

Directional seat valves, direct operated, with solenoid actuation

(Area of application according to the Explosion Protection
Directive 2014/34/EU: **II 2G; II 2D**)

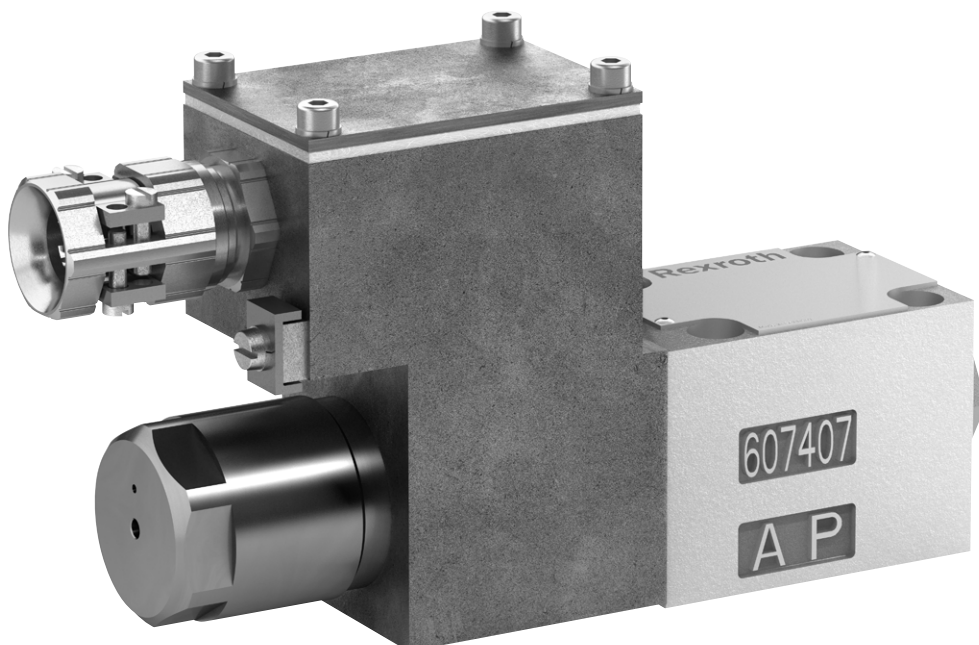
Type SED6 ..1X/...XE...



(IECEx certificate of conformity of
the solenoid coil)

Operating instructions
RE 22049-XE-B/09.20

Replaces: 08.19
Document no.: RA78490357_AB
German



DE Die Inbetriebnahme dieses Produkts darf erst dann erfolgen, wenn Sie diese Betriebsanleitung in einer für Sie verständlichen EU-Amtssprache vorliegen und den Inhalt verstanden haben. Ist dies nicht der Fall, wenden Sie sich bitte an Ihren Bosch Rexroth Ansprechpartner oder die zuständige Servicestelle. Diese finden Sie auch unter www.boschrexroth.com.

EN: This product may only be commissioned if these operating instructions are available to you in an official EU language that you understand and you have understood the contents. If this is not the case, please contact your Bosch Rexroth contact partner or the responsible service point. You can also find them at www.boschrexroth.com.

BG: Въвеждането в експлоатация на този продукт може да се извърши едва тогава, когато разполагате с това ръководство за експлоатация на разбираем за Вас официален език на ЕС и сте разбрали неговото съдържание. Ако това не е така, обърнете се към Вашия партньор Bosch Rexroth или към компетентен сервиз. Ще го намерите на www.boschrexroth.com.

CS: Tento výrobek smíte uvést do provozu teprve tehdy, jestliže si obstaráte tento návod k obsluze v úředním jazyce EU, který je pro vás srozumitelný, a pochopíte celý jeho obsah. Pokud tomu tak není, obraťte se na svoji kontaktní osobu u společnosti Bosch Rexroth nebo na příslušné servisní středisko. Potřebné kontaktní informace naleznete také na stránkách www.boschrexroth.com.

DA: Dette produkt må først tages i brug, når du har modtaget og læst driftsvejledningen på et for dig forståeligt officielt EU-sprog og har forstået indholdet. Hvis det ikke er tilfældet, bedes du kontakte din kontaktperson hos Bosch Rexroth eller den ansvarlige kundeserviceafdeling. Den kan du finde på hjemmesiden www.boschrexroth.com.

EL: Το προϊόν επιτρέπεται να τεθεί σε λειτουργία μόνο εάν διαθέτετε τις παρούσες οδηγίες χρήσης σε κατανοητή σε εσάς επίσημη γλώσσα της Ε.Ε. και εφόσον έχετε κατανοήσει το περιεχόμενό τους. Εάν δεν πληρούνται αυτές οι προϋποθέσεις, απευθυνθείτε στους κατά τόπους αντιπροσώπους της Bosch Rexroth ή σε κάποιο εξουσιοδοτημένο σέρβις. Για τα σχετικά στοιχεία, επισκεφτείτε την ιστοσελίδα www.boschrexroth.com.

ES: La puesta en marcha de este producto únicamente podrá realizarse cuando disponga de las instrucciones de servicio en una lengua oficial de la UE comprensible para usted y haya entendido su contenido. En caso contrario, diríjase a su persona de contacto en Bosch Rexroth o al servicio técnico competente, que podrá encontrar también en la dirección www.boschrexroth.com.

ET: Selle toote tohib kasutusele võtta ainult siis, kui teil on olemas ühes EL-i ametlikus keeles kirjutatud kasutusjuhend ja te olete selle endale selgeks teinud. Kui see nii ei ole, võtke ühendust oma Bosch Rexrothi kontaktisiku või vastutava teeninduskusega. Need leiate aadressilt www.boschrexroth.com.

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.

FR: Ce produit ne doit être mis en service que lorsque vous disposez des présentes instructions de service dans une langue officielle de l'UE que vous comprenez et que vous avez compris son contenu. Si cela n'est pas le cas, veuillez vous adresser à votre interlocuteur Bosch Rexroth ou au service compétent. Vous pouvez trouver ces coordonnées également sur le site www.boschrexroth.com.

HU: A termék üzembe helyezése csak akkor történhet meg, ha az üzemeltetési utasítást az EU egyik hivatalos nyelvének elolvasta, és megértette a tartalmát. Ha nem ez a helyzet, kérjük, forduljon Bosch Rexroth kapcsolattartójához vagy az illetékes szervizhez. A szervizek elérhetőségét a www.boschrexroth.com webhelyen találja meg.

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.

LT: Šį gaminį eksploatuoti leidžiama tik tada, kai turėsite šią naudojimo instrukciją viena iš ES suprantamų oficialių kalbų ir kai suprasite jos turinį. Priešingu atveju kreipkitės į „Bosch Rexroth“ kontaktinį asmenį arba įgaliojį paslaugų centrą. Informacijos apie juos rasite www.boschrexroth.com.

LV: Ierīces ekspluatāciju drīkst sākt tikai tad, ja šī ekspluatācijas instrukcija Jums ir pieejama kādā no jums saprotamām ES oficiālajām valodām un Jūs esat izpratis tās saturu. Pretējā gadījumā lūdzam vērsties pie savas „Bosch Rexroth“ kontaktpersonas vai kompetentā servisa dienesta. Nepieciešamā informācija ir pieejama arī interneta vietnē www.boschrexroth.com.

