Lubrication pump CLP Touch

for progressive systems

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Read these instructions before installation or start-up of the product and keep them readily available for 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 feeding of lubricants in interval operation inside a centralized lubrication system
Type: CLP-xxxxxx-xxxx-xxxx-xxxxxxxx

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

EN ISO 12100:2010	EN 60204-1:2018	EN 61000-6-2:2005/AC:2005	EN 61000-6-4:2007/A1:2011
EN 61131-2:2007	EN 809:1998+A1:2009/AC:2010	EN 60034-1:2010/AC:2010	EN 60947-5-1:2004/A1:2009
EN 60947-5-2:2007/A1:2012			
EN IEC 63000:2018			

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, 01.11.2022

Jürgen Kreutzkämper
Manager R&D Germany

Dr. Holger Schmidt
Manager Modularization
SKF Lubrication Management

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

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 feeding of lubricants in interval operation inside a centralized lubrication system
Type: CLP-xxxxxx-xxxx-xxxx-xxxxxxxx

Furthermore, the following regulations and standards were applied in the respective applicable areas:
Supply of Machinery (Safety) Regulations 2008 No. 1597
The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 No. 3032
Electromagnetic Compatibility Ordinance 2016 No. 1091

EN ISO 12100:2010	EN 60204-1:2018	EN 61000-6-2:2005/AC:2005	EN 61000-6-4:2007/A1:2011
EN 61131-2:2007	EN 809:1998+A1:2009/AC:2010	EN 60034-1:2010/AC:2010	EN 60947-5-1:2004/A1:2009
EN 60947-5-2:2007/A1:2012			
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Appendix to Declaration of Incorporation in accordance with 2006/42/EC, Annex II, No. 1 B
Description of the essential health and safety requirements according to 2006/42/EC, Annex I, which have been applied and fulfilled. Any essential health and safety requirements not listed here are not relevant to this product.

Table 1

Appendix to Declaration of Incorporation
Valid for: CLx lubricant feed pumps

No.:	Essential health and safety requirement	Applicable:	Fulfilled:
1.1.1	Definitions	Yes	Yes
1.1.2	Principles of safety integration	Yes	Yes
1.1.3	Materials and products	Yes	Partially[1)]
1.1.5	Design of machinery to facilitate its handling	Yes	Yes
1.1.6	Ergonomics	Yes	Partially[2)]
1.2	Control systems	Yes	Yes
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	Yes	Yes
1.3.1	Risk of loss of stability	Yes	Yes
1.3.2	Risk of break-up during operation	Yes	Partially[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	Yes	Yes
1.5.1	Electricity supply	Yes	Yes
1.5.6	Fire	Yes	Yes
1.5.8	Noise	Yes	Yes
1.5.11	External radiation	Yes	Yes
1.5.13	Emissions of hazardous materials and substances	Yes	Yes
1.5.15	Risk of slipping, tripping, or falling	Yes	Yes
1.6	Servicing		
1.6.1	Machinery maintenance	Yes	Yes
1.6.2	Access to operating positions and servicing points	Yes	Partially[4)]
1.6.4	Operator interventions	Yes	Yes
1.7	Information	Yes	Yes
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) Not completely fulfilled: Hazards due to the lubricant used must be assessed by the operator on the basis of the Safety Data Sheet (SDS) and, if necessary, protective measures must be taken.
2) Not completely fulfilled: 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) Not completely fulfilled: The operator must protect the lubrication system against excessive pressure. For this purpose, a pressure relief valve with max. 270 bar opening pressure must be provided on each pump element.
4) Not completely fulfilled: The operator must ensure that the pump is integrated into the higher-level machine in such a way that the pump can be operated without danger.

Masthead

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

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

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

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

Table of contents

Safety alerts, visual presentation, and layout

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

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

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

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

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

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

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

Text layout:

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

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

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

1 Safety instructions

1.1 General safety instructions

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

1.2 General electrical safety instructions

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

1.3 General behaviour when handling the product

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

1.4 Intended use

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

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

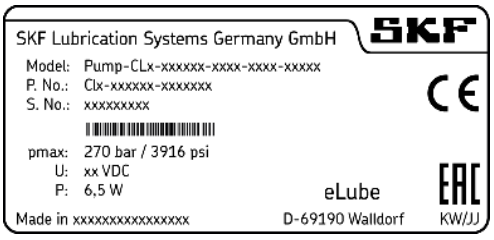
NOTE

Further to the findings of the workplace risk evaluation the operating company has to attach additional markings (e. g. warnings, signs giving orders, prohibition signs or labelling as specified by CLP / GHS), where appropriate.

1.11 Note on the type plate

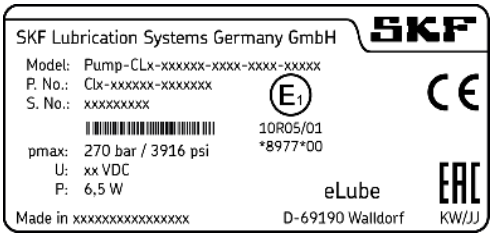
The type plate provides important data such as the type designation, order number, and sometimes regulatory characteristics. To avoid loss of this data in case the type plate becomes illegible, it should be entered in the manual.

Fig. 1



Type plate

Fig. 2



Type plate with ECE mark

1.12 Notes on CE marking

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

- 2006/42/EG Machinery Directive
- 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 UL mark

The UL Mark certifies that the product has UL certification of compliance with U.S. and Canadian safety regulations.

1.16 Note on ECE mark

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

1.17 Note on UKCA marking

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

1.18 Note on EAC marking

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

1.19 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).

1.20 Emergency shutdown

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

1.21 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.

1.22 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.

1.23 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	Unauthorized persons must be kept away. Nobody is allowed to be present below hoisted parts. Lift parts using suitable lifting gear.
Personal injury / property damage due to tilting or falling product due to non-compliance with specified torques.	B C G	Adhere to the specified torques. Mount the product only on components with a sufficient load-carrying capacity. If no torques are specified, use those specified for the screw size for screws of strength class 8.8.
Personal injury, property damage due to spilled, leaked lubricant.	B C D F G H K	Be careful when connecting or disconnecting the lubricant lines. Use only hydraulic screw unions and lubrication lines suitable for the specified pressure. Do not mount lubrication lines on moving parts or chafe points. If this cannot be avoided, use anti-kink coils and/or conduits.
Fire hazard or damage to the pump from operation with damaged electrical components, such as power leads and plugs.	B C D E F G H	Inspect electrical components for damage prior to initial use and then at regular intervals. Do not install the cable on moving parts or chafe points. If this cannot be avoided, use anti-kink coils and/or conduits.
Damage to the pump from failure to comply with the permissible relative ON-time.	C D	Operate the pump only within the permissible relative ON-time.
Damage to the pump from installing at the place of use without the mounting brackets and fastening hardware intended for that purpose (see Installation chapter).	B C D G	Install the pump only with the mounting brackets and fastening hardware intended for that purpose.

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

2 Lubricants

2.1 General information

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

2.2 Material compatibility

The lubricants must generally be compatible with the following materials:

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

2.3 Temperature properties

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

2.4 Aging of lubricants

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

2.5 Avoidance of faults and hazards

To avoid faults and hazards, please observe the following:

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

2.6 Solid lubricants

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

Graphite:

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

MoS2:

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

Copper:

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

Calcium carbonate:

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

Calcium hydroxide:

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

PTFE, zinc, and aluminum:

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

3 Overview, functional description

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 3 modules:

- The upper part of the pump housing (**12**)
- The reservoir (**1**)
- The lower part of the pump housing (**13**).

Fig. 3

CLP pump, front view

3.1 Pump housing, upper part

The upper part of the pump housing (**12**) contains the electrical connections (**10.1** to **10.4**), the control electronics, the touch panel (**15**), and an UART cable (**16**).

NOTE
The UART cable is located in a bolted compartment and is intended for use only by persons authorized by the pump manufacturer (e.g., SKF service personnel or dealers).

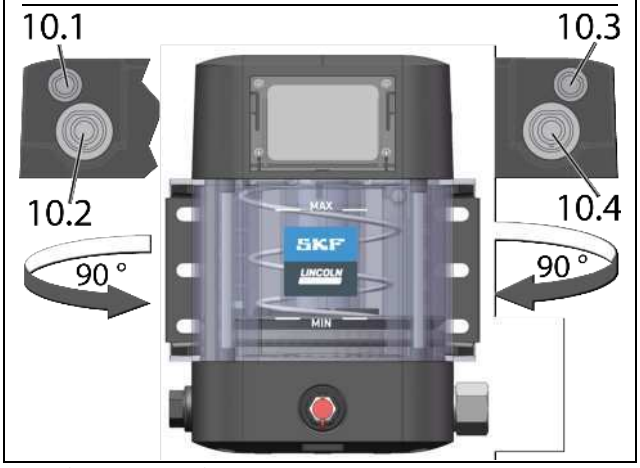
Fig. 4

Compartment with UART cable in the upper part of the pump housing

3.2 Electrical connections

The electrical connections (**10.1** to **10.4**) are used for the power supply and for signals and communications. The following electrical connections are possible depending on the exact version of the pump.

Fig. 5



Electrical connections

Table 3

Possible positions of the electrical connections and type identification codes

Top left (**10.1**) or top right (**10.3**)		
A		M12x1 plug, 4-pin, male A-coded DIN EN ISO 61076-2-101
B		M12x1 socket, 5-pin, female A-coded DIN EN ISO 61076-2-101
C		M12x1 socket, 5-pin, female B-coded DIN EN ISO 61076-2-101
Bottom left (**10.2**) or bottom right (**10.4**)		
4		Bayonet connector, 4-pin, A-coded ISO 15170-1
7*		Bayonet connector, 7-pin, A-coded ISO 15170-1
8		Bayonet connector, 7-pin, A-coded ISO 15170-1
W		Rectangular connector 3 + PE DIN EN 175301-803

*) with piston detector signal line

3.3 Reservoir

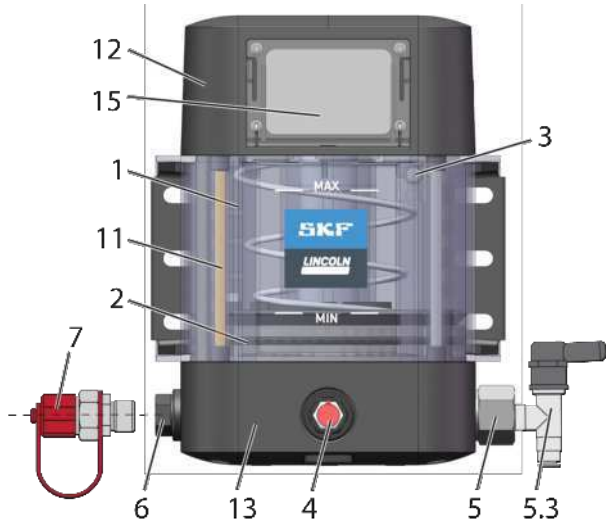
The reservoir (**1**) stores the lubricant. The follower plate (**2**) is positioned on top of the lubricant and presses it with spring force in the direction of the pump elements. This improves the suction characteristics of the pump, and the pump can then also be used for rotary applications.
The reservoir ventilation (**3**) aerates the reservoir while the pump is running and supplying lubricant, and bleeds the reservoir when the pump is being filled with lubricant. The MAX marking must not be exceeded when the reservoir is being filled with lubricant. As a rule, the lubricant level must not fall below the MIN marking during pump operation.
Different variants of the pump come with different reservoir designs, with and without low-level signal. The pumps with low-level signal have a magnet in the follower plate which issues a low-level signal when it reaches the reed contact in the contact rod (**11**).

NOTICE

Damage to the main machine from pump failure due to empty reservoir

Take care to ensure that the lubricant level does not fall below the MIN marking during pump operation.

Fig. 6



CLP pump, front view

3.4 Pump housing, lower part

The lower part of the pump housing contains:

Pump elements

The pump can be fitted with up to two pump elements (**5**) at positions 5, 6, or 4. Each pump element must be secured with a pressure relief valve (**5.3**) that is suitable for the maximum permissible operating pressure for which the centralized lubrication system is designed.
If an outlet is not needed, it can be sealed off with a plug screw (**6**). Alternatively, a grease port (**7**) can also be fitted.

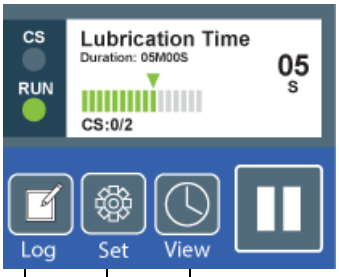
Filler nipple

The filler nipple (**4**) can be used to fill the pump with lubricant. If a grease port (**7**) is present, the pump should ideally be filled through that grease port.

3.5 Program structure

Below you can see an overview of the program structure of the CLP Touch pump and its possible functions and setting options. For details, see the relevant chapters.

Table 4



	This menu is only available in Cycle Controlled mode. It shows any deviations in the cycle switch signals (Balance mode).
Info	This shows general information for the pump (e.g., name, item number) and also the hardware and software specifications.
View Settings	This is used for displaying the current operating mode and its parameters.
Change Settings	This is used for changing the operating mode and its parameters.
Set Password	This is used for changing the pump password.
Error	Display of errors that have occurred.
Warning	Display of warnings that have occurred.
Thermometer icon	Display of the current pump temperature.
Clock icon	Display of the total operating hours and the date and time of the pump. The date and time can be set.
Info	Display of the lubrications that have been carried out

Program structure of the CLP Touch display

3.6 Explanation of icons and symbols

Table 5

General icons

Icon	Function	Icon	Function	Icon	Function
	Carry out additional lubrication		Go back to the start display		Cancel the current user input
	Modify the setting value upwards		Used together with the house icon to exit the screensaver		Confirm the current user input
	Modify the setting value downwards		Stop. This switches the pump to pause time. Used together with the house icon to acknowledge warning and error messages		Indicates another figure where the operating sequence is continued
					Alternative operating sequence. The dashed arrow indicates another possible operating sequence, depending on what was entered previously

Icons specific to the individual menus

The icons belonging to each menu are listed below it.

	Log menu		Set menu		View menu (only in Cycle Controlled mode)
	Display the pump temperature		Additional information about Block mode		Balance mode display (only in Cycle Controlled mode)
	Display of the date and time, and the total operating hours				
	Set the date and time of the pump				
	Display of the individual faults in relation to the current date and time of the pump				
	Display the individual faults in relation to the total operating hours of the pump				
	Display of the total time of all faults on the pump				

Icons and symbols of the CLP Touch display

3.7 Normal pump operation

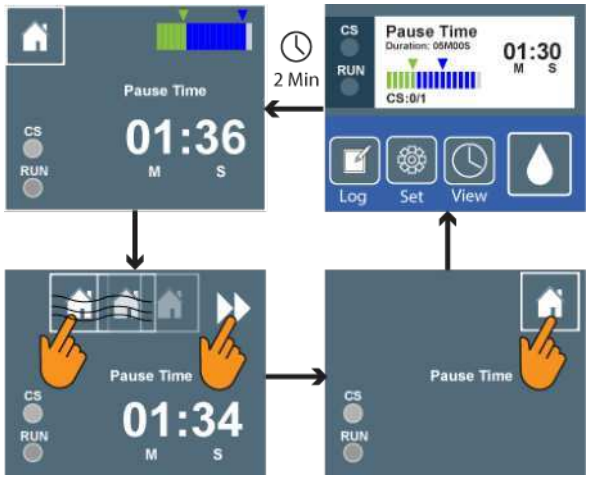
NOTE
This section presents the basic operating functions of the pump which can be performed by the operator in normal operation.
To learn how to change settings, see the “Setting operation” section of this manual.

3.7.1 Exiting the screensaver

NOTE
The screensaver is activated after 2 minutes without any user action on the pump.

To exit the screensaver, proceed as described below using the example of pause time:
1. Push the house icon to the right onto the double arrow icon which appears.
2. Press the house icon to exit the screensaver.

Table 6



Exiting the screensaver

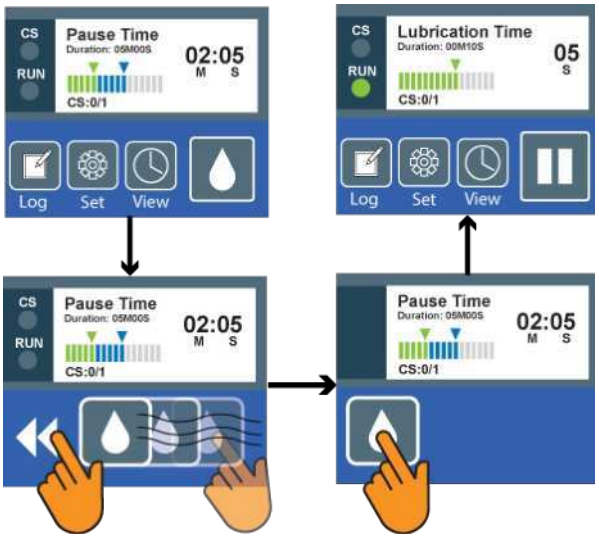
3.7.2 Triggering additional lubrication

NOTE
Additional lubrication can only be triggered when the pump is in pause time. The duration of the additional lubrication is the same as the set lubrication time. At the end of additional lubrication, the pump starts again with the set pause time.

To trigger additional lubrication, proceed as follows:
1. Push the drop icon to the left onto the double arrow icon which appears.

The pause time is ended and the additional lubrication begins. The display switches to the lubrication time display.

Table 7



Triggering additional lubrication

3.7.3 Displaying lubrications

NOTE

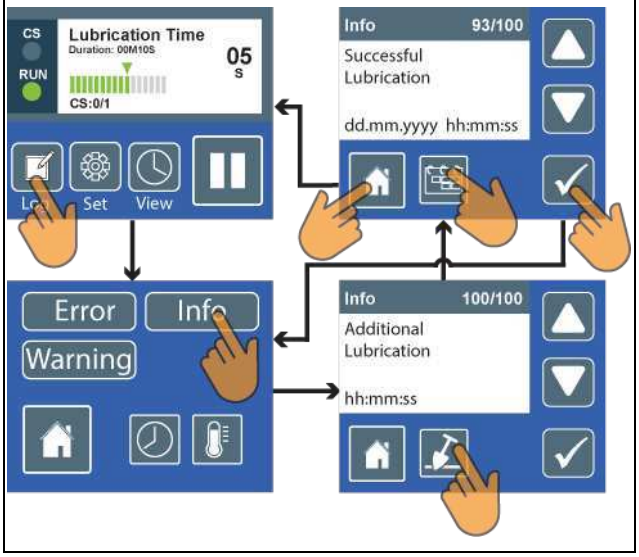
The pump saves the last 100 lubrications. After that, the oldest data record will be overwritten by the last lubrication carried out.

