exclusively use the valve mounting screws specified in chapter 7.6 "Required accessories"!
Always fasten the valve with all 4 valve mounting screws, otherwise leak-tightness is not guaranteed.

8. When using the subplates mentioned under 7.6 "Required accessories" or in case of an assembly on comparable cast iron installation surfaces, tighten all four mounting screws with a tightening torque of 7 Nm ± 0.7 Nm (with a friction coefficient of µtotal = 0.09...0.14). This tightening torque refers to the maximum admissible operating pressure.

If the valve is to be used at a reduced maximum pressure and in this connection is to be mounted on connection surfaces of a different material, it might be necessary to use a lower tightening torque in order to exclude any damage to the subplate.

7.7.3 Hydraulic connection of the valve

CAUTION

Damage to the valve
If you install hydraulic lines and hoses under pressure, they are exposed to additional mechanical forces during operation, which reduce the life cycle of the valve and the complete machine or system.
- ▶ Assemble lines and hoses without stress.

1. Depressurize the relevant system part.
2. Establish all connections observing 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 closed with plug screws.
4. Carry out a special check to make sure that the cap nuts and flanges are correctly tightened at the pipe fittings and flanges.

   Mark all checked fittings, e.g. using a permanent marker.

5. Make sure that all pipes and hose lines and every combination of connection pieces, couplings or connection points with hoses or pipes are checked for their operational safety by a person with appropriate knowledge and experience.

7.7.4 Connecting the power supply

⚠ WARNING

Faulty electrical assembly!
Danger to life, risk of injury caused by electric shock due to incorrect connection and faulty pin assignment.
- The valve may only be connected by or under the supervision of a specialized electrician.
- De-energize the system before the assembly and any installation work. Secure the electrical equipment against restarting.
- The connection may only be established to an intrinsically safe electric circuit. For the admissible maximum values and information on electric connection, see *"Data sheet 29564-XL"*.

Explosion hazard due to lack of equipotential bonding!
Electrostatic processes, an incorrect grounding concept or a lack of equipotential bonding may lead to an explosion. Apart from this, malfunctions or uncontrolled movements at the machine may be caused!
- Provide for correct grounding and proper equipotential bonding.
- The subplate on which the valve is fitted must be electrically conductive and included in the equipotential bonding according to EN 60079-14 and IEC 60364-4-41.

⚠ CAUTION

Danger of damage to property and personal injury!
Faulty energy supply may lead to uncontrolled valve movements. These could result in possible malfunctions or failure of the valve and cause injury.
- Always observe country-specific regulations.

Faulty electrical assembly!
Device might be destroyed.
- Disconnect the device from the mains or from the voltage source or de-energize it prior to installation work.

- Check the correct assignment of the connection cable braided wires at the external control electronics.
- Ensure that there are no bends in the connection line and braided wires to avoid short-circuits and interruptions.
- For the electrical supply, the mating connector specified in *"Data sheet 29564-XL"* can be used. Mating connectors are available as accessories, see chapter 7.6 "Required accessories".

ℹ When selecting the mating connector, observe the safety instructions in this chapter.

- The temperature rating of the lines used must be at least 20 K higher than the ambient and fluid temperature.

When connecting the mating connector (see mounting instructions below), also observe the package leaflet of the mating connector.

Assembly steps to connect the mating connector

1. Strip the cable and the braided wires of the control line.

For the corresponding dimensions, refer to the package leaflet of the mating connector.

2. Crimp the contacts using the tools listed in the package leaflet.

The braided wires can also be soldered into the crimp sleeve.

3. Install the contacts using the specified tools.
   - Insert the wired contacts into the installation tool up to the contact shoulder.

Observe the specified pin assignment, see *"Data sheet 29564-XL"*.

   - To make inserting the contacts into the insulating body easier, dip them in isopropyl alcohol.
   - Insert the contacts in the back of the plug and push them forward with constant pressure until you feel them engage in the insulating body.