NL: U mag het product pas in bedrijf stellen, als deze bedieningshandleiding voor u beschikbaar is in een voor u begrijpelijke, officiële taal van de EU en als u de inhoud daarvan begrepen heeft. Is dit niet het geval, neem dan a.u.b. contact op met uw Bosch Rexroth contactpersoon of de servicepartner. Deze vindt u ook op www.boschrexroth.com.

NO: Dette produktet må settes i drift først når denne bruksanvisningen foreligger på et offisielt EU-språk som er forståelig for deg, og du må også forstå innholdet i bruksanvisningen. Hvis dette ikke er tilfelle, kontakter du din kontaktperson i Bosch Rexroth eller ansvarlig servicesenter. Disse finner du også under www.boschrexroth.com.

PL: Przed uruchomieniem niniejszego produktu należy zapoznać się z instrukcją obsługi w zrozumiałym dla Państwa języku urzędowym UE i zrozumieć jej treść. W przypadku gdy nie dołączono instrukcji w takim języku, należy zwrócić się zapytaniem do osoby kontaktowej Bosch Rexroth lub do odpowiedniego punktu obsługi. Listę takich punktów można znaleźć na stronie www.boschrexroth.com.

PT: A colocação em funcionamento desse produto só pode ocorrer se estas instruções de operação estiverem disponíveis para você em uma língua oficial da UE que você entenda e se você tiver compreendido seu conteúdo. Se não for esse o caso, entre em contato com a pessoa de contato da Bosch Rexroth ou com o centro de serviço responsável. Você também pode encontrá-las em www.boschrexroth.com.

RO: Aveți voie să puneți în funcțiune acest produs, doar dacă aveți acest manual de utilizare într-o limbă oficială a UE, pe care o înțelegeți, și după ce ați înțeles conținutul. Dacă aceste condiții nu sunt îndeplinite, adresați-vă persoanei de contact Bosch Rexroth sau centrului de service responsabil. Găsiți aceste service-uri și pe www.boschrexroth.com.

RU: Данное изделие разрешается вводить в эксплуатацию только в том случае, если у вас имеется эта инструкция по эксплуатации на знакомом вам официальном языке ЕС и вам понятно ее содержание. В случае отсутствия инструкции обратитесь к вашему контактному лицу в Bosch Rexroth или в соответствующий сервисный центр. Адрес сервисного центра можно найти на сайте www.boschrexroth.com.

SK: Tento výrobok sa môže uviesť do prevádzky až po predložení tohto návodu na obsluhu v pre vás zrozumiteľnom úradnom jazyku EÚ a po oboznámení sa s jeho obsahom. Ak to nie je váš prípad, obráťte sa na vašu kontaktnú osobu Bosch Rexroth alebo na príslušné servisné miesto. Nájdete ho na www.boschrexroth.com.

SL: Z uporabo tega izdelka lahko pričnete šele, ko ste prebrali ta navodila za uporabo v vam razumljivem uradnem jeziku EU in razumeli njihovo vsebino. Če navodila za uporabo niso na voljo v vašem jeziku, vas prosimo, da se obrnete na kontaktno osebo podjetja Bosch Rexroth oz. pooblaščen servis. Te lahko najdete tudi na www.boschrexroth.com.

SV: Du får inte ta denna produkt i drift förrän du har denna bruksanvisning på ett EU-språk som du kan och du har förstått innehållet. Om detta inte är fallet ska du kontakta din kontaktperson på Bosch Rexroth eller ansvarig serviceplats. Denna hittar du också på www.boschrexroth.com.

HR: Ovaj proizvod smijete pustiti u pogon tek kada pročitate ove upute za uporabu na službenom jeziku EU-a koji razumijete i shvatite njihov sadržaj. Ako to nije slučaj, obratite se osobi za kontakt tvrtke Bosch Rexroth ili nadležnoj servisnoj službi. Te ćete podatke pronaći na adresi www.boschrexroth.com.

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.

© All rights with Bosch Rexroth AG, also in case of applications for industrial property protection. It may not be reproduced or given to third parties without consent of Bosch Rexroth AG.

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	7
1.1	Validity of the documentation	7
1.2	Required and amending documentation	7
1.3	Representation of information	7
2	Safety instructions	9
2.1	General information on this chapter	9
2.2	Intended use	9
2.3	Improper use	10
2.4	Qualification of personnel	11
2.5	General safety instructions	12
2.6	Product-specific safety instructions	13
2.7	Notes on the valve use	15
2.8	Personal protective equipment	15
2.9	Obligations of the machine end-user	15
3	General information on damage to property and damage to product	16
4	Scope of delivery	17
5	Product information	17
5.1	Product identification	18
6	Transport and storage	21
6.1	Transporting the valve	21
6.2	Storing the hydraulic valve	21
7	Assembly	23
7.1	Unpacking	23
7.2	Changes to the surface protection of the valve	23
7.3	Installation conditions	23
7.4	Prior to assembly	24
7.5	Required tools	24
7.6	Required accessories	25
7.7	Assembling the valve	26
8	Commissioning	34
9	Operation	36
9.1	General information	36
9.2	Operating the manual override (only relevant for type M-.SED6...N9...)	37
10	Maintenance and repair	38
10.1	Cleaning and care	38
10.2	Inspection and maintenance	38
10.3	Maintenance schedule	40
10.4	Repair	40
10.5	Rectifying external leakages	40
10.6	Spare parts	41
11	Disassembly and removal	42
12	Disposal	43
12.1	Environmental protection	43
12.2	Return to Bosch Rexroth AG	43
12.3	Packaging	43
12.4	Materials used	43

12.5	Recycling	44
13	Extension and modification	44
14	Troubleshooting	44
14.1	How to proceed for troubleshooting	44
15	Technical data	45
16	Appendix	46
16.1	List of addresses	46
17	Declaration of conformity	47
18	Index	48

1 About this documentation

1.1 Validity of the documentation

This documentation applies to the following products:

- SED6..1X/...XE...

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.



The documentation version with which the product was supplied is valid.

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 seat valves, direct operated, with solenoid actuation	22049-XE	Data sheet
 General product information on hydraulic products	07008	Data sheet
Subplates	45100	Data sheet
Declaration of conformity SED6..1X/...XE...	Document	Refer to chapter 17

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 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 structured as follows:

 SIGNAL WORD
Type and source of danger! Consequences in case of non-compliance ▶ Hazard avoidance measures ▶ <Enumeration>

- **Warning sign:** Draws attention to the danger
- **Signal word:** Identifies the degree of danger
- **Type and source of danger!:** Specifies the type and source of danger
- **Consequences:** Describes the consequences in case 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 medium 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
ATEX	EU Directive for Explosion Protection (<i>Atmosphère explosible</i>)
EN	European Standard
ISO	International Organization for Standardization
IEC	International Electrotechnical Commission

Abbreviation	Meaning
RE	Rexroth document in English language
IP	Ingress protection class of electric operating equipment
A, B	Hydraulic connections (actuators)
T	Hydraulic connection (tank)
P	Hydraulic connection (pump)
ANSI	American National Standards Institute

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:

- as direct operated directional seat valve with solenoid actuation for intended use in explosive atmospheres.

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 ATEX Directive 2014/34/EU.

Details about the device group, category, temperature class and equipment protection level (EPL) in accordance with ATEX Directive 2014/34/EU and the derived standards are provided in “Data sheet 22049-XE” under “Information on explosion protection” and on 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 those 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 the data 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 injuries and/or damage to property. Therefore, please only use a product for safety-relevant applications if this use is expressly specified and permitted in the documentation of the product. For example, in explosion-protected areas or in safety-related control components (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 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 explosion-proof areas

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
- Understanding of the contents of certificates and relevant parts of this standard
- General understanding of the test, maintenance and repair requirements from IEC 60079-17
- 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.
- Only use Bosch Rexroth products in a technically perfect condition.
- Observe all notes on the product.
- Persons assembling, operating, disassembling or maintaining Bosch Rexroth products must not be under the influence of alcohol, other drugs or medications influencing the ability to react.
- Only use original Bosch Rexroth accessories and spare parts in order to prevent 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 injuries and/or damage to property. Therefore, only use a product for safety-relevant applications if this use is expressly specified and permitted in the documentation of the product, 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) where the Bosch Rexroth products are 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 ignitable atmosphere during all work on the valve!

During all work on the valve (assembly, disassembly etc.), an explosive atmosphere must be avoided! Otherwise, an ignition may be triggered which may lead to an explosion.

- ▶ Before working with the valve, ensure that no explosive atmosphere can occur during the work.

Easily inflammable liquid!

In connection with an explosive atmosphere or other heat sources, the use of fluids (e.g. hydraulic fluid, coolants etc.) may lead to explosions.

- ▶ Only use the valve in the intended explosion protection area.
- ▶ The ignition temperature of the liquid used must be 50 K higher than the maximum surface temperature.

Exceeding the maximum temperatures!

The use of the valve outside the approved temperature ranges may lead to functional failures like overheating of the solenoid coil. Explosion protection is therefore no longer ensured.

- ▶ Only use the valve within the intended environmental and hydraulic fluid temperature range.

Hot surface at the valve!

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.

Pressurized system parts and leaking hydraulic fluid!

When working at hydraulic systems with stored energy (accumulator or cylinders working under gravity), valves may even be pressurized after switching off the pressure supply. During assembly and disassembly works, the valve or parts may be ejected and cause personal injury and/or damage to property. Furthermore, there is the danger of severe injury caused by a powerful leaking hydraulic fluid jet.

- ▶ Ensure before working at the hydraulic product that the hydraulic system is depressurized and the electrical control de-energized.
- ▶ Completely unload the pressure at machines and systems before working at the valve.



WARNING

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.

Penetrating water and humidity!

In case of use in humid or wet environments, water or humidity may penetrate 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.
- ▶ Before the assembly, ensure that all seals and caps of the plug-in connections are tight and intact.



CAUTION

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 details in the data sheet over the entire operating range.

Leakage in case of incorrect working temperatures!

Use of the valve outside the approved temperature range 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 comprises of surface protection (see "*Data sheet 22049-XE*"). Use of the valve in humid environments still holds the danger of corrosion on the valve and on the valve mounting screws and thus a reduction of the preload force of the screw connection. To prevent the valve from becoming loose and causing a risk of injury:

- ▶ Exchange the valves with corrosion damages as soon as possible.
- ▶ Check the surface protection on the valve and the valve mounting screws at regular intervals.



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

2.7 Notes on the valve use

- ▶ The valve must always be filled with hydraulic fluid.
- ▶ To ensure proper functioning, the valve must be vented.
- ▶ Pressure peaks in the joint return line of more than one valve may cause an unintended movement of the control spool and thus unintended switching processes. It is recommended to use separate return lines.

2.8 Personal protective equipment

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

2.9 Obligations of the machine end-user

The machine end-user is obligated to check in the order confirmation whether the delivered valve corresponds to the required category and associated zone or equipment protection level .

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 22049-XE*”, in particular that the limit values indicated in “*Data sheet 22049-XE*” are not exceeded.
- the applicable provisions, rules and directives on explosion protection are being 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 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 can no longer be 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.
- ▶ Before commissioning, ensure that all hydraulic connections are tight and that all seals and caps of the plug-in connections are correctly installed and undamaged.
- ▶ Do not use linting 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 seat valves, direct operated, with solenoid actuation
Type SED6..1X/...XE...
 - Product documentation (operating instructions with 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 and valve mounting screws (except for valve type M-4SED6..1X/...XE...) 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 power and product description please refer to "Data sheet 22049-XE" of your valve.

5.1 Product identification

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

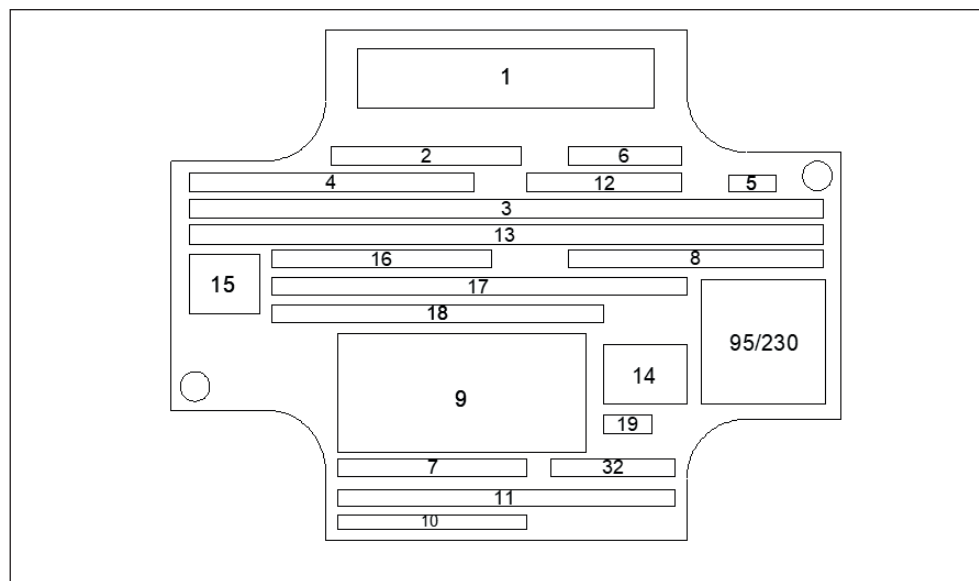


Fig. 1: Name plate of the valve

Table 5: Information on the name plate

No.	Type of information
1	Manufacturer's logo
2	Material no. of the valve
3	Type designation valve
4	Serial number of the valve
5	Manufacturer's factory number
6	Date of manufacture (year and week)
7	Maximum operating pressure
8	Ambient temperature range
9	Hydraulic symbol according to ISO 1219
10	Designation of origin
11	Name and address of the manufacturer
12	Customer's or production order number
13	Customer material number or additional information
14	CE mark
15	Explosion protection mark
16	Mark - according to ATEX Directive 2014/34/EU - for the type of protection of the mechanical part according to EN 80079-36
17	Mark - according to ATEX Directive 2014/34/EU - for the type of protection of the mechanical part according to EN 80079-36
230	Bosch Rexroth QR code

With the 4/2 directional seat valve, another name plate is attached to the Plus-1 subplate. It only contains an identification number internally used by Bosch Rexroth.

The meaning of the information on the name plate of the solenoid coil can be obtained from the correspondingly numbered fields of the following table.

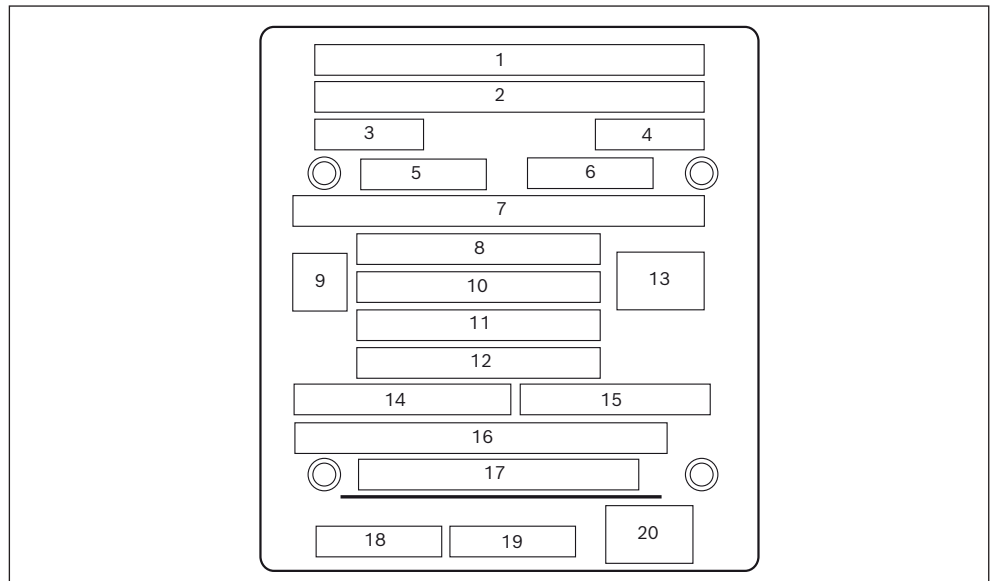


Fig. 2: Name plate solenoid coil

Table 6: Information on the name plate

No.	Type of information
1	Name / logo of the solenoid coil manufacturer
2	Address of the solenoid coil manufacturer
3	Internal identification number
4	Customer material number
5	Nominal voltage
6	Rated current
7	Electrical characteristic values: Duty cycle according to IEC 34-1 (VDE 0580) and frequency
8	Admissible ambient temperature range of the solenoid coil ¹⁾
9	Explosion protection mark
10	Type examination certificate number
11	Mark according to ATEX directive 2014/34/EU and for the type of protection according to EN 60079-7 or EN 60079-18
12	Mark according to ATEX directive 2014/34/EU and for the type of protection according to EN 60079-31
13	CE mark and identification number of the notified body
14	IECEx Certificate of Conformity
15	Ex marking according to EN IECEx
16	Serial number of the solenoid coil and date of production
17	Application note
18	Rated current for external miniature fuse
19	Rated voltage for external miniature fuse
20	Data matrix code of the solenoid coil manufacturer

¹⁾ Dependent on valve sizes and the configuration of the solenoid coils, higher ambient temperatures of up to 70°C are admissible. Also observe the "Special conditions for safe use" in "Data sheet 22049-XE".

5.1.1 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. In the following table, the corresponding zones for device groups and categories are shown.

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 22049-XE".

Table 7: 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 where 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 where 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 where 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 where an explosive atmosphere due to stirred dust (= device group II) is normally not present or occurs only rarely or short-time. Corresponds to zone 22 according to Directive 1999/92/EC. Normal safety level.	22

6 Transport and storage

6.1 Transporting the valve

CAUTION

Danger of damage to property and personal injuries!

With improper transport, the valve can fall and lead to damages and/or injuries 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 low stability, e.g. valve solenoids, connectors or cables.

Sharp edges!

Danger of cut injuries!

- ▶ Wear suitable protective equipment for the transport of the valve.



Further information regarding 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 at:

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

6.2 Storing the hydraulic valve

Valves are delivered in a perfect state.



For the transportation and storage of the product, always observe the environmental conditions specified in "Data sheet 22049-XE". Improper storage may damage the valve.

Valves can be stored for up to 12 months under the following conditions:

- ▶ Observe the storage temperature range indicated in “Data sheet 22049-XE” .
- ▶ 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.
- ▶ The storage facilities must be free from etching substances and gases.
- ▶ Do not store the valve outdoors but in a well-ventilated room.
- ▶ 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 comparable packaging in order to protect it from dust and dirt.
- ▶ All connections at the valve must be closed with cap elements.
- ▶ After opening the transport packaging, it must be closed properly again for storage. Use the original packaging for storage.

Procedure after the expiration of the maximum storage time of 12 months



1. Check the complete valve for damages 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 Bosch Rexroth service. In case of questions regarding spare parts, please contact the Bosch Rexroth service responsible for your valve, see chapter 10.6 “Spare parts”.

Following disassembly

If a dismantled valve is to be stored, it has to be preserved for protection against corrosion for the duration of storage.

Bosch Rexroth recommends the following procedure:

1. Clean the valve; refer to chapter 10.1 “Cleaning and care”.
 2. Close all connections so that they are airtight.
 3. Pack the valve with a desiccant air-tightly in corrosion protection film.
 4. Store the valve protected against shocks.
- ▶ In each case, please observe any applicable provisions and laws regarding the handling of substances hazardous to water or to health.

7 Assembly

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 injuries or damage of 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!

In the event of changes to the surface protection of the valve, the following points must be observed:

- ▶ The valve solenoid must not be painted or otherwise coated with non-conductive substances. This leads to a loss of the explosion protection.
- ▶ The valve housing may only be painted according to the provisions of EN 80079-36, section 6.7; otherwise, explosion protection can no longer be ensured.

7.3 Installation conditions

- ▶ For installing the product, always observe the environmental conditions specified in “Data sheet 22049-XE”.
- ▶ It is imperative to provide for 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 “Data sheet 22049-XE”.

7.3.1 Requirements on the valve subplate



WARNING

Explosion hazard caused by overheating!

Non-compliance with the requirements for the valve subplate will void the explosion protection.

- ▶ Observe the prescribed minimum distance when assembling several valves to a valve battery.
- ▶ Observe the prescribed minimum size and minimum thermal conductivity of the valve connection surface.



Recommended subplates, see chapter 7.6 “Required accessories”.

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 all 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.
 - ▶ Make sure that the zone 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”.
 - ▶ Transport protection elements (e.g. cover plates, protective plugs) must be removed prior to use in an explosive atmosphere.

