Electrically driven piston pump units of ECP series

for single-line centralized lubrication systems

Assembly instructions

acc. to Machinery Directive 2006/42/EC

EN

Version 03
951-170-232-EN

EC Declaration of Incorporation acc. to Machinery Directive 2006/42/EC, Appendix II Part 1 B

The manufacturer, SKF Lubrication Systems Germany GmbH , Berlin Plant, Motzener Strasse 35/37 12277 Berlin, Germany
hereby declares conformity of the partly completed machinery

Designation: **Electrically driven piston pump unit**
Model: **ECP**
Year of manufacture: See rating plate

with all relevant provisions below of Machinery Directive 2006/42/EC at the time of placing on the market.
1.1.2 · 1.13 · 1.3.2 · 1.3.4 · 1.5.1 · 1.5.6· 1.5.8 · 1.5.9 · 1.6.1 · 1.7.1 · 1.7.3 · 1.7.4

The technical documentation described in Annex VII, Part A of this Directive has been prepared. We undertake to transmit, in response to a reasoned request by the national authorities, the technical documents for this partly completed machine. The Head of Technical Standards is the authorized representative for the technical documentation. See the manufacturer information for the address.

Furthermore, the following Directives and (harmonized) standards were applied in the applicable areas:
2011/65/EU RoHS II
2014/30/EU Electromagnetic Compatibility | Industry

Standard	Edition	Standard	Edition	Standard	Edition	Standard	Edition
DIN EN ISO 12100	2011	DIN EN 60034-1	2011	DIN EN 61000-6-2	2006	DIN EN 61000-6-3	2011
Correction	2013	Correction	2015	Correction	2011	Correction	2012
DIN EN 809	2012						
DIN EN 50581	2013						

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

Berlin, November 30, 2015

Jürgen Kreutzkämper
Manager R&D Germany
SKF Lubrication Business Unit

Dr.-Ing. Holger Schmidt
Manager Development Center Berlin
SKF Lubrication Business Unit

Masthead

These assembly instructions pursuant to EC Machinery Directive 2006/42/EC are an integral part of the product described here and must be kept for future use.

Warranty

The instructions do not contain any information on the warranty. This can be found in the General Conditions of Sales, which are available at:
www.skf.com/lubrication.

Copyright/Integration of instructions

Manufacturer's service addresses

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Table of contents

Explanation of symbols and signs

You will find these symbols, which warn of specific dangers to persons, material assets, or the environment, next to all safety instructions in these operating instructions.

Read the instructions completely and follow all operating
instructions and the warning and safety instructions.

Warning level		Consequence	Probability
⚠	DANGER	Death / serious injury	Immediate
⚠	WARNING	Serious injury	Possible
⚠	CAUTION	Minor injury	Possible
	NOTE	Property damage	Possible

Information symbols within the text	
Symbol	Meaning
●	Prompts an action
○	Used for itemizing
☞	Refers to other facts, causes, or consequences
→	Provides additional information within procedures

Possible symbols	
Symbol	Meaning
	Note
	Electrical component hazard, electric shock hazard
	Slipping hazard
	Hazard from hot components Hazard from hot surface
	Risk of being drawn into machinery
	Crushing hazard
	Danger from suspended load
	Pressure injection hazard
	Explosion-proof component
	Electrostatic sensitive components
	Wear personal safety equipment (goggles)
	Secure (lock) the closing device against accidental starting of the machine
	Environmentally sound disposal

Instructions placed directly on the ECP must be followed without fail and kept in fully legible condition.

Abbreviations and conversion factors

Abbreviations

re	regarding	oz.	ounce
approx.	approximately	psi	pound per square inch
°C	degrees Celsius	hp	horsepower
s	second	lb.	pound
dB (A)	sound pressure level	sq.in.	square inch
i.e.	that is	kp	kilopond
etc.	et cetera	cu.in.	cubic inch
poss.	possibly	mph	miles per hour
<	less than	fpsec	feet per second
±	plus or minus	°F	degrees Fahrenheit
>	greater than	fl.oz.	fluid ounce
e.g.	for example	in.	inch
Ø	diameter	gal.	gallon
incl.	including		
K	Kelvin		
kg	kilogram		
RH	relative humidity		
kW	kilowatt		
l	liter		
min.	minute		
max.	maximum		
min.	minimum		
mm	millimeter		
ml	milliliter		
N	Newton		
Nm	Newton meter		

Conversion factors

Length	1 mm = 0.03937 in.
Area	1 cm^2 = 0.155 sq.in.
Volume	1 ml = 0.0352 fl.oz.
	1 l = 2.11416 pints (US)
Mass	1 kg = 2.205 lbs
	1 g = 0.03527 oz.
Density	1 kg/cm^3 = 8.3454 lb./gal. (US)
	1 kg/cm^3 = 0.03613 lb./cu.in.
Force	1 N = 0.10197 kp
Speed	1 m/s = 3.28084 fpsec
	1 m/s = 2.23694 mph
Acceleration	1 m/s^2 = 3.28084 $ft./s^2$
Pressure	1 bar = 14.5 psi
Temperature	°C = (°F-32) x 5/9
Power	1 kW = 1.34109 hp

1. Safety instructions

1.1 General safety instructions

The operator must ensure that the assembly instructions are read by all persons tasked with working on the product or who supervise or instruct such persons. The operator must also ensure that the staff fully understands the content of the instructions.
The assembly instructions must be kept readily available together with the product. Note that the assembly instructions form part of the product and must accompany the product if sold to a new owner.
The product described here was manufactured according to the state of the art. Risks may, however, arise from its usage and may result in personal injury or damage to material assets.
Any malfunctions which may affect safety must be remedied immediately. In addition to the assembly instructions, general statutory regulations and other regulations for accident prevention and environmental protection must be observed and applied.

1.2 General behavior when handling the product

- The product may only be used in awareness of the potential dangers, in proper technical condition, and according to the information in this manual.
- Personnel must familiarize themselves with the functions and operation of the product. The specified assembly and operating steps and their sequences must be observed.
- Any unclear points regarding proper condition or correct assembly/operation must be clarified. Operation is prohibited until issues have been clarified.
- Unauthorized persons must be kept away from the product.
- All safety instructions and in-house instructions relevant to the particular activity must be observed.
- Responsibilities for different activities must be clearly defined and observed. Uncertainty seriously endangers safety.
- Protective and safety mechanisms cannot be removed, modified, nor disabled during operation and must be checked for proper function and completeness at regular intervals.
  If protective and safety mechanisms must be removed, they must be installed immediately following conclusion of work and checked for proper function.
- Any malfunctions that occur must be resolved according to responsibility. The supervisor must be notified immediately in case of malfunctions outside one's individual scope of responsibility.
- Wear personal protective equipment.
- Observe the relevant safety data sheets when handling lubricants/equipment.

1.3 Qualified technical personnel

Only qualified technical personnel may install, operate, maintain, and repair the products described here.
Such persons are familiar with the relevant standards, rules, accident prevention regulations, and assembly 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 any potential hazards. The definition of qualified personnel and the prohibition against employing non-qualified personnel are laid down in DIN VDE 0105 and IEC 364. Relevant country-specific definitions of qualified technical personnel apply for countries outside the scope of DIN VDE 0105 or IEC 364.
The operator is responsible for assigning tasks and the area of responsibility.

The personnel must be trained and instructed prior to beginning work if they do not possess the requisite knowledge.

Product training can also be performed by SKF in exchange for costs incurred.

1.4 Electric shock hazard

WARNING

Electric shock
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 regulations (e.g., DIN, VDE) must be observed.

1.5 System pressure or hydraulic pressure hazard

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.

1.6 Operation

The following must be observed while working on the product.

- All information within this manual and the information within the referenced documents
- All laws and regulations that the operator must observe

1.7 Assembly/maintenance/malfunction/decommissioning/disposal

All relevant persons (e.g., operating personnel, supervisors) must be informed of the activity prior to the start of work. Precautionary operational measures / work instructions must be observed.

- Take appropriate measures to ensure that moving/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 is integrated must be de-energized and 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.