4. When all contacts are installed, visually inspect the plug-in connector on the contact side. The contacts have to be at the same height in the insulating body.
5. Completely assemble the mating connector according to the assembly instructions. The torques depend on the line.
6. When routing the control line, make sure it is strain-relieved.
7. Fit the mating connector on the connector and screw it on tightly with the bayonet lock. The connection between mating connector and connector may only be established and interrupted in a de-energized condition.

8 Commissioning

⚠ WARNING

Faulty installation!
If the valve is not correctly mounted, persons might be injured or the product or system could be damaged when commissioning the valve.
- Only commission your system when all hydraulic connections and the valve have been completely and properly mounted according to the specifications.
- Look out for defective sealing points and exchange defective seal rings immediately.
- Wear personal protective equipment during the initial commissioning.

Inadmissibly high operating pressure!
In hydraulic applications with different area ratios, the hydraulic pressure is fortified and may - in case of incorrect design - lead to an exceedance of the maximum admissible operating pressure. Thus, the valve may burst or the closing elements may be ejected and cause personal injury.
- Before commissioning the hydraulic system, ensure that the maximum admissible pressure of the hydraulic valve in the system is not exceeded by any means.
- Ensure that, in your system, the maximum admissible operating pressure is secured by means of a pressure limitation element.

Damage to persons and property!
The commissioning of the valve requires basic hydraulic and electrical knowledge.
- Only qualified personnel (see section 2.4 "Qualification of personnel") is authorized to commission the valve.

Proceed as described in the following sections to commission the valve:

Checking electrical connections
- Have the electrical connections checked for proper condition by or under the guidance and supervision of a specialized electrician before the initial commissioning or any re-commissioning.

Performing a functional test
- If possible, only check the hydraulic functions in a controlled way and at low pressure.

For the control and functional test, special test devices are available. Refer to chapter 7.6 "Required accessories".

Performing a leak test
- Ensure that no hydraulic fluid leaks on the valve or on the connections during operation.

9 Operation

9.1 General information

⚠ WARNING

Explosion hazard caused by dust accumulations!
If the maximum dust layer thickness of > 50 mm is exceeded, there is an explosion hazard!
- Make sure that the maximum dust layer thickness is not exceeded.
- Regularly remove dust accumulations, if required.

⚠ CAUTION

Loud noise!
An unfavorable arrangement of valves results in resonance or fluid noises, such as whistling. In continuous operation, these noises may cause hearing damage in persons or damage to the valves.
- In this case, contact a service engineer.

Only use the valve within the performance range provided in *"Data sheet 29564-XL"*.
The machine and/or system manufacturer is responsible for the correct project planning of the hydraulic system and its control.
Changing the settings at the valve is not admissible.

For information on the operation, please refer to the operating instructions for the hydraulic system into which the valve is installed.

If errors occur, refer to chapter 14 "Troubleshooting".

10 Maintenance and repair

10.1 Cleaning and care

NOTICE

Penetrating dirt and fluids will cause faults!
When dirt and fluids penetrate, a safe function is no longer ensured.
- Always ensure absolute cleanliness when working at the valve.

Solvents and aggressive cleaning agents!
Aggressive cleaning agents may damage the seals and the surface of the valve and let them age faster.
- Never use solvents or aggressive cleaning agents.

Damage to property!
If a high-pressure washer is used, humidity may enter the control motor underneath the valve cap and damage the valve.
- Do not use high-pressure washers for cleaning.

For cleaning and care of the valve, please observe the following:
- Close all openings with appropriate protective caps/devices.
- Ensure that all seals and electrical connections are firmly attached so that no humidity can penetrate the valve during cleaning.
- Remove external coarse dirt and keep sensitive and important parts clean.
- Remove dust and dirt accumulations on the valve at regular intervals. Comply with the max. admissible dust layer thickness of 50 mm.