7.5 Required tools

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

7.6 Required accessories

The following accessories are recommended for the connection of the valve. These accessories are not included in the scope of delivery and can be ordered separately from Bosch Rexroth:



For valve type M-4SED6..1X/...XE..., valve mounting screws are included in the scope of delivery.

Valve mounting screws

Table 8: Valve mounting screws for valve type M-3SED 6...

Type	Quantity	Friction coefficient according to VDA 235-101	Material number
Hexagon socket head cap screw ISO 4762-M5x50-10.9 (corrosion-protected)	4	0.09...0.14	R913043758

Subplates



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

Special tool



The special tool is used to operate the manual override.

Table 9: Special tool

	Material number
Special tool	R900024943

Ordering address for accessories and valves

The address of our responsible sales organizations can be found on the Intranet at www.boschrexroth.com and in the appendix 16.1 “List of addresses”.

7.7 Assembling the valve

7.7.1 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 and may be ejected due to the pressure. This may cause severe injuries!

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

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 injuries 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 actuation and adjustment work at the valve.

- ▶ Provide for sufficient installation space.
- ▶ Ensure that actuation, adjustment elements and plug-in connectors are easily accessible.

Leaking hydraulic fluid!

Hydraulic fluid may leak during assembly and disassembly of the valve. This might cause persons to slip or fall.

- ▶ Do not remove the protective caps of the valve until assembly.
- ▶ After disassembly, seal the hydraulic fluid bores with suitable cap elements.
- ▶ Immediately remove 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 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.
- ▶ Only use seal kits as listed in chapter 10.6 "Spare parts".



With the 4/2 directional seat valve, assemble the supplied Plus-1 subplate between valve and mounting surface.

1. Before any assembly and disassembly work starts, the environment must be cleaned so that no dirt can get into the oil circuit. Only fiber-free cloth or special paper may be used for cleaning.
2. Remove existing preservative agent.
3. Check the valve contact surface for the required surface quality (see "Data sheet 22049-XE"). 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 and, if applicable, at the Plus-1 subplate for completeness. Other sealants are not admissible.
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 in case of pressurization.

7. Place the valve on the contact surface. If applicable, assemble the Plus-1 subplate between valve and connection surface.



Only use valve mounting screws with the thread diameters, screw lengths and strength properties listed in chapter 10.6 "Spare parts".

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 assembly on comparable cast iron installation surfaces, tighten all four valve mounting screws with a tightening torque of $7 \text{ Nm} \pm 0.7 \text{ Nm}$ (with a friction coefficient of $\mu_{\text{total}} = 0.09 \dots 0.14$). 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.

7.7.2 Hydraulic connection of the valve



CAUTION

Damage to the valve!

During operation, hydraulic lines and hoses installed under mechanical stress create additional mechanical forces, which reduces 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.

7.7.3 Establishing the electrical connection

WARNING

High electrical voltage!

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, pulling and connecting plug-in connectors and all other installation works. Secure the electrical equipment against restarting.
- ▶ Provide for proper, safe PE connection.
- ▶ Check before switch-on whether the protective grounding conductors at all electric devices are firmly connected according to the connection diagram.
- ▶ Close the terminal box according to the guidelines in these operating instructions.

Explosion hazard due to missing 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 provide for proper equipotential bonding.
- ▶ The base plate or 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.

Explosion hazard caused by overheating!

An incorrectly dimensioned fuse protection may lead to overheating and thus cause an explosion!

- ▶ A fuse which corresponds to the rated current according to DIN 41571 and EN / IEC 60127 has to be connected upstream of every solenoid coil (max. $3 \times I_{rated}$). The shut-off threshold of the fuse has to match the prospective short-circuit current of the supply source.
- ▶ The prospective short-circuit current of the supply source may amount to a maximum of 1500 A.
- ▶ This fuse may only be installed outside the potentially explosive atmospheres or must be of an explosion-proof design.

Explosion hazard caused by improper assembly!

No precautions are taken for safe connection of the shielding or sheathing in the terminal box of the solenoid coil and on the cable and line entry. The use of connection lines with shielding or sheathing can lead to potential backfeeding and is thus an explosion hazard!

- ▶ Only use connection lines without shielding or armoring.



For information on the prescribed pre-fuse, refer to “Data sheet 22049-XE”.

! CAUTION

Danger of damage to property and personal injuries!

Faulty energy supply may lead to uncontrolled valve movements. These could result in possible malfunctions or failure of the valve and cause injuries.

- ▶ Only use a power supply unit with safe separation.
- ▶ Always observe country-specific regulations.

Danger of short circuit caused by missing seals and caps!

Fluids may enter the valve and cause a short-circuit.

- ▶ Before commissioning, ensure that all seals and caps of the plug-in connections are leak-proof.

- ▶ Only the cable and line entry included in the scope of delivery and the installed blind plug may be used.
- ▶ When selecting the connection line, please observe the requirements regarding the temperature rating and/or avoid contact of the connection line with the surface of the solenoid coil. For selection and installation, observe the requirements of EN 60079-14.
- ▶ Ensure that there are no bends in the connection line and braided wires to avoid short-circuits and interruptions.
- ▶ Only assemble the cable and line entries according to the assembly instructions. Before assembly, check whether the individual components of the cable and line entry are complete and that the sealing elements are undamaged.
- ▶ The sealing elements of the cable and line entry are only intended for single use.
- ▶ Only use finely stranded conductors if they have pressed-on wire end ferrules.
- ▶ Only use lines which satisfy the requirements for the terminal areas of the connection terminals and the cable and line entry, see "*Data sheet 22049-XE*".
- ▶ During the assembly, ensure leak-tightness between cable and line entry and terminal box. Route the connection line in a strain-relieved form. The first mounting point must be within 15 cm of the cable and line entry.



The connection of the solenoid coil is polarity-independent. Solenoid coils for connection to alternating voltage have a bridge rectifier which is integrated in the solenoid coil.

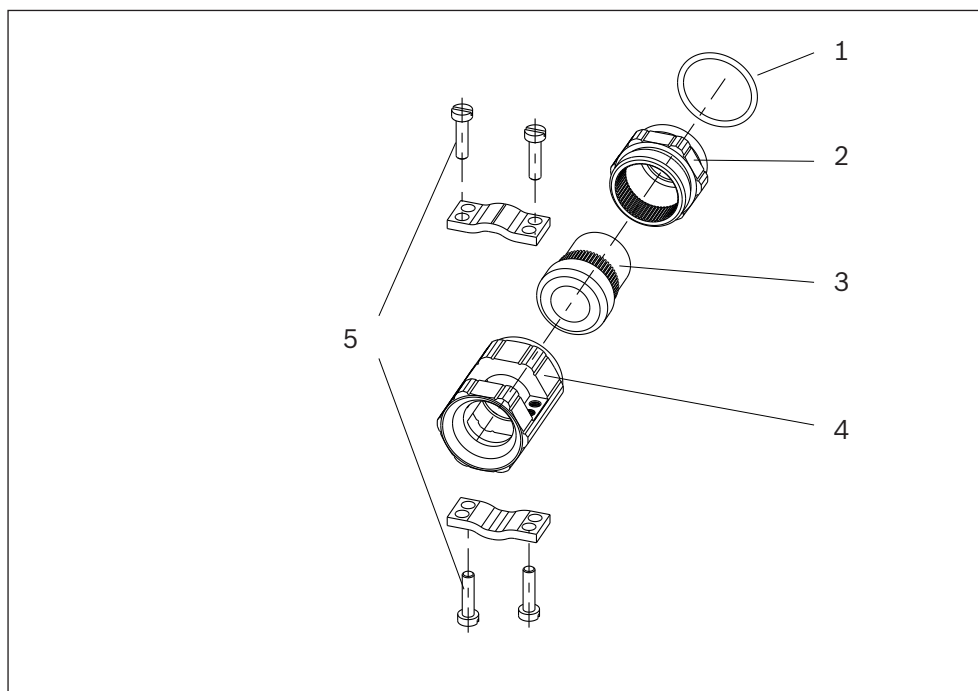


Fig. 3: Cable and line entry

- 1 O-ring
- 2 Double nipple
- 3 Seal insert
- 4 Pressure nut (with clamping collar)
- 5 Clamping screws of the strain relief



