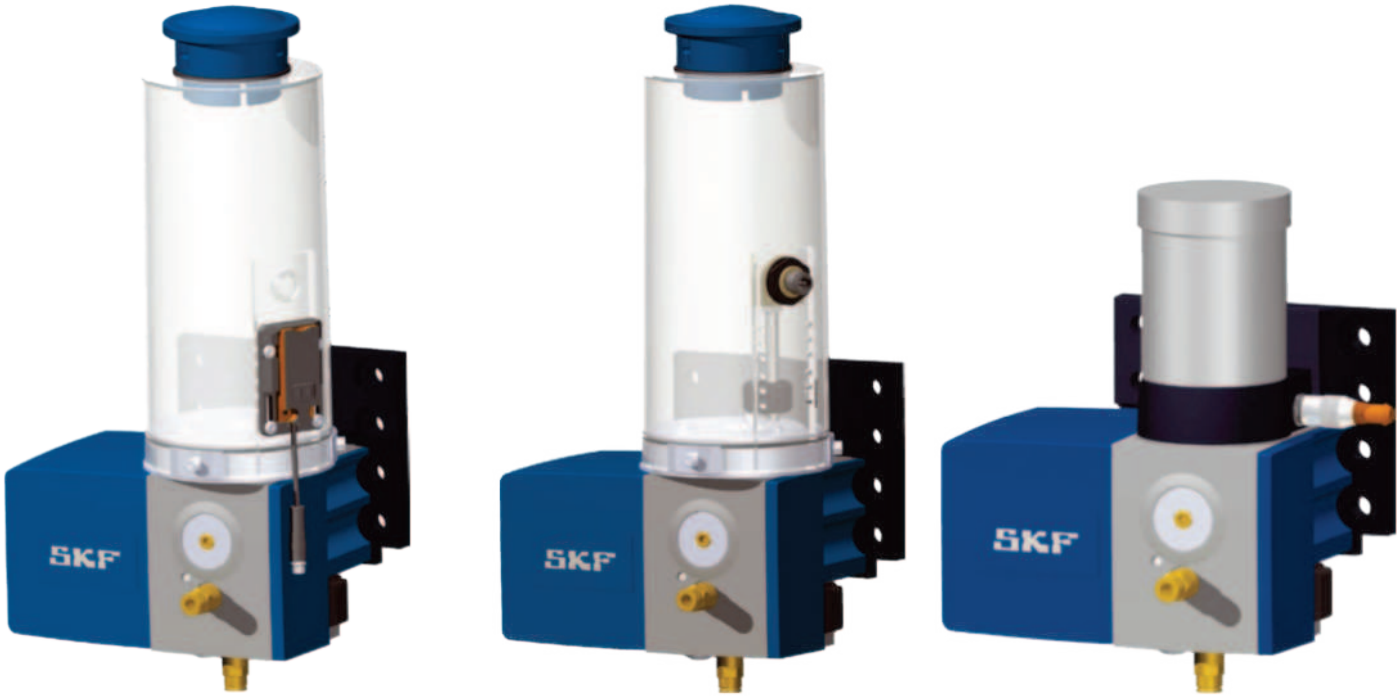
Electrically driven piston pump units of the series ECP

for single-line centralized lubrication systems



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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: Electrically driven piston pump unit
Type / item number: ECP
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 IEC 63000:2018 EN IEC 61000-6-2:2005/AC:2005 EN IEC 61000-6-3:2007+A1:2011
EN 809:1998+A1:2009/AC:2010
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, 04.09.2020
Jürgen Kreutzkämper
Manager, R&D
Germany

Richard Lindemann
Manager, SE
Berlin

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: Electrically driven piston pump unit
Type / item number: ECP
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 IEC 63000:2018 EN IEC 61000-6-2:2005/AC:2005 EN IEC 61000-6-3:2007+A1:2011
EN 809:1998+A1:2009/AC:2010
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 UK legislation Supply of Machinery (Safety) Regulations 2008 No. 1597 and all other applicable Directives.

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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		
1.2.3	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). The installation of a drip pan could be required.
[2)] The integrator must ensure that the pump is integrated into the system 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 system in such a way that it can be operated without danger.

Masthead

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- 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.
Spare parts should only be used to replace faulty components of identical construction.
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

- Replacement of or modifications to the pistons of the pump elements
- Repairs or modifications to the drive
- Alterations to the control circuit board beyond adjustment of lubrication times and interval times or replacement in case of defect
- Alterations to the power supply board beyond replacement in case of defect

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, barcode, week, year of manufacture, and serial number.

To avoid loss of this data in case a type plate becomes illegible, these characteristics , should be entered in the figure below.

Fig. 1

Key data from type plate

Legend to Figure 1:

1 Type designation (order code)
2 Barcode
3 Week/year of manufacture
4 Serial number

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 Low Voltage Directive

The protection objectives of the Low Voltage Directive 2014/35/EU are met in accordance with Annex I, No. 1.5.1 of the Machinery Directive 2006/42/EC.

1.14 Note on UKCA marking

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

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
Personnel slipping due to floor contamination with spilled or leaked lubricants	B F 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	If possible, do not use on moving hose lines

Table 2

Residual risks

Residual risk	Possible in lifecycle	Avoidance / Remedy
When undoing the cartridge holder, be mindful of the spring loading on the holder, because otherwise the spring pressure can cause the holder to detach from the pump in an uncontrolled manner.	C D F G	The cartridge holder must therefore be opened carefully when replacing the lubricant cartridge. The pressure spring, follower plate, and cartridge cannot be removed until the load on the pressure spring is relieved.
Lubricant spraying out due to faulty component fitting, or incorrect connection of lines	C D	Tighten all components securely or using the specified torques. Use hydraulic screw unions and lines suitable for the indicated pressures. These must be checked for proper connection and for damage prior to commissioning.
Personal injury / property damage due to falling of hoisted parts	A B C G H K	Unauthorized persons must be kept away. Nobody is allowed to be present below hoisted parts. Lift parts using suitable lifting gear.
Personal injury / property damage due to tilting or falling product due to non-compliance with specified torques	B C G	Adhere to the specified torques. Mount the product only on components with a sufficient load-carrying capacity. If no torques are specified, use those specified for the screw size for screws of strength class 8.8.
Personal injury, property damage due to spilled, leaked lubricant	B C D F G H K	Be careful when filling the reservoir and then 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 K	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.
Damage to the pump from failure to comply with the permissible cyclic duration factor	C D	Operate the pump only within the permissible cyclic duration factor.

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.

2.7 Chisel pastes

Due to their high resistance to pressure and temperature, chisel pastes are used to reduce wear on insert tools and wear bushings on hydraulic and pneumatic hammers, stone crushers and hydraulic grabs. Before use, observe the safety data sheet (SDS) and the technical data and application limits of the respective chisel paste.

Chisel pastes may be pumped only with SKF pumps and pump elements developed for this application.

Chisel pastes are special lubricants and must not be used as a lubricant for bearings.

Grease guns filled with chisel paste must be permanently marked with a corresponding note.

NOTE

The use of chisel paste requires prior consultation with the SKF Product Management.

3. Overview, functional description

3.1 General

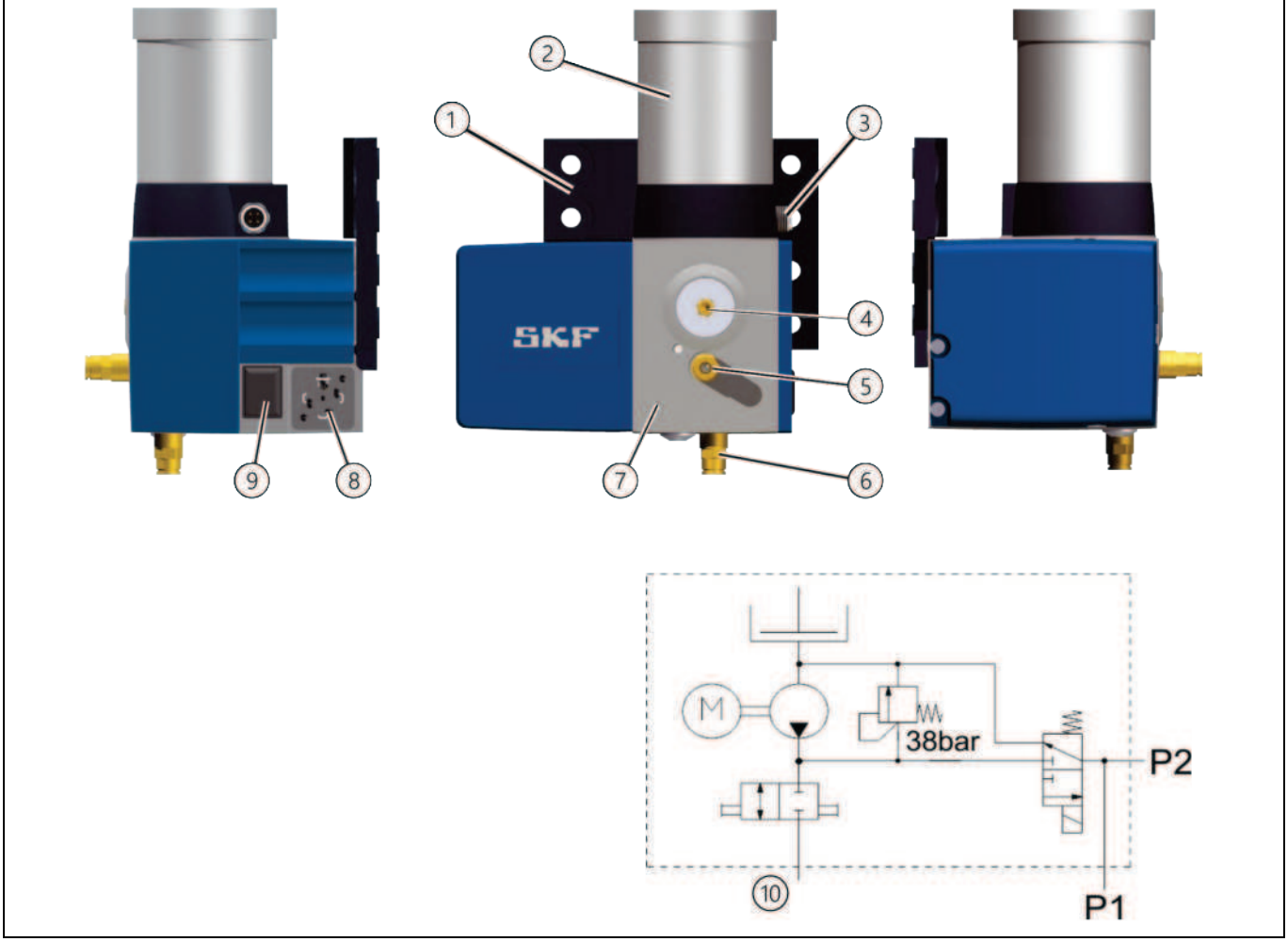
The ECP is a piston pump unit for operation in single-line centralized lubrication systems.