10.2 Inspection and maintenance

⚠ WARNING

Uncontrolled machine movements!
Risk of injury due to maintenance work at an activated machine.
- Unless expressly prescribed otherwise, deactivate the machine via the main switch, lock it and remove the key before carrying out any work.

The following inspection, testing and maintenance work is to be carried out regularly. The intervals for the same have to be selected in a way - also dependent on the operating conditions - that ensures that any deficiencies which have to be anticipated are identified timely. The check must, however, at least be carried out every **three years from the date of manufacture of the valve.** The date of manufacture of the valve can be found on the name plate, see chapter 5.1.1 "Information on the name plate".

The check is also to be carried out if the valve is only stored, however not used! For order details for seal kits, please refer to chapter 10.7 "Spare parts".

In order to ensure a long life cycle and functionality, include the following activities in your maintenance schedule for the overall system:

1. De-energize the connection line.
2. Remove coarse dirt from the exterior.
3. Check all external fittings for completeness and tight seat.
4. Check the mating connector, connector and connection line for damage and tight seat.
5. Check the valve for external leakage and replace the sealing devices, if required, see chapter 10.6 "Rectifying external leakages".

10.3 Maintenance schedule

Valves are low-maintenance provided that they are used as intended.
To ensure that the valve functions reliably for a long time, Bosch Rexroth recommends checking the hydraulic system and the valve regularly.

10.3.1 Checking for leakages

Check the valve for external leakages. An early detection of hydraulic fluid loss may help you identify and remedy errors. Bosch Rexroth therefore recommends always keeping the valve and/or the system clean.

10.3.2 Checking for noise development

Check the valve for noise development. Based on the noise development or the increase in noise development, a possible failure of one or several components can be recognized in time, and consequential damage can be avoided.

10.3.3 Checking the mounting elements

Check that the mounting elements are attached firmly. All mounting elements are to be checked when the system is switched off, depressurized and has cooled down.

10.4 Repair

⚠ WARNING

Explosion hazard due to improper repair!
Improper repair will void the explosion protection!

- For repair, the valve may only be disassembled to the extent described in these operating instructions.
- Defective parts may only be replaced by new, interchangeable, tested components in original equipment quality.
- Never disassemble the valve cap or the connector. A disassembly of the valve cap or the connector will lead to loss of the explosion protection.

10.5 Exchanging the filter element

The valve contains an installed, exchangeable filter element. You can also exchange the filter element if the valve has already been installed. Replacement filter elements with FKM seal are available as spare part, see 10.7 "Spare parts".
In case of contamination, you must exchange the filter element as follows:

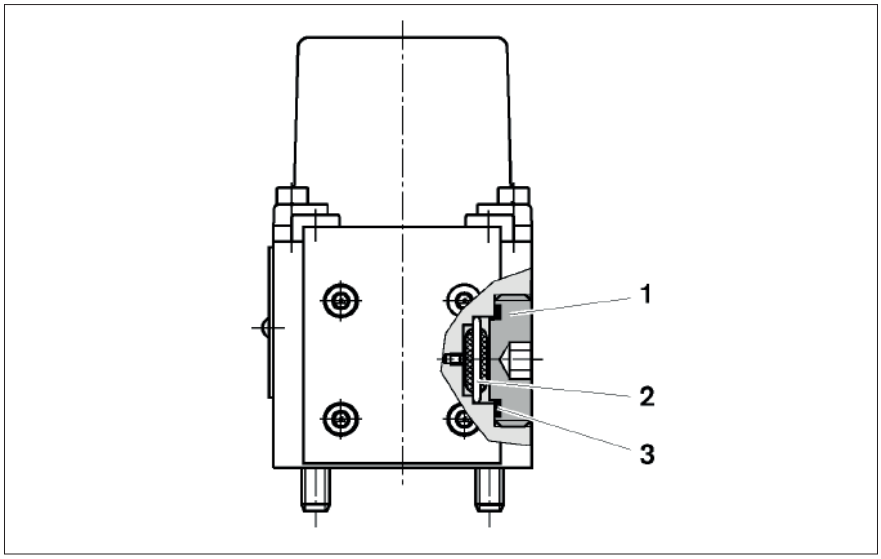

Fig. 3: Filter element

1 Filter screw
2 Filter element
3 Profile seal

1. Depressurize the system.
2. Unscrew the filter screw **(1)** (wrench size 6).
3. Remove the filter element **(2)** using tweezers or small pliers. Clean the filter screw **(1)**.

Do not clean the filter element but replace it with a new one.

4. Check whether the profile seal **(3)** at the filter screw **(1)** is intact and replace it, if required (see chapter 10.7 "Spare parts").
5. Install a new filter element.
6. Screw the filter screw **(1)** into the valve housing and tighten it using a tightening torque of 30 Nm.
7. After the filter element has been exchanged, you should check the system for contamination before re-commissioning. In this connection, observe the operating instructions of the relevant system manufacturer.

10.6 Rectifying external leakages

External leakages at the valve connection surface can be rectified on site.
Other leakages have to be rectified by specialists of the manufacturer.

10.6.1 Rectifying leakages at the valve connection surface

1. Remove the valve, see chapter 11 "Disassembly and removal".
2. Inspect the contact surfaces for seal rings at the valve for cleanliness and damage.
3. Inspect the seal rings and recesses on the connection flanges for cleanliness and damage.
4. Dry the mounting surface and the contact surface using suitable cleaning materials.
5. Assemble the new seals.
6. Assemble the valve at the contact surface, see chapter 7 "Assembly".

10.6.2 Rectifying leakages at the filter screw

1. Disassemble the filter screw as described in chapter 10.5 "Exchanging the filter element".
2. Check whether the sealing surface for the profile seal is clean and intact.
3. Dry the mounting surface and the contact surface using suitable cleaning materials.
4. Assemble the new sealing device.

10.7 Spare parts

Filter element repair kit

Table 14: Filter element repair kit

	Material number
Filter element repair kit with FKM seal	**R961001949**

Standard seal kit

Table 15: Standard seal kit

	Material number
Standard seal kit NG6	**R961001582**

In case of questions regarding spare parts, please contact the competent Rexroth service:
Bosch Rexroth AG
Service Hydraulics
Bürgermeister-Dr.-Nebel-Str. 8
97816 Lohr am Main
Tel: +49 (0) 9352/40 50 60
service@boschrexroth.de

For the addresses of our sales and service network please refer to:
www.boschrexroth.com/adressen

11 Disassembly and removal

⚠ WARNING

Danger of damage to property and personal injury at pressurized and energized system parts!
When working at pressurized and energized system parts, there is the danger of injury by leaking hydraulic fluid or electric current.
- Before disassembly, ensure that the hydraulic system is depressurized and the electrical control is de-energized.

Explosion hazard and/or risk of fire due to the ignition of an existing explosive atmosphere!
Serious injury caused by explosion pressure and fire may result.
- During disassembly and exchange work, there may be no explosive atmosphere.
- The machine end-user of the system must provide suitable environmental conditions.

Explosion hazard!
A disassembly of the valve cap or the connector will lead to loss of the explosion protection!
- Never disassemble the valve cap or connector.

⚠ CAUTION

Falling of an incompletely disassembled valve!
An incompletely disassembled valve may fall down and cause injury.
- During disassembly, secure the valve against falling.

Have sufficiently dimensioned collecting containers, sufficient cleaning cloths and medium-binding materials ready in order to collect or bind leaking hydraulic fluid.