1. Press the Log icon, and then on the next screen, press the Info icon.

The data record for the last lubrication will be displayed. A distinction is made between additional lubrication and regular lubrication.

2. By pressing the shovel icon and then the calendar icon that appears next, you can toggle between displaying the date and time of the last lubrication and displaying when the last lubrication was performed within the total operating hours of the pump.
3. Press the arrow keys to display more data records.
4. Press the checkmark icon to return to the Log menu, or press the house icon to go back to the start display.

Fig. 7



Displaying lubrications

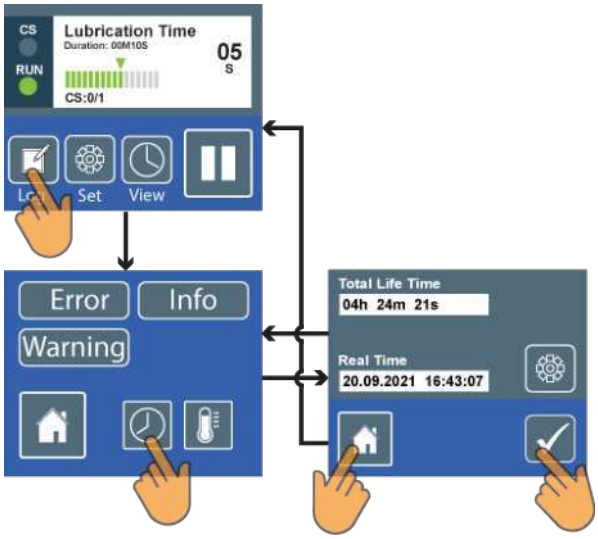
3.7.4 Displaying the total operating hours and the date and time

1. Press the Log icon, and then on the next screen, press the clock icon.

The screen will display the total operating hours and the date and time of the pump.

2. Press the checkmark icon to return to the Log menu, or press the house icon to go back to the start display.

Fig. 8

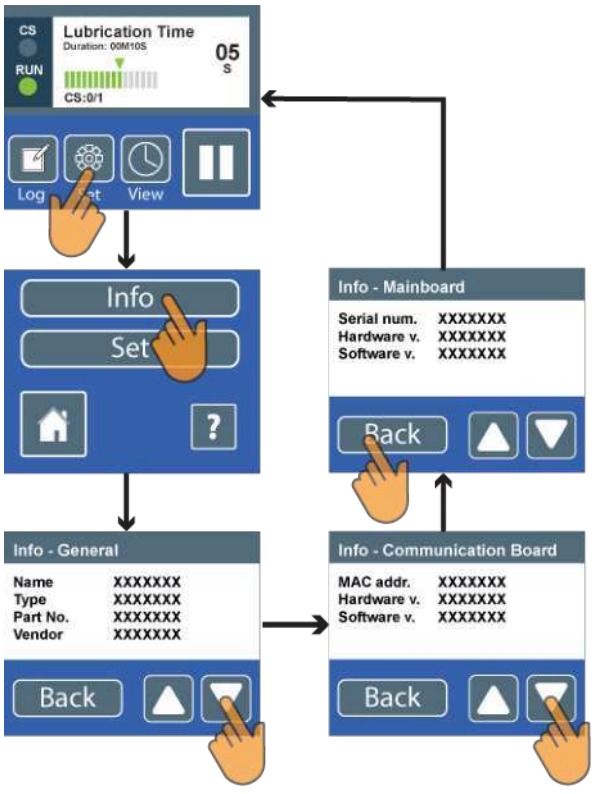


Displaying the total operating hours and the date and time

3.7.5 Displaying pump information

The Info menu item shows general information about the pump and its hardware and software.
To display this, proceed as follows:
1. Press Set, and then on the next screen, press Info.
2. Use the arrow keys to scroll through the 3 screens.
3. Press the Back icon to go back to the start display.

Fig. 9



Displaying pump information

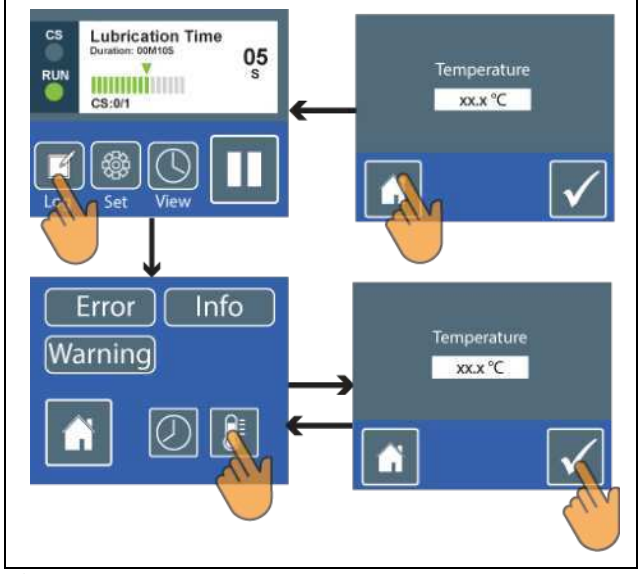
3.7.6 Display the pump temperature

1. Press the Log icon, and then on the next screen, press the thermometer icon.

The current pump temperature is displayed.

2. Press the checkmark icon to return to the Log menu, or press the house icon to go back to the start display.

Fig. 10



Display the pump temperature

3.7.7 Displaying warnings

NOTE

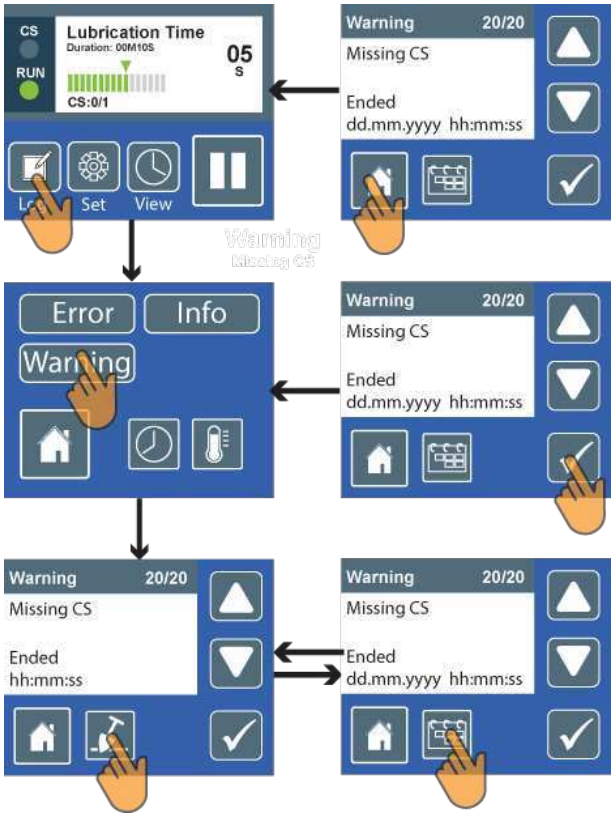
The pump saves the last 200 warnings. After that, the oldest data record will be overwritten by the newest data record. If there are active warnings, the Warning display will be shown in orange.

1. Press the Log icon, and then on the next screen, press the Warning icon.

The data record for the last warning will be displayed.

2. By pressing the shovel icon and then the calendar icon that appears next, you can toggle between displaying the date and time of the last warning and displaying when the last warning occurred within the total operating hours of the pump.
3. Press the arrow keys to display more data records.
4. Press the checkmark icon to return to the Log menu, or press the house icon to go back to the start display.

Fig. 11



Displaying warnings

3.7.8 Acknowledging warnings

NOTE

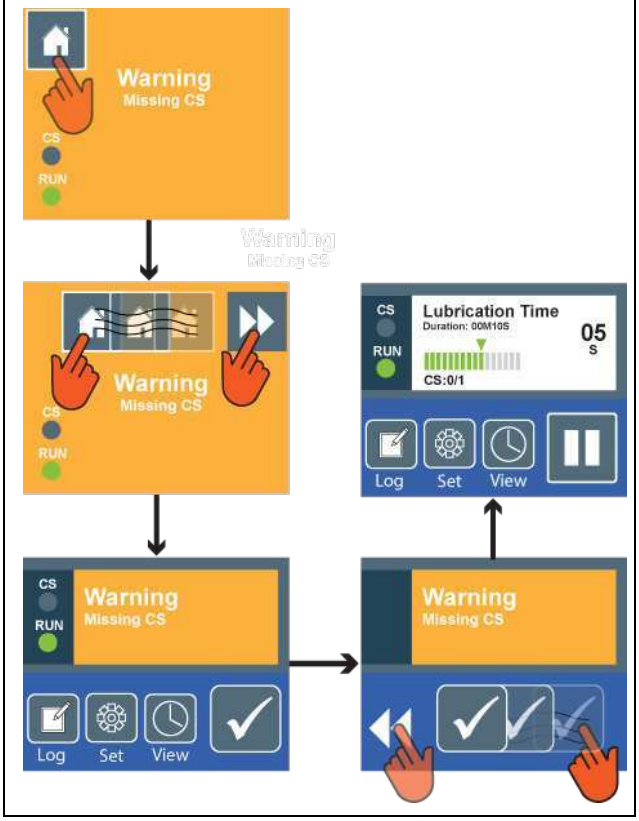
When warnings are active, the pump initially continues to run. Active warnings are displayed in orange. The warning display and the screensaver with warning will alternate every 3 seconds. After 2 minutes, the display switches permanently to the screensaver with warning.

Displays for active warning and screensaver with active warning

To acknowledge a warning, proceed as follows:

1. Eliminate the cause of the warning. The cause of the warning is shown on the display (in this example: Missing CS, meaning a missing cycle switch signal).
2. To exit the screensaver, drag the house icon to the right onto the double arrow icon.
3. To acknowledge the warning, drag the pause icon to the left onto the double arrow icon.
   The pump will switch over to the start display.

Fig. 12



Acknowledging warnings

3.7.9 Displaying errors

NOTE

The pump saves the last 100 errors. After that, the oldest data record will be overwritten by the newest data record. If there are active errors, the error display will be shown in red.

1. Press the Log icon, and then on the next screen, press the Error icon.

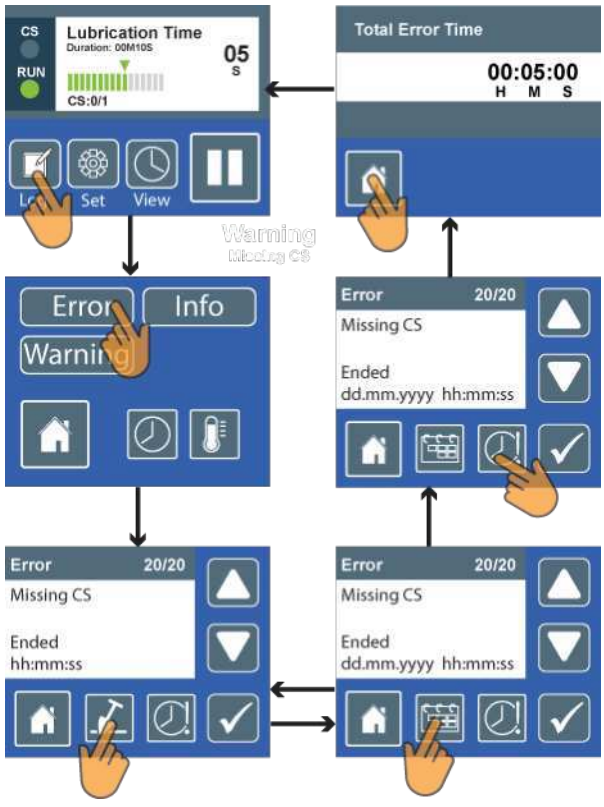
The data record for the last error will be displayed.

2. By pressing the shovel icon and then the calendar icon that appears next, you can toggle between displaying the date and time of the last error and displaying when the last error occurred within the total operating hours of the pump.

Press the arrow keys to display more data records.

3. Press the clock icon with exclamation mark to display the total time of pump errors.
4. Press the house icon to go back to the start display.

Fig. 13



Displaying errors

3.7.10 Acknowledging errors

NOTE

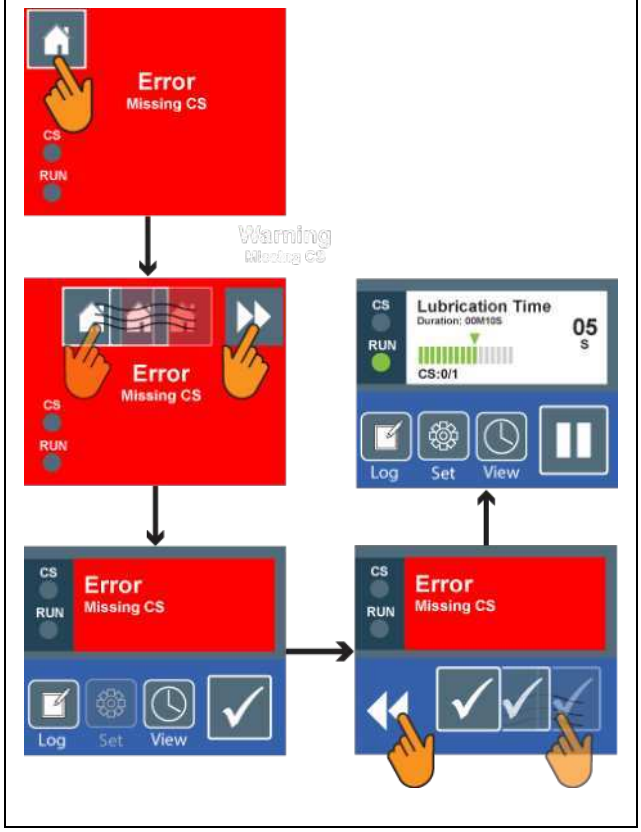
If an error occurs, the pump will stop. To make the pump operational again, you must remedy and acknowledge the error. Active errors are displayed in red. The error display and the screensaver with error will alternate every 3 seconds. After 2 minutes, the display switches permanently to the screensaver with error.

To acknowledge an error, proceed as follows:

1. Eliminate the cause of the error. The cause of the error is shown on the display.
2. To exit the screensaver, drag the house icon to the right onto the double arrow icon.
3. To acknowledge the error, drag the confirm icon to the left onto the double arrow icon.

The pump will switch over to the start display.

Fig. 14

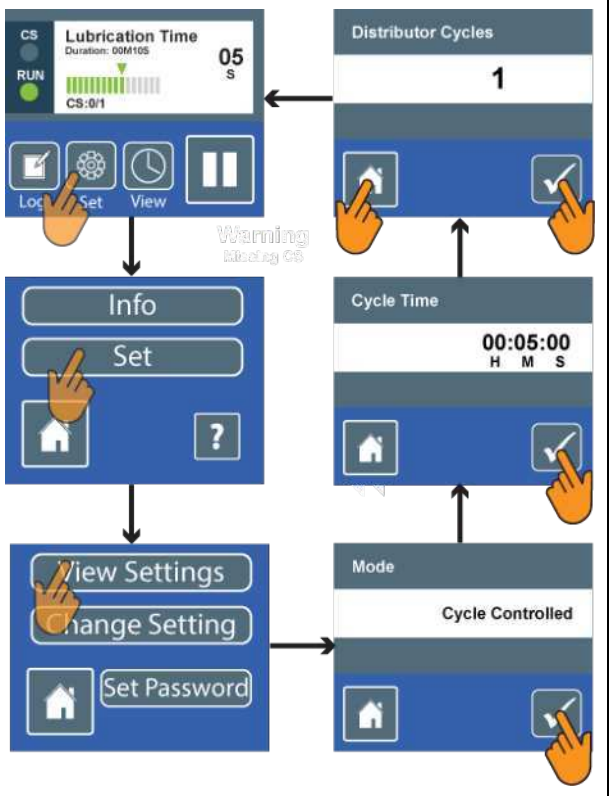


Acknowledging errors

3.7.11 Displaying the current working mode

1. Press Set, and then on the next screen, again press Set and then View Settings.
   - You will see the set mode of the pump, which in this example is the Cycle Controlled mode.
2. Press the checkmark icon.
   - You will see the set cycle time for the mode.
3. Press the checkmark icon.
   - You will see the set metering device cycles (cycle switch signals, CS) for the mode.
4. Press the house icon or the checkmark icon to go back to the start display.

Fig. 15



Displaying the current working mode

3.8 Setting operation of the pump

NOTE

The following actions may be done only by individuals authorized by the operator for that purpose. Modifications such as changes to the pump password should be suitably documented and protected to prevent unauthorized use.

3.8.1 Changing the pump password

NOTE

The master password supplied together with the pump cannot be changed. Only the specific pump password can be changed. The pump password set at the factory and the master password can be found in the “Technical data” chapter for the pump.

Proceed as follows to change the pump password:

1. Press Set, and then on the next screen, again press Set and then Set Password.
2. Enter the master password and confirm each digit by pressing the checkmark icon.

NOTE

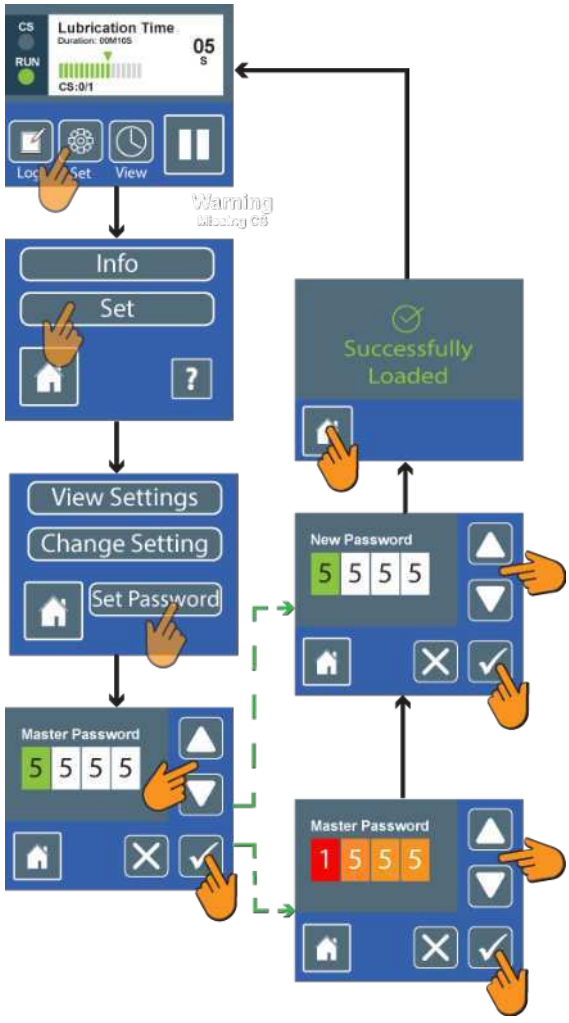
If you have entered the wrong master password, the 4 digits will be shown in red. In that case, enter the password again with the correct digits.

