Compact unit for use in centralized lubrication systems

Product series: KFU2(6)-... and KFUS2-...

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Read these instructions before installation or start-up of the product and keep them readily available for later consultation!

Original EC Declaration of Incorporation in accordance with Directive 2006/42/EC, Appendix II Part 1 B

The manufacturer hereby declares at its sole responsibility that the partly completed machinery conforms to the essential health and safety requirements of the Machinery Directive 2006/42/EC, Annex I, marked in the Annex to the EC Declaration of Incorporation as applicable and fulfilled at the time of placing on the market.
The special technical documents were prepared following Annex VII part B. Upon justifiable request, these special technical documents can be forwarded electronically to the respective national authorities. The authorized company for the compilation of the technical documentation is the manufacturer.

Designation: Compact unit for use in centralized lubrication systems
Type / item number: KFU2(6)-...
KFUS2-...
Year of manufacture: See type plate

Furthermore, the following directives and standards were applied in the respective applicable areas:
2006/42/EC: Machinery Directive
2011/65/EU: RoHS II
2014/30/EU: Electromagnetic Compatibility

EN ISO 12100:2010	EN 60204-1:2018	EN 809+A1/AC:2010	EN IEC 63000:2018
EN IEC 61000-6-1:2007	EN IEC 61000-6-2:2005	EN IEC 61000-6-3:2012	EN IEC 61000-6-4:2011

The partly completed machinery must not be put into service until it has been established that the machinery into which it is to be incorporated is in compliance with the provisions of the Machinery Directive 2006/42/EC and all other applicable Directives.

Berlin, 07.08.2021
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Germany

Richard Lindemann
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Manufacturer: SKF Lubrication Systems Germany GmbH, Motzener Strasse 35/37, 12277 Berlin, Germany

Original UK Declaration of incorporation according to the Supply of Machinery (Safety) Regulations 2008 No. 1597 Annex II

The manufacturer hereby declares under sole responsibility that the partly completed machinery complies with the essential health and safety requirements of UK legislation Supply of Machinery (Safety) Regulations 2008 No. 1597 Annex I, marked in the Annex to the EC Declaration of Incorporation as applicable and fulfilled at the time of placing on the market.
The special technical documents were prepared following Annex VII part B. Upon justifiable request, these special technical documents can be forwarded electronically to the respective national authorities. The authorized company for the compilation of the technical documentation is SKF (U.K.) Limited, 2 Canada Close, Banbury, Oxfordshire, OX16 2RT, GBR.

Designation: Compact unit for use in centralized lubrication systems
Type / item number: KFU2(6)-...
KFUS2-...
Year of manufacture: See type plate

Furthermore, the following regulations and standards were applied in the respective applicable areas:
Supply of Machinery (Safety) Regulations 2008 No. 1597

- Electromagnetic Compatibility Ordinance 2016 No. 1091
- The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 No. 3032

EN ISO 12100:2010	EN 60204-1:2018	EN 809+A1/AC:2010	EN IEC 63000:2018
EN IEC 61000-6-1:2007	EN IEC 61000-6-2:2005	EN IEC 61000-6-3:2012	EN IEC 61000-6-4:2011

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Appendix to Declaration of Incorporation in accordance with 2006/42/EC, Annex II, No. 1 B

Description of the essential health and safety requirements according to 2006/42/EC, Annex I, which have been applied and fulfilled:

Table 1

Appendix to Declaration of Incorporation

No.:	Essential health and safety requirement	Applicable:	Fulfilled:
1.1	Principles		
1.1.2	Principles of safety integration	Yes	Yes
1.1.3	Materials and products	Yes	Not completely fulfilled [1)]
1.1.5	Design of machinery to facilitate its handling	Yes	Yes
1.1.6	Ergonomics	Yes	Not completely fulfilled [2)]
1.2	Control systems		
1.2.1	Safety and reliability of control systems	Yes	Yes
1.2.3	Starting	Yes	Yes
1.2.6	Failure of the power supply	Yes	Yes
1.3	Protection against mechanical hazards		
1.3.1	Risk of loss of stability	Yes	Yes
1.3.2	Risk of break-up during operation	Yes	Not completely fulfilled [3)]
1.3.4	Risks due to surfaces, edges or angles	Yes	Yes
1.3.7	Risks related to moving parts	Yes	Yes
1.3.9	Risks of uncontrolled movements	Yes	Yes
1.5	Risks due to other hazards		
1.5.1	Electricity supply	Yes	Yes
1.5.6	Fire	Yes	Yes
1.5.8	Noise	Yes	Yes
1.5.13	Emissions of hazardous materials and substances	Yes	Yes
1.5.15	Risk of slipping, tripping, or falling	Yes	Yes
1.6	Servicing		
1.6.1	Machinery maintenance	Yes	Yes
1.6.2	Access to operating positions and servicing points	Yes	Not completely fulfilled [4)]
1.6.4	Operator interventions	Yes	Yes
1.7	Information		
1.7.1	Information and warnings on the machinery	Yes	Yes
1.7.1.1	Information and information devices	Yes	Yes
1.7.2	Warning of residual risks	Yes	Yes
1.7.3	Marking of machinery	Yes	Yes
1.7.4	Operating instructions/assembly instructions	Yes	Yes
1.7.4.1	General principles for the drafting of operating instructions/assembly instructions	Yes	Yes
1.7.4.2	Contents of the operating instructions/assembly instructions	Yes	Yes
1.7.4.3	Sales literature	Yes	Yes

[1)] The product is designed for operation with non-hazardous media. The owner-operator must check whether the lubricant used has certain hazardous effects (such as sensitization). Appropriate safety measures must be taken if needed.
[2)] The integrator must ensure that the pump is integrated into the machine in such a way that it can be filled and operated ergonomically.
[3)] The operator must protect the system against excessive pressure. For this purpose, the system must be provided with a pressure limiting valve with suitable opening pressure.
[4)] The integrator must ensure that the pump is integrated into the machine in such a way that it can be operated without danger.

Masthead

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Authorized local distributors
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OX16 2RT, GBR.

- North America -
SKF Lubrication Business Unit
Lincoln Industrial
5148 North Hanley Road, St. Louis,
MO. 63134 USA

- South America -
SKF Argentina Pte. Roca 4145,
CP 2001 Rosario, Santa Fe

Warranty
The instructions contain no statements regarding the warranty or liability for defects. That information can be found in our General Terms of Payment and Delivery.

Training
We conduct detailed training in order to enable maximum safety and efficiency. We recommend taking advantage of this training. For further information, contact your authorized SKF dealer or the manufacturer.

Table of contents

Safety alerts, visual presentation, and layout

While reading these instructions, you will encounter various symbols, illustrations, and text layouts intended to help you navigate and understand the instructions. Their meaning is explained below.

Safety alerts:
Activities that present specific hazards (to life and limb or possible damage to property) are indicated by safety alerts. Always be sure to follow the instructions given in the safety alerts.

⚠ DANGER
These safety alerts indicate an imminent danger. Ignoring them will result in death or serious injury

⚠ WARNING
These safety alerts indicate potentially imminent danger. Ignoring them could result in death or serious injury

⚠ CAUTION
These safety alerts indicate potentially imminent danger. Ignoring them could result in minor injury

NOTICE
These safety alerts indicate a potentially harmful situation. Ignoring them could result in damage to property or malfunctions

Illustrations:
The illustrations used depict a specific product. For other products, they may have the function of a diagram only. This does not alter the basic workings and operation of the product.