1. De-energize and depressurize the relevant system part.
2. Screw out the mating connector from the connector and pull it out.
3. Use suitable tools to loosen the valve mounting screws.
4. Remove the valve mounting screws and remove the valve from the flange surface.
5. Collect 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 valve connection surface using the protective plate supplied or protect it using equivalent packaging in order to avoid contamination and damage.
7. Seal the subplate in order to avoid contamination.

If the valve is exchanged, all further steps are analogous to mounting, see chapter 7 "Assembly".

12 Disposal

12.1 Environmental protection

A careless disposal of the valve and the hydraulic fluid could lead to environmental pollution.

- Thus, dispose of the product and 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 these hydraulic fluids.
- Please observe the following information for the environmentally-friendly disposal of the valve.

12.2 Return to Bosch Rexroth AG

The hydraulic products manufactured by us can be returned to us for disposal purposes at no cost. There must be no inappropriate foreign substances or third-party components when products are returned. Hydraulic valves have to be drained before being returned. The components have to be sent free to the door to the following address:

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

12.3 Packaging

Upon request, reusable systems can be used for regular deliveries.
The materials for disposable packaging are mostly cardboard, wood, and expanded polystyrene. They can be recycled without any problems. For environmental reasons, disposable packaging should not be used for returning products to Bosch Rexroth.

12.4 Materials used

Hydraulic components from Bosch Rexroth do not contain any hazardous materials that could be released during the intended use. Usually no unfavorable effects on human beings and on the environment have to be expected.
The hydraulic valves basically consist of:

- Cast iron
- Steel
- Aluminum
- Copper
- Plastics
- Electronics components and assemblies
- Elastomers

12.5 Recycling

Due to the high metal content, hydraulic products can mostly be recycled. In order to achieve an ideal metal recovery, their disassembly into individual assemblies is required. The metals contained in electric and electronic assemblies can be recovered by means of special separation procedures as well.

13 Extension and modification

⚠ WARNING

Explosion hazard caused by unauthorized modification!
Every non-permitted modification will void the explosion protection.

- ▶ Modifications exceeding the extent described in these operating instructions are not permitted.

14 Troubleshooting

14.1 How to proceed for troubleshooting

- Always work systematically and purposefully, even when under time pressure. In the worst case, a random, thoughtless disassembly and change in settings might result in the inability to identify the original cause of error.
- First, get an overview of the functions of the valve in conjunction with the overall system.
- Try to find out whether the valve was functioning properly in conjunction with the overall system before the error occurred.
- Try to determine any changes to the overall system in which the valve is integrated:
  - Have there been any changes to the application conditions or to the area of application of the valve?
  - Have any changes (e.g. refittings) been made or has any repair work been carried out on the overall system (machine/system, electrical systems, control) or on the valve? If so: what type of changes or work?
  - Has the valve and/or the machine been used as intended?
  - How did the fault become apparent?

- Try to get a clear idea of the cause of error. Ask the direct (machine) operator.

Fault table

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

Table 16: Fault table

Error	Possible cause(s)	Remedy
Valve does not react to control	Electrical connection interrupted, no current continuity	
	• Cable break	Replace the connection cable
	• Mating connector not connected	Connect the mating connector
	• Connector without contact	Remove valve and have it repaired
	• Valve-internal cable break	Remove valve and have it repaired
	No pilot oil pressure available	
	• No pressure at P	Ensure the pilot oil supply
	• Filter blocked	Exchange filter element and check system for contamination
	• Orifice blocked	Remove valve and have it repaired
Zero flow too high	• Control edges worn	Remove valve and have it repaired
Bad dynamic behavior	• Filter contaminated	Exchange filter element and check system for contamination
	• Orifice contaminated	Remove valve and have it repaired
Instable zero point	• Control spool friction due to contamination	Remove valve and have it repaired
Hysteresis	• Control spool friction due to contamination	Remove valve and have it repaired
Large zero point deviation	• Orifice contaminated	Remove valve and have it repaired
External leakage	Seal defective	
	• Seal at the connection surface is defective	Remove the valve and replace the seals
	• Seal at filter screw is defective	Disassemble the filter screw and replace the seal
	• Other leakage	Remove valve and replace it with a new one

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

15 Technical data

For the technical data of your valve please refer to *"Data sheet 29564-XL"*.