3.2 Overview

3.2.1 Cartridge-based piston pump unit

Thanks to their compact design, with either lubricant cartridge or reservoir, the ECP makes it very easy to set up single-line systems for lubrication of small machines, machine groups, and systems with little installation effort. If using the cartridge-based design, approved lubricants can be fed quickly and easily according to customer requirements by changing the lubricant cartridge.

Fig. 2



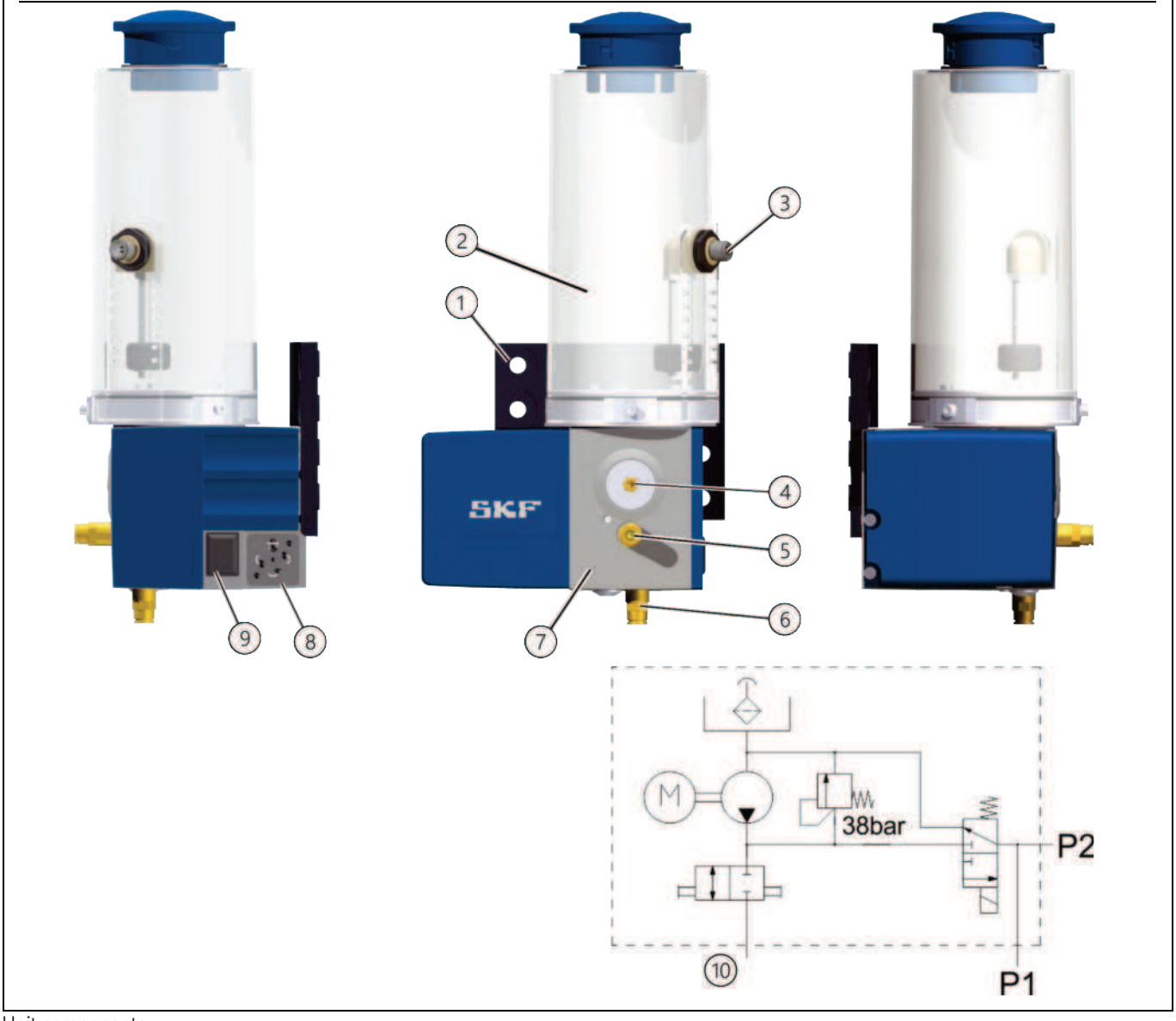
Unit components

Legend to Figure 2:

1	Mounting flange/wall bracket
2	SKF disposable lubricant cartridge
3	Connector plug for optional fill level monitoring (M12x1)
4	Pump vent / vent screw
5	Lubricant outlet 1 optionally with SKF quick coupling
6	Lubricant outlet 2 optionally with SKF quick coupling
7	ECP pump body
8	Rectangular connector acc. to DIN EN 175301-803-A for 24 V DC power supply
9	Pushbutton (DK) (press and hold function)
10	Vent screw
P1	Outlet
P2	Outlet

3.2.2 Reservoir-based piston pump unit

Fig. 3



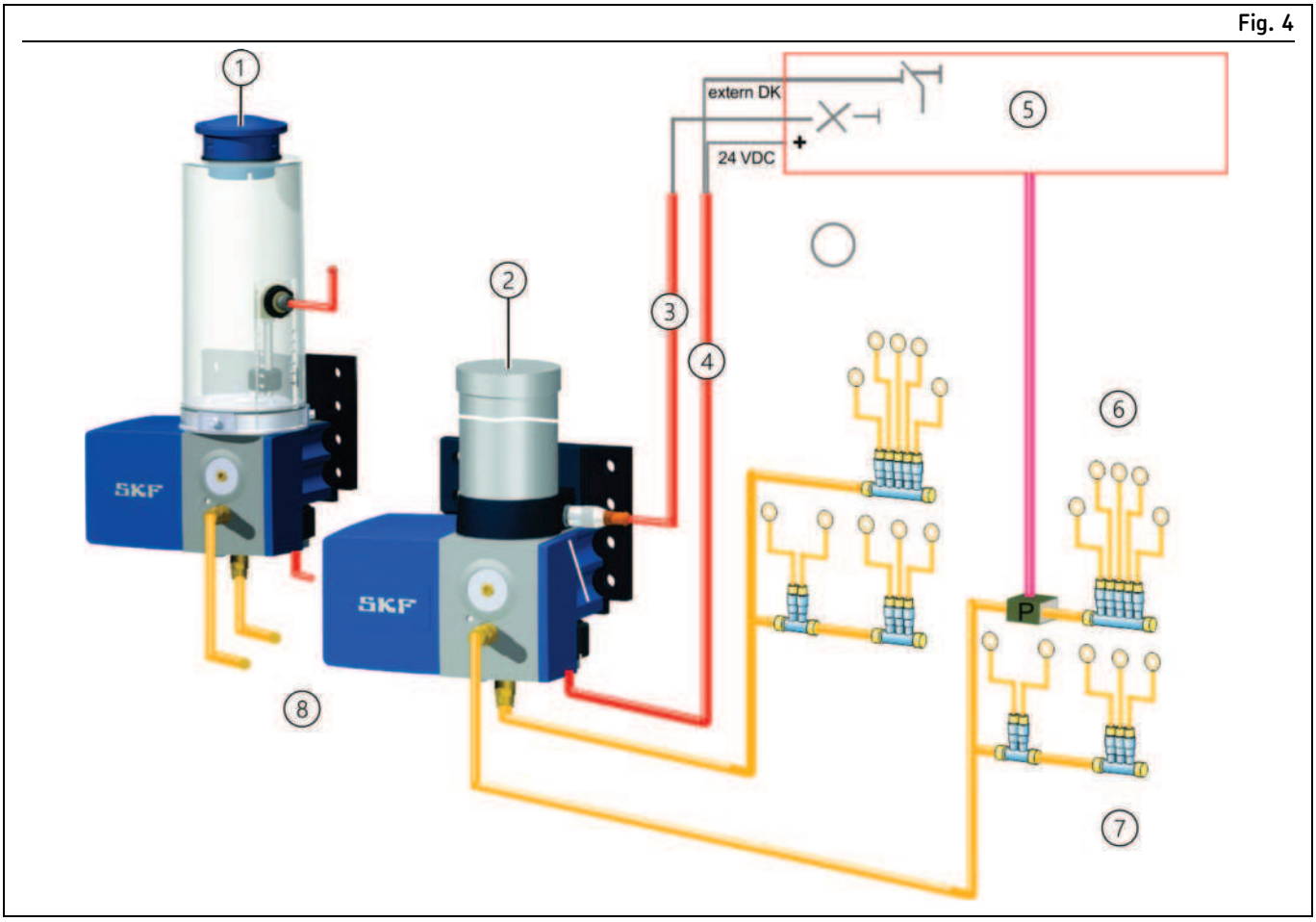
Unit components

Legend to Figure 3:

1	Mounting flange/wall bracket
2	Lubricant reservoir
3	Connector plug for optional fill level monitoring (M12x1)
4	Pump vent / vent screw
5	Lubricant outlet 1 optionally with SKF quick coupling
6	Lubricant outlet 2 optionally with SKF quick coupling
7	ECP pump body
8	Rectangular connector acc. to DIN EN 175301-803-A for 24 V DC power supply
9	Pushbutton (DK) (press and hold function)
10	Vent screw
P1	Outlet
P2	Outlet

3.2.3 Single-line centralized lubrication system

Fig. 4



Single-line centralized lubrication system

Legend to Figure 4:

1 Versions with lubricant reservoir
2 Versions with cartridge
3 Fill level evaluation by customer's system
4 Intermediate lubrication triggered externally
5 Machine control / external process control level
6 (P) Pressure switch
7 SKF single-line metering device
8 ECP piston pump units

3.3 Design of the ECP piston pump unit

NOTE
The relevant figures "Cartridge-based piston pump unit" and "Reservoir-based piston pump unit" can be seen in section 3.2 Overview

The ECP piston pump unit consists primarily of an electric motor that drives a delivery piston in axial direction via an eccentric cam.