Text layout:
- **First-order bulleted lists:** Items on a bulleted list start with a solid black dot and an indent.
  - **Second-order bulleted lists:** If there is a further listing of subitems, the second-order bulleted list is used.

1 **Legend:** A legend explains the numbered contents of an illustration, presented as a numbered list. Items in a legend start with a number (with no dot) and an indent.
  - **Second-order legend:** In some cases, the numbered contents of an image represent more than just one object. A second-order legend is then used.

1. **Instruction steps:** These indicate a chronological sequence of instruction steps. The numbers of the steps are in bold and are followed by a period. If a new activity follows, the numbering starts again at "**1.**"
  - **Second-order instruction steps:** In some cases, it is necessary to divide up a step into a few substeps. A sequence of second-order instruction steps is then used.

1. Safety instructions

1.1 General safety instructions

- Putting the products into operation or operating them without having read the instructions is prohibited. The operator must ensure that the instructions are read and understood by all persons tasked with working on the product or who supervise or instruct such persons. Retain the instructions for further use.
- The product may only be used in awareness of the potential dangers, in proper technical condition, and according to the information in this manual.
- Any faults that could affect safety must be remedied according to responsibility. The supervisor must be notified immediately in case of malfunctions outside one's individual scope of responsibility.
- Unauthorized modifications and changes can have an unpredictable effect on safety and operation. Unauthorized modifications and changes are therefore prohibited. Only original SKF spare parts and SKF accessories may be used.
- Any unclear points regarding proper condition or correct assembly/operation must be clarified. Operation is prohibited until issues have been clarified.
- The components used must be suitable for the intended use and the applicable operating conditions, e.g. max. operating pressure and ambient temperature range, and must not be subjected to torsion, shear, or bending.

1.2 General electrical safety instructions

- Electrical devices must be kept in proper condition. This must be ensured by periodic inspections in accordance with the relevant applicable standards and technical rules. The type, frequency, and scope of the inspections must be determined in accordance with the risk assessment to be carried out by the operator. Work on electrical components may be performed only by qualified electricians. Connect the electrical power only in accordance with the valid terminal diagram and in observance of the relevant regulations and the local electrical supply conditions.
- Work on electrical components may be performed only in a voltage-free state and using tools suitable for electrical work. Do not touch cables or electrical components with wet or moist hands.
- Fuses must not be bridged. Always replace defective fuses with fuses of the same type.
- Ensure proper connection of the protective conductor for products with protection class I. Observe the specified enclosure rating.
- The operator must implement appropriate measures to protect vulnerable electrical devices from the effects of lightning during use. The electrical device is not furnished with a grounding system for the dissipation of the respective electric charge and does not have the voltage strength necessary to withstand the effects of lightning.

1.3 General behaviour when handling the product

- Familiarize yourself with the functions and operation of the product. The specified assembly and operating steps and their sequences must be observed.
- Keep unauthorized persons away.
- Wear personal protective equipment always.
- Precautionary operational measures and instructions for the respective work must be observed.
- In addition to these Instructions, general statutory regulations for accident prevention and environmental protection must be observed.
- Precautionary operational measures and instructions for the respective work must be observed. Uncertainty seriously endangers safety.
- Safety-related protective and safety equipment must not be removed, modified or affected otherwise in its function and is to be checked at regular intervals for completeness and function.
- If protective and safety equipment has to be dismantled, it must be reassembled immediately after finishing the work, and then checked for correct function.
- Remedy occurring faults in the frame of responsibilities. Immediately inform your superior in the case of faults beyond your competence.
- Never use parts of the centralized lubrication system or of the machine as standing or climbing aids.

1.4 Intended use

Supply of lubricants.
The product is intended solely for installation in another machine.
Use is only permitted within the scope of commercial or economic activity by professional users, in compliance with the specifications, technical data, and limits specified in this manual.

1.5 Persons authorized to use the product

Operator
A person who is qualified by training, knowledge and experience to carry out the functions and activities related to normal operation. This includes avoiding possible hazards that may arise during operation.

Specialist in electrics
Person with appropriate professional education, knowledge and experience to detect and avoid the hazards that may arise from electricity.

Specialist in mechanics
Person with appropriate professional education, knowledge and experience to detect and avoid the hazards that may arise during transport, installation, start-up, operation, maintenance, repair and disassembly.

1.6 Foreseeable misuse

Any usage of the product other than as specified in this manual is strictly prohibited. Particularly prohibited are:

- Use of non-specified consumables, contaminated lubricants, or lubricants with air inclusions.
- Use of C3 versions in areas with aggressive, corrosive substances (e.g., high salt load).
- Use of plastic parts in areas with high exposure to ozone, UV light, or ionizing radiation.
- Use to supply, convey, or store hazardous substances and mixtures as defined in the CLP Regulation (EC 1272/2008) or GHS with acute oral, dermal, or inhalation toxicity or substances and mixtures that are marked with hazard pictograms GHS01-GHS06 and GHS08.
- Use to supply, convey, or store Group 1 fluids classified as hazards as defined in the Pressure Equipment Directive (2014/68/EU) Article 13 (1) a).
- Use to supply, convey, or store gases, liquefied gases, dissolved gases, vapors, or fluids whose vapor pressure exceeds normal atmospheric pressure (1013 mbar) by more than 0.5 bar at their maximum permissible operating temperature.
- Use in an explosion protection zone.
- Use without proper securing against excessively high pressures, in the case of pressurized products.
- Use outside of the technical data and limits specified in this manual.

1.7 Referenced documents

In addition to this manual, the following documents must be observed by the respective target group:

- Company instructions and approval rules

If applicable:

- Safety data sheet of the lubricant used
- Project planning documents
- Supplementary information regarding special designs of the pump. This you will find in the special system documentation.
- Instructions for other components for setting up the centralized lubrication system.

1.8 Prohibition of certain activities

- Repairs or modifications to the drive

1.9 Painting plastic components and seals

The painting of any plastic components and seals of the products described is prohibited. Completely mask or remove plastic components before painting the main machine.

1.10 Safety markings on the product

No safety markings on the product

NOTE

In accordance with the results of the workstation risk assessment, additional labels (e.g., warnings, safety signs, prohibition signs, or labels in accordance with CLP/GHS) are to be attached by the operator if necessary.

1.11 Note on the type plate

The type plate provides important data such as the type designation, order number, and sometimes regulatory characteristics. To avoid loss of this data in case the type plate becomes illegible, it should be entered in the manual.

1.12 Notes on CE marking

CE marking is effected following the requirements of the applied directives requiring a CE marking:

- 2014/30/EC Electromagnetic Compatibility
- 2011/65/EU Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS II)

1.13 Note on UKCA marking

The UKCA conformity marking confirms the product's conformity with the applicable legal provisions of Great Britain.

1.14 Note on ECE mark

The ECE test mark (E1) confirms that an ECE type approval (components requiring approval on motor vehicles) has been granted for a product which bears this mark on its type plate.

1.15 Note on EAC marking

The EAC conformity marking confirms the product's conformity with the applicable legal provisions of the Eurasian customs union.

1.16 Note on China RoHS mark

The China RoHS mark confirms that there is no danger to persons or the environment from the regulated substances contained within for the intended period of use (year number shown in the circle).