In the state as delivered, the cable and line entry is already screwed in the terminal box of the valve.

1. De-energize and depressurize the relevant system part.
2. Open the terminal box (internal hexagon, wrench size 3)
3. Remove the outer sheath of the connection line and the insulation of the individual conductors. Press the wire end ferrules to the individual conductors.



For the stripping lengths, refer to Fig. 4 and Table 10.

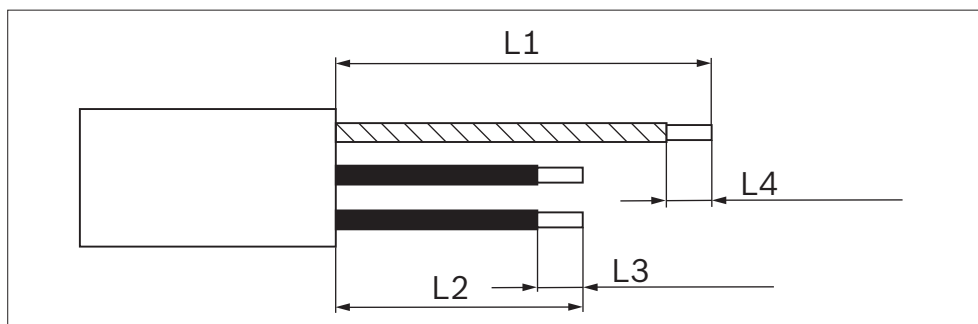


Fig. 4: Stripping lengths

- L1** Stripping length of the cable sheath and simultaneously resulting length of the individual conductor for the connection of the protective grounding conductor
- L2** Length of the individual conductors of the voltage supply
- L3** Stripping length of the insulation of the individual conductor for the attachment of the wire end ferrules
- L4** Stripping length of the individual conductor for protective equipotential bonding (PE) (internal)

Table 10: Stripping lengths

Cable and line entry position	Length L1 [mm]	Length L2 [mm]	Length L3 [mm]	Length L4 [mm]
Page manual override	≥ 44	24	5 +1	5.5 ±0.5
Page valve housing	≥ 84	64	5 +1	5.5 ±0.5

4. Disassemble the screw-in bushing and the clamping screws of the strain relief.
5. Ensure the correct seat of the seal insert in the double nipple.
6. Assemble the pressure nut (with clamping collar) **(4)** to the connection line and insert it through the seal insert **(3)** and the double nipple **(2)** in the terminal box.



The outer sheath of the connection line must lie in the sealing insert **(3)**. Otherwise, explosion protection and the IP protection are no longer ensured.

7. Screw the pressure nut (with clamping collar) **(4)** to the double nipple **(2)** and tighten it securely applying a torque of 10...12 Nm (hexagon nut, wrench size 22). When tightening the pressure nut (with clamping collar) **(4)**, the solenoid coil must be supported in an appropriate manner or held up at the double nipple **(2)** using an open-end wrench (wrench size 22).
8. Securely tighten the clamping screws of the strain relief **(5)**. The required tightening torque depends on the line diameter.
9. Guide the individual conductor into the connection terminal and screw this into place with the clamping screws.
Tightening torques for the clamping screws:

Table 11: Tightening torques

Operating voltage connection	0.4...0.5 Nm
Connection for protective grounding conductor	1.0...1.2 Nm
Connection for potential equalization conductor	2.0...2.4 Nm

10. Assemble the cover with the sealing device underneath.
Tighten the mounting screws with their spring washers diagonally, one after the other.
Tightening torque of the cover screws: 1...1.1 Nm.

Assembling the cable and line entry on the opposite side of the terminal box

1. Dismount the solenoid coil (see chapter 7.7.4 "Rotating the solenoid coil by ± 90°").
2. Remove the blind plug (hexagon, wrench size 22).
3. Remove the cable and line entry. To do this, unscrew the cable and line entry from the double nipple **(2)**. Make sure not to lose the O-ring **(1)** between the housing and double nipple.

4. Assemble the cable and line entry at the opposite side of the terminal box.
Tightening torque of the double nipple **(2)**: 10..12 Nm
5. Assemble the blind plug. Tightening torque of the blind plug 7...9 Nm
6. Assemble the solenoid coil (see chapter 7.7.4 "Rotating the solenoid coil by $\pm 90^\circ$ ").

7.7.4 Rotating the solenoid coil by $\pm 90^\circ$



WARNING

Explosion hazard caused by improper assembly!

Improper assembly will result in the loss of the explosion protection!

- ▶ Strictly observe the following modification instructions for turning the solenoid coil.
- ▶ When turning the solenoid coil, make sure that it does not project over the valve connection surface.
- ▶ Make sure that the solenoid coil moves freely and does under no circumstance rest on the base plate.
- ▶ A gap between the valve housing and the solenoid coil is not admissible.
- ▶ Ensure that every solenoid coil is re-assigned to the original valve.
- ▶ After the rotation of the solenoid coil, the coil pin must engage in the bore of the valve housing.

Solenoid coils can be assembled in staggered assembly around the pole tube, i.e. the longitudinal axis of the valve, displaced by $\pm 90^\circ$.



The pole tube of the valve solenoid is completely sealed towards the oil circuit. The solenoid coil can therefore still be twisted if the valve has already been installed.

1. Detach the mounting nut of the valve solenoid at the pole tube (hexagon nut, wrench size 32).
2. Remove the solenoid coil and the O-ring from the valve and rotate it by 90° in the desired direction.
3. Re-attach the solenoid coil in the desired position. After the rotation of the solenoid coil, the coil pin must engage in the bore of the valve housing.
4. Assemble the O-ring onto the pole tube and slide it forward up to the solenoid coil.
5. Re-tighten the mounting nut of the valve solenoid (hexagon nut, wrench size 32, tightening torque 4 + 1 Nm). Afterwards, there must be no visible gap between the solenoid coil and the valve housing.

8 Commissioning



WARNING

Faulty assembly!

If the valve is not correctly mounted, persons might be injured and the valve or system could be damaged when commissioning the valve.