3. After successfully entering the master password, enter the new 4 digit pump password.

You then see “Successfully Loaded” on the display.

4. Press the house icon to go to the start display.

Fig. 16



Changing the pump password

3.8.2 Setting the date and time

NOTE

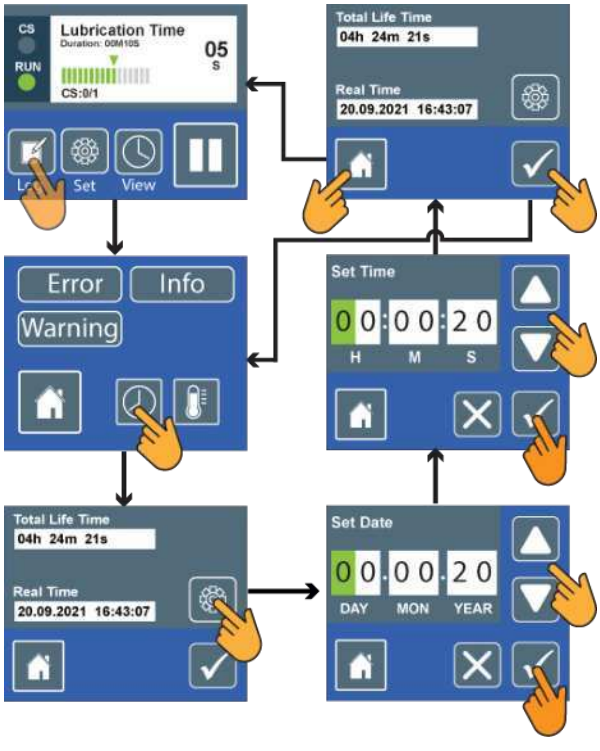
When the pump is disconnected from the power supply, the time and date of the pump will be stopped. This means that you need to update the time and possibly also the date when the pump is started for the first time and after every interruption of the power supply.

1. Press the Log icon.
2. Press the clock icon.

The screen will display the total operating hours and the date and time of the pump.

3. Press the gear icon to go to the settings area.
4. Use the arrow keys to set the date and use the checkmark icon to confirm the change of each digit. When the last digit of the date is confirmed, the display automatically switches to setting the time. Repeat the procedure described above to set the time. When the last digit of the time is confirmed, the display switches over automatically.
5. Press the checkmark icon to return to the Log menu, or press the house icon to go back to the start display.

Fig. 17



Setting the date and time

3.9 Time-controlled mode

In this mode, the pump operates in time-dependent lubrication cycles, which means it switches continuously between the set lubrication time and the set pause time. The values for the lubrication time and pause time can be adjusted via the control.

NOTE

When cycle switch monitoring is activated, the lubrication cycle is not only controlled by time alone, but also requires one signal from the cycle switch per lubrication cycle.
This value is fixed and cannot be changed by the user. If the control receives more signals during a cycle, they will be ignored. If the control does not receive any signal during a cycle, the pump will go into Block mode. If no signal is received from the cycle switch during that time either, the pump will go into a fault state. For a detailed description of Block mode, see the “Block operation” chapter.

3.9.1 Modifying settings

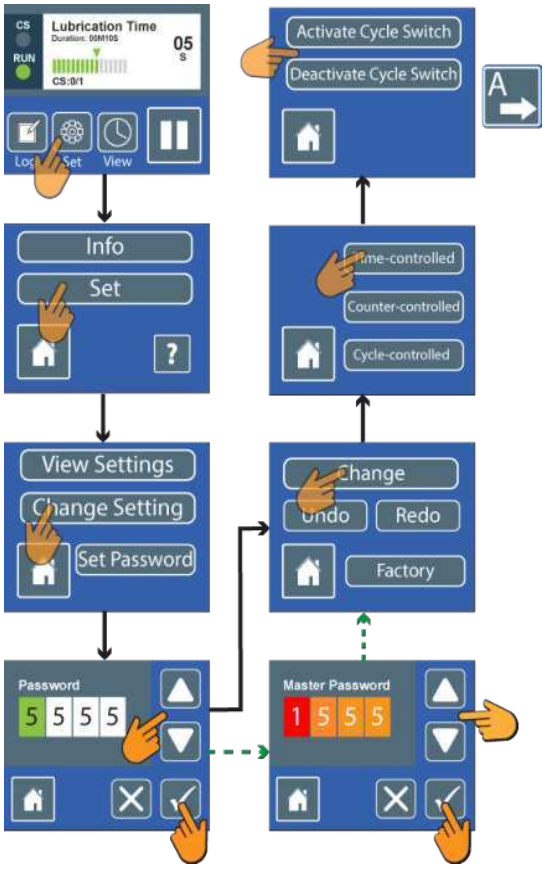
To make changes in the Time-controlled mode, proceed as follows:

1. Press Set, and then on the next screen, again press Set and then Change Settings.
2. Enter the 4 digit pump password and confirm it with the checkmark icon.

NOTE

If you have entered the wrong pump password, the 4 digits will be shown in red. In that case, enter the password again with the correct digits. The pump password set at the factory can be found in the “Technical data” chapter.

Fig. 18



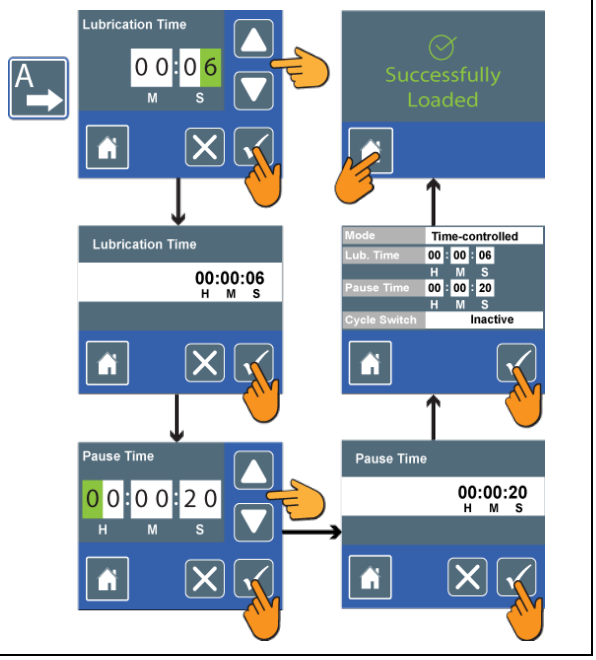
Setting the Time-controlled mode

3. Press Change and then select the “Time-controlled” mode.
4. On the next screen, activate cycle switch monitoring by pressing “Activate Cycle Switch” or deactivate it by pressing “Deactivate Cycle Switch”.

3.9.2 Setting the lubrication time and pause time

1. Enter the lubrication time and confirm each digit by pressing the checkmark icon. The set value will then be displayed again. Confirm it by pressing the checkmark icon.

Fig. 19



Setting the Time-controlled mode

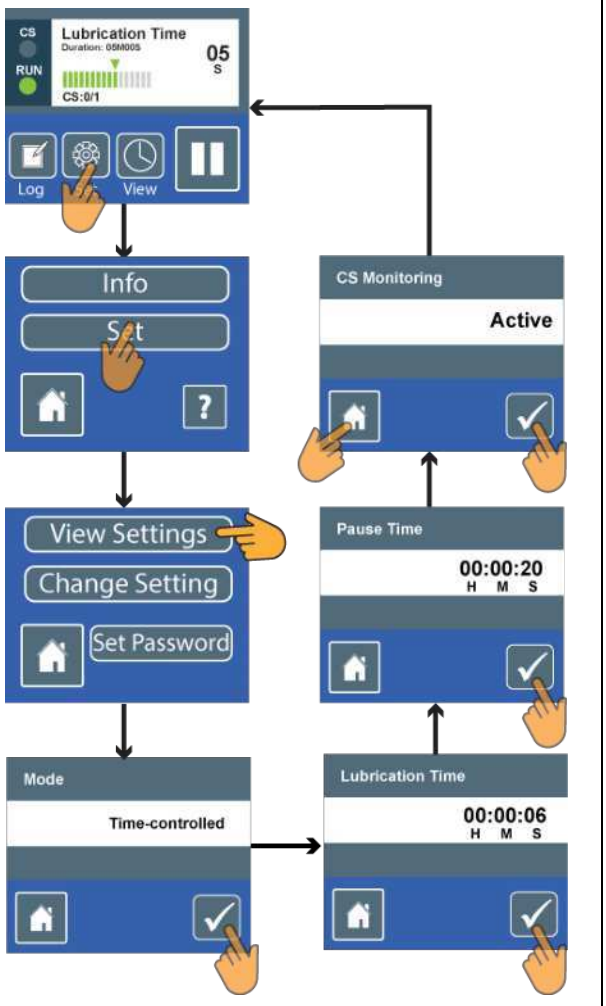
2. Enter the pause time and confirm each digit by pressing the checkmark icon. The set value will then be displayed again. Confirm it by pressing the checkmark icon.
3. All the set values for the Time-controlled mode will then be displayed again. Confirm them by pressing the checkmark icon. “Successfully Loaded” will appear on the display.
4. Press the house icon to go to the start display.

3.9.3 Checking the settings

To check the settings for the Time-controlled mode, proceed as follows:

1. Press Set, and then on the next screen, again press Set and then View Settings.
   – The operating mode “Time-controlled” is displayed.
2. Press the checkmark icon.
   – The lubrication time is displayed.
3. Press the checkmark icon.
   – The number of pulses expected is displayed.
4. Press the checkmark icon.
   – The display shows whether cycle switch monitoring is activated or deactivated.
5. Press the house icon or the checkmark icon to go back to the start display.

Fig. 20



Checking the settings

3.10 Counter-controlled mode

In this mode, the pump operates with a lubrication time based on a set time value and a pause time based on external signals (e.g. machine contact). You also have the option of using a cycle switch signal to monitor the lubrication cycle.

NOTE

When cycle switch monitoring is activated, the lubrication cycle is not only controlled by time and pulses alone, but also requires one signal from the cycle switch per lubrication cycle.
This value is fixed and cannot be changed by the user. If the control receives more signals from the cycle switch during a cycle, they will be ignored. If the control does not receive any signal from the cycle switch during a cycle, the pump will go into Block mode. If no signal is received from the cycle switch during that time either, the pump will go into a fault state. For a detailed description of Block mode, see the “Block operation” chapter.

3.10.1 Settings

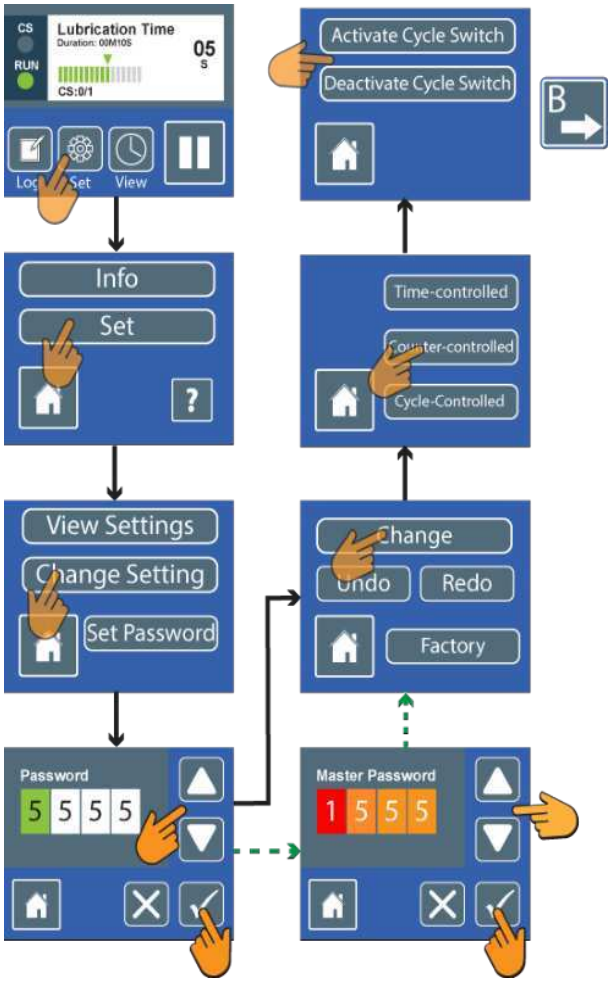
To enter settings in the Counter-controlled mode, proceed as follows:

1. Press Set, and then on the next screen, again press Set and then Change Settings.
2. Enter the 4 digit pump password and confirm this password with the checkmark icon.
3. Press Change and then select the “Counter-controlled” mode.
4. On the next screen, activate cycle switch monitoring by pressing “Activate Cycle Switch” or deactivate it by pressing “Deactivate Cycle Switch”.

NOTE

If you have entered the wrong pump password, the 4 digits will be shown in red. In that case, enter the password again with the correct digits. The pump password set at the factory can be found in the “Technical data” chapter.

Fig. 21

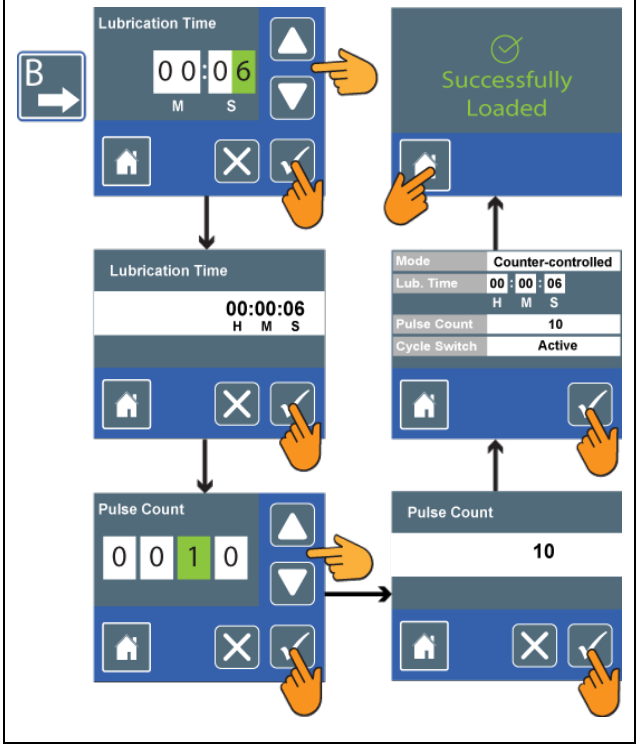


Setting the Counter-controlled mode

3.10.2 Setting the lubrication time and the number of pulses

1. Enter the lubrication time on the next screen and confirm each digit by pressing the checkmark icon. The set value will then be displayed again. Confirm it by pressing the checkmark icon.
2. Enter the number of external signals (e.g., machine contacts) per lubrication cycle and confirm each digit by pressing the checkmark icon. The set value will then be displayed again. Confirm it by pressing the checkmark icon.
3. All the set values for the Counter-controlled mode will then be displayed again. Confirm them by pressing the checkmark icon. “Successfully Loaded” will appear on the display.
4. Press the house icon to go to the start display.

Fig. 22



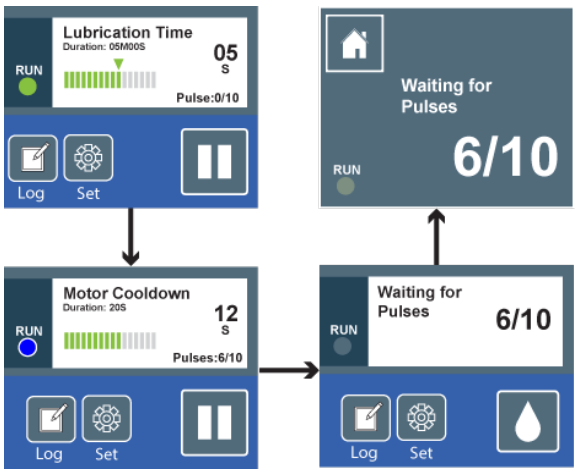
Setting the lubrication time and the pulses

The pump will start with the lubrication time. It will then pause for 20 seconds and “Motor Cooldown” will be displayed. If no pulses or too few pulses are received in that time, the pump waits until the right number of pulses is received.

NOTE

After one minute, the “Waiting for Pulses” screen switches to the screensaver. When the right number of pulses is reached, the pump starts a new lubrication cycle

Fig. 23



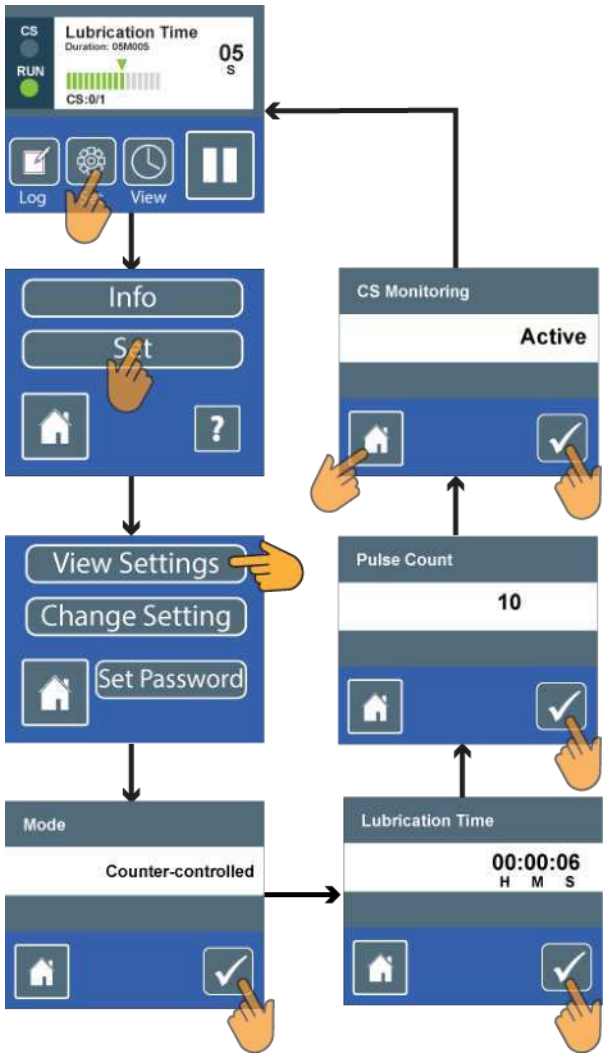
Motor Cooldown

3.10.3 Checking the settings

To check the settings for the Counter-controlled mode, proceed as follows:

1. Press Set, and then on the next screen, again press Set and then View Settings.
   – The operating mode “Counter-controlled” is displayed.
2. Press the checkmark icon.
   – The lubrication time is displayed.
3. Press the checkmark icon.
   – The number of pulses expected is displayed.
4. Press the checkmark icon.
   – The display shows whether cycle switch monitoring is activated or deactivated.
5. Press the house icon or the checkmark icon to go back to the start display.

Fig. 24



Checking the settings

3.11 Cycle Controlled mode

In this mode, the control expects a certain adjustable number of cycle switch signals within the time-dependent lubrication cycle. If the pump receives the expected number of cycle switch signals within the set cycle time, it considers the lubrication cycle to be completed successfully.

NOTE

If the pause part of the cycle time is greater than the lubrication time, the pause time will be also used when waiting for cycle switch signals.
If the lubrication time is greater than the maximum permissible pump run time, the pump will switch to a cooldown phase during the lubrication time. This cooldown phase has the same duration as the minimum pause time. During this time, “Motor Cooldown” is shown on the display. After that, the lubrication time is resumed.

Fig. 25

Cooldown time within the lubrication time, with “Motor Cooldown” display

3.11.1 Modifying settings

To modify settings in the Cycle Controlled mode, proceed as follows:

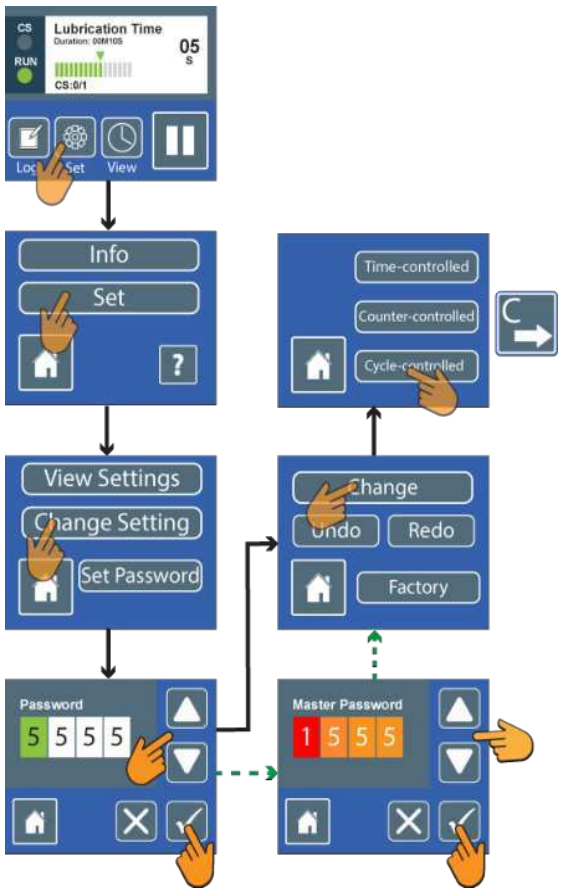
1. Press Set, and then on the next screen, again press Set and then Change Settings.
2. Enter the 4 digit pump password and confirm it with the checkmark icon.

NOTE

If you have entered the wrong pump password, the 4 digits will be shown in red. Enter the password again with the correct digits. The pump password set at the factory can be found in the “Technical data” chapter.

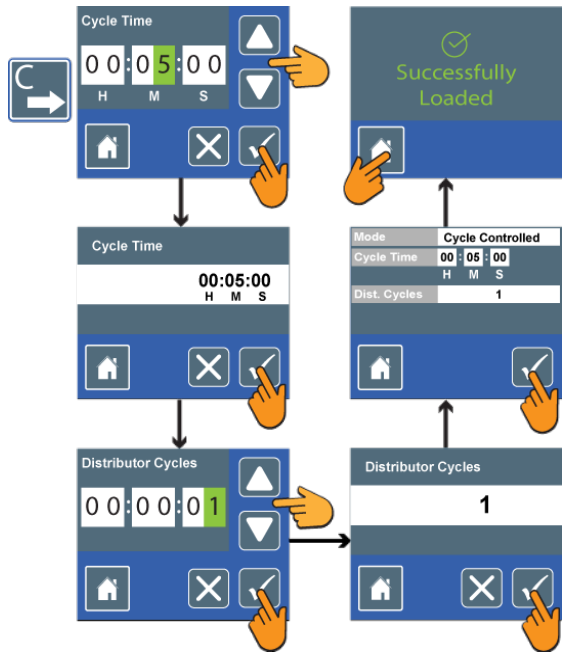
3. Press Change and select the “Cycle Controlled” mode.

Fig. 26



4. Enter the cycle time and confirm each digit by pressing the checkmark icon. The set value will then be displayed again. Confirm it by pressing the checkmark icon.
5. Enter the number of cycle switch signals per lubrication cycle and confirm each digit by pressing the checkmark icon. The set value will then be displayed again. Confirm it by pressing the checkmark icon.
6. All the set values for the Progressive mode will be displayed again. Confirm them by pressing the checkmark icon. “Successfully Loaded” will appear on the display.

Fig. 27



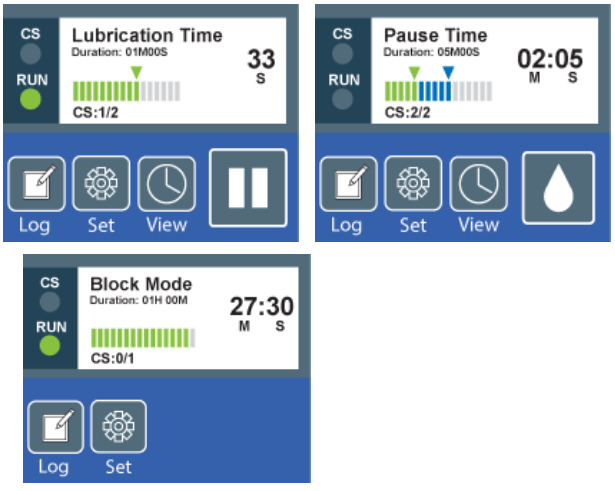
Setting the Cycle Controlled mode

7. Press the house icon to go back to the start display.

3.11.2 Monitoring by the cycle switch

The set cycle time is made up of the variable lubrication time until the set number of cycle switch signals (CS) is reached, and the likewise variable pause time until the end of the cycle time. This means that the pump runs until the set number of cycle switch signals (CS) is reached, and then switches to pause time for the rest of the cycle time.
You can view the number of cycle switch signals (CS) received on the progress bar on the display screens for lubrication time and pause time, and also on the Block mode display screen.

Fig. 28



Cycle switch signals (CS) received

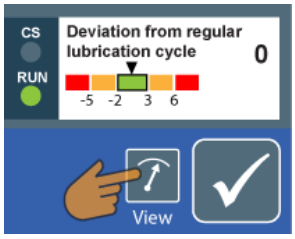
3.11.3 Deviations in the cycle switch signals

You can view the deviations in the cycle switch signals by pressing the View icon.

Fig. 29

Upward (4) and downward (-3) deviations in cycle switch signals

Fig. 30



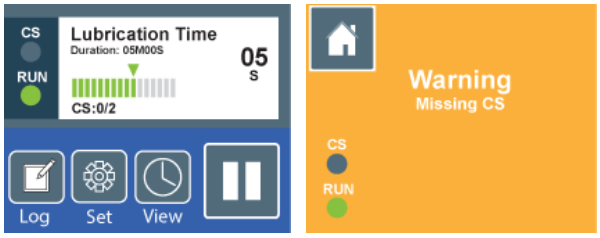
No deviation in cycle switch signals

3.11.3.1 Downward deviation in cycle switch signals

The pump will start another lubrication time directly, without any pause time. If the number of cycle switch signals can be made up within that lubrication time, the lubrication time will end at that point and the pump will switch to the regular pause time.
If the number of cycle switch signals cannot be made up within that lubrication cycle, more lubrication times will follow without any pause time between them.

Deviation in the orange range (-2 to -5)
The pump will keep running. The display will alternate between the lubrication time display and the warning display.

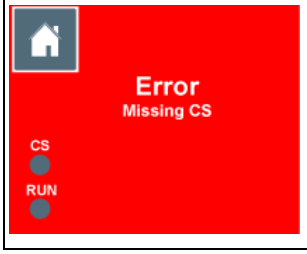
Fig. 31



Deviation in the orange range with display alternation

Deviation in the red range (-6):
Underlubrication was detected. The pump will stop until the error is eliminated and acknowledged. The display will switch permanently to the red Error display. Eliminate the cause of the error. To acknowledge the error, proceed as instructed earlier in this manual.

Fig. 32



Deviation in the red range

3.11.3.2 Upward deviation in cycle switch signals

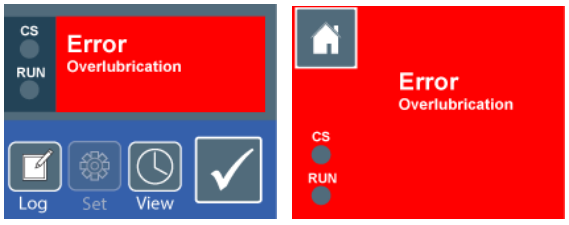
If the pump receives more cycle switch signals during the lubrication cycle,the lubrication time ends and the pump switches to pause time for the rest of the lubrication cycle time.

Deviation in the orange range (+3 to +5):
The pump will keep running. In the next lubrication cycle, the pump will try to balance out the cycle switch signals by ending the lubrication time before the set number of cycle switch signals is reached.

Example 1: 2 cycle switch signals are supposed to be received per lubrication cycle, but 3 cycle switch signals were received. In the next lubrication cycle, the lubrication time will be ended after just one cycle switch signal. This will balance out the deviation in the cycle switch signals.
Example 2: 2 cycle switch signals are supposed to be received, but 4 cycle switch signals were received. The next lubrication cycle will be skipped and the pump will start another pause time. In the event that the pump receives another cycle switch signal during the pause time, another lubrication time will be carried out, but with a shorter duration.

Deviation in the red range (+6):
Excess lubrication was detected. The pump will stop until the error is eliminated and acknowledged. The display will switch permanently to the Error display. Eliminate the cause of the error. To acknowledge the error message, proceed as instructed earlier in this manual.

Fig. 33



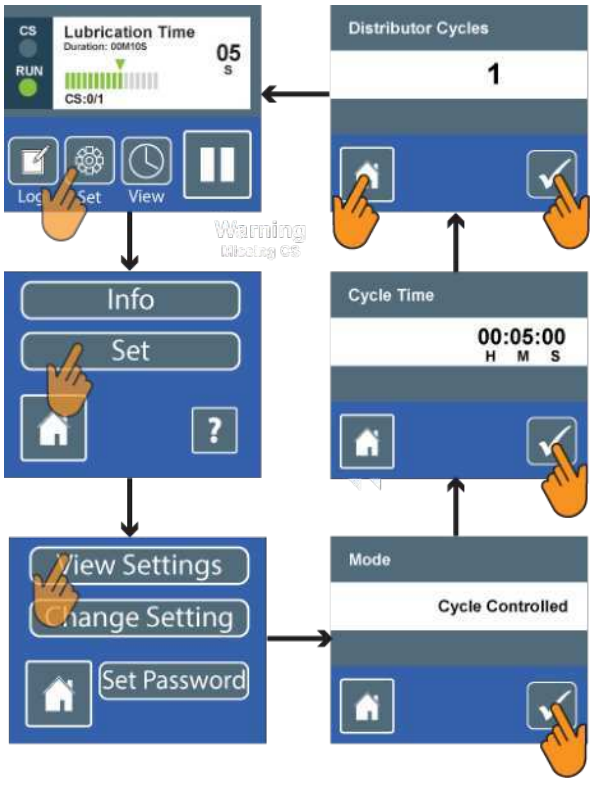
Deviation in the red range

3.11.4 Checking the settings

To check the settings for the Cycle Controlled mode, proceed as follows:

1. Press Set, and then on the next screen, again press Set and then View Settings.
   – The operating mode “Cycle Controlled” is displayed.
2. Press the checkmark icon.
   – The lubrication time is displayed.
3. Press the checkmark icon.
   – The “Cycle Time” is displayed.
4. Press the checkmark icon.
   – The number of metering device cycles expected (cycle switch signals, CS) is displayed.
5. Press the house icon or the checkmark icon to go back to the start display.

Fig. 34



Checking

3.12 Block operation

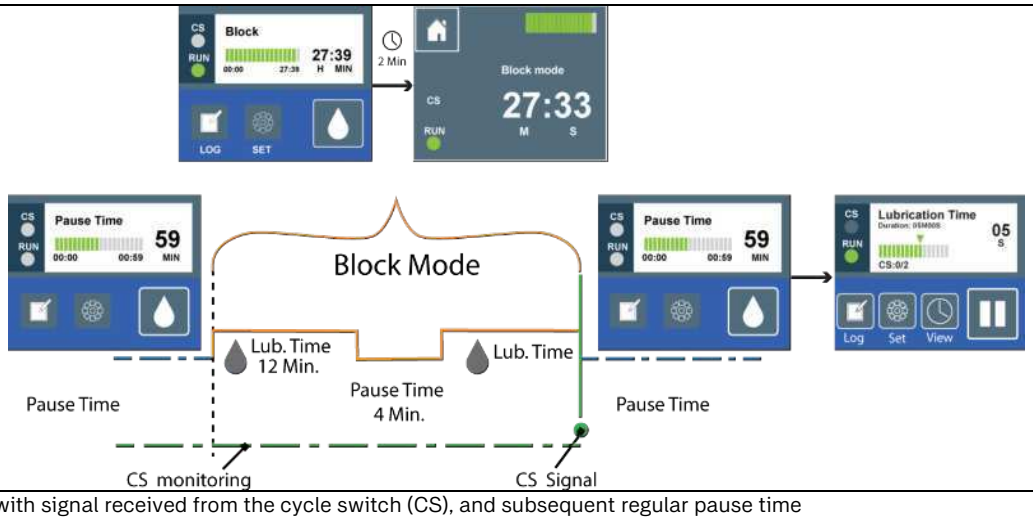
For a variety of non-critical reasons, it may happen that the cycle switch signal does not appear during the regular lubrication time and subsequent monitoring time of the pump when a cycle switch is used to monitor a lubrication system. In such cases, the pump control switches to block operation after the monitoring time.

A block operating cycle consists of no more than the following: 2 x lubrication time (2 x 12 minutes), 2 x pause time (2 x 4 minutes)

3.12.1 Block operation with cycle switch signal received

If the cycle switch signal is received during a block operating cycle, then the pump control exits block operation and begins with a regular pause time.

Fig. 35

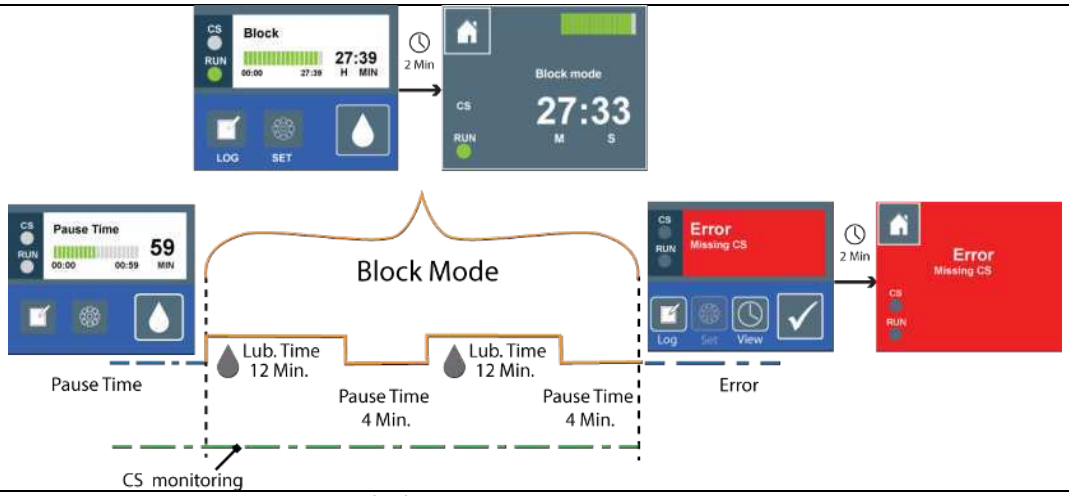


Block operation with signal received from the cycle switch (CS), and subsequent regular pause time

3.12.2 Block operation with no cycle switch signal received

If still no cycle switch signal is received during a block operating cycle, then the pump control issues an error message and the pump remains stopped until the cause is eliminated and the error message is acknowledged.

Fig. 36



Block operation without signal from the cycle switch (CS), and subsequent error message

3.13 Factory settings

This restores the factory settings, meaning the settings that applied when the pump was delivered.

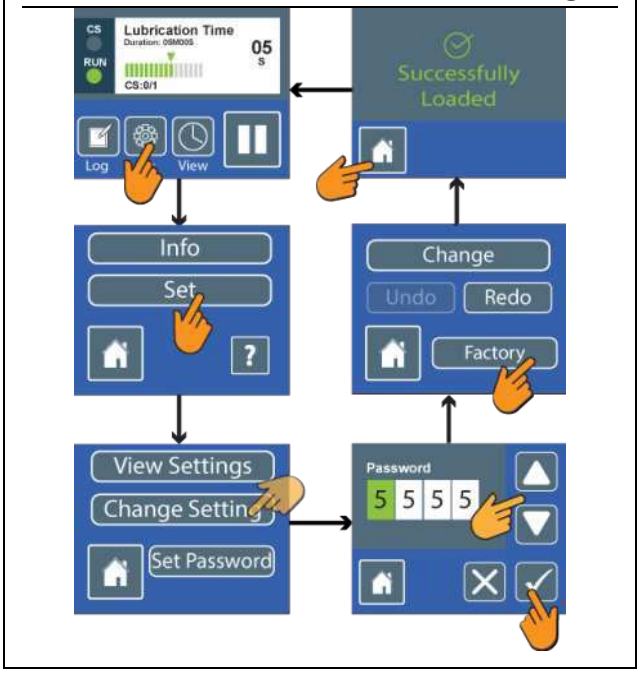
NOTE

Resetting to the factory settings also means resetting the pump password. Make sure that you know either the pump password set at the factory or the master password. Otherwise you will not be able to make any more modifications on the pump. The passwords can be found in the “Technical data” chapter for the pump.

To restore the factory settings, proceed as follows:

1. Press Set, and then on the next screen, again press Set and then Change Settings.
2. Enter the current pump password and confirm each digit by pressing the checkmark icon.
   If you have entered the wrong pump password, the 4 digits will be shown in red. In that case, enter the password again with the correct digits.
3. After entering the pump password successfully, press Factory.
   The factory settings will be loaded and “Successfully Loaded” will appear on the display.
   Press the house icon to go to the start display.

Fig. 37



Restoring factory settings

3.14 Undo/redo

Undo reverses the last changes. Redo restores the last changes. If no settings have been changed since the pump was delivered, undo/redo are not possible.

NOTE

Undo/redo will also change the pump password. Make sure you know both the **previous** and **current** pump password. Otherwise you will only be able to make modifications on the pump by entering the master password and setting a new pump password.

To execute undo/redo, proceed as follows:

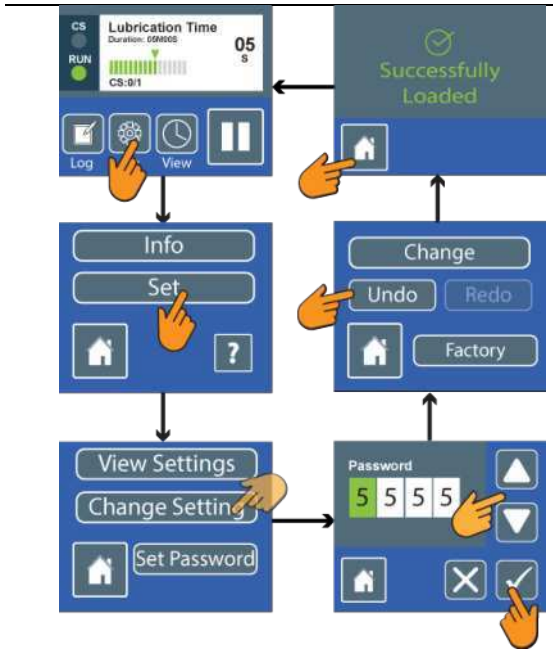
1. Press Set, and then on the next screen, again press Set and then Change Settings.
2. Enter the current pump password and confirm each digit by pressing the checkmark icon.

NOTE

If you have entered the wrong pump password, the 4 digits will be shown in red. In that case, enter the password again with the correct digits. The pump password set at the factory can be found in the “Technical data” chapter.

3. Press Undo or Redo to execute the respective function. if one of the functions is not possible, it will be grayed out on the display screen.
4. Loaded” will appear on the display. Press the house icon to go back to the start display.

Fig. 38



Undo/redo, using Undo as an example

4 Technical data

Table 8

General technical data

Operating pressure	Max. 270 bar	Mounting position[2)]	Vertical
Ambient temperature[1)]	-25 °C to 65 °C	Sound pressure level	< 70 dB (A)
Pump elements	Max. 2	Weight (empty)	5 kg
Reservoir capacity[3)]	1 liter nominal		
Feedable lubricants	Lubrication greases from NLGI 0 up to and including NLGI 2		
Filling	Filler nipple Filler coupling Cartridge filling		

Nominal delivery rate[4)] of the individual pump elements

Pump element	5	6	7	R	
Delivery rate per stroke	0.10	0.16	0.22	0.04-0.18	ccm
Delivery rate per minute	1.90	3.04	4.18	0.76-3.42	ccm

Electrical data

	12 VDC pump	**24 VDC pump**	
Rated voltage	12 VDC ± 10 %	24 VDC ± 10 %	
Current input, max.	4 A	3 A	
Recommended back-up fuse	4.0 A (slow)	3.0 A (slow)	
Nominal speed	19 rpm	19 rpm	
Enclosure ratings[5)]			
Pumps with Bayonet-plug	IP69K (ISO 20653)		
Pumps with M12-plug	IP67 (IEC 60529)		4x (Nema)
Pumps with Rectangular connector	IP65 (IEC 60529)		4x (Nema)
Switched voltage of fault signal	10-30 V AC/DC		
Switched current, max.	500 mA		
Protection class of nominal voltage connection (IEC 61140) Protection class of signal line connection (IEC 61140)			PELV
Relative ON-time	15 % ON-time S3 30 minutes (see also the chart on the following page)		

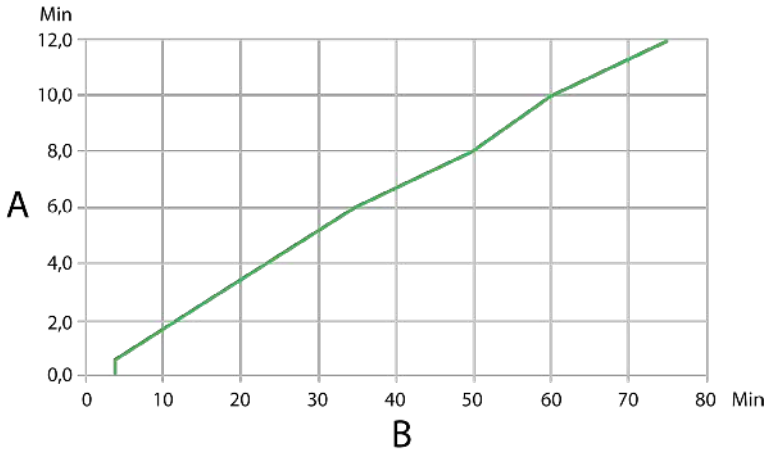
Factory settings

Cycle Controlled:		**Time-controlled:**	
Cycle time	5 minutes	Lubrication time	4 minutes
Metering device cycles (cycle switch signals)	1	Pause time	1 hour
Block operation:		**Counter-controlled:**	
Cycles	2	Lubrication time	4 minutes
Lubrication time (max.)	12 minutes	Machine pulses	10
Pause time (min.)	4 minutes		
Pump password (factory setting)	5555		
Master password (cannot be changed)	0337		

1) The lower limit for the permissible ambient temperature is contingent on the pumpability of the lubricants used.
2) Rotary installation is possible for pumps with a follower plate, e.g., in wind turbines. Maximum speed and maximum distance to the rotational axis on request.
3) About 1.2 liters of lubricant are needed to fill a newly delivered empty pump, as the space below the intermediate base has to be filled with lubricant initially.
4) The nominal delivery rate for the pump elements 5, 6, 7, R is based on NLGI grade 2 lubrication greases at an ambient temperature of + 20 °C and a back pressure of 100 bar on the pump element.
5) The specified enclosure rating is contingent on the use of appropriate connection sockets and cables. If connection sockets and cables with a lower protection rating are used, the lowest of the protection ratings will apply.

4.1 Diagram relative duty cycle

Table 9

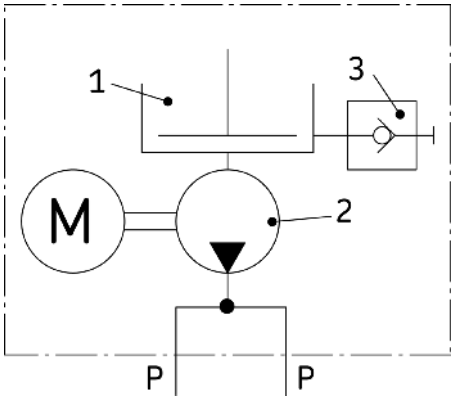


A = Pump runtime in minutes

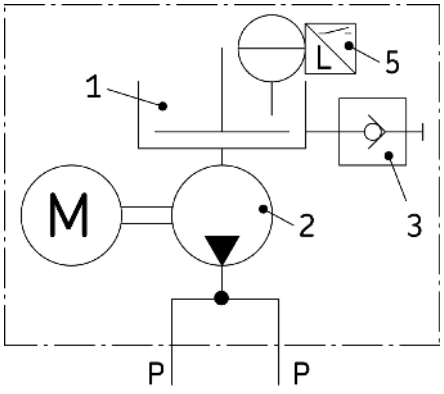
B = Minimum pause time in minutes

4.2 Hydraulic connection diagrams

Fig. 39



Pump with follower plate



Pump with follower plate and low-level signal

Table 10

Hydraulic connection diagram following ISO 1219-1:2019-01

1 = Reservoir
2 = Pump
3 = Filler fitting
5 = Low-level signal
P = Pressure line

4.3 Tightening torques

Fig. 40

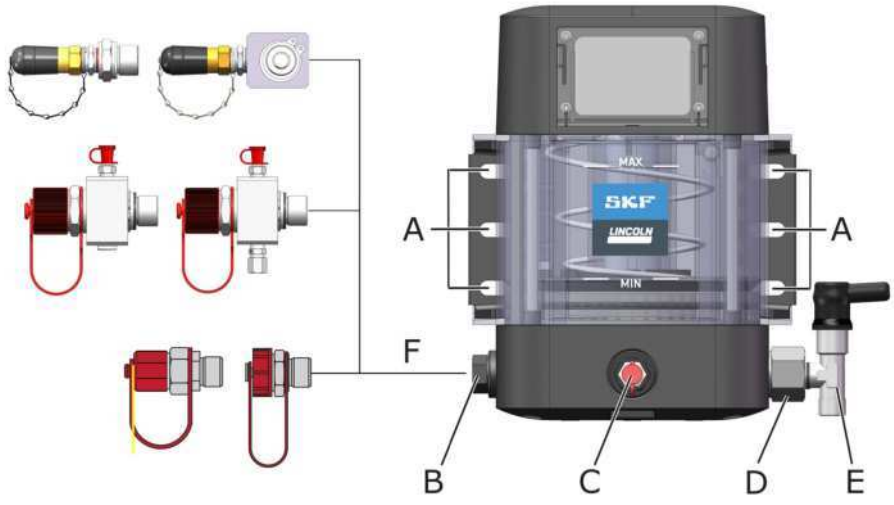
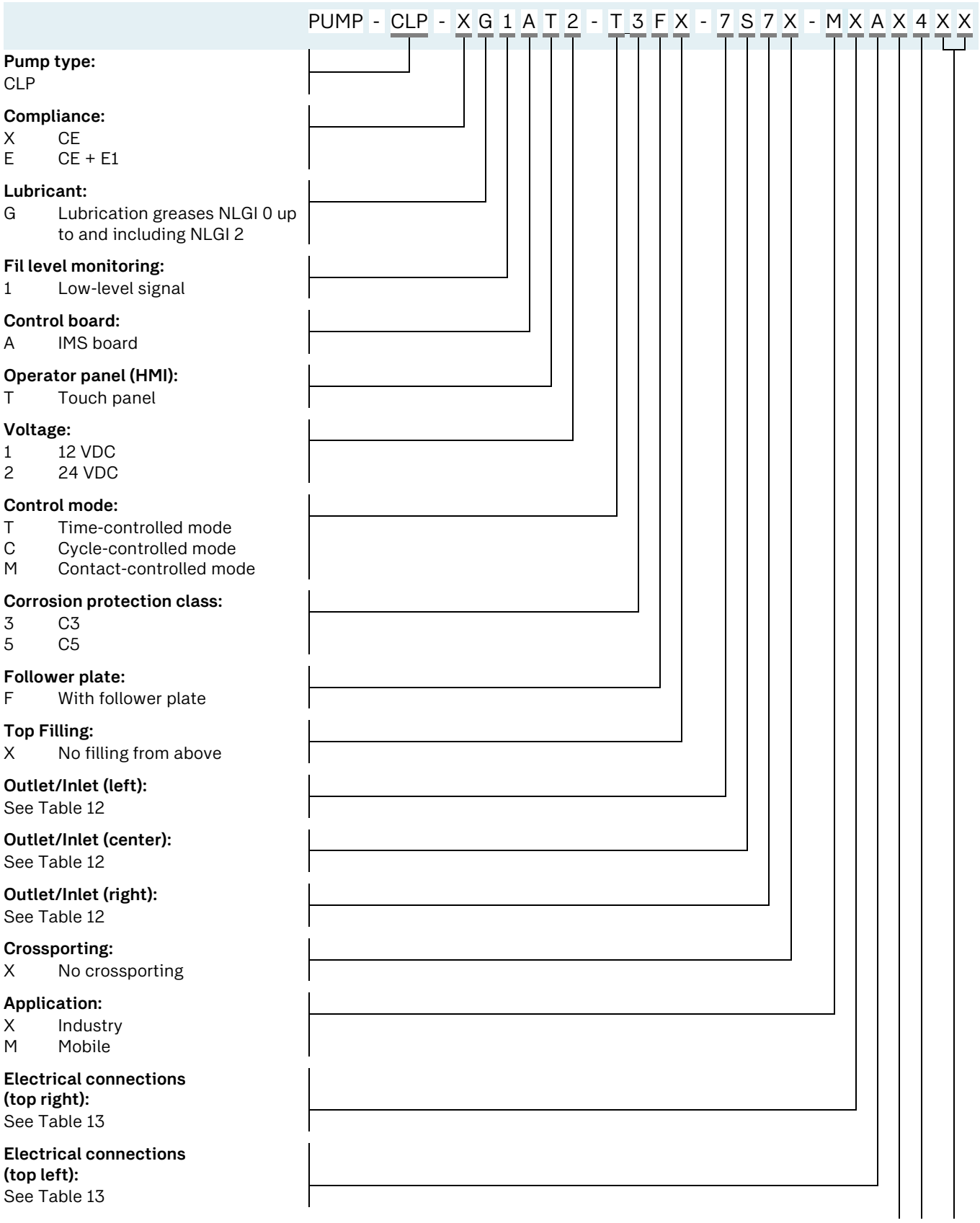


Table 11

Tightening torques

A	Pump at the place of use	10 Nm ± 1.0 Nm	7.40 ft.lb. ± 0.74 ft.lb.
B	Plug screw in housing	10 Nm ± 1.0 Nm	7.40 ft.lb. ± 0.74 ft.lb.
C	Grease fitting in housing	10 Nm ± 1.0 Nm	7.40 ft.lb. ± 0.74 ft.lb.
D	Pump element in housing	20 Nm ± 2.0 Nm	14.43 ft.lb. ± 0.15 ft.lb.
E	Pressure relief valve in pump element	6 Nm - 0.5 Nm	4.43 ft.lb. - 0.07 ft.lb.
F	Optional grease port in housing	20 Nm ± 2.0 Nm	14.43 ft.lb. ± 0.15 ft.lb.
	Not shown: center screw of the rectangular connector on pumps with rectangular connector	0.5 Nm	0.37 ft.lb.

4.4 Type identification code



PUMP - CLP - X G 1 A T 2 - T 3 F X - 7 S 7 X - M X A X 4 X X

Electrical connections (bottom right):
See Table 14

Electrical connections (bottom left):
See Table 14

Pre-filling:
XX None

Table 12

Outlets/Inlets

Code	Outlet/Inlet	Code	Outlet/Inlet
S	Grease fitting	5	Pump element K5
K	Cartridge filling	6	Pump element K6
Y	Lincoln cartridge filling	7	Pump element K7
Z	Closed (plug screw)	R	Pump element KR

Table 13

Electrical connections (left/right top)

Code	Connection	Code	Connection
X	None	B	M12x1 socket, 5-pin, A-coded[2)]
A	M12x1 plug, 4-pin, A-coded[1)]	C	M12x1 socket, 5-pin, B-coded[2)]

[1)] Male
[2)] Female

Table 14

Electrical connections (left/right bottom)

Code	Connection	Code	Connection
X	None	4	Bayonet connector, 4-pin, A-coded
7	Bayonet connector, 7-pin with CS[*)]	W	Rectangular connector 3 + PE
8	Bayonet connector, 7-pin		

[*)] with Piston Detector Signal

5 Delivery, returns, storage

5.1 Delivery

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

5.2 Return shipment

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

Fig. 41

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 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.

Fig. 42

Mounting dimensions

6.2 Assembly holes

NOTICE

Possible damage to the main machine and the pump

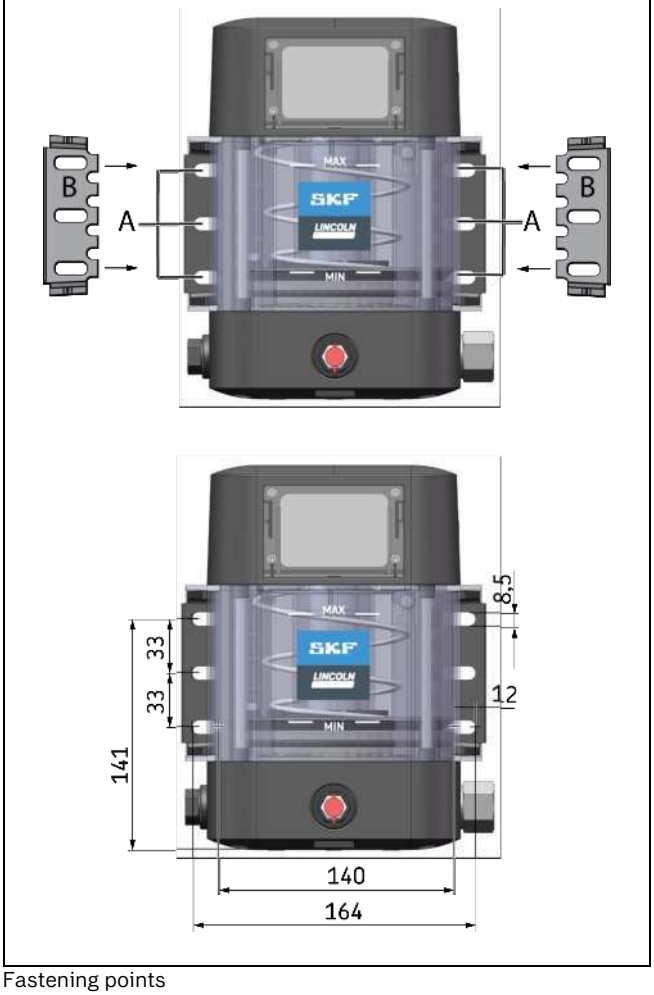
The assembly holes should be created only on non-load-bearing parts of the main machine. The fastening may not be set up on two parts which move in opposite directions to one another (e.g., machine base and machine assembly). When installing, always use the accompanying mounting brackets and washers and comply with the specified torques.

The pump should be mounted at the mounting points (**A**) using:

- 2 mounting brackets (B)
- 4 screws M8 (8.8) and 4 washers to DIN 7349
- If necessary, 4 hexagon nuts M8 (8.8) and 4 washers to DIN 7349

Tightening torque = 10 Nm ± 1,0 Nm.