The delivery piston feeds the lubricant coming from the lubricant cartridge toward the lubricant outlet via an internal control valve.

The pressure-relief valve is used to relieve the system pressure built up during a lubricating cycle once the pump motor is switched off. This is required for the operation of the single-line metering devices.

A pressure limiting valve, which is likewise integrated, limits the maximum system pressure in the centralized lubrication system to 38 bar. In case of centralized lubrication systems, SKF recommends additionally securing the system against excessive pressure using a suitable pressure limiting valve by default; see section 14. Spare parts.

Lubricant is fed via SKF disposable cartridges or the reservoir. The ECP optionally comes with a fill level switch that is used to monitor the minimum fill level (exception: 0.5-liter reservoir).

In the cartridge-based design, the pre-warning is at approx. 10 % of cartridge fill level.

Evaluation is conducted by the customer. The ECP is available in the 24 V DC voltage design.

3.4 Functional description

NOTE

The relevant figures for "Single-line centralized lubrication system" can be seen in section 3.2 Overview

The ECP piston pump unit is designed to supply single-line centralized lubrication systems.

A delivery piston, which is driven by an electric motor, feeds the lubricant to the pump outlet via the control valve switched simultaneously.

In case of two lubricant outlets, lubricant is delivered to the outlets simultaneously and the same applies to the subsequent pressure relief.

The lubricant coming from the ECP is supplied to the single-line metering devices under pressure. Depending on the metering device type, i.e., prelubrication metering device or relubrication metering device, a metered amount of lubricant is delivered to the respective lubrication points.

The lubrication cycles are controlled by the customer by external actuation through a control system provided by the customer for the machine requiring lubrication.

The control system sets the lubricating frequency, ON-time, and pause time.

System pressure is monitored by a pressure switch (P) that is likewise installed by the customer, typically in the lubrication line before the last metering device. The pressure switch sends a signal to the machine control unit that turns off the ECP pump after successful metering (a completed lubrication cycle).

The bleeding process can be carried out at first start-up, and when changing a cartridge, by pressing a pushbutton (DK) fitted on the pump. The pushbutton can also be used to trigger a manual intermediate lubrication (by pressing and holding it).

The minimum fill level can optionally be monitored by an integrated fill level switch.

This warning signal is evaluated by an external control system (provided by the customer).

4. Technical data

4.1 ECP technical characteristics

Table 3

ECP technical characteristics

Designation		Value
Mounting position		Vertical
Cartridge-based design	Empty weight of ECP without installed cartridge	Approx. 2330 g for version ECP1-10AA1XX-000000
	Cartridge capacity/filling	380 cm^3
	Cartridge weight	450 g (for LF001/MR380)
Reservoir version	Empty weight of ECP (with nothing in reservoir)	Approx. 2410 g for design ECP1-1WAA11-1U1000 Approx. 2500 g for design ECP1-1WAA11-1U1700
Reservoir size		0.5 liters; 1.0 liters; 1.7 liters
Delivery rate		10 cm^3/min [1)]
Operating pressure		Max. 38 bar
Ambient temperature		+ 10 °C to + 50 °C
Operating temperature		+ 10 °C to + 50 °C
Pumped medium		Fluid greases of NLGI Grades 00 to 000 with mineral oil base, environmentally friendly base, or synthetic base, with a permissible dynamic viscosity of 20 to 1500 mm^2/s, in duty type: S3 15% duty cycle according to DIN EN 60034- 1
Enclosure rating per EN 60529		IP 54

1) This is a calculated value at a lubricant outlet and applies to 5 bar back pressure and precise supply voltage of 24 V DC. Due to minor variations in the supply voltage and/or back pressure in the system, this value may vary slightly in the actual application. When using both lubricant outlets on the ECP, this delivery rate is divided indefinitely on both connected lines. SKF therefore recommends using the ECP only in conjunction with suitable SKF single-line metering devices.

Table 4

Electrical characteristics (motor), 24 V DC version

Designation	Value
Rated voltage	24 V DC
Maximum current input	1.5 A
Duty type according to DIN EN60034-1 [1)]	S3 15 % duty cycle
Recommended line protection according to DIN EN 60898	B 6A or C4 A

1) The piston pump unit can briefly and occasionally be operated outside the specified duty type S3 15% duty cycle, such as when filling lubrication piping or bleeding the piston pump unit (after changing the cartridge). Brief and occasional continuous duty (S1 100% duty cycle) is permitted for this, but the maximum pump running time must not exceed 15 minutes at such times. After such continuous duty, an interval of at least 10 minutes must be provided (for the electrical components of the pump to cool down). Continuous duty can be implemented via the pushbutton (DK) on the piston pump unit or via a corresponding filling program (recommended) on the machine's control (PLC) for the piston pump unit.

4.2 Minimum level switch, 24 V DC version

Table 5

Fill level switch for cartridge-based piston pump unit (XS2)

Designation	Value
Function	Normally closed (NC) contact (opens when magnet is close)
Switching capacity	Max. 3 W/VA
Switching voltage	Max. 100 V
Switched current	Max. 0.3 A
Contact resistance	150 mΩ
Damping	30 to 35
Damping compensation	>15 At

Table 6

Fill level switch for reservoir-based piston pump unit, oil level monitoring (XS3)

Designation	Value
Function	Contact opens at minimum fill level (NC)
Switching voltage, max.	42 V DC
Switching capacity	50 W
Plug connection	4-pin circular plug M12x1

Table 7

Fill level switch for reservoir-based piston pump unit, grease level monitoring (XS4)

Designation	Value
Function	NPN, PNP/NO contact or NC contact (programmable)
Switching voltage, max.	10 to 36 V DC
Operating current at switching output, max.	150 mA
Connection	4-pin circular connector M8x1

4.3 Order code

Order example: **Cartridge-based design** ECP 1 - 1 W A A 1 3 - 000000
Order example: **Reservoir version** ECP 1 - 1 W A A 1 1 - 1 U 17 0 0

ECP [1] Electrically driven piston pump unit

Delivery rate / lubrication system

1 [1] 10 cm³/min - see section 4.1 ECP technical characteristics3.2

Version index / working pressure

1 38 bar

Fill level monitoring, pre-warning for minimum

W [1] With fill level monitoring
0 Without fill level monitoring

Wall bracket

A [1] With standard bracket
0 Without bracket

Electrical connection

A [1] Rectangular connector acc. to DIN EN 175301-803-A

Lubricant line connections (1.=front / 2.=bottom - see section Overview

1	Pipe thread M10x1	898-110-120	(blind plug)
2 [1]	Ø6 quick coupling	406-004-VS	
3	Ø6 banjo fitting	506-140-VS	
4	Ø8 quick coupling	408-004-VS	
X	Closed	466-431-001	

Cartridge-based design

000000 [1] Without cartridge
Cartridge, 380 ml, filled with lubricant
F00138 Zeller+Gmelin Divinol Lithogrease 00 (541-85009-8)

Lubricant reservoir design

1 Plastic reservoir

Lubricant type

U Oil (reservoir with filler screen)
F Fluid grease (reservoir without filler screen)

Reservoir volume

05 0.5 liters (generally without filling strainer and fill level switch)
10 1.0 liters
17 1.7 liters

0 Placeholder

[1] Standard design

4.3.1 Order example

ECP piston pump unit with lubricant cartridge
Electrical piston pump unit for single-line lubrication systems (ECP), delivery volume of 10 cm³/min (1) with a max. working pressure of 38 bar (1), with warning switch for pre-warning minimum fill level (W), with wall bracket (A), rectangular connector electrical pump connection acc. to DIN EN 175301-803-A (A), with M10x1 front main line connection (1) and a banjo fitting ø6 mm for bottom main line connection (3), without cartridge (000000) gives the order number:
ECP1-1WAA13-000000

ECP piston pump unit with lubricant reservoir
Electrical piston pump unit for single-line lubrication systems (ECP), delivery volume of 10 cm³/min (1) with a max. working pressure of 38 bar (1), with warning switch for pre-warning minimum fill level (W), with wall bracket (A), rectangular connector electrical pump connection acc. to DIN EN 175301-

803-A (A), with quick coupling for ø6 mm lubricant line for front main line connection (2) and quick coupling for ø6 mm lubricant line for bottom main line connection (2), with plastic reservoir (1), for oil (U) with a reservoir volume of 1.7 liters (17) with two placeholders (0) (0) gives the order number:
ECP1-1WAA22-1U1700

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. 5

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

⚠ WARNING

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

- Assembly, maintenance, and repair work may only be performed by qualified technical personnel
- De-energize the product prior to beginning work
- Local electrical operating conditions and regulations (e.g., DIN, VDE) must be observed

⚠ WARNING

System pressure
Hydraulic pressure
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.

⚠ CAUTION

Lubricant coming out
Risk of slipping and injury
Centralized lubrication systems 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.

6.1 General

Only qualified technical personnel may install, operate, and maintain the ECP electrically driven pump unit.

Qualified technical personnel are persons who have been trained, assigned, and instructed by the operator of the final product into which the piston pump unit described here is incorporated.
Such persons are familiar with the relevant standards, rules, accident prevention regulations, and operating conditions as a result of their training, experience, and instruction. They are qualified to carry out the required activities and in doing so recognize and avoid potential hazards.

Before assembling/setting up the product, remove the packaging material and any shipping braces (e.g., plugs).

The packaging material must be preserved until any discrepancies are resolved.

