

CHANGE OVER VALVE UNIT SKF MAXILUBE

(Translation from original Finnish operating and maintenance instructions compliant with EU Directive 2006/42/EC)



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1 EC Declaration of incorporation, SKF Maxilube with internal control (power supply 230V/115V)

Original Declaration of Incorporation for Partly Completed Machinery (Machinery Directive 2006/42/EC, Annex II, part 1, section B)

Oy SKF Ab
Teollisuustie 6 (P.O. Box 80)
FIN-40951 MUURAME

Person authorised to compile the relevant technical documentation:
Technical Manager and Product Manager, Centralised Lubrication Systems, Muurame Unit.

Herewith declares that for the partly completed machinery:

SKF Maxilube MAX-X-X-230-IF105-X-X-X **SKF Maxilube MAX-X-X-115-IF105-X-X-X**

- the following essential requirements of the Machinery Directive 2006/42/EC are applied and fulfilled: 1.1.2, 1.1.3, 1.1.5, 1.1.6, 1.2.1, 1.2.2, 1.2.3, 1.2.4, 1.2.6, 1.3.1, 1.3.2, 1.3.4, 1.3.7, 1.5.1, 1.5.4, 1.5.6, 1.5.7, 1.5.13, 1.6.1, 1.6.2, 1.6.3, 1.6.4, 1.7.1, 1.7.2, 1.7.3, 1.7.4
- the relevant technical documentation is compiled in accordance with part B of Annex VII and that this documentation or parts hereof will be transmitted by post or electronically in response to a reasoned request by the national authorities
- and that this partly completed machinery is in conformity with the provisions of the following other EC Directives:
 - EMC Directive 2014/30/EC
 - Low Voltage Directive 2014/35/EC
- and furthermore declares that the following European harmonised standards have been used:
 - Machinery Directive 2006/42/EC EN ISO 12100-1/A1, EN ISO 12100-2/A1
 - EMC Directive 2014/30/EC EN 61000-6-4:2011 (interference emissions); EN 61000-6-2:2006 (interference immunity)
 - Low Voltage Directive 2014/35/EC IEC 61010-1:2010

This 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 provisions of the Machinery Directive 2006/42/EC, where appropriate.

In Muurame
Place

5 April 2016
Time



Juha Kärkkäinen
Manager R&D Nordic
SKF Lubrication Business Unit

2 EU Declaration of incorporation, SKF Maxilube with external control (control voltage 24V)

Original declaration of incorporation for partly completed machinery (Machinery Directive 2006/42/EC, Annex II, part 1, section B)

Oy SKF Ab
Teollisuustie 6 (P.O. Box 80)
FI-40951 MUURAME, FINLAND

Person authorised to compile the relevant technical documentation:
Technical Manager and Product Manager, Centralized Lubrication Systems, Muurame Unit.

Herewith declares that for the partly completed machinery:

SKF Maxilube MAX-X-X-24-X-X-X

- the following essential requirements of the Machinery Directive 2006/42/EC are applied and fulfilled: 1.1.2, 1.1.3, 1.1.5, 1.1.6, 1.2.1, 1.2.2, 1.2.3, 1.2.4, 1.2.6, 1.3.1, 1.3.2, 1.3.4, 1.3.7, 1.5.1, 1.5.4, 1.5.6, 1.5.7, 1.5.13, 1.6.1, 1.6.2, 1.6.3, 1.6.4, 1.7.1, 1.7.2, 1.7.3, 1.7.4
- The relevant technical documentation is compiled in accordance with part B of Annex VII of the Machinery Directive and that this documentation or parts hereof will be transmitted by post or electronically in response to a reasoned request by the national authorities.
- And furthermore, declares that this partly completed machinery complies with the following European harmonised standards:
 - Machinery directive 2006/42/EC: EN ISO 12100-1/A1, EN ISO 12100-2/A1

This partly completed machinery must not be put into service until, where appropriate, the final machinery into which it is to be incorporated has been declared in conformity with the provisions of the Machinery Directive 2006/42/EC.

Muurame
Place

April 05, 2016
Date



Juha Kärkkäinen
Manager R&D Nordic
SKF Lubrication Business unit

3 Legal disclosure

Manufacturer

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Training courses

In order to provide a maximum of safety and economic viability, SKF provides detailed training courses. Attending the training courses is recommended. For further information, please contact the provided SKF Service address.

Copyright

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Warranty and liability

Oy SKF Ab assumes no liability, nor will the warranty provided cover any loss in the following cases:

- The system or component has been used for something other than its intended purpose.
- The system or component has not been installed, commissioned, decommissioned, maintained or used according to the instructions provided.
- Impure lubricants or materials not approved by Oy SKF Ab have been used in the system or component.
- The system or component has been incorrectly maintained or repaired.
- Parts other than Oy SKF Ab's original spare parts have been used in the system or component.
- The system or component has been altered in ways that Oy SKF Ab has not approved.
- The system or component has been used outside the specified operating limits.
- The system or component has not been stored according to the storage instructions herein.

Notes related to the operating instructions

The present operating instructions are original operating instructions of the manufacturer pursuant to Machinery Directive 2006/42/EC. The instructions are part of the described products and must be kept in an accessible location for further use.

Disclaimer

The manufacturer shall not accept any liability for damages caused by the following actions by the customer:

- accidents, negligent or inappropriate use, assembly, operation, configuration, maintenance or repairs,
- improper or late response to malfunctions,
- unauthorised modifications to the product,
- intent or negligence, and
- the use of non-original (non-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 any kind is excluded.

4 Explanation of symbols, signs and abbreviations

The following symbols are used in the safety instructions included in this manual to highlight conditions which are potentially harmful to people, materials or the environment.

Please follow the instructions provided especially in the highlighted conditions. Also, relate the safety instructions to other operators.

	General warning		Risk of electric shock
	Risk of slipping		Hot surface
	Fire hazard		Use protective goggles
	Use hearing protectors		Read the operating instructions before use
	General note		Environmentally friendly disposal
	Dispose of cartridges in an environmentally friendly way		

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

Symbol	Meaning
●	Instruction step
○	List item
✓	Conditions which must be met before the activities described in the title clause can be completed
☞	Related factors, causes or consequences

ap-prox.	approximately	°C	degrees Celsius	°F	degrees Fahrenheit
i.e.	that is	K	Kelvin	Oz.	Ounce
etc.	et cetera	N	Newton	fl. oz.	fluid ounce
poss.	possibly	h	hour	in.	inch
incl.	including	s	second	psi	pounds per square inch
min.	minimum	d	day	sq.in.	square inch
max.	maximum	Nm	Newton metre	cu. in.	cubic inch
min	minute	ml	millilitre	mph	miles per hour
etc.	et cetera	ml/d	millilitre per day	rpm	revolutions per minute
e.g.	for example	cc	cubic centimetre	gal.	gallon
kW	kilowatt	mm	millimetre	lb.	pound
U	voltage	l	litre	hp	horse power
R	resistance	dB (A)	sound pressure level	kp	kilopond
I	current	>	greater than	fpsec	feet per second
V	volt	<	less than		
W	watt	±	plus/minus		
AC	alternating current	∅	diameter		
DC	direct current	kg	kilogram		
A	ampere	rh	relative humidity		
Ah	Ampere hour	≈	approximately		
Hz	frequency [Hertz]	=	equal to		
NC	normally closed	%	per cent		
NO	normally open	‰	per mille		
		≥	equal to or greater than		
		≤	equal to or less than		
		mm ²	square millimetre		

Conversion factors	
length	1 mm = 0.03937 in.
area	1 cm ² = 0.155 sq.in
volume	1 ml = 0.0352 fl.oz.
	1 l = 2.11416 pints (US)
mass	1 kg = 2.205 lbs
	1 g = 0.03527 oz.
density	1 kg/cc = 8.3454 lb./gal (US)
	1 kg/cc = 0.03613 lb./cu.in.
force	1 N = 0.10197 kp
pressure	1 bar = 14.5 psi
temperature	°C = (°F-32) x 5/9
output	1 kW = 1.34109 hp
acceleration	1 m/s ² = 3.28084 ft./s ²
speed	1 m/s = 3.28084 fpsec.
	1 m/s = 2.23694 mph

5 Safety instructions

5.1 General safety instructions

- These safety instructions should be read and followed by any persons entrusted with working on the product and those who supervise or instruct the group of persons mentioned above. In addition, the owner must ensure that the relevant personnel are fully familiar with the contents of the instructions and have understood them. 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 have been manufactured according to the state of the art. However, if the products are used for other than their intended purpose, there may be risks which may result in personal injury or property damage.
- 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.

5.2 General behaviour when handling the product

- Please follow these instructions whenever you use the product. If the product is not in proper technical condition or you are unaware of the potential hazards, do not use the product.
- Familiarise yourself with the functions and operation of the product. All specified assembly and operating steps must be completed in the indicated order.
- Any unclear points regarding proper condition or correct assembly/operation must be clarified. Operation is prohibited until issues have been clarified.
- Prevent unauthorised access.
- Always wear personal protective equipment.
- Take the proper precautions and follow the instructions concerning the relevant task. Responsibilities for different activities must be clearly defined and observed. Uncertainty is a major risk factor for safety.
- Safeguards and other protective and emergency equipment must not be removed, modified, disconnected or otherwise disabled. Their completeness and function must also be checked at regular intervals.
- If a safeguard or other protective equipment has to be detached, it must be reattached and tested immediately after the work is complete.
- Remedy any faults included in your area of responsibility. If the fault is beyond your competence, notify your supervisor immediately of the fault.
- Never use parts of the centralised lubrication system or of the machine as standing or climbing aids.

5.3 Intended use

Supply of lubricants within a centralised lubrication system in accordance with 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.

5.4 Foreseeable misuse

Any use differing from that stated in these instructions is strictly prohibited, particularly the following:

- use outside the indicated temperature range,
- use of non-specified lubricants,
- exceeding the maximum allowable operating pressure,
- use in continuous operation,
- use in areas with aggressive or corrosive materials (e.g. high ozone pollution),
- use in areas with harmful radiation (e. g. ionising radiation),
- feeding, forwarding, or storing hazardous substances and mixtures described in Annex I part 2–5 of the CLP regulation (EG 1272/2008) and marked with warnings GHS01–GHS06 and GHS08
- feeding, forwarding or storing gases, liquefied gases, dissolved gases, vapours or fluids whose vapour pressure exceeds normal atmospheric pressure (1,013 mbar) by more than 0.5 bar at the maximum permissible operating temperature, and
- use in an explosion protection zone.

5.5 Modifications to the product

Unauthorised conversions or modifications may have unforeseeable effects on product safety and functionality. Therefore, any unauthorised conversions or modifications are expressly prohibited.

5.6 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 (MSDS) of the lubricant used

Where appropriate:

- project planning documents
- instructions provided by the suppliers of purchased parts
- any documents of other components required to set up the centralised lubrication system
- other documents relevant for the integration of the product into the machine or system.

5.7 Notes concerning the type identification plate

The type identification plate indicates the type designation, order code and other key details of the machine.

To make sure no information is lost if the type identification plate becomes illegible, enter the details in this manual:

Type _____

Code _____

Date of manufacture _____

SKF Maxilube		SKF
TYYPPI TYPE	_____	_____
JÄNNITE VOLTAGE	V DC	SARJANUMERO SERIAL NO.
SULAKE FUSE	A	KOODI CODE
TAAJUUS FREQ	Hz	VALM. PVM. MANUF. DATE
TEHO POWER	W	PIIRUSTUS DRAWING
		Oy SKF Ab VALMISTAJA MANUFACTURER P.O. Box 80 FIN - 40951 MUURAME FINLAND

5.8 Persons authorised to operate the device

5.8.1 Operator

An operator is a person who is qualified to carry out the functions and activities related to normal operation based on his or her training, knowledge and experience. This includes avoiding possible hazards that may arise during operation.

5.8.2 Mechanical specialist

A mechanical specialist is a person with appropriate professional education, knowledge and experience to detect and avoid the hazards that may arise during transport, installation, commissioning, operation, maintenance, repair and disassembly.

5.8.3 Electrician

An electrician is a person with appropriate professional education, knowledge and experience to detect and avoid electrical hazards.

5.8.4 Providing briefing for external technicians

Prior to commencing any activities, external technicians must be informed by the end-user of its safety provisions, applicable accident prevention procedures and the functions of the superordinate machine and its protective devices.

5.8.5 Provision of personal protective equipment

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

5.9 Operation

The following must be observed during commissioning and operation:

- any information within this manual and the information within the referenced documents, and
- all laws and regulations that the end-user must observe.

5.9.1 Stopping the pump in an emergency

Conduct an emergency stop as follows:

- Cut off the pump's pressurised air supply from the pressure air regulator.

5.9.2 Transport, installation, maintenance, malfunctions and repairs

- All relevant persons must be informed of the activity prior to starting any work. Observe the precautionary operational measures and work instructions.
- Transport the products with suitable transportation and hoisting equipment using suitable work methods.
- 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.
- Before conducting any work, depressurise the product or machine into which the product will be integrated and secure it against unauthorised activation.
- Ensure through suitable measures that movable or detached parts are immobilised during the work

- and that no limbs can be caught in between if there are inadvertent movements.
- Assemble the product only outside of the operