Lubrication pump P623S
for single-line lubrication systems

Installation instructions
following machinery directive 2006/42/EC

EN

951-171-014-EN
Version 01
2016/03/14

EC Declaration of incorporation following machinery directive 2006/42/EC, annex II, part 1 B

The manufacturer, SKF Lubrication Systems Germany GmbH, Walldorf Facilities, Heinrich-Hertz-Str. 2-8, DE - 69190 Walldorf, hereby declares that the partly completed machinery

Designation:	Electrically driven pump to supply lubricant during intermittent operation within a centralized lubrication system
Type:	P623S
Part number:	645-xxxxx-x
Year of construction:	See type identification plate

complies with the following basic safety and health requirements of the EC machinery directive 2006/42/EC at the time when first being launched in the market.

1.1.2 · 1.1.3 · 1.3.2 · 1.3.4 · 1.5.1 · 1.5.6· 1.5.8 · 1.5.9 · 1.6.1 · 1.7.1 · 1.7.3 · 1.7.4

The special technical documents were prepared following Annex VII part B of this directive. Upon justifiable request, these special technical documents can be forwarded electronically to the respective national authorities. The person empowered to assemble the technical documentation on behalf of the manufacturer is the head of standardization. See manufacturer's address.

Furthermore, the following directives and standards were applied:

2011/65/EU	RoHS II
2014/30/EU	Electromagnetic compatibility | Industry

Standard	Edition	Standard	Edition	Standard	Edition	Standard	Edition
DIN EN ISO 12100	2011	DIN EN ISO 50581	2013	DIN EN 60034-1	2011	DIN EN 61000-6-4	2011
DIN EN ISO 809	2012	DIN EN 60947-5-1	2010	DIN EN 61000-6-2	2006		
DIN EN 60204-1	2007	DIN EN 61131-2	2008	Amendment	2011		
Amendment	2010	Amendment	2009				

The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the previsions of machinery directive 2006/42/EC and any other applicable directives.

Walldorf, February 24, 2016

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Legal disclosure

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Training courses
In order to provide a maximum of safety and economic viability, SKF carries out detailed training courses. It is recommended that the training courses are attended. For more information please contact the respective SKF Service address.

Copyright

Warranty
The instructions do not contain any information on the warranty. This can be found in our general terms and conditions.

Disclaimer
The manufacturer shall not be held responsible for damages caused by:

- non appropriate use
  faulty assembly, operation, setting, maintenance, repair, negligence or accidents
- use of inappropriate lubricants
- improper or late response to malfunctions
- unauthorized modifications of the product
- the use of non-original SKF spare parts

Liability for loss or damage resulting from the use of our products is limited to the maximum purchase price. Liability for consequential damages of whatever kind is excluded.

Table of contents

Explanation of symbols, signs and abbreviations

The following abbreviations may be used within these instructions. Symbols within safety notes mark the kind and source of the hazard.

	General warning		Dangerous electrical voltage		Risk of falling		Hot surfaces
	Unintentional intake		Crushing hazard		Pressure injection		Suspended load
	Electrostatically sensitive components						
	Wear personal protective equipment (goggles)		Wear personal protective equipment (face shield)		Wear personal protective equipment (gloves)		Wear personal protective equipment (protective clothes)
	Wear personal protective equipment (safety shoes)		Release the product.		General obligation		
	Keep unauthorized persons away.		Protective earth		Safety extra-low voltage (SELV)		Safe galvanic isolation (SELV)
	CE marking		Disposal, recycling		Disposal of waste electrical and electronic equipment		

	Warning level	Consequence	Probability
	DANGER	Death, serious injury	imminent
	WARNING	Serious injury	possible
	CAUTION	Minor injury	possible
	NOTICE	Property damage	possible

Symbol	Meaning
●	Chronological guidelines
○	Lists
☞	Refers to other facts, causes, or consequences

Abbreviations and conversion factors

re.	regarding	°C	degrees Celsius	°F	degrees Fahrenheit
approx.	approximately	K	Kelvin	Oz.	Ounce
i.e.	that is	N	Newton	fl. oz.	fluid ounce
etc.	et cetera	h	hour	in.	inch
poss.	possibly	s	second	psi	pounds per square inch
if appl.	if applicable	d	day	sq.in.	square inch
a.a.r.	as a rule	Nm	Newtonmeter	cu. in.	cubic inch
incl.	including	ml	millilitre	mph	miles per hour
min.	minimum	ml/d	millilitre per day	rpm	revolutions per minute
max.	maximum	cc	cubic centimetre	gal.	gallon
min.	minute	mm	millimetre	lb.	pound
etc.	et cetera	l	litre	hp	horse power
e.g.	for example	dB (A)	Sound pressure level	kp	kilopound
kW	kilowatt	>	greater than	fpsec	feet per second
U	Voltage	<	less than	Conversion factors	
R	resistance	±	plus/minus	Length	1 mm = 0.03937 in.
I	current	Ø	diametre	Area	1 cm^2 = 0.155 sq.in
V	volt	kg	kilogram	Volume	1 ml = 0.0352 fl.oz.
W	watt	rh	relative humidity		1 l = 2.11416 pints (US)
AC	alternating current	≈	about	Mass	1 kg = 2.205 lbs
DC	direct current	=	equal to		1 g = 0.03527 oz.
A	ampere	%	per cent	Density	1 kg/cc = 8.3454 lb./gal(US)
Ah	Ampere hour	‰	per mille		1 kg/cc = 0.03613 lb./cu.in.
Hz	Frequency [Hertz]	≥	greater than	Force	1 N = 0.10197 kp
nc	normally closed	≤	less than	Pressure	1 bar = 14.5 psi
no	normally open contact	mm^2	square millimetre	Temperature	°C = (°F-32) x 5/9
OR	logical OR	rpm^{-1}	revolutions per minute	Output	1 kW = 1.34109 hp
&	logical AND			Acceleration	1 m/s^2 = 3.28084 $ft./s^2$
				Speed	1 m/s = 3.28084 fpsec.
					1 m/s = 2.23694 mph

1. Safety instructions

1.1 General safety instructions

- The owner must ensure that safety information has been read by any persons entrusted with works on the product or by those persons who supervise or instruct the before-mentioned group of persons. In addition, the owner must also ensure that the relevant personnel are fully familiar with and have understood the contents of the Instructions. It is prohibited to commission or operate the product prior to reading the Instructions.
- These Instructions must be kept for further use.
- The described products were manufactured according to the state of the art. Risks may, however, arise from a usage not according to the intended purpose and may result in harm to persons or damage to material assets.
- Any malfunctions which may affect safety must be remedied immediately. In addition to these Instructions, general statutory regulations for accident prevention and environmental protection must be observed.

1.2 General behaviour when handling the product

- The product may be used only in awareness of the potential dangers, in proper technical condition, and according to the information in these instructions.
- Familiarize yourself with the functions and operation of the product. The specified assembly and operating steps and their sequences must be observed.
- Any unclear points regarding proper condition or correct assembly/ operation must be clarified. Operation is prohibited until issues have been clarified.
- Unauthorized persons must be kept away.
- Precautionary operational measures and instructions for the respective work must be observed.
- Responsibilities for different activities must be clearly defined and observed. Uncertainty seriously endangers safety.
- Safety-related protective and emergency devices must not be removed, modified or affected otherwise in their function and are 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.
- Wear personal protective equipment.
- Never use parts of the centralized lubrication system or of the machine as standing or climbing aids.

1.3 Intended use

Supply of lubricants within a single-line system following the specifications, technical data and limits stated in these Instructions:
Usage is allowed exclusively for professional users in the frame of commercial and economic activities.

1.4 Foreseeable misuse

Any usage differing from the one stated in these Instructions is strictly prohibited. It is expressly forbidden to be used:

- outside the indicated operating temperature range
- with non-specified means of operation
- without adequate pressure relief valve
- in continuous operation
- in areas with aggressive or corrosive materials (e.g. high ozone pollution). These may affect seals and painting.
- in areas with harmful radiation (e. g. ionising radiation)
- to supply, transport, or store hazardous substances and mixtures in accordance with annex I part 2-5 of the CLP regulation (EG 1272/2008) and marked with GHS01 - GHS06 and GHS08 hazard pictograms.
- to feed, forward, or store gases, liquefied gases, dissolved gases, vapours, or fluids whose vapour pressure exceeds normal atmospheric pressure (1013 mbar) by more than 0.5 bar at the maximum permissible operating temperature.
- in an explosion protection zone.

1.5 Painting of plastic parts

Painting of any plastic parts or seals of the described products is expressly prohibited. Remove or tape plastic parts completely before painting the superior machine

1.6 Notes related to the CE marking

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

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

Reference on Low Voltage Directive 2014/35/EU
The protective regulations of Low Voltage Directive 2014/35/EU are fulfilled according to annex I (1.5.1) of Machinery Directive 2006/42/EC.
Reference on Pressure Equipment Directive 2014/68/EU
Because of its performance data the product does not achieve the limit values defined in Article 4 (1) (a) (i) and is therefore excluded from the scope of application of Pressure Equipment Directive 2014/68/EU following Article 4 (3).

1.7 Modifications of the product

Unauthorized conversions or modifications may result in unforeseeable impacts on safety. Therefore, any unauthorized conversions or modifications are expressly prohibited.

1.8 Prohibition of certain activities

Due to potential sources of faults that may not be visible the following activities may be carried out by trained and authorized specialists only:

- Repairs or changes to the electrical equipment of the pump
- Replacement of or changes on the pistons of the pump elements

1.9 Inspections prior to delivery

The following inspections were carried out prior to delivery:

- Safety and functional tests
- Electrical inspections following DIN EN 60204-1:2007 / VDE 0113-1:2007 (for electrically driven products.

1.10 Other applicable documents

In addition to these instructions, the following documents must be observed by the respective target group:

- Operational instructions and approval rules
- Safety data sheet of the lubricant used

Where appropriate:

- Project planning documents
- Additional information on special versions of the pump. You will find these in the special system documentation.
- Any documents of other components required to set up the centralized lubrication system

1.11 Markings on the product

Warning of dangerous electrical voltage

Warning of spring-loaded components when opening the reservoir lid of pumps with follower plate

Warning of unintended intake by the stirring paddle with the reservoir lid being open

Marks the protective conductor connection

1.12 Notes related to the type identification plate

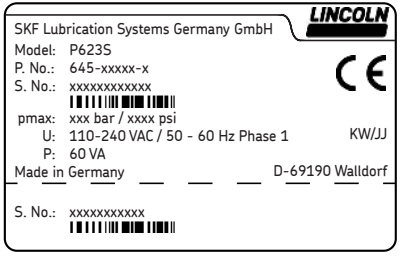
The type identification plate states important characteristics such as type designation, order number, and regulatory characteristics.
To ensure that the loss of data due to an illegible type identification plate is avoided, the characteristics should be entered in the Instructions.

Model: _____

P. No. _____

S. No. _____

(CW/YY) _____
Calendar week/year of construction



1.13 Persons authorized to operate the pump

1.13.1 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.

1.13.2 Specialist in mechanics

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

1.13.3 Specialist in electrics

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

1.14 Briefing of external technicians

Prior to commencing the activities, external technicians must be informed by the operator of the company safety provisions, the applicable accident prevention regulations to be maintained, and the functions of the superordinate machine and its protective devices.

1.15 Provision of personal protective equipment

The operator must provide suitable personal protective equipment for the respective location of operation and the purpose of operation.

1.16 Order

The following must be observed during commissioning and operation.

- Any information within this manual and the information within the referenced documents.
- All laws and regulations to be complied with by the user.

1.17 Emergency stopping of the pump station

In case of an emergency stop the pump station by:

- Interrupting the power supply to the pump
- Using measures determined by the operator, such as actuating the emergency stop switch of the superior machine.

1.18 Transport, installation, maintenance, malfunctions, repair, shutdown, disposal.

- All relevant persons must be informed of the activity prior to starting any work. Observe the precautionary measures and work instructions provided by the operator.
- Carry out transport using suitable transport and hoisting equipment on suitable ways only.
- Maintenance and repair work can be subject to restrictions in low or high temperatures (e.g. changed flow properties of the lubricant). Therefore, where possible, try to carry out maintenance and repair work at room temperature.
- Prior to performing work, the product and the machine, into which the product will be integrated, must be depressurized and secured against unauthorized activation. Observe all electrotechnical safety regulations.
- Ensure through suitable measures that movable or detached parts are immobilized during the work and that no limbs can be caught in between by inadvertent movements.
- Assemble the product only outside of the operating range of moving parts, at an adequate distance from sources of heat or cold. Other units of the machine or vehicle must not be damaged or impaired in their function by the installation.
- Dry or cover wet, slippery surfaces accordingly.
- Cover hot or cold surfaces accordingly.
- Work on electrical components must be carried out by electrical specialists only. Observe any waiting periods for discharging, if necessary. Carry out works on electrical components only while the system is depressurized and use voltage isolated tools suitable for electrical works only.
- Carry out electrical connections only according to the information in the valid wiring diagram and taking the relevant regulations and the local connection conditions into account.
- Do not touch cables or electrical components with wet or damp hands.
- Fuses must not be bypassed. Replace defective fuses always by fuses of the same type.
- To avoid potential differences, where applicable, use the potential connection of the pump.
- Adhere to any protective measures, e. g. connection of protective conductor, IP type of protection, safety distances.
- Undertake drilling at non-critical, non-load bearing parts only. Use any available boreholes. Do not damage lines and cables when drilling.
- Observe possible abrasion points. Protect the parts accordingly.

- All components used must be designed according to the maximum operating pressure and the maximum respectively minimum operating temperature.
- No parts of the centralized lubrication system may be subjected to torsion, shear, or bending.
- Check all parts prior to their usage for contamination and clean, if necessary.
- Lubricant lines should be primed with lubricant prior to installation. This makes the subsequent ventilation of the system easier.
- Observe the specified tightening torques. When tightening, use a calibrated torque wrench.
- When working with heavy parts use suitable lifting tools.
- Avoid mixing up or wrong assembly of dismantled parts. Mark these parts accordingly.

1.19 Initial commissioning, daily start-up

Ensure that:

- All safety devices are completely available and functional
- All connections are correctly connected
- All parts are correctly installed
- All warning labels on the product are present completely, highly visible and undamaged
- Illegible or missing warning labels are to be replaced without delay

1.20 Cleaning

- Risk of fire and explosion when using inflammable cleaning agents. Only use non-flammable cleaning agents suitable for the purpose.
- Do not use aggressive cleaning agents.
- Thoroughly remove residues of cleaning agents from the product.
- Do not use steam jet and high pressure cleaners. Components may be damaged. Observe the IP type of protection of the pump.
- Cleaning work may not be carried out on energized components.
- Mark damp areas accordingly.

1.21 Residual risks

Residual risk	Possible in life cycle									Prevention/ remedy
Personal injury/ material damage due to falling of raised parts	A	B	C				G	H	K	Keep unauthorized persons away. No people may remain under suspended loads. Lift parts with adequate lifting devices.
Personal injury or material damage due to tilting or falling of the product because of non-observance of the stated tightening torques		B	C				G			Observe the specified tightening torques. Fix the product only to components with sufficient load capacity. If no tightening torques are stated, apply tightening torques according to the screw size characteristics for 8.8 screws.
Personal injury/ material damage due to electric shock in case of damage to the connection cable		B	C	D	E	F	G	H		Check the connection cable with regard to damages before the first usage and then at regular intervals. Do not mount cable to moving parts or friction points. If this cannot be avoided, use spring coils respectively protective conduits.
Personal injury/ damage to material due to spilled or leaked lubricant		B	C	D		F	G	H	K	Be careful when filling the reservoir and when connecting or disconnecting lubricant feed lines. Always use suitable hydraulic screw connections and lubrication lines for the stated pressures. Do not mount lubrication lines to moving parts or friction points. If this cannot be avoided, use spring coils respectively protective conduits.

Life cycles:
A = transport, B = installation, C = initial start-up, D = operation, E = cleaning, F = maintenance, G = fault, repair,
H = shutdown K = Disposal

2. Lubricants

2.1 General information

Lubricants are used specifically for certain application purposes. In order to fulfil their tasks, lubricants must fulfil various requirements.
The most important requirements for lubricants are:

- Reduction of abrasion and wear
- Corrosion protection
- Noise minimisation
- protection against contamination or penetration of foreign objects
- Cooling (primarily with oils)
- longevity (physical/ chemical stability)
- economic and ecological aspects

2.2 Selection of lubricants

SKF considers lubricants to be an element of system design. A suitable lubricant is selected already when designing the machine and forms the basis for the planning of a centralized lubrication system.
The selection is made by the manufacturer or operator of the machine, preferably together with the lubricant supplier based on the requirement profile defined.
Should you have little or no experience with the selection of lubricants for centralized lubrication systems, please contact SKF.
If required we will be glad to support customers to select suitable components for feeding the selected lubricant and to plan and design their centralized lubrication system.
You will avoid possible downtimes through damage to your machine or system or damage to the centralized lubrication system.

2.3 Material compatibility

Lubricants must generally be compatible with the following materials:

- steel, grey iron, brass, copper, aluminium
- NBR, FPM, ABS, PA, PU

2.4 Temperature characteristics

The lubricant used must be suitable for the specific operating temperature of the pump. The viscosity and consistency range required for proper operation of the product must be adhered to and must not be exceeded in case of low temperatures nor fall below specification in case of high temperatures. Specified viscosities, see chapter Technical data.

2.5 Ageing of lubricants

After a prolonged downtime of the machine, the lubricant must be inspected prior to re-commissioning as to whether it is still suitable for use due to chemical or physical ageing. We recommend that you undertake this inspection already after a machine downtime of 1 week.
If doubts arise as to a further suitability of the lubricant, please replace it prior to re-commissioning and, if necessary, undertake initial lubrication manually.
It is possible for lubricants to be tested in the company's laboratory for their suitability for being pumped in centralized lubrication systems (e.g. "bleeding").
Please contact SKF. if you have further questions regarding lubricants.

Only lubricants specified for the product may be used. Unsuitable lubricants may lead to a failure of the product.

Do not mix lubricants. This may have unforeseeable effects on the usability and therefore on the function of the centralized lubrication system.

When handling lubricants the relevant safety data sheets and hazard designations, if any, on the packaging have to be observed.

Due to the multitude of possible additives, individual lubricants, which according to the manufacturer's data sheets fulfil the necessary specification, may not, in fact, be suitable for use in centralized lubrication systems (e.g. incompatibility between synthetic lubricants and materials). In order to avoid this, always use lubricants tested by SKF.

3. Overview, functional description

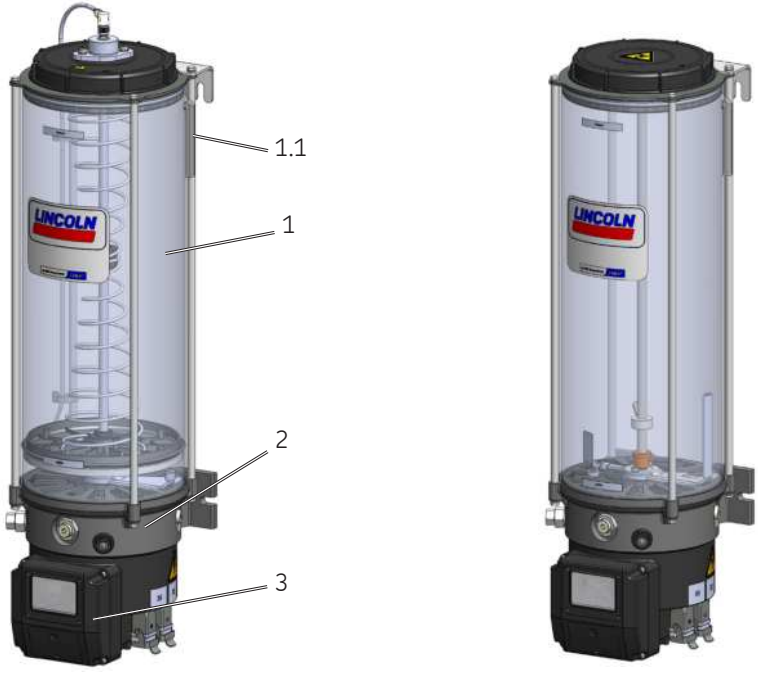
1 reservoir
The lubricant is stored in the reservoir. Depending on the pump version there are different types of reservoirs and reservoir sizes.

1.1 Reservoir venting device
It provides air for the reservoir while the pump is operating and supplying lubricant. It vents the reservoir while the pump is filled via the filler fitting.

2. Pump housing
All electrical components are accommodated in the pump housing. Exception: In case of the version with follower plate the switching rod for the low-level indication is positioned in the reservoir.

3. Housing front cover
On the housing front cover there is the membrane keypad to operate and adjust the pump. Furthermore, if service is required, the housing front cover provides access to the inside electrical components.

Overview Fig. 1

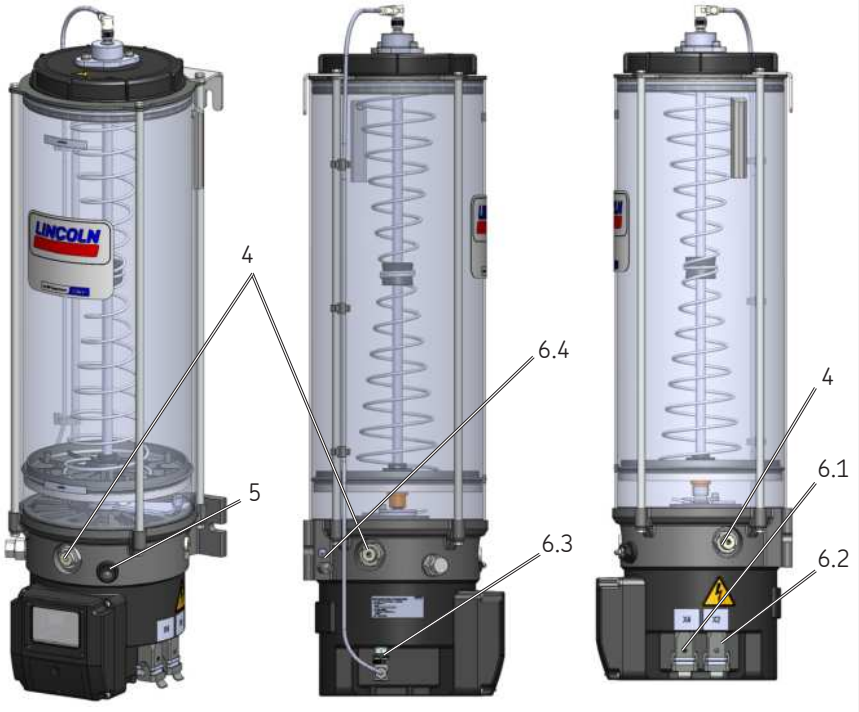


4. Pump elements
The pump is operated with 3 pump elements cross-ported to one outlet.

5. Filler fitting
It serves to fill the reservoir via a suitable filler pump with a corresponding connection.

6. Electrical connections
They serve for (6.1) signal connection (X4), for (6.2) power supply connection (X2) and for connection of the low-level indication (6.3) in case of pumps with follower plate. The equipotential bonding port (6.4) at the pump housing serves to connect an equipotential bonding conductor in order to avoid potential differences in case of long connection lines.

Overview Fig. 2



7. ProProtect indication
If the LED (7) is green, the ProProtect protection up to 8 kV is available.

If the LED (7) is off despite existing operating voltage, only the standard protection level (EN 61000-6-4) is available. However, the pump is still fully functional.

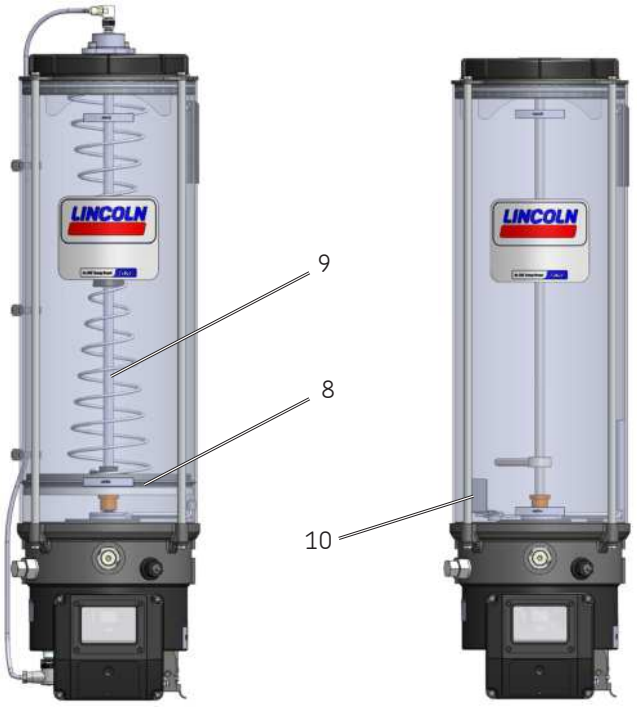
Overview Fig. 3

8. 2 Follower plate (in case of pumps with follower plate)
The follower plate (8) rests on the lubricant and presses it down in the direction of the pump elements by spring force. As a result the suction behaviour of the pump improves.

9. Contact rod
The contact rod (9) of the follower plate accommodates the reed contacts for the low-level function. In the follower plate there is a magnet that actuates the reed contact when reaching a certain switch point. The reed contact for the low-level indication is positioned at the lower switch point.

10 Stirring paddle (in case of pumps with stirring paddle)
While the pump operates, the stirring paddle homogenises and smoothens the lubricant. The stirring paddle's lower vertical part pushes the lubricant towards the pump elements thus improving the suction behaviour of the pump.

Overview Fig. 4



17 Membrane keypad
The membrane keypad (17) with display is the primary operating and display element of the pump. It offers the following functions:

18 Display
Display of operating states, error codes and programming parameters

19 Set button
Confirming faults in the operating mode
Retrieve programming steps in the programming mode

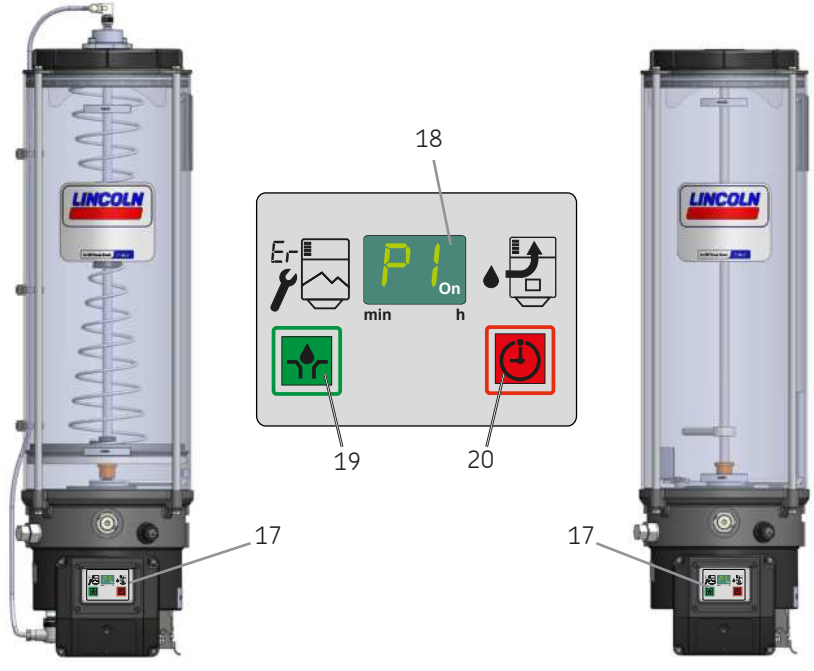
20 Shift key
Trigger an additional lubrication in the operating mode

Display and change parameters in the query and programming mode

Pump adjustments are made via the green adjustment key (19) and the red switch key (20) and are shown on the display (18).

All functions, except from the display of error codes, are available during the pump's pause time only.

Overview Fig. 5



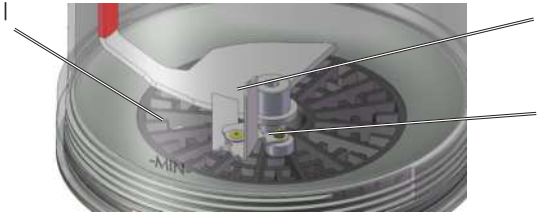
3.1 Functioning principle of the intermittent low-level indication

The intermittent low-level indication operates free of contact. Its main components are the following:

- firmly positioned magnetic switch (I) inside of the reservoir bottom
- flexible guide plate (II) connected to the stirring paddle with a magnet (III) and a control cam (IV)

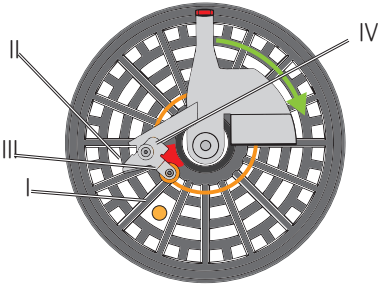
If the reservoir is filled with a lubrication grease suitable for the intermittent low-level indication and the pump is operating, then the guide plate (II) is deflected by the resistance of the lubrication grease. As a consequence the magnet (III) connected to the guide plate (II) is moved on its inner circuit and does not trigger a pulse of the magnetic switch (I) with its magnetic field. A control cam (IV) positively guides the round magnet together with the pivoted guide plate towards the outside during each revolution. As soon as the guide plate leaves the control cam, the lubricant's resistance pushes the guide plate together with the magnet to the inside again.
As soon as the lubricant inside the reservoir has fallen to that level that the lubricant's resistance is no more sufficient to further deflect the guide plate (II), the magnet (III) remains on the outer circuit and triggers a pulse each time it slides across the magnetic switch (I). If during an operating cycle the magnet (III) slides across the magnetic switch (I) six times, a low-level signal is sent by the control printed circuit board of the pump.
For programming of the external control of the pump, see corresponding chapter in these instructions.

Perspective representation

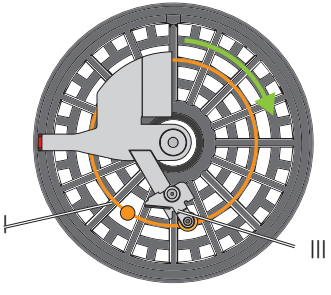


Schematic representation

Magnet on inner circuit



Magnet on outer circuit



3.2 Functioning principle of pressurization, holding time and pressure relief

Functional chart, see the following page

The following procedure must be completed within the fixed monitoring time of 30 minutes. Otherwise a failure will be indicated.

Phase 1 Pressurization:
When the pause time (PT) has lapsed, the pump starts pressurization within the pressurization time A1. At the same time the monitoring time starts to lapse.

Phase 2 Holding time:
When the operating pressure set on the pressure switches/ sensors is reached, the pump motor will be switched off and the pressure holding time (PHT) consisting of several fixed holding times will start to lapse.

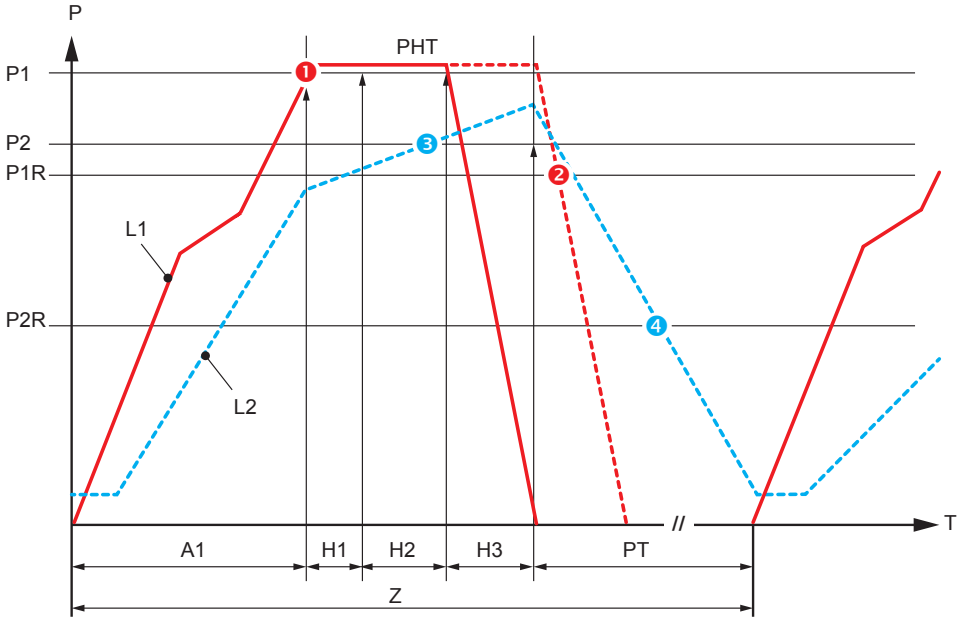
As long as the pressure holding time (PHT) lapses, pressure on the pressure switches/ sensors will be monitored. The pump motor may be switched on shortly to avoid inadmissibly high pressure fluctuations.

Reaching and holding the operating pressure via the pressure holding time (PHT) ensures that the single-line metering devices provide the lube points with lubricating grease properly.

Phase 3 Pressure relief:
When the pressure holding time (PHT) has lapsed, the main line will be relieved from pressure. The relief process is monitored at the switch-back points.

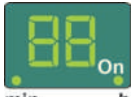
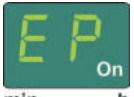
Phase 4 Pause time (PT)
The pump is in the preset pause time.

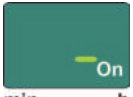
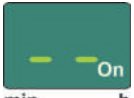
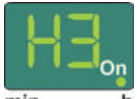
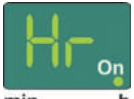
Functional diagram P623S Fig. 6



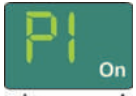
Legend	
L1	Internal pressure course
L2	External pressure course
P1	Operating pressure in case of internal pressure switches/ sensors
P2	Operating pressure in case of external pressure switches/ sensors
P1R	Switch-back pressure in case of internal pressure switches/ sensors
P2R	Switch-back pressure in case of external pressure switches/ sensors
PHT	Pressure holding time
H1 - H3	Holding times
A1	Pressure build-up time
PT	Pause time
Z	Lubrication interval
❶	Switch point of internal operating pressure P1
❷	Switch-back point of internal operating pressure P1R
❸	Switch point of external operating pressure P2
❹	Switch-back point of external operating pressure P2R

3.3 Overview of the displays

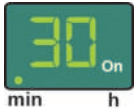
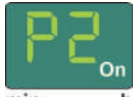
Starting process		Fault signals	
	Functional test after switching on. All segments are lit for about 2 seconds.		**Fault signal EP** A fault of the membrane keypad or the display is pending.
	Pressure control via internal pressure switch		**Fault signal E1 (flashing)** Fault of pressurization (internal pressure control). Pressure P1 was not reached within the monitoring time.
	Pressure control via internal and external pressure switches		**Fault signal E2 (flashing)** Fault of pressurization (internal or external pressure control). Pressure P1 or P2 was not reached within the monitoring time.
	Pressure control via internal pressure sensor		**Fault signal E3 (flashing)** Fault of pressure relief (internal pressure control). Pressure P1R was not undercut within the monitoring time.
	Pressure control via internal and external pressure sensors		**Fault signal E4 (flashing)** Fault of pressure relief (external pressure control). Pressure P2R was not undercut within the monitoring time.

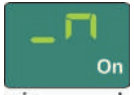
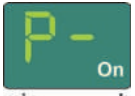
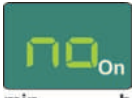
Order			
	**Operating voltage** The operating voltage of the pump is switched on		**Pause time** After the pressure relief the pause time („br“ = break) starts
	**Operating voltage and machine contact** The operating voltage and the machine contact are switched on.		**Holding time H1** For internal pressure sensors After building up the operating pressure, the holding time starts to lapse
	Pump is on (operating time) The rotational direction of the motor is clockwise (forward).		**Holding time H2** For internal and external pressure sensors/ pressure switches The operating pressure of at least one pressure sensor or pressure switch was not reached within holding time H1
	Pump is on (pressure relief) The rotational direction of the motor is anticlockwise (backward) shortly for pressure relief		**Holding time H3** For internal and external pressure sensors/ pressure switches The operating pressure of at least one pressure sensor or pressure switch was not reached within holding time H2
	**Low-level signal (flashing)** The ongoing lubrication cycle will still be completed. An automatic restart will take place after filling only. An additional lubrication, however, can be initiated by hand on the pump or in case of an existing machine contact via the control stand.		**Change of rotational direction** It is indicated shortly after the holding time and signalises that the pump will change the rotational direction shortly for pressure relief purposes

Programming mode

<table>
<tr><td rowspan="2"> 
</td><td rowspan="2">Program steps P1 and P2
With these program steps the pause time value is set

Time control (jumper on control pcb)
P1 = 0 to 59 hours
P2 = 0 to 59 minutes
Example: Pause time = 12 h 30 min

Pulse control (jumper on control pcb)
Factory setting = 1 pulse
Display P1 = 00
Display P2 = 01</td><td colspan="2">Time control</td></tr>
<tr><td>Hours
 
</td><td>Minutes
 
</td></tr>
<tr><td> 
</td><td colspan="2">Pulse control
Pulses (x100)
 
</td><td>Pulses (x1)
 
</td></tr>
<tr><td></td><td>Program step P3
This program step is not available for pump P623S</td><td> 
</td><td>Program step P5
Display of factory setting = no underscore N
In this program step it is determined whether a differentiation is made between a fault signal or a low-level signal. See display of nc respectively no</td></tr>
<tr><td> 
</td><td>Program step P4
Displays how the output signal of the fault indication has been programmed.
no = normally open contact</td><td> 
</td><td>Program step P6
In this program step it is determined whether a differentiation is made between a fault signal and a low-level signal. See display SP respectively SO</td></tr>
</table>

Programming mode			
	Program step P7 Setting of the operating pressure Factory setting 300 bar / Display value = 30		Output signal programmed as normally open contact. Intermittent low-level signal, functional faults as permanent signal (ON). See program step P5.
	Program step P8 Setting of the relief pressure (only in case of external pressure sensor) to which the main line must be relieved.		Output signal programmed as normally closed contact Intermittent low-level signal, functional faults as permanent signal (OFF). See program step P5.
	End of programming Programming has been completed. To adopt the values set the programming has to be confirmed with the green key (19) within 30 seconds.		Start phase SP When being switched on the pump starts with a pause time. See program step P6.
	Normally closed contact Output signal is preset as normally closed contact. See program step P4.		Start stage S0 When being switched on the pump starts with the lubrication time. See program step P6.
	Normally open contact Output signal is preset as normally open contact. See program step P4.		

Query mode		Example	
	In case of a time control of the pump, the preset pause time is displayed by 2 consecutive displays. Example = 12 h 30 min (also see query mode, chapter 8.2)		
	In case of a pulse control of the pump, the preset pause time is displayed by 2 consecutive displays. Example = 1230 pulses		
	The program version of the control pcb will then be displayed by two successive displays. Display 1 = main version 01 Display 2 = sub-version 03		
	In case of a time control of the pump, the remaining pause time is displayed by 2 consecutive displays. Example = 5 h 10 min		
	In case of a pulse control of the pump, the remaining pause time is displayed by 2 consecutive displays. Example = 510 pulses		

4. Technical data

4.1 Mechanics

	P623S				
Admissible operating temperature range of the pump	-25 °C to +55 °C				
The indicated operating temperature range of the pump presupposes the suitability of the lubricant used for the respective actually existing operating temperature. Using an unsuitable lubricant may result in malfunctions and even in a downtime of the lubrication system Failure caused by lubricant may occur temporarily, e. g. if the application temperature stated for the lubricant for lubrication systems is exceeded or is not reached.					
Lubricants	Lubricating greases up to NLGI II				
Admissible operating pressure	300 bar max.				
Installation position	vertical [1] i. e. reservoir on top, deviation max 5 °				
Filling	with follower plate		without follower plate		
	filler fitting or filling connection (optional)		reservoir lid, filler fitting or filling connection (optional)		
Number of pump elements	max. 3				
Number of outlets (R1/4“)	1				
Sound pressure level	< 70 dB (A)				
IP type of protection (DIN EN 60529:2014) Harting connector	67				
Weight of the empty pump	8 kg	10 kg	12 kg	14 kg	19 kg
Reservoir size (nominal volume)	4 l	8 l	10 l	15 l	20 l

[1] Pumps with follower plate allow for a rotating installation as well, e. g. in wind turbine generators.
Maximum speed and maximum distance to the rotation axis on request.

4.2 Nominal output volumes

Pump element	Z7
Nominal output per pump element and stroke	0.22 cc

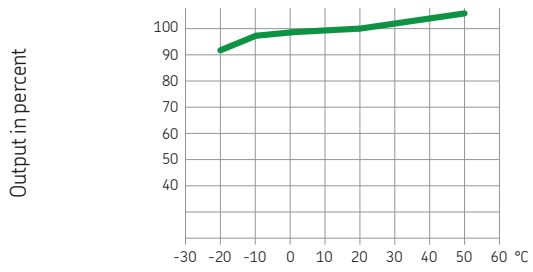
The stated nominal outputs per stroke refer to NLGI II lubricating greases at an operating temperature of + 20 °C and a backpressure of 100 bar on the pump element. Deviating operating conditions or deviating pump configuration result in a changed motor speed and thus in a change of the actual output per time unit. If as a consequence of the changed motor speed the output per time unit needs to be adapted, this will be done by adapting the lubrication and pause time settings of the pump.

4.2.1 Influencing variables on the actual output volume

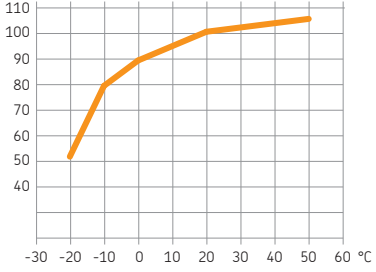
Operating temperature	> + 20 °C	↑	< + 20 °C	↓	Consistency class of lubricant	> NLGI 2	↓	< NLGI 2	↑
Number of pump elements	> 1 piece	↓			Backpressure	< 100 bar	↑	> 100 bar	↓

4.2.2 Output diagrams of typical NLGI 2 lubricants

Low temperature grease



High temperature grease



Example: high temperature grease

Nominal speed of the pump motor per minute x nominal output of the Z7 pump element per stroke x efficiency in percent at an assumed operating temperature of -10 °C = 20 U/min^{-1} x 0.22 ccm x 80 % = 3.50 ccm/min^{-1}.

4.3 Useable reservoir volume

Regarding the reservoir version without follower plate the useable reservoir volume mainly depends on the NLGI consistency class and the operating temperature of the lubricant to be used. In case of high consistency and low operating temperature normally more lubricant sticks to the inner surfaces of the reservoir and the pump and is thus no more available for being dispensed.

Ueseable reservoir volume (XN, XL, XNBO, XLBO)	4 l	8 l	10 l	15 l	20 l
Lubricants with relatively low consistency [1,3]	3.65 l to 4.15 l	6.65 l to 7.15 l	8.78 l to 9.28 l	14.35 l to 14.90 l	16 l to 20 l
Lubricants with relatively high consistency [2]	3.35 l to 3.85 l	7.00 l to 7.50 l	9.13 l to 9.63 l	14.75 l to 15.25 l	18 l to 20 l

[1] Lubricant consistencies of NLGI 000 lubricants at + 70 °C up to lubricant consistencies of NLGI 1.5 lubricants at + 20 °C.
[2] Lubricant consistencies of NLGI 2 lubricants at + 20 °C up to the maximum admissible lubricant consistency.
[3] When using lubricants of a relatively low consistency in pumps subjected to strong vibrations or tilting motions (e.g. construction and agricultural machinery), make sure to maintain a level that is about 15 mm below the MAX marking of the reservoir. This prevents lubricant from entering the reservoir vent. In case of very strong vibrations this value must be increased, for low vibrations it can be reduced. Changing the filling level by 10 mm corresponds to a volume change of about 0.34 litres (4 l).

4.4 Lubricant requirement for priming of an empty pump

To prime an empty pump up to the MAX marking of the reservoir, the following lubricant quantities are required.

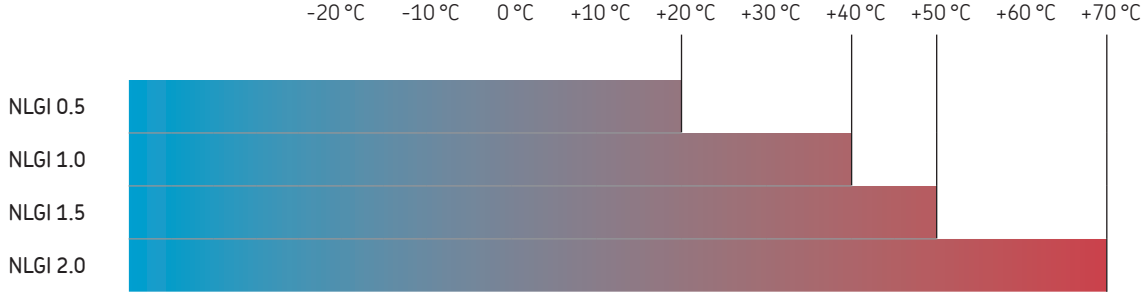
Nominal volume	4 l	8 l	10 l	15 l	20 l
Actually required lubricant quantity	5.8 ± 0.25 l	9.15 ± 0.25 l	11.2 ± 0.25 l	17.5 ± 0.25 l	22 ± 0.25 l

The deviation between the lubricant quantity actually required for priming and the nominal volume of the reservoir results from the filling of the pump housing up to the MIN marking of the reservoir.

4.5 Limits of use of the intermittent low-level indication

The following lubricant consistencies have to be complied with in order to ensure the correct functioning of the intermittent low-level indication. Above the stated range of temperature a correct functioning of the intermittent low-level indication cannot be ensured.
The inferior temperature ranges require the suitability of the lubricant for the respective temperature range. Otherwise the too high consistency of the lubricant may result in malfunctions, e.g. interruption of the lubricant supply, or in damages to the pump (e. g. bending of the stirring paddle).

The intermittent low-level indication is not appropriate for lubricants of NLGI class ≤ 0.



4.6 Factory settings

Program	Parameters	Factory setting	Setting range
P1/ P2	Pause time value P1 for hours / pulses (x 100) P2 for minutes / pulses (x 1)	Time control: 6 hours 0 minutes	4 min up to 59h 59 min
		Pulse control: 10 pulses	1 to 9999
P4	Signal output fault relay	no (normally open contact) reservoir with stirring paddle	no (normally open contact) reservoir with stirring paddle nc (normally closed contact) reservoir with follower plate
P5	Differentiation external fault signal	no (normally open contact)	no (normally open contact) nc (normally closed contact)
P6	Start	SP (pump starts with a pause time)	SP (pump starts with a pause time) S0 (pump starts with a lubrication time)
P7	Operating pressure of pressure sensor (internal) (displayed value x 10)	Display 24 (corresponding to 240 bar)	10 - 32 (100 - 320 bar)
	Operating pressure of pressure switch (internal) (displayed value x 10)	Display 24 (corresponding to 240 bar)	fixed value
	Operating pressure of external pressure sensor/ switch	170 bar	fixed value
	Relief pressure of pressure sensor (internal)	30 bar	fixed value
P8	Relief pressure of pressure sensor (external) (displayed value x 10)	5 (50 bar)	1-7 (10 - 70 bar)
	Relief pressure of pressure switch (external) (value x 10)	5 (50 bar)	50 bar, fixed value
	Holding time	2 minutes	None, fixed value
	Monitoring time	20 minutes	None, fixed value

4.7 Tightening torques

The stated tightening torques must be adhered to.	
Pump with supporting construction provided by the customer	25 Nm ± 1.0 Nm
Pump element with pump housing	40 Nm ± 2.0 Nm
Pressure control valve with pump element	8 Nm + 0.8 Nm
Housing front cover with pump housing	2.5 Nm + 0.1 Nm

4.8 Electrics:

Input	
Rated voltage/ operating voltage range	230 - 273 V AC / 120 - 300 V DC
Rated frequency/ frequency range	50-60 Hz / 0 Hz
Current consumption	typically 0.82 A at 230 V AC
Switch-on current limitation	< 40 A (cold start @25 °C)
Touch current	< 250 µA
Leakage current	< 1 mA
Overvoltage resistance	Surge voltage pulse following EN 61000-4-5 (8kVpeak L-N and L/N-PE, criterion B Rise time 1.2 µs, time to half-value of the wave-tail 50µs) Surge voltage pulse following VDE 0160 (860 Vpeak L-N, criterion B, rise time 0.1ms, time to half-value of the wave-tail 1.3ms) Overvoltage 350 Vrms for t<200ms; criterion B Overvoltage 470 Vrms for t< 30ms; criterion B
Specified back-up fuse	max. 6 A characteristic B
Protection class	Protection class 1, device with connection of protective conductor (PE) ⏚
Output	
Output voltage	24 V DC ± 2 % (PELV)
Output current limit	4 A
Overvoltage protection	< 60 V (PELV)
Ripple	< 50m Vpp (at a bandwith of 20 MHz)
Resistance to reverse feed	max. 35 V DC

4.8.1 Control pcb

Rated voltage	12 V DC / 24 V DC
Output fault / readiness for operation	1 A short-circuit resistant (transistor)
Length of pulse in case of pulse control	≥ 200 ms

4.8.2 Motor

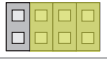
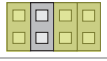
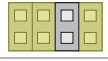
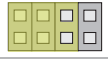
Operating voltage	24 V DC
Nominal motor speed	20 rpm^{-1}
Max. admissible run time	20 min (with subsequent minimum pause time of 1 hour)

4.8.3 Relay circuit board

Number of outlets	3
Maximum switching capacity	60 W / 62.5 VA
Switching voltage	24 VDC / V AC
Maximum switching current	2A

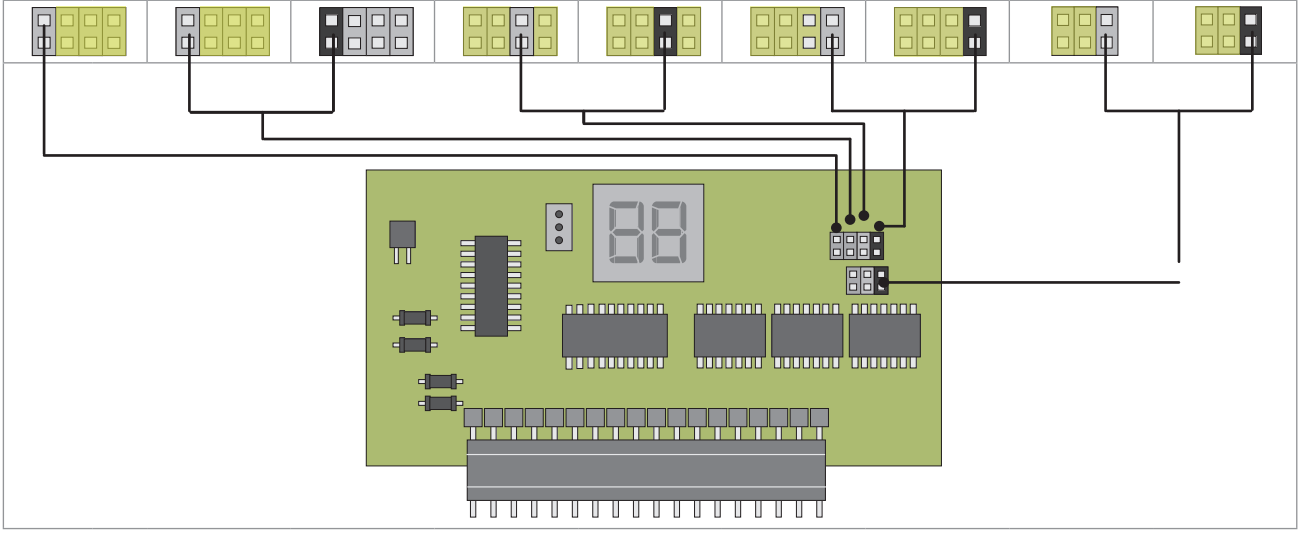
4.8.4 Configuration of the control pcb

The jumper configuration on the control pcb is done ex works following the customer's specifications. As changes of the configuration by third parties are not immediately apparent, the configuration should not be modified by the operator later on.

Setting options			Application	Time or cycle control		Number of pressure switches/ pressure sensors		Low level indication		Programming lock	
			Stationary	Time	Cycle	1	2	Normally open contact	Normally closed contact	without	with
			S	TC	CC	1S	2S	No	Nc	U	L
											
			removed	removed	plugged	removed	plugged	removed	plugged	removed	plugged
Combination no.:	S05	B05	x		x	x			x	x	
	S06	B06	x		x	x			x		x
	S07	B07	x		x		x		x	x	
	S08	B08	x		x		x		x		x
	S09	B09	x		x	x		x		x	
	S10	B10	x		x	x		x			x
	S11	B11	x		x		x	x		x	
	S12	B12	x		x		x	x			x
	S13	B13	x	x		x			x	x	
	S14	B14	x	x		x			x		x
	S15	B15	x	x			x		x	x	
	S16	B16	x	x			x		x		x
	S17	B17	x	x		x		x		x	
	S18	B18	x	x		x		x			x
	S19	B19	x	x			x	x		x	
	S20	B20	x	x			x	x			x

Changes of the configuration will become effective only after switching the pump off and on again.

Application	Time or cycle control		Number of pressure switches/ pressure sensors		Low level indication		Programming lock	
Stationary	Time	Cycle	1	2	Normally open contact	Normally closed contact	without	with
S	TC	CC	1S	2S	No	Nc	U	L
removed	removed	plugged	removed	plugged	removed	plugged	removed	plugged



4.9 Type identification code

The type identification code facilitates identification of important equipment features of the product.
See type identification plate of the pump for specific pump type identification code.

Structure of the type identification code

P	6	2	3	S			-	4		X	L	B	O	-	3	Z	7	-	A	C	-	H	1	.H	2	-	S	0	8		-	D	S	Example A
P	6	2	3	S	X		-	1	5	X	L	F		-	3	Z	7	-	A	C		H	1	.H	2	-	B	R	0	5	-	S	E	Example B
P	6	2	3	S	X	U	-	1	5	X	N			-	3	Z	7	-	A	C		H	1	.H	2	-	B	R	0	5	-	D	S	Example C
A					B	C		D		E				F				G			H					K				M			

(A) Product designation
P623S

(B) Corrosion protection class
X C5M version

(C) Approvals
U UL approval

(D) Reservoir sizes
4 4 litres
8 8 litres
10 10 litres
15 15 litres
20 20 litres

(E) Possible reservoir versions
XN | XL | XNBO | XLBO | XLF

Legend:
X = reservoir for lubricating grease
N = reservoir without low-level indication
L = reservoir with low-level indication
BO = reservoir with filling from the top via the reservoir lid
LF[1] = reservoir with follower plate and low-level indication
[1] electrical connection of the low-level indication via square plug

(F) Pump elements
3Z7 3 pump elements piston diameter Ø 7 mm.
Pump elements cross-ported to one outlet

(G) Connection voltage
AC 120-240 V AC ± 10%, 50-60 Hz ± 5% with motor 24 V DC

(H) Electrical connections on the pump
H1 (X2) 5-pin Harting connector
H1 (X2) 7-pin Harting bushing
00 No signal connection

(K) Control pcb's
S Control (configurable by means of jumper on the pcb)
B like control pcb version "S", however, terminal 15/30 bridged
SR like control pcb version "S", however, with additional relay circuit board
BR like control pcb version "B", however, with additional relay circuit board
05-20 Jumper configuration of the control pcb
(see chapter Configuration of the control pcb)

(M) Pressure sensor/ pressure switch
SE Pressure sensor 100-320 bar (adjustable via control pcb)
DS Pressure switch (not adjustable)

5. Delivery, returns, and storage

5.1 Delivery

After receipt of the shipment, check the shipment for damage and completeness according to the shipping documents. Immediately report any transport damages to the forwarding agent.
Keep the packaging material until any discrepancies are resolved. During in-house transport ensure safe handling.

5.2 Returns

Clean all parts and pack them properly (i.e. following the regulations of the recipient country) before returning them.
Protect the product against mechanical influences such as impacts. There are no restrictions for land, sea or air transport.
Mark returns on the packaging as follows.

5.3 Storage

SKF products are subject to the following storage conditions:

- dry, dust- and vibration-free in closed premises
- no corrosive, aggressive materials at the place of storage (e. g. UV rays, ozone)
- protected against pests and animals (insects, rodents, etc.)
- possibly in the original product packaging
- shielded from nearby sources of heat and coldness
- in case of high temperature fluctuations or high humidity take adequate measures (e. g. heater) to prevent the formation of condensation water.

Before application inspect the products with regard to possible damages occurred during their storage. This particularly applies for parts made out of plastic and rubber (embrittlement).

5.4 Storage temperature range

- In case of parts not primed with lubricant the admissible storage temperature range corresponds to that of the operating temperature of the pump (see Technical data).
- In case of parts primed with lubricant the admissible storage temperature range is:

min. + 5 °C
max. +35 °C

If the storage temperature range is not adhered to, the following work steps for replacing the lubricant may not in all cases lead to the desired result.

5.5 Special storage conditions for parts primed with lubricant

The conditions mentioned in the following will have to be adhered to when storing products primed with lubricant,

5.5.1 Storage period of up to 6 months

The primed products can be used without having to take further measures.

5.5.2 Storage period from 6 to 18 months

Pump

- Connect the pump electrically.
- Switch the pump on and let it run, e.g. by triggering an additional lubrication, until about 4 cc of lubricant will leak from each pump element.
- Switch the pump off and disconnect it from the electrical grid.
- Remove and dispose of leaked lubricant.

Single-line metering device

- Remove all connection lines and closure screws, if any.
- Connect the pump primed with new lubrication grease suitable for the application purpose to the divider bar in such way that the opposite port of the divider bar remains open.
- Let the pump run until new lubricant leaks from the divider bar.
- Remove leaked lubricant.
- Reinstall closure screws and connection lines.

Lines

- Dismantle preassembled lines.
- Ensure that both line ends remain open.
- Prime lines with new lubricant.

Pressure switch/ way valve

- Process, see description of single-line metering devices

5.5.3 Storage period exceeding 18 months

To avoid dysfunctions consult the manufacturer before commissioning. The general procedure to remove the old grease filling corresponds to that of a storage period from 6 to 18 months.

6. Assembly

6.1 General information

Only qualified technical personnel may install the products described in these Instructions.
During assembly pay attention to the following:

- Other units must not be damaged by the assembly.
- The product must not be installed within the range of moving parts.
- The product must be installed at an adequate distance from sources of heat and coldness.
- Observe the product's IP type of protection.
- 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 or piston detectors, must be clearly visible.
- Observe prescriptions in the Technical data (chapter 4) regarding the installation position.

6.2 Place of installation

Protect the product against humidity, dust and vibrations and install it in an easily accessible position to facilitate other installation and maintenance works. Observe the IP protection class.

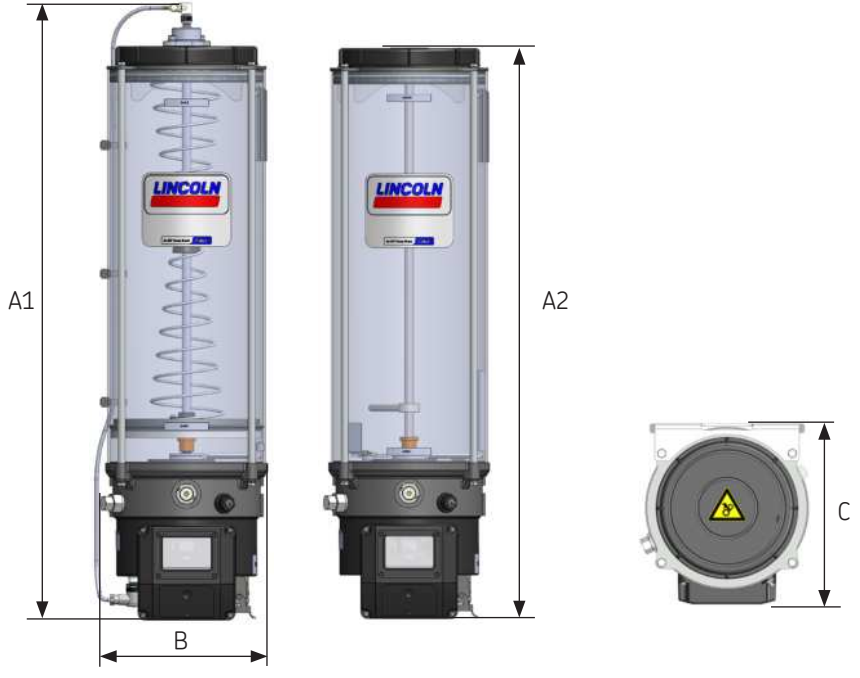
6.3 Mechanical connection

6.3.1 Minimum assembly dimensions

Ensure sufficient space for maintenance or repair work or for assembly of further components of the centralized lubrication system by leaving a free space of at least 100 mm into each direction in addition to the stated dimensions.

Minimum installation dimensions in mm					
	4 l	8 l	10 l	15 l	20 l
A1	498	598	658	841	976
A2	439	539	599	782	917
B	220				
C	278				

Minimum assembly dimensions Fig. 7



6.3.2 Installation bores

Pumps with 4 l and 8 l reservoirs:
Are fastened at the two lower mounting points (A).

Pumps with 10 l, 15 l and 20 l reservoirs:
Are fastened at the two lower mounting points (14) and additionally a the two upper mounting points (15).

NOTICE

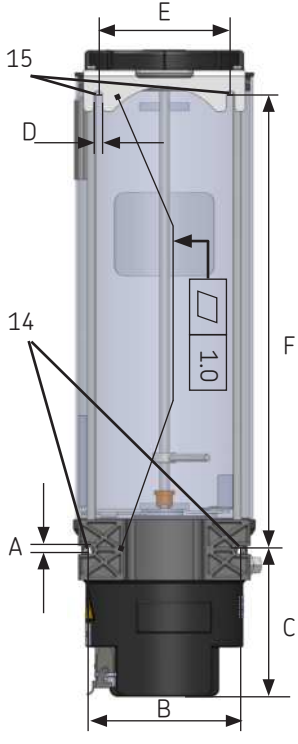
Risk of damage to the superior machine and to the pump
Drill the mounting bores on non-load-bearing parts of the superior machine only.
Fastening must not be done on two parts moving against one another (e. g. machine bed and machine assembly). Flatness of the upper and lower mounting faces to each other must not deviate by more than 1 mm.

Mounting bores in mm

	4 l	8 l	10 l	15 l	20 l
A	11	11	11	11	11
B	180	180	180	180	180
C	177.5	177.5	177.5	177.5	177.5
D			10.4	10.4	10.4
E			160	160	160
F			367.5	550.5	685.5

Fastening is done by means of:
2 resp. 4 screws M10 (8.8)
2 resp. 4 hexagon nuts M10 (8.8)
2 resp. 4 washers 10C
Tightening torque = 25 Nm ± 1 Nm

Installation bores Fig. 8



6.4 Electrical connection

WARNING

Electric shock

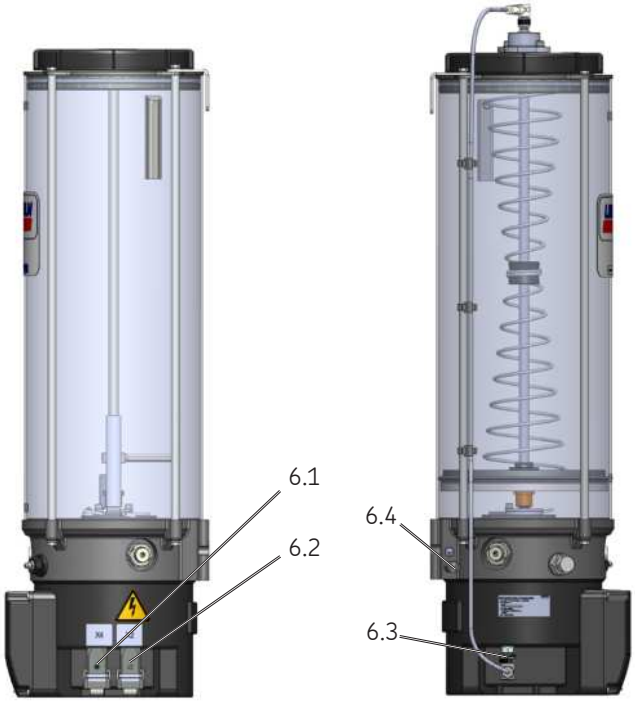
Make sure to disconnect the product from the power supply before carrying out any works on electrical components.

Connect the cables in such way that no mechanical forces are transferred to the product.

For connection proceed as follows:

- Connect and lock the plug (6.1) for the signal connection.
- Connect and lock the plug (6.2) for the voltage supply.
- Where applicable, connect the plug (6.3) for the low-level indication.
- If needed, connect the equipotential bonding connection on the housing (6.4) with the equipotential bonding connection of the superordinate machine.

Electrical connection, Fig. 9



6.5 Lubrication line connection

CAUTION

Risk of falling
Exercise care when dealing with lubricants. Immediately absorb and remove and leaked lubricant.

Connect lubrication lines in such way that no forces are transferred to the product (tension-free connection).

All components of the centralized lubrication system must be laid out for:

- the maximum arising pressure
- the admissible temperature range
- the output volume and the lubricant to be supplied.

Protect the centralized lubrication system against too high pressure by means of a suitable pressure relief valve.

Observe the following installation instructions for safe and smooth operation.

- Use clean components and primed lubrication lines only.
- The main lubrication line should be laid preferably rising with a possibility to vent it at its highest point. Lubrication lines shall generally be laid in such way that there can never be created air pockets at any point.
- Mount the lubricant metering devices at the end of the main lubrication line in such way that the outlets of the lubricant metering devices show upwards.
- If lubricant metering devices have to be mounted below the main lubrication line, then this should not be done at the end of the main lubrication line.
- The lubricant flow should not be impeded by the installation of sharp elbows, angle valves, gaskets protruding to the inside, or cross-section changes (big to small). Provide unavoidable changes of the cross sections in the lubrication lines with as smooth transitions as possible.

6.6 Programming

To program the pump proceed according to the following programming scheme.

- Simultaneously press key 19 and key 20 for more than 4 seconds to access the first programming step P1.

After releasing the keys the adjusted value will be displayed.

- Change the value of the programming step by pressing key 20.
- Confirm adjusted value within 30 seconds by pressing key 19. Otherwise the value will be lost.
- Programming is continued with programming step P2.

After confirming the last step P8 the programming is completed.

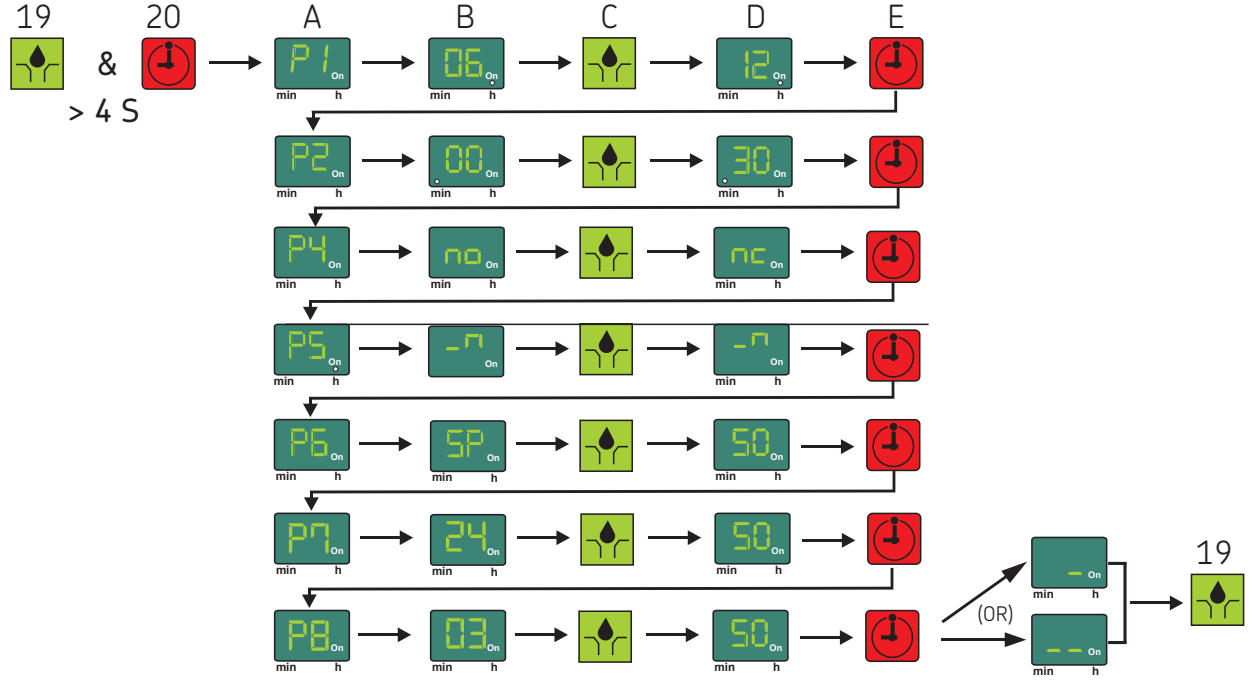
6.6.1 Legend of the programming scheme

Program functions
P1/ P2 Setting of the pause time in hours
P1/ P2 Setting of the pause time in minutes
P4 Setting of the output signal on the monitoring relay
P5 Setting of the differentiation between fault and low-level signal
P6 Setting of the start stage
P7 Adjusting the operating pressure
P8 Adjusting the relief pressure

A = Programming step
B = Possible value
C = Change value by pressing the shown key 20.
D = Possible new value
E = Confirm adjusted value within 30 seconds by pressing key 19 and continue with the next programming step.
Confirm and finish the programming by pressing key 20 after the last programming step.

Notes related to the programming
Settings can be done in one direction only (+)
Fast forward by holding down key 20.

Programming scheme P623S Fig. 10



6.6.2 Filling via filler fitting

- Place filling connection of the filler pump onto filler fitting R1/4 (5).
- Switch on filler pump and fill reservoir with lubricant until shortly below the MAX marking.
- Switch the filler pump off and remove it from the filler fitting (5) of the pump.

Filling via filler fitting Fig. 11

6.6.3 Filling via the reservoir lid in case of pumps without follower plate

WARNING

Crushing hazard
on the rotating stirring paddle. Filling via the reservoir lid is allowed only after disconnecting the pump from the power supply by removing it from the connection (6.2).

- Unscrew the reservoir lid (1.2) anticlockwise from the reservoir. Deposit the reservoir lid at a clean place. The reservoir lid must not be contaminated. Remove possible contaminations from the reservoir lid.
- Fill the reservoir from the top up to the MAX marking. Make sure to fill in the lubricant without air inclusions, if possible.
- Reinstall the reservoir lid (1.2) clockwise.

Filling via the reservoir lid Fig. 12

7. Initial start-up

In order to warrant safety and function, a person assigned by the operator must carry out the following inspections. Remedy detected defects before the initial start-up. Deficiencies may be remedied by an authorized and qualified specialist only.

Start-up check list

7.1 Inspections prior to initial start-up	YES	NO
Electrical connection carried out correctly.	☐	☐
Mechanical connections carried out correctly	☐	☐
Pump filled with the planned lubricant	☐	☐
The performance data of the previously indicated connections correspond to the specifications stated in the Technical data.	☐	☐
All components, such as lubrication lines and metering devices, have been correctly installed.	☐	☐
Product protected with adequate pressure relief valve	☐	☐
No visible damage, contamination and corrosion	☐	☐
Any dismantled protection and monitoring equipment has been reassembled and checked for correct function	☐	☐
Earth strap fully present, properly connected and electrically conductive	☐	☐
7.2 Inspections during initial start-up		
No unusual noises, vibrations, accumulation of moisture, or odours present	☐	☐
No unwanted escape of lubricant from connections	☐	☐
Bearings and friction points to be lubricated are provided with the planned amount of lubricant.	☐	☐

8. Order

SKF products operate automatically to the greatest possible extent.
Basically, activities during standard operation are limited to the control of the filling level and the timely refilling of lubricant as well as the outside cleaning of the product in case of contamination.
Furthermore it is possible to query the adjusted parameters in the query mode.

8.1 Refill lubricant

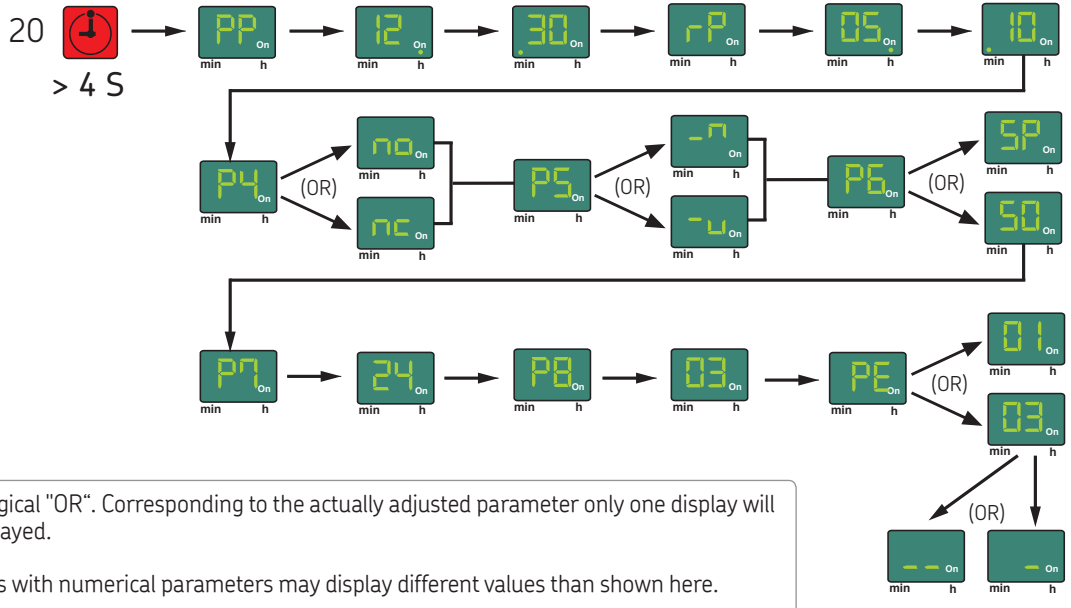
Description see corresponding chapter.

8.2 Query mode

In the query mode all adjusted programming parameters of the pump are displayed one after the other. The displays change every 2 seconds and finish automatically after the last value was displayed. To access the operating mode, press key 20 of the membrane keypad for more than 4 seconds. Total duration of the query is about 40 seconds.

8.2.1 Flow chart of query mode in case of time control

Course of displays in case of time control (configuration of the pcb) Fig. 13

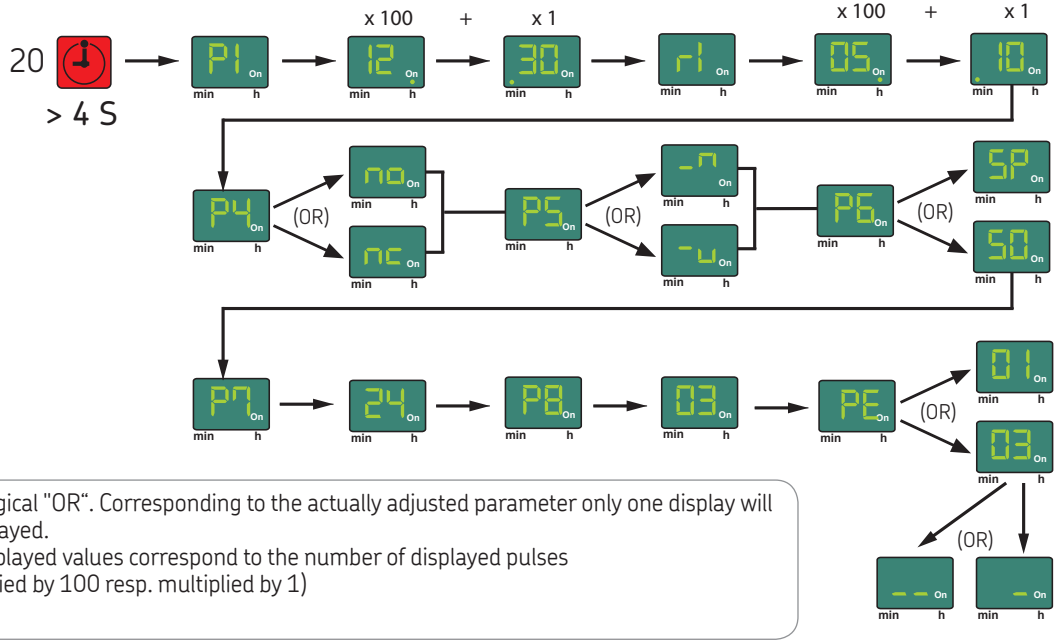


OR = logical "OR". Corresponding to the actually adjusted parameter only one display will be displayed.

Displays with numerical parameters may display different values than shown here.

8.2.2 Flow chart of query mode in case of pulse control

Course of displays in case of pulse control (configuration of the pcb) Fig. 14



OR = logical "OR". Corresponding to the actually adjusted parameter only one display will be displayed.
The displayed values correspond to the number of displayed pulses (multiplied by 100 resp. multiplied by 1)

9. Cleaning

	WARNING
	Electric shock Carry out cleaning works only on depressurized products that have been disconnected from the power supply. Do not touch cables or electrical components with wet or damp hands. Use steam-jet cleaners or high-pressure cleaners only in accordance with the IP protection class of the pump. Otherwise electrical components may be damaged. Cleaning execution, required personal protective equipment, cleaning agents and devices following the valid operational regulations of the operator.

9.1 Cleaning agents

Cleaning agents compatible with the material may be used only (materials, see chapter 2.3).

Thoroughly remove residues of cleaning agents from the product and rinse off with clear water.

9.2 Exterior cleaning

Make sure to keep the reservoir closed during the cleaning procedure.

- Mark and secure wet areas.
- Keep unauthorized persons away.
- Thorough cleaning of all outer surfaces with a damp cloth.

9.3 Interior cleaning

Normally, interior cleaning is not required. Should incorrect or contaminated lubricant have been filled, inside cleaning of the product will be required.
To do so, contact the SKF Customer Service.

10. Maintenance

Regular and appropriate maintenance is a prerequisite to detect and clear faults in time.
As it is not possible for us to exactly define the operating conditions, we cannot indicate any definite deadlines. The specific timelines have to be determined, verified at regular intervals and adapted, if necessary, by the operator based on the local operating conditions. If needed, copy the table for regular maintenance activities.

Maintenance check list

Activity to be done	YES	NO
Electrical connection carried out correctly.	☐	☐
Mechanical connections carried out correctly	☐	☐
The performance data of the previously indicated connections correspond to the specifications stated in the Technical data.	☐	☐
All components, such as lubrication lines and metering devices, have been correctly installed.	☐	☐
Product protected with adequate pressure relief valve	☐	☐
No visible damage, contamination and corrosion	☐	☐
Any dismantled protection and monitoring equipment has been reassembled and checked for correct function	☐	☐
All warning labels on the product are available and in proper condition.	☐	☐
No unusual noises, vibrations, accumulation of moisture, or odours present	☐	☐
No unwanted escape of lubricant from connections	☐	☐
Bearings and friction points to be lubricated are provided with the planned amount of lubricant.	☐	☐
Earthing cable fully present, properly connected and electrically conductive.	☐	☐

11. Troubleshooting

Fault table 1

Fault signal (flashing)	Possible cause	Remedy
	**Low level indication** The ongoing lubrication cycle will still be completed. An automatic restart will take place after filling only. However, an additional lubrication is possible.	Fill the reservoir with the specified lubricant
	**Fault signal E1** Fault of pressurization (internal pressure control). Pressure P1 was not reached within the monitoring time.	Check the system. May be the operating pressure must be reduced
	**Fault signal E2** Fault of pressurization (internal or external pressure control). Pressure P1 or P2 was not reached within the monitoring time.	Check the system. May be the operating pressure must be reduced
	**Fault signal E3** Fault of pressure relief (internal pressure control). Pressure P1R was not undercut within the monitoring time.	1. Triggering an additional lubrication. The motor rotates in the direction of the relief (10 sec.) After a successful relief, the fault signal will disappear 2. If there is no pressure relief: Reduce the system pressure and carry out step 1 once again If fault signal continues: Check relief device or inform our Customer Service
	**Fault signal E4** Fault of pressure relief (external pressure control). Pressure P2R was not undercut within the monitoring time.	
	**Fault signal EP** A fault of the membrane keypad or the display is pending.	Replace membrane keypad

Fault table 2

Fault	Possible cause	Remedy
Pump does not run Display is off	- Power supply to the pump is interrupted - Superior machine is switched off - Connection cable of pump is loose or defective - External fuse is defective - Pump supply board of pump is defective - Printed circuit board of pump is defective	Check whether one of the indicated faults is present and remedy it in the frame of your responsibilities. Faults outside of your own responsibility have to be reported to your superior to initiate further measures. If the fault cannot be determined and remedied, please contact our Customer Service.
Pump runs but supplies no or only little lubricant	- air pockets in the lubricant - suction bore of a pump element is clogged -worn pump element - too high lubricant consistency (at low temperatures) - too low lubricant consistency (at high temperatures)	Check whether one of the indicated faults is present and remedy it in the frame of responsibilities. Faults outside of your own responsibility have to be reported to your superior to initiate further measures. If the fault cannot be determined and remedied, please contact our Customer Service.

12. Repairs

WARNING

Risk of injury
Before carrying out any repair work, take at least the following safety measures:

- Keep unauthorized persons away.
- Mark and secure work area.
- Depressurize the product.
- Disconnect the product from the power supply and secure it against being switched on.
- Verify that no power is being applied
- Earth and short-circuit the product.
- Where needed, cover neighbouring units that are live.

The work described should possibly be done at room temperature. At low temperatures the work may be subject to restrictions.

12.1 Check pump element and replace pressure control valve.

The characteristics of the new pump element must correspond to the characteristics of the pump element to be replaced (see spare parts).

To replace the pump element, proceed as follows:

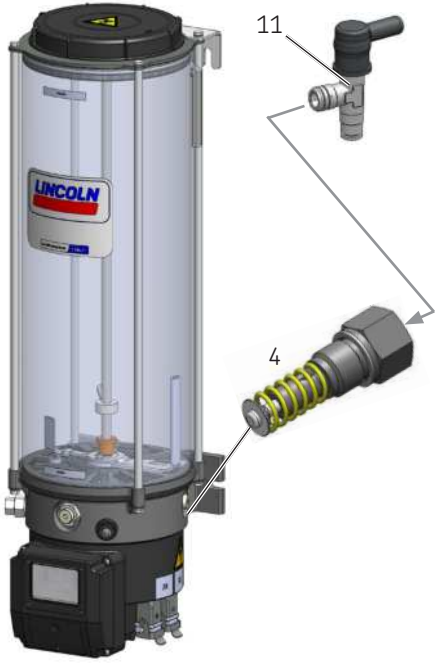
- Unscrew the defective pump element (4) at its hexagon out of the pump housing together with the pressure control valve (11).
- Screw the new pump element (4) into the pump housing together with a new gasket.

Tightening torque = 40 Nm ± 2.0 Nm

- Then screw a new pressure relief valve (9) into the pump element.

Tightening torque = 8 Nm + 0.8 Nm

Replace pump element Fig. 15



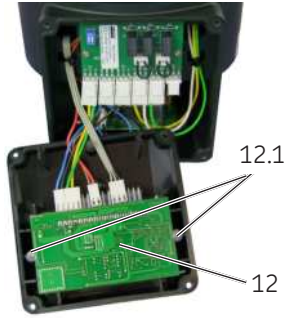
12.2 Replace membrane keypad

To replace the membrane keypad proceed as follows:

- Check the new membrane keypad for accordance with the documentation and the intended purpose.
- Implement the safety measures as specified in the warning notice at the beginning of this chapter.
- Take protection measures against electrostatic discharge.
- Turn screws (3.1) out of the housing front cover (3). Remove housing front cover (3) from pump housing. Keep parts for further use.
- Unscrew the control pcb (12) at the two screws (12.1).
- Carefully tilt the control pcb (12) upward until the connection for the membrane keypad (17.1) becomes visible.
- Loosen the plug of the membrane keypad (17.1) on the control pcb (see Fig. 18).

Remove the housing front cover Fig. 16

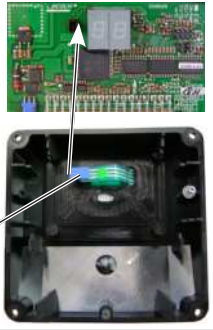
Housing front cover removed Fig. 17



- Carefully loosen and remove the membrane keypad (17) forward from the housing.
- Guide the plug (17.1) of the new membrane keypad (17) from the front through the opening on the housing front cover and plug it onto the corresponding port of the control pcb. Ensure that the plug is oriented correctly.
- Carry out the assembly in the reverse order to the disassembly.

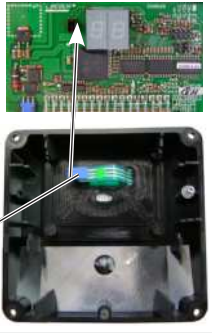
Tightening torque of the screws of the housing front cover = 2.5 Nm + 0.1 Nm.

Loosened plug of the membrane keypad Fig. 18



Remove the housing front cover Fig. 20

Connect the plug of the membrane keypad Fig. 19



12.3 Replace control printed circuit board

To replace the control pcb proceed as follows:

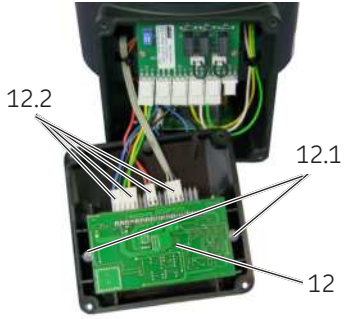
- Check the new control pcb for accordance with the documentation and the intended purpose.
- Implement the safety measures as specified in the warning notice at the beginning of this chapter.
- Take protection measures against electrostatic discharge.
- Unscrew the screws (3.1) from the housing front cover (3). Remove the housing front cover from pump housing. Keep parts for further use.
- Carefully loosen all plugs (12.2) of the control pcb (12).
- Note down the set-up and position of the plugs or mark plugs accordingly.
- Open the reservoir lid (12) on the two screws (12.1) and remove it.
- Carefully loosen the plug (17.1) of the membrane keypad.

Remove the housing front cover Fig. 21

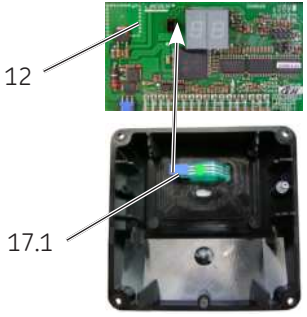
- Carry out the assembly in the reverse order to the disassembly.

Tightening torque of the screws of the housing front cover = 2.5 Nm + 0.1 Nm.

Remove the control pcb 22



Loosen the plug of the membrane keypad Fig. 23



12

12.4 Replace relay circuit board

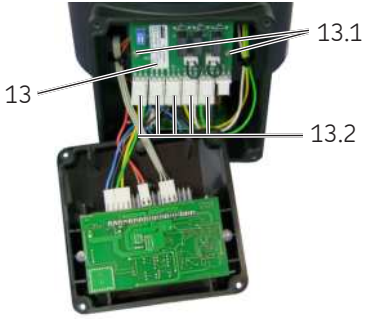
To replace the relay circuit board proceed as follows:

- Check the new relay circuit board for accordance with the documentation and the intended purpose.
- Implement the safety measures as specified in the warning notice at the beginning of this chapter.
- Take protection measures against electrostatic discharge.
- Unscrew the screws (3.1) from the housing front cover (3). Remove the housing front cover from the pump housing. Keep parts for further use.
- Carefully loosen all plugs (13.2) of the relay circuit board (13).
- Loosen the relay circuit board (13) on the two screws (13.1) and remove it.
- Carry out the assembly in the reverse order to the disassembly.

Remove the housing front cover Fig. 24

Tightening torque of the screws of the housing front cover = 2.5 Nm + 0.1 Nm.

Remove relay circuit board Fig. 25



12.5 Replace power supply board

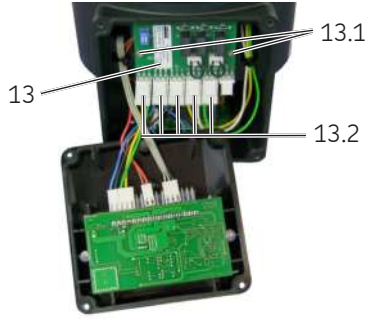
To replace the power supply board proceed as follows:

- Check the new power supply board for accordance with the documentation and the intended purpose.
- Implement the safety measures as specified in the warning notice at the beginning of this chapter.
- Take protection measures against electrostatic discharge.
- Unscrew the screws (3.1) from the housing front cover (3). Remove the housing front cover from the pump housing. Keep parts for further use.
- Loosen the relay circuit board (13) on the two screws (13.1) and remove it upwards together with the housing front cover and the control pcb.
- Loosen and remove the plug (13.2) between the relay circuit board and the power supply board (14) by carefully lifting the lock.

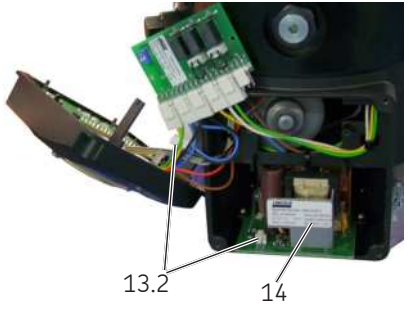
Remove housing front cover Fig. 26

- Carefully pull the power supply board (14) forward and out of the two lateral guide rails (14.1) and out of the housing.

Remove relay circuit board Fig. 27



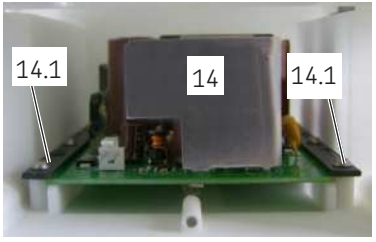
Removed relay circuit board Fig. 28



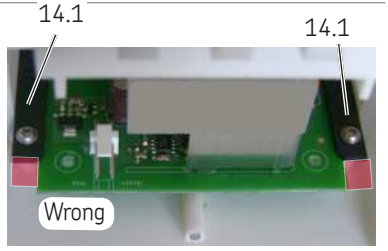
- Place new power supply board in the lateral guide rails (14.1) and push it into the housing until you notice resistance.
- Then push power supply board forward until the front edge of the power supply board fits flush with the guide rails. The power supply board is in the correct mounting position.
- Carry out the assembly in the reverse order to the disassembly.

Tightening torque of the screws of the housing front cover = 2.5 Nm + 0.1 Nm.

Power supply board Fig. 29

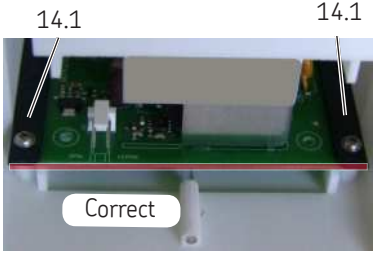


Power supply board mounted incorrectly Fig. 31



Removed power supply board Fig. 30

Power supply board mounted correctly Fig. 32



12.6 Tests after replacement of the power supply board

After replacement of the power supply board carry out an electrical test acc. to EN 60204-1 in the following order:

12.6.1 Visual check

- Housing front cover mounted properly. No visible damages to the pump.

12.6.2 Electrical safety test

Use measuring equipment following EN 61557 for the mentioned electrical tests.

- Testing the protective conductor system with regard to conductivity.
- Insulation test (terminals L and N bridged against PE).

12.6.3 Electrical functionality test

The electrical function test must be carried out immediately after the repair following the protection class of the electrical apparatus to be tested. The electrical function test may be carried out by a trained electrician observing the statutory provisions and pertinent regulations.

Filing

After the replacement of the power supply board the scope and findings of the test have to be recorded in writing and handed over for filing to the person responsible for machine operation.

13. Shutdown and disposal

13.1 Temporary shutdown

Temporarily shut the system down by:

- switching off the superior machine.
- Disconnecting the product from the power supply.

13.2 Final shutdown and disassembly

The final shutdown and disassembly of the product must be professionally planned and carried out by the operator in compliance with all regulations to be observed.

13.3 Disposal

Countries within the European Union

Disposal should be avoided or minimized wherever possible. Disposal of products contaminated with lubricant must be effected via a licensed waste disposal contractor in accordance with environmental requirements and waste disposal regulations as well as local authority requirements.

The specific classification of the waste is in the waste producer's responsibility, as the European Waste Catalogue provides different waste disposal codes for the same type of waste but of different origin.

Dispose of or recycle electrical components following WEEE directive 2012/19/EU.

Parts made of plastic or metal can be disposed of with the commercial waste.

Countries outside the European Union

The disposal has to be done according to the valid national regulations and laws of the country where the product is used.

14. Spare parts

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

14.1 Housing front cover, assy.

Designation	Qty.	Part number
Consisting of: 1 x housing front cover 1 x profile seal 1 x membrane keypad 4 x screw with washer	1	545-60168-1

Fig. 33

14.2 Pump element Z7

Designation	Qty.	Part number
Pump element Z7 including sealing ring	1	645-29818-1

Fig. 34

14.3 Pressure control valve

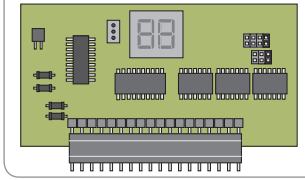
Designation	Qty.	Part number
Consisting of: 1 x pressure control valve SVTS-400-R 1/4A-D10	1	624-77641-1

Fig. 35

14.4 Control pcb

Designation	Qty.	Part number
Consisting of: 1 x control pcb 1 x profile seal 4 x screw with washer	1	545-60169-1

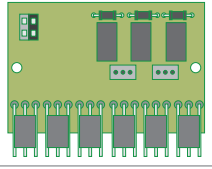
Fig. 36



14.5 Relay circuit board

Designation	Qty.	Part number
Consisting of: 1 x relay circuit board 1 x profile seal 4 x screw with washer	1	545-60170-1

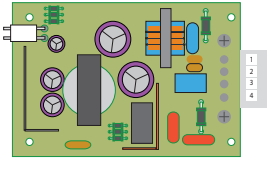
Fig. 37



14.6 Power supply board

Designation	Qty.	Part number
Consisting of: 1 x power supply board 1 x profile seal 4 x screw with washer	1	545-60171-1

Fig. 38

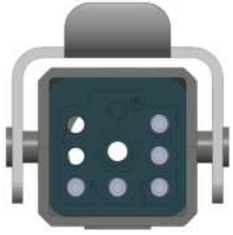


15. Electrical connections

15.1 Cable colours following IEC60757							
Abbreviation	Colour	Abbreviation	Colour	Abbreviation	Colour	Abbreviation	Colour
BK	black	GN	green	WH	white	PK	pink
BN	brown	YE	yellow	OG	orange	TQ	turquoise
BU	blue	RD	red	VT	violet		

15.2 Wire allocation of the connectors

For wire allocation of the connectors see the corresponding circuit diagram of these instructions

Connector H1 / X2	Connector H2 / X4
	

15.3 Assignment of the circuit diagrams to the pump type identification code

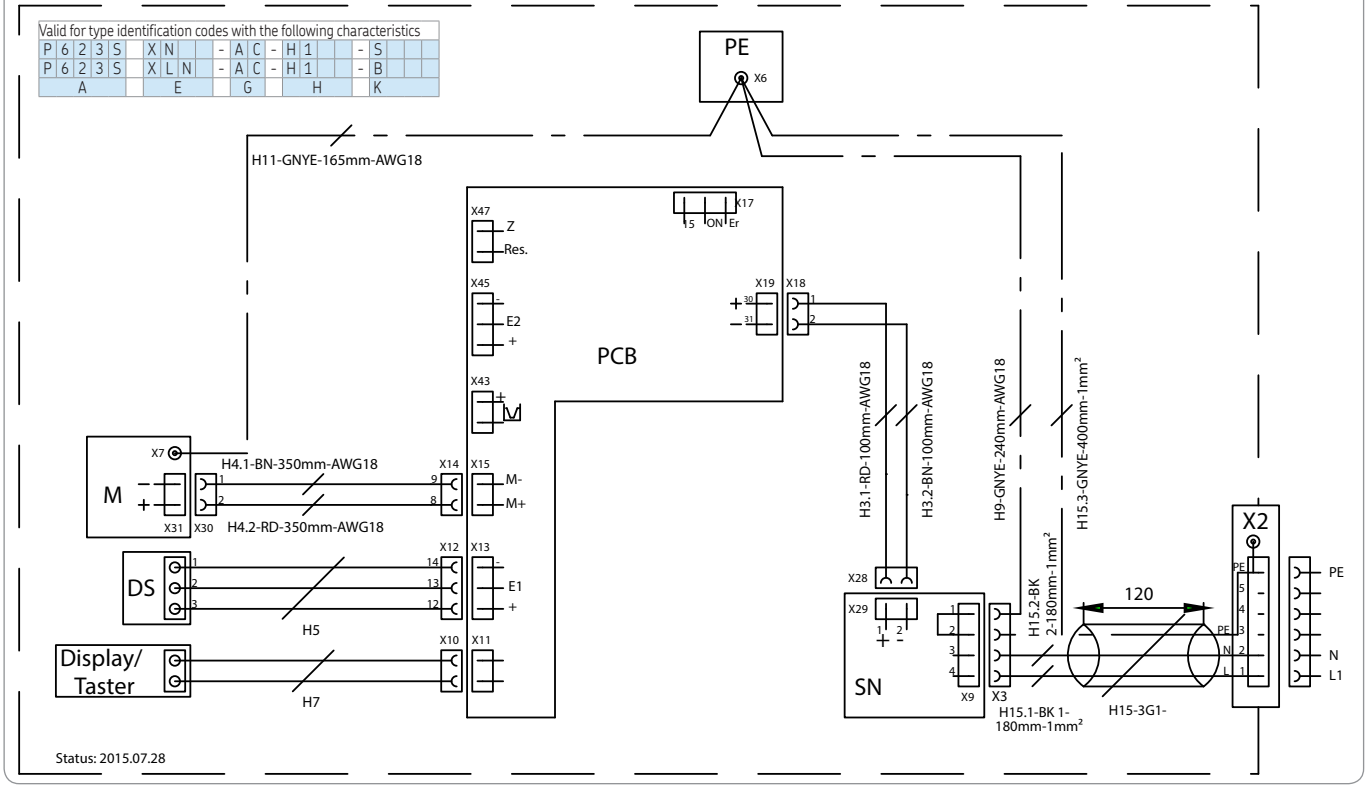
Assignment of the circuit diagrams to a certain pump is done via the characteristics given in the type identification code (see type identification code in these instructions).

Characteristic A	Product designation
Characteristic E	Reservoir version
Characteristic G	Connection voltage
Characteristic H	Electrical connections
Characteristic K	Control pcb

If the indications of the type identification code correspond to those of the circuit diagram, then the circuit diagram applies.
See type identification plate of the pump for specific pump type identification code.

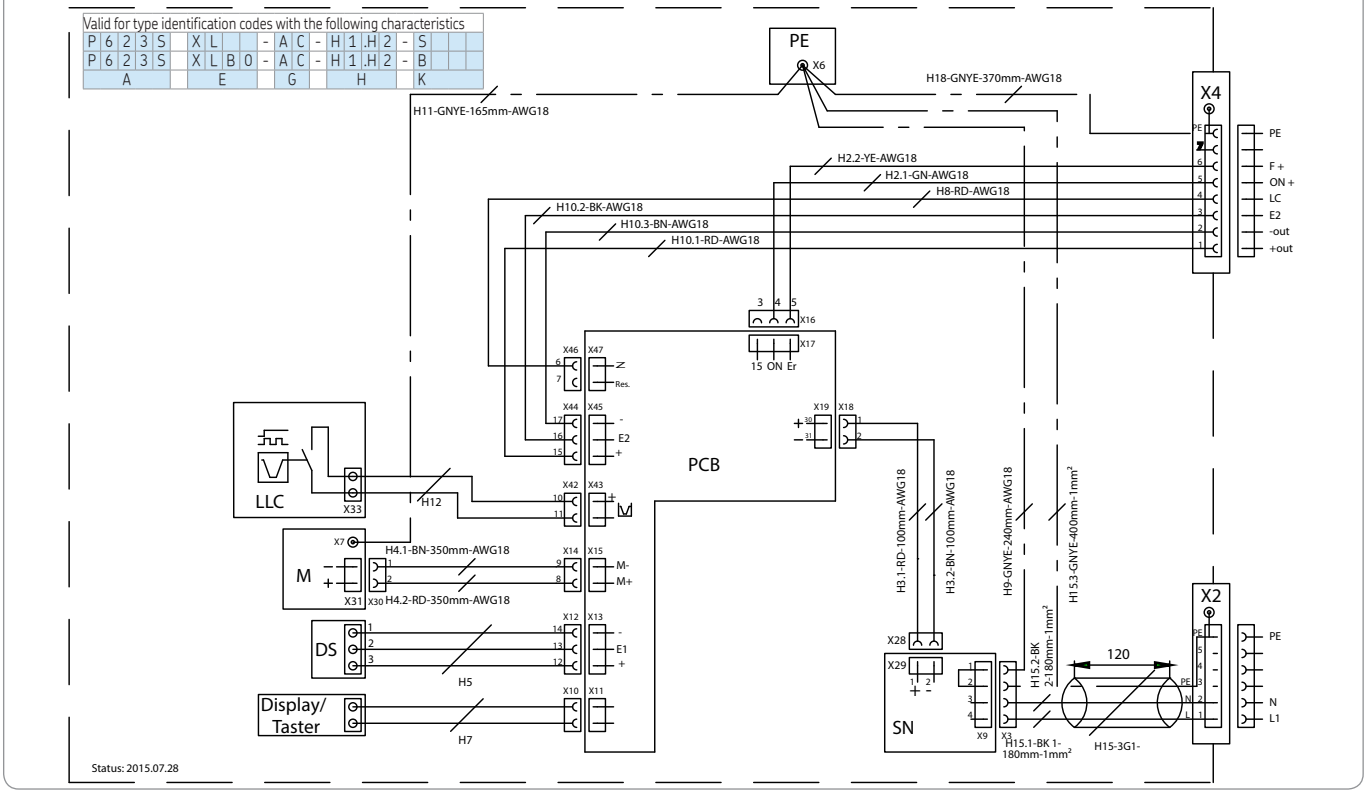
15.4 Connection diagram P623S-PCB-M-DS-DT-SN-H1

Connection diagram P623S-PCB-M-DS-DT-SN-H1 Fig. 39



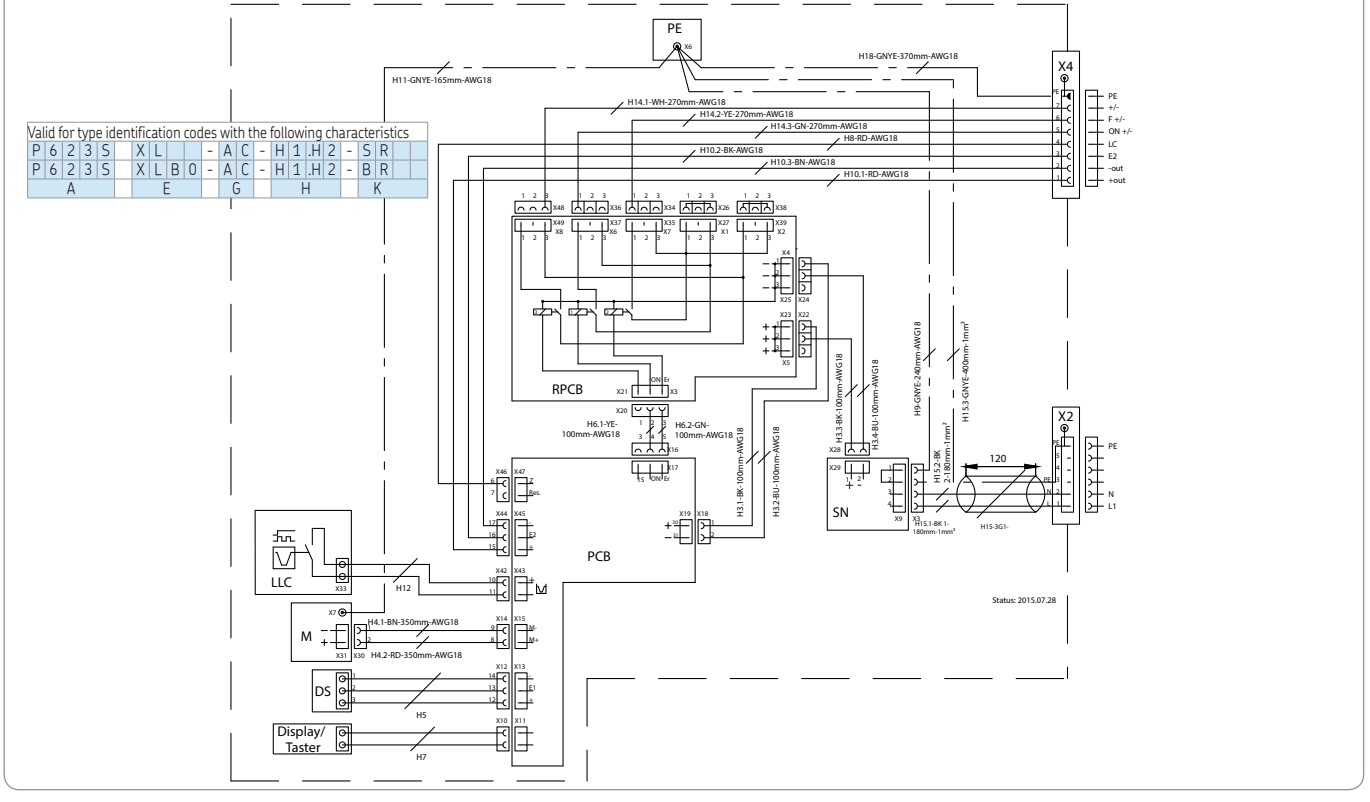
15.5 Connection diagram P623S-PCB-M-DS-DT-SN-H1-H2-LLC

Connection diagram P623S-PCB-M-DS-DT-SN-H1-H2-LLC Fig. 40



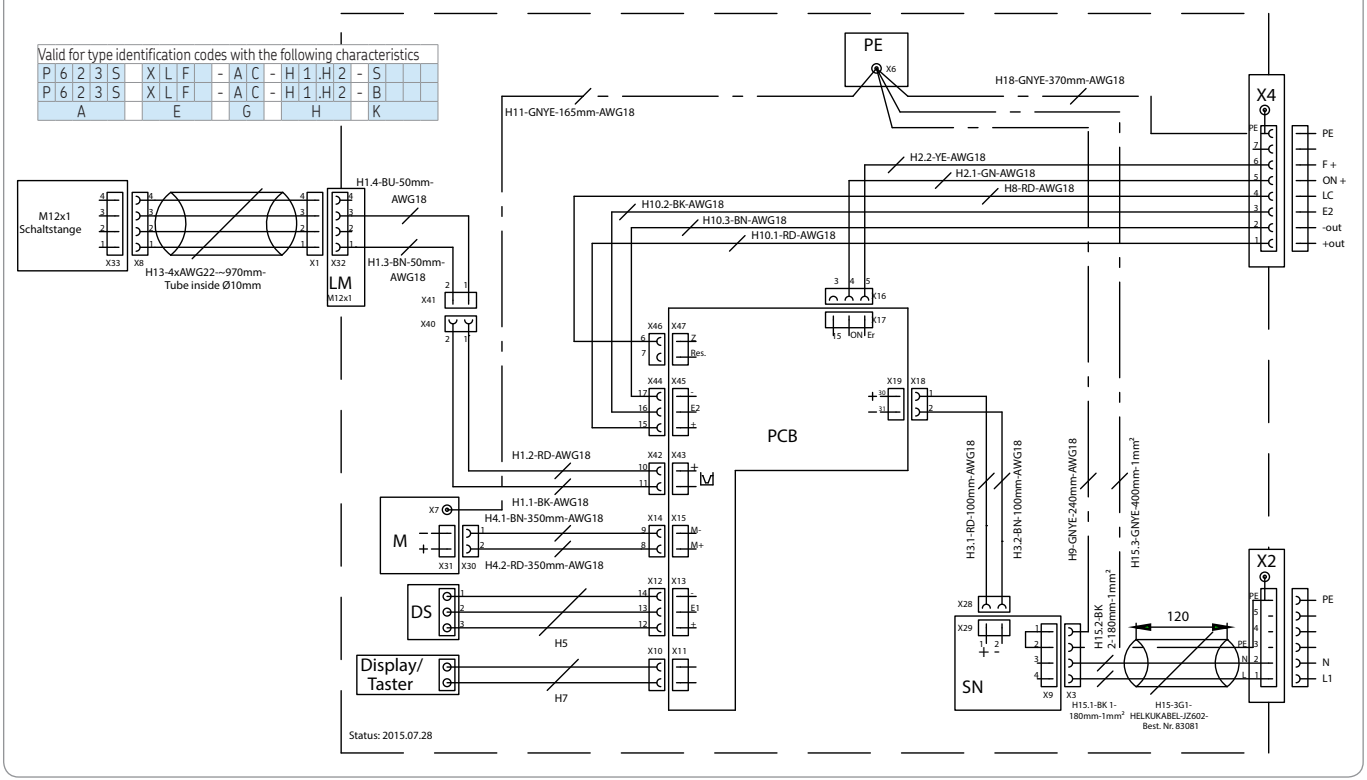
15.6 Connection diagram P623S-PCB-M-DS-DT-H1-H1-LLC-RPCB

Connection diagram P623S-PCB-M-DS-DT-H1-H2-LLC-RPCB Fig. 41



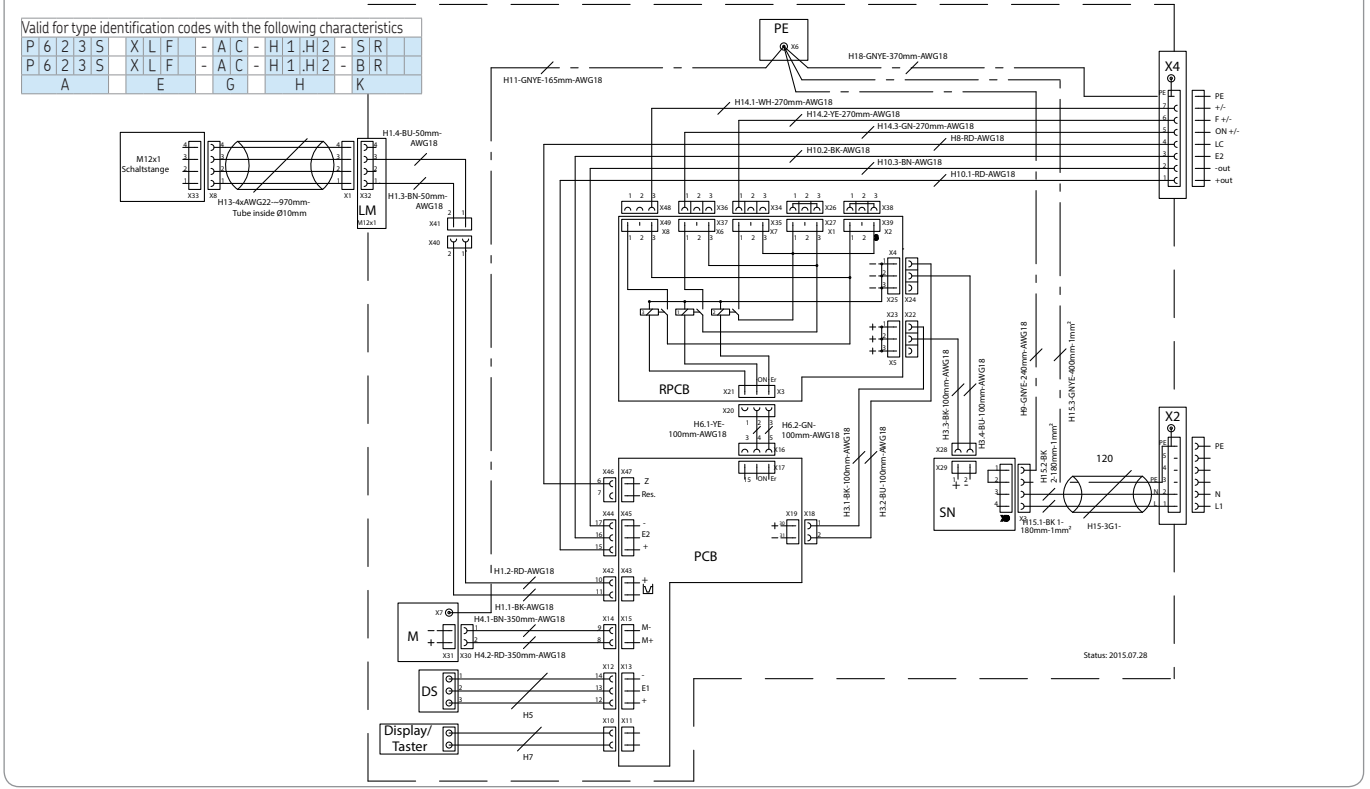
15.7 Connection diagram P623S-PCB-M-DS-DT-SN-H1-H2-LF

Connection diagram P623S-PCB-M-DS-DT-SN-H1-H2-LF Fig. 42

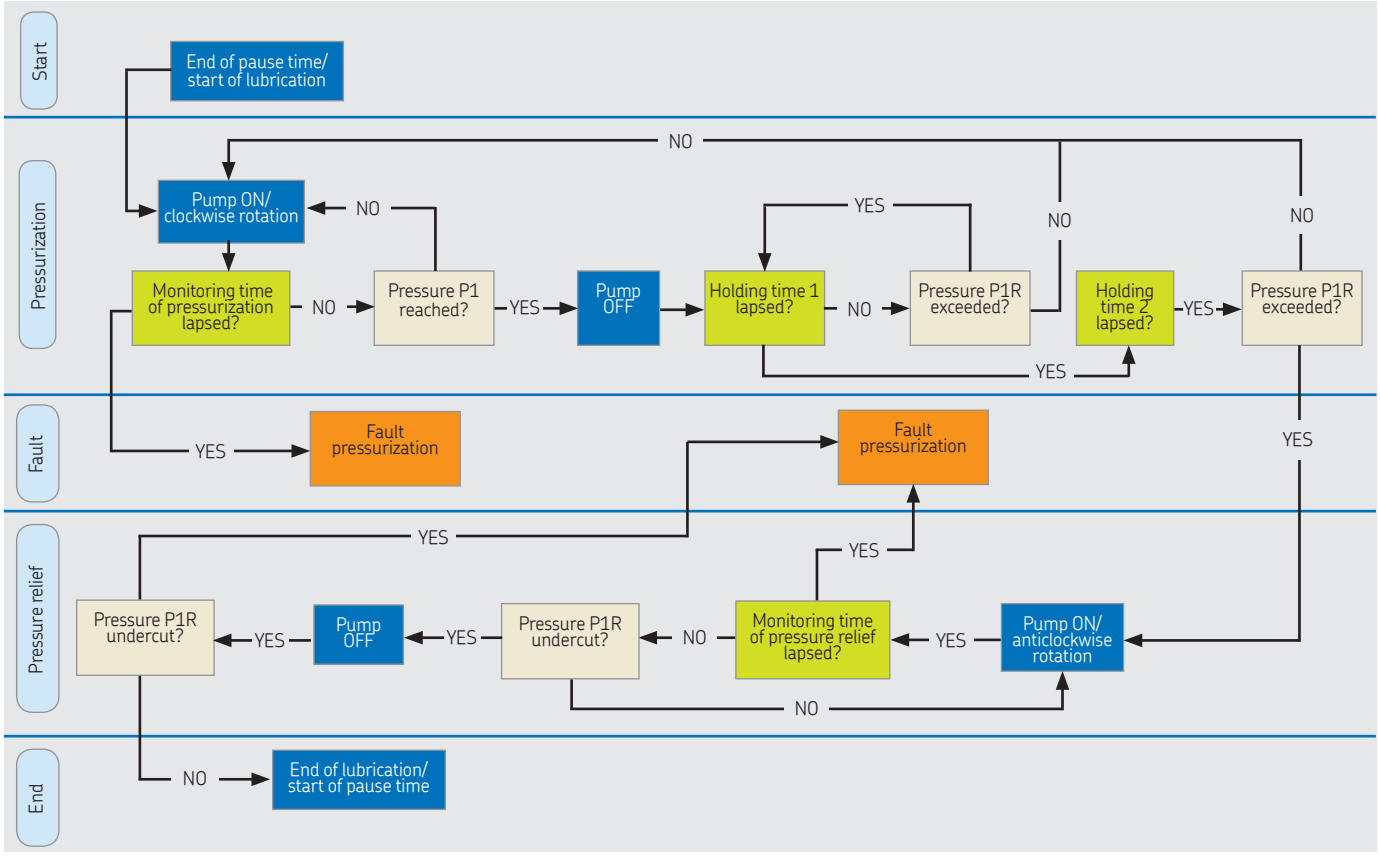


15.8 Connection diagram P623S-PCB-M-DS-DT-H1-H1-LF-RPCB

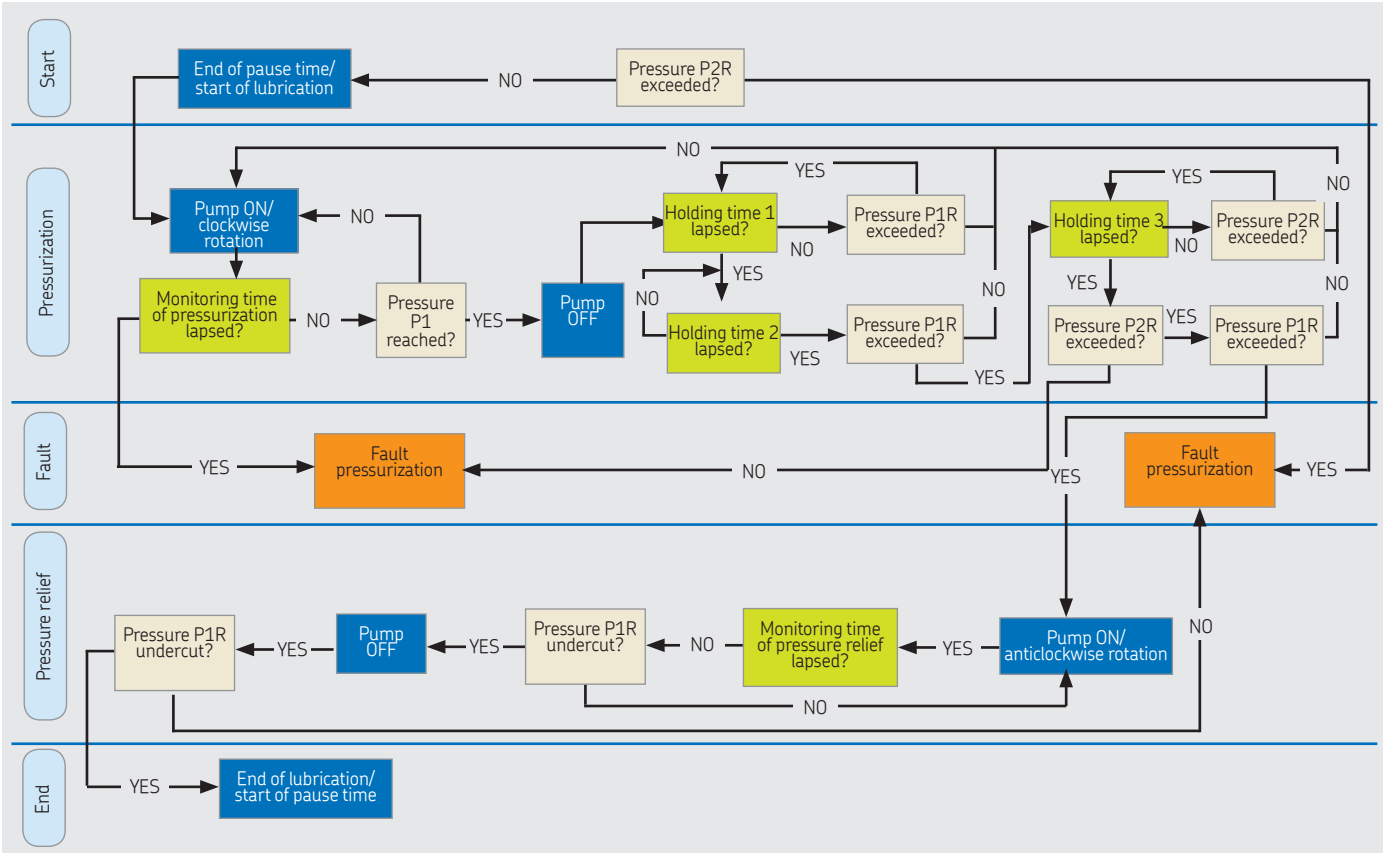
Connection diagram P623S-PCB-M-DS-DT-SN-H1-H1-LF-RPCB Fig. 43



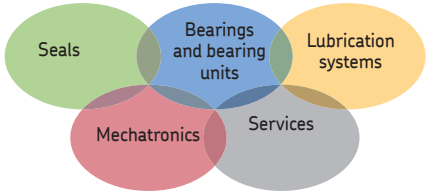
15.9 Functional flow chart P623S with internal pressure sensor/ pressure switch



15.10 Functional flow chart P623S with internal and external pressure sensor/ pressure switch



Notes



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Drawing on five areas of competence and application-specific expertise amassed over more than 100 years, SKF brings innovative solutions to OEMs and production facilities in every major industry worldwide.

These five areas of competence include bearings and bearing units, seals, lubrication systems, mechatronics (combining mechanics and electronics into intelligent systems), and a wide range of services, from 3-D computer modelling to advanced condition monitoring and reliability and assessment management systems. A global presence provides SKF customers uniform quality standards and worldwide product availability.

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Important information on product usage

All products from SKF may be used only for their intended purpose as described in this brochure and any instructions.

Not all lubricants are suitable for use in centralized lubrication systems. SKF does offer an inspection service to test customer supplied lubricant to determine if it can be used in a centralized lubrication system.

SKF lubrication systems or their components are not approved for use with gases, liquefied gases, pressurized gases in solution and fluids with a vapour pressure exceeding normal atmospheric pressure (1013 mbar) by more than 0.5 bar at their maximum permissible temperature.

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