In addition:

- Take appropriate measures to ensure that moving or detached parts are immobilized during the work and that no body parts can be pinched by unintended movements
- Assemble the product only outside the operating range of moving parts, at an adequate distance from sources of heat
- Prior to performing work, the product and the machine/system in which the product will be integrated must be de-energized, depressurized and secured against unauthorized activation
- All work on electrical components may be performed only with voltage-insulated tools
- Fuses must not be bridged. Always replace fuses with fuses of the same type
- Ensure proper grounding of the product
- Drill required holes only on non-critical, non-load-bearing parts
- Other units of the machine must not be damaged or their function impaired by the installation of the centralized lubrication system
- No parts of the centralized lubrication device may be subjected to torsion, shear, or bending
- Use suitable lifting gear when working with heavy parts
- Avoid mixing up/incorrectly assembling disassembled parts. Label parts.

NOTICE

Damage if the technical data is ignored

Observe the technical data

NOTICE

Damage if the safety instructions are ignored

Follow the safety instructions on the lubricant's safety data sheet

6.2 Setup and attachment

NOTICE

Damage due to the product being tipped over or dropped

Do not tilt or drop the product.

NOTICE

Supply lines or moving parts

When drilling the assembly holes, you must be careful of any supply lines or other units, as well as of other hazards such as moving components. Maintain safety clearances and comply with local regulations for assembly and accident prevention.

NOTICE

Damage due to magnetic coupling

On the pump unit's electrical connections, ensure that appropriate measures prevent interference between signals due to inductive, capacitive, or electro-magnetic couplings. Shielded cables must be used in places where electrical interference fields can distort signal transmissions despite separate laying of cables.

The rules and empirical values for "EMC-compliant" cabling must be taken into consideration.

The product 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 and cartridge replacement or refilling of the lubricant reservoir to be done easily.
The fill level of the cartridge or the lubricant reservoir must be clearly visible.

Assembly holes must be applied according to the figures in section 6.3 Port dimensions, assembly holes, and minimum mounting dimensions.

During assembly, always pay attention to the following:

- Design specifications of the manufacturer and conditions of the object must be observed when installing the piston pump unit
- For the maximum permissible ambient temperature, see "Technical data."
- Existing supply lines must not be damaged by assembly work
- Other units must not be damaged by assembly work
- The mounting position of the ECP is vertical as shown in the documentation
- Protruding parts such as pushbuttons or pressure gauges must not be misused as handles or grips
- The product must not be installed within range of moving parts
- The product must be installed at an adequate distance from sources of heat
- Maintain safety clearances and comply with regulations for assembly and accident prevention
- In case of centralized lubrication systems, SKF recommends additionally securing the system against excessive pressure using a suitable pressure limiting valve by default; see section 14. Spare parts

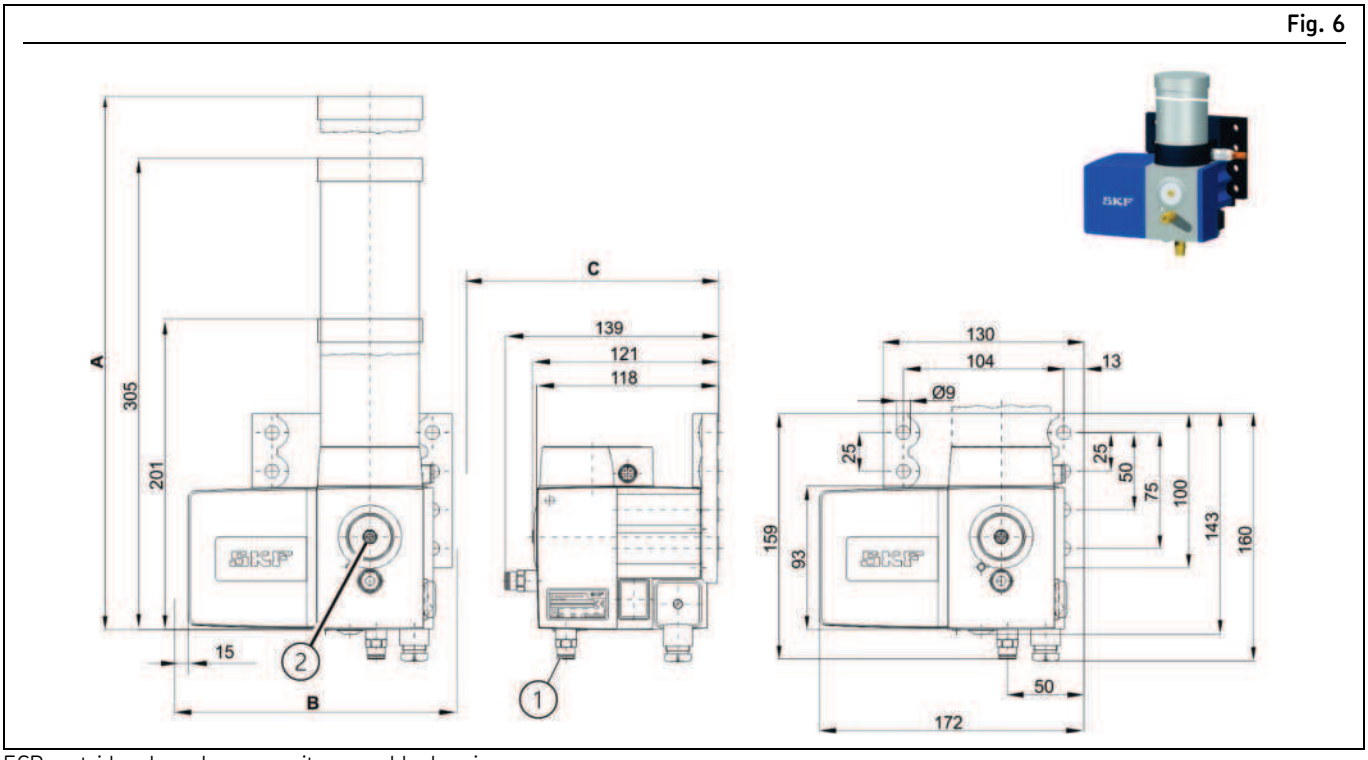
6.2.1 Minimum mounting dimensions

To ensure enough space for maintenance work and for any disassembly of the ECP, be sure to comply with the minimum mounting dimensions; see the figures in section 6.3 Port dimensions, assembly holes, and minimum mounting dimensions

6.3 Port dimensions, assembly holes, and minimum mounting dimensions

6.3.1 Cartridge-based piston pump unit

Fig. 6



ECP cartridge-based pump unit, assembly drawing

Legend to Figure 6:
1 Lubricant outlet 2 (bottom), pipe thread M10x1
2 Vent screw

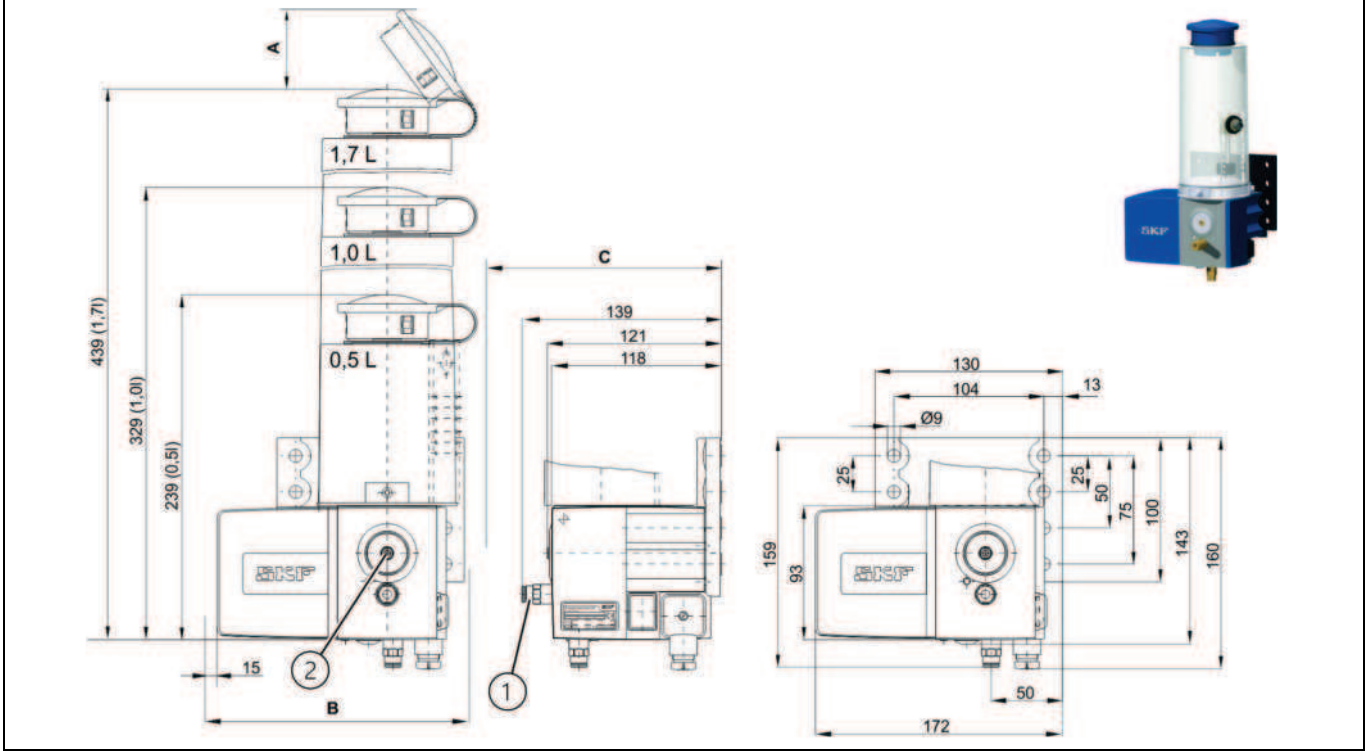
Table 8

Minimum mounting dimensions

No.	Designation	Dimension
A	Height	440 mm
B	Width	240 mm
C	Depth	210 mm

6.3.2 Reservoir-based piston pump unit

Fig. 7



ECP reservoir-based pump unit, assembly drawing

Legend to Figure 7:
1 Lubricant outlet 2 (bottom), pipe thread M10x1
2 Vent screw

Table 9

Minimum mounting dimensions

No.	Designation	Dimension
A	Height	100 mm + height of respective pump with reservoir
B	Width	240 mm
C	Depth	210 mm

6.4 Assembly of piston pump unit ECP

Six optional assembly holes are available for assembly of the ECP. Four screws are required for assembly, whereby the two upper horizontal assembly holes should be used preferentially.

