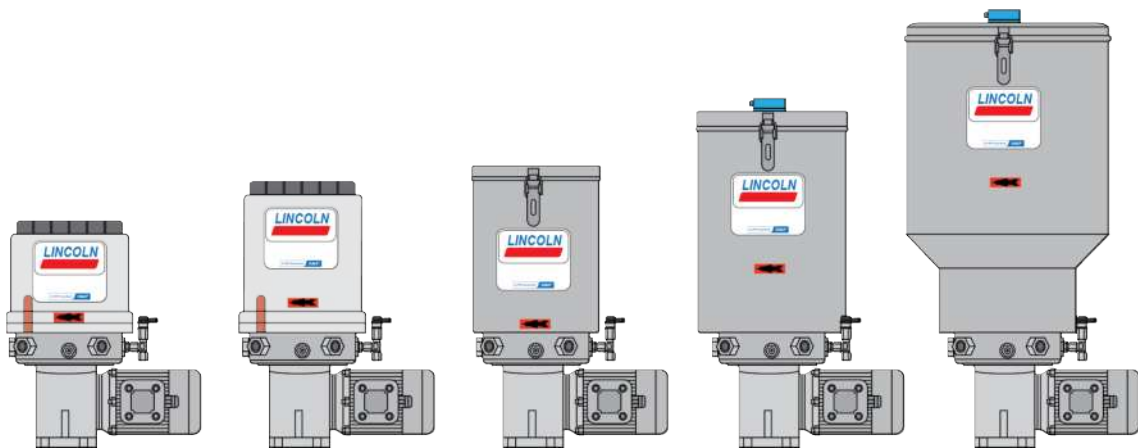


Lubrication pump P205



Created on: **02.01.2024**

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Version: **05**



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 operated pump for the supply of lubricants within a centralized lubrication system
Type: Pump P205
Item number: 655-xxxxx-x
6550-xxxxxxx

Furthermore, the following directives and standards were applied in the respective applicable areas:

2006/42/EC: Machinery Directive

2014/30/EU: Electromagnetic Compatibility

2011/65/EU: RoHS II

EN ISO 12100:2010 EN 60204-1:2018

EN 809+A1/AC:2010 EN 60947-5-1:2017

EN IEC 63000:2018 EN 60947-5-2:2017

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.

Walldorf, 31.07.2023

Jürgen Kreutzkämper
Manager, R&D
Germany

Stefan Schürmann
Manager, PD
Germany South

Manufacturer: SKF Lubrication Systems Germany GmbH, Heinrich-Hertz-Str. 2-8, 69190 Walldorf, 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 operated pump for the supply of lubricants within a centralized lubrication system
Type: Pump P205
Item number: 655-xxxxx-x
6550-xxxxxxx

Furthermore, the following regulations and standards were applied in the respective applicable areas:

Supply of Machinery (Safety) Regulations 2008 No. 1597

Electromagnetic Compatibility Ordinance 2016 No. 1091

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 No. 3032

EN ISO 12100:2010 EN 60204-1:2018

EN 809+A1/AC:2010 EN 60947-5-1:2017

EN IEC 63000:2018 EN 60947-5-2:2017

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Stefan Schürmann
Manager, PD
Germany South

Manufacturer: SKF Lubrication Systems Germany GmbH, Heinrich-Hertz-Str. 2-8, 69190 Walldorf, Germany

NOTE

The **product variants without electrical components** do **not** fall within the scope of application of the EMC Directive (2014/30/EU) or the "Electromagnetic Compatibility Regulations 2016 No. 1091," nor the scope of the RoHS Directive (2011/65/EU) or the "Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 No. 3032."

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			
Piston pumps with reservoir, with/without external motor, without control unit			
Types: P205, P208, P212, P215, P230, ZPUxx, JM, FF, FB, FK, RA, TA, TB			
No.:	Essential health and safety requirement	Applicable:	Fulfilled:
1.1	Principles		
1.1.2	Principles of safety integration	Yes	Yes
1.1.3	Materials and products	Yes	Not completely fulfilled ¹⁾
1.1.5	Design of machinery to facilitate its handling	Yes	Yes
1.1.6	Ergonomics	Yes	Not completely fulfilled ²⁾
1.2	Control systems		
1.2.1	Safety and reliability of control systems	Yes	Yes
1.2.3	Starting	Yes	Yes
1.2.6	Failure of the power supply	Yes	Yes
1.3	Protection against mechanical hazards		
1.3.1	Risk of loss of stability	Yes	Yes
1.3.2	Risk of break-up during operation	Yes	Not completely fulfilled ³⁾
1.3.4	Risks due to surfaces, edges or angles	Yes	Yes
1.3.7	Risks related to moving parts	Yes	Yes
1.3.9	Risks of uncontrolled movements	Yes	Yes
1.5	Risks due to other hazards		
1.5.1	Electricity supply	Yes	Yes
1.5.6	Fire	Yes	Yes
1.5.8	Noise	Yes	Yes
1.5.13	Emissions of hazardous materials and substances	Yes	Yes
1.5.15	Risk of slipping, tripping, or falling	Yes	Not completely fulfilled ⁴⁾
1.6	Servicing		
1.6.1	Machinery maintenance	Yes	Yes
1.6.2	Access to operating positions and servicing points	Yes	Not completely fulfilled ⁵⁾
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. Pressure-relief valves must also be used.

²⁾ The operator must ensure that the pump is integrated into the higher-level machine in such a way that the pump can be operated and filled ergonomically.

³⁾ The operator must protect the lubrication system against excessive pressure. This should be done by fitting every pump element with a pressure limiting valve with suitable opening pressure (see the "Technical data" for the pump in question).

⁴⁾ Not relevant inside the incomplete machine (pump), only outside the partially completed machine. The machine's owner or operator is responsible here.

⁵⁾ The owner-operator must ensure that the pump is integrated into the main machine in such a way that it can be operated without danger.

Masthead

Manufacturer

SKF Lubrication Systems Germany GmbH
Email: Lubrication-germany@skf.com
www.skf.com/lubrication

Berlin Plant
Motzener Strasse 35/37
12277 Berlin
Germany
Tel. +49 (0)30 72002-0
Fax +49 (0)30 72002-111

Walldorf Plant
Heinrich-Hertz-Strasse 2-8
69190 Walldorf, Germany
Germany
Tel.: +49 (0) 6227 33-0
Fax: +49 (0) 6227 33-259

Authorized local distributors

- Great Britain -
SKF (U.K.) Limited,
2 Canada Close, Banbury, Oxfordshire,
OX16 2RT, GBR.

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

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

Warranty

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

Training

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

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Safety alerts, visual presentation, and layout

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

Safety alerts:

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

DANGER

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

WARNING

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

CAUTION

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

NOTICE

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

Illustrations:

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

Text layout:

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

1. Instruction steps: These indicate a chronological sequence of instruction steps. The numbers of the steps are in bold and are followed by a period. If a new activity follows, the numbering starts again at “1.”

- **Second-order instruction steps:** In some cases, it is necessary to divide up a step into a few substeps. A sequence of second-order instruction steps is then used.

1. Safety instructions

1.1 General safety instructions

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

1.2 General electrical safety instructions

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

1.3 General behaviour when handling the product

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

1.4 Intended use

Supply of lubricants.

The product is intended solely for installation in another machine.

Use is only permitted within the scope of commercial or economic activity by professional users, in compliance with the specifications, technical data, and limits specified in this manual.

1.5 Persons authorized to use the product

Operator

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

Specialist in electrics

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

Specialist in mechanics

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

1.6 Foreseeable misuse

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

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

1.7 Referenced documents

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

- Company instructions and approval rules

If applicable:

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

1.8 Prohibition of certain activities







- Replacement of or modifications to the pistons of the pump elements
- Repairs or modifications to the drive

1.9 Painting plastic components and seals

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

1.10 Safety markings on the product

Fig. 1

	Risk of dangerous electrical voltage (for VAC pumps only)
 	Risk of wrapping, pinching, crushing, or shearing when the reservoir lid is open (only for reservoirs with filling from above)
	Risk of injury from spring tension (only for pumps with a follower plate)
	Direction of rotation of the pump (stirring paddle)
	Read the instructions (before initial filling of a pump with double-lip follower plate delivered without lubricant)

Possible safety markings on the product

NOTE

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

1.11 Note on the type plate

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

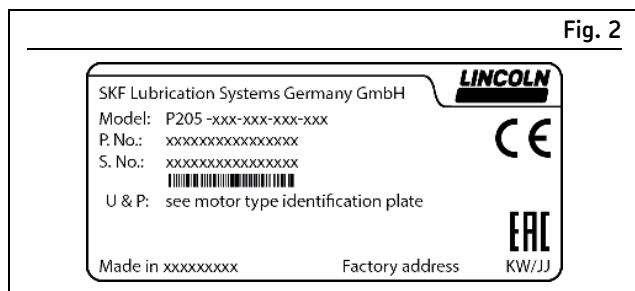
Model: _____

P.No.: _____

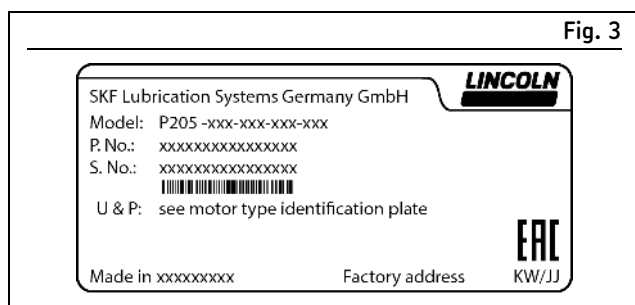
S. No.: _____

(CW/YY): _____

Calendar week/year of manufacture



Type plate with CE



Type plate without CE (pumps without motor and without electrical components)

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 Pressure Equipment Directive

Due to its performance characteristics, the product does not reach the limit values defined in Article 4, Paragraph 1, Subparagraph (a) (ii) and is excluded from the scope of Pressure Equipment Directive 2014/68/EU in accordance with Article 1, Paragraph 2 Subparagraph (f).

1.15 Note on UKCA marking



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

1.16 Note on EAC marking



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

1.17 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).

1.18 Emergency shutdown

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

1.19 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.

1.20 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

1.21 Residual risks

Table 2

Residual risks												
Residual risk	Possible in lifecycle						Avoidance / Remedy					
Personal injury / property damage due to falling of hoisted parts	A	B	C				G	H	K	<ul style="list-style-type: none"> Unauthorized persons must be kept away. Nobody is allowed to be present below hoisted parts. Lift parts using suitable and tested lifting gear. 		
Personal injury/property damage due to tilting or falling product due to non-compliance with specified torques		B	C	D	E	F	G			<ul style="list-style-type: none"> 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 electric shock		B	C	D	E	F	G	H		<ul style="list-style-type: none"> Inspect power cables for damage prior to initial use and then at regular intervals. Before connecting the pump unit, de-energize all relevant electrical components. Observe any discharge times. Do not install the cable on moving parts or wearing spots. If this cannot be avoided, use anti-kink coils and/or conduits. 		
Personal injury / property damage due to spilled, leaked lubricant		B	C	D	E	F	G	H	K	<ul style="list-style-type: none"> 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 install lubrication lines on moving parts or chafe points. If this cannot be avoided, use flexible hose lines or anti-kink coils and/or conduits. Promptly apply suitable binding agents and then remove the spilled or leaked lubricant. Follow operational instructions for handling the lubricants and contaminated parts. 		
Injury from contact with the stirring paddle when filling the pump			C	D		F				<ul style="list-style-type: none"> Preferably fill via the fill connection. Fill from the top, only when the paddle is motionless, and with the pump de-energized. Do not reach into the reservoir while filling. 		
Injury from hot/faulty motor					E	F	G			<ul style="list-style-type: none"> Switch off the pump. Let parts cool off; remedy the cause. 		
Injury due to spring tension in reservoirs with a follower plate						F	G	H		<ul style="list-style-type: none"> Wait until tension has been relieved on the spring as much as possible (i.e., the reservoir is empty) before removing a reservoir with a follower plate. Provide a suitable protective measures when loosening the reservoir, e.g., a retaining strap. Do not work with your head directly above the reservoir. 		