Fig. 43



Fastening points

6.3 Setting the delivery rate on pump element R

NOTE

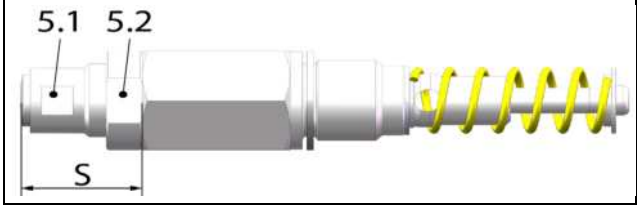
The delivery rate of pump element R can be adjusted only when the pump is at a standstill. When delivered, the rate is set to full delivery, meaning the setting dimension is **S = 29 mm [1.14 in.].**

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 diagram 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.

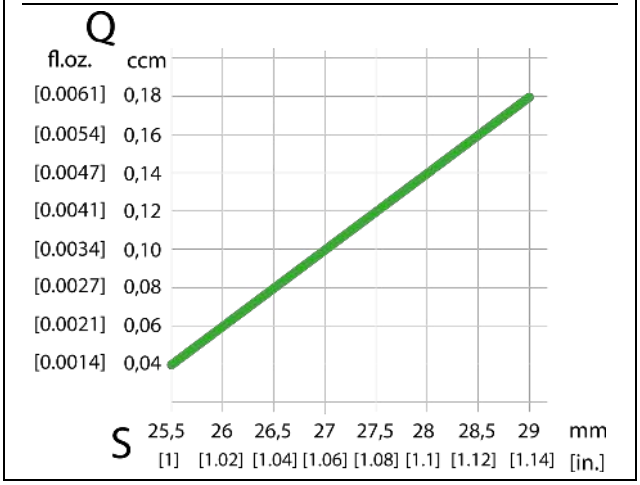
Tightening torque = 20 Nm ± 2.0 Nm.

Fig. 44



Pump element R

Fig. 45



Delivery rate diagram for pump element R per stroke

6.4 Installing the pressure relief valve

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

Proceed as follows for installation:

1. Remove the plug screw from the pump element (**5**).
2. Screw the pressure relief valve (**5.3**) into the pump element (**5**). **Tightening torque = 6 Nm -0.5 Nm**.
3. Repeat the procedure for each pump element installed.

Fig. 46

Installing the pressure relief valve

6.5 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 limiting valve (only in the case of pumps without an internal pressure limiting valve).
- The main lubricant line should be routed on a rising gradient and should 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.

6.6 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.

6.7 Setting/checking the working mode and parameters of the pump

If you have not already done so, set the operating mode and the parameters for pump operation. See the chapter Overview / functional description.

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	☐	☐
Mechanical connection established correctly	☐	☐
The performance characteristics for the aforementioned connections match the specifications in “Technical data”	☐	☐
All components such as lubrication lines and metering devices are correctly installed	☐	☐
Product is protected by a suitable pressure relief valve	☐	☐
No apparent damage, contamination, or corrosion	☐	☐
Any dismantled protective and monitoring equipment is fully reinstalled and functional	☐	☐
All safety markings on the product are present and in proper condition	☐	☐
The set operating mode and its parameters are appropriate for the intended use	☐	☐

7.2 Inspections during first start-up

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

8 Operation

SKF products operate largely automatically.
The activities required during normal operation are limited primarily to checking the pump for damage and proper functioning.

NOTICE

Possible damage to the pump and air in the lubrication system

In the case of pumps without a low-level signal, the fill level must be checked regularly and topped up with lubricant in good time.

8.1 Initial filling of a pump delivered without lubricant

NOTE

For initial filling of a pump delivered without lubricant, the pump is fitted with a bleed thread (**C**) and a “Read instructions” sticker (**G**). The bleed thread ensures that the air under the follower plate can escape when filling the pump for the first time. This prevents faults due to negative effects on the suction characteristics of the pump resulting from air inclusions under the follower plate. The bleed thread (**C**) is **ONLY** required for the initial filling and must then be removed together with the “Read instructions” sticker (**G**).

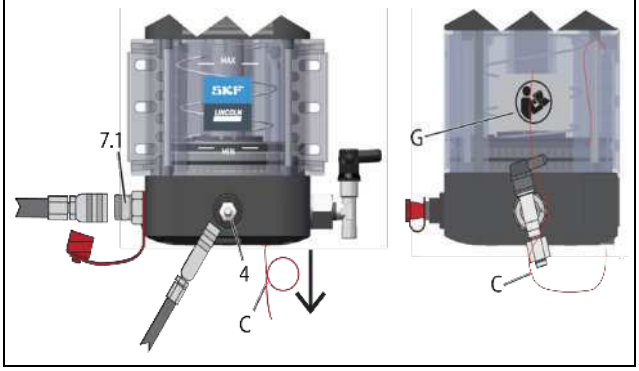
NOTE

During initial filling of a pump delivered without lubricant, we recommend running the pump while filling it. This improves the distribution of the lubricant in the lower part.

When filling for the first time, proceed as described below:

1. Align the pump so that it is upright.
2. Connect a filling pump to the fill connection (**7.1**) or filler nipple (**4**).
3. Switch on the filling pump and carefully fill the space under the follower plate completely with lubricant, while observing the follower plate.
4. Switch off the filling pump once all the air under the follower plate has been displaced.
5. Detach the sticker (**G**) and slowly and carefully pull the bleed thread (**C**) down and out of the pump.
6. Switch on the filling pump and fill the reservoir with lubricant up to just below the - MAX - marking.
7. Properly dispose of the bleed thread (**C**) and the sticker (**G**).

Fig. 47

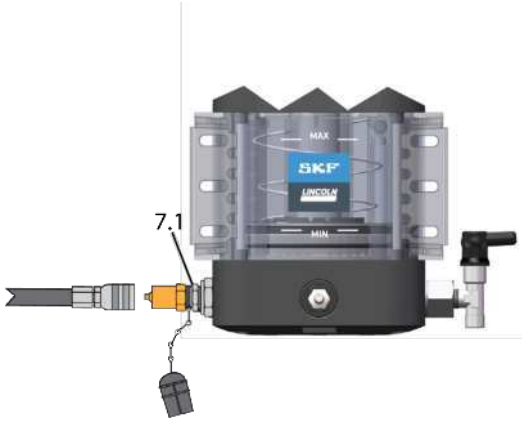


Initial filling of a pump delivered empty

8.2 Regular filling with a transfer pump

1. Connect the filling pump to the fill connection (**7.1**).
2. Switch on the filling pump and fill the reservoir up to just below the - MAX - marking.
3. Switch off the filling pump and detach it from the fill connection (**7.1**) of the pump.
4. Screw the protective cap back onto the fill connection (**7.1**) of the pump.

Fig. 48



Regular filling with transfer pump

8.3 Regular filling with cartridge

1. Connect the cartridge to the fill connection (**7.1**).
2. Fill the reservoir up to just below the - MAX - marking.
3. Detach the cartridge from the fill connection (**7.1**) of the pump.
4. Screw the protective caps back onto the cartridge and the fill connection (**7.1**) of the pump.

Fig. 49

Regular filling with cartridge

8.4 Regular filling via the filler nipple

1. Connect the fill connection of the filling pump to the filler nipple (**4**).
2. Switch on the filling pump and fill the reservoir up to just below the - MAX - marking.
3. Switch off the filling pump and disconnect it from the filler nipple (**4**) of the pump.
4. Put the protective cap back on the filler nipple of the pump.

Fig. 50

Regular filling with filler nipple

8.5 Triggering additional lubrication

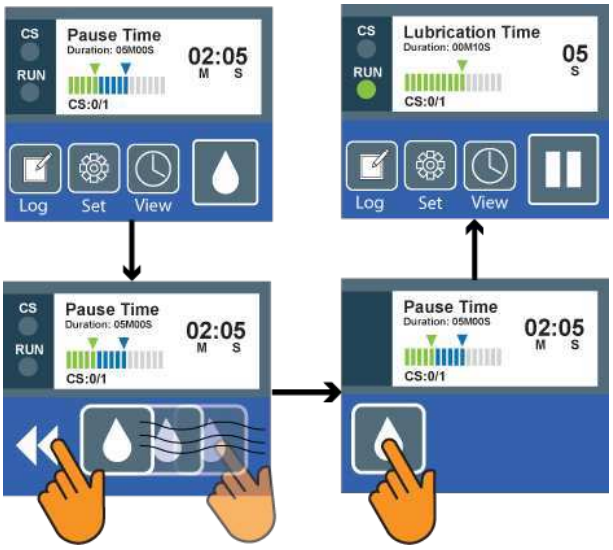
NOTE

An additional lubrication can be triggered only during the pump's pause time. The duration of additional lubrication is the same as the value set for a lubrication cycle. At the end of additional lubrication, the pump starts again with the set pause time. Pressing the drop icon again during additional lubrication will end the additional lubrication.

To trigger additional lubrication, proceed as follows:

1. To trigger an additional lubrication cycle, press the drop icon and then drag it onto the double arrow icon. The duration of an additional lubrication is the same as the duration of a normal lubrication interval.

Fig. 51



Triggering additional lubrication

9 Maintenance

9.1 Maintenance

Careful and regular maintenance is required in order to detect and remedy possible faults in time. The specific intervals must always be determined by the operator according to the operating conditions and regularly reviewed and adapted where necessary. If necessary, copy the table for regular maintenance activities.

NOTE
In addition to the activities described, the log files of errors and warnings should also be read as part of any maintenance or repair work.

Checklist Maintenance Table 16

Activity to be performed	YES	NO
Electrical connection established correctly	☐	☐
Mechanical connection established correctly	☐	☐
The performance characteristics for the aforementioned connections match the specifications in “Technical data”	☐	☐
All components such as lubrication lines and metering devices are correctly installed	☐	☐
Product is protected by a suitable pressure relief valve	☐	☐
No apparent damage, contamination, or corrosion	☐	☐
Any dismantled protective and monitoring equipment is fully reinstalled and functional	☐	☐
Warning labels which may be present on the product are present and in proper condition	☐	☐
No unusual noises, vibrations, moisture accumulation, odors present	☐	☐
No undesired discharge of lubricant (leakages) at connections	☐	☐
Lubricant is fed without bubbles	☐	☐
The bearings and friction points requiring lubrication receive the planned lubricant volume	☐	☐

10 Cleaning

10.1 Basics

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

10.2 Interior cleaning

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

10.3 Exterior cleaning

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

⚠ WARNING

Risk of fatal electric shock

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

⚠ WARNING

Serious injury from contact with or inhalation of hazardous substances

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

10.4 Cleaning the vent pipe

NOTE

The vent pipe is an option that cannot be selected in SKF's online product customization tool, and it is not present in all pumps.

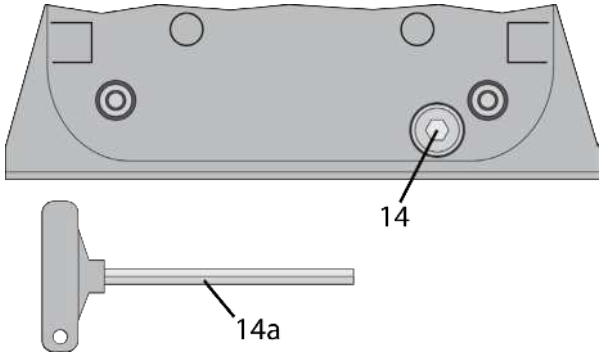
The easy-to-clean vent pipe can be ordered separately (see Spare Parts). The use of the vent pipe is recommended if the CLx pump is used in dirty surroundings or if there is a risk that vermin could nest in it (e.g. in agriculture).

If the vent pipe has to be cleaned due to clogging (e.g. grease deposits), proceed as described below:

1. Remove the vent pipe (**14**) from the underside of the pump housing using a hex key (WAF 6) (**14a**).
2. Remove the clogging from the vent pipe using a suitably thin tool and possibly also compressed air.
3. Screw the vent pipe (**14**) back into the pump housing using the hex key (**14a**).

Tightening torque:
3 Nm ± 1.0 Nm.

Fig. 52



Cleaning the vent pipe

11 Faults, causes, and remedies

Table 17

Malfunctions table

Fault	Possible cause	Remedy
Pump does not run	• Power supply to pump interrupted – Main machine is switched off – Pump power cable detached or defective – External fuse defective • The pump is in pause time • The motor of the pump is faulty • Internal cable break	• 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.
Pump runs, but delivers either no lubricant at all or not enough	• Jam, malfunction within the centralized lubrication system • Check valve defective • Pressure relief valve defective • Suction bore in a pump element is clogged • Pump element R is set incorrectly. • 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 • Lubrication time or pause time of the pump is set incorrectly.	

Table 18

Fault table

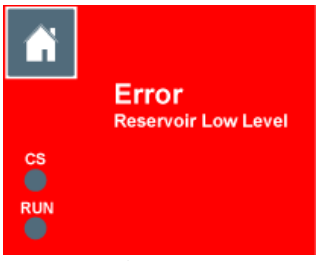
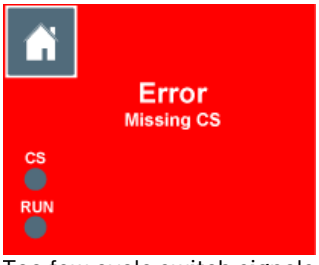
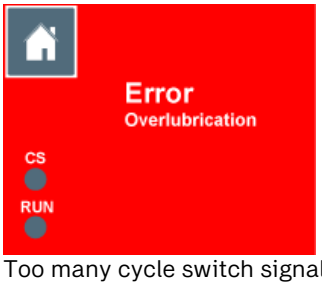
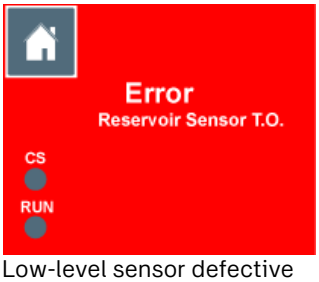
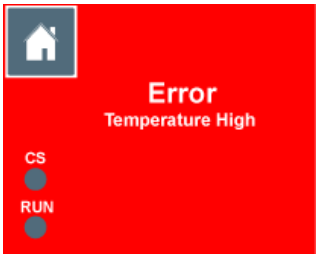
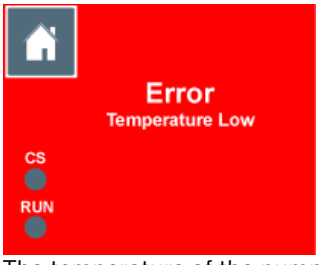
Displayed error message	Possible cause	Remedy
 Low-level signal	• Lubricant supply of the pump is exhausted	• Top up lubricant
	• The refill interval set by the user is too long for the level of lubricant consumption	• Top up lubricant and shorten the refill interval
 Too few cycle switch signals received	• The cycle time of the pump is set too short, meaning that the pump cannot supply the required lubricant volume in that time, resulting in too few metering device cycles and consequently too few cycle switch signals	• Extend the cycle time of the pump
	• Cycle switch defective or cable damaged	• Replace the cycle switch
	• The lubricant metering device with the cycle switch is too far away from the pump	• Install the metering device with cycle switch closer to the pump
	• Lubricant not suitable for the actual ambient temperature (consistency too high)	• Use a suitable lubricant with a lower NLGI grade, if necessary
 Too many cycle switch signals received	• Cycle time of the pump too long	• Shorten the cycle time of the pump
	• Motor does not switch off when the expected number of cycle switch signals is reached	• Check and replace the motor if necessary. Contact our Service department
	This message is only possible in cycle-controlled mode	
 Low-level sensor defective	• Wire breakage on the low-level sensor	• Replace the low-level sensor. Contact our Service department

Table 18

Fault table

Displayed error message	Possible cause	Remedy
 The temperature of the pump went above the maximum permissible temperature	• The temperature of the pump went above the maximum permissible temperature	Let the pump cool down. When the temperature falls below the shut-down temperature, the error can be acknowledged and reset. The factory setting is 70 °C.
 The temperature of the pump went below the minimum permissible temperature	• The temperature of the pump went below the minimum permissible temperature	Let the pump warm up. The error resets itself when the temperature goes back over the shut-down temperature.

Error table for CLP Touch Basic

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 relief 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 (**5**) from the pump housing together with the pressure relief valve (**5.3**), 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 (**5**) into the pump housing together with a new packing ring.

Tightening torque 20 Nm ± 2.0 Nm

3. Afterwards, screw a new pressure relief valve (**5.3**) into the pump element (**5**).

Tightening torque 6 Nm -0.5 Nm

Fig. 53

Replacing pump element and pressure relief 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.

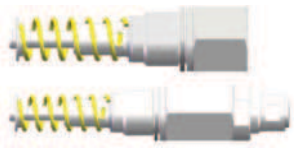
14 Spare parts and accessories

Spare parts may be used exclusively for replacement of identical defective parts. Modifications with spare parts on existing products are not allowed.
Accessories are used to extend, supplement the functional range or to assemble the product.

Table 19

14.1 Pump elements

Designation	Qty.	Part number	Fig.
Pump element 5 including gasket C3 version	1	600-26875-2	
Pump element 6 including gasket C3 version	1	600-26876-2	
Pump element 7 including gasket C3 version	1	600-26877-2	
Pump element R including gasket C3 version	1	655-28716-1	

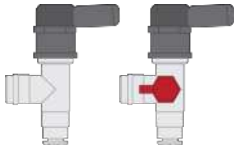


Output volumes see chapter Technical data.