NOTICE

Be mindful of the installation conditions

The total length of the mounting screws is to be determined according to the particular installation conditions

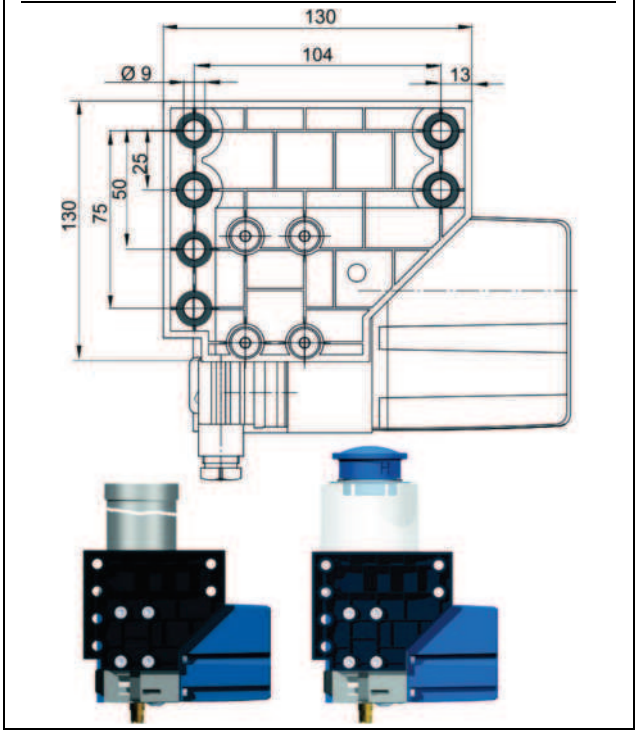
Recommended fastening hardware:

- Hexagon socket screws (4x) acc. to ISO 4762-M8x..-8.8
- Washers (8x) acc. to ISO 7090-6-200HV

Optionally:

- Self-locking nuts (4x) acc. to ISO 7042-M8x...-8 or ISO10512-M8x...-8

Fig. 8



Mounting template

NOTE

Also observe the figures in section 6.3 Port dimensions, assembly holes, and minimum mounting dimensions

1. Drill assembly holes (recommended diameter 8.5 mm) on the customer-provided mounting surface according to the assembly drawing (Fig. 8) as well as the conditions on the surface

2. Clean surface to remove drilling chips

3. Place the ECP on the surface and roughly align it.

4. Pass the hexagon socket screws (4x) acc. to ISO 4762-M8x..-8.8, with associated washers (4x), through the piston pump unit and insert them into the M8 mounting holes supplied by the customer

Optionally:

5. Apply to self-locking M8 nuts

6. Gently tighten hexagon socket screws (4x)

Align the ECP and tighten the hexagon socket screws with subsequent tightening torque of 10 +5 Nm

⚠ CAUTION

Lubricant coming out

Risk of slipping and injury

Leaking lubricant is hazardous. Eliminate leaks immediately and remove leaked lubricant in accordance with company and statutory regulations.

NOTICE

Ensure that the connection is free of stress

Always connect the lubrication lines in such a way that no forces are transferred to the assembled ECP piston pump unit (stress-free connection).

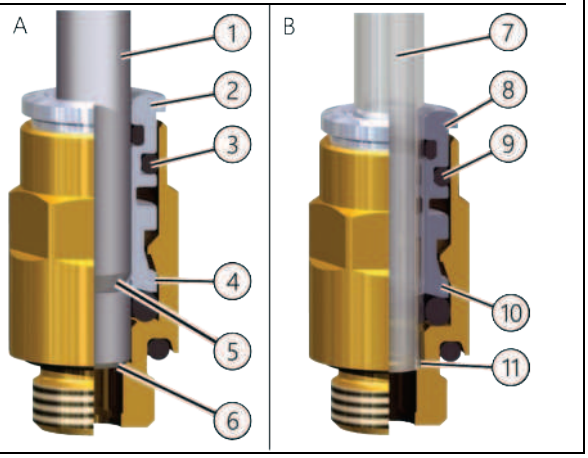
Lubricant lines made of transparent plastic are recommended so that the lubricant transport can be assessed visually.

The following applies in general:

- The pipes, hoses, shut-off valves, directional control valves, fittings, etc. that will be used must be designed for the maximum operating pressure of the ECP, the permissible temperatures, and the lubricants that will be delivered
- 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
- 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
- The flow of lubricant in the lubrication lines should not be impeded by the incorporation of 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.

6.5 Assembly of the lubrication lines using SKF quick couplings

Fig. 9



Quick coupling for metal pipes (A) und plastic pipes (B)

Legend to Figure 9:
A Quick coupling for metal pipes
B Quick coupling for plastic pipes
1 Metal pipe
2 Collet
3 First O-ring
4 Locking claw
5 Claw groove
6 Mechanical stop
7 Plastic pipe
8 Collet
9 First O-ring
10 Locking claw
11 Mechanical stop

The SKF quick disconnect couplings are available in designs for metal pipes or plastic pipes. With the design for metal pipes, you can choose between pipe versions with and without claw groove.

The claw groove securely fastens the pipe in the quick disconnect coupling, which prevents the metal pipe from slipping out of the quick disconnect coupling. The claw groove does not need to be used if appropriate fastening hardware such as pipe clamps are used to prevent the pipe from slipping out of the quick disconnect coupling.

Both versions – the one for metal pipes and the one for plastic pipes – have a locking claw. The locking claw of the collet secures the pipe in the quick disconnect coupling, which prevents the pipe from accidentally slipping out, at least in the case of the version for plastic pipes.

1. Cut the pipe to be installed (Fig. 9/1) to the correct length with a tube cutter

NOTE
During the following installation of the pipe, a noticeable resistance must be overcome when passing through the first O-ring (Fig. 9/3 or 9) and the locking claw (Fig. 9/4 or 10) of the collet (Fig. 9/2 or 8). If a claw groove is not used, secure the pipe using appropriate fastening hardware such as pipe clamps, to prevent the pipe from slipping out of the SKF quick disconnect coupling.

2. Insert the pipe (Fig. 9/1 or 7) fully into the collet (Fig. 9/2 or 8) of the SKF quick disconnect coupling until it passes the first O-ring (Fig. 9/3 or 9) and the locking claw (Fig. 9/4 or 10) of the collet (Fig. 9/2 or 8) and it reaches the mechanical stop (6 or 113)

3. To remove the metal pipe (Fig. 9/1), press the collet (Fig. 9/2) inward into the SKF quick disconnect coupling. The metal pipe (Fig. 9/1) can now be pulled out of the collet (Fig. 9/2) of the SKF quick coupling.

4. To remove the plastic pipe (Fig. 9/1), press the collet (4) inward into the SKF quick coupling. To do this, also press the plastic pipe (Fig. 9/1) inward into the SKF quick coupling fitting, which releases the collet (Fig. 9/8) from the plastic pipe (Fig. 9/1). The plastic pipe (Fig. 9/1) can now be pulled out of the collet (Fig. 9/8) of the SKF quick coupling.

Before reassembling, shorten the end of the plastic pipe by at least 7 mm to ensure that the locking claw (Fig. 9/10) of the collet (Fig. 9/8) functions properly.

6.6 Electrical connection

6.6.1 General

The ECP piston pump unit is driven by a 24 VDC DC motor.

The power supply and the integrated pushbutton (DK) are connected to the port **XS1**, by a rectangular connector acc. to DIN EN 175301-803, type A.

The WS fill level monitoring, on the other hand, uses a plug adapter acc. to DIN EN 60947-5-2 (M12x1 for cartridge and oil reservoir, M8x1 for fluid grease reservoir).

For the electrical characteristics of the motor, see section 4. Technical data.

Observe the guidelines in EN 60034-1 (VDE 0530-1) for operation at the limits of the ranges A (combination of ±5 % voltage deviation and ±2 % frequency deviation) and B (combination of ±10% voltage deviation and +3/-5 % frequency deviation). This applies especially with regard to deviations in operating parameters from the ratings. The limits must never be exceeded.

Be sure to connect the motor or its connection cable 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 connecting 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 motor to the power supply, especially terminal and connector pin assignment, can be found in section ECP terminal diagrams.