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.

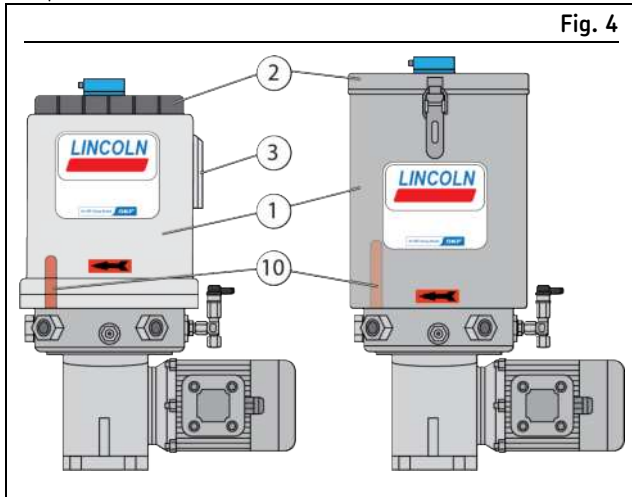
Grease guns filled with chisel paste must be permanently marked with a corresponding note.

NOTE

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

3. Overview, functional description

In the following you will find an overview of the most important functions and equipment features of the pump described in this manual. The pump essentially consists of the following main components:



Main components

1 Reservoir

The reservoir stores the lubricant. Different reservoir designs and reservoir sizes exist in accordance with the pump variant.

2 Reservoir cover

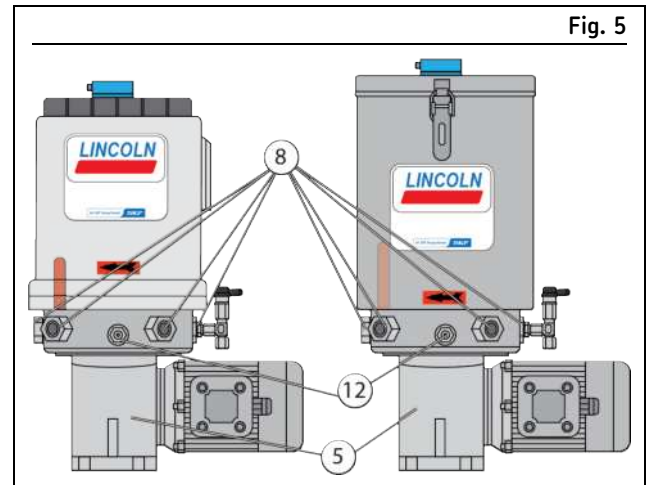
Serves as protection against lubricant contamination. The reservoir can be filled from above with clean and suitable lubricant once the reservoir cover has been removed.

2. Reservoir ventilation

Aerates the reservoir while the pump is working and lubricant is being fed.

10 Stirring paddle

The stirring paddle homogenizes and smooths the lubricant while the pump is running. In addition, the lower vertical part of the stirring paddle presses the lubricant in the direction of the pump elements and improves the suction characteristics of the pump as a result.



Main components

5 Pump housing

The pump housing is used for installation of the pump. The pump housing contains the pump elements, the filler nipple, and the shaft that drives the stirring paddle and pump elements.

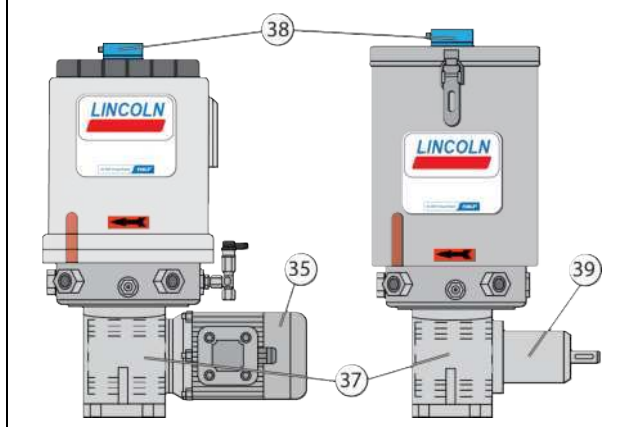
8 Pump elements

The pump can be equipped with up to 5 pump elements.

12 Filler nipple

The filler nipple is used for filling the pump from below. If the filler nipple is removed, the optional fill connection, or the optional external grease return from the pressure limiting valves on the pump elements, can be connected to this port, using the applicable accessories.

Fig. 6



Main components

35 Motor

Used to drive the pump. There are different motors, according to the particular version of the pump.

37 Gearbox (concealed)

The gearbox reduces the speed of the motor to the required speed of the pump.

38 Ultrasonic sensor

Used for monitoring the fill level in the reservoir. The current fill level is indicated by two LEDs (see the "Technical data" of the ultrasonic sensor). The switching points are set at the factory according to the reservoir size.

39 Free shaft end

In the case of pumps that are delivered without a motor, a suitable motor is selected and installed by the operator.

44 Follower plate

The follower plate is positioned on top of the lubricant and presses it with the force of the spring (45) toward the pump elements. Its pressure improves the suction characteristics of the pump.

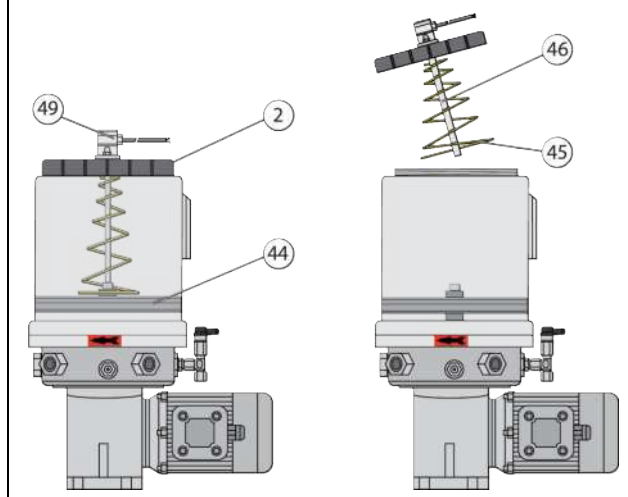
46 Contact rod

The contact rod of the follower plate houses the reed contacts for the low-level signal function. The follower plate contains a magnet that activates a reed contact when one of the switching points is reached. The reed contact for the empty signal is located on the bottom switching point.

49 Electrical connection of low-level signal

Used in the case of pumps with a follower plate, to connect the level signal via a rectangular connector (DIN EN 175301-803).

Fig. 7



Pumps with a follower plate

4. Technical data

Table 3

General technical data for P205

Operating pressure	Max. 350 bar	Mounting position ²⁾	Vertical
Ambient temperature ¹⁾	-20 °C to 70 °C	Sound pressure level	< 70 dB (A)
Pump elements	Max. 5	Direction of rotation	Clockwise
Feedable lubricants	Lubrication greases from NLGI 000 up to and including NLGI 2 Lubrication oils with min. 40 mm ² /s at operating temperature Chisel paste ³⁾		
Filling	Filler nipple Reservoir cover Optional fill connection		
Connections on the pump	5 x outlets M22 x 1.5 for pump elements, plug screws, fill connection G1/4" or G 1/2" or adapter with grease fitting		
Transmission ratios and speeds	Multigrade motor	Monograde motor	Free shaft end
700:1	YES	YES	YES
280:1	YES	YES	NO
70:1	YES	YES	NO
Multigrade motor	380-420 V AC	440-480 V AC	
700:1	2.0 rpm	2.4 rpm	
280:1	4.7 rpm	6.0 rpm	
Monograde motor	500 VAC		Free shaft end ⁵⁾
700:1	2.0 rpm		Lubrication grease min. 2 rpm max. 25 rpm
280:1	4.4 rpm		Lubrication oil min. 2 rpm max. 35 rpm

Delivery rate of pump elements

Nominal delivery rate in [ccm] per pump element and stroke ⁴⁾	K5	K6	K7	KR	B7	C7 ⁴⁾
	0.10	0.16	0.22	0.04-0.18	0.10	0.22

Weight of the empty pump⁶⁾

Reservoir capacity [liters]	Approx. weight [kg]	Reservoir capacity [liters]	Approx. weight [kg]
4	10.5	10	12.5
5	10.5	30	14.5
8	10.5		

- 1) The lower limit for the permissible ambient temperature is contingent on the pumpability of the lubricant used. Pumps without an ultrasonic sensor for level monitoring can be operated up to + 80 °C.
- 2) The maximum filling must be reduced in accordance with the inclination to be expected (e.g., with construction or agricultural machinery).
- 3) The pump element C is designed only for pumping chisel paste. When using chisel paste, observe the relevant information in the "Lubricants" section. Please consult SKF product management before using chisel paste.
- 4) The nominal delivery rate is based on NLGI 2 lubrication greases at an ambient temperature of + 20 °C and a back pressure of 100 bar on the pump element.
- 5) When selecting a suitable motor, compliance with the speeds is essential
- 6) Specified weight does not include lubricant. The actual value could vary from those specified due to the specific reservoir design, the gearbox used, and the motor used. When delivered without a motor, about 3.0 kg should be deducted from the specified weight.