1.8 Intended use

Electrically driven piston pump units of series ECP are used to supply single-line centralized lubrication systems and are intended for use in single-line centralized lubrication systems.
It feeds fluid greases approved by SKF that are based on mineral oils as well as environmentally friendly and synthetic fluid greases of NLGI grades 00 to 000; it also feeds environmentally friendly and synthetic oils with a permitted operating viscosity from 20 to 1500 mm^2/s, in the following duty type: **S3 15% ON-time (according to DIN EN 60034-1)**.
The piston pump units can briefly and occasionally be operated outside the specified duty type S3 15% ON-TIME, for example to fill lubrication lines or to vent the piston pump units (after changing the cartridge).
Brief and occasional continuous duty (S1 100% ON-TIME) is permitted, whereby the maximum pump run time must not exceed 15 minutes.
After such continuous duty, an interval of at least 10 minutes must be provided (for the electrical components of the pump to cool down).
Failure to comply with these requirements for brief and occasional continuous duty may result in damage to the ECP and represents improper use.
Continuous duty can be implemented via the DK button on the piston pump unit or a corresponding filling program (recommended) on the machine's control unit (SPC) of the piston pump unit.
The fluid greases used must be compatible with plastic and NBR elastomers.
The use of synthetic and biodegradable fluid greases requires prior approval from SKF.
The ECP electrically driven piston pump unit has two lubricant outlets that can be used individually or collectively (note the design guidelines for centralized lubrication systems!).
In order to ensure a defined quantity distribution especially when using both outlets in parallel, the outlet (the outlets) must always be connected to metering distributors (lubricant distributor).
Only lubricants approved for the ECP may be used. Only SKF disposable cartridges are permitted for the cartridge-based version.
Any other usage is deemed non-compliant with the intended use.

1.9 Foreseeable misuse

Any usage of the product differing from the aforementioned conditions and stated purpose is strictly prohibited. Particularly prohibited are:

- Disregarding of the duty type for brief and occasional continuous duty.
- Use in an explosion protection zone
- Use to feed, forward, or store hazardous substances and mixtures as defined in Annex I Part 2-5 of the CLP Regulation (EC 1272/2008)
- Use to feed / forward / 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

1.10 Disclaimer of liability

The manufacturer shall not be held liable for damage resulting from:

- Resulting from failure to comply with these instructions.
- The use of lubricants/media not approved for the pump type
- Contaminated or unsuitable lubricants
- Installation of non-original SKF components.
- Inappropriate usage
- Improper assembly, configuration, or filling
- Improper response to malfunctions
- Non-observance of maintenance intervals
- Independent modification of system components

1.11 Referenced documents

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

- Operational instructions and approval rules
- Instructions from suppliers of purchased parts
- Safety data sheet of the lubricant/equipment used
- Project planning documents and other relevant documents, if available

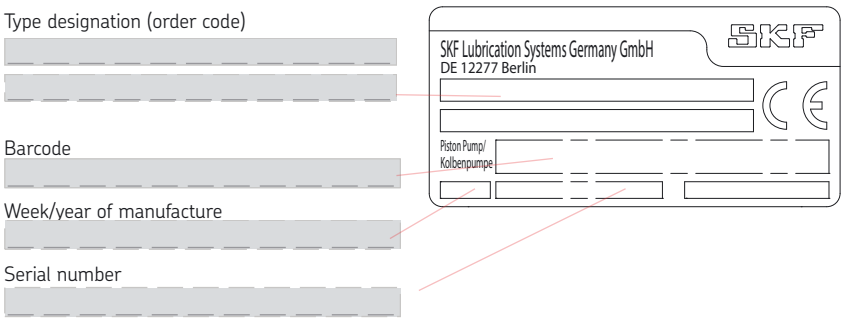
The operator must supplement these documents with applicable regulations for the country of use. The documentation must be included if the product is transferred to a new operator.

1.12 Note on the rating plate

The rating 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 rating plate becomes illegible, these characteristics should be entered in Figure 1 below.

- Enter characteristics from rating plate in Figure 8 below:

Characteristics from rating plate, Fig. 1



1.13 Information on CE marking

The CE marking is based on the requirements of the applied Directives:

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

Note on Low-Voltage Directive 2014/35/EU

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

Note on Pressure Equipment Directive 2014/68/EU

Due to its performance characteristics, the product does not reach the limit values defined in Article 4, Paragraph 1, Subparagraph (a) item (i) and is, pursuant to Article 4, Paragraph 3, excluded from the scope of Pressure Equipment Directive 2014/68/EU.

1.14 Existing residual risks (residual risk assessment)

Residual risk	Remedy
Life cycle: Assembly	
People slipping due to floor contamination with spilled/leaked lubricant	• Exercise caution when replacing the cartridge or refilling the lubricant reservoir. • Promptly apply suitable binding agents and remove leaked/spilled lubricant. • Follow operational instructions for handling the oils and contaminated parts
Tearing/damage to lines when installed on moving machine components	• If possible, do not install on moving parts; if this cannot be avoided, use flexible hose lines.
Life cycle: Commissioning / operation **Life cycle: Setup, retrofit**	
Lubricating spraying out due to faulty component fitting/line connection.	• Tighten all components with the appropriate tightening 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.
People slipping due to floor contamination with spilled/leaked lubricant	• Exercise caution when replacing the cartridge or refilling the lubricant reservoir. • Promptly apply suitable binding agents and remove leaked/spilled lubricant. • Follow operational instructions for handling the oils and contaminated parts
Life cycle: Malfunctions, fault-finding	
People slipping due to floor contamination with spilled/leaked lubricant	• Exercise caution when replacing the cartridge or refilling the lubricant reservoir. • Promptly apply suitable binding agents and remove leaked/spilled lubricant. • Follow operational instructions for handling the oils and contaminated parts

Residual risk	Remedy
Life cycle: Maintenance, repair	
Electric shock	• De-energize the ECP before performing maintenance work.
People slipping due to floor contamination with spilled/leaked lubricant	• Exercise caution when replacing the cartridge or refilling the lubricant reservoir. • Promptly apply suitable binding agents and remove leaked/spilled lubricant. • Follow operational instructions for handling the oils and contaminated parts
Life cycle: Decommissioning, disposal	
Environmental contamination by lubricants and wetted parts	• Dispose of contaminated parts according to the applicable legal/company rules
People slipping due to floor contamination with spilled/leaked lubricant	• Exercise caution when replacing the cartridge or refilling the lubricant reservoir. • Promptly apply suitable binding agents and remove leaked/spilled lubricant. • Follow operational instructions for handling the oils and contaminated parts
Life cycle: Malfunction, troubleshooting, maintenance, repair	
Electric shock due to defective power lead.	• Inspect the power lead for damage before commissioning the ECP
People slipping due to floor contamination with spilled/leaked lubricant	• Promptly apply suitable binding agents and remove leaked/spilled lubricant • Follow operational instructions for handling the lubricants and contaminated parts
Life cycle: Decommissioning, disposal	
Environmental contamination by lubricants and wetted parts	• Dispose of contaminated parts according to the applicable legal/company rules

2. Lubricants

2.1 General information

NOTE

All products from SKF Lubrication Systems Germany GmbH may be used only for their intended purpose and in accordance with the information in the product's operating instructions.

Intended use is the use of the products for the purpose of providing centralized lubrication/lubrication of bearings and friction points using lubricants within the physical usage limits which can be found in the documentation for the devices, e.g., operating instructions and the product descriptions, e.g., technical drawings and catalogs.
Particular attention is called to the fact that hazardous materials of any kind, especially those materials classified as hazardous by EC Directive 67/548/EEC, Article 2, Paragraph 2, may only be filled into SKF centralized lubrication systems and components and delivered and/or distributed with such systems and components after consulting with and obtaining written approval from SKF Lubrication Systems.
No products manufactured by SKF Lubrication Systems are approved for use in conjunction with gases, liquefied gases, pressurized gases in solution, vapors, or such fluids
whose vapor pressure exceeds normal atmospheric pressure (1013 mbar) by more than 0.5 bar at their maximum permissible temperature.
Other media which are neither lubricant nor hazardous substance may only be fed after consultation with and written approval from SKF Lubrication Systems.
SKF Lubrication Systems considers lubricants
To be an element of system design that must always be factored into the selection of components and the design of centralized lubrication systems. The lubricating properties of the lubricants are critically important in making these selections.

2.2 Selection of lubricants

NOTE

Observe the instructions from the machine manufacturer regarding the lubricants that are to be used.
The amount of lubricant required at a lubrication point is specified by the bearing or machine
manufacturer. It must be ensured that the required quantity of lubricant is provided to the lubrication point. The lubrication point may otherwise not receive adequate lubrication, which can lead to damage and failure of the bearing.

Selection of a lubricant suitable for the lubrication task is made by the machine/system manufacturer and/or the operator of the machine/system in cooperation with the lubricant supplier.
When selecting a lubricant,
the type of bearings/friction points, their expected load during operation, and the anticipated ambient conditions must be taken

into account. All economic and environmental aspects must also be considered.

NOTE

If necessary, SKF Lubrication Systems can help customers to select suitable components for feeding the selected lubricant and to plan and design their centralized lubrication system.

Please contact SKF Lubrication Systems if you have further questions regarding lubricants. It is possible for lubricants to be tested in the company's laboratory for their suitability for pumping in centralized lubrication systems (e.g., "bleeding").
You can request an overview of the lubricant tests offered by SKF Lubrication Systems from the company's Service department.

2.3 Approved lubricants

IMPORTANT NOTE

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

NOTE

Different lubricants must not be mixed together. Doing so can cause damage and require costly and complicated cleaning of the ECP/the 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.

The ECP can be operated using lubricants that meet the specifications in the technical data, Chapter 4. These can be oils or fluid greases.
Mineral, synthetic, and/or and rapidly biodegradable oils and base oils can be used.
Consistency agents and additives may be added depending on the operating conditions.
Note that in rare cases, there may be lubricants whose properties are within permissible
limit values but whose other characteristics render them unsuitable for use in centralized lubrication systems. For example, synthetic lubricants may be incompatible with elastomers.

2.4 Lubricants and the environment

NOTE

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.

It is important to note that lubricants are environmentally hazardous, flammable substances which require special precautionary measures during transport, storage, and processing. Consult the safety data sheet from the lubricant manufacturer for information regarding transport, storage, processing, and environmental hazards of the lubricant that will be used.
The safety data sheet for a lubricant can be requested from the lubricant manufacturer.

2.5 Lubricant hazards

WARNING

Lubricants
Products 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.

Leaking lubricant is a serious hazard. Leaking lubricant can create risks that may result in physical harm to persons or damage to other material assets.

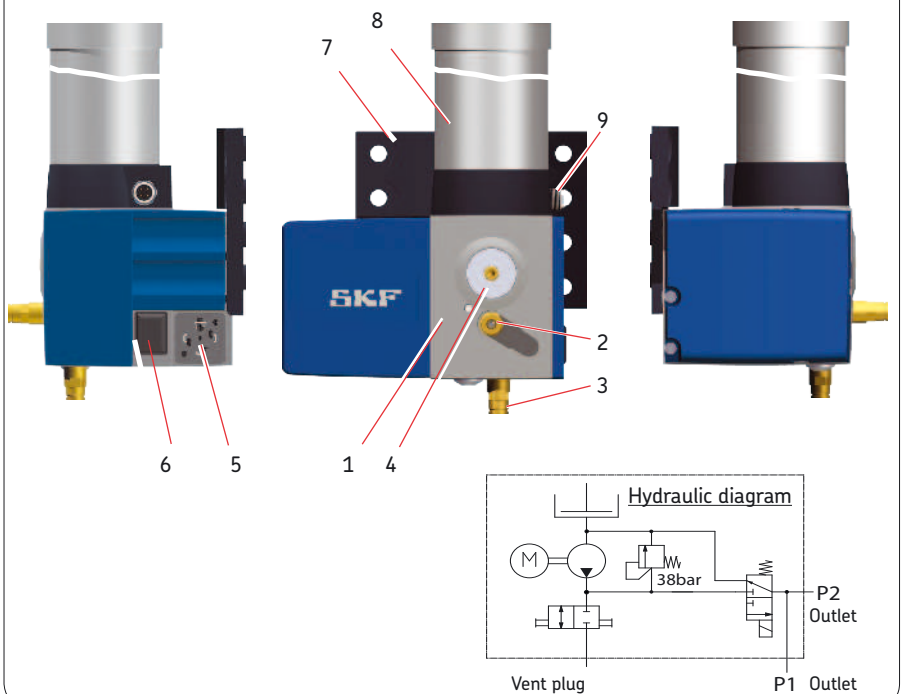
NOTE

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

3. Overview

3.1 Cartridge-based piston pump unit

Unit components, Fig. 2

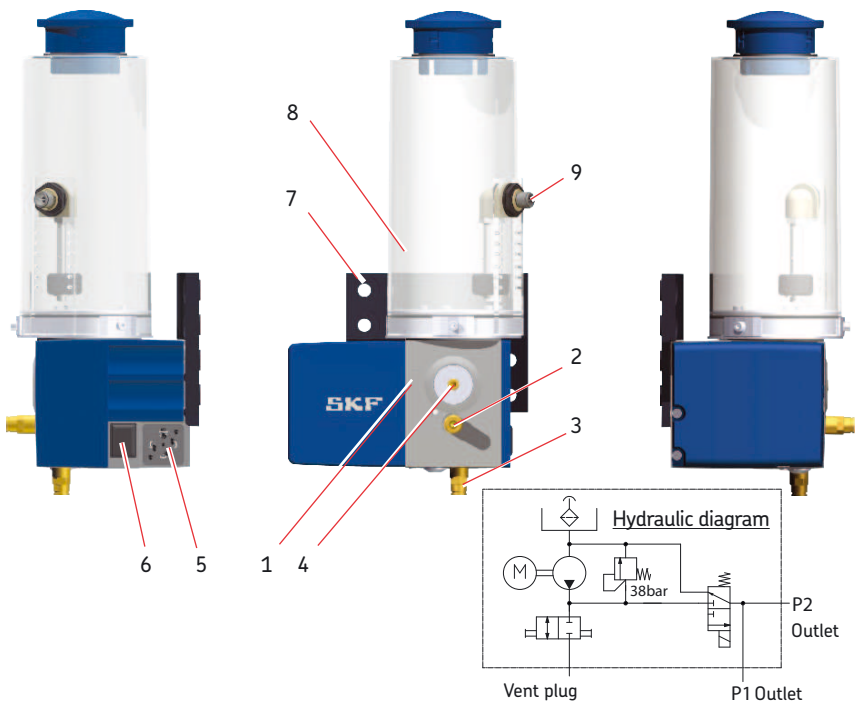


Unit components

Item	Description
1	ECP pump body
2	Lubricant outlet 1 optionally with SKF plug connector
3	Lubricant outlet 2 optionally with SKF plug connector
4	Pump vent/ vent plug
5	Cubical plug acc. to DIN EN 175301-803-A for 24 VDC power supply
6	Pushbutton (DK) (press and hold function)
7	Mounting flange/wall bracket
8	SKF disposable lubricant cartridge
9	Connector plug for optional fill level monitoring (M12x1)

3.2 Reservoir-based piston pump unit

Unit components, Fig. 3

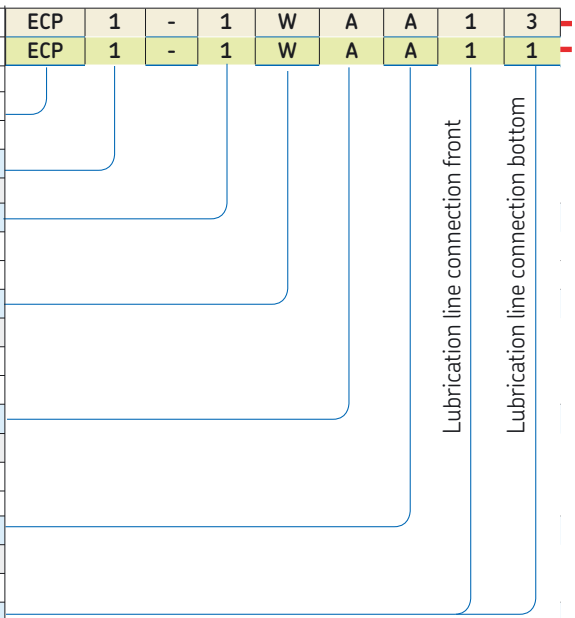


Unit components

Item	Description
1	ECP pump body
2	Lubricant outlet 1 optionally with SKF plug connector
3	Lubricant outlet 2 optionally with SKF plug connector
4	Pump vent/ vent plug
5	Cubical plug acc. to DIN EN 175301-803-A for 24 VDC power supply
6	Pushbutton (DK) (press and hold function)
7	Mounting flange/wall bracket
8	Lubricant reservoir
9	Connector plug for optional fill level monitoring (M12x1)

3.3 Product codes

	Order example **Cartridge-based design**	ECP 1 - 1 W A A 1 3	
	Order example **Reservoir-based design**	ECP 1 - 1 W A A 1 1	
ECP	Electrically driven piston pump unit		
Delivery rate / lubrication system			
1	10 cm³/min -see Chapter 4, "Technical data," page 27		
Version index / working pressure			
1	38 bar		
Pre-warning minimum fill level monitoring			
W	With fill level monitoring		
0	Without fill level monitoring		
Wall bracket			
A	With standard bracket		
0	Without bracket		
Electrical connection			
A	Cubical plug acc. to DIN EN 175301-803-A		
Lubricant line connections (1.=Front / 2.=Bottom - see Figure 1 and Fig. 2)			
1	Pipe thread M10x1	898-110-120	(blind plug)
2	Ø6 plug connector	406-004-VS	
3	Ø6 banjo fitting	506-140-VS	
4	Ø8 plug connector	408-004-VS	
X	Closed	466-431-001	



Order numbers shaded in gray indicate the standard design.
Explanation of order examples
- See the following page.

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

				-	1	U	17	0	0
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 filler screen and fill level switch)								
10	1.0 liter								
17	1.7 liter								
0	Placeholder								

3.4 Order examples

☞ See order code on page 22/23

ECP piston pump unit with cartridge
Electrical piston pump unit for single-line lubrication systems (**ECP**), displacement of 10 cm^3/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**), cubical plug 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**), displacement of 10 cm^3/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**), cubical plug electrical pump connection acc. to DIN EN 175301-803-A (**A**), with push connector for Ø6 mm lubricant line for front main line connection (**2**) and plug connector 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

3.5 General information

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

3.6 Design of the ECP piston pump unit

☞ See Figures 2 to 4

The ECP piston pump unit consists primarily of an electric motor that drives a delivery piston in axial direction via an eccentric disc. 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 distributors.
A pressure-regulating 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 overpressure limiter by default (see Chapter 13, "Accessories").

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 prewarning is at approx. 10% of cartridge fill level.
Evaluation is conducted by the customer.
The ECP is available in the 24 VDC voltage design.

3.7 Functional description

☞ See Figure 4

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.

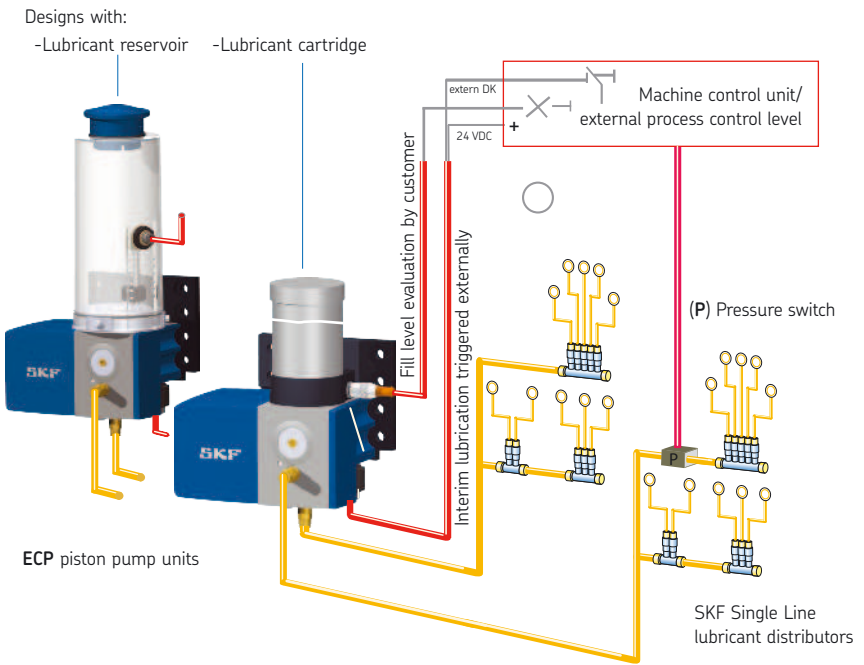
The lubricant coming from the ECP is supplied to the single-line distributors under pressure. Depending on the distributor type, i.e., prelubrication distributor or relubrication distributor, a metered amount of lubricant is delivered to the respective lubrication points.

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

A pushbutton (DK) attached to the pump can be used to perform the venting procedure on initial commissioning or cartridge replacement. Further, a manual interim lubrication can be triggered using the pushbutton (press and hold).

The minimum fill level can optionally be monitored by an integrated fill level switch. This warning system is evaluated control system (provided by the customer).

Single-line centralized lubrication system, Fig. 4



4. Technical data

4.1 ECP technical characteristics

Technical data

ECP piston pump unit

Mounting position:	Vertical	
Cartridge-based design:	Empty weight of ECP without installed cartridge Cartridge capacity/filling: Cartridge weight:	Approx. 2330 g for design ECP1-10AA1XX-000000 380 cm^3 450 g (for LF001/MR380)
Reservoir design:	Empty weight of ECP (without reservoir filling)	Approx. 2410 g for design ECP1-1WAA11-1U1000 Approx. 2500 g for design ECP1-1WAA11-1U1700
Reservoir capacity	0.5 liter; 1.0 liter; 1.7 liter	
Delivery rate:	10 cm^3/min 1)	
Operating pressure:	Max. 38 bar	
Ambient temperature: Operating temperature:	+ 10°C to + 50°C + 10°C to + 50°C	
Medium:	Fluid greases of NLGI grades 00 to 000 with mineral oil, environmentally friendly, or synthetic base, with a permissible Permissible effective operating viscosity of 20 to 1500 mm^2, in duty type: S3 15% ON-time according to DIN EN 60034-1	
Protection class 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 VDC. 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 distributors.

4.2 Minimum fill level switch, 24 VDC design

Electrical characteristics, 24 VDC design

ECP piston pump unit

Motor

Rated voltage	24 VDC
Power consumption (maximum)	1,5 A
Duty type acc. to	S3 15% ON-time
acc. to DIN EN 60034-1 [1])	
Recommended line protection	
Acc. 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% ON-TIME, for example to fill lubrication lines or to vent the piston pump unit (after changing the cartridge). Brief and occasional continuous duty (S1 100% ON-TIME) is permitted, whereby the maximum pump run time must not exceed 15 minutes. 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 DK button on the piston pump unit or a corresponding filling program (recommended) on the machine's control unit (SPC) of the piston pump unit.

Fill level switch for minimum fill level monitoring

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

Function	Normally closed (NC) contact (opens on solenoid approach)
Switching capacity	Max. 3 W/VA
Switching voltage	Max. 100 V
Switched current	Max. 0.3 A
Contact resistance	150 mOhm
Pull-in sensitivity	30 to 35 Θ
Drop-out sensitivity	>15 Θ

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

Function	Contact opens at minimum fill level (NC)
Switching voltage, max.	42 VDC
Switching capacity	50 W
Plug connector	4-pin circular plug M12x1

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

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

5. Delivery, returns, and storage

SKF Lubrication Systems Germany GmbH products are packaged in accordance with standard commercial practice according to the regulations of the recipient's country and DIN ISO 9001. During transport, safe handling must be ensured and the product must be protected from mechanical effects such as impacts. The transport packaging must be marked "Do not drop!"

5.1 Checking the delivery

Immediately after receipt, the delivery must be checked for completeness according to the shipping documents. Any transport damage must be reported to the transport company immediately. The packaging material should be preserved until any discrepancies are resolved.

5.2 Returns

Before return shipment, all parts must be cleaned and properly packed (i.e., according to the requirements of the recipient country). There are no restrictions for land, air, or sea transport.

The following must be marked on the packaging of return shipments:

	Do not top load / This side up
	Keep dry
	Handle with care, Do not drop

5.3 Lubrication units

- Ambient conditions: dry and dust-free surroundings, storage in well ventilated dry area
- Storage time: Max. 24 months
- Permissible humidity: < 65%
- Storage temperature: + 10 to +40°C
- Light: Avoid direct sun or UV exposure and shield nearby sources of heat

5.4 General notes

- The product(s) can be enveloped in plastic film to provide low-dust storage.
- Protect against ground moisture by storing on a shelf or wooden pallet.
- Bright-finished metallic surfaces, especially wearing parts and assembly surfaces, must be protected using long-term anti-corrosive agents before storage.

At approx. 6-month intervals:

- Check for corrosion; if there are signs of corrosion, reapply anti-corrosive agents.
- Drives must be protected from mechanical damage.

6. Assembly

6.1 General information

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.

The definition of qualified personnel and the prohibition against employing non-qualified personnel are laid down in DIN VDE 0105 and IEC 364.

Before assembling/setting up the product, the packaging material and any shipping braces (e.g., plugs) must be removed.
The packaging material must be preserved until any discrepancies are resolved.

IMPORTANT NOTE

Observe technical data (Chapter 4).

6.2 Setup and attachment

☞ See Figure 4 and Fig. 5

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.
Make assembly holes according to Figure 3/4.

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.

- o Protruding parts such as pushbuttons or pressure gauges must not be misused as handles or grips.
- o The product must not be installed within range of moving parts.
- o The product must be installed at an adequate distance from sources of heat.
- o Maintain safety clearances and comply with regulations for assembly and accident prevention.
- o In case of centralized lubrication systems, SKF recommends additionally securing the system against excessive pressure using a suitable overpressure limiter by default (see Chapter 13, "Accessories").

WARNING

Personal injury / property damage

Do not tilt or drop the product.

WARNING

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.

NOTE

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.

6.2.1 Minimum mounting dimensions

☞ See Figure 5 and Fig. 6

To ensure enough space for maintenance work and possible disassembly of the ECP, ensure that the minimum mounting dimensions are maintained.

6.3 Cartridge-based piston pump unit

6.3.1 Port dimensions, assembly holes, and minimum mounting dimensions

ECP cartridge-based pump unit, assembly drawing, Fig. 5

Minimum mounting dimensions

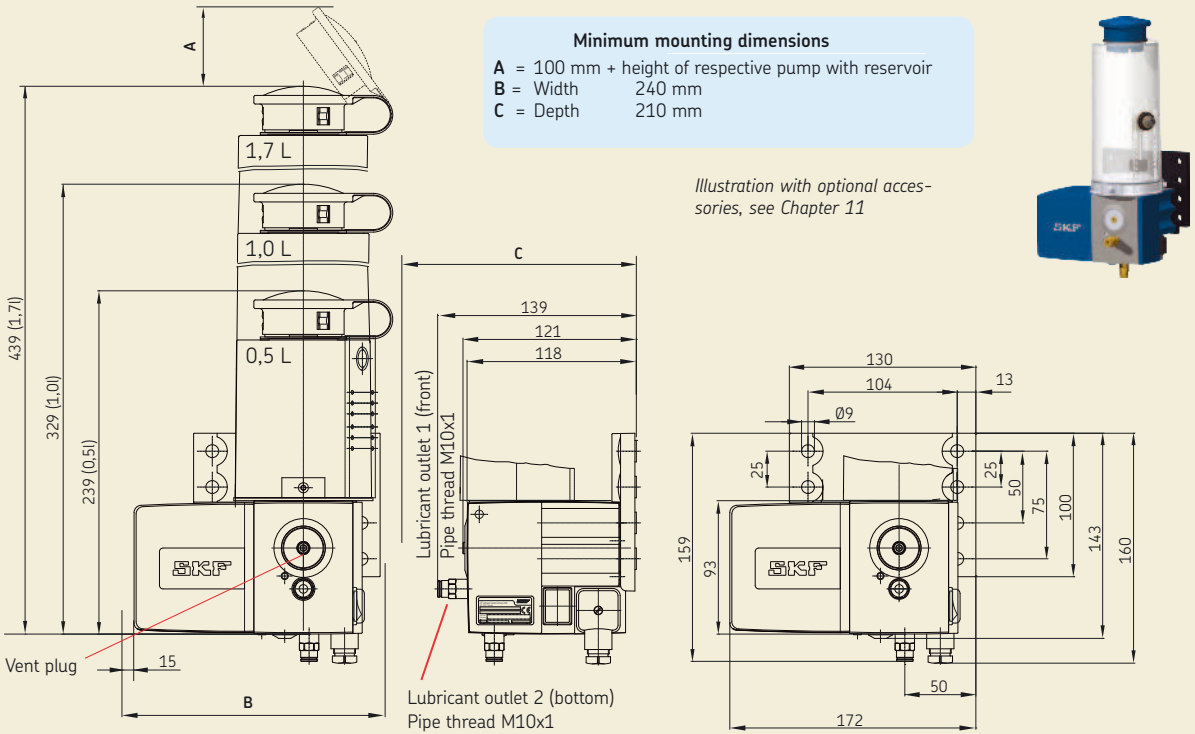
A	=	Height:	440 mm
B	=	Width	240 mm
C	=	Depth	210 mm

Illustration with optional accessories, see Chapter 11

6.4 Reservoir-based piston pump unit

6.4.1 Port dimensions, assembly holes, and minimum mounting dimensions

ECP reservoir-based pump unit, assembly drawing, Fig. 6



Minimum mounting dimensions

A = 100 mm + height of respective pump with reservoir
B = Width 240 mm
C = Depth 210 mm

Illustration with optional accessories, see Chapter 11

6.5 Assembly of piston pump unit ECP

☞ See Figure 5 to Fig. 7

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.

NOTE

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

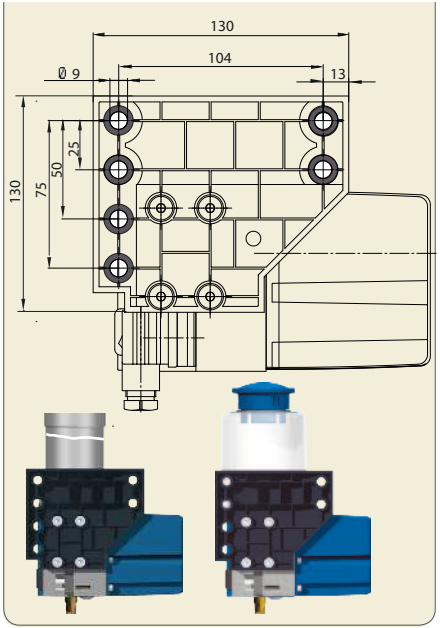
Recommended fastening hardware:
- o Hexagon socket screws (4x) acc. to ISO 4762-M8x..-8.8
- o Washers (8x) acc. to ISO 7090-6-200HV

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

- Drill assembly holes (recommended diameter 8.5 mm) on the customer-provided mounting surface according to the assembly drawing (Figs. 2 and 3) as well as the conditions on the surface.
- Clean surface to remove drilling chips.
- Place the ECP on the surface and roughly align it.
- Pass hexagon socket screws (4x) acc. to ISO 4762-M8x..-8.8 with associated washers (4x) through the piston pump unit and apply to the M8 fixing holes supplied by the customer

Optionally:
- Apply to self-locking M8 nuts
- Gently tighten hexagon socket screws (4x).
- Align the ECP and tighten the hexagon socket screws with subsequent tightening torque of **10** $^{+5}$ **Nm**

Mounting template, Fig. 7



6.6 Lubrication line connection

☞ See Figures 2 to 6

CAUTION

Risk of slipping and injury

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

NOTE

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, shutoff 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, shutoff 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 pockets cannot form anywhere.
- Avoid changes in the cross-section of the lubrication line from small to large cross-sections in the direction of flow 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.

6.7 Assembly of the lubrication lines using SKF plug connectors

☞ See Figure 8 and Fig. 9

The SKF plug connectors are available in designs for metal or plastic tubing.
With the design for metal pipes, there is a choice available between pipe versions with and without claw groove.
The claw groove securely fastens the pipe in the plug connector, which prevents the metal tube from slipping out of the plug connector. The claw groove does not need to be used if appropriate fastening hardware (e.g., mounting clips) is used to prevent the metal tube from slipping out of the plug connector.
Both designs, for metal and plastic pipes, have a locking claw. The locking claw of the collet secures the tube in the plug connector, which prevents the tube from accidentally slipping out, at least in the case of the design for plastic tube.

- Cut the connecting pipe (**1**) to the correct length with a pipe cutter.

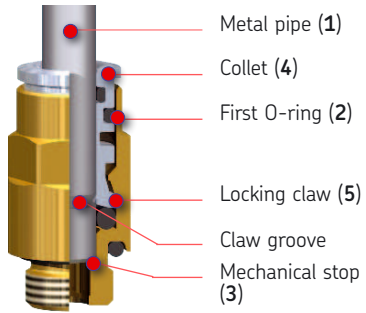
☞ In the following installation of the pipe, a noticeable resistance must be overcome when passing through the first O-ring (**2**), the locking claw (**5**) of the collet (**4**). If a claw groove is not used, fix the tube using appropriate fastening hardware (e.g., mounting clips) to prevent the tube from slipping out of the SKF plug connector.

- Manually insert the tube (**1**) fully into the collet (**4**) of the SKF plug connector until it clears the first O-ring (**2**) and the locking claw (**5**) of the collet (**4**) and reaches the mechanical stop (**3**).

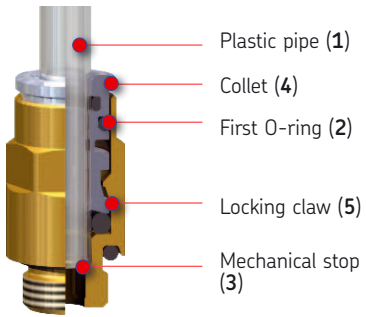
☞ To remove the metal tube (**1**), press the collet (**4**) inward into the SKF plug connector. The metal tube (**1**) can now be pulled out of the collet (**4**) of the SKF plug connector.

To remove the plastic tubing (**1**), press the collet (**4**) inward into the SKF plug connector. To do this, also press the plastic pipe (**1**) inward into the SKF plug connector fitting, which releases the collet (**4**) from the plastic pipe (**1**). The plastic tube (**1**) can now be pulled out of the collet (**4**) of the SKF plug connector.
Before reassembling, shorten the end of the plastic pipe by at least 7 mm to ensure that the locking claw (**5**) of the collet (**4**) functions properly.

Plug connectors for metal tubes, Fig. 8



Plug connectors for plastic tubes, Fig. 9



6.8 Electrical connection

6.8.1 General

☞ See Figure 10 to Fig. 14

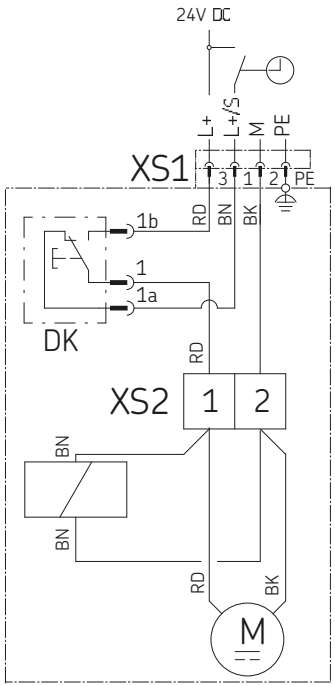
The ECP piston pump unit is driven by a 24 VDC DC motor.
The power supply and the integrated push-button (DK) are connected via port **XS1**, a cubical plug acc. to DIN EN 175301-803, type A.
Fill level monitoring WS, in contrast, is performed via a plug adapter acc. to DIN EN 60947-5-2 (M12x1 for cartridge and oil reservoir, M8x1 for fluid grease reservoir).

Consult Chapter 4, "Technical data," for the electrical characteristics of the motor.
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.

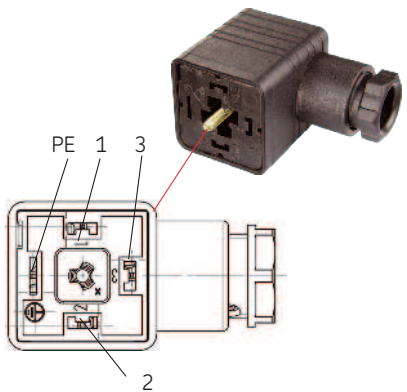
Be sure to connect the motor/its power lead so as to guarantee a continuously safe electrical connection (no protruding wire ends); use the assigned cable end fittings (e.g., cable lugs, wire end ferrules).
Select connecting cables conforming to DIN VDE 0100 taking into account the rated current and the conditions of the specific system
(e.g., ambient temperature, type of routing, etc. in accordance with DIN VDE 0298 or EC / EN 60204-1).
Details regarding electrical connection of the motor to the power supply, especially terminal and connector pin assignment, can be taken from Chapter 6.8.2.

6.8.2 ECP electrical terminal diagrams

Connection without fill level monitoring, with pushbutton, Fig. 10



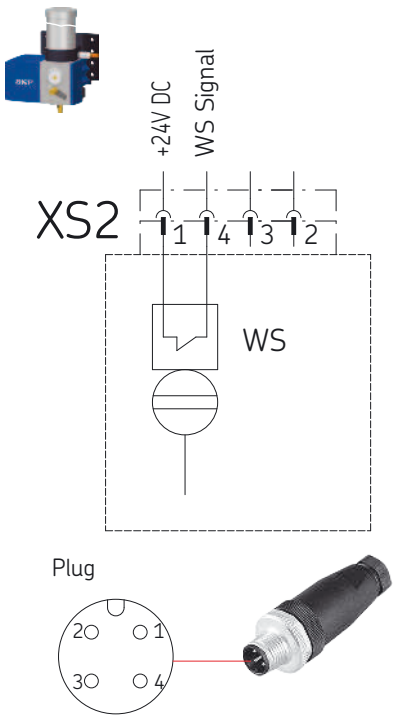
ECP electrical socket outlet, Fig. 11



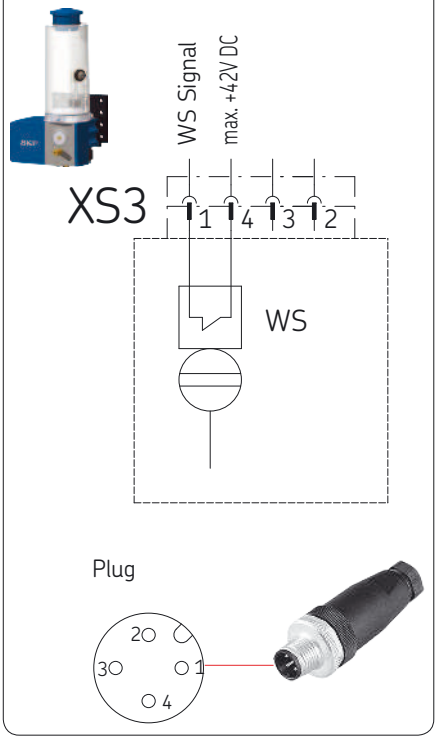
NOTE

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

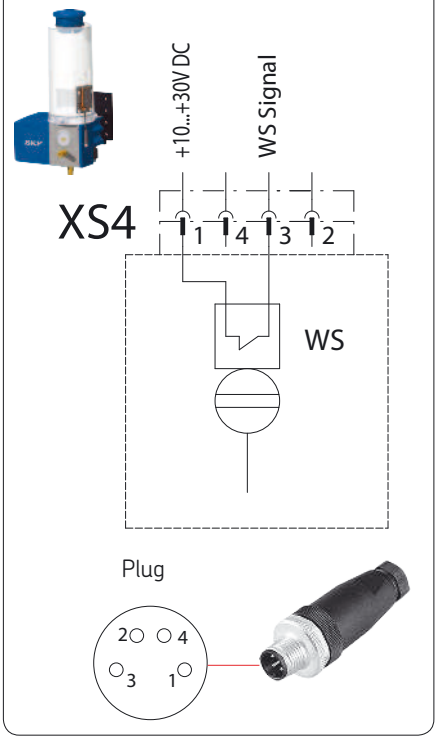
Fill level switch on cartridge-based piston pump unit, Fig. 12



Fill level switch on reservoir-based piston pump unit for oil, Fig. 13



Fill level switch on reservoir-based piston pump unit for fluid grease, Fig. 14



Legend to Figures 10 and 11

XS1 plug (power supply)	
Pin	Assignment
1	Switching signal L+/S
2	Mass
3	Power supply 24 VDC
PE	PE grounding

Pushbutton DK (interim lubrication)	
Pin	Internal assignment
1a	Switching signal L+/S
1b	Power supply 24 VDC
1b	Electric motor voltage

Legend to Figure 12 to Fig. 14

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

6.9. Filling

NOTE

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

NOTE

Avoid air pockets!
Air pockets in the lubricant can lead to failure of lubricant delivery. Therefore, refill lubricant without forming bubbles to the extent possible.

6.9.1 Replacing the cartridge

☞ See Figure 15

NOTE

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).

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

Installing the cartridge

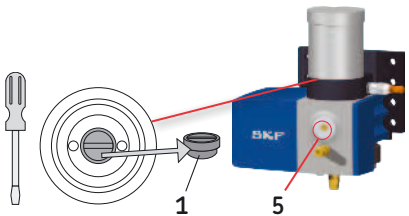
- Remove the protective screw (**1**) from the ECP piston pump unit (cartridge thread) and store for later use
- Remove the screw plug (**2**) from the cartridge (**3**)
- If necessary, remove contamination in the area of the cartridge/lubricant inlet
- Screw in the cartridge (**3**) finger-tight by hand clockwise into the ECP until the stop

Removing the cartridge

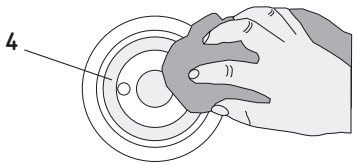
- Rotate the empty cartridge (**3**) counterclockwise from the ECP
- Check the sealing ring (**4**), replace the sealing ring if defective (see Accessories).
- Screw in the new cartridge (**3**) as described
- Rotate the vent plug (**5**) (WAF 4) by one turn
- Perform interim lubrication using push-button **DK** (**6**)
- As soon as bubble-free lubricant discharges, close the vent plug (**5**)

Cartridge replacement, Fig. 15

❶ Remove the protective screw (**1**)
(only for initial installation of a cartridge)

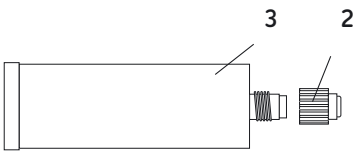


❷ Remove contamination, check sealing ring (**4**)



Sealing ring (**4**) order No. 541-34901-5

❸ Remove the cartridge screw plug (**2**).



❹ Dispose of the cartridge in an environmentally friendly way

6.9.2 Filling the lubricant reservoir

☞ See Figure 16

- If necessary, clean contamination from the ECP reservoir
- Loosen the filler cap (**1**) and fold it up
- Use a suitable filling device to fill the reservoir to approx. 1 cm below the reservoir lid
- Close the filler cap (**1**)
- Clean any lubricant residues from the ECP

Filling the lubricant reservoir, Fig. 16

6.10 Venting the centralized lubrication system

☞ See Figure 17

The piston pump unit can briefly and occasionally be operated outside the specified duty type S3 15% ON-TIME, for example to fill lubrication lines or to vent the piston pump unit (after changing the cartridge). Brief and occasional continuous duty (S1 100% ON-TIME) is permitted, whereby the **maximum pump run time must not exceed 15 minutes.** 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 venting the centralized lubrication system can be facilitated by:

o Pre-filling long pipe sections before connecting to the lubrication point.

Requirement:
The ECP piston pump unit (**1**) must be assembled as described above.

- Pre-fill the lubricant lines with lubricant
- Install lubricant lines (**5**/**6**); do **not yet** connect the lubricant line (**5**) to the piston pump unit

ECP cartridge-based piston pump unit

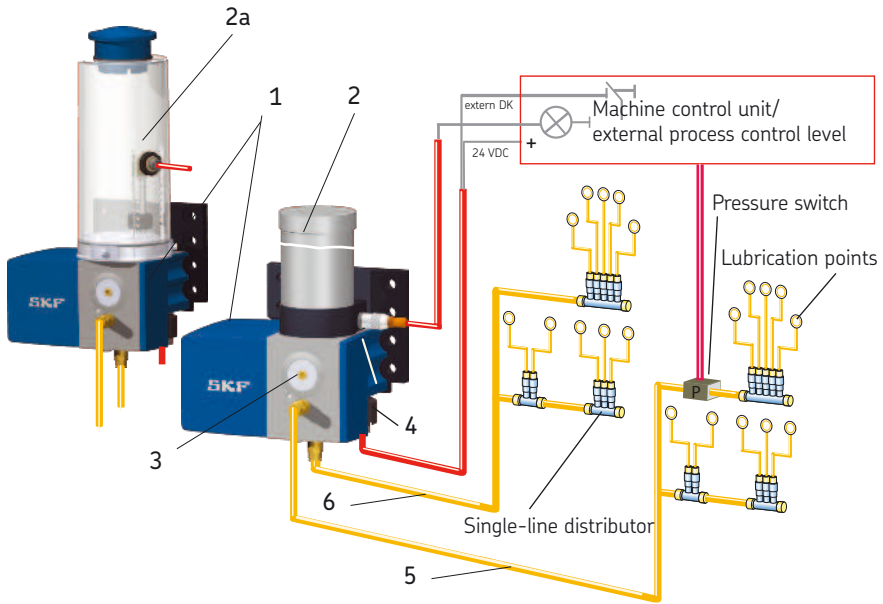
- Screw the lubricant cartridge (**2**) into the ECP (see Chapter 6.8.1)
-

ECP reservoir-based pump unit

- Fill the lubricant reservoir (**2a**) (see Chapter 6.8.2)
- Rotate the vent plug (**3**) (WAF 4) by one turn
- Press and hold pushbutton DK (**4**) until bubble-free lubricant discharges at the vent plug (**3**)
- Tighten the vent plug (**3**).
- Clean the outlet, dispose of leaked lubricant
- Connect the lubricant line (**5**) to the ECP (**1**)
- Remove the lubricant line (**6**) on the first distributor (as viewed from the pump outlet)
- Press and hold pushbutton DK (**4**) until bubble-free lubricant discharges at the lubricant line
- Connect the lubricant line (**6**)
- Repeat the venting procedure on the second distributor (as viewed from the pump outlet)

- Perform subsequently on all distributors
- Loosening lubrication lines at the lubrication points
- Press and hold pushbutton DK (**4**) until bubble-free lubricant discharges at the lubricant lines
- Connect the lubricant lines

Single-line centralized lubrication system, Fig. 17



7. Initial commissioning

To ensure safety and functionality, the person specified by the operator is required to conduct 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.

Checklist for commissioning

7.1 Inspections before initial commissioning	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 “Technical data”	☐	☐
All components such as lubrication lines and distributors are correctly mounted	☐	☐
The lubricant cartridge is installed and/or the lubricant reservoir is completely filled with lubricant. -See Chapter 6.8.1 or 6.8.2 The responsible person is aware of the refill interval.	☐	☐
The pump was vented correctly at the vent plugs; vent the centralized lubrication system if necessary - see Chapter 6.10	☐	☐
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	☐	☐
7.2 Inspections during initial commissioning		
No unusual noises, vibrations, moisture accumulation, 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

NOTE

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

NOTE

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

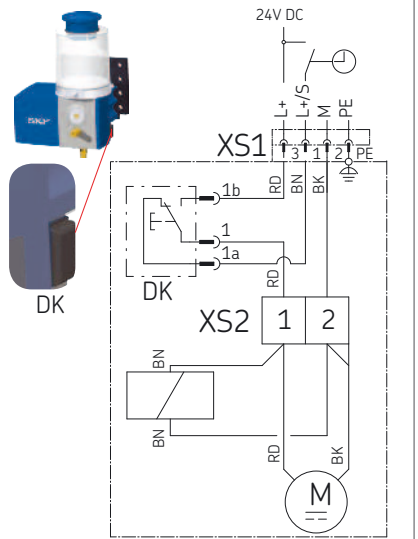
8.1 General information

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

☞ See Figure 18
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 interim lubrication (press and hold).
In interim 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% ON-TIME, for example to fill lubrication lines or to vent the piston pump unit (after changing the cartridge).
Brief and occasional continuous duty (S1 100% ON-TIME) is permitted, whereby the maximum pump run time must not exceed 15 minutes.
After such continuous duty, an interval of at least 10 minutes must be provided (for the electrical components of the pump to cool down).

Pushbutton (DK), Fig. 18



1) WS opens when pre-warning "min. fill level" (NC function) is reached

9. Cleaning

WARNING

Electric shock
Perform cleaning work only on products that have been de-energized and depressurized. Do not touch cables or electrical components with wet or moist hands.
Use steam-jet equipment or high-pressure cleaners only in accordance with the IP protection class of the pump. Otherwise, electrical components may be damaged.
Cleaning, required personal protective gear, cleaning agents, and equipment are in accordance with the current operating rules of the operator.

9.1 Cleaning agents

Only cleaning agents compatible with the materials can be used for cleaning (see Chapter 2.3 for materials).

Always completely remove residue of the cleaning agent on the product and rinse with clear water. This prevents the formation of alkaline deposits.

9.2 Exterior cleaning

- Mark and secure wet areas.
- Unauthorized persons must be kept away.
- Thoroughly clean all external surfaces with a moist cloth.

The cartridge/reservoir must be kept closed during cleaning.

9.3 Interior cleaning

The interior normally does not need to be cleaned.
The interior of the product must be cleaned if incorrect or contaminated lubricant is accidentally filled.
Please contact SKF Customer Service.

10. Maintenance

10.1 General information

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.

IMPORTANT NOTE

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

IMPORTANT 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 and nullify the statutory warranty.

SKF shall not be held liable for damages resulting from improperly performed assembly, maintenance, or repair work on the product.

NOTE

The housing of the screw-in cartridge for ECP cartridge-based piston pump units must be free of contamination; the same applies to the environment for filling the reservoir of ECP reservoir-based piston pump units.
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.

10.2 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.

10.3 Service

If you encounter problems or have any questions, please contact our sales and service centers or our representatives abroad.
A list with current addresses is available on the Internet at:

www.skf.com/lubrication

Maintenance work

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

11. Malfunctions, causes, and remedies

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

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.

WARNING

System pressure
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.

11.1 Commissioning, product, and system malfunctions

Malfunction	Cause	Remedy
Motor fails to start when the operating voltage is applied	o No operating voltage on motor	• Check mains connection • Check mains plug/cable and connect properly if necessary • Check operating voltage on motor (press DK)
No pressure build-up/relief	o Pump delivers too little medium	• Cartridge/reservoir empty • If motor resistance is high, replace the pump
	o Unsuitable lubricant (see "Technical data")	• Remove lubricant from entire system and dispose of lubricant in the proper manner; use a suitable cartridge
	o Pressure too low or too high, pressure-regulating valve is jammed or defective	• Replace pump
	o Ambient temperature too low (see "Technical data")	• Increase ambient temperature
	o Air in the main line o Main line leaky/broken	• Vent main line • Repair main line
No pressure build up in the main line	o Air in the main line o Main line leaky/broken	• Vent main line • Repair main line

12. Shutdown, disposal

12.1 Temporary shutdown

Temporary shutdown is performed by:

- Switching off the main machine

12.2 Permanent shutdown, disassembly

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

12.3 Disposal

Countries within the European Union

Waste should be avoided or minimized to the extent possible. The disposal of products contaminated with lubricant must be performed by a recognized waste disposal company in compliance with environmental protection requirements and waste disposal regulations as well as the requirements of local authorities.

The producer of waste is responsible for its specific classification, as the European Waste Catalog provides for different disposal keys for waste that is the same but of different origin.

Dispose of or recycle electrical components in accordance with WEEE Directive 2012/19/EU.

Plastic or metal parts can be disposed of as industrial waste.

Countries outside the European Union

Disposal is carried out according to the applicable laws and regulations of the country.

13. Spare parts/accessories

13.1 Spare parts

Description	Order No.
Spare parts set sealing ring, self-adhesive	**541-34901-5**
Screw plug (ECP cartridge outlet)	**541-34901-4**
ECP mounting plate (kit)	**995-901-065** (6 Nm tightening torque for wall bracket/pump mounting screws)

13.2 Accessories

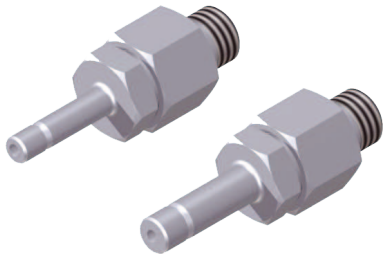
Lubricant	NLGI grade	Cartridge capacity [ml]	Order No.	Quantity [pcs.]	Note
Divinol Lithogrease 00	00	380 ml	LF001/MR380	1	Minimum order 10 pieces each

Overpressure limiter for use of main lubricant line

Designation	Burst pressure [bar]	Ø A [mm]	B [mm]	Order number
Pressure limiter	60	6	22.5	**451-006-060**
Pressure limiter	60	8	24	**451-008-060**

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

451-00*-060



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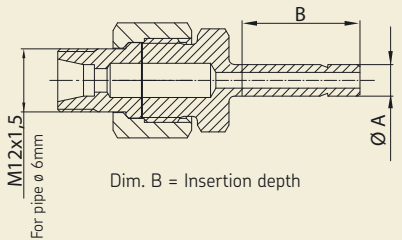
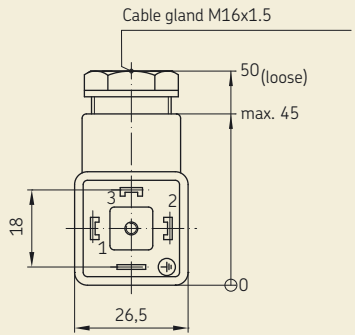


Square connector

Designation	Order Number
Cable socket per DIN EN 175301-803 Type A Line diameter 4.5 -7 mm	**179-990-147**

179-990-147

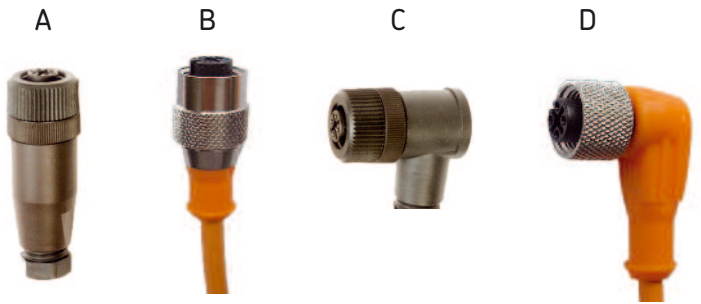
179-990-147



Circular connector M12x1

Designation		Order Number
Cable socket, straight	(A)	**179-990-371**
Cable socket, straight, with molded cable, 5 m, 3x0.25 mm²	(B)	**179-990-381**
Cable socket, angled,	(C)	**179-990-372**
Cable socket, angled, with molded cable (5 m, 3×0.25 mm²)	(D)	**179-990-382**

Circular connector



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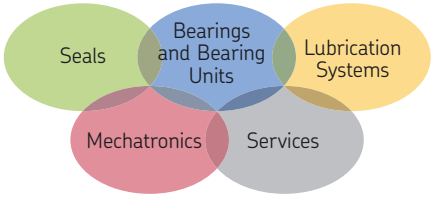

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