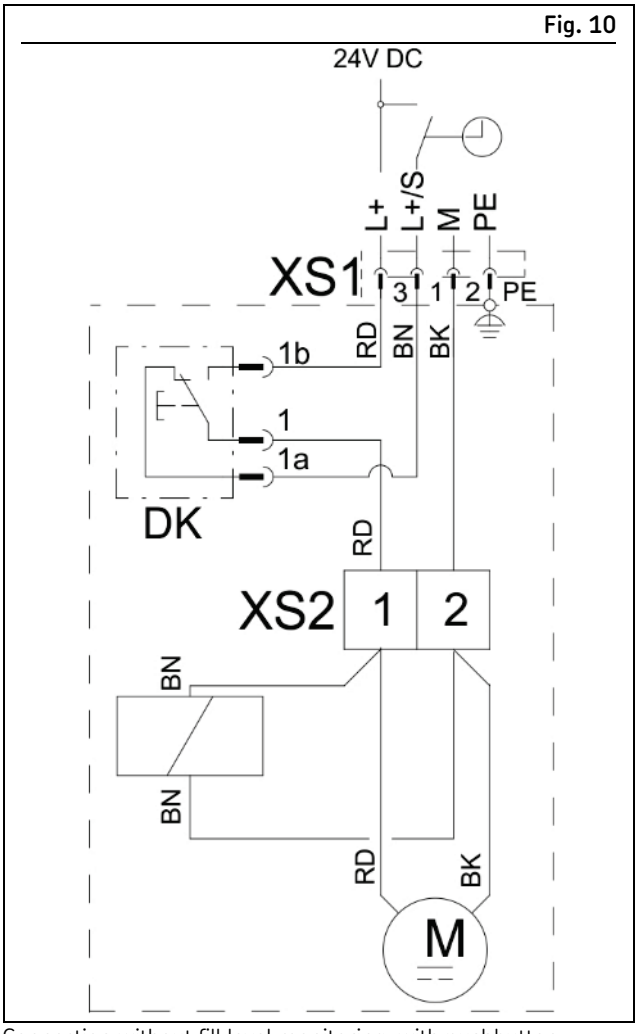
6.6.2 ECP terminal diagrams

NOTICE

Damage due to incorrect fuse protection

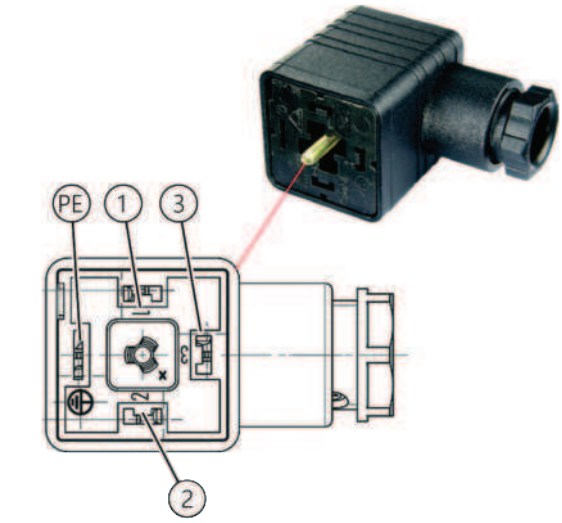
The rated supply voltage is 24 VDC. Check the fuse protection of the electrical circuit. Use only fuses with the prescribed amperage,

Fig. 10



Connection without fill level monitoring, with pushbutton

Fig. 11



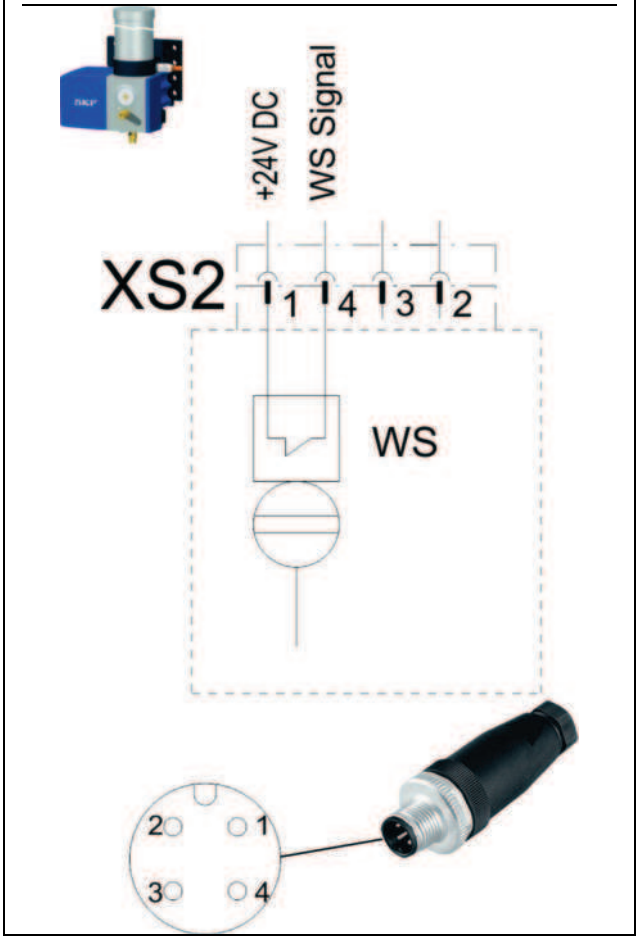
ECP electrical socket outlet

Table 10

Legend to Figures 10 and 11:

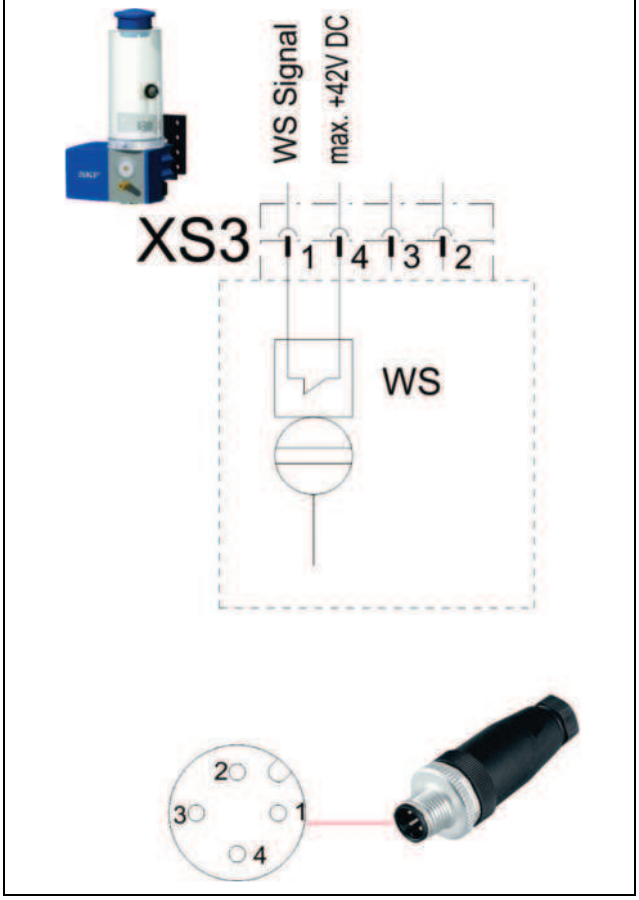
Pin	Assignment / internal assignment
XS1 plug (power supply)	
1	Switching signal L+/S
2	Ground
3	Power supply 24 VDC
PE	PE grounding
Pushbutton DK (intermediate lubrication)	
1a	Switching signal L+/S
1b	Power supply 24 VDC
1b	Electric motor voltage

Fig. 12



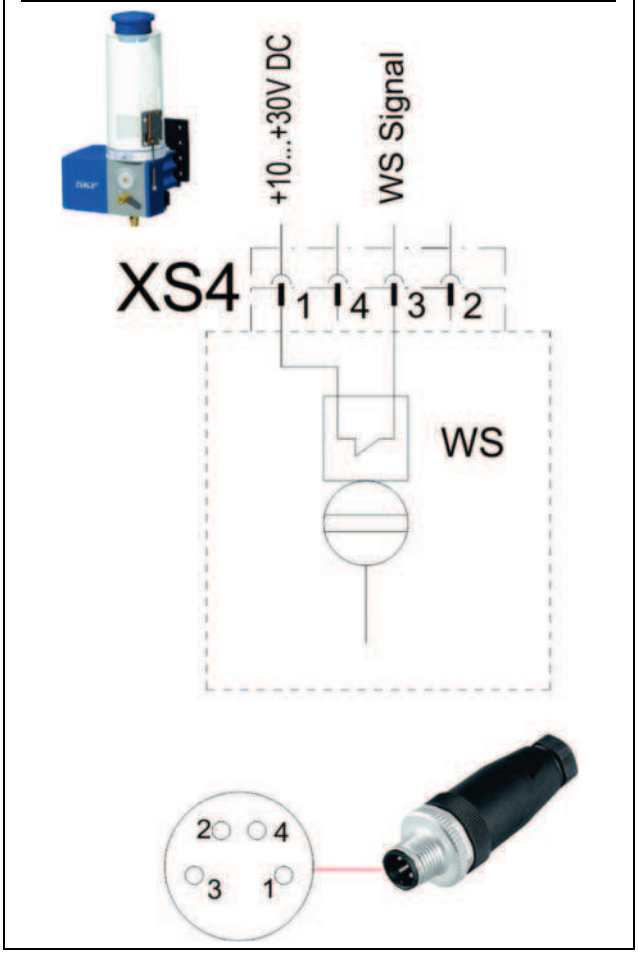
Lubricant level switch on cartridge-based piston pump unit

Fig. 13



Lubricant level switch on reservoir-based piston pump unit for oil

Fig. 14



Lubricant level switch on reservoir-based piston pump unit for fluid grease

Table 11

Legend to Figures 12, 13, and 14:

Pin	
XS2 plug (lubricant level switch WS)	
1	Power supply 24 VDC
4	Fill level switch signal (WS) Pre-warning for min. fill level

6.7 Filling

NOTICE

Damage due to contaminated lubricant

Only fill using clean lubricant and an appropriate device (reservoir-based version). Contaminated lubricant can result in system malfunctions.

NOTICE

Faults or damage from non-original cartridges

Only use original SKF disposable cartridges. Refilling the cartridges can result in pump malfunctions/system malfunctions and is therefore strictly prohibited!

NOTICE

Avoid air inclusions!

Air inclusions in the lubricant can lead to failure of lubricant delivery. Therefore, refill lubricant without forming bubbles to the extent possible

6.7.1 Replacing the cartridge

NOTICE

Damage from fluid grease

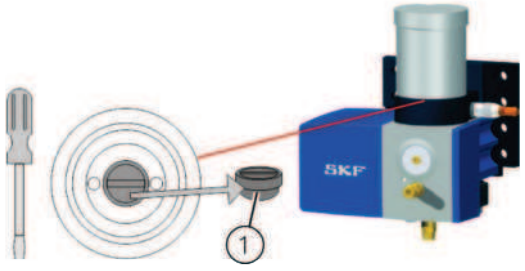
Use only SKF disposable cartridges for fluid greases based on mineral oils as well as environmentally friendly and synthetic fluid greases of NLGI grades 00 to 000, (0)

NOTE

The ECP piston pump unit is delivered from the factory without an installed lubricant cartridge. In this case, there is a protective screw (Fig. 15/1) in the lubricant inlet.