16 Appendix

16.1 List of addresses

Contacts for transport damage, repair and spare parts

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

Phone +49 (0) 9352/40 50 60
Email service@boschrexroth.de

Ordering address for accessories and hydraulic valves

Headquarters:
Bosch Rexroth AG
Zum Eisengießer 1
97816 Lohr am Main
Germany

Phone +49 (0) 9352/40 30 20
Email my.support@boschrexroth.de

The addresses of our sales and service network and sales organizations can be found at www.boschrexroth.com/adressen

17 Declaration of conformity

rexroth
A Bosch Company

EU-Konformitätserklärung - *Original*
EU declaration of conformity

Dok.-Nr. / *Doc. No.*: DCTC 31000-145
Datum / *Date*: 14.10.2020

- ☐ nach Maschinenrichtlinie 2006/42/EG / *in accordance with Machinery Directive 2006/42/EC*
- ☐ nach Niederspannungsrichtlinie 2014/35/EU / *in accordance with Low Voltage Directive 2014/35/EU*
- ☐ nach EMV-Richtlinie 2014/30/EU / *in accordance with EMC Directive 2014/30/EU*
- ☐ nach Druckgeräte-Richtlinie 2014/68/EU / *in accordance with Pressure Equipment Directive 2014/68/EU*
- ☒ nach ATEX-Richtlinie 2014/34/EU / *in accordance with ATEX Directive 2014/34/EU*
- ☐ nach RoHS-Richtlinie 2011/65/EU / *in accordance with RoHS Directive 2011/65/EU*
- ☐

Hiermit erklärt der Hersteller, / *The manufacturer*

Bosch Rexroth AG
Zum Eisengießer 1
97816 Lohr am Main
DEUTSCHLAND

dass das nachstehende Produkt / *hereby declares that the product below*

Bezeichnung / *Name*:	**Servo-Wegeventil mit mechanischer Wegrückführung / *Directional servo valve with mechanical position feedback***
Typ / *Type*:	**4WS2EM6...XL...** (nach Datenblatt 29564-XL / *according to data sheet 29564-XL*)
Kennzeichnung / *Marking*	**II 3G**

in Übereinstimmung mit oben genannte(n) Richtlinie(n) entwickelt, konstruiert und gefertigt wurde. / *was developed, designed and manufactured in compliance with the above-mentioned directive(s).*

Die alleinige Verantwortung für die Ausstellung dieser EU-Konformitätserklärung trägt der Hersteller. / *This EU declaration of conformity is issued under the sole responsibility of the manufacturer.*

Angewandte harmonisierte Normen / *Harmonized Standards applied:*

EN IEC 60079-0:2018, EN 60079-11:2012

IECEx Konformitätsbescheinigung
IECEx Certificate of Conformity **IECEx BVS 18.0045X**

Weitere Erläuterungen / *Further explanations:*

Die Montage- und Installationshinweise gemäß Produktdokumentation 29564-XL sind zu beachten. / *The assembling and installation instructions according to the manual 29564-XL have to be followed.*

Lohr am Main	14.10.2020	i.V.	i.V.
Ort / *Place*	Datum / *Date*	Achim Richartz, DC-IH/EHC Entwicklung Industriehydraulische Steuerungen *Engineering Industrial Hydraulic Controls*	Enno Klaaßen, LoP1/PT Technische Werkleitung *Vice President, Technical Plant Manager*

Änderungen im Inhalt der EU-Konformitätserklärung sind vorbehalten. Derzeit gültige Ausgabe auf Anfrage.
We reserve the right to make changes to the content of the EU Declaration of Conformity. Current issue on request.

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