Table 4

Technical data for single-range motor

Item number	245-13590-1
Motor type	B04-03
Parameter	Value
Rated voltage	500 V +/- 10 %
Rated frequency	50 Hz
Rated power	0.09 kW
Rated speed	1500 rpm
Rated current	0.3 A
Starting current	2.5 x rated current
Efficiency	52 % η
Power factor	0,62 $\cos \phi$
Operating mode	S1
Type	B14/18
Frame size	56
Enclosure rating	IP 55
Insulation class	F
Flange	80 mm
Shaft	9 x 20 mm

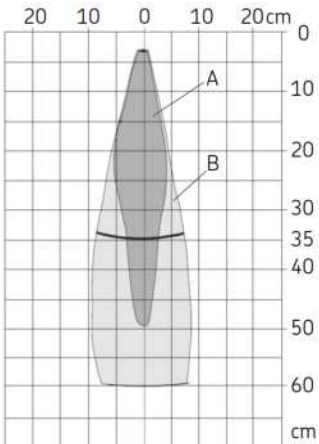
Table 5

Technical data for multi-range motor

Item number	245-13989-2	
Motor type	TN56B4	
Parameter	Value	
Rated voltage	380-420 VAC ± 10 %	440-480 VAC ± 10 %
Rated frequency	50 Hz	60 Hz
Rated power	0.09 kW	0.11 kW
Rated speed	1340 rpm	1600 rpm
Rated current	0.3 A	0.43 A
Starting current	2.5 x rated current	2.5 x rated current
Efficiency	52 % η	56 % η
Power factor	0,62 cos φ	0,65 cos φ
Operating mode	S1	S1
Type	B14/18	B14
Frame size	56	56
Enclosure rating	IP 55	IP 55
Insulation class	F	F
Flange	80 mm	80 mm
Shaft	9 x 20 mm	9 x 20 mm

Technical data

Parameter	Value
Blind zone	0-65 mm
Sensing range	600 mm
Ultrasonic frequency	Approx. 400 kHz
Sonic frequency	3.7 Hz
Resolution	0.18 mm
Accuracy	± 1 %
Reproducibility	± 15 %
Sensing range in centimeters	
Operating voltage U_B	9-30 VDC (reverse polarity resistant)
Residual ripple	± 10%
No-load power consumption	≤ 60mA
Connection type	M12 connector, 5-pin
Response delay	272 ms
Readiness delay	< 300 ms
Enclosure rating per EN 60529	IP65 / IP67 (depending on the cable box used)
Operating temperature range	- 40 °C to + 70 °C
Switching points	Full signal D1; low-level signal D2 according to the reservoir size; pre-empty signal D3 programmable upon customer request, preset to 10 mm above the low-level signal (use is optional)
Conformity with standards	DIN EN IEC 60947-5-2
Display elements	LED green/LED orange Switching output set/not set
Housing material	PBT, polyester, ultrasonic transducer: PUR, epoxy resin with glass contents
Switching output	3x pnp; UB-2V; I _{max} = 3 x 200 mA; NO contact, short-circuit proof



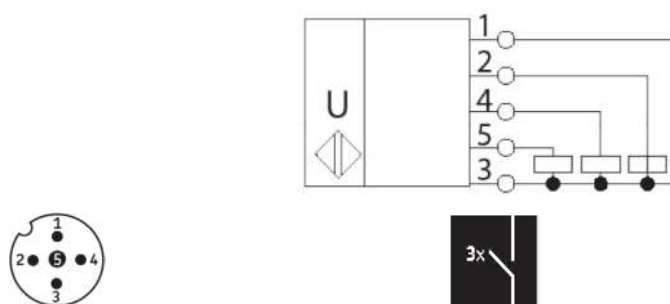
The dark gray areas (A) indicate the range in which the standard reflector (a tube) is reliably detected. The light gray areas (B) represent the range in which a large reflector (such as the lubricant surface) is still detected provided that it is optimally aligned to the sensor. No evaluation is possible outside the light gray area.

NOTE

The specified enclosure rating is contingent on the use of connection sockets and cables suitable for that enclosure rating. If connection sockets and cables with a lower protection rating are used, the lowest of those protection ratings will apply.

Table 7

Electrical connection



Cable colors in accordance with IEC 60757

1	+ U _B	Brown (BN)
3	- U _B	Blue (BU)
4	D2	Black (BK)
2	D1	White (WH)
5	D3 / Com	Gray (GY)

Table 8

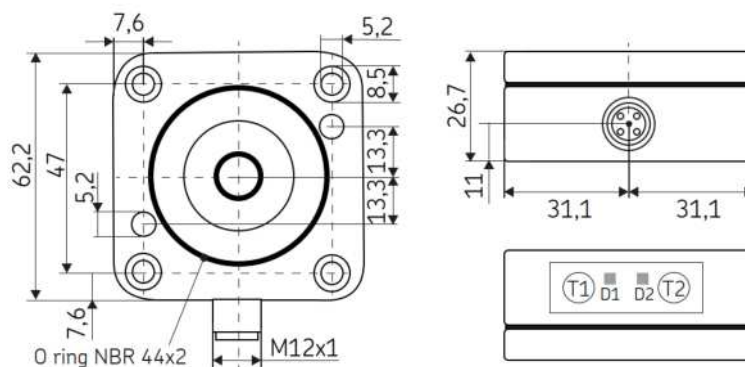
Display of the circuit states

Parameter	Switching points		D3	D1 (up to 10/21)	Display of the LEDs			--
	D1	D2			D1 (from 10/21)	D2 (up to 10/21)	D2 (from 10/21)	
Full signal (high level)	A	A	B	Orange	Green	Orange	Green	C
Between full signal and pre-B empty signal		A	B	Green	Orange	Orange	Green	C
Pre-empty signal	B	A	A	Green	Orange	Orange	Green	D
Low-level signal	B	B	B	Green	Orange	Green	Orange	C

A = switched, B = not switched, C = steady, D = flashing

Dimensions:

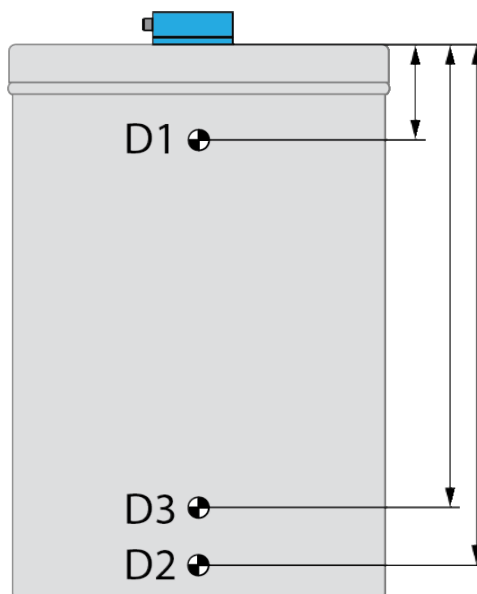
Fig. 8



Dimensions

4.1 Switching points of ultrasonic sensor

Fig. 9



Switching points for reservoir design XYBU

Table 9

Switching points for reservoir design XYBU

Size	Material	D1	D2	D3
4 l	Plastic	65	150	140
4 l	Plastic	65	130	120
5 l	Sheet steel	65	180	170
8 l	Plastic	65	245	235
8 l	Plastic	65	225	215
10 l	Sheet steel	65	210	200
30 l	Sheet steel	65	420	410

Item numbers of the sensors: see spare parts

NOTE

- D1 (full signal) always set to 65 mm
- D2 (low-level signal) set according to the reservoir capacity
- D3 (pre-empty signal) always set to 10 mm above the low-level signal.

4.2 Reservoir designs

The possible reservoir designs for the pumps described in these instructions can be found below (see also the type identification code). To improve the clarity of the illustrations, only the smallest possible reservoir size is shown in each case. The differences between the reservoir designs may not be visible in the illustrations, as the differences lie in the internal structure (e.g. with and without low-level signal). (✓ = available reservoir sizes)

NOTE					
The XYNA reservoir design is available only as a 4l or 8l reservoir. The XBF reservoir design is available only as an 8 l reservoir.					

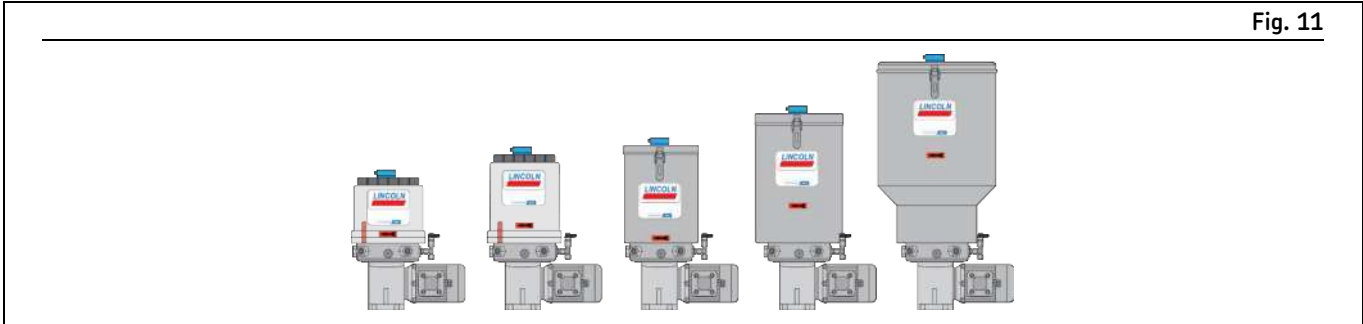
Table 10					
XYN / XYNA					
liters	4	8	5	10	30
XYN	✓	✓	✓	✓	✓
XYNA	✓	✓			



Reservoir designs XYN / XYNA

Table 11					
XYBU /					
liters	4	8	5	10	30
XYBU	✓	✓	✓	✓	✓
XBF*		✓			

* Not shown. Reservoir design with rectangular connector and follower plate



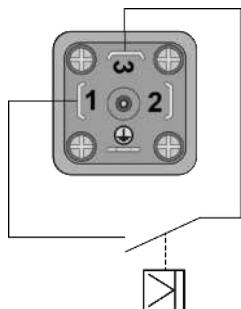
XYBU reservoir designs

Technical data for the low-level signal connection on the reservoir cover

Rectangular connector	DIN EN 175301-803 SELV / PELV / FELV	The specified enclosure rating of the pump requires the use of connection sockets compatible with that enclosure rating, and corresponding cables. Classification is in accordance with the lowest enclosure rating when connection sockets and cables with low type of protection are used.
Enclosure rating (IEC 60529)	3 (signal line connection)	
Protection class	IP 65	

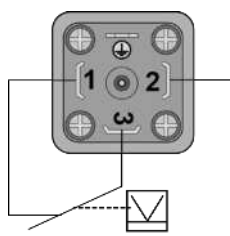
Connection of the signal line with rectangular connector

Connection diagram (lubrication grease):
reed switch for low-level signal



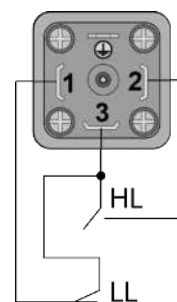
Depiction in non-actuated state
Max. switching capacity 21 VA
Max. switching voltage 30 V DC
Max. switched current 700 mA

Connection diagram (lubrication grease):
reed switches for full and low-level signals



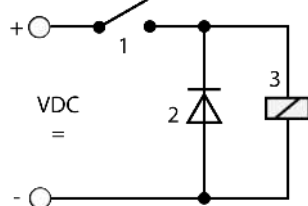
Max. switching capacity 21 VA
Max. switching voltage 30 V DC
Max. switched current 700 mA

Connection diagram (lubrication oil): float
switch for low-level signal



Max. switching capacity 60 VA
Max. switching voltage 230 V
Max. switched current 1 A
HL = full signal | LL = low-level signal

Recommended contact protection for switching inductive loads



To protect the relay contacts, the operator should implement the following contact protection.