1.17 Emergency shutdown

This is done by a course of action to be defined by the operator.

1.18 Assembly, maintenance, fault, repair

Prior to the start of this work, all relevant persons must be notified of it. At a minimum, the following safety measures must be taken before any work is done:

- Unauthorized persons must be kept away
- Mark and secure the work area
- Cover adjacent live parts
- Dry any wet, slippery surfaces or cover them appropriately
- Cover hot or cold surfaces appropriately

Where applicable:

- Depressurize
- Isolate, lock and tag out
- Check to ensure live voltage is no longer present
- Ground and short-circuit

The product should be protected as much as possible from humidity, dust, and vibration, and should be installed so that it is easily accessible. Ensure an adequate distance from sources of heat or cold. Any visual monitoring devices present, such as pressure gauges, min./max. markings, or oil level gauges must be clearly visible. Observe the mounting position requirements.

Drill required holes only on non-critical, non-load-bearing parts of the operator's infrastructure. Use existing holes where possible. Avoid chafe points. Immobilize any moving or detached parts during the work. Adhere to the specified torques.

If guards or safety devices need to be removed, they must be reinstalled immediately following conclusion of work and then checked for proper function.

Check new parts for compliance with the intended use before using them.

Avoid mixing up or incorrectly assembling disassembled parts. Label parts. Clean any dirty parts.

1.19 First start-up, daily start-up

Ensure that:

- All safety devices are fully present and functional
- All connections are properly connected
- All parts are correctly installed
- All warning labels on the product are fully present, visible, and undamaged
- Illegible or missing warning labels are immediately replaced

1.20 Residual risks

Table 2

Residual risks

Residual risk	Possible in lifecycle	Avoidance / Remedy
Parts tipping/falling during transport, e.g., on an incline.	A	Secure parts against tipping/falling during transport (e.g., using belts, straps, ropes, etc.).
Falling of hoisted parts/tools.	B	Nobody is allowed to be present below hoisted parts. Unauthorized persons must be kept away. Secure hoisted parts using suitable lifting gear (e.g., using belts, straps, ropes, etc.).
Falling of parts inadequately secured to the machine.	B	Mount the product only on machine parts with sufficient load-carrying capacities. Be mindful of the weight. Comply with the specified torques. If no torques are specified, use those specified for thread size 8.8 ➔ See literature from the screw manufacturer.
Personnel slipping due to floor contamination with spilled or leaked lubricants.	B C E G H K	• Exercise caution when connecting hydraulic connections on the product. • Promptly apply suitable binding agents and then remove the spilled or leaked lubricant. • Follow operational instructions for handling the lubricants and contaminated parts.
Tearing or damage to lines when installed on moving machine components.	B	Installing the pump on moving machine components should be avoided whenever possible. In cases where mounting the pump in this way cannot be avoided, flexible hose lines must be used.
Lubricant spraying out due to faulty component fitting, or incorrect connection of lines.	B C	• Tighten all components securely or using the specified torques. • Use hydraulic screw unions and lines suitable for the indicated pressures, and check them for proper connection and for damage prior to first start-up.

Table 2

Residual risks

Residual risk	Possible in lifecycle	Avoidance / Remedy
Strong heating of the motor, or motor fault, due to jamming.	G	Switch off the pump. Let parts cool off; remedy the cause.
Environmental contamination by lubricants and wetted parts.	K	Dispose of contaminated parts according to the applicable legal/company rules.
Personal injury, property damage due to spilled, leaked lubricant.	B C D F G H K	Be careful when connecting or disconnecting the lubricant lines. Use only hydraulic screw unions and lubrication lines suitable for the specified pressure. Do not mount lubrication lines on moving parts or chafe points. If this cannot be avoided, use anti-kink coils and/or conduits.
Fire hazard or damage to the pump from operation with damaged electrical components, such as power cables and plugs.	B C D E F G H	Inspect electrical components for damage prior to initial use and then at regular intervals. Do not install cables on moving parts or chafe points. If this cannot be avoided, use anti-kink coils and/or conduits.
Loss of electrical protective function due to incorrect assembly of the electrical components after a repair.	G	An electrical safety check in accordance with ISO 60204-1 must be performed after the replacement of electrical components.

Lifecycle phases: A = Transport, B = Assembly, C = First start-up, D = Operation, E = Cleaning, F = Maintenance, G = Malfunction, repair, H = Shutdown, K = Disposal

2. Lubricants

2.1 General information

Lubricants are selected specifically for the relevant application. The manufacturer or operator of the machine should ideally make the selection in consultation with the supplier of the lubricant. If you have no or little experience in selecting lubricants for lubrication systems, please contact us. We would be happy to assist you in selecting suitable lubricants and components to build a lubrication system optimized for your particular application. Consider the following points when selecting/using lubricants. This will spare you potential downtime and damage to the machine or lubrication system.

2.2 Material compatibility

The lubricants must generally be compatible with the following materials:

- Plastics: ABS, CR, FPM, NBR, NR, PA, PET, PMMA, POM, PP, PS, PTFE, PU, PUR
- Metals: steel, gray cast iron, brass, copper, aluminum

2.3 Temperature properties

The lubricant used must be suitable for the specific ambient temperature of the product. The viscosity approved for proper functioning must neither be exceeded at low temperatures nor fall too low at high temperatures. For the approved viscosity, see the “Technical data” chapter.

2.4 Aging of lubricants

Based on past experience with the lubricant used, checks should be conducted at regular intervals defined by the operator, to determine whether the lubricant needs to be replaced due to aging processes (oil separation). In case of doubt regarding the continued suitability of the lubricant, it must be replaced before the system is started up again. If you do not yet have any experience with the lubricant used, we recommend conducting a check after just one week.

2.5 Avoidance of faults and hazards

To avoid faults and hazards, please observe the following:

- When handling lubricants, observe the relevant safety data sheet (SDS) and any hazard labeling on the packaging.
- Due to the large number of additives, some lubricants that meet the pumpability requirements specified in the manual are not suitable for use in centralized lubrication systems.
- Whenever possible, always use SKF lubrication greases. They are ideal for use in lubrication systems.
- Do not mix lubricants. This can have unpredictable effects on the properties and usability of the lubricant.
- Use lubricants containing solid lubricants only after technical consultation with SKF.
- The lubricant’s ignition temperature has to be at least 50 kelvin above the maximum surface temperature of the components.

2.6 Solid lubricants

Solid lubricants may only be used after prior consultation with SKF. When solid lubricants are used in lubrication systems, the following rules generally apply:

Graphite:

- Maximum graphite content 8%
- Maximum grain size 25 µm (preferably in lamellar form)

MoS2:

- Maximum MoS2 content 5%
- Maximum grain size 15 µm

Copper:

- Lubricants containing copper are known to lead to coatings forming on pistons, bore holes, and mating surfaces. This can result in blockages in the centralized lubrication system.

Calcium carbonate:

- Lubricants containing calcium carbonate are known to lead to very heavy wear on pistons, bore holes, and mating surfaces.

Calcium hydroxide:

- Lubricants containing calcium hydroxide are known to harden considerably over time, which can lead to failure of the centralized lubrication system.

PTFE, zinc, and aluminum:

- For these solid lubricants, it is not yet possible to define any limit values for use in lubrication systems on the basis of existing knowledge and practical experience.

3. Overview, functional description

3.1 General

Compact units of the KFU(S)... series are reservoir units with electrically driven gear pumps that contain all hydraulic and electrical components required for the operation of a piston metering system. Thanks to their compact construction, compact units can be used to set up piston metering systems to lubricate commercial vehicles very easily, with little installation work required. Compact units of the KFU(S)... series come in a standard version designed for use with fluid grease of NLGI Grades 00 and 000. Special designs for oil and for industrial machine lubrication are available on request.

3.2 Design

In the basic design, compact units of the KFU(S)... series include an electrically driven gear pump (supplied by 12 V or 24 V DC power), a lubricant reservoir made of plastic (3 or 6 liter rated capacity), plus a pressure-relief valve and pressure limiting valve which are mounted inside the compact unit. A filler coupling with built-in strainer is provided for filling the lubricant reservoir. This filler coupling is accessed by removing the cover cap of the compact unit. Special designs with a filling cover are available on request. Optionally, a lubricant level switch can also be fitted for monitoring of the minimum level.

The plastic reservoirs consist of transparent plastic (3 and 6 liter rated capacity) that allows visual inspection of the fill level. Due to the components built into the reservoir, only a maximum of 80 % of the theoretical reservoir capacity (rated capacity) can be used.

The pressure-relief valve mounted in the compact unit is required in order to relieve the system pressure built up during a lubricating cycle to a residual pressure of ≤ 0.5 bar once the motor is turned off. This is required for the operation of the piston metering devices.

The pressure limiting valve mounted in the compact unit is required to limit the maximum permissible system pressure in the lubrication system. The pressure limiting valve in the KFU(S)... series compact unit is set to a maximum system pressure of 38 bar.

Compact units of the KFU(S)... are available in model designs with or without a control unit. In the model design without a control unit (for commercial vehicles and industry), the compact unit (and thereby the lubrication interval) is controlled by the control unit of the commercial vehicle/machine that the compact unit is mounted on. In the model design with a control unit (commercial vehicles only), the compact unit is equipped with an electronic control unit that controls the compact unit (and thereby the lubrication interval).
In the model design without a control unit, the KFU(S)... series compact units are connected to the 12 V or 24 V DC supply voltage via a 2-pin circular connector, M24 x 1, protected against reverse polarity (with positive and negative pins). In the model design with a control unit, the supply voltage is connected via a 4-pin circular connector DIN 72585-A1-4.1-Ag/K1 (only pins 1 and 2 are used, pins 3 and 4 are not used).

In both model designs, optional monitoring devices, such as a float switch, are electrically connected directly via the electrical connection of the monitoring device.

Depending on the model design, the compact unit may be equipped with a pushbutton under the cover cap. The pushbutton is used for manually performing an intermediate lubrication.

Depending on the model design, the hydraulic pressure to the main lubricant line is connected either via a plug connection for 10 mm diameter tubes or by a threaded port for solderless fitting of 10 mm diameter tubes. The port for the solderless fitting has a M16 x 1.5 thread.

For reservoir ventilation and overfill release, there is an overfill release tube on the left side of the compact unit.

The standard version is designed for use with fluid greases of NLGI Grades 00 and 000 as the lubricant. Special designs for oil are available on request.

3.3 Control unit IG490+924

In the model design of the KFU(S)... series compact units with a control unit, the control unit used is the IG490+924 (24V DC). The IG490+924 control unit is designed as a circuit board, installed under a separate cover cap on the compact unit. The IG490+924 control unit acts as a timer for four different pause times (6, 9, 11, and 20 hours). The lubrication interval (the pump run time) is permanently set to 160 seconds. The different pause times are set by positioning two jumpers directly on the circuit board of the control unit. The factory setting for the pause time is 9 hours.

3.4 Functional description

3.4.1 General

Compact units of the KFU(S)... series are generally used for single-line systems with piston metering devices. Single-line systems with piston metering devices are total-loss lubrication systems.

3.4.2 Total-loss lubrication systems

Total-loss lubrication systems feed clean lubricant (in this instance: oil or fluid grease) to one or more lubrication points at specific intervals during the lubrication run time (also called the contact time, or pump run time). The quantity of lubricant fed is measured so that the lubrication points are supplied with adequate lubricant during the total-loss lubrication system's pause time to maintain a lubricant film between the friction partners. During operation, the lubricant fed is partially consumed by aging, evaporation, oil separation, and leakage. An interval-controlled supply of lubricant to the lubrication point is required in order to ensure that the lubrication point receives adequate lubrication. Such systems are referred to as intermittently operated lubrication systems.

A total-loss lubrication system cannot be used to cool the lubrication points.

3.4.3 Single-line lubrication systems with piston metering devices

Single-line systems with piston metering devices generally consist of a reservoir unit (in this instance a compact unit), piston metering devices, and lubrication lines. The pressure limiting valve and pressure-relief valve required for operation of the lubrication system are mounted in the compact unit.
If pressure losses greater than 10 bar are expected in the lubrication system—due to expansion of the lubrication system, lubricant viscosity, or low ambient temperatures, for example—a pressure switch should be installed to monitor the lubrication system, mounted at the end of the main lubricant line if possible. The pressure switch monitors whether the required pressure build-up occurs in the lubrication system during the pump run time.

Pressure in the main lubricant line must be relieved after the pump is switched off in order to ensure proper functioning of the piston distributors. This is performed by the pressure relief valve mounted in the compact unit.

3.4.4 Lubrication cycle sequence

The sequence of a lubrication cycle depends on the type of piston metering devices in use. Piston metering devices are differentiated into prelubrication metering devices and relubrication metering devices. Piston metering devices designed as prelubrication metering devices deliver the metered quantity of lubricant at the same time that pressure is built up in the lubrication system. Piston metering devices designed as relubrication metering devices supply the metered quantity of lubricant after the pressure relief procedure in the lubrication system.

3.4.4.1 Lubrication cycle of prelubrication metering device

When the electric motor is switched on, the lubricant is drawn out of the lubricant reservoir by the gear pump and fed through the main lubricant line to the prelubrication metering devices, via the pressure-relief valve and the pressure limiting valve. The pressure built up in the main lubricant line is used to meter the lubricant separately for each lubrication point, and to feed it through the feed line to the consuming point. When the electric motor is switched off, the pressure is relieved in the main lubricant line to a residual pressure of ≤ 0.5 bar. In the process, the lubricant is moved into the storage chamber of the prelubrication metering device. The lubrication system is ready for the next lubrication cycle.

3.4.4.2 Lubrication cycle of relubrication metering device

When the electric motor is switched on, the lubricant is drawn out of the lubricant reservoir by the gear pump and fed through the main lubricant line to the relubrication metering devices, via the pressure-relief valve and the pressure limiting valve. The pressure built up in the main lubricant line feeds the lubricant into the storage chamber of the relubrication metering devices. When the electric motor is switched off, the pressure is relieved in the main lubricant line to a residual pressure of ≤ 0.5 bar. In this process, the lubricant is metered within the relubrication metering device and dispensed to the lubrication point via the feed line (for a relubrication effect). When the lubricant has been completely expelled to the lubrication point, the lubrication system is ready for the next lubrication cycle.

4. Technical data

Table 3

Technical data

Designation	KFU2-40+912/924	KFU6-20+912/924	KFUS2-64+924	KFUS2-60-...+924
General				
Delivery rate [1.]	0.14 l/min	0.14 l/min	0.14 l/min	0.14 l/min
Connected load, max.	80 cm^3	80 cm^3	80 cm^3	80 cm^3
Ambient temperature	-25 to +75°C	-25 to +75°C	-25 to +75°C	-25 to +75°C
Rated capacity of reservoir	3 liters	6 liters	3 liters	3 liters
Reservoir material	Plastic	Plastic	Plastic	Plastic
Pressure limiting valve	38 bar	38 bar	38 bar	38 bar
Pressure-relief valve	Included	Included	Included	Included
Enclosure rating	IP5K9K	IP5K9K	IP5K9K	IP5K9K
Weight	Approx. 5.5 kg	Approx. 7.5 kg	Approx. 5.5 kg	Approx. 5.5 kg
NLGI grade	000.00	000.00	000.00	000.00
Motor (type)	Brush motor	Brush motor	Brush motor	Brush motor
Rated voltage	12 / 24 V DC	12 / 24 V DC	24 V DC	24 V DC
Rated current	3,6 / 1,8 A	3,6 / 1,8 A	1.8 A	1.8 A
Current, max.	5,3 / 2,65 A	5,3 / 2,65 A	2.65 A	2.65 A
Starting current	21 / 10,6 A	21 / 10,6 A	10.6 A	10.6 A
Fuse protection required	16 / 8 A	16 / 8 A	/8 A	/8 A
Rated speed	1940 rpm	1940 rpm	1940 rpm	1940 rpm
Service life	3000 h	3000 h	3000 h	3000 h
Electrical connection	Circular connector	Circular connector	Circular connector	Circular connector
Type	-	-	DIN72585-A1-4.1-Ag/K1	DIN72585-A1-4.1-Ag/K1
Number of pins	2-pin	2-pin	4-pin	4-pin
Connection thread	M24 x 1	M24 x 1	Bayonet	Bayonet
Reverse voltage protection	Yes	Yes	Yes	Yes
Control unit	None	None	IG490+924	IG490+924
Pause time, adjustable	-	-	6, 9 [2.], 11, 20 h	6, 9 [2.], 11, 20 h
Lubrication time, fixed	-	-	160 s	160 s
Pushbutton for manual intermediate lubrication	No	No	Yes	Yes
Lubrication line connection	solderless tube union	solderless tube union	Quick release fittings	Quick release fittings
Pipe diameter	10 mm	10 mm	10 mm	10 mm
Connection thread	M16 x 1.5	M16 x 1.5	None	None

[1.] With back pressure of p = 38 bar and ambient temperature of 25°C

[2.] Factory setting

5. Delivery, returns, storage

5.1 Delivery

After receipt of the shipment, it must be inspected for any shipping damage and for completeness according to the shipping documents. Immediately inform the transport carrier of any shipping damage. The packaging material must be preserved until any discrepancies are resolved.

5.2 Return shipment

Before return shipment, all contaminated parts must be cleaned. If this is not possible or practical, e.g. if it would impede fault detection in the case of complaints, the medium used must always be specified. In the case of products contaminated with hazardous substances as defined by GHS or CLP regulations, the safety data sheet (SDS) must be sent with the product and the packaging must be labelled in accordance with GHS/CLP. There are no restrictions for land, air, or sea transport. The choice of packaging should be based on the specific product and the stresses to be expected during transport (e.g., necessary anti-corrosion measures in the case of shipment by sea). In the case of wooden packaging, the applicable import regulations and the IPPC standards must be observed. Required certificates must be included in the shipping documents. The following information, as a minimum, must be marked on the packaging of return shipments.

Fig. 1

Marking of return shipments

5.3 Storage

The following conditions apply to storage:

- Dry, low-dust, vibration-free, in closed rooms
- No corrosive, aggressive substances at the storage location (e.g., UV rays, ozone)
- Protected against animals (insects, rodents)
- If possible, keep in the original product packaging
- Protected from nearby sources of heat or cold
- In the case of large temperature fluctuations or high humidity, take appropriate measures (e.g., heating) to prevent the condensation of water
- Before usage, check products for damage that may have occurred during storage. This applies in particular to parts made of plastic (due to embrittlement).

5.4 Storage temperature range

For parts not filled with lubricant, the permitted storage temperature is the same as the permitted ambient temperature range (see “Technical data”).

5.5 Storage conditions for products filled with lubricant

For products filled with lubricant, the permitted storage temperature range is:

minimum	+ 5 °C	[+41 °F]
maximum	+ 35 °C	[+95 °F]

If the storage temperature range is not maintained, the following steps for replacing the lubricant may not lead to the desired result under certain circumstances.

5.5.1 Storage period up to 6 months

Filled products can be used without implementing additional measures.

5.5.2 Storage period between 6 and 18 months

Pump:

- Connect the pump to a power source
- Switch on the pump and run it until lubricant comes out of every outlet without air bubbles
- Disconnect the pump from the power source
- Remove and dispose of the lubricant that came out

Lines:

- Remove pre-installed lines
- Ensure that both ends of the line are open
- Fill the lines completely with fresh lubricant

Metering devices:

NOTE

Due to the large number of different metering devices, no universally valid statement can be made regarding the removal of the old lubricant and correct bleeding after filling with new lubricant. The instructions can be found in the technical documentation of the specific metering device used.

5.5.3 Storage period more than 18 months

To prevent faults, the manufacturer should be consulted before start-up. The basic procedure for removal of the old lubrication filling corresponds to that for storage periods between 6 and 18 months.

5.6 Declaration of decontamination

If the product came in contact with harmful substances, make sure to thoroughly clean the product before returning it to us. Due to statutory provisions and for the safety of our employees and operation facilities we further need a fully completed and signed “Declaration of decontamination”.

6. Assembly

6.1 Setup and attachment

⚠ WARNING

Pressure
Damage and injury from working on pressurized system components
Centralized lubrication systems are pressurized during operation. Centralized lubrication systems must therefore be depressurized before starting assembly, maintenance, or repair work, or any system modifications or system repairs.

The compact unit should be protected from humidity and vibration and should be mounted so that it is easily accessible, allowing all further installation work to be done without difficulty. Ensure that there is adequate air circulation to prevent excessive heating of the compact unit. For the maximum permissible ambient temperature, see "Technical data."

NOTE
For the product-specific technical data on the compact unit and the control unit, see the relevant documentation. If the documentation is not present, you can request it directly from SKF Lubrication Systems Germany GmbH.

The compact unit must be mounted vertically in accordance with the specifications of the documentation.

Create assembly holes for installation of the feed pump unit on a flange or base, as specified in section .

NOTICE

Damage due to incorrect installation

During installation and especially when drilling, always pay attention to the following:

- Existing supply lines must not be damaged by the installation work.
- Other units must not be damaged by the installation work.
- The compact unit must not be installed within range of moving parts.
- The compact unit must be installed at an adequate distance from sources of heat.
- Maintain safety clearances and comply with local regulations for installation and accident prevention.
- Use existing holes on the vehicle frame or other vehicle parts.
- Bridge large holes using body washers.
- Bear in mind the steering lock angle, spring action, and possible chafe points during installation.

NOTE
Any change to a motorized vehicle, especially the installation of additional equipment such as centralized lubrication systems, must be checked and approved by the relevant technical authorities in the operator country. Non-compliance can void the license to operate the vehicle.

6.2 Dimensions

Compact units of the KFU(S)... series are designed for wall mounting (industrial design) or installation on a vehicle (commercial vehicle design). They are attached to the intended mounting location using appropriate fastening materials (e.g., bolts, washers, and nuts).

For the dimensions and location of the mounting holes, see the documentation of the compact unit. If no documentation is available, the dimensions and location of the fixing holes for mounting the unit can be determined by taking measurements.

6.3 Electrical connection

6.3.1 Electric motor connection

Compact units of the KFU(S)... series are driven by direct-current motors. The direct-current motors used are designed for a voltage of 12 VDC or 24 VDC. The model design of the KFU(S)... series compact unit with control unit is designed only for 24 VDC.

⚠ WARNING

Electric shock
Disconnect the product from the power supply before any work on electrical components
Electrical connections for the compact unit may only be established by qualified and trained personnel authorized to do so by the operator. The local electrical operating conditions and local regulations (e.g., DIN, VDE) must be observed. Serious injury or death and property damage may result from improperly connected compact units.

NOTICE

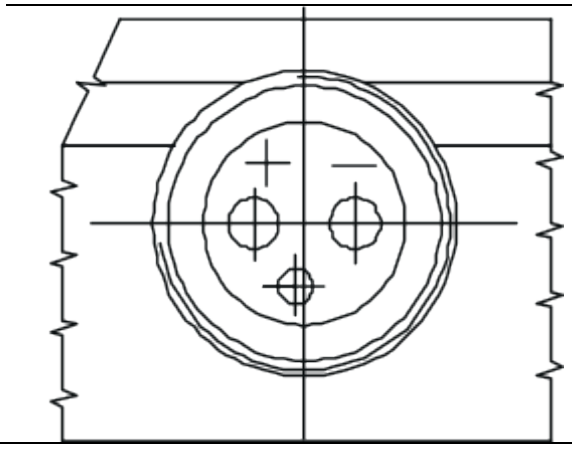
Damage due to faulty connection
Faulty connection of the compact unit can result in damage

- Connect the compact unit according to the connector pin assignment
- Observe the local electrical operating conditions and local regulations (e.g., DIN, VDE)
- The available line voltage (supply voltage) must match the specifications on the rating plate of the motor or the rating plate of the electrical components
- Check the fuse protection of the electrical circuit. Use only fuses with the prescribed amperage.

In the model design of the compact unit without a control unit (12 VDC and 24 VDC), the power to the electric motor is connected directly via the 2-pin connector with reverse polarity protection (positive and negative pins) (Fig. 2).

In the model design with control unit (24 VDC only), the electric motor is connected to the electronic control unit IG490+924. The power is connected via the 4-pin circular connector DIN 72585-A1-4.1-Ag/K1 (Fig. 3). Only pins 1 and 2 are used. Pins 3 and 4 are not used.

Fig. 2



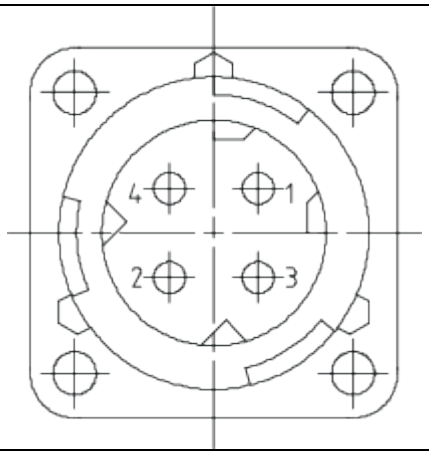
2-pin connector

Table 4

Connector pin assignment (Fig. 2)

Pin No.	Function	
+	+ 15	Positive potential
-	- 31	Negative potential

Fig. 3



4-pin connector

Table 5

Connector pin assignment (Fig. 3)

Pin No.	Function	
1	+ 15	Positive potential
2	- 31	Negative potential
3	Not assigned	-
4	Not assigned	-

Be sure to connect the electrical power so as to guarantee a continuously safe electrical connection (no protruding wire ends). Use the assigned cable end fittings (e.g., cable lugs, wire end ferrules). Select power cables conforming to DIN VDE 0100, taking into account the rated current and the conditions of the specific system (e.g., ambient temperature, type of routing etc. in accordance with DIN VDE 0298 and IEC / EN 60204-1).

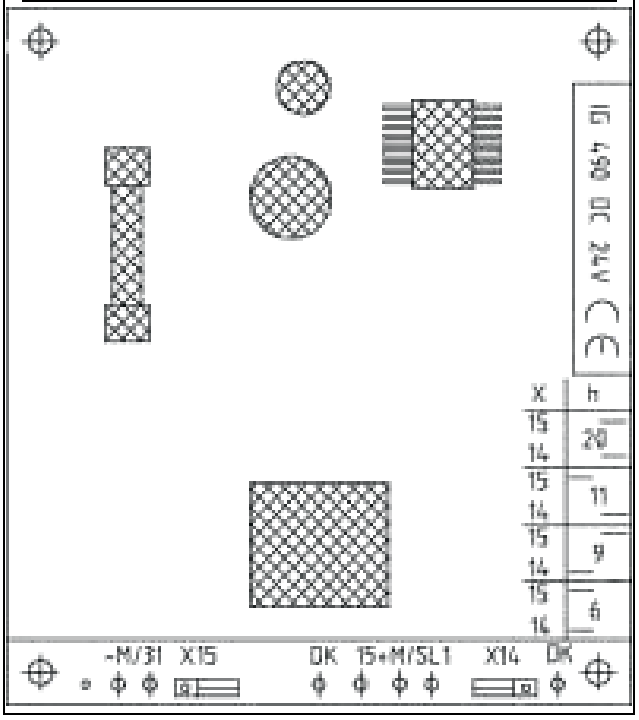
Details regarding electrical connection of the compact unit to the power supply, especially the connector pin assignment, can also be found in the documentation for the compact unit.

To find out the electrical characteristics of the motor, such as rated voltage and rated current, consult the electric motor's rating plate or the documentation for the compact unit.

6.3.2 Control unit IG490+924

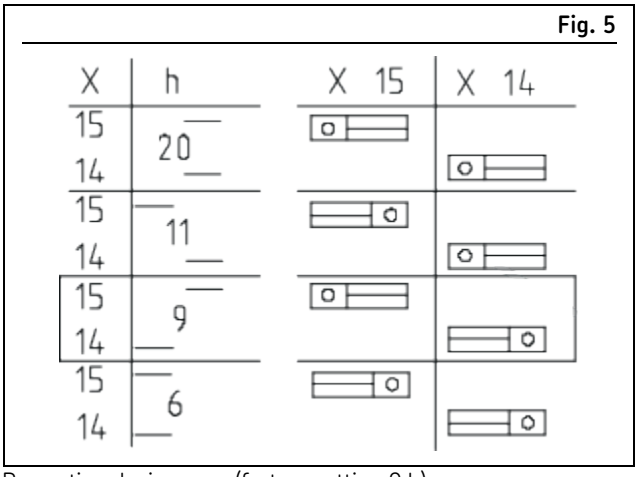
In the model design of the KFU(S)... series compact units with a control unit, the control unit IG490+924 (24 VDC) is used. The IG490+924 control unit works autonomously and performs the control of the lubrication interval. It is designed as a circuit board, installed under a separate cover cap on the compact unit. The IG490+924 control unit acts as a timer for four different pause times (6, 9, 11, and 20 hours). The lubrication interval (the pump run time) is permanently set to 160 seconds. The different pause times are set by positioning two jumpers directly on the circuit board of the control unit. The factory setting for the pause time is 9 hours.

Fig. 4



Structure of the circuit board

Fig. 5



Pause time by jumpers (factory setting 9 h)

The control unit is connected to the 24 VDC power supply by a 4-pin connector designed according to Fig. 3.

Details regarding electrical connection of the control unit can also be found in the documentation for the compact unit.

6.4 Connection of the lubrication line

The lubrication line must be connected to the lubrication unit in such a way that no forces can be transferred to the installed lubrication unit (stress-free connection).

NOTICE

Damage due to incorrect selection of fittings

During assembly, always pay attention to the following:

- The fittings used to connect the lubrication line should be rated for the maximum operating pressure of the lubrication unit.
- If they are not, the lubrication line system needs to be protected from excessive pressure by means of an overpressure valve.

For operating pressures up to 45 bar, as can occur especially in single-line piston metering systems, SKF fittings for solderless pipe unions can be used (double or single cone rings). If using fittings from other manufacturers, pay careful attention to the assembly instructions and technical specifications provided by the manufacturer.

NOTE

Only for model designs of the **KFU(S)... series compact units** that are fitted with quick couplings for **10 mm diameter tubes**:

- When inserting the main lubricant line into the quick coupling, you should clearly feel it click into a series of two locking positions.

6.5 Laying the lubrication lines

When routing the main lubricant lines and the feed lines, observe the following instructions in order to ensure that the entire centralized lubrication system functions smoothly.

The main lubricant line must be dimensioned in accordance with the maximum pressure occurring in the lubrication unit used and the delivery volume of that lubrication unit. If possible, the main lubricant line should rise upward from the lubrication unit and be ventable at the highest point on the lubrication line system.

Metering devices at the end of the main lubricant line must be installed such that the outlets of the metering devices point upwards. If the system configuration requires that the lubricant metering devices be arranged below the main lubricant line, they should not be placed at the end of the main lubricant line.

The pipes, tubes, shutoff valves, directional control valves, fittings, etc. that will be used must be designed for the maximum operating pressure of the lubrication unit, the permissible temperatures, and the lubricants that will be fed. The pressure limiting valve (38 bar) installed in the unit protects the lubrication system from excess pressure.

All components of the lubrication line system such as pipes, hoses, shut-off valves, directional control valves, fittings, etc. must be carefully cleaned before assembly. No seals in the lubrication line system should protrude inwards in a way that disrupts the flow of the lubricant and could allow contaminants to enter the lubrication line system.

Lubrication lines should always be arranged so that air inclusions cannot form anywhere. Avoid changes in the cross-

section of the lubrication line from small to large cross-sections in the flow direction of the lubricant. When the cross-section does change, the transition should be gentle.

The flow of lubricant in the lubrication lines should not be impeded by sharp bends, angle valves, or flap valves. Unavoidable changes in the cross-section in lubrication lines must have smooth transitions. Sudden changes of direction should be avoided if possible.

⚠ CAUTION

Lubricant coming out
Risk of slipping and injury
Centralized lubrication systems and lubrication lines must always be free of leaks. Leaking lubricant is hazardous due to the risk of slipping and injury. Beware of any lubricant leaking out during assembly, operation, maintenance, or repair of centralized lubrication systems. Leaks must be sealed off without delay.

NOTICE

Lubricant coming out
Risk of contamination of waterways and soil
Lubrication lines must always be free of leaks. Lubricants can contaminate soil and waterways. Lubricants must be used and disposed of properly. Observe the local regulations and laws regarding the disposal of lubricants.

NOTE

Follow the safety instructions on the lubricant's safety data sheet. The safety data sheet for a lubricant can be requested from the lubricant manufacturer.

7. First start-up

NOTICE

Damage from non-approved lubricant

Only lubricants approved for the product may be used. Unsuitable lubricants can lead to failure of the product and to damage.

NOTICE

Damage from mixing lubricants

Different lubricants must not be mixed together. Doing so can cause damage and require extensive cleaning of the product/centralized lubrication system. It is recommended that an indication of the lubricant in use be attached to the lubricant reservoir in order to prevent accidental mixing of lubricants.

Before the compact unit is put into operation for the first time, all electrical, hydraulic, and (if present) pneumatic connections must be inspected.

The lubricant may only be fed without bubbles. The lubricant reservoir, if present, must be filled with clean lubricant without introducing bubbles. The compact unit should then be run until lubricant without bubbles is discharged at all lubrication points.

The process of bleeding the air from the centralized lubrication system can be facilitated by:

- Opening the ends of the pipes until lubricant without bubbles is discharged there
- Filling long pipe sections before connecting to the lubrication points

Air inclusions in the lubricant adversely affect the function of the devices and impair the reliability of lubricant delivery, which can result in damage to the bearings that are being lubricated.

To fill the compact units of the KFU(S)... series, a coupling socket is required.

The coupling socket is available from
SKF Lubrication Systems Germany GmbH under the following order number:

- 995-001-500

8. Operation

The described compact unit works automatically. The lubricant transport in the lubrication lines should, however, be subjected to regular visual inspection.

The lubricant fill level in the lubricant reservoir, if present, should likewise be subjected to regular visual inspection. If the lubricant fill level is too low, top up to the maximum mark as described in the "First start-up" chapter.

NOTICE

Damage from mixing lubricants

Different lubricants must not be mixed together. Doing so can cause damage and require costly and complicated cleaning of the product and the centralized lubrication system. It is recommended that a sign indicating the lubricant in use be attached to the lubricant reservoir in order to prevent accidental mixing of lubricants.

NOTICE

Damage from contaminated lubricant

Only fill using clean lubricant and an appropriate device. Contaminated lubricants can result in severe system malfunction. The lubricant reservoir must be filled without introducing bubbles.

NOTE

Observe the instructions from the machine manufacturer regarding the lubricants that are to be used

9. Maintenance and repair

⚠ WARNING

Pressure

Damage and injury from working on pressurized system components

Centralized lubrication systems are pressurized during operation. Centralized lubrication systems must therefore be depressurized before starting assembly, maintenance, or repair work, or any system modifications or system repairs.

⚠ WARNING

Electric shock

Disconnect the product from the power supply before any work on electrical components

Performing work on products that have not been de-energized may result in serious injury or death. Assembly, maintenance, and repair work may only be performed on products that have been de-energized by qualified technical personnel. The supply voltage must be switched off before opening any of the product's components.

NOTE

Dismantling of the product or individual parts of the product within the statutory warranty period is prohibited and voids any claims

NOTE

Only original spare parts from SKF Lubrication Systems Germany GmbH may be used. Unauthorized alterations to products and the use of non-original spare parts and accessories are prohibited and nullify the statutory warranty.

SKF Lubrication Systems Germany GmbH products are low-maintenance. However, all connections and fittings must be regularly inspected for proper seating to ensure proper function and to prevent hazards from arising.

