CLS pump

Pump for single-line systems

Created on:	**20.11.2023**
Document no.:	**951-171-069-EN**
Version:	**06**

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

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

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

Designation: Electrically operated pump for the feeding of lubricants in interval operation inside a centralized lubrication system
Type: CLS-xxxxxx-xxxx-xxxx-xxxxxxxx

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

EN ISO 12100:2010 | EN 60204-1:2018 | EN 809:1998+A1:2009/AC:2010
EN 61000-6-2:2005/AC:2005 | EN 61000-6-4:2007/A1:2011
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, 20.12.2021

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

EN ISO 12100:2010 | EN 60204-1:2018 | EN 809:1998+A1:2009/AC:2010
EN 61000-6-2:2005/AC:2005 | EN 61000-6-4:2007/A1:2011
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 UK legislation Supply of Machinery (Safety) Regulations 2008 No. 1597 and all other applicable Directives.

Walldorf, 20.12.2021

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

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: CLS 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	Yes
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	Partially[3)]
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: For pumps without control, the operator must take suitable measures to ensure that the cyclic duration factor (see Technical Data) is adhered to. Otherwise, the heat of the motor could become unacceptably high.
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

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

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

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

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

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

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

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

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

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 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.

1.2 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.

1.3 General behavior when handling the product

Putting the product into operation or operating it 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. All operating instructions, safety instructions, and in-house instructions relevant to the particular activity must be followed. Uncertainty seriously endangers safety. Responsibilities for different activities must be clearly defined and observed. In addition to these instructions, the statutory regulations for accident prevention and environmental protection must be observed.

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. Guards and safety devices must not be removed, modified, nor disabled during operation and must be checked for proper function and completeness at regular intervals.

Unauthorized modifications and changes can have an unpredictable effect on safety and operation. Unauthorized modifications and changes are therefore prohibited.

Tasks in the context of repair or maintenance work may be carried out only with the spare parts and accessories offered by SKF for the respective product.

Any unclear points regarding proper condition or correct assembly/operation must be clarified. Operation is prohibited until issues have been clarified.

The painting of any plastic components, visual monitoring devices or seals is prohibited. Completely mask or remove parts before painting.

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. 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.

1.4 Transport, assembly, maintenance, malfunction, repair, shutdown, disposal

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. Other units must not be damaged or impaired in their function by the installation work.

Avoid chafe points when installing. 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.

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.

Shutdown in an emergency is to be performed by measures specified by the operator, e.g. by pressing the emergency stop switch of the higher-level machine or by cutting off the power supply.

In the case of electrical products, the following must also be observed:

- 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 damp 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.

1.5 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

1.6 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 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.

1.9 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

1.10 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)

1.11 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.

1.12 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).

1.13 Note on UL mark

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

1.14 Note on ECE mark

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

1.15 Note on UKCA marking

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

1.16 Note on EAC marking

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

1.17 Note on China RoHS mark

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

1.18 Prohibition of certain activities

- Repairs or modifications to the drive.

1.19 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** or **12a**) with or without filling hole (**8**)
- The reservoir (**1**) with or without follower plate (**2**)
- The lower part of the pump housing (**13**)

Fig. 3

CLS pump, front view

Fig. 4

CLS pump with flat upper part on pump housing, front view

3.1 Pump housing, upper part

The upper part of the pump housing (**12**) contains:

- The electrical connections
- Possibly a button to trigger an additional lubrication
- Possibly a filling hole for filling from above

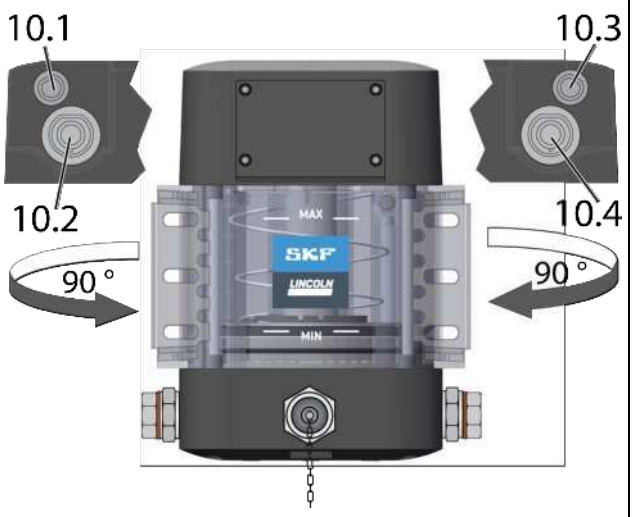
Pump housing, flat upper part

The pump housing with flat upper part (**12a**) is standard on pumps without a M12 plug.

3.1.1 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

Top left (10.1) or top right (10.3)

M12x1 plug, 4-pin,
A-coded
DIN EN ISO 61076-2-101

Bottom left (10.2) or bottom right (10.4)

Bayonet connector, 4-pin
A-coded
ISO 15170-1

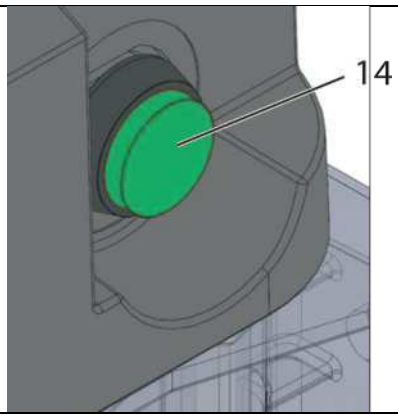
Bayonet connector, 7-pin
A-coded
ISO 15170-1

Rectangular connector 3
+ PE
DIN EN 175301-803

3.1.2 Button for additional lubrication

On pumps without control, there can optionally be a button (**14**) on the right or the left of the upper part of the pump housing, to trigger an additional lubrication. An additional lubrication can be triggered only during the pump's interval time. The additional lubrication continues as long as the button is pressed.

Fig. 6



Button for additional lubrication

3.2 Reservoir

The reservoir (**1**) stores the lubricant. The reservoir ventilation (**3**) aerates the reservoir while the pump is running and supplying lubricant, and bleeds the reservoir while the pump is being filled with lubricant from below. When filling is done from above, the reservoir is aerated primarily through the open filling hole (**8**). 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.

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.

Different variants of the pump come with different reservoir designs:

3.2.1 Reservoir with follower plate

The follower plate (**2**) lies on top of the lubricant and presses it with spring force in the direction of the gear pump in the lower part of the pump. Its pressure improves the suction characteristics of the pump. On pumps with follower plate, the low-level warning is issued by a magnet in the follower plate which triggers a low-level signal when it reaches the reed contact in the contact rod (**11**).

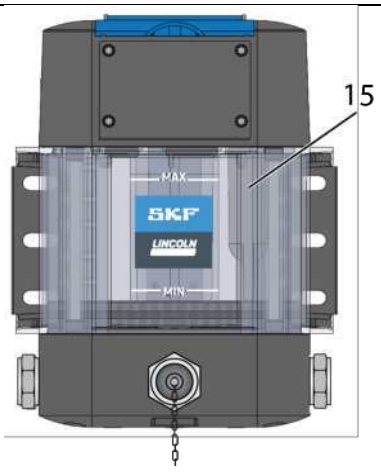
Fig. 7

CLS pump, front view, reservoir with follower plate

3.2.2 Reservoir without follower plate

On pumps without a follower plate, the low-level warning is issued by a level sensor (**15**) located inside the reservoir, on the right-hand side.

Fig. 8



CLS pump, front view, reservoir without follower plate

3.3 Pump housing, lower part

Gear pump
The gear pump in the lower part of the pump housing can be operated with up to 2 outlets (**5**). If an outlet is not needed, it can be sealed off with a plug screw (**6**), or alternatively the pivoted fill connection 995-997-297 can be used in this position. The gear pump is equipped with an internal pressure limiting valve to safeguard it against excessive pressure.

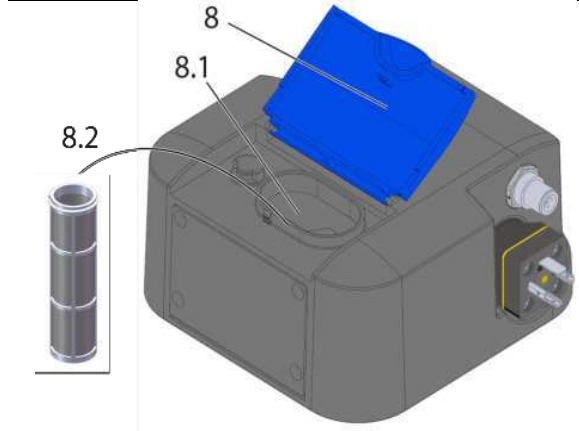
NOTICE
Malfunction
Damage to gear pump in pump housing
Connectors (**5**) must not be removed at the same time. Make sure there is always one side connector (**5**) on the pump housing.

Fill connection
In position (**A**), the pump could have a grease fitting or one of the fill connections described in these instructions, depending on the specific pump type. The pivoted fill connection 995-997-297 can also be mounted in one of the outlets (**5**) on the left or the right.

3.4 Filling hole

The filling hole (**8**) is situated over the filling port (**8.1**) for filling with clean lubricant. On pumps for lubrication oil, the filling port (**8.1**) contains a filter insert (**8.2**). The filter insert (**8.2**) must be checked regularly for clogging and replaced if needed. After filling, close the filling hole (**8**) again completely (you should hear it lock shut).

Fig. 9



Filling hole open

4 Technical data

Table 4

General technical data

Operating pressure	Max. 38 bar	Mounting position[2)]	Vertical
Relief pressure	0.5 bar	Sound pressure level	< 70 dB (A)
Ambient temperature[1)]	-25 °C to 65 °C	Weight (empty)	Approx. 5 kg
Pump type	Gear pump	Outlets	2 (equal priority)
Reservoir capacity[3)]	1 liter nominal		
Feedable lubricants	Lubrication oils with 20–1500 mm^2/s, fluid greases NLGI 00–000		
Purity level of lubrication oils	Code 19/17/14 acc. to ISO 4406:1999 or class 8 acc. to NAS 1638		
Filling	Filling hole at top of reservoir Filler nipple / filler coupling		
Nominal delivery rate[4)]	50 cm^3/min)		

Electrical data

	24 VDC pump
Rated voltage	24 VDC ± 25 %
Current input, max.	3 A
Rated current	0.6 A
Rated capacity	5.7 W
Recommended back-up fuse	3.0 A (slow)
Nominal speed (motor output)	750 rpm
Cyclic duration factor (IEC 60034-1:2017)	S3 duty: 15 % duty cycle over 15 minutes max. operating time 2.5 minutes / min. pause time 15 minutes
Enclosure ratings[5)]	
Pumps with filling hole	IP 54
Pumps with rectangular connector	IP 65 (IEC 60529)
Pumps with M12 connector	IP 67 (IEC 60529)
Pumps with bayonet connector	IP69K (ISO 20653)
Switching capacity, max.	5 W / 5 VA
Switching voltage of low-level 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)	

[1)] The lower limit for the permissible ambient temperature is contingent on the pumpability of the lubricants used.
[2)] Upright, as shown in the instruction manual, meaning the reservoir is at the top.
[3)] About 1.2 liters of lubricant are required to fill a pump that was delivered empty.
[4)] With back pressure of 5 bar and viscosity of 90 mm^2/s.
[5)] The specified enclosure rating is contingent on the use of appropriate connection sockets and cables, and on proper connection. The enclosure rating of the pump depends on its configuration: it is the lowest enclosure rating out of all the components used.

4.1 Tightening torques

Fig. 10

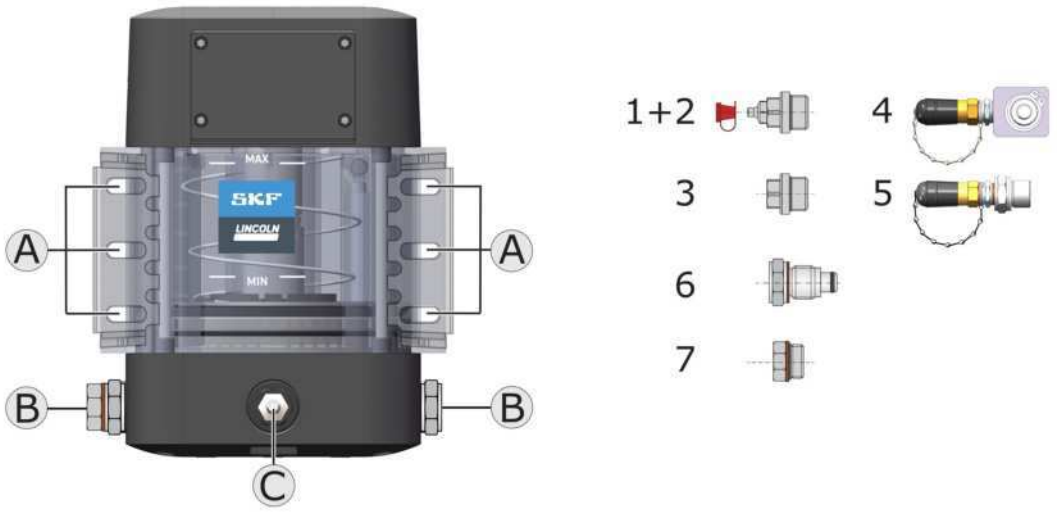


Table 5

Tightening torques for CLS pump

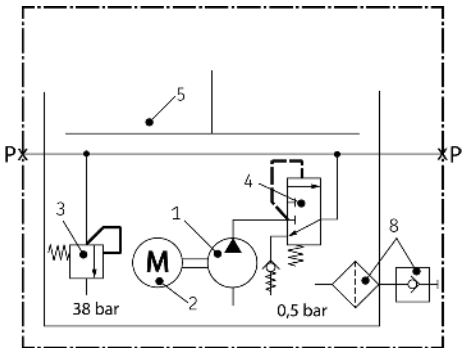
Item	Number	Name	Torque	
A	/	Pump at the place of use	10 Nm ± 1.0 Nm	7.40 ft.lb. ± 0.74 ft.lb.
B	4	Optional fill connection, pivoted	20 Nm ± 2.0 Nm	14.43 ft.lb. ± 1.5 ft.lb.
	6	Fitting in housing M 22 x 1.5	20 Nm ± 2.0 Nm	14.43 ft.lb. ± 1.5 ft.lb.
	7	Plug screw in fitting M 16 x 1.5	10 Nm ± 1.0 Nm	7.40 ft.lb. ± 0.74 ft.lb.
C	1	Grease fitting in adapter M 22 x 1.5	10 Nm ± 1.0 Nm	7.40 ft.lb. ± 0.74 ft.lb.
	2	Adapter in housing M 22 x 1.5	20 Nm ± 2.0 Nm	14.43 ft.lb. ± 1.5 ft.lb
	3	Plug screw for fill connection M 22 x 1.5	10 Nm ± 1.0 Nm	7.40 ft.lb. ± 0.74 ft.lb.
	4	Optional fill connection, pivoted	20 Nm ± 2.0 Nm	14.43 ft.lb. ± 1.5 ft.lb.
	5	Optional fill connection	20 Nm ± 2.0 Nm	14.43 ft.lb. ± 1.5 ft.lb.
Not shown: center screw of the rectangular connector on pumps with rectangular connector			0.5 Nm	0.37 ft.lb.

NOTE

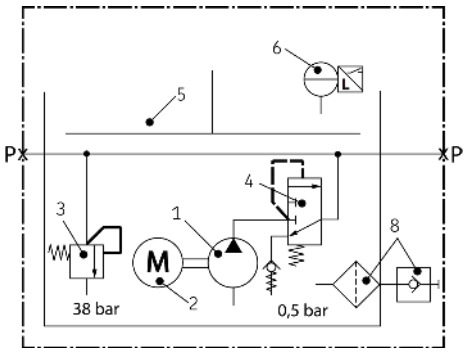
For pumps with an optional fill connection 169-460-406 or optional fill connection 995-997-297, the tightening torques in the section “Cleaning the filter of the fill connection” must also be adhered to.

4.2 Hydraulic connection diagrams

Fig. 11

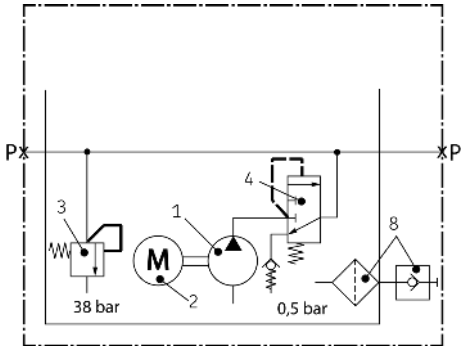


Pumps with follower plate, without low-level signal

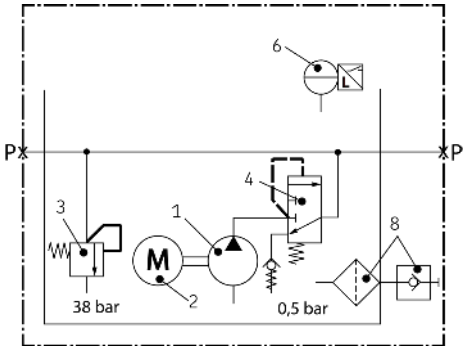


Pumps with follower plate and low-level signal

Fig. 12

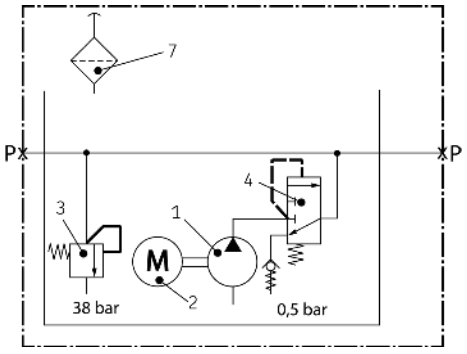


Pump without follower plate and without low-level signal

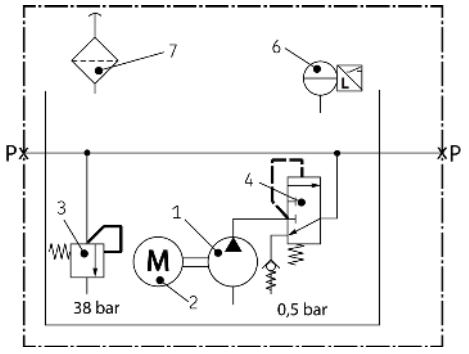


Pump without follower plate and with low-level signal

Fig. 13



Pump with filling from above and without low-level signal



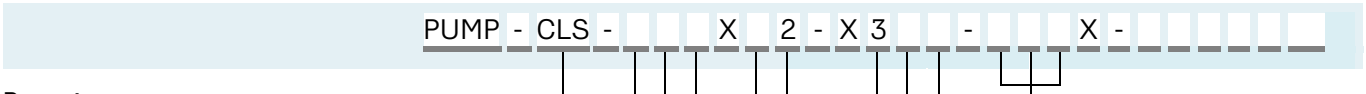
Pump with filling from above and with low-level signal

Table 6

Hydraulic connection diagram acc. to ISO 1219-1:2019-01

1 = Pump
2 = Motor
3 = Pressure limiting valve
4 = Pressure-relief valve
5 = Follower plate
6 = Low-level signal
7 = Filling from above*
8 = Filler nipple / fill connection *
P = Pressure line
* With filter in the case of oil applications, without filter in the case of fluid grease applications

4.3 Type identification code



Pump type
CLS

Compliance
X: = CE
E: = CE + ECE (E1) mark

Lubricant
U: Lubrication oil
F: Fluid grease up to and including NLGI 00

Fill level monitoring
X: Without
1: With low-level signal (reed contact)
pumps with follower plate
4: With pre-warning / low-level signal
(capacitive sensor)
pumps without follower plate

Operator panel (HMI)
X: Without button for additional lubrication
Y: Button for additional lubrication, right[4)]
Z: Button for additional lubrication, left[4)]

Voltage
2: 24 VDC

Corrosion protection class
3: C3 (not selectable)

Follower plate
X: Without follower plate
F: With follower plate

Top filling
X: No filling from above
F: With filling from above

Outlet/Inlet: left, center, right
See Table 7

Table 7

Outlet/Inlet		Position		
Code	Outlet/Inlet	Left	Center	Right
S	Filler nipple	/	YES	/
M	Fill connection, plug-in (with or without filter)[1)]	/	YES	/
F	Fill connection, plug-in and swivel-mounted (with or without filter)[2)]	YES	YES	YES
Z	Closed with plug screw[3)]	YES (outlet) (M16x1.5)	YES (M22x1.5)	YES (outlet) (M16x1.5)

[1)] Item no. 169-460-406 with filter (for oil applications), item no. 995-000-870 without filter (for fluid grease applications)
[2)] Item no. 995-997-297 with filter (for oil applications), item no. 5590-00000026 without filter (for fluid grease applications)
[3)] At least one outlet must be connected during operation:
– Plug screw for right or left outlet: item no. 995-001-854 (M16 x 1.5)
– Plug screw for center inlet: item no. 519-60445-1 (M22 x 1.5)
[4)] Position only possible opposite the electrical connection (bottom left / bottom right).

PUMP - CLS - _ _ _ X _ 2 - X 3 _ _ - _ _ _ X - _ _ _ _ _ _

Application
X: Industrial applications
M: Mobile applications

Electrical connections
See Table 8

Top right

Top left

Bottom right

Bottom left

Pre-filling
See Table 9

Table 8

Electrical connections

Top right / top left		**Bottom left / bottom right**	
Code	Connection	Code	Connection
X	No connection	X	No connection
A	M12 connector (4-pin, A-coded)	4	Bayonet connector (4-pin)
		7	Bayonet connector (7-pin)
		W	Rectangular connector (3+PE)

NOTE
The electrical connection of the pump is located on the upper part of the pump housing, on the right or the left. See also section 3.1. Power supply connection to the pump only with a bayonet connector or a rectangular connector. See wiring diagrams chapter 14.1.

Table 9

Pre-filling

Code	Lubricant
XX	Without lubricant
FT	Fluid grease Fuchs Plantogel ECO 00S or 000 S
RA	Special fluid grease

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. 14

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

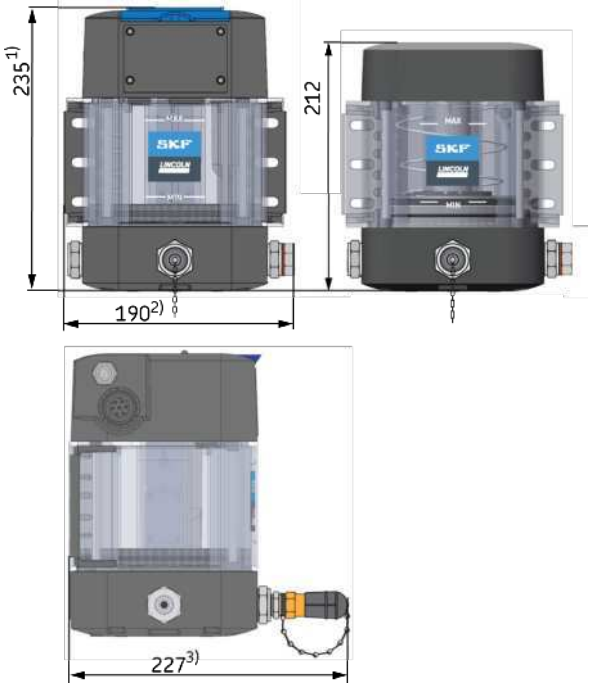
Observe the safety instructions and the technical data in this manual. Additionally, during assembly pay attention to the following:

- 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. 15



Mounting dimensions

1) 300 mm with filling hole open
2) 185 mm without plug screws
190 mm with a plug screw
205 mm with pivoted fill connection*
3) 169 mm with a plug screw
188 mm with filler nipple
195 mm with pivoted fill connection*
227 mm with fill connection**

*Item number 995-997-297 / 5590-00000026
**Item number 169-460-406 / 995-000-870

6.2 Assembly holes

NOTICE

Possible damage to the main machine and the pump

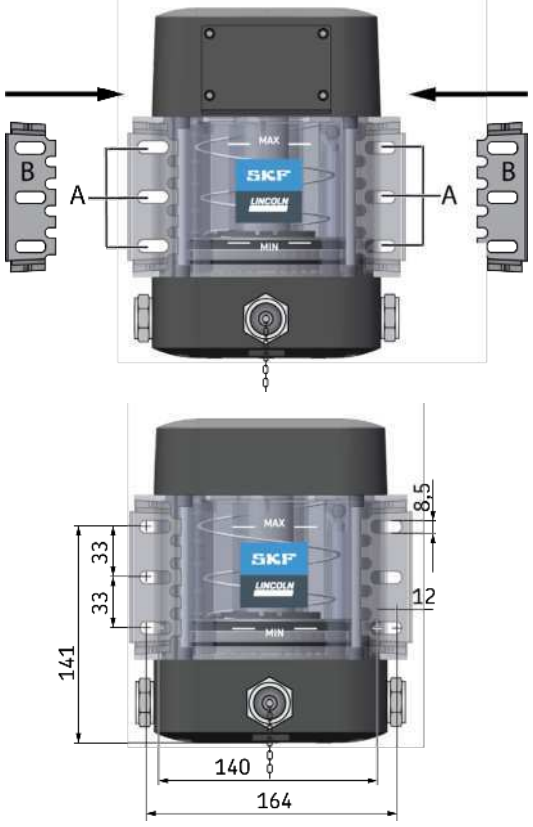
The assembly holes should be created only on non-load-bearing parts of the main machine. Do not fasten on two parts which move in opposite directions to one another (e.g., machine base and machine assembly). When installing, always use the accompanying mounting brackets and washers. The fastening screws should be fitted with appropriate screw locking.

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. 16



Fastening points

6.3 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.

6.4 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.

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 1

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	☐	☐
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	☐	☐

7.2 Inspections during first start-up

No unusual noises, vibrations, moisture accumulation, or 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	☐	☐

7.3 Triggering additional lubrication

NOTE
An additional lubrication can be triggered only during the pump's interval time.

NOTICE

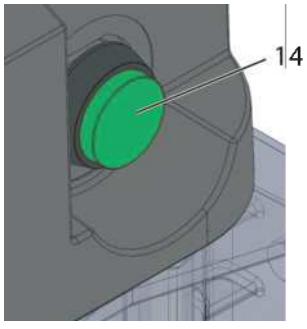
Possible damage to the main machine due to underlubrication.
Additional lubrication should continue until the metering device farthest from the pump has dispensed one complete dose of lubricant. This is the only way to ensure that all the lubrication points are supplied with additional lubricant.

To trigger additional lubrication, proceed as follows:

7.3.1 Pumps without control but with optional button for additional lubrication

1. Press the optional button for additional lubrication (**14**). The additional lubrication is carried out for as long as the button is pressed. The button is located on the upper part of the pump housing, on the right or the left.

Fig. 17



Button for additional lubrication

NOTE
An additional lubrication can be triggered only during the pump's interval time.

7.3.2 Pumps without control and without optional button for additional lubrication

7.3.2.1 Additional lubrication on pumps without control

To trigger additional lubrication on pumps without control, please refer to the documentation for the main machine/the control of that machine.

7.4 Acknowledge receipt of a fault indication

Please see the documentation of the superior machine or machine controller, if you want to acknowledge receipt of a fault in case of pumps without internal controller but with filling-level monitoring.

8 Operation

SKF products operate automatically to the greatest possible extent.
Basically, activities during standard operation are limited to:
Regular function checks and timely refilling of lubricant, and also cleaning the exterior if dirty.

8.1 Filling the pump with lubricant

NOTICE/ACHTUNG/ATTENTION/HUOMIO

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.

⚠ CAUTION

Lubricant coming out
Risk of injury

When filling the pump, make sure that no lubricant escapes into the surroundings from the vent hole (**3**). If any lubricant escapes, collect it immediately, and clean the components and the surroundings properly.

8.1.1 Initial filling of a pump delivered without lubricant, with follower plate

When filling for the first time, carry out the following steps:

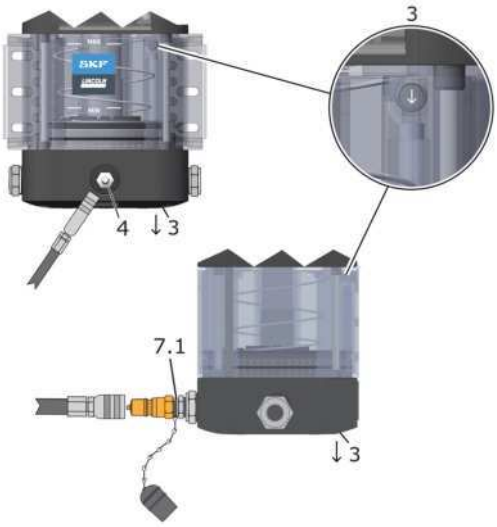
1. Align the pump so that it is upright.
2. Connect a filling pump to the fill connection (**7.1**) or filler nipple (**4**).
3. Switch on the filling pump and slowly fill the pump with lubricant.

NOTE

When a pump with follower plate is filled for the first time, the lubricant initially pushes the follower piston up until the vent hole (**3**) is released. During the remainder of the filling process, the air can then escape from the lubricant reservoir at the bottom of the pump housing.

4. Switch off the filling pump when the reservoir is filled with lubricant up to just below the MAX marking.

Fig. 18

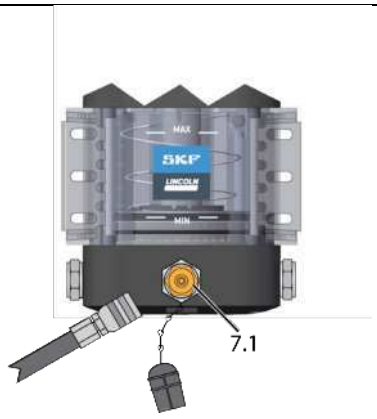


Initial filling of a pump delivered empty, with follower plate

8.1.2 Regular filling via the fill connection

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. 19



Regular filling via the fill connection

8.1.3 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. 20

Filling via the filler nipple

8.1.4 Regular filling with lubrication oil via the filling hole

NOTICE

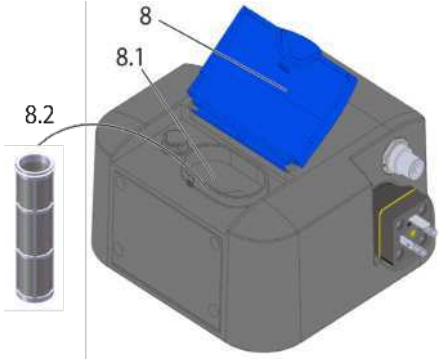
Possible damage to the pump and the lubrication system

Before filling with lubrication oil, check the filter insert for clogging and, if needed, clean or replace it before filling.

The closed filling hole (**8**) conceals the filling port (**8.1**). In the filling port (**8.1**), there is a filter insert (**8.2**).

1. Open the filling hole (**8**).
2. Check if the filter insert (**8.2**) is dirty. If needed, clean or replace it first.
3. Fill the reservoir up to just below the - MAX - marking.
4. Close the filling hole (**8**) (you should hear it lock shut).

Fig. 21



Filling with lubrication oil

8.1.5 Regular filling with fluid grease via the filling hole

NOTICE

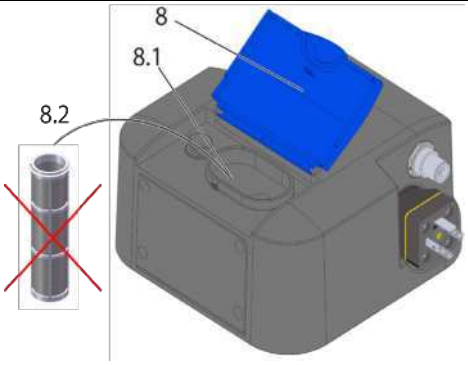
Possible damage to the pump and the lubrication system

Before filling with fluid grease, remove the filter insert, if it is present.

The closed filling hole (**8**) conceals the filling port (**8.1**).

1. Open the filling hole.
2. Check whether the filter insert (**8.2**) has been removed, and if not, remove the filter insert.
3. Fill the reservoir up to just below the - MAX - marking.
4. Close the filling hole (you should hear it lock shut).

Fig. 22



Fill with fluid grease only with the filter insert removed

9 Maintenance

9.1 Maintenance

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

Maintenance Checklist Table 10

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	☐	☐
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, or 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 filter of the fill connection

10.4.1 Fill connection 169-460-406

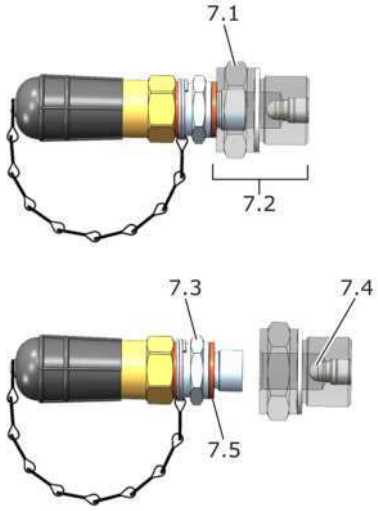
If the filter has to be cleaned due to clogging, proceed as described below:

1. Remove the fill connection together with the filter adapter (**7.2**) by applying a size 27 mm open-end wrench to the hexagon (**7.1**).
2. Remove the filter adapter (**7.2**) from the fill connection using a size 27 mm open-end wrench (**7.1**) and size 19 mm open-end wrench (**7.3**).
3. Clean the fill connection, filter adapter (**7.2**), and filter (**7.4**) with a suitable cleaning agent and dry them (using compressed air, for example).
4. Reinstall all the parts in reverse order. When installing, use a new flat washer (**7.5**) DIN 7603-A14x18-CU.

Tightening torques:
7.1 Fill connection with filter adapter (SW 27 mm): 20 Nm ± 2.0 Nm

7.3 Fill connection (SW 19 mm): 10 Nm ± 1.0 Nm

Fig. 23



Cleaning the fill connection with filter adapter

10.4.2 Fill connection 995-997-297

If the filter has to be cleaned due to clogging, proceed as described below:

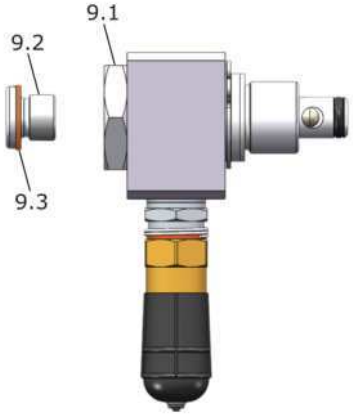
1. Remove the fill connection by applying a size 32 mm open-end wrench to the hexagon (**9.1**).
2. Use a size 6 mm hex key to undo and remove the plug screw (**9.2**) together with the flat washer (**9.3**).
3. Clean the fill connection with a suitable cleaning agent and dry it (using compressed air, for example).
4. Reinstall all the parts in reverse order. When inserting the plug screw (**9.2**), use a new flat washer (**9.3**) DIN 7603-A14x20-CU.

NOTICE

Tightening torque
Malfunction/leakage
When installing, make sure that the tightening torque does not increase sharply until the flat washer and the fill connection are flat up against the housing. If the tightening torque increases sharply earlier than that, the fill connection must be taken off and positioned on the thread again.

Tightening torque:
9.1 Fill connection, swivel-mounted (SW 32 mm):
20 Nm ± 2.0 Nm
9.2 Plug screw (SW 6 mm): 10 Nm ± 1.0 Nm

Fig. 24



Cleaning the filter in fill connection 995-997-297

10.5 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.

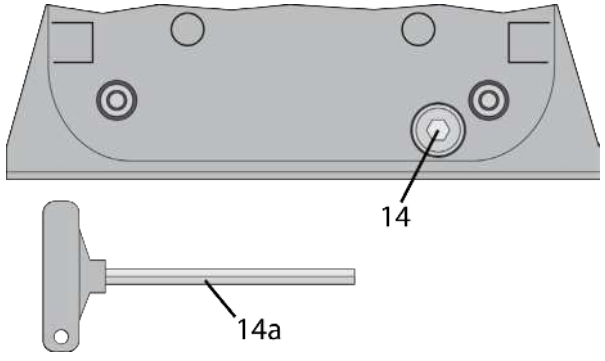
The easy-to-clean vent pipe can be ordered separately (see Spare Parts). The use of the vent pipe is recommended if the CLx pump is used in dirty surroundings or if there is a risk that vermin could nest in it (e.g. in agriculture).

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. 25



Cleaning the vent pipe

11 Faults, causes, and remedies

Table 11

Fault 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 interval 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 supplies either no lubricant at all or not enough	• Jam, malfunction within the centralized lubrication system • Internal or external leaks on the CLS pump; e.g., internal pressure limiting valve is defective. • 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) • Lubrication time or interval time of the pump on the control of the main machine is set incorrectly.	

12 Repairs

12.1 Repairs

The unit contains no parts which can be repaired.

NOTE
Carry out maintenance and cleaning at regular intervals (see section 9.1 and section 10).

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

Accessories are used to extend, supplement the functional range or to assemble the product.

Table 12

14.1 Closure screw

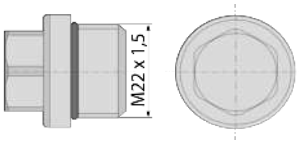
Designation	Qty.	Part number	Fig.
Cap screw M22x 1.5 including gasket to close unneeded outlets	1	519-60445-1	

Table 13

14.2 Plug screw for CLS pumps

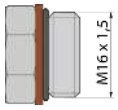
Designation	Pcs.	Item number	Figure
Plug screw M16 x 1.5 including seal for closing off an unused grease port	1	995-001-854	

Table 14

14.3 Fitting, complete, for CLS pumps

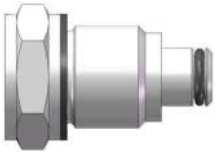
Designation	Pcs.	Item number	Figure
Fitting, complete, including seal	1	995-001-853	

Table 15

14.4 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 16

14.5 Grease port, plug-in with filter

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 with filter (320 µm).	1	169-460-406	

Table 17

14.6 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 18

14.7 Fill connection, pivoted, with filter

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, with filter (320 µm).	1	995-997-297	

Table 19

14.8 Adapter with filler nipple

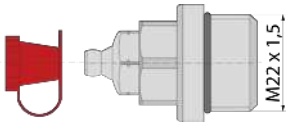
Designation	Pcs.	Item number	Figure
Adapter with filler nipple ST 1/4 acc. to NPTF, incl. seal	1	519-33840-1	
Adapter with filler nipple A2 AR 1/4, incl. seal	1	519-33959-1	
Adapter with filler nipple ST AR 1/4, incl. seal	1	519-33955-1	
Protective cap for filler nipple (red)	1	898-210-050	

Table 20

14.9 Vent pipe assy

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

Table 21

14.10 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 22

14.11 Power lead

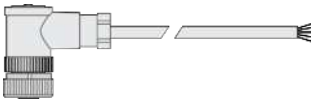
Designation	Pcs.	Item number	Figure
Power lead 10 m with bayonet connector (4/2-pin)	1	664-34167-9	
Power lead 10 m with bayonet connector (7/5-pin)	1	664-34428-3	
Power lead 10 m with rectangular connector, junction box (black)	1	664-36078-7	
Power lead 5 m with M12x1 connector, straight (A-coded)	1	179-990-600	
Power lead 5 m with M12x1 connector, 90° angled (A-coded)	1	179-990-601	
M12x1 connector, straight (A-coded)	1	179-990-371	
M12x1 connector, 90° angled (A-coded)	1	179-990-372	

Table 23

14.12 Filter insert, complete

Designation	Pcs.	Item number	Figure
Filter insert, complete, for filling with lubrication oil on CLS pumps with filling flap and without follower plate	1	993-000-098	

Table 24

14.13 Accessories

Suitable accessories (for connecting the lubrication piping or for further expansion of the lubrication system, etc.) can be found online in the latest SKF “Fittings and Accessories” product catalog.

15 Appendix

15.1 Connection diagrams

Table 25

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 26

Plug	Color	Pin	Item number	Length	Cross-section	Enclosure rating
 Bayonet, 7-pin A-coded	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, 4-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
 Rectangular connector 3 + PE	RD BN BK YE/GN	1 2 3 PE	664-36078-7	10 m	4 x 0.5 mm²	IP65
 M12x1 A-coded	BN WH BU BK ---	1 2 3 4 5	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

15.3 CL_-__1XY/Z_-X_FX-___X-MXX(7)(7)_

NOTE

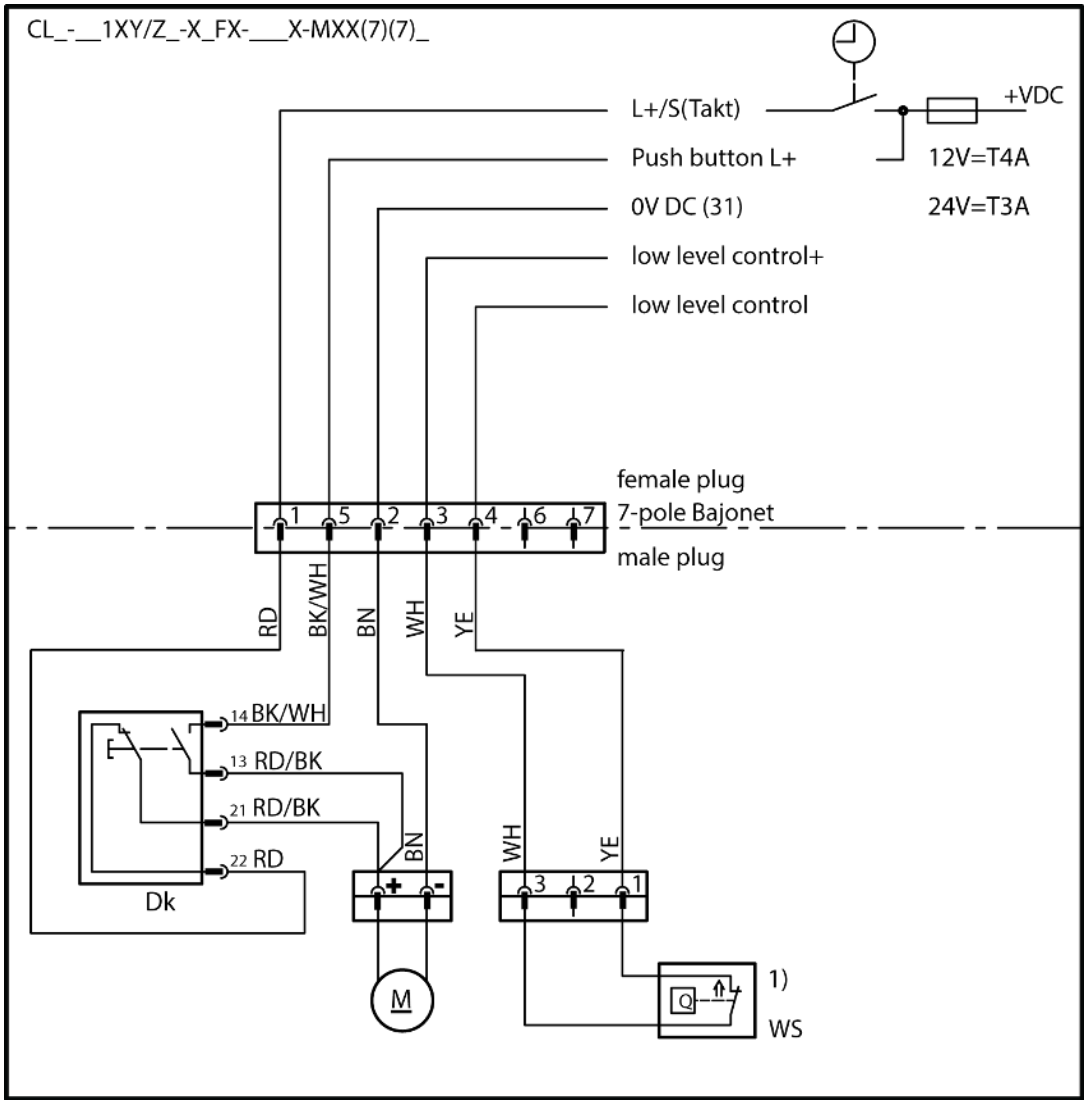
For the meaning of each detail of the type identification code, see the type identification code in this manual. The actual type identification code details of your pump can be found on the type plate on the pump.

Table 27

Terminal diagram valid for pumps with the following equipment features

- ✓ 7-pin bayonet connector
- ✓ 12 or 24 VDC
- ✓ Button for additional lubrication
- ✓ Mobile applications
- ✓ Low-level signal

Fig. 26



1) Contact opens at minimum fill level

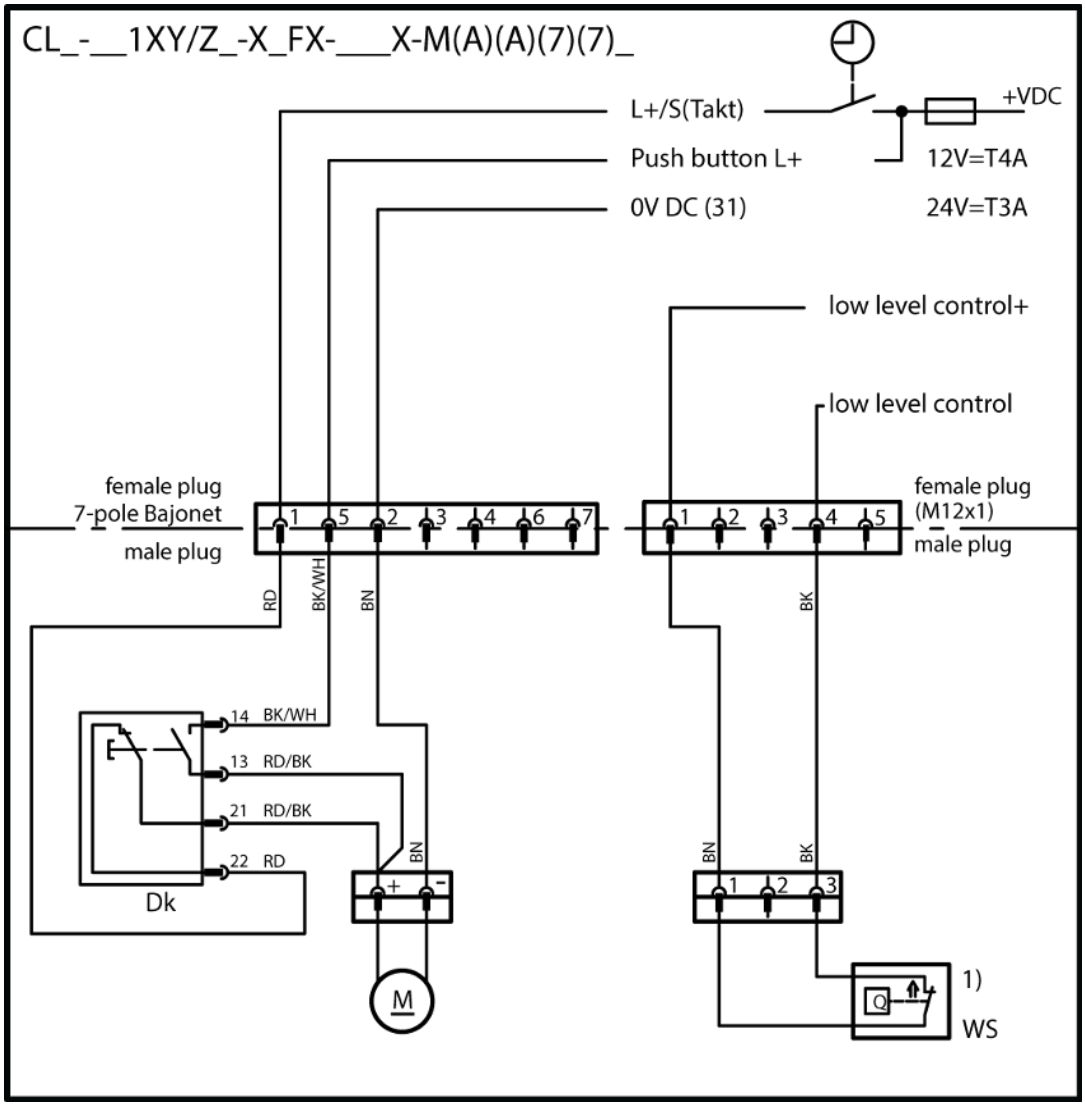
15.4 CL_-__1XY/Z_-X_FX-___X-M(A)(A)(7)(7)_

Table 28

Terminal diagram valid for pumps with the following equipment features

- ✓ 7-pin bayonet connector
- ✓ 4-pin M12 connector (A-coded)
- ✓ Button for additional lubrication
- ✓ 12 or 24 VDC
- ✓ Low-level signal
- ✓ Mobile applications

Fig. 27



1) Contact opens at minimum fill level

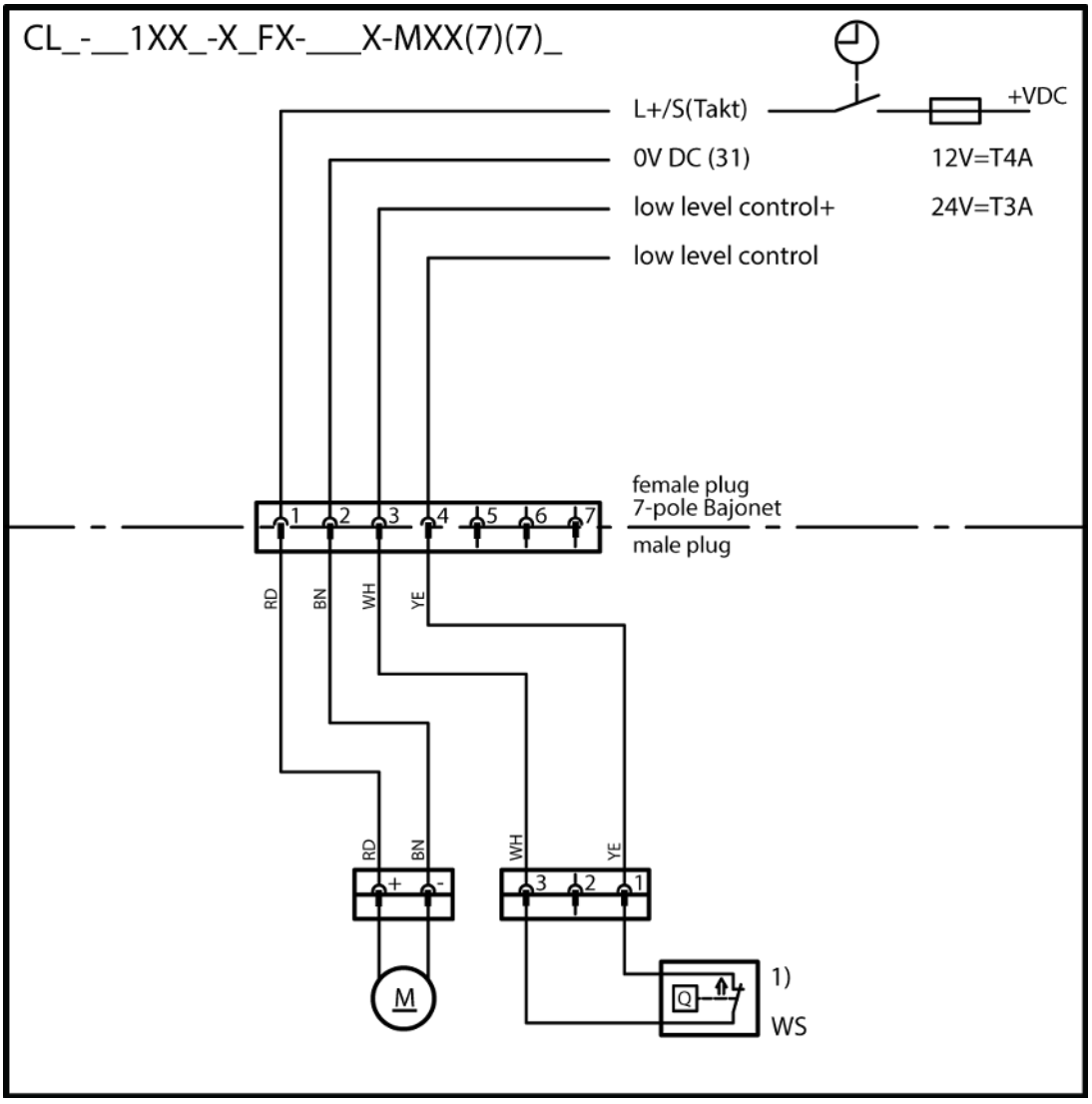
15.5 CL_-__1XX_-X_FX-___X-MXX(7)(7)_

Table 29

Terminal diagram valid for pumps with the following equipment features

- ✓ 7-pin bayonet connector
- ✓ Low-level signal
- ✓ 12 or 24 VDC
- ✓ Mobile applications

Fig. 28



1) Contact opens at minimum fill level

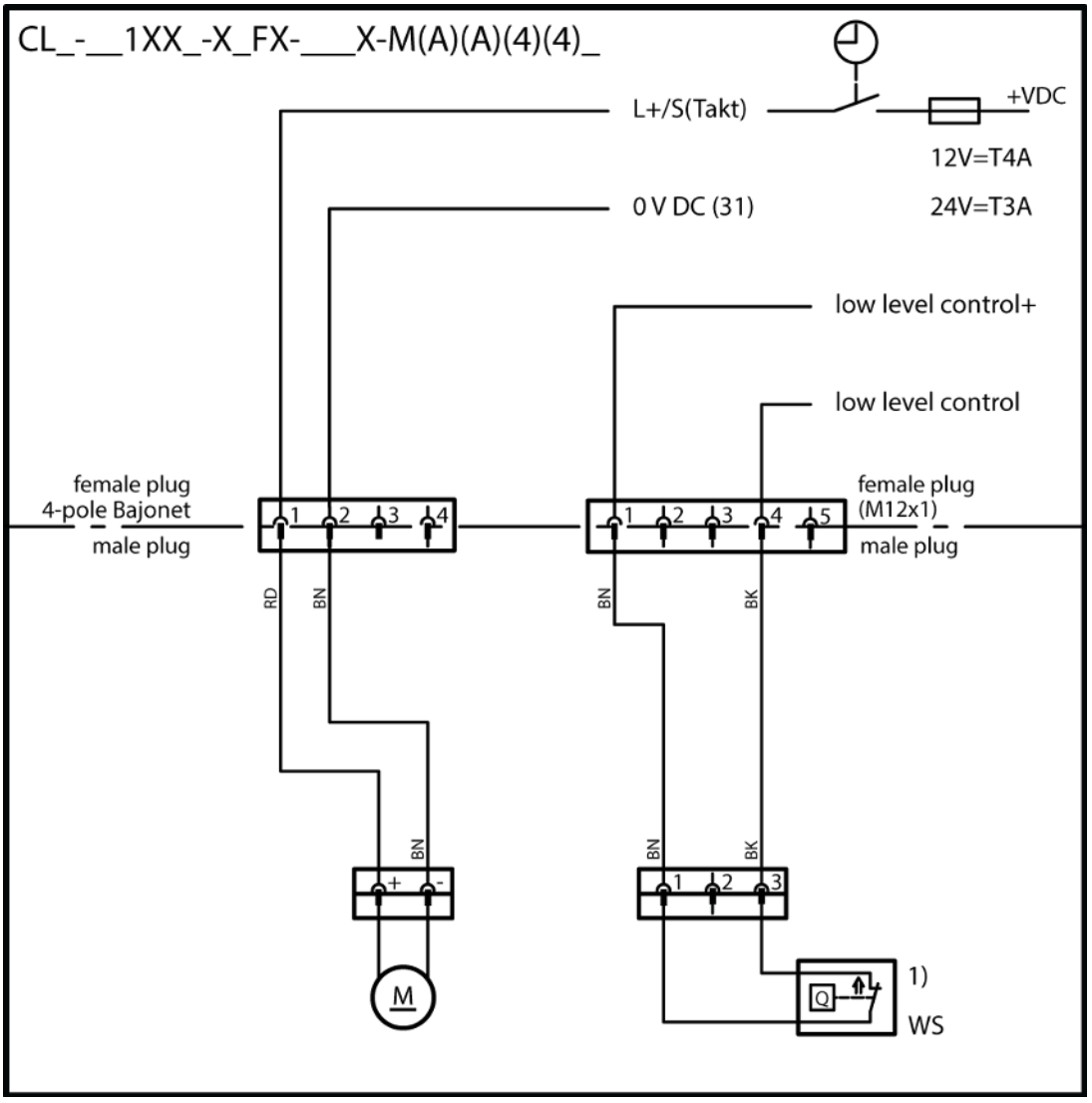
15.6 CL_-__1XX_-X_FX-___X-M(A)(A)(4)(4)_

Table 30

Terminal diagram valid for pumps with the following equipment features

- ✓ 1 x 4-pin M12 connector (A-coded)
- ✓ 1 x 4-pin bayonet connector
- ✓ Low-level signal
- ✓ Mobile applications
- ✓ 12 or 24 VDC

Fig. 29



1) Contact opens at minimum fill level

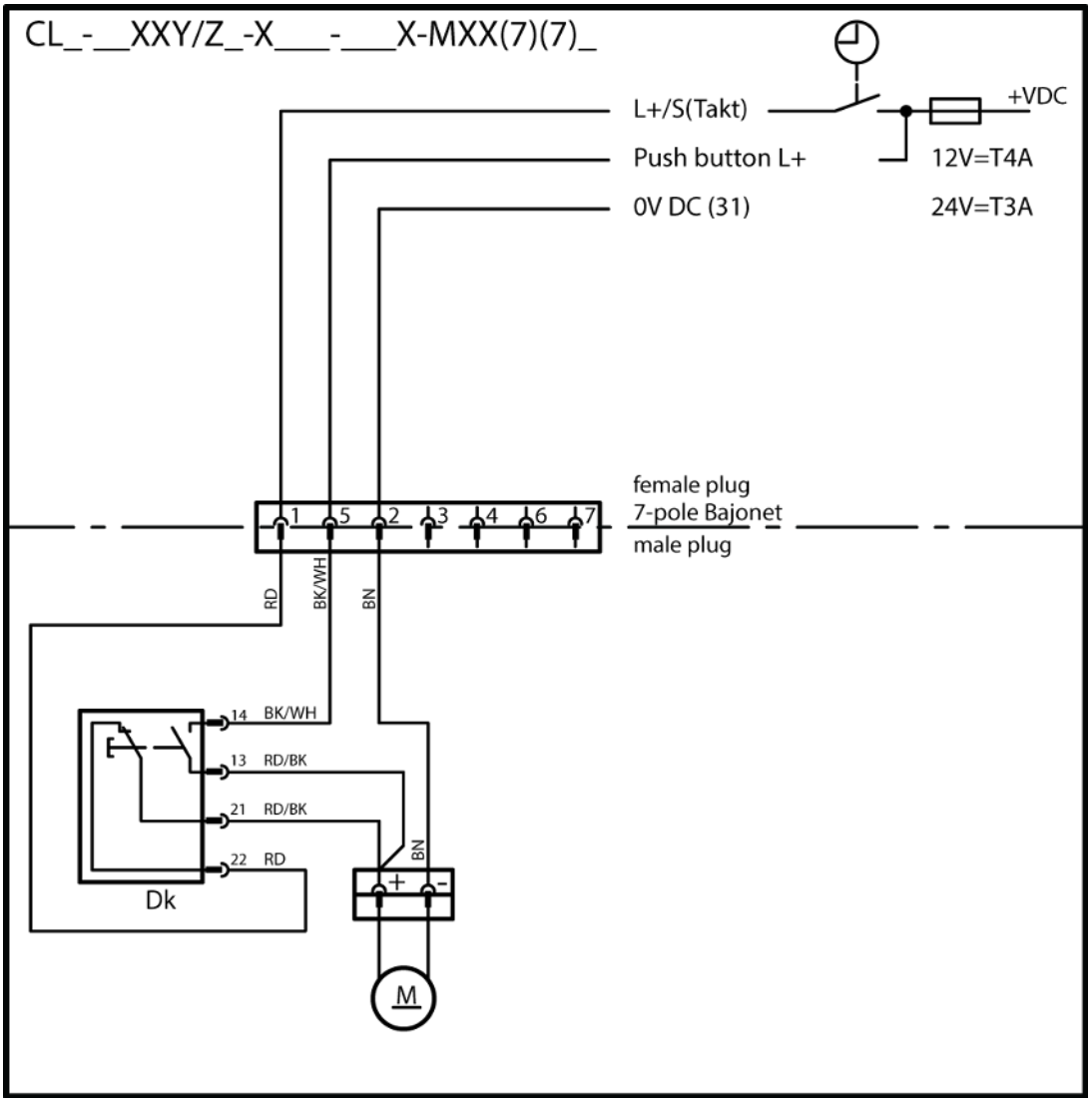
15.7 CL_-__XXY/Z_-X___-___X-MXX(7)(7)_

Table 31

Terminal diagram valid for pumps with the following equipment features

✓ 1 x 7-pin bayonet connector ✓ Button for additional lubrication ✓ 12 or 24 VDC
✓ Mobile applications

Fig. 30



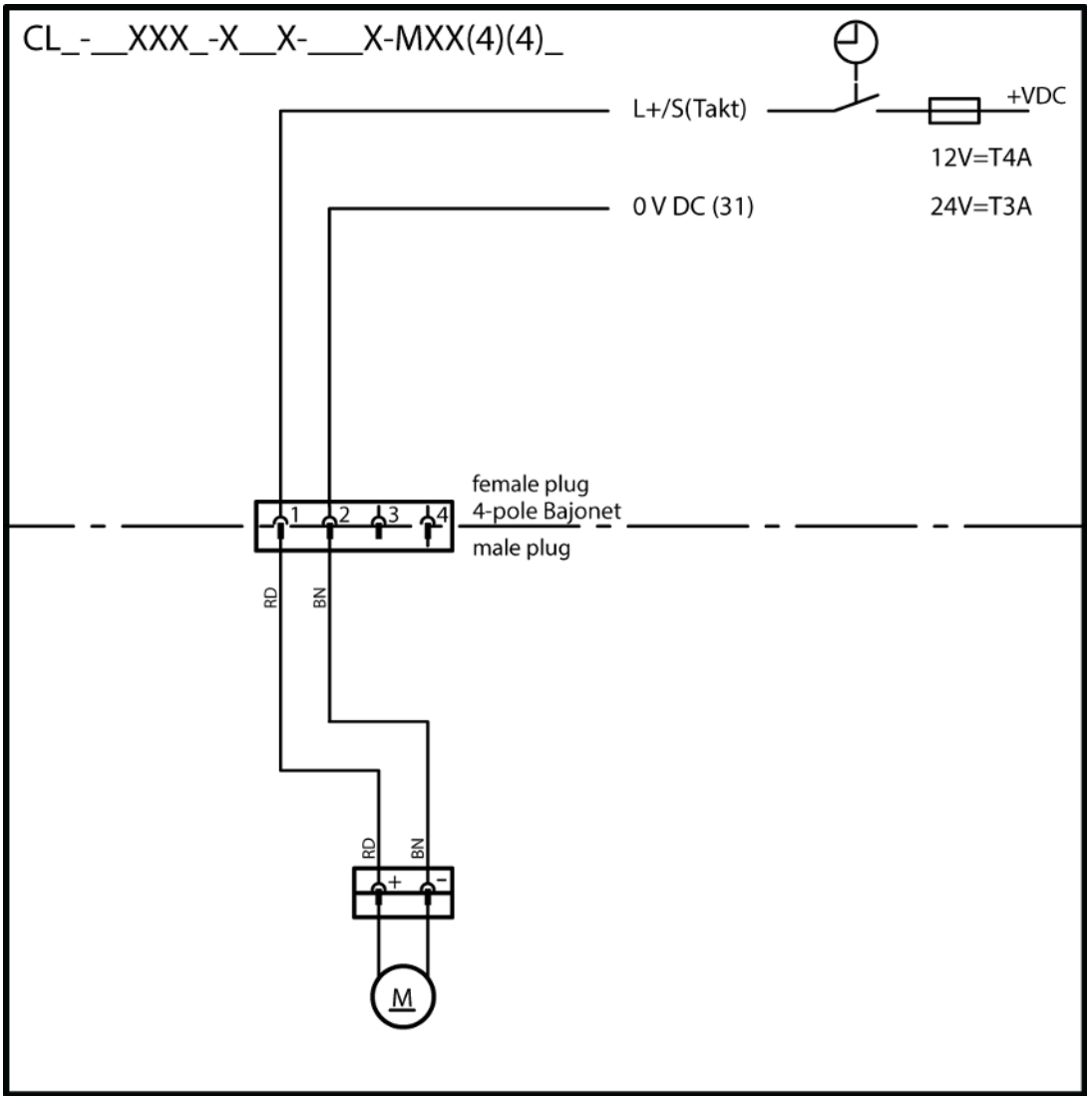
15.8 CL_-__XXX_-X__X-___X-MXX(4)(4)_

Table 32

Terminal diagram valid for pumps with the following equipment features

✓ 1 x 4-pin bayonet connector ✓ 12 or 24 VDC ✓ Mobile applications

Fig. 31



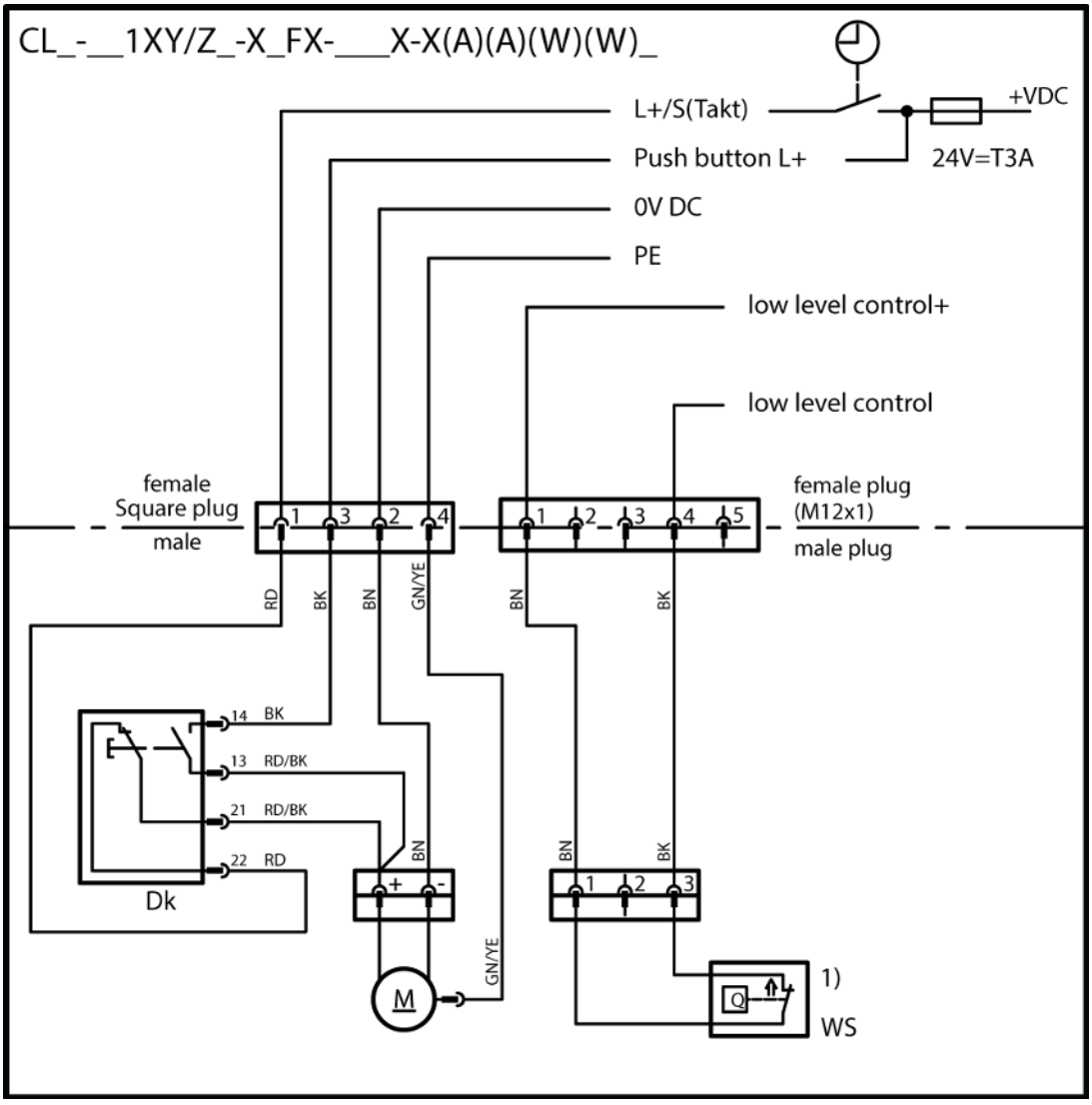
15.9 CL_-__1XY/Z_-X_FX-___X-X(A)(A)(W)(W)_

Table 33

Terminal diagram valid for pumps with the following equipment features

- ✓ 1 x 4-pin M12 connector (A-coded)
- ✓ 1 x rectangular connector
- ✓ Button for additional lubrication
- ✓ Low-level signal
- ✓ 24 VDC
- ✓ Industrial applications

Fig. 32



1) Contact opens at minimum fill level

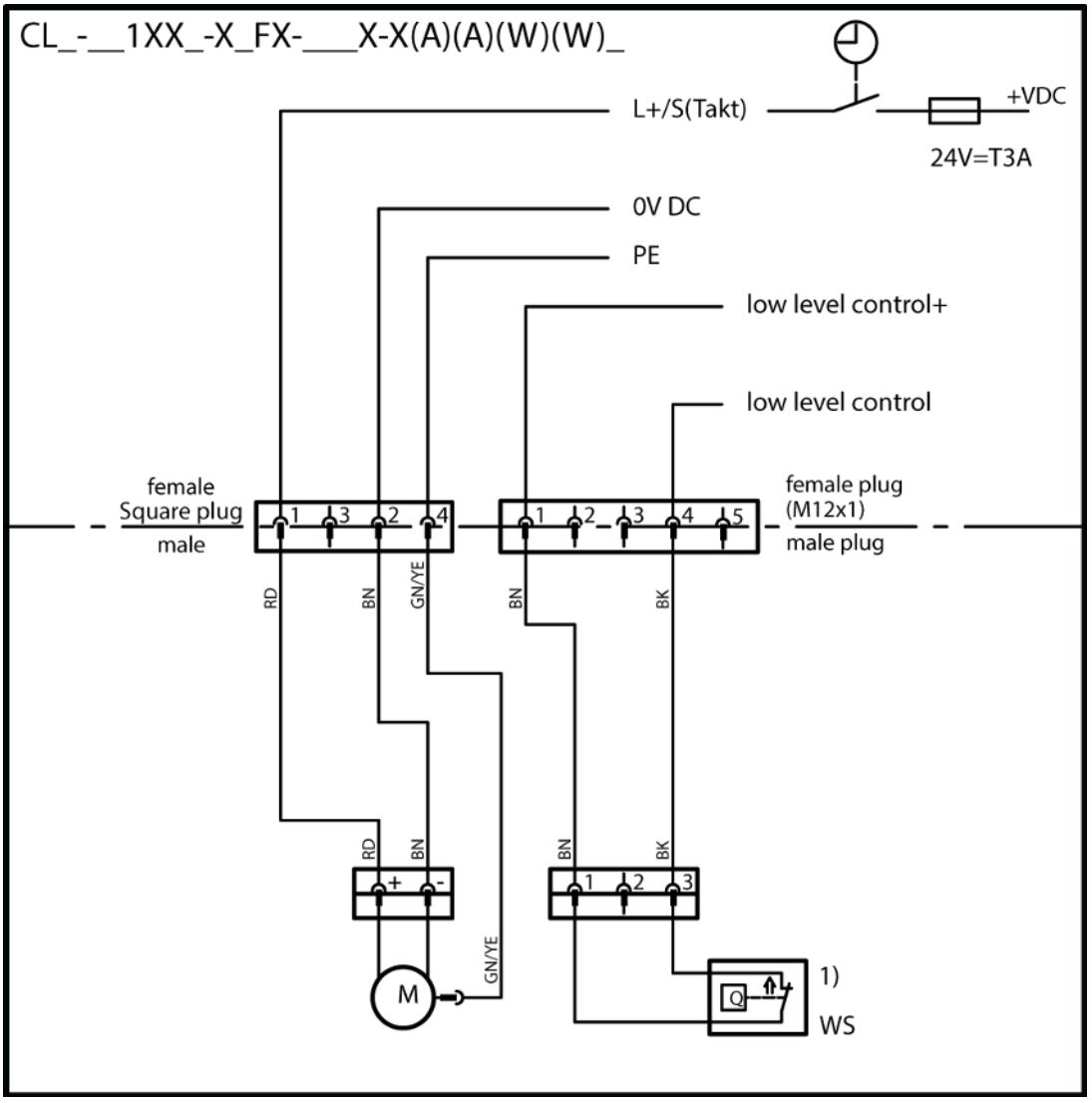
15.10 CL_-__1XX_-X_FX-___X-X(A)(A)(W)(W)_

Table 34

Terminal diagram valid for pumps with the following equipment features

- ✓ 1 x 4-pin M12 connector (A-coded)
- ✓ 1 x rectangular connector
- ✓ Low-level signal
- ✓ Industrial applications
- ✓ 24 VDC

Fig. 33



1) Contact opens at minimum fill level

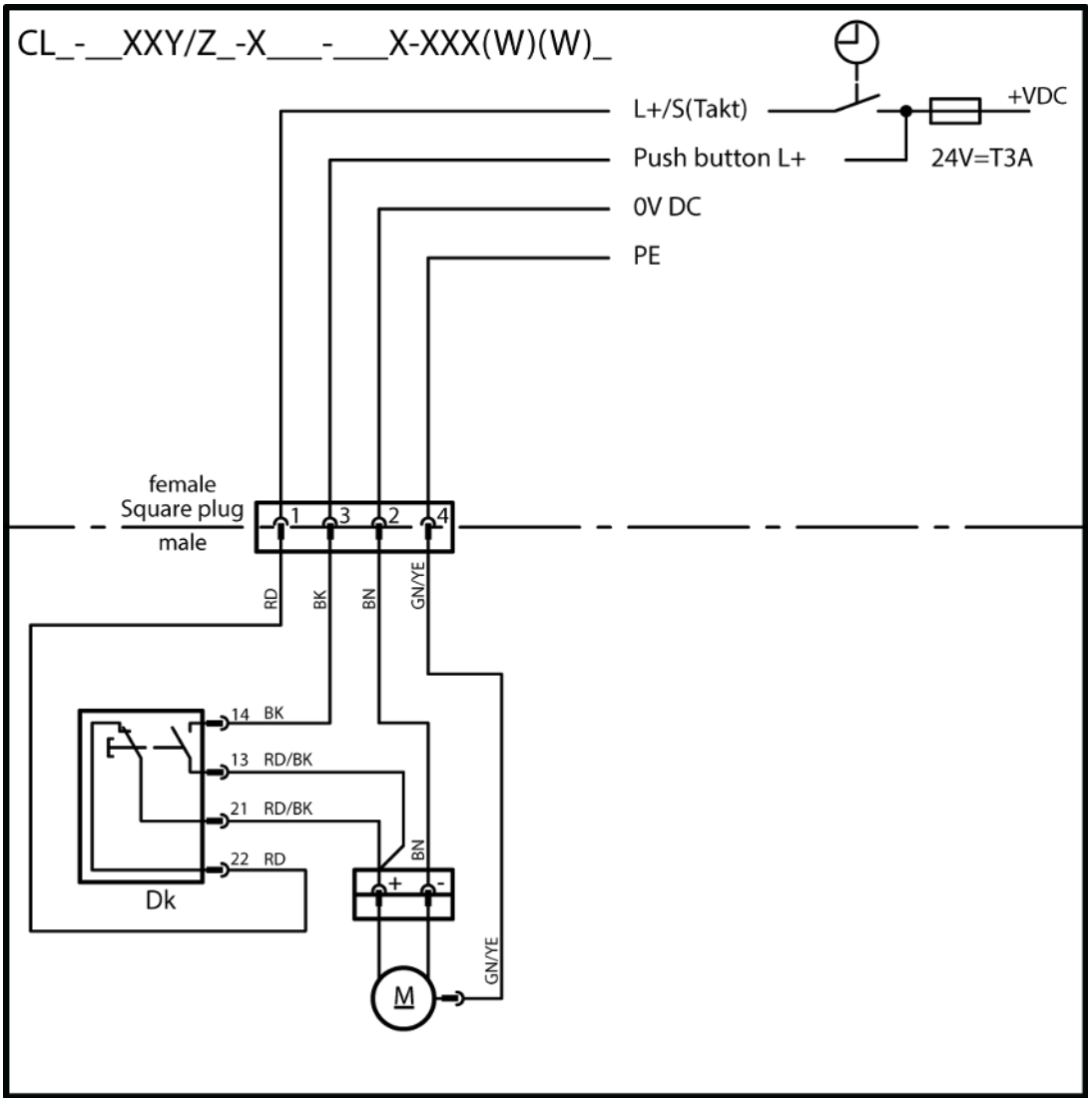
15.11 CL_-__XXY/Z_-X___-___X-XXX(W)(W)_

Table 35

Terminal diagram valid for pumps with the following equipment features

✓ 1 x rectangular connector (3+PE) ✓ Button for additional lubrication ✓ 24 VDC
✓ Industrial applications

Fig. 34



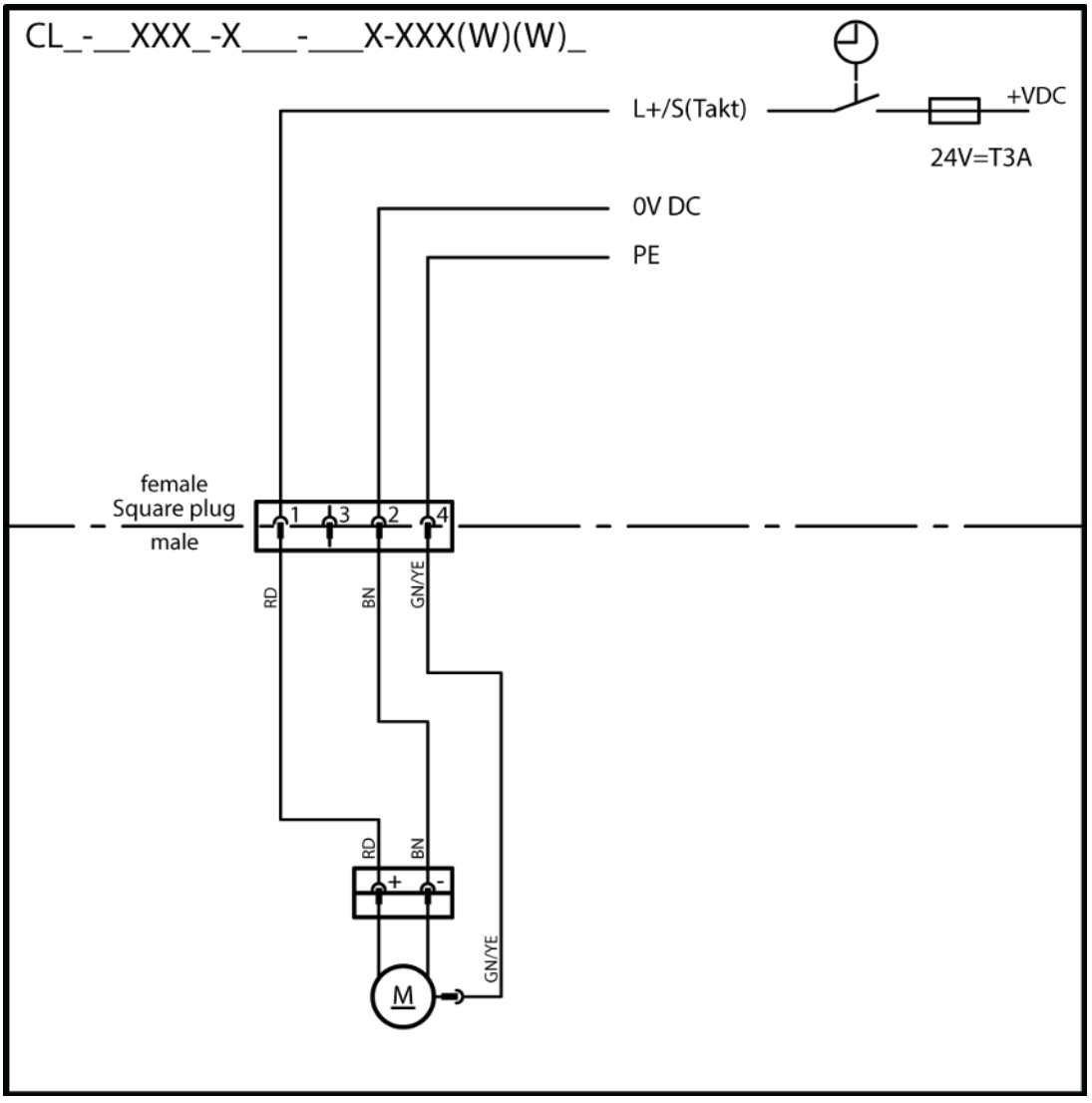
15.12 CL_-__XXX_-X___-___X-XXX(W)(W)_

Table 36

Terminal diagram valid for pumps with the following equipment features

✓ 1 x rectangular connector (3+PE) ✓ 24 VDC ✓ Industrial applications

Fig. 35



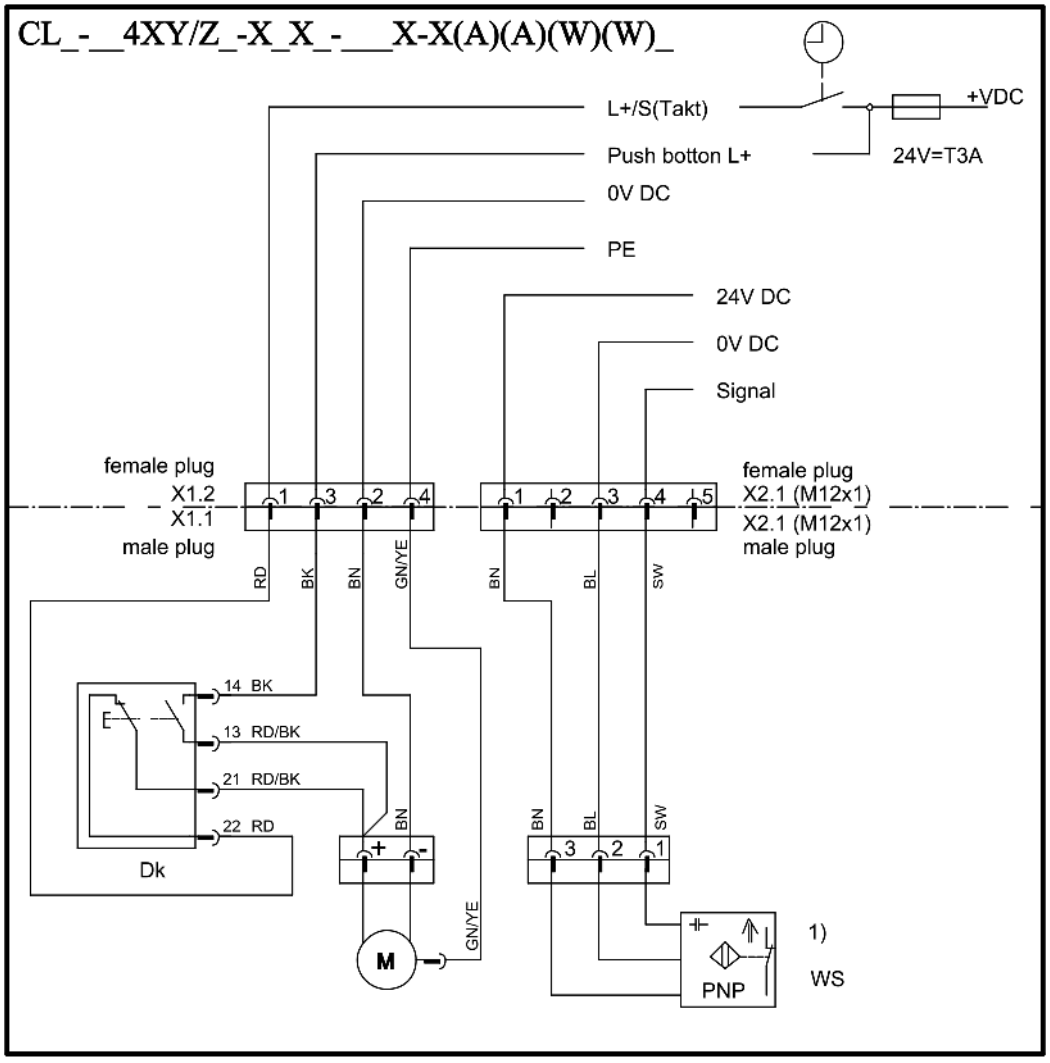
15.13 CL_-__4XY/Z_-X_X_-___X-X(A)(A)(W)(W)_

Table 37

Terminal diagram valid for pumps with the following equipment features

- ✓ 5-pin M12 connector (A-coded)
- ✓ Rectangular connector
- ✓ Button for additional lubrication
- ✓ Pre-warning for low-level signal
- ✓ 24 VDC
- ✓ Industrial applications

Fig. 36



1) Contact opens at pre-warning for minimum fill level

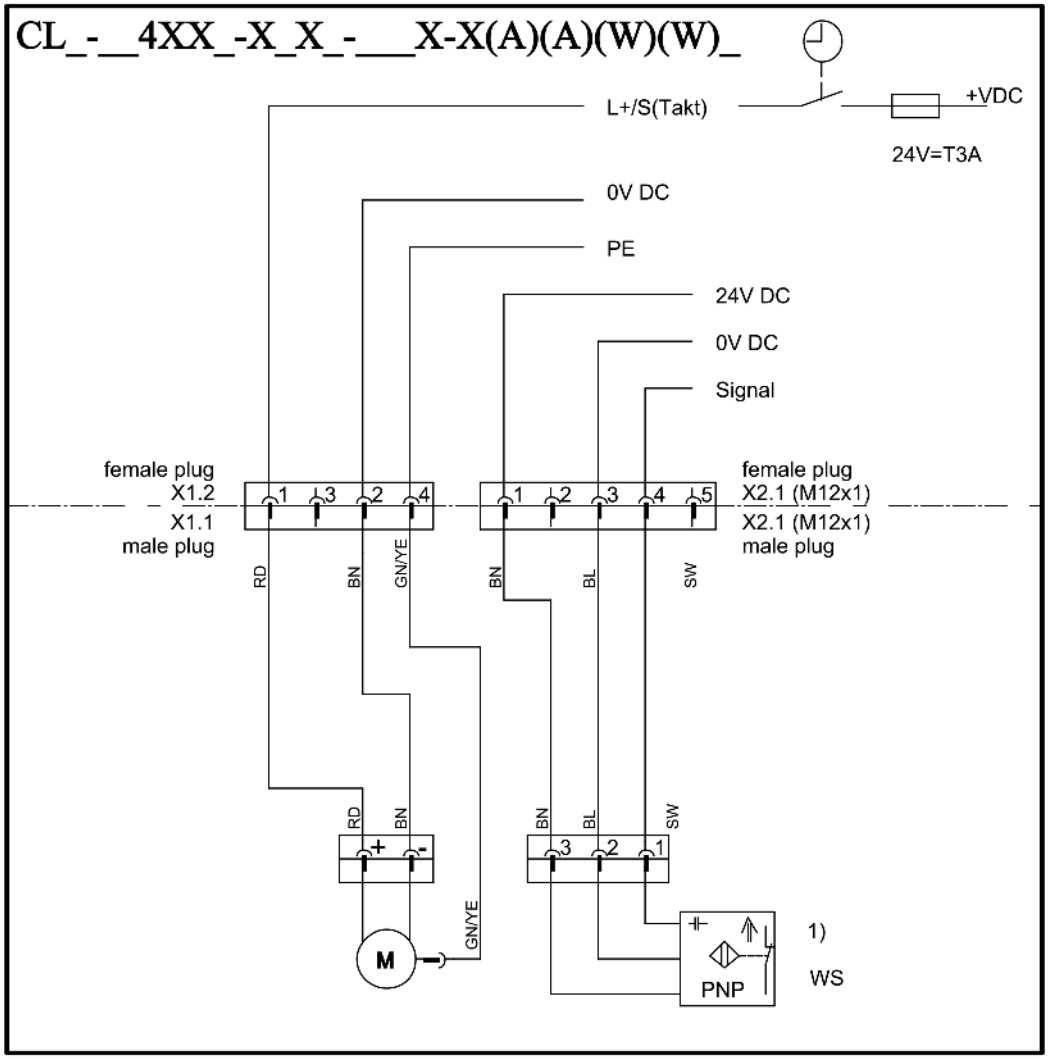
15.14 CL_-__4XX_-X_X_-___X-X(A)(A)(W)(W)_

Table 38

Terminal diagram valid for pumps with the following equipment features

- ✓ 5-pin M12 connector (A-coded)
- ✓ Rectangular connector
- ✓ Pre-warning for low-level signal
- ✓ Industrial applications
- ✓ 24 VDC

Fig. 37



1) Contact opens at pre-warning for minimum fill level

15.15 China RoHS Table

Table 39

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	O	O	O	O	O

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.)

O：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.)

skf.com/lubrication

951-171-069-EN 20.11.2023