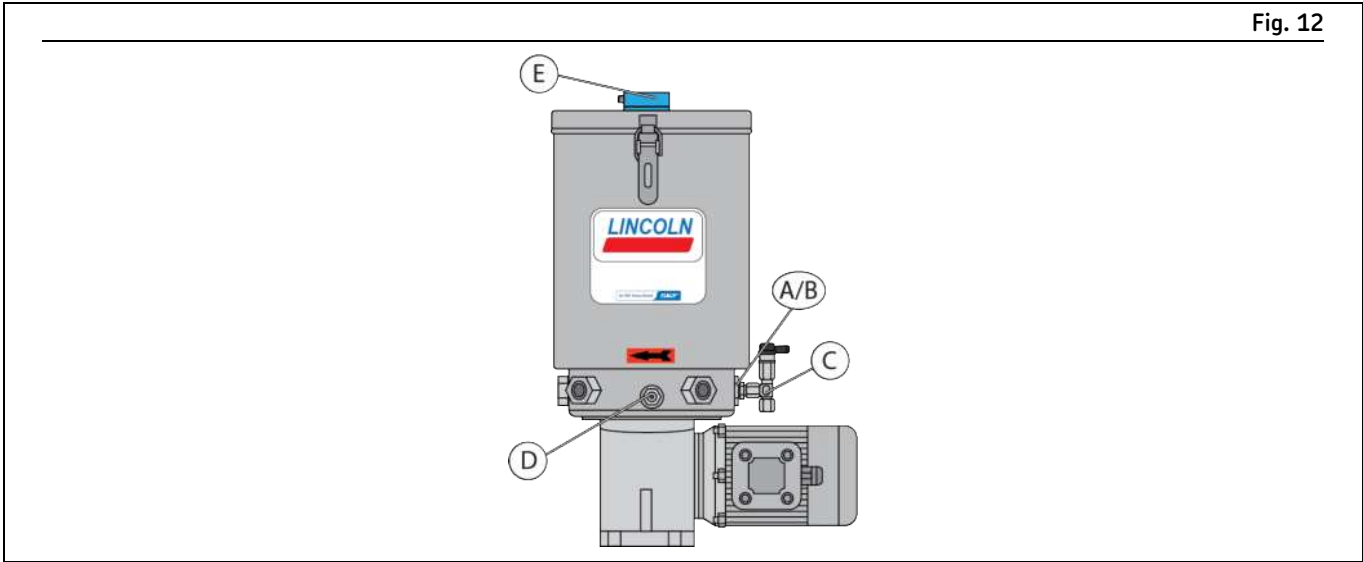
1 reed switch, 2 TVS diode, 3 load

PIN assignment

Rectangular connector	Pin	Color	Function
	1	RD	
	2	BN	GND
	3	XXXX	XXXX
	PE	GY/YE	PE

4.3 Tightening torques

NOTE
If no torques are specified for screw connections, use those specified for the screw size and strength class 8.8.

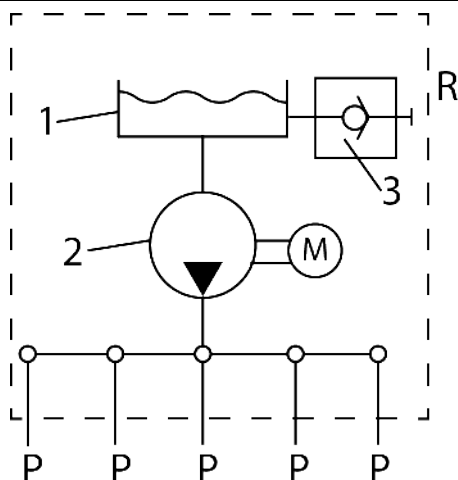


P205 tightening torques

Table 13		
Tightening torques		
A	Pump element with housing	25 Nm ± 2.5 Nm
B	Plug screw with housing	20 Nm ± 0.2 Nm
C	Pressure limiting valve with pump element	6 Nm ± 0.6 Nm
D	Grease fitting with housing	10 Nm ± 0.1 Nm
E	Ultrasonic sensor with reservoir cover (XYBU reservoir design only)	1.5 Nm ± 0.2 Nm
E	Screw for rectangular connector M3 (XBF reservoir design only)	0.5 Nm

4.4 Hydraulic connection diagram

Fig. 13



Hydraulic connection diagram for P205

Table 14

Designations

1 = Reservoir
3 = Check valve
R = Return line

2 = Pump
P = Pressure line

4.5 Type identification code

	P205	X	-	M	280	-	10	XYBU	-	3	K7	-	380-420.440-480
Type series: P205 Pump for grease and oil													
Corrosion protection classes: X = C5-M protection period ≥ 15 years The corrosion protection duration is not a warranty period													
Drive assembly: M Three-phase flange-mounted motor F Free shaft end													
Transmission ratio: 280 $i = 280 : 1$ 700 $i = 700 : 1$ 70 $i = 70 : 1$													
Reservoir sizes: 4 4-liter plastic reservoir 5 5-liter sheet steel reservoir 8 8-liter plastic reservoir 10 10-liter sheet steel reservoir 30 30-liter sheet steel reservoir													
Reservoir designs: XYN Reservoir for lubrication grease and lubrication oil without level monitoring (all reservoir sizes) XYBU Reservoir for lubrication grease and lubrication oil with ultrasonic sensor for level monitoring (all reservoir sizes) XYNA Reservoir for lubrication grease and lubrication oil without level monitoring, with lockable reservoir cover (4 l and 8 l reservoirs only) XBF Reservoir for lubrication grease with follower plate and level monitoring (8 l reservoir only)													
Number of pump elements: 1-5 1 to 5 pump elements													
Type of pump elements: K5 Piston $\varnothing 5$ mm K6 Piston $\varnothing 6$ mm K7 Piston $\varnothing 7$ mm KR Piston $\varnothing 7$ mm (adjustable delivery rate) B7 Piston $\varnothing 7$ mm C7 Piston $\varnothing 7$ mm													
Motor: 380-420,440-480 = multi-range motor 380 - 420 VAC 50 Hz or 440-480 VAC 60 Hz 290-500 = single-range motor 290-500 VAC 50 Hz 000 Pump without motor (free shaft end)													

Important features of the product can be selected/identified by means of the type identification code. The actual type identification code of the respective product can be found on the type plate on the pump.

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.



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

Observe the safety instructions and the technical data in this manual. Additionally, during assembly pay attention to the following:

- Only qualified and authorized technical personnel may install the products described in this manual.
- Adhere to safety distances and legal prescriptions on assembly and prevention of accidents.
- Possibly existing visual monitoring devices, e.g. pressure gauges, MIN/MAX markings, oil inspection glasses must be clearly visible.
- Protect the product against humidity, dust and vibrations.
- Install the product in an easily accessible position. This facilitates other installations, control and maintenance work.

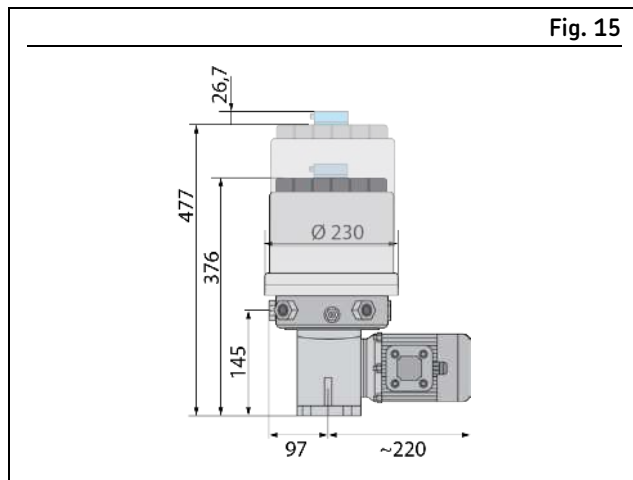
6.1 Mechanical connection

6.1.1 Mounting dimensions

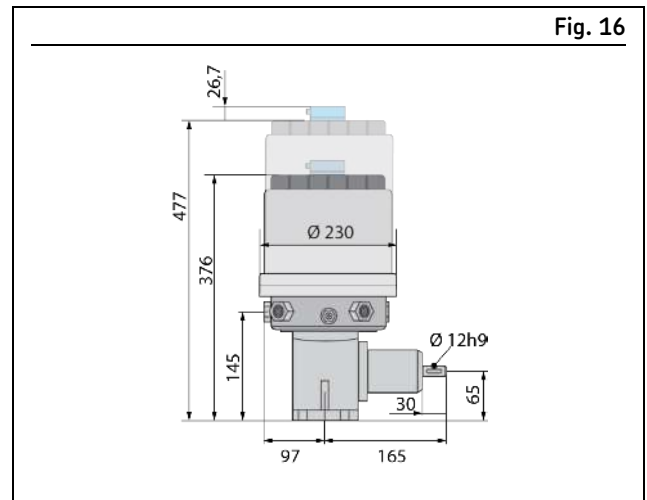
In order to have sufficient space for maintenance work or for the attachment of additional components for the construction of a centralized lubrication system on the pump, a clearance of at least 100 mm should be provided for in every direction in addition to the specified dimensions.

NOTE

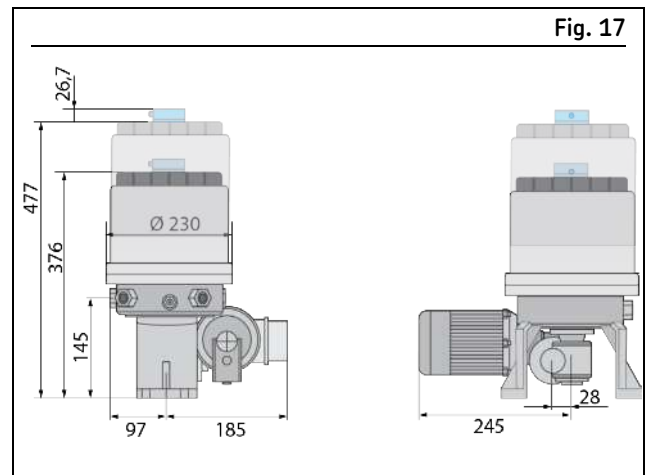
For 8 liter XBF reservoirs, 30 mm must be added to the height specified for 8 liter XYN reservoirs.