- ▶ Only commission your system after 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.
- ▶ The solenoid coil may only be commissioned if mounted to the valve including pole tube and mounting nut and if the protective grounding conductor and the connection for potential equalization conductor are connected.

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 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 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!

Commissioning the valve requires basic hydraulic and electrical knowledge.

- ▶ Only qualified personnel (see chapter 2.4 "Qualification of personnel") is authorized to commission the valve.

NOTICE

Risk of short-circuit!

Condensed water may form inside the terminal box and cause a short-circuit!

- ▶ Allow the valve to acclimatize for a few hours prior to commissioning as the electronics might be damaged by the generation of condensed water.

In order to commission the valve, proceed as described in the sections below:

Checking the connection line

The following applies to all valves irrespective of the type of connection:

- ▶ The connection line must be checked for proper condition by or under the guidance and supervision of a specialized electrician before the initial commissioning or any re-commissioning.
- ▶ Replace damaged connection lines.

Checking electrical connections

- ▶ Check the inside of the terminal box for corrosion. In case of visible corrosion, do not install the valve.
- ▶ Electrical connections in the terminal box must be checked for proper condition by or under the guidance and supervision of a specialized electrician before the initial commissioning or any re-commissioning.
- ▶ Seals are subject to a natural process of aging and, for this reason, check seals for damages every time the terminal box is opened and replace them if required.

Bleeding the hydraulic system



Observe the operating instructions of the device and/or system into which the valve is installed.

- ▶ Before the actual operation, switch the valve several times with reduced pressure (50% operating pressure). This will press out any remaining air from the valve. Thus, mechanical damage caused by inadmissibly high acceleration of the fluid and the valve control spool is avoided and the life cycle of the valve is extended.



Do not switch the valve under operating pressure as this may cause damage.

- ▶ You can also achieve the switching movement of the valve control spool necessary for the bleeding procedure by manual actuation of the manual override, see chapter 9.2 “Operating the manual override (only relevant for type M-.SED6... N9...)”.

Performing a leak test

- ▶ Ensure that no hydraulic fluid leaks at the valve and the connections during operation.
- ▶ Check for internal leakage. The check must be carried out according to the possibilities present at the hydraulic system.



Internal leakage can be valve-specific but does not necessarily affect the functionality of the valve.

9 Operation

9.1 General information



WARNING

Explosion hazard caused by overheating!

Loss of explosion protection due to overheating!

- ▶ A simultaneous power supply of several valves in bank assembly is possible if the ambient temperature does not exceed 60°C.
- ▶ In case of bank assembly, if only one of the solenoid coils is energized at a time, and during individual operation, the maximum ambient temperature may not exceed 70°C.

Explosion hazard by the ignition of dust accumulations!

If the maximum dust layer thickness of > 5 mm is exceeded, there is an explosion hazard!

- ▶ Make sure that the maximum dust layer thickness is not exceeded.
- ▶ Regularly remove dust accumulations.



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 at the valves.

- ▶ In this case, contact a service engineer.

Only use the valve within the performance range provided in “Data sheet 22049-XE”.

The machine and/or system manufacturer is responsible for the correct project planning of the hydraulic system and its control.

Changing the settings on 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".

9.2 Operating the manual override (only relevant for type M-.SED6...N9...)

NOTICE

Danger of damage to property!

An uncontrolled operation of the manual override bears the danger of damaging the system!

- ▶ Only operate the manual override if it is ensured that this will not trigger any dangerous working movement of the connected actuator.
- ▶ Do not use sharp-edged tools to operate the manual override.

Valve type **M-.SED6...N9...** is equipped with a manual override. Using this manual override, the switching function of the valve can also be triggered if the solenoid coil is not energized.

The manual override is only intended for manual operation. It is not suitable for frequently recurring manual operation.

The manual override is located on the side of the valve solenoid facing away from the valve.

- ▶ For operation, push the manual override in the direction of the valve housing using a rounded tool with a maximum diameter of 5 mm or using a dedicated special tool (see chapter 7.6 “Required accessories”).

10 Maintenance and repair

10.1 Cleaning and care

NOTICE

Penetrating dirt and fluids will cause faults!

When dirt and fluids penetrate, safe function is no longer ensured.

- ▶ Always ensure absolute cleanliness when working at the valve.

Solvents and aggressive, highly inflammable cleaning agents!

Aggressive cleaning agents may damage the seals and the surface of the valve and cause them to age faster.

- ▶ Never use solvents or aggressive or highly inflammable cleaning agents.

Damage to the hydraulic system and seals!

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

- ▶ Do not use a high-pressure washer for cleaning.

For cleaning and care of the valve, please observe the following:

- ▶ Close all openings with appropriate protective caps/devices.
- ▶ Check that all seals and caps of the plug-in connections are firmly fitted so that no humidity can penetrate the valve during cleaning.
- ▶ Remove external dirt and keep sensitive and important parts like valve solenoids clean.
- ▶ Remove dust and dirt accumulations from the valve at regular intervals. Observe the max. admissible dust layer thickness.

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 that - also dependent on the operating conditions - expected deficiencies are identified in good time. 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 seen from the name plate.



Before the initial commissioning or re-commissioning of the valve in a system, check whether the valve requires maintenance. If required, carry out maintenance.

For order details for seal kits, please refer to chapter 10.6 “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 and depressurize the relevant system part.
2. Remove coarse dirt from the exterior.

CAUTION! Damage to persons and property caused by electrostatic charging!

- In order to avoid electrostatic charging, clean the valve using a damp cloth only.

3. Check all external fittings for completeness and tight seat.
4. Check cable and line entry, blind plug, external grounding connection and connection line for tight seat.
5. Check the valve for external leakage and replace the sealing devices, if required, see chapter 10.5 “Rectifying external leakages”.
6. Open the terminal box and replace any damaged seals. Check the inside of the terminal box for corrosion. Corrosion is an indication of leakage. In case of visible corrosion, remove the valve and have it repaired.
7. Check the potting compound of the solenoid coil, the internal lines and braided wires of the solenoid coil for visible damage. In case of visible damage, remove the valve and have it repaired.
8. Check all screws and connections for tight seat.
9. Check all connection lines for damage. Replace the connection line if there is any visible damage.
10. The sealing elements of the cable and line entry are only intended for single use. Replace the cable and line entry and the blind plug each time it is released; for spare parts, see chapter 10.6.
11. Re-assemble the cover of the terminal box with the seal beneath it. Tighten the mounting screws with the spring washers diagonally, one after the other. Tightening torque of the cover screws: 1...1.1 Nm.

10.3 Maintenance schedule

Valves require low maintenance if used as intended.

For a long and reliable operation of the valve, Bosch Rexroth recommends regularly checking the hydraulic system and the valve.

10.3.1 Checking for leakage

Check the valve for leakage. An early detection of hydraulic fluid loss may help you to identify and remedy errors. Bosch Rexroth therefore recommends that you keep the valve and/or the system permanently clean.

10.3.2 Checking for noise development

Check the valve for noise development. Based on noise development or the increase of 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 caused by improper repair!

Improper repair will void the explosion protection!

- For repair works, the valve may only be disassembled to the extent described in these operating instructions.
- Defective parts may only be replaced by new, interchangeable components in original equipment quality.