10. Cleaning

10.1 Basics

Cleaning should be carried out in accordance with the operator's own company rules, and cleaning agents and devices and the personal protective equipment to be used should likewise be selected in accordance with those rules. Only cleaning agents compatible with the materials may be used for cleaning. Completely remove any cleaning agent residue left on the product and rinse with clear water. Unauthorized persons must be kept away. Use signage to indicate wet areas.

10.2 Interior cleaning

The interior normally does not need to be cleaned. The interior of the product must be cleaned if incorrect or contaminated lubricant accidentally enters the product. Please contact our Service department.

10.3 Exterior cleaning

Do not allow any cleaning fluid to enter the interior of the product during cleaning.

⚠ WARNING

Risk of fatal electric shock

Cleaning work may only be performed on products that have been de-energized first. When cleaning electrical components, be mindful of the IP enclosure rating.

⚠ WARNING

Serious injury from contact with or inhalation of hazardous substances

Wear personal protective equipment. Observe the safety data sheet (SDS) of the hazardous substance. Avoid contaminating other objects or the environment during cleaning.

If products have ultrasonic sensors, the active sensor surface must be cleaned with a cloth when it becomes contaminated.

11. Faults, causes, and remedies

The following table provides an overview of possible malfunctions and their causes. Contact the Service department of SKF Lubrication Systems Germany GmbH if you cannot remedy the malfunction.

NOTE

Dismantling of the product or individual parts of the product within the statutory warranty period is prohibited and voids any claims.

NOTE

All assembly, maintenance, and repair work beyond this scope must be performed by the Service department of SKF Lubrication Systems Germany GmbH only.

NOTE

Only original spare parts from SKF Lubrication Systems Germany GmbH may be used. Unauthorized alterations to products and the use of non-original spare parts and accessories are prohibited.

⚠ WARNING

Electric shock

Performing work on products that have not been de-energized may result in serious injury or death

Disconnect the product from the power supply before any work on electrical components. Assembly, maintenance, and repair work may only be performed on products that have been de-energized by qualified technical personnel. The supply voltage must be switched off before opening any of the product's components.

⚠ WARNING

Burn injury hazard

Injury due to hot surfaces on system components

Hot surfaces on a motor may cause burns. Motor surfaces may only be touched with appropriate gloves or after the motor has been shut off for an extended time.

⚠ WARNING

Pressure

Damage and injury from working on pressurized system components

Centralized lubrication systems are pressurized during operation. Centralized lubrication systems must therefore be depressurized before starting assembly, maintenance, or repair work, or any system modifications or system repairs.

Table 6

Fault analysis and rectification:

Malfunction	Possible cause	Rectification
Motor fails to start when the operating voltage is switched on	• Operating voltage not applied to the motor	• Check the power supply connection • Check the circular connector/power cable and make sure they are connected properly • Check the operating voltage on the motor • Check the fuse
	• Pump is jammed	• Measure the motor current. If current is too high: – Remove the pump, crank it by hand – If there is high resistance, replace the pump
	• Motor is jammed	• Measure the motor current. If current is too high: – Remove the pump, crank it by hand – If there is high resistance, replace the pump
Motor runs with difficulty and at a low speed	• Pump is sluggish	• Measure the motor current. If current is too high: – Remove the pump, crank it by hand – If there is high resistance, replace the pump
	• Motor is sluggish	• Measure the motor current. If current is too high: – Remove the pump, crank it by hand – If there is high resistance, replace the pump
	• Impermissible lubricant (see technical data)	• Remove the lubricant from the entire system and dispose of lubricant properly; fill system with suitable lubricant
	• Pressure too high, pressure limiting valve is jammed or defective	• Check the pressure limiting valve and replace if necessary
Pump does not supply lubricant; no pressure build-up	• Pump is jammed	• Measure the motor current. If current is too high: – Remove the pump, crank it by hand – If there is high resistance, replace the pump
	• Motor is jammed	• Measure the motor current. If current is too high: – Remove the pump, crank it by hand – If there is high resistance, replace the pump
	• Incorrect direction of motor rotation	• Check the electrical connection and modify it if necessary
	• Pressure limiting valve does not close	• Check the pressure limiting valve to make sure that its opening pressure is correct and that there is no contamination or damage. • If the opening pressure is incorrect or if the pressure limiting valve is damaged, replace the valve. Only use original SKF spare parts. • If contaminated, clean the pressure limiting valve

Table 6

Fault analysis and rectification:

Malfunction	Possible cause	Rectification
No pressure build up in the main line	• Air in the main line	• Bleed the main line
	• Main line leaky or break in line	• Repair the main line
	• Pressure limiting valve does not close	• Check the pressure limiting valve to make sure that its opening pressure is correct and that there is no contamination or damage • If the opening pressure is incorrect or if the pressure limiting valve is damaged, replace the valve. Only use original SKF spare parts. • If contaminated, clean the pressure limiting valve
	• Pressure-relief valve does not close	• Clean or replace the pressure-relief valve. Only use original SKF spare parts
	• Impermissible lubricant (see technical data)	• Remove the lubricant from the entire system and dispose of lubricant properly; fill system with suitable lubricant
	• Fill level too low	• Top up the lubricant
During operation, lubrication points are supplied insufficiently or not at all	• Metered volume is too small	• Adjust the metered volume (the metering mechanism) to match the requirements of the lubrication points
	• Air in the main line	• Bleed the main line
	• Main line is leaky, broken, or clogged	• Repair/replace the main line, clean the main line
	• Feed line is leaky, broken, or clogged	• Repair/replace the feed line, clean the feed line
	• Metering device is faulty	• Replace the metering device
	• Fill level too low	• Top up the lubricant
During operation, lubrication points are over-lubricated	• Metered volume is too large	• Adjust the metered volume to match the requirements of the lubrication points

12. Repairs

⚠ WARNING

Risk of injury

At a minimum, the following safety measures must be taken before any repairs:

- Unauthorized persons must be kept away
- Mark and secure the work area
- Depressurize the product
- Isolate the product, and lock and tag it out
- Check to ensure live voltage is no longer present
- Ground and short-circuit the product
- Cover any adjacent live parts

13. Shutdown, disposal

13.1 Temporary shutdown

Temporary shutdowns should be done by a course of action to be defined by the operator.

13.2 Permanent shutdown, disassembly

Permanent shutdown and disassembly of the product must be planned properly by the operator and conducted in compliance with all applicable laws and regulations.

13.3 Disposal

The waste producer/operator must dispose of the various types of waste in accordance with the applicable laws and regulations of the country in question.

14. Spare parts

Spare parts may be used exclusively for replacement of identical defective parts. Modifications with spare parts on existing products are not allowed.

15. Appendix

15.1 China RoHS Table

Table 7

部件名称 (Part Name)	有毒害物质或元素 (Hazardous substances)					
	铅	汞	镉	六价铬	多溴联苯	多溴二苯醚
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr(VI))	Polybrominated biphenyls (PBB)	Polybrominated diphenyl ethers (PBDE)
用钢和黄铜加工的零件 (Components made of machining steel and brass)	X	0	0	0	0	0

本表格依据SJ/T11364的规定编制 (This table is prepared in accordance with the provisions of SJ/T 11364.)

0：	表示该有毒有害物质在该部件所有均质材料中的含量均在GB/T 26572 规定的限量要求以下。 (Indicates that said hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.)
X：	表示该有毒有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572标准规定的限量要求。 (Indicates that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.)

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