Install the cartridge

Fig. 15

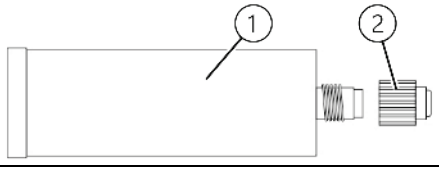


Removing the protective screw

Legend to Figure 15:
1 Protective screw

1. Remove the protective screw (Fig. 15/1) from the ECP piston pump unit (cartridge thread) and store for later use

Fig. 16



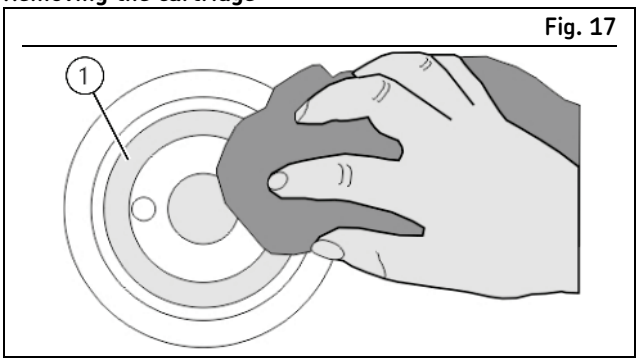
Removing the cap screw

Legend to Figure 16:
1 Cartridge
2 Cap screw

2. Remove the plug screw (Fig. 16/2) from the cartridge (Fig. 16/1)
3. If necessary, remove contamination in the area of the cartridge/lubricant inlet
4. Screw in the cartridge (Fig. 16/1) finger-tight by hand clockwise into the ECP until the stop

Removing the cartridge

Fig. 17



Checking the packing ring

Legend to Figure 17:
1 Packing ring

1. Rotate the empty cartridge counterclockwise out of the ECP
2. Check the packing ring (Fig. 17/1); if it is defective, replace it; see 14. Spare parts
3. Screw in the new cartridge as described

Fig. 18

Undoing the vent screw

Legend to Figure 18:
1 Vent screw

4. Rotate the vent screw (Fig. 18/1) (spanner width 4 mm) by one turn
5. Perform intermediate lubrication using pushbutton DK
6. As soon as bubble-free lubricant discharges, close the vent screw (Fig. 18/1)
7. Dispose of the cartridge in an environmentally friendly way

6.7.2 Filling the lubricant reservoir

Fig. 19

Filling the lubricant reservoir

Legend to Figure 19:
1 Filler cap

1. If necessary, clean contamination from the ECP reservoir
2. Loosen the filler cap (Fig. 19/1) and fold it up
3. Use a suitable filling device to fill the reservoir to approx. 1 cm below the reservoir cover
4. Close the filler cap (Fig. 19/1)
5. Clean any lubricant residues from the ECP

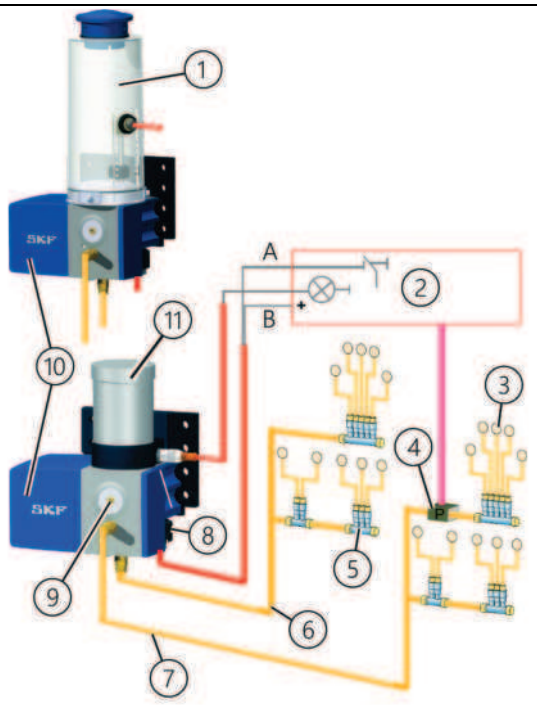
6.8 Venting the centralized lubrication system

The piston pump unit can briefly and occasionally be operated outside the specified duty type S3 15% duty cycle, such as when filling lubrication lines or bleeding the piston pump unit (after changing the cartridge). Brief and occasional continuous duty (S1 100% duty cycle) is permitted for this, but the maximum pump running time must not exceed 15 minutes at such times. After such continuous duty, an interval of at least 10 minutes must be provided (for the electrical components of the pump to cool down).

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

- Filling long pipe sections first, before connecting to the lubrication points

Fig. 20



Single-line centralized lubrication system

Legend to Figure 20:
1 Lubricant reservoir (ECP reservoir-based pump unit)
2 Machine control / external process control level
3 Lubrication points
4 Pressure switch
5 Single-line metering device
6 Lubricant lines
7 Lubricant lines
8 Pushbutton
9 Vent screw
10 ECP piston pump unit
11 Cartridge (ECP cartridge-based piston pump unit)
A Extern DK
B 24 VDC

Requirement:
The ECP piston pump unit (Fig. 20/10) must be assembled as described above.

1. Pre-fill the lubricant lines with lubricant
2. Install lubricant lines (Fig. 20/6 and 7) to the metering devices, but **do not yet** connect the lubricant line (Fig. 20/7) to the piston pump unit
3. *For ECP cartridge-based piston pump unit only:* Screw the cartridge (Fig. 20/11) into the ECP; see section 6.7 Filling
4. *For ECP reservoir-based pump unit only*: Fill the lubricant reservoir (Fig. 20/1); see section 6.7 Filling
5. Rotate the vent screw (Fig. 20/9) (spanner width 4 mm) by one turn
6. Press and hold pushbutton DK (Fig. 20/8) until bubble-free lubricant discharges at the vent screw (Fig. 20/9)
7. Tighten the vent screw (Fig. 20/9)
8. Clean the outlet, dispose of leaked lubricant
9. Connect the lubricant line (Fig. 20/7) to the ECP (Fig. 20/10)
10. Remove the lubricant line (Fig. 20/6) on the first metering device (as viewed from the pump outlet)
11. Press and hold pushbutton DK (Fig. 20/8) until bubble-free lubricant discharges at the lubricant line
12. Connect the lubricant line (Fig. 20/6)
13. Repeat the venting procedure on the second metering device (as viewed from the pump outlet)

Perform subsequently on all metering devices

14. Loosening lubrication lines at the lubrication points
15. Press and hold pushbutton DK (Fig. 20/8) until bubble-free lubricant discharges at the lubricant lines
16. Connect the lubricant lines

7. First start-up

To ensure safety and functionality, the person specified by the operator is required to perform the following inspections. Any detected deficiencies must be resolved immediately. The correction of deficiencies must be done exclusively by a specialist competent and authorized to do so.

Table 12

Inspections before first start-up

	YES	NO
Mechanical connection established correctly	☐	☐
Hydraulic connection established correctly	☐	☐
Electrical pump connection and electrical fill level monitoring implemented correctly	☐	☐
The performance characteristics for the aforementioned connections match the specifications in the “Technical data”	☐	☐
All components, such as lubrication lines and metering devices, are correctly installed	☐	☐
The cartridge is installed or the lubricant reservoir is completely filled with lubricant: see section 6.6 Electrical connection. The person responsible is aware of the refill interval.	☐	☐
The pump was vented correctly at the vent screw; vent the centralized lubrication system if necessary; see section 6.8 Venting the centralized lubrication system	☐	☐
No apparent damage, contamination, or corrosion	☐	☐
Any dismantled protective and monitoring equipment is fully reinstalled and functional	☐	☐
All warning labels on the product are present and in proper condition	☐	☐

Table 13

Inspections during first start-up

	YES	NO
No unusual noises, vibrations, moisture accumulation, or odors present	☐	☐
No undesired discharge of lubricant at connections (leakage)	☐	☐
Lubricant is fed without bubbles	☐	☐
The bearings and friction points requiring lubrication receive the planned lubricant volume	☐	☐

8. Operation

⚠ CAUTION

Lubricant coming out
Risk of slipping and injury
Centralized lubrication systems 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

Damage from ignoring manufacturer's instructions

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

NOTICE

Faults or damage from non-original cartridges

Only use original SKF disposable cartridges. Refilling the cartridges can result in pump malfunctions/system malfunctions and is therefore strictly prohibited!

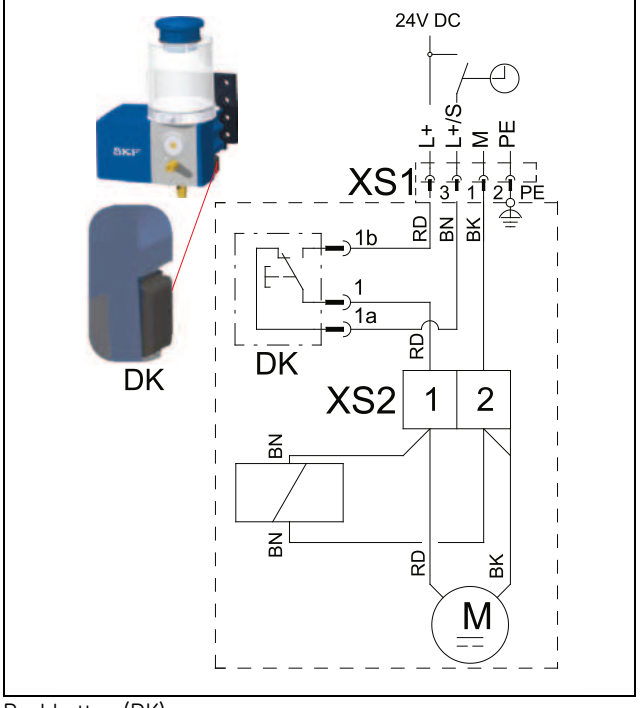
8.1 General

The ECP piston pump unit functions automatically. The lubricant transport in the lubrication lines should, however, be subjected to regular visual inspection.

The lubricant level (cartridge, reservoir) should be subjected to visual inspection on a regular basis. If the lubricant level is too low, replace the cartridge or top up the lubricant, respectively.

8.2 Pushbutton DK

Fig. 21



Pushbutton (DK)

The ECP piston pump unit is equipped with a pushbutton that can be used to conduct a venting procedure (e.g., after cartridge replacement). It can also be used to trigger an intermediate lubrication (press and hold). In intermediate lubrication, the ECP cartridge-based pump unit delivers lubricant only as long as the pushbutton remains pressed. The piston pump unit can briefly and occasionally be operated outside the specified duty type S3 15% duty cycle, such as when filling lubrication lines or bleeding the piston pump unit (after changing the cartridge). Brief and occasional continuous duty (S1 100% duty cycle) is permitted for this, but the **maximum pump running time must not exceed 15 minutes at such times**.