10.5 Rectifying external leakages

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

10.5.1 Rectifying leakage 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 sealing devices.
6. Assemble the valve at the contact surface, see chapter 7 “Assembly”.

10.6 Spare parts

Seal kit for the valve connection surface

Table 12: Seal kit for the valve connection surface

Spare part	Material number
NBR seal kit for the valve connection surface	R900075699
FKM seal kit for the valve connection surface	R900075700



Ensure the suitability of the sealing materials for the hydraulic fluid used!
See "Data sheet 22049-XE".

Terminal box spare part kit

Table 13: Terminal box spare part kit

Spare part	Material number
Terminal box spare part kit includes: 1 x complete cable and line entry 1 blind plug with O-ring 4 M4 hexagon socket head cap screws for the terminal box 4 x spring washers for the terminal box 1 x flat seal	upon request

Valve mounting screws

Table 14: Valve mounting screws for valve type M-3SED 6...

Type	Quantity	Friction coefficient according to VDA 235-101	Material number
Hexagon socket head cap screw ISO 4762-M5x50-10.9 (corrosion-protected)	4	0.09...0.14	R913043758

Table 15: Valve mounting screws for valve type M-4SED 6 ...

Type	Quantity	Friction coefficient according to VDA 235-101	Material number
Hexagon socket head cap screw ISO 4762-M5x95-10.9 (corrosion-protected)	4	0.09...0.14	R913051579

In case of questions about spare parts, please contact your responsible
Bosch 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 injuries at pressurized or energized system parts!

For works at pressurized or energized system parts, there is a danger of injury due to escaping hydraulic fluid or electric energy.

- Before disassembly, ensure that the hydraulic system is depressurized, and the electrical control is de-energized.



CAUTION

Falling of an incompletely disassembled valve!

An incompletely disassembled valve may fall down and cause injuries.

- 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. Disconnect the electrical connections professionally.
3. Prepare a container for collecting leaking hydraulic fluid.
4. Use suitable tools to loosen the valve mounting screws of the valve.
5. Remove the valve mounting screws and remove the valve from the mounting surface.
6. Collect 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, please close the valve connection surface using the supplied protective plate or protect it using equivalent packaging in order to avoid contamination and damage.
8. Close the hydraulic channels of the subplate (on the customer side) 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

Careless disposal of the valve and the hydraulic fluid may 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. Valves must be drained before being returned. The components should be delivered free 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 intended use. Normally, no unfavorable effects on human beings and on the environment have to be expected.

The valves basically comprise 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, 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, random, thoughtless disassembly and changing 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 has worked 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:
 - Were there any changes to the application conditions or area of application of the valve?
 - Have changes (e.g. refitting) or repair work been carried out on the overall system (machine/system, electrical systems, control) or at the valve? If so: What were they?
 - Was the valve and/or the machine 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 switch	Electrical connection interrupted, no current continuity	
	• Cable break	Replace connection line
	• Electrical defect in the solenoid coil	Remove valve and have it repaired
	• No pressure at P	Check and/or reapply pressure at port P
	• Control spool is jammed due to contamination	If possible, try to release the control spool by manually actuating the manual override. See chapter 9.2“Operating the manual override (only relevant for type M-.SED6...N9...)”. If this fails: Remove valve and replace it with a new one.
External leakage	Contact problems at the connection terminal	Check the mounting screws of the connection terminal and tighten using a manual torque wrench. Observe the instructions in chapter 7 “Assembly”.
	Seal defective	
	• Seal at the connection surface is defective	Remove the valve and replace the seals
	• 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 22049-XE*”.

16 Appendix

16.1 List of addresses

Contacts for service and spare parts

Bosch Rexroth AG
Bürgermeister-Dr.-Nebel-Straße 8
97816 Lohr am Main
Germany

Phone

+49 (0) 9352/40 50 60

Email

service@boschrexroth.de

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


EU-Konformitätserklärung - Original
EU declaration of conformity

Dok.-Nr. / Doc. No.: DCTC 31001-012

Datum / Date: 28.09.2020

- ☐ 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: **Wege-Sitzventile, direktgesteuert, mit Magnetbetätigung / Directional spool valves, direct operated, with solenoid actuation**

Typ / Type: **SED6..1X/...XE...** (nach Datenblatt 22049-XE / according to data sheet 22049-XE)
 Kennzeichnung / Marking: **II 2G; II 2D**

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:

Nicht elektrischer Teil / Non-electrical part **EN 80079-36:2016, EN 80079-37:2016**

EU-Baumusterprüfbescheinigung Nr. der Magnetspule /

EU type examination certificate no. of the solenoid coil **BVS 20 ATEX E 009 X**

IECEx Konformitätsbescheinigung der Magnetspule /

IECEx Certificate of Conformity of the solenoid coil **IECEx BVS 20.0007X**

Weitere Erläuterungen / Further explanations:

Die Montage- und Installationshinweise gemäß Produktdokumentation 22049-XE sind zu beachten. / The assembling and installation instructions according to the manual 22049-XE have to be followed.

Eine Kopie der technischen Unterlagen dieses Gerätes wird bei der notifizierten Stelle 0637 IBExU aufbewahrt. / A copy of the technical documentation of this device is kept by the notified body 0637 IBExU.

Lohr am Main
 Ort / Place

28.09.2020
 Datum / Date

i.V.
 Achim Richartz, DC-IH/EHC
 Entwicklung Industriehydraulische
 Steuerungen
 Engineering Industrial Hydraulic
 Controls

Frank Theil, DC-IH/MG
 Leitung Fertigung Industriehydraulik
 Senior Vice President Manufacturing
 Industrial Hydraulics

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.

Seite Page 1 / 1

RA51217547
 DCTC-31001-012_KOE_M_DE_EN_2020-09-28.docx

18 Index

► A			
Abbreviations	8		
Accessories	25		
Appendix	46		
Assembly	23		
► C			
Commissioning	34		
► D			
Damage to product	16		
Declaration of conformity	47		
Disassembly and removal	42		
Disposal	43		
► E			
Explosion protection marking	20		
Extension and modification	44		
► F			
Fault table	45		
► I			
Information	7		
Inspection	38		
Installation conditions	23		
Intended use	9		
► L			
List of addresses	46		
► M			
Maintenance	38		
Maintenance and repair	38		
Maintenance schedule	40		
Manual override	37		
Materials used	43		
► O			
Obligations of the machine end-user	15		
Operation	36		
► P			
Packaging	43		
Personal protective equipment	15		
Product identification	18		
► Q			
Qualification of personnel	11		
► R			
Recycling	44		
Repair	40		
Required and amending documentation	7		
Risk classes	8		
► S			
Safety instructions	9		
Scope of delivery	17		
Spare parts	41		
Surface protection	23		
Symbols	8		
► T			
Technical data	45		
Transport and storage	21		
Troubleshooting	44		
► V			
Valve subplate	24		
Valve use	15		

Bosch Rexroth AG

Zum Eisengießer 1
97816 Lohr a. Main
Germany
Tel: +49 (0) 9352/40 30 20
my.support@boschrexroth.de
www.boschrexroth.com