Table 20

14.2 Pressure control valves 270 bar, plug-in type for tube Ø 6

Designation	Qty.	Part number	Fig.
SVTSV-270-R1/4-1/8 NPTFI-NIP00R-A	1	270864	
SVTSV-270-R1/4-6	1	624-29036-1	
SVTSV-270-R1/4-6 NIPOOL	1	624-77803-1	
SVTSV-270-R1/4-6 NIPOOR	1	624-77802-1	

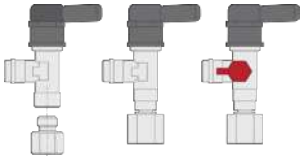


Legend:
NIPOOL = Lubrication fitting left-side, NIPOOR = lubrication fitting right-side
NPTFI = self-sealing tapered pipe thread (female)

Table 21

14.3 Pressure control valves 270 bar, screw-in type for tube Ø 6

Designation	Qty.	Part number	Fig.
SVTS-270-R1/4-D 6	1	624-28892-1	
SVTS-270-R1/4-6 NIPOOL	1	624-77810-1	
SVTS-270-R1/4-6 NIPOOR	1	624-77813-1	
SVTS-270-R1/4-D 6 W/O.M+D	1	624-36481-1	
Adapter kit M14x1.5 IxM12x1.5A including gasket for 624-36481-1	1	5240-00000005	



Legend:
NIPOOL = Lubrication fitting left-side, NIPOOR = lubrication fitting right-side

Table 22

14.4 Adapter with filler nipple

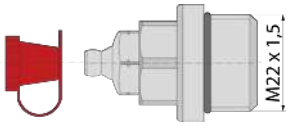
Designation	Pcs.	Item number	Figure
Adapter with filler nipple ST 1/4 acc. to NPTF, incl. seal	1	519-33840-1	
Adapter with filler nipple A2 AR 1/4, incl. seal	1	519-33959-1	
Adapter with filler nipple ST AR 1/4, incl. seal	1	519-33955-1	
Protective cap for filler nipple (red)	1	898-210-050	

Table 23

14.5 Closure screw

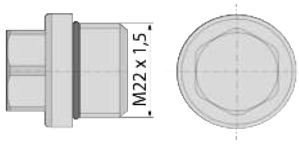
Designation	Qty.	Part number	Fig.
Cap screw M22x 1.5 including gasket to close unneeded outlets	1	519-60445-1	

Table 24

14.6 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 25

14.7 Fill connection, pivoted

Designation	Pcs.	Item number	Figure
Optional fill connection with nipple for quick-release coupling, for filling with lubricant from below via the lower part of the housing (without filter).	1	5590-00000026	

Table 26

14.8 Grease port, plug-in

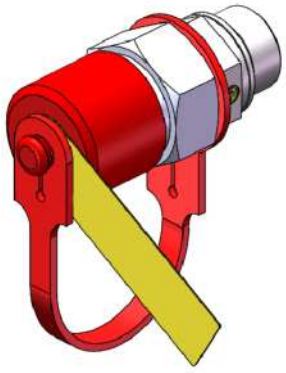
Designation	Pcs.	Item number	Figure
Optional grease port for filling with lubrication grease from below via the lower part of the housing	1	5590-00000002	

Table 27

14.9 Filling connection, screwable

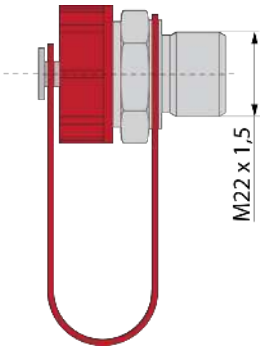
Designation	Qty.	Part number	Fig.
Optional filling connection for filling with lubrication grease from the bottom via the lower housing part (connection sleeve M26x1.5)	1	538-36763-1	

Table 28

14.10 Grease port with lubricant return

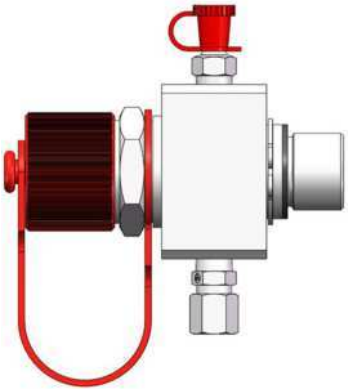
Designation	Pcs.	Item number	Figure
Optional grease port for filling with lubricant from below via the lower part of the housing, with R1/4 grease fitting to DIN 71412 and lubricant return via compression connector to DIN 2353-L for Ø 6 mm pipes.	1	995-997-300	

Table 29

14.11 Grease port without lubricant return

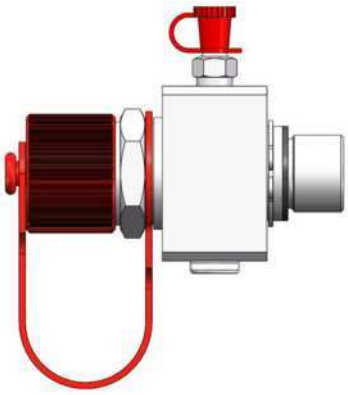
Designation	Pcs.	Item number	Figure
Optional grease port for filling with lubricant from below via the lower part of the housing, with R1/4 grease fitting to DIN 71412.	1	995-997-301	

Table 30

14.12 Vent pipe assy

Designation	Pcs.	Item number	Figure
Vent pipe assy, for aeration and bleeding of reservoirs for CLx pumps	1	5590-00000014	

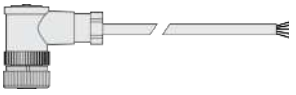
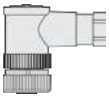
Table 31

14.13 Mounting brackets

Designation	Qty.	Part number	Fig.
Mounting brackets Consisting of: 2 x Mounting bracket 4 x Washer 8.4 DIN 7349	1	5590-00000015	

Table 32

14.14 Power lead

Designation	Feature*	Pcs.	Item number	Figure
Power lead 10 m with bayonet socket (4-pin)	4	1	664-34167-9	
Power lead 10 m with bayonet socket (7-pin) with CS**	7	1	6640-00000182	
Power lead 10 m with bayonet socket (7-pin)	8	1	664-34428-3	
Power lead 10 m with rectangular connector, junction box (black)	W	1	664-36078-7	
Power lead 5 m with M12x1 socket, straight (A-coded)	A	1	179-990-600	
Power lead 5 m with M12x1 plug, straight (A-coded)	B	1	179-990-719	
Power lead 5 m with M12x1 socket, angled 90° (A-coded)	A	1	179-990-601	
Power lead 5 m with M12x1 plug, angled 90° (A-coded)	B	1	179-990-729	
Power lead 5 m with M12 x1 socket, straight (A-coded) and M12x1 plug, straight (B-coded)	C	1	2370-00000167	
Power lead 3 m with M12 x1 socket, straight (A-coded) and M12x1 plug, straight (B-coded)	C	1	2370-00000086	
M12 socket, straight (A-coded)	A	1	179-990-371	
M12 plug, straight (A-coded)	B	1	179-990-663	
M12x1 socket, angled 90° (A-coded)	A	1	179-990-372	
M12x1 plug, angled 90° (A-coded)	B	1	179-990-765	

*Feature in the type identification code
**) With piston detector signal lead

15 Appendix

15.1 Connection diagrams

Table 33

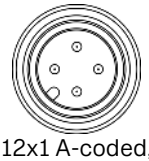
Cable colors in accordance with IEC 60757

Abbreviation	Color	Abbreviation	Color	Abbreviation	Color	Abbreviation	Color
BK	Black	GN	Green	WH	White	PK	Pink
BN	Brown	YE	Yellow	OG	Orange	TQ	Turquoise
BU	Blue	RD	Red	VT	Violet	GY	Gray
GNYE	Green/Yellow	RDWH	Red/White	GD	Gold	SR	Silver

Not all cable colors need to be used in the terminal diagrams.

15.2 Overview of cables and possible connections

Table 34

Plug	Color	Pin	Item number	Length	Cross-section	Enclosure rating
	RD BN BK WH YE BU GN	1 2 3 4 5 6 7	664-34428-3*	10 m	7 x 1.5 mm²	IP69K
Bayonet, 7-pin, A-coded			*) With piston detector signal lead			
	BN RD/BK BU PK YE BK VT/GN	1 2 3 4 5 6 7	6640-00000182	10 m	7 x 1.5 mm²	IP69K
Bayonet, 7-pin, A-coded						
	RD/YE BN/YE WH/RD WH/BN	1 2 3 4	664-34167-9	10 m	4 x 0.5 mm²	IP69K
Bayonet, 4-pin, A-coded						
	RD BN BK YE/GN	1 2 3 PE	664-36078-7	10 m	4 x 0.5 mm²	IP65
Rectangular connector 3 + PE						
	BN WH BU BK	1 2 3 4	179-990-600 179-990-601 179-990-371 179-990-372	5 m 5 m --- ---	4 x 0.34 mm² 4 x 0.34 mm² Max. 4 x 0.75 mm² Max. 4 x 0.75 mm²	IP67 IP67 IP67 IP67
M12x1 A-coded, female						
	BN WH BU BK	1 2 3 4	179-990-719 179-990-729 179-990-663 179-990-765	5 m 5 m --- ---	4 x 0.25 mm² 4 x 0.25 mm² Max. 4 x 0.75 mm² Max. 4 x 0.75 mm²	IP67 IP67 IP67 IP67
M12x1 A-coded, male						
	BN WH BU BK	1 2 3 4	2370-00000086 2370-00000167	3 m 5 m	5 x 0.34 mm² 5 x 0.34 mm²	IP67 IP67
	GY	5				
Power lead for cycle switch with M12 x1 socket, straight (A-coded) and M12x1 plug, straight (B-coded)						

15.3 Terminal diagram for 7-pin bayonet connector

NOTE

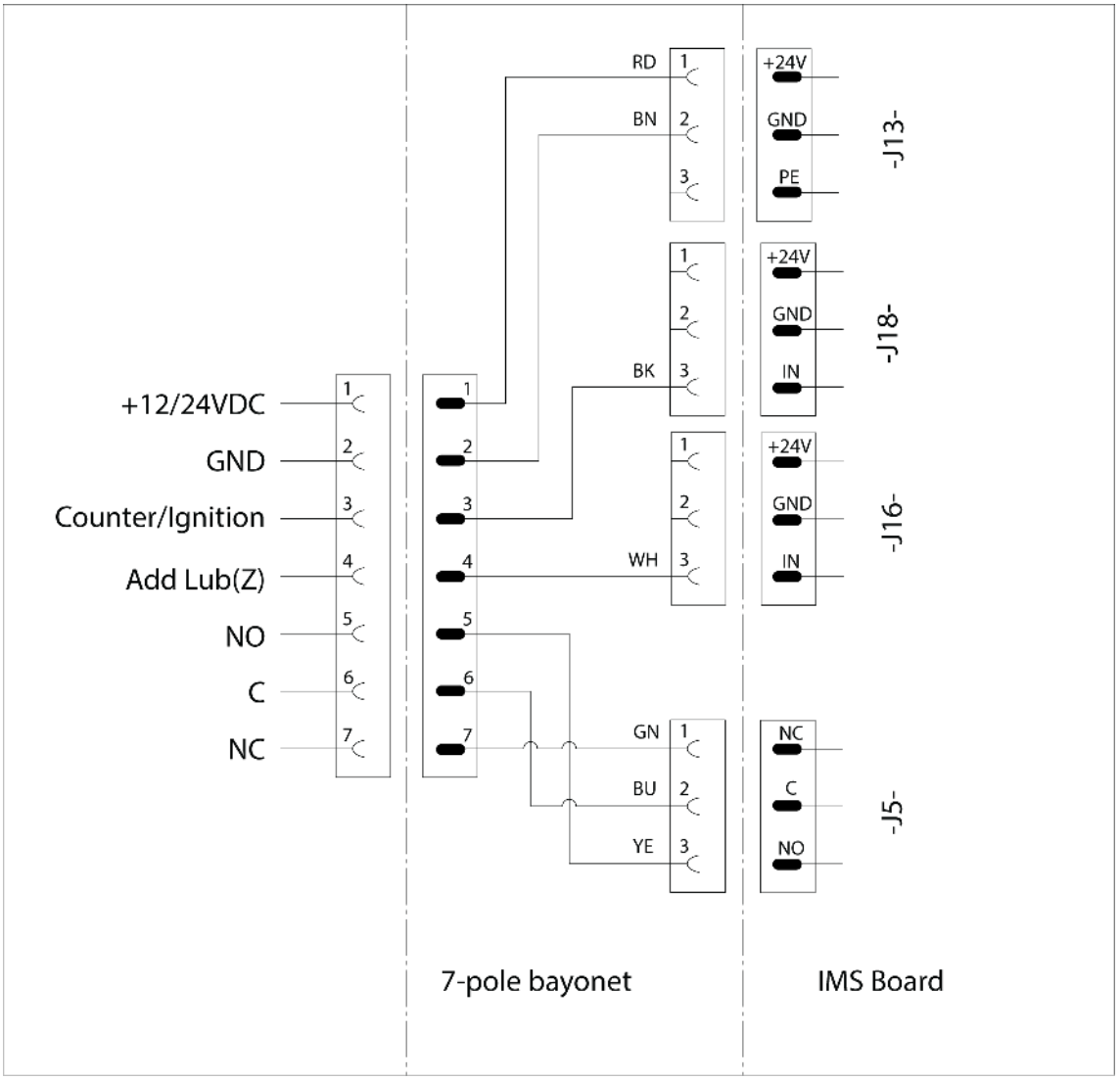
The following terminal diagrams all display the specifications for a single electrical connection only. Therefore, in the case of pumps with multiple electrical connections, it is always necessary to refer to multiple terminal diagrams. The assignment of the terminal diagrams to the electrical connection of a specific pump can be made based on the specifications for the connection plugs and sockets.

Table 35

Terminal diagram valid for pumps with the following equipment features

- ✓ Mobile applications
- ✓ 12/24 VDC
- ✓ Additional lubrication (J16)
- ✓ 7-pin bayonet connector
- ✓ Fault signal (J5)
- ✓ Ignition (J18)

Fig. 54



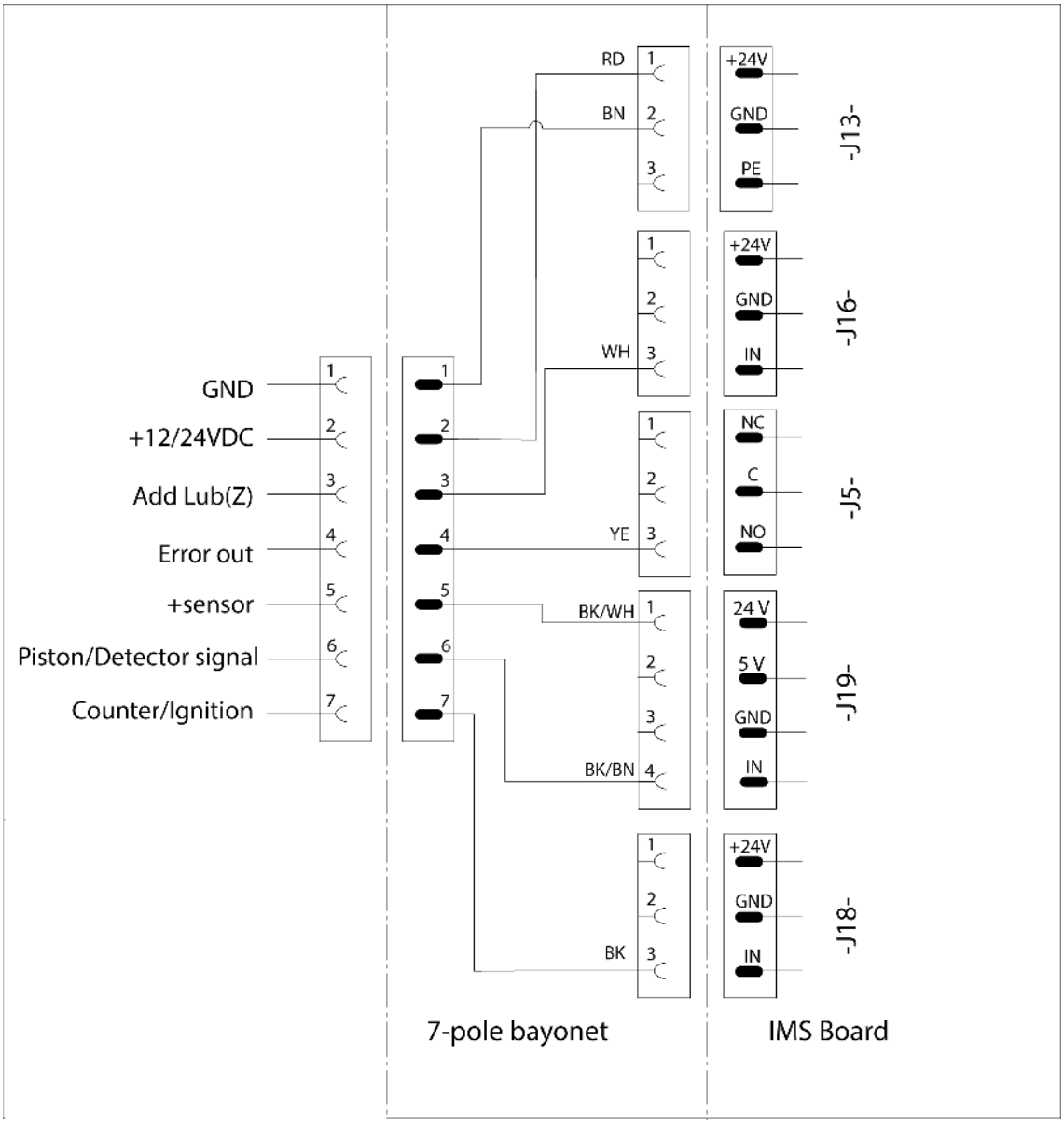
15.4 Terminal diagram for 7-pin bayonet connector with Piston Detector

Table 36

Terminal diagram valid for pumps with the following equipment features

- ✓ Mobile applications
- ✓ 12/24 VDC
- ✓ Additional lubrication (J16)
- ✓ 7-pin bayonet connector
- ✓ Fault signal (J5)
- ✓ Ignition (J18)

Fig. 55



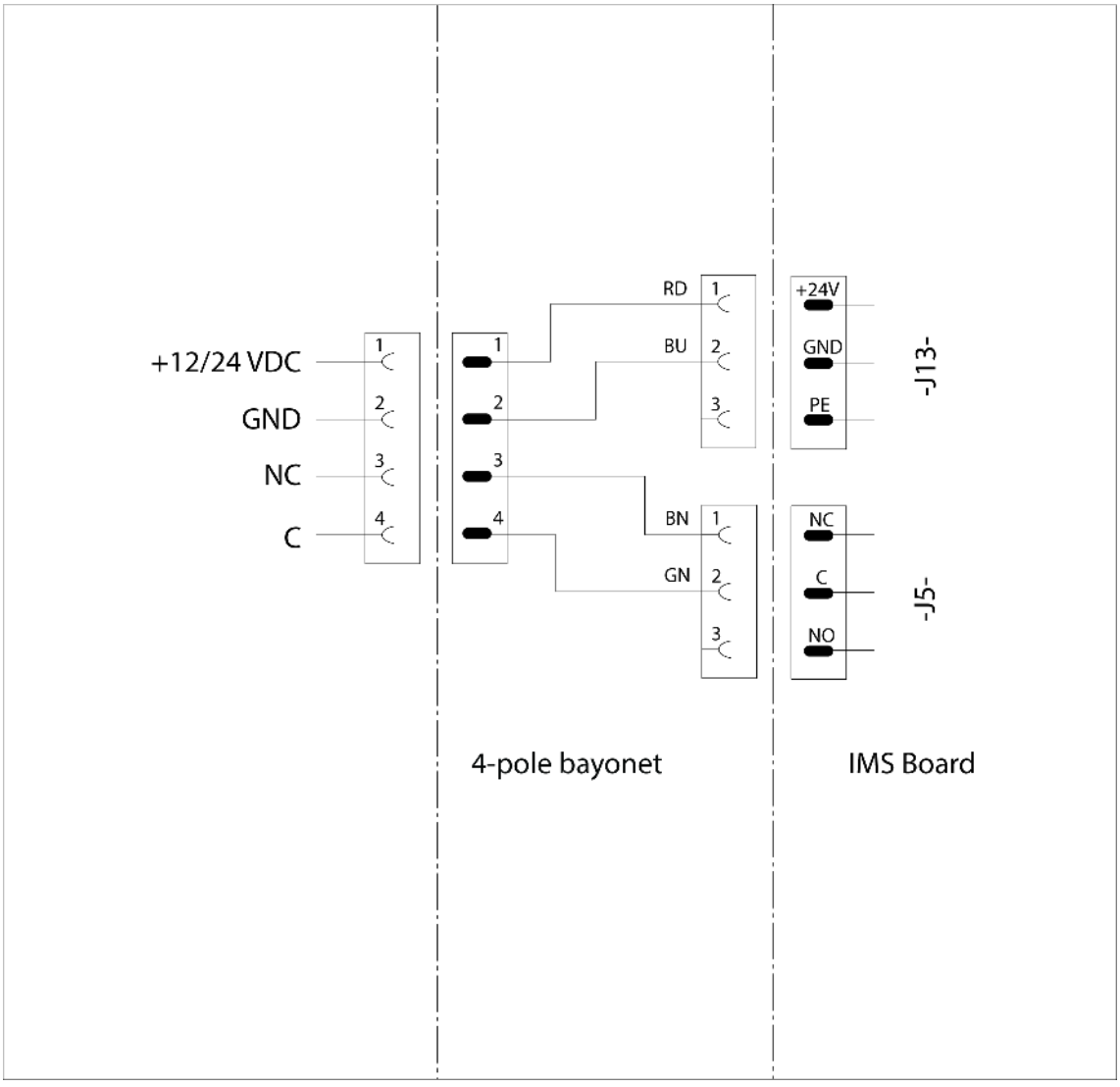
15.5 Terminal diagram for 4-pin bayonet connector

Table 37

Terminal diagram valid for pumps with the following equipment features

- ✓ Mobile applications
- ✓ 12/24 VDC
- ✓ Fault signal (J5)
- ✓ 4-pin bayonet connector, A-coded

Fig. 56



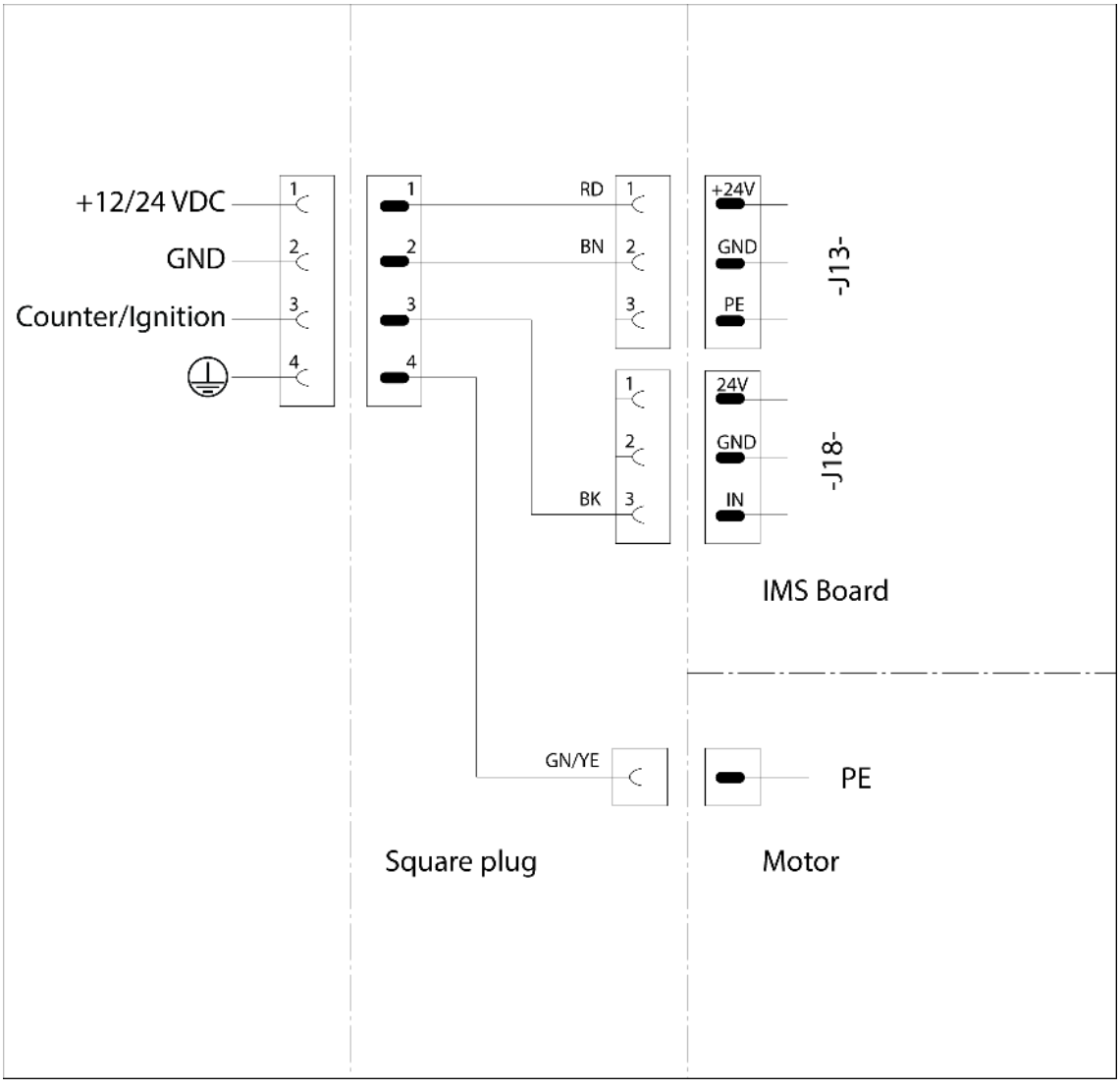
15.6 Terminal diagram for rectangular connector

Table 38

Terminal diagram valid for pumps with the following equipment features

- ✓ Industry
- ✓ 12/24 VDC
- ✓ Ignition (J18)
- ✓ Rectangular connector

Fig. 57



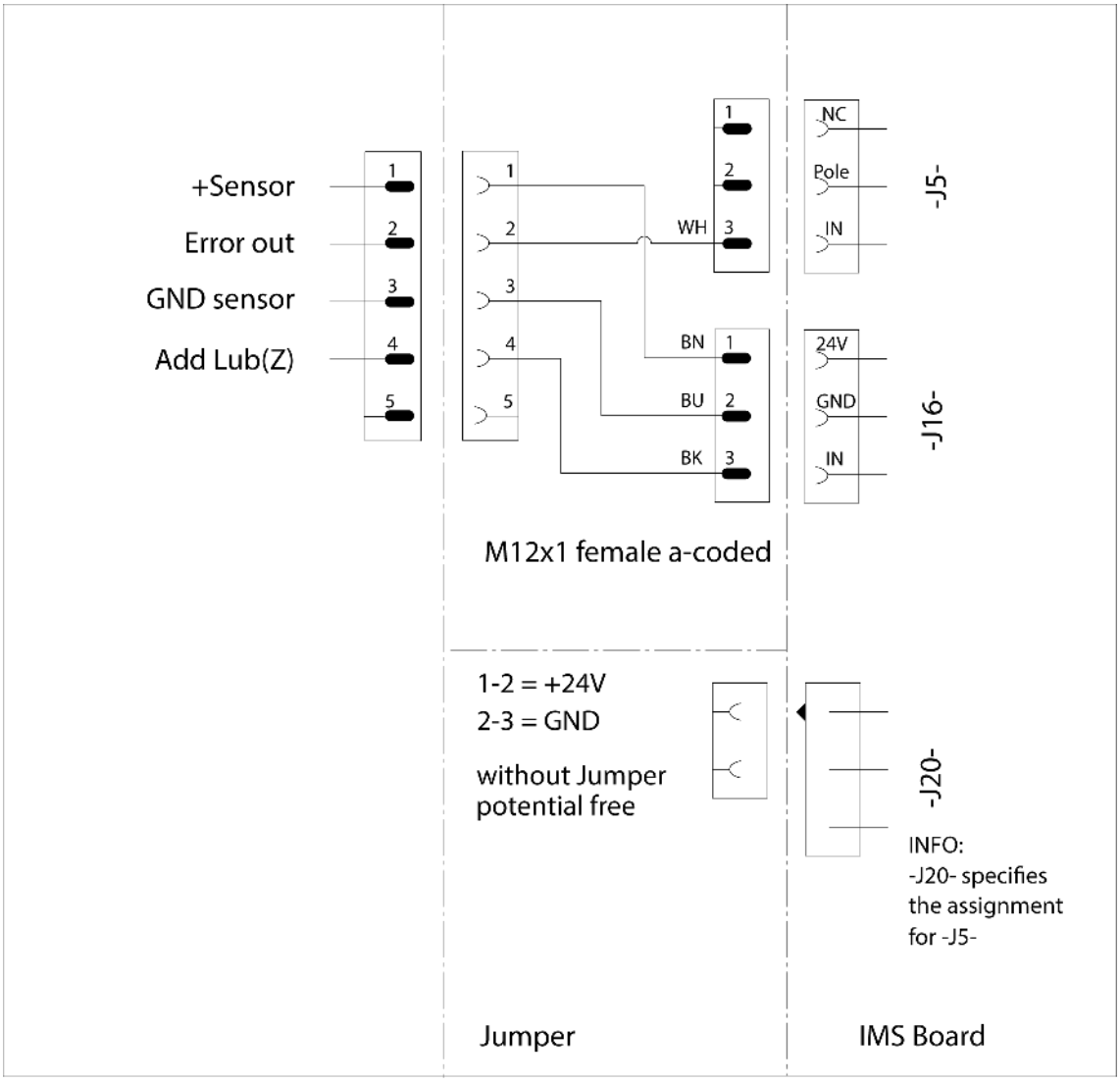
15.7 Terminal diagram for M12x1 socket, A-coded

Table 39

Terminal diagram valid for pumps with the following equipment features

✓ 5-pin M12 socket, A-coded ✓ Additional lubrication (J16) ✓ Fault signal (J5)

Fig. 58



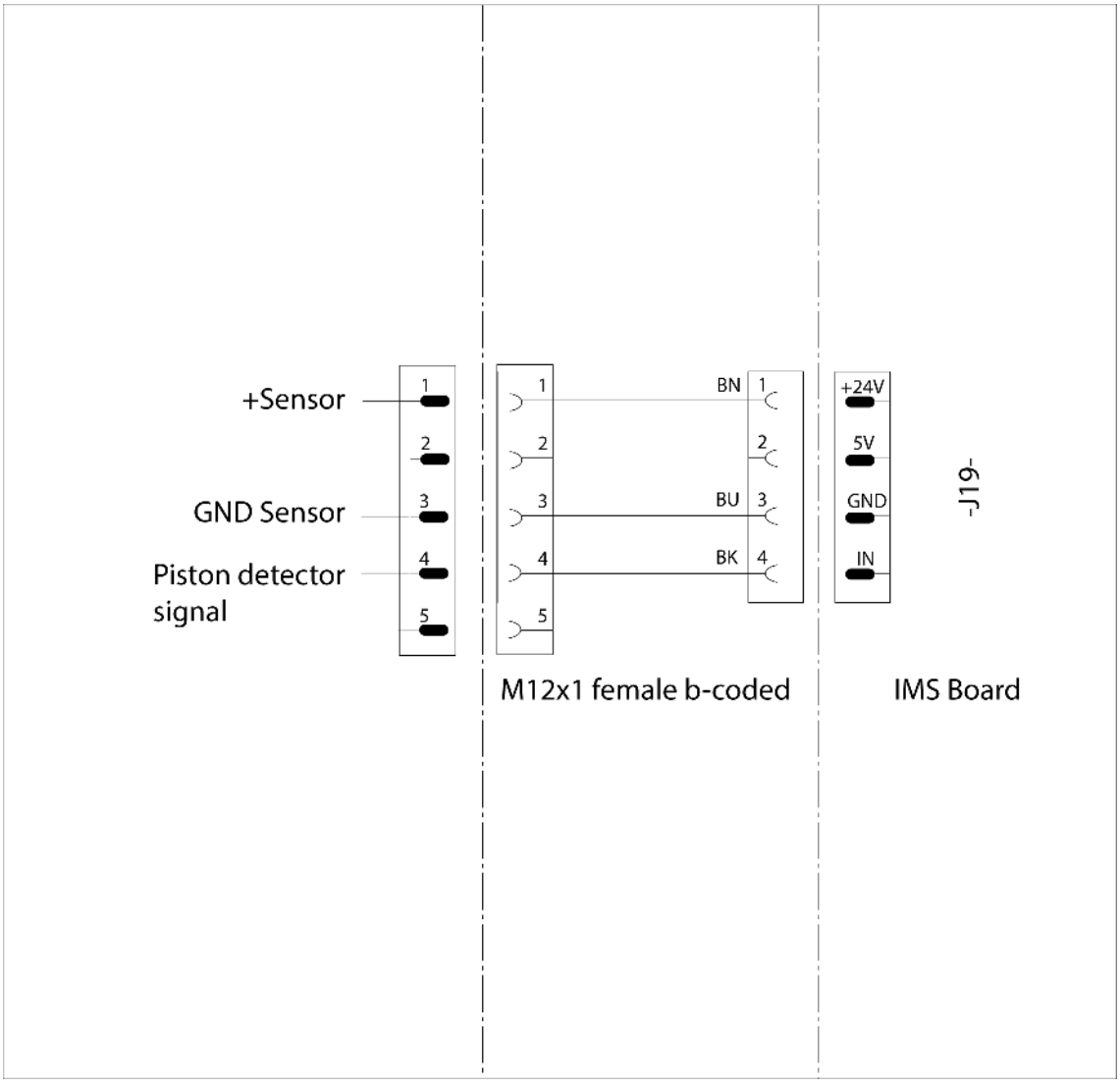
15.8 Terminal diagram for M12x1 socket, B-coded

Table 40

Terminal diagram valid for pumps with the following equipment features

✓ 5-pin M12 socket, B-coded ✓ Cycle switch (J19)

Fig. 59



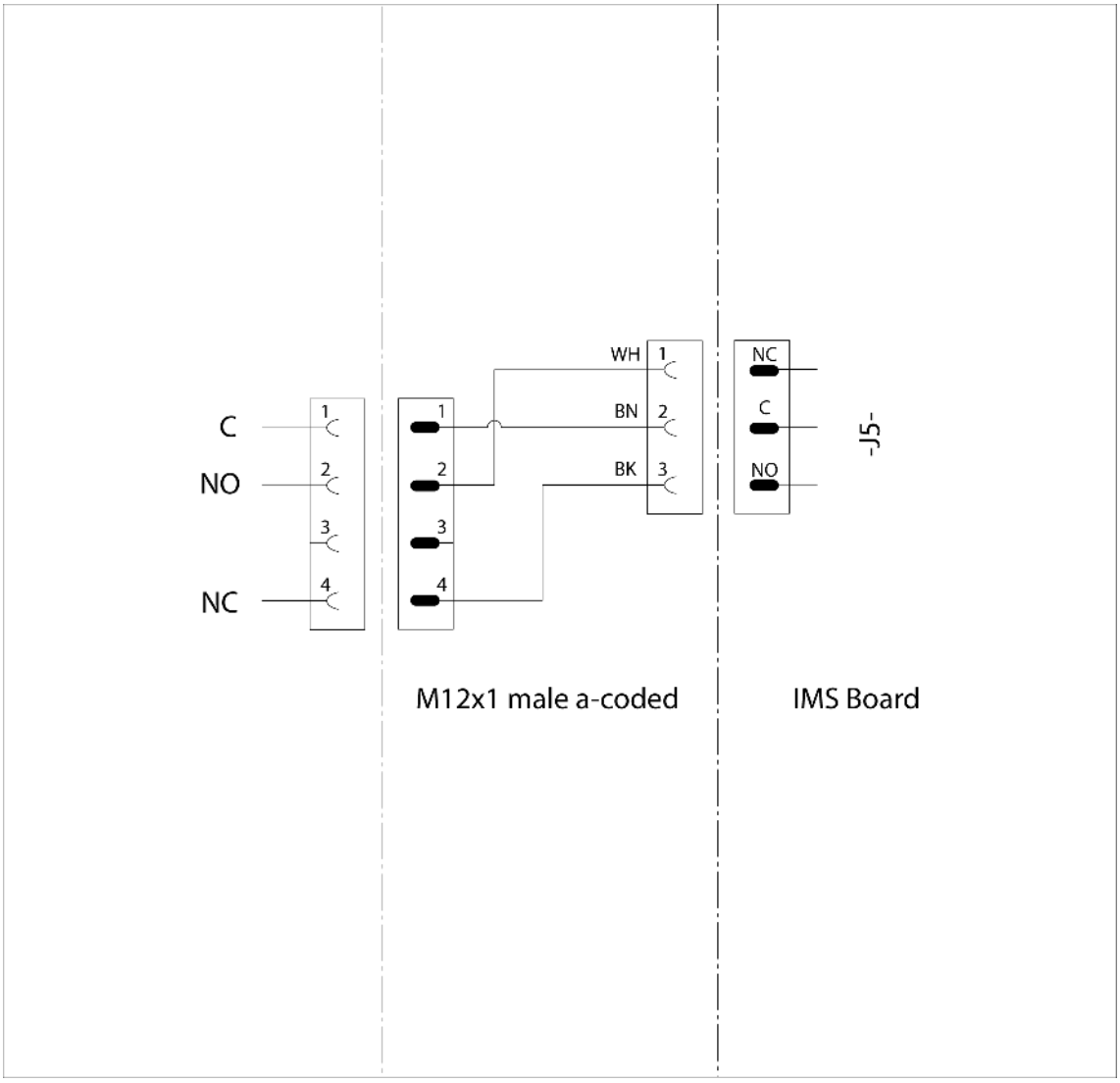
15.9 Terminal diagram for M12x1 plug, A-coded

Table 41

Terminal diagram valid for pumps with the following equipment features

✓ 4-pin M12 plug, A-coded ✓ Fault signal (J5)

Fig. 60



15.10 China RoHS Table

Table 42

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.)

Notes / Notizen / Apuntes

Notes / Notizen / Apuntes

Notes / Notizen / Apuntes

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