After such continuous duty, an **interval of at least 10 minutes must be provided** (for the electrical components of the pump to cool down).

9. Maintenance and repair

9.1 General

⚠ WARNING

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

- Assembly, maintenance, and repair work may only be performed by qualified technical personnel
- De-energize the product prior to beginning work
- Local electrical operating conditions and regulations (e.g., DIN, VDE) must be observed

⚠ WARNING

System pressure
Hydraulic pressure
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.

⚠ CAUTION

Lubricant coming out
Risk of slipping and injury
Centralized lubrication systems 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

Nullification of warranty

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

NOTICE

Incorrect spare parts
Nullification of warranty
Only original SKF spare parts may be used. Unauthorized alterations to products and the use of non-original spare parts and accessories are prohibited and nullify the statutory warranty.

NOTICE

Damage due to contamination

With ECP cartridge-based piston pump units, the cartridge housing of the screw-in cartridge must be free of dirt and contamination. The same applies to the filling area of the reservoir of the ECP reservoir-based piston pump unit. The lubricant must not become contaminated during cartridge replacement or during reservoir refilling.
The purity of the lubricants used is the decisive factor in the service life of ECP piston pump units and the lubricated machinery elements.

SKF products are low-maintenance. All connections and fittings must be regularly inspected for proper seating to ensure proper function.

If necessary, the product can be cleaned using mild cleaning agents that are compatible with the product's materials (non-alkaline, non-soap). Do not allow any cleaning agent to enter the interior of the product during cleaning. It is normally not necessary to clean the interior of the product.

The interior of the product must be cleaned if incorrect or contaminated lubricant is accidentally filled into the product. Contact the SKF Service department if this occurs.
SKF shall not be held liable for damages resulting from improperly performed assembly, maintenance, or repair work on the product.

In addition:

- Take appropriate measures to ensure that moving or detached parts are immobilized during the work and that no body parts can be pinched by unintended movements
- Assemble the product only outside the operating range of moving parts, at an adequate distance from sources of heat
- Prior to performing work, the product and the machine/system in which the product will be integrated must be de-energized, depressurized and secured against unauthorized activation
- All work on electrical components may be performed only with voltage-insulated tools
- Fuses must not be bridged. Always replace fuses with fuses of the same type
- Ensure proper grounding of the product
- Drill required holes only on non-critical, non-load-bearing parts
- Other units of the machine must not be damaged or their function impaired by the installation of the centralized lubrication system
- No parts of the centralized lubrication device may be subjected to torsion, shear, or bending
- Use suitable lifting gear when working with heavy parts
- Avoid mixing up/incorrectly assembling disassembled parts. Label parts.

9.2 Maintenance schedule

Maintenance intervals vary depending on the system and are affected by the lubricant consumption as well as environmental

factors such as dust and heat. The maintenance intervals are therefore defined by the system manufacturer.

Table 14

Maintenance schedule

Maintenance work	Time period
Visually inspect the fill level of the lubricant cartridge or the reservoir (in the case of versions without fill level control)	Depending on pump cycles and system configuration
Regularly inspect system components for leaks (trigger intermediate lubrication using DK)	During each filling
Inspect electrical cables for damage.	Annually
Visual inspection of bearings' lubrication	Annually

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.

11. Faults, causes, and remedies

⚠ WARNING

Electric shock

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

- Assembly, maintenance, and repair work may only be performed by qualified technical personnel
- De-energize the product prior to beginning work
- Local electrical operating conditions and regulations (e.g., DIN, VDE) must be observed

⚠ WARNING

System pressure

Damage and injury from working on pressurized system components

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

⚠ CAUTION

Lubricant coming out

Risk of slipping and injury

Centralized lubrication systems 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.

NOTE

Dismantling of the product is prohibited and voids any claims. Defective products must be replaced. Only SKF Service is capable of repairing them.

NOTE

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

- Take appropriate measures to ensure that moving or detached parts are immobilized during the work and that no body parts can be pinched by unintended movements
- Assemble the product only outside the operating range of moving parts, at an adequate distance from sources of heat
- Prior to performing work, the product and the machine/system in which the product will be integrated must be de-energized, depressurized and secured against unauthorized activation
- All work on electrical components may be performed only with voltage-insulated tools
- Fuses must not be bridged. Always replace fuses with fuses of the same type
- Ensure proper grounding of the product
- Drill required holes only on non-critical, non-load-bearing parts
- Other units of the machine must not be damaged or their function impaired by the installation of the centralized lubrication system
- No parts of the centralized lubrication device may be subjected to torsion, shear, or bending
- Use suitable lifting gear when working with heavy parts
- Avoid mixing up/incorrectly assembling disassembled parts. Label parts.

The following tables provide an overview of possible malfunctions and their causes. Contact the SKF Service department if you cannot remedy the malfunction.

11.1 Commissioning, product, and system malfunctions

Table 15

Fault analysis and rectification:

Fault	Cause	Remedy
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 power supply plug/cable and connect properly if necessary • Check operating voltage on motor (press DK)
	• Pump delivers too little medium	• Cartridge/reservoir empty • If motor resistance is high, replace the pump
	• Impermissible lubricant (see technical data)	• Remove lubricant from entire system and dispose of lubricant in the proper manner; use a suitable cartridge
No pressure build-up/relief	• Pressure too low or too high, pressure limiting valve is jammed or defective	• Replace pump
	• Ambient temperature too low (see technical data)	• Increase the ambient temperature
	Air in the main line	• Bleed the main line
	• Main line leaky/broken	• Repair the main line
No pressure build up in the main line	• Air in the main line	• Bleed the main line
	• Main line leaky/broken	• Repair the main line

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

Table 16

Spare parts

Description	Order No.
Spare parts set for packing ring, self-adhesive	TLMR 1-5
Plug screw (ECP cartridge outlet)	TLMR 1-4
ECP mounting plate (kit)	995-901-065

(6 Nm tightening torque for wall bracket/pump mounting screws)

14.1 Accessories

Lubricant

Table 17

Lubricant - Divinol Lithogrease 00

NLGI grade	Cartridge size [ml]	Order No.	Quantity [pcs.]
00	380	LF001/MR380	1*

* Minimum order: 10 pieces each

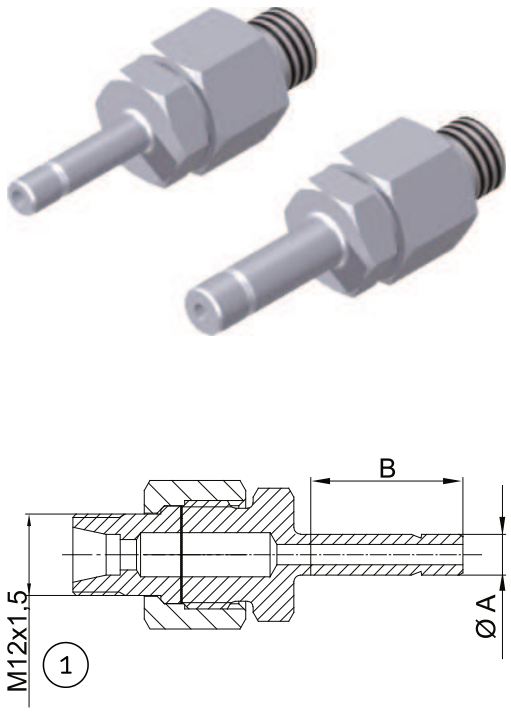
Overpressure limiter for use of main lubricant line

NOTICE

Damage from incorrect installation

When using pressure-limiting devices, observe the associated installation instructions and safety precautions!

Fig. 22



451-00*-060

Legend to Figure 22:
B = Insertion depth
1 For pipe ø 6mm

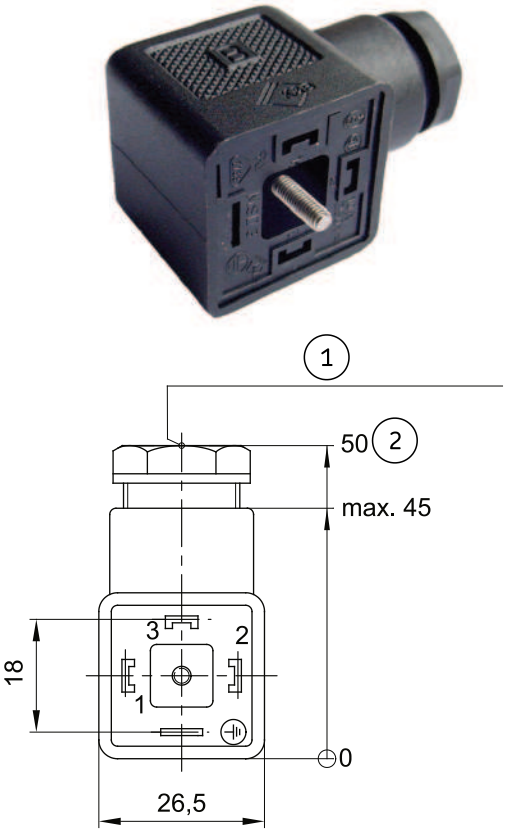
Table 18

Pressure limiting valve for use of main lubricant line

Designation	Burst pressure [bar]	Ø A [mm]	B [mm]	Order No.
Pressure limiter	60	6	22.5	451-006-060
Pressure limiter	60	8	24	451-008-060

Rectangular connector

Fig. 23



179-990-147

Legend to Figure 23:
1 Screwed gland M16x1.5
2 Loose

Table 19

Rectangular connector

Designation	Order No.
Cable socket acc. to DIN EN 175301-803, type A, line diameter 4.5 to 7 mm	179-990-147

Circular connector

Fig. 24

Circular connector

Table 20

Circular connector M12x1

Designation	Order No.
Cable socket, straight (A)	2360-00000316
Cable socket, straight (B) with molded cable, 5 m, 3x0.25 mm^2	179-990-381
Cable socket, angled (C)	2360-00000317
Cable socket (D), angled, with molded cable (5 m, 3×0.25 mm²)	179-990-382

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 21

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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