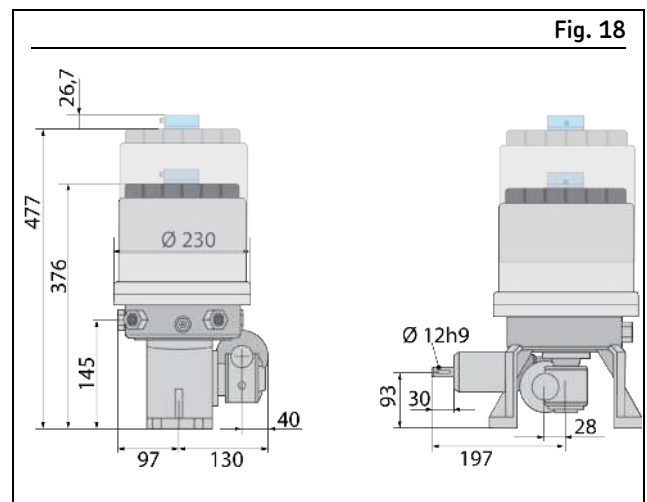
4/8 liter reservoir, 1-stage gearbox and motor



4/8 liter reservoir, 1-stage gearbox and free shaft end

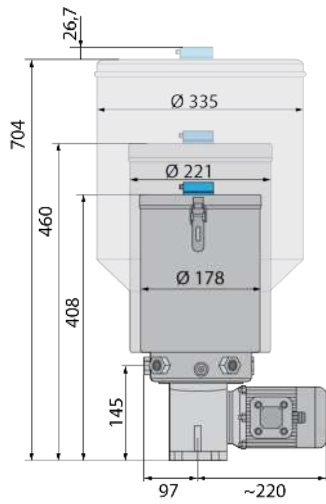


4/8 liter reservoir, 2-stage gearbox and motor



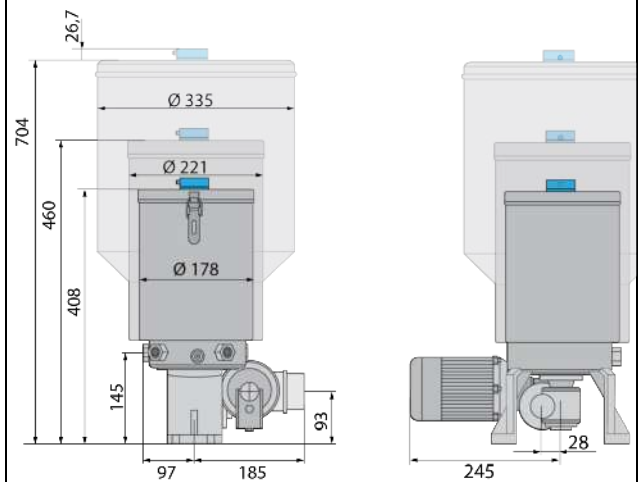
4/8 liter reservoir, 2-stage gearbox and free shaft end

Fig. 19



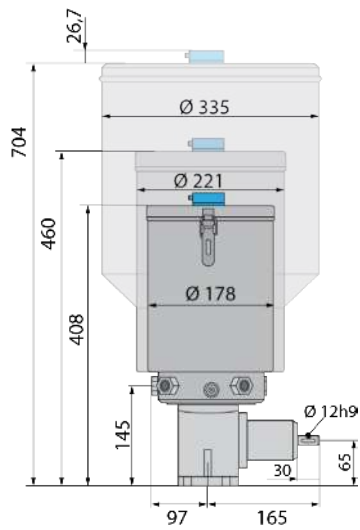
5/10/30 liter reservoir, 1-stage gearbox and motor

Fig. 21



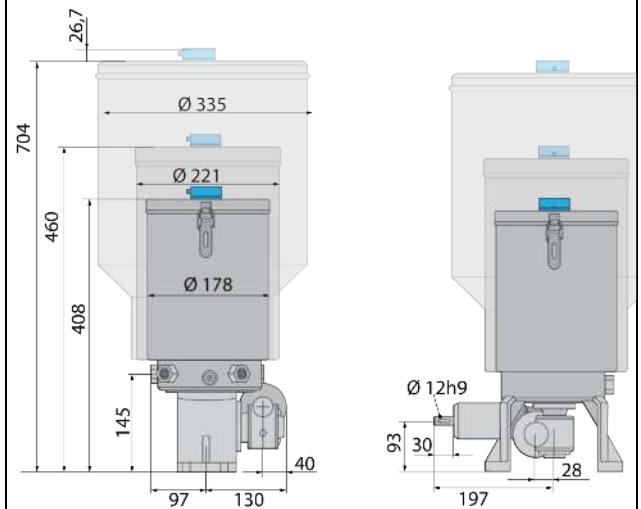
5/10/30 liter reservoir, 2-stage gearbox and motor

Fig. 20



5/10/30 liter reservoir, 1-stage gearbox and free shaft end

Fig. 22



5/10/30 liter reservoir, 2-stage gearbox and free shaft end

6.2 Assembly holes

NOTICE

Possible damage to the main machine and the pump

The assembly holes should be created only on non-load-bearing parts of the main machine. Do not fasten on two parts which move in opposite directions to one another (e.g., machine base and machine assembly).

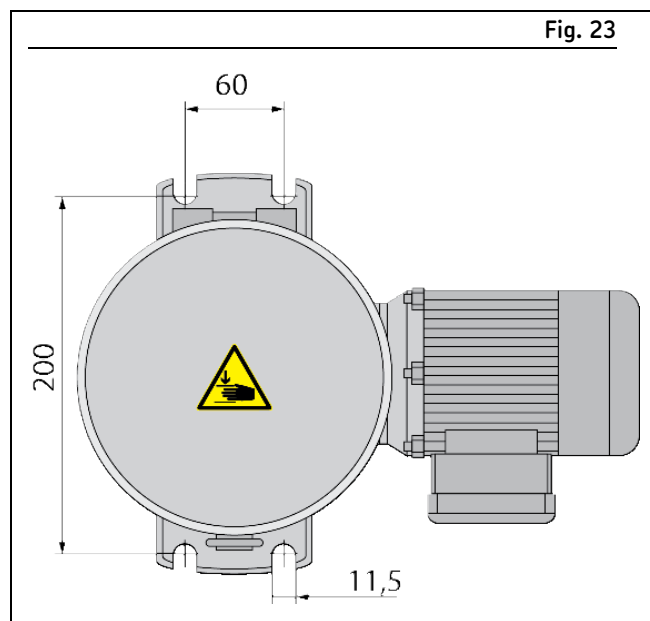
The pump should be fastened at the fastening points using:

4 x M8 screw (strength class 8.8)

4 x M8 hexagon nut

4 x 8C washer

Tightening torque = 25 Nm ± 2,05 Nm



Dimensions of the fastening points

6.3 Setting the delivery rate on pump element KR

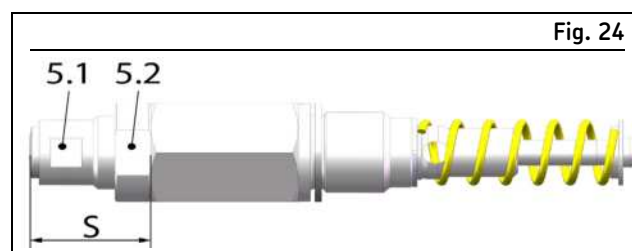
NOTE

The delivery rate of pump element R can be adjusted only when the pump is at a standstill. When delivered, the rate is set to full delivery, meaning the setting dimension is **S = 29 mm**.

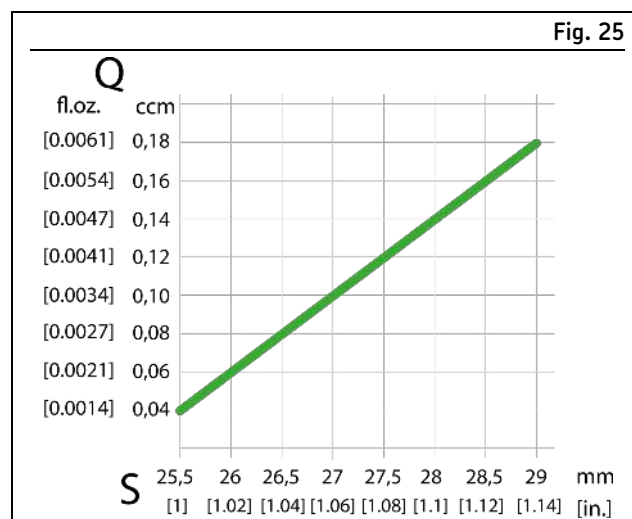
To set the delivery rate per stroke, proceed as follows:

1. Release the locknut (5.2)
2. Set the delivery rate to the dimension specified in the delivery rate chart by turning the spindle (5.1).
 - Turning clockwise reduces the delivery rate
 - Turning counterclockwise increases the delivery rate
3. Once the delivery rate is set, tighten the locknut (5.2) again.

Tightening torque = 20 Nm ± 2.0 Nm



Pump element KR



Delivery rate chart for pump element KR per stroke

6.4 Installing the pressure limiting valve

Each pump element must be secured with a pressure limiting valve that is suitable for the projected maximum approved operating pressure of the centralized lubrication system. You can find suitable pressure limiting valves in the spare parts and accessories section of this manual.

Proceed as follows for installation:

1. Remove the plug screw (42) from the pump element (8).
2. Screw the pressure limiting valve (21) into the pump element (8). **Tightening torque = 6 Nm -0.5 Nm.**
3. Repeat the procedure for each pump element installed.

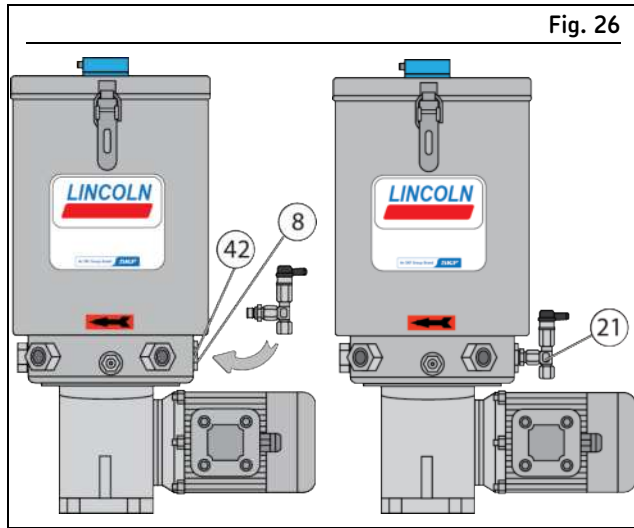


Fig. 26

Installing the pressure limiting valve

6.5 Electrical connection

⚠ WARNING



Electric shock

Work on electrical components may be performed only by qualified electricians.

At a minimum, the following safety measures must be taken before any work on electrical components is done:



- Isolate, lock and tag out
- Check to ensure the absence of voltage
- Ground and short-circuit the product
- Cover any live parts in the surrounding area

Observe the following instructions for a safe connection:

- The electrical connection must be implemented in accordance with the specifications of the standards of the DIN VDE 0100 series or of the standards of the IEC 60364 series, respectively

Connect the electrical lines in such a way that no mechanical forces are transferred to the product

- The pump must be secured with a suitable external fuse (see terminal diagram)

The electrical connection is established in accordance with the type of connection of the specific pump.

1. Assemble the required cables in accordance with the respective connection diagram or use preassembled cables for the connection.
2. Connect plugs with their respective bushes and secure them against becoming loose using the type of securing method specified for the quick disconnect couplings. Only this way is a safe connection and compliance with the enclosure rating secured.

NOTE

Connect the cables in such a way that no tensile forces can be transferred to the product.

Connect the motor (35) according to the terminal diagram in the terminal box (36)

Connect the ultrasonic sensor (38) according to the terminal diagram in these instructions (see the "Technical data" for the ultrasonic sensor)

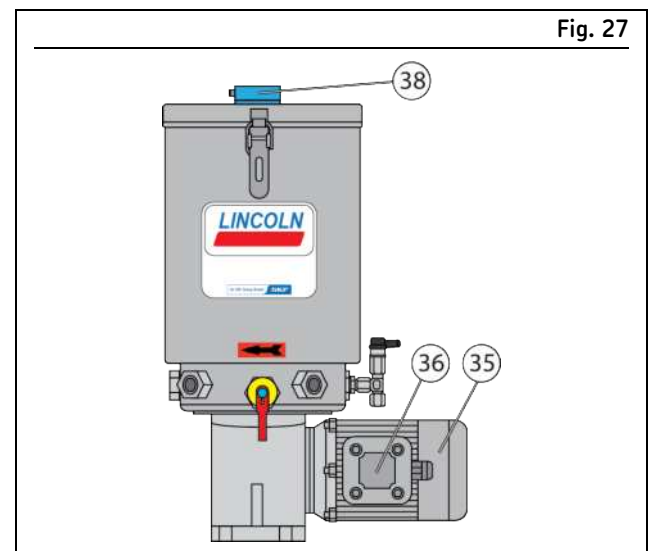


Fig. 27

Electrical connection

6.6 Connection of the lubrication line

CAUTION



Risk of slipping

Exercise caution when handling lubricants. Immediately remove and bind any leaked lubricants.

NOTICE

Damage to the higher-level machine caused by faulty planning of the centralized lubrication system

All parts for the construction of the centralized lubrication system must be designed for the maximum operating pressure that occurs, the permissible ambient temperature range, the required delivery volume, and the lubricant to be supplied.

Observe the following assembly information for safe and trouble-free operation:

- Generally valid regulations and company regulations regarding the laying of pressurized pipe and hose lines must be observed.
- Use only clean, pre-filled components and lubrication piping.
- Secure every lubricant line on the pump against excessive pressure through the use of a suitable pressure relief valve (only in the case of pumps without an internal pressure relief valve).
- The main lubricant line should be arranged ascending and be able to be bled at the highest point. Lubrication lines should always be arranged so that air inclusions cannot form anywhere.
- Install lubricant metering devices at the end of the main lubricant line such that the outlets of the lubricant metering devices point upwards wherever possible.
- If the system configuration requires that the lubricant metering devices be arranged below the main lubricant line, they should not be placed at the end of the main lubricant line.
- The flow of lubricant should not be impeded by the presence of sharp bends, angle valves, flap valves, seals protruding inward, or changes in cross-section (large to small). Unavoidable changes in the cross-section in lubrication lines must have smooth transitions.
- Connect the lubricant lines in such a way that no mechanical forces are transferred to the product (stress-free connection).
- Lubrication piping is to be positioned in such a way that they cannot become kinked, pinched or frayed.

6.7 Filling with lubricant

6.7.1 Filling via reservoir cover

WARNING



Crushing hazard

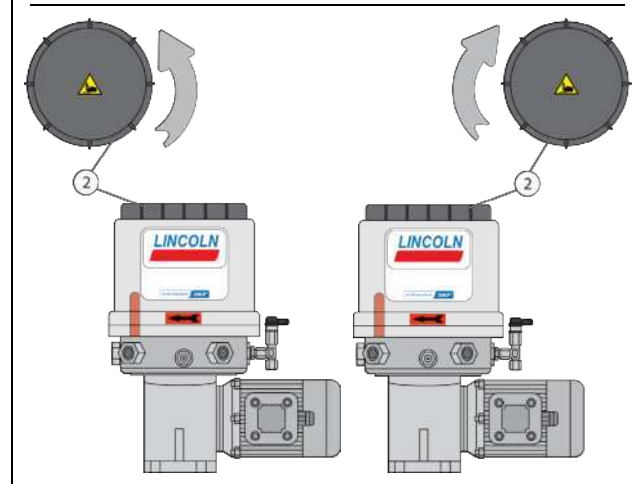
on the rotating stirring paddle.
Filling through the opening of the reservoir cover is permitted only when the pump is at a standstill

6.7.2 Plastic reservoirs

Remove the reservoir cover (2) by turning it counterclockwise.

1. Switch on the filling pump and fill the reservoir up to about 20 mm below the reservoir rim. Take care to ensure while doing so that the lubricant is filled in without air inclusions if at all possible.
2. Turn off the filling pump.
3. Install the reservoir cover (2) by turning it clockwise.

Fig. 28



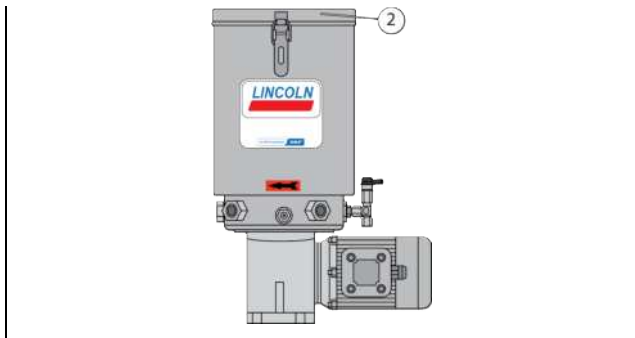
Filling through the reservoir cover on a plastic reservoir

6.7.3 Sheet steel reservoirs

Remove the reservoir cover (2) by turning it counterclockwise.

1. Switch on the filling pump and fill the reservoir up to about 20 mm below the reservoir rim. Take care to ensure while doing so that the lubricant is filled in without air inclusions if at all possible.
2. Turn off the filling pump.
3. Install the reservoir cover (2) by turning it clockwise.

Fig. 29



Filling through the reservoir cover on a sheet steel reservoir

5. In the case of steel reservoirs, close the reservoir cover (2) and lock it. In the case of plastic reservoirs, install the reservoir cover (2) by turning it clockwise.

6.8 Filling via filler nipple

6.8.1 Pumps with an ultrasonic sensor

1. Connect the fill connection of the filling pump with the filler nipple (12).
2. Switch on the filling pump and fill the reservoir until the LED of the ultrasonic sensor indicates that the reservoir is full (full signal). See also the "Technical data" section for the ultrasonic sensor.
3. Switch off the filling pump and remove it from the filler nipple (12) of the pump.

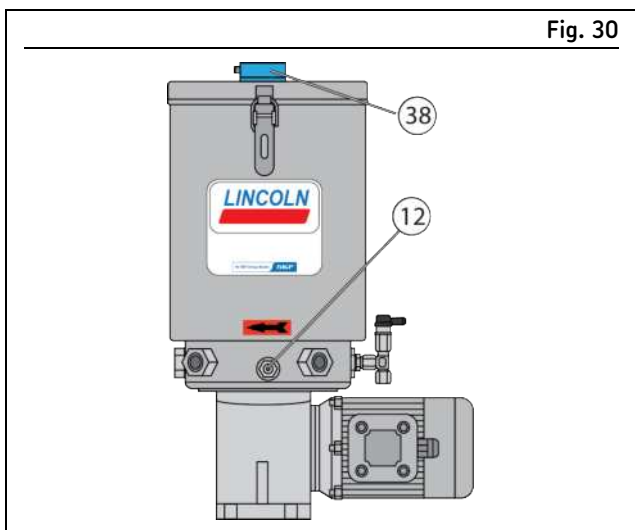
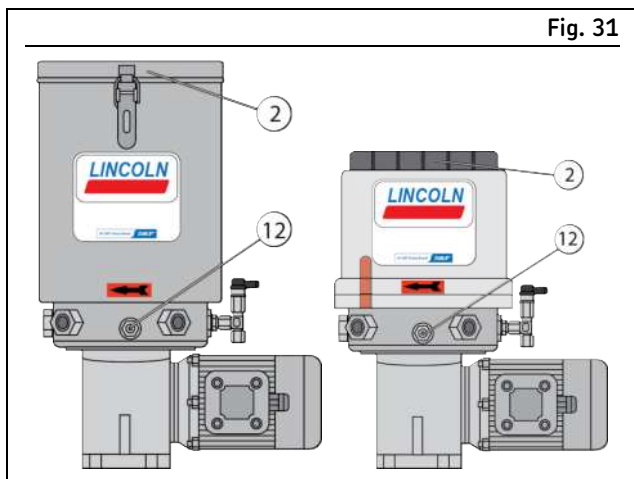


Fig. 30

Filling via filler nipple

6.8.2 Pumps without an ultrasonic sensor

1. In the case of steel reservoirs, release the lock, open up the reservoir cover (2), and secure it to prevent it falling closed accidentally. In the case of plastic reservoirs, remove the reservoir cover (2) by turning it counterclockwise, and put it down somewhere clean.
2. Connect the fill connection of the filling pump with the filler nipple (12).
3. Switch on the filling pump and fill the reservoir up to about 20 mm below the reservoir rim.
4. Switch off the filling pump and remove it from the filler nipple (12) of the pump.

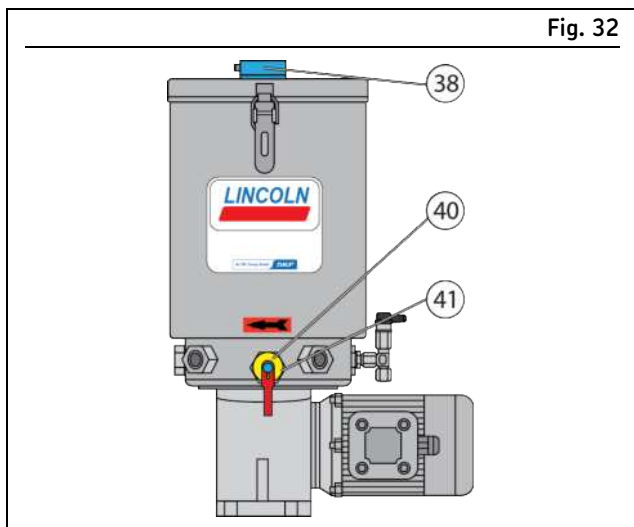


Filling via filler nipple

6.9 Filling via the optional fill connection

6.9.1 Pumps with an ultrasonic sensor

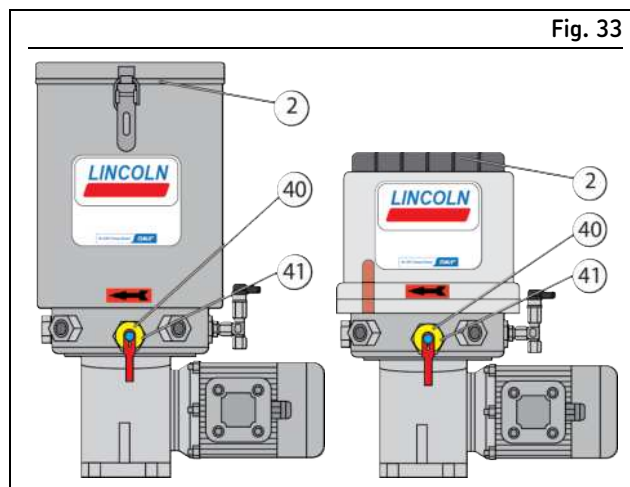
1. Unscrew the protective cap (41) on the fill connection (40) by turning it counterclockwise.
2. Connect the fill connection of the filling pump to the fill connection (40) on the pump.
3. Switch on the filling pump and fill the reservoir until the LED of the ultrasonic sensor (38) indicates that the reservoir is full (full signal). See also the "Technical data" section for the ultrasonic sensor.
4. Switch off the filling pump and remove it from the fill connection (40) of the pump.
5. Screw the protective cap (41) in clockwise direction back onto the fill connection (40) of the pump.



Filling via the optional fill connection

6.9.2 Pumps without an ultrasonic sensor

1. Unscrew the protective cap (41) on the fill connection (40) by turning it counterclockwise.
2. In the case of steel reservoirs, release the lock, open up the reservoir cover (2), and secure it to prevent it falling closed accidentally. In the case of plastic reservoirs, remove the reservoir cover (2) by turning it counterclockwise, and put it down somewhere clean.
3. Connect the fill connection of the filling pump to the fill connection (40) on the pump.
4. Switch on the filling pump and fill the reservoir up to about 20 mm below the reservoir rim.
5. Switch off the filling pump and remove it from the fill connection (40) of the pump.
6. In the case of steel reservoirs, close the reservoir cover (2) and lock it. In the case of plastic reservoirs, install the reservoir cover (2) by turning it clockwise.
7. Screw the protective cap (41) in clockwise direction back onto the fill connection (40) of the pump.



Filling via the optional fill connection

6.9.3 Initial filling of pumps with a follower plate

NOTE

For pumps without grease filling, the space underneath the follower plate must be filled with lubricant prior to first start-up. All further fillings take place exclusively via the filler nipple or the optional fill connection on the pump

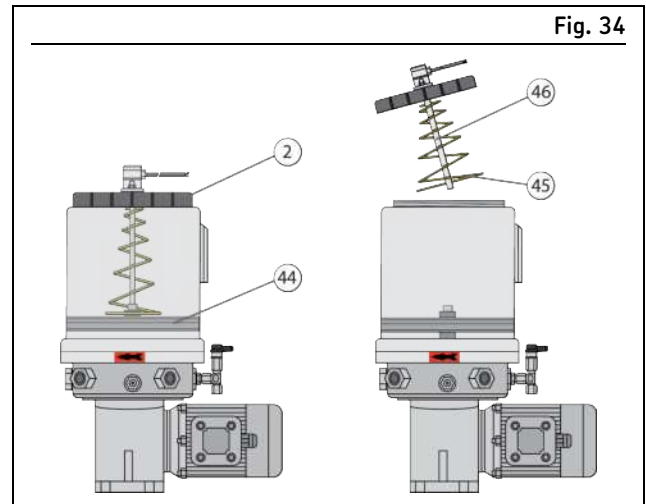
⚠ CAUTION

Spring tension

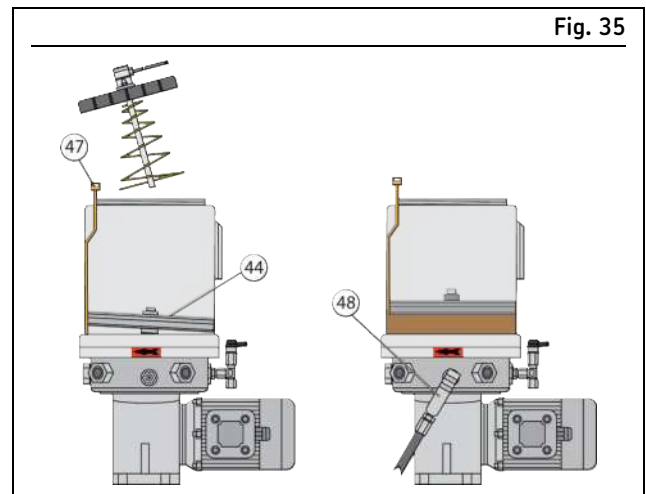
Eye injuries due to the reservoir cover coming loose.

Release the reservoir cover slowly, holding it securely while doing so. Wear goggles.

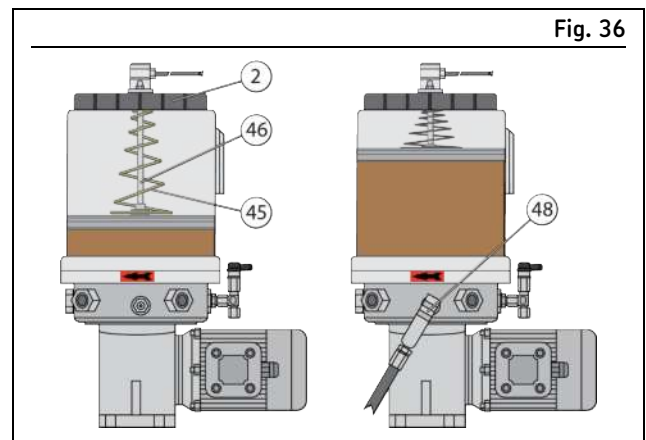
1. Detach the reservoir cover (2) counterclockwise from the reservoir
2. Carefully release the spring (45) from its fixation on the follower plate (44).
3. Carefully pull the contact rod (46) out of the follower plate (44)
4. Remove the reservoir cover (2), contact rod (46), and spring (45) together.
5. Lightly oil the inner side of the reservoir and the sealing lip of the follower plate.
6. Tilt the follower plate (6) in the reservoir slightly so that the side opposite the filler nipple (4) is positioned at the highest point.
7. At this point, push the cable tie (13) into the area underneath the follower plate as shown.
8. Move the follower plate (44) into horizontal position once again. While doing so, take care to ensure that an air gap is created by the cable tie (47).
9. Set the fill connection (48) of the filling pump on the filler nipple and fill the space underneath the follower plate with lubricant. Take care to ensure that no air inclusions remain under the follower plate and that no lubricant reaches the upper side of the follower plate.
10. Remove the cable tie (7).
11. Reinstall the spring (45) and the contact rod (46).
12. Close the reservoir cover (2) by turning it clockwise.
13. Fill the reservoir up to the MAX marking.



Initial filling of pumps with a follower plate



Initial filling of pumps with a follower plate



Initial filling of pumps with a follower plate

6.10 Accidental filling with wrong lubricant

Proceed as follows if an incorrect lubricant is accidentally filled:

1. Switch off the pump and secure it against being switched back on (lock it out).
2. Remove the lubricant.
3. Clean the reservoir/pump housing and also, if necessary, the piping system.
4. Fill with lubricant. Make sure the specifications are correct.
5. Switch on the pump.
6. Inform your supervisor so the error can be avoided by organizational changes in future.

7. First start-up

In order to warrant safety and function, a person assigned by the operator must carry out the following inspections. Immediately eliminate detected deficiencies. Deficiencies may be remedied by an authorized and qualified specialist only.

Table 15

7.1 Inspections before first start-up

	YES	NO
Electrical connection established correctly	<input type="checkbox"/>	<input type="checkbox"/>
Mechanical connection established correctly	<input type="checkbox"/>	<input type="checkbox"/>
The performance characteristics for the aforementioned connections match the specifications in the "Technical data"	<input type="checkbox"/>	<input type="checkbox"/>
All components such as lubrication lines and metering devices are correctly installed	<input type="checkbox"/>	<input type="checkbox"/>
Product is protected by a suitable pressure limiting valve	<input type="checkbox"/>	<input type="checkbox"/>
No apparent damage, contamination, or corrosion	<input type="checkbox"/>	<input type="checkbox"/>
Any dismantled protective and monitoring equipment is fully reinstalled and functional	<input type="checkbox"/>	<input type="checkbox"/>
All safety markings on the product are present and in proper condition	<input type="checkbox"/>	<input type="checkbox"/>

7.2 Inspections during first start-up

No unusual noises, vibrations, moisture accumulation, or odors present	<input type="checkbox"/>	<input type="checkbox"/>
No undesired discharge of lubricant (leakages) at connections	<input type="checkbox"/>	<input type="checkbox"/>
Lubricant is fed without bubbles	<input type="checkbox"/>	<input type="checkbox"/>
The bearings and friction points requiring lubrication receive the planned lubricant volume	<input type="checkbox"/>	<input type="checkbox"/>
The lubrication time and pause time displayed on the pump's display match the planned lubrication time and pause time	<input type="checkbox"/>	<input type="checkbox"/>

8. Operation

SKF products operate largely automatically.

The activities required during normal operation are largely limited to inspecting the fill level of pumps without a low-level signal, and timely refilling of lubricant (see the corresponding section in these instructions).

9. Maintenance and repair

⚠ 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

The pump is largely maintenance-free.

However, the following should be checked at regular intervals and, if necessary, replaced with new parts:

- Pressure limiting valves (tolerance range + 5 % / - 10 %)
- Check valves
- Pump elements

Checked and replaced with new parts as needed.

9.1 Maintenance of the gearbox

9.1.1 Service life

The basic rating life of the gearbox is 15,000 hours at a load characteristic of SF 1.0.

9.1.2 Oil change

The gearboxes are supplied with a synthetic oil filling, so the oil does not need to be changed for 5 years.

9.1.3 Maintenance of the motors

Because we are unable to define the exact operating conditions, we can only state general maintenance intervals that are based on trouble-free operation. The operator must always adapt the intervals to suit the actual operating conditions.

9.1.4 Motor bearings

When the basic rating life of the bearings is reached, they should either be replaced or an inspection must demonstrate that they are free of mechanical damage.

- 20,000 h under axial loading
- 40,000 h in all other loading scenarios

9.1.5 Measuring the insulation resistance

⚠ WARNING

Electric shock



Do not touch the terminals during the insulation measurement. Wear insulating gloves. Follow the instruction manual for the insulation resistance tester.

NOTICE

Damage to the motor

The voltage applied during the installation test must not exceed 500 V.

At first start-up and after long periods of downtime, the insulation resistance must be measured in accordance with the standards applicable in the country of use (e.g., VDE 0100 / IEC / EN 61557). If the insulation resistance is less than the required value, determine the cause and remedy it (e.g., by drying the winding properly, etc.).

Table 16

Maintenance table for motors

<Action	Interval
Check the air passages and the surfaces	According to the degree of contamination during use. But every 4 weeks at the latest
Check for condensation water	According to the climatic conditions, but during the major inspection at the latest.
Relubrication / oil change	For the relubrication interval, quantity of grease, and quality of grease, see the motor's name plate or lubrication plate.
Initial inspection	After about 500 operating hours, but after 6 months at the latest
Major inspection	After about 10,000 operating hours, but after 12 months at the latest.

9.2 Maintenance

Regular and appropriate maintenance is a prerequisite to detect and clear faults in time. The specific time lines have to be determined, verified at regular intervals and adapted, if necessary, by the operator based on the operating conditions. If needed, copy the table for regular maintenance activities.

Checklist Maintenance Table 17		
Activity to be done	YES	NO
Electrical connection carried out correctly	<input type="checkbox"/>	<input type="checkbox"/>
Mechanical connection carried out correctly	<input type="checkbox"/>	<input type="checkbox"/>
The performance data of the previously indicated connections correspond to the specifications stated in the Technical data	<input type="checkbox"/>	<input type="checkbox"/>
All components, such as lubrication lines and metering devices, have been correctly installed	<input type="checkbox"/>	<input type="checkbox"/>
Product protected with adequate pressure control valve	<input type="checkbox"/>	<input type="checkbox"/>
No visible damage, contamination and corrosion	<input type="checkbox"/>	<input type="checkbox"/>
Any dismantled protection and monitoring equipment has been reassembled and checked for correct function	<input type="checkbox"/>	<input type="checkbox"/>
Any warning labels on the product are present and in proper condition	<input type="checkbox"/>	<input type="checkbox"/>
No unusual noises, vibrations, accumulation of moisture, or odours present	<input type="checkbox"/>	<input type="checkbox"/>
No unwanted escape of lubricant (leakages) from connections	<input type="checkbox"/>	<input type="checkbox"/>
Lubricant is supplied free from bubbles	<input type="checkbox"/>	<input type="checkbox"/>
Bearings and friction points are provided with the planned amount of lubricant	<input type="checkbox"/>	<input type="checkbox"/>

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.

10.4 Cleaning sensors

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

WARNING

Risk of fatal electric shock



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

WARNING

Serious injury from contact with or inhalation of hazardous substances



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

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

11. Faults, causes, and remedies


Table 18



Fault table

Fault	Possible cause	Remedy
Pump does not run	<ul style="list-style-type: none"> • Power supply to pump interrupted <ul style="list-style-type: none"> – Main machine is switched off – Pump power cable detached or defective – External fuse defective – The motor of the pump is faulty • Motor circuit breaker has tripped 	
Pump runs, but supplies either no lubricant at all or not enough	<ul style="list-style-type: none"> • Reservoir empty • Jam, malfunction within the centralized lubrication system • Check valve defective • Pressure limiting valve defective • Suction bore in a pump element is clogged • Air inclusion in the lubricant / under the follower plate • Consistency of the lubricant is too high (at low temperatures) • Consistency of the lubricant is too low (at high temperatures) • Metering device within the centralized lubrication system is configured incorrectly 	<ul style="list-style-type: none"> • Check whether one of the specified faults exists, and remedy it according to responsibility. • Faults outside one's own scope of responsibility must be reported to the supervisor for initiation of further measures. • Please contact our Customer Service if you cannot determine or resolve the error.

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

12.1 Replacing pump element and pressure limiting valve

NOTE

The characteristics of the new parts must match the characteristics of the parts being replaced.

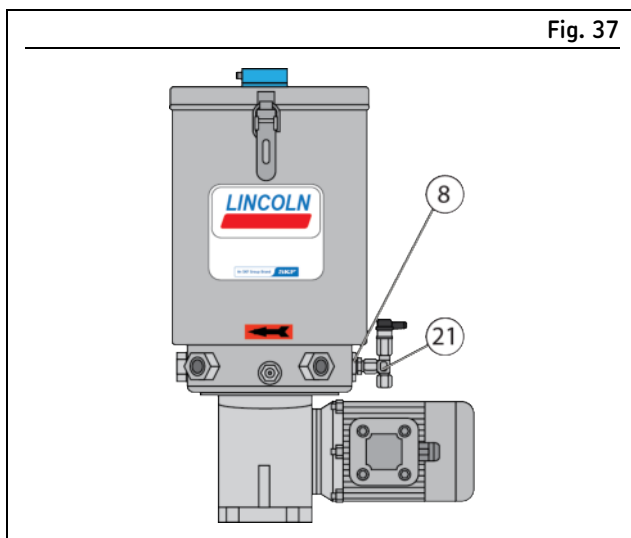
Proceed as follows to replace a pump element:

1. Remove the defective pump element (8) from the pump housing together with the pressure limiting valve (21), by unscrewing on the hexagon of the pump element. You may also need to remove the old seal of the pump element on the pump housing.
2. Screw the new pump element (8) together with a new packing ring into the pump housing.

Tightening torque 20 Nm \pm 2.0 Nm

3. Afterwards, screw a new pressure limiting valve (21) into the pump element (8).

Tightening torque 6 Nm \pm 0.5 Nm



Replacing pump element and pressure limiting valve

13. Shutdown, disposal

13.1 Temporary shutdown

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

13.2 Permanent shutdown, disassembly

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

13.3 Disposal

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

14. Spare parts

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

Exceptions to this are the pump elements and the optional fill connection.

Table 19

14.1 Pump elements

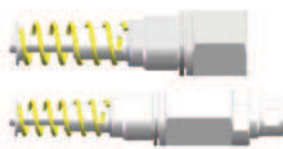
Designation	Pcs	Item number C3 design	Item number C5-M design	Figure
Pump element K5 incl. packing ring, C3 design	1	600-26875-2	600-29303-1	
Pump element K6 incl. packing ring, C3 design	1	600-26876-2	600-29304-1	
Pump element K7 incl. packing ring, C3 design	1	600-26877-2	600-29305-1	
Pump element KR incl. packing ring, C3 design	1	655-28716-1	Not available	
Pump element B7 incl. packing ring, C3 design	1	600-29185-1	Not available	
Pump element C7 incl. packing ring, C3 design	1	600-28750-1	Not available	
Delivery rates: see the "Technical data" chapter				

Table 20

14.2 Pressure limiting valve


Designation	Pcs.	Item number	Figure
SVTS-350-R 1/4-D6 C3	1	624-28894-1	
SVTS-350-R 1/4-D6 C5-M	1	624-29343-1	
SVET-350-G 1/4 A-D8 C3	1	624-29054-1	
SVTSV-270-R1/4-1/8NPTFI-NIP00R-A C3	1	270864	

Table 21

14.3 Ultrasonic sensors

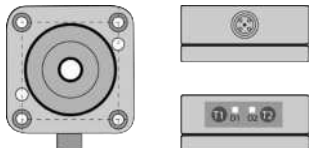
Designation	Pcs.	Item number	Figure
Sensor BU LS = 150; VS=65; VLO 140	1	664-85313-5	
Sensor BU LS = 180; VS=65; VLO 170	1	664-85313-6	
Sensor BU LS = 245; VS=65; VLO 235	1	664-85313-7	
Sensor BU LS = 225; VS=65; VLO 215	1	664-85314-2	
Sensor BU LS = 210; VS=65; VLO 200	1	664-85313-8	
Sensor BU LS = 420; VS=65; VLO 410	1	664-85313-9	

Table 22

14.4 Motors

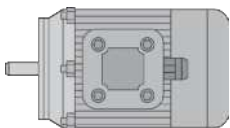
Designation	Pcs.	Item number	Figure
A Single-range motor 500 V AC 50 Hz	1	245-13590-1	
B Multi-range motor 380-420 VAC 50 Hz / 440-480 VAC 60 Hz	1	245-13989-2	

Table 23

14.5 Gearboxes

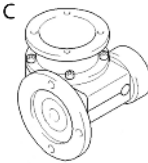
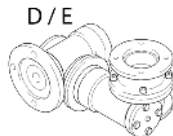
Designation	Pcs.	Item number	Figure
C Gearbox 70:1	1	246-14174-1	 
D Gearbox 280:1	1	246-14174-2	
E Gearbox 700:1	1	246-14174-3	

Table 24

14.6 Drives, compl. (motor and gearbox)

Designation	Pcs.	Item number	Figure
Drive, compl. consisting of motor [B] and gearbox [C]	1	245-13932-1	Not shown
Drive, compl. consisting of motor [B] and gearbox [D]	1	245-13933-1	
Drive, compl. consisting of motor [B] and gearbox [E]	1	245-13934-1	
Drive, compl. consisting of motor [A] and gearbox [C]	1	245-13935-1	
Drive, compl. consisting of motor [A] and gearbox [D]	1	245-13936-1	
Drive, compl. consisting of motor [A] and gearbox [E]	1	245-13937-1	

Table 25

14.7 Drive, compl. (free shaft end)

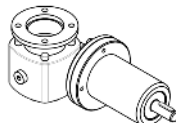
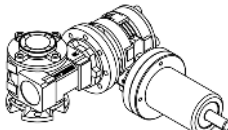
Designation	Pcs.	Item number	Figure
Drive P205-F070 (gearbox 70:1)	1	655-28733-1	 
Drive P205-F280 (gearbox 280:1)	1	655-28740-1	
Drive P205-F700 (gearbox 700:1)	1	655-28732-1	

Table 26

14.8 Flange gaskets

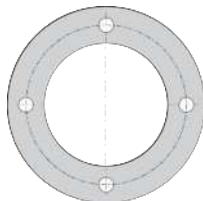
Designation	Pcs.	Item number	Figure
Flange gasket for between gearbox and motor or between gearbox and free shaft end, 50 x 80 x 0.5	1	306-19714-1	
Flange gasket for between between gearbox and pump housing, 40 x 70 x 0.5	1	306-19713-1	

Table 27

14.9 Reservoir cover


Designation	Pcs.	Item number	Figure
Reservoir cover, 4/8l design	1	544-31992-1	

Table 28

14.10 Plug screw M22x1.5

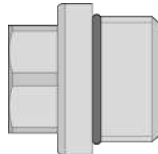
Designation	Pcs.	Item number	Figure
Plug screw M22x 1.5 incl. seal	1	519-60445-1	
Used to close an unused outlet, e.g., when a pump element is removed			

Table 29

14.11 Adapter with filler nipple

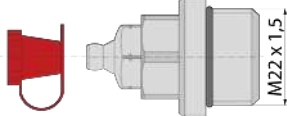
Designation	Pcs.	Item number	Figure
Adapter with filler nipple ST 1/4 acc. to NPTF, incl. seal	1	519-33840-1	
Adapter with filler nipple A2 AR 1/4, incl. seal	1	519-33959-1	
Adapter with filler nipple ST AR 1/4, incl. seal	1	519-33955-1	
Protective cap for filler nipple (red)	1	898-210-050	

Table 30

14.12 Grease port, plug-in


Designation	Pcs.	Item number	Figure
Optional grease port with nipple for quick-release coupling, for filling with lubricant from below via the lower part of the housing (without filter).	1	995-000-870	

Table 31

14.13 Grease port, plug-in

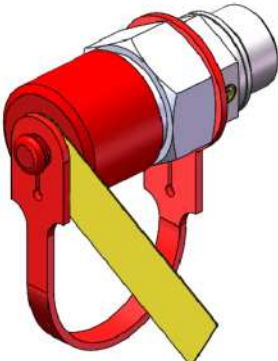
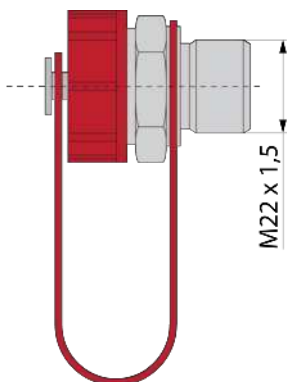
Designation	Pcs.	Item number	Figure
Optional grease port for filling with lubrication grease from below via the lower part of the housing	1	5590-00000002	

Table 32

14.14 Filling connection, screwable









Designation	Qty.	Part number	Fig.
Optional filling connection for filling with lubrication grease from the bottom via the lower housing part (connection sleeve M26x1.5)	1	538-36763-1	

14.15 Reservoir assy

Designation					Pcs.	Item number	Figure	
A	4l	XYN	Plastic		1	655-28734-1	A	B
B	5l	XYN	Sheet steel		1	655-28735-1		
C	8l	XYN	Plastic		1	655-28736-1		
D	4l	XYBU	Plastic		1	655-28738-1		
E	5l	XYBU	Sheet steel		1	655-28737-1		
F	8l	XYBU	Plastic		1	655-28739-1		
G	10l	XYBU	Sheet steel		1	655-29325-1		
H	30l	XYBU	Sheet steel		1	655-28915-1		

Delivery includes reservoir cover, stirring paddle, transition ring*, fixed paddle, ultrasonic sensor#, and all stickers.

* Not with sheet steel reservoirs
 # Only with XYBU reservoir design

15. Appendix

15.1 China RoHS Table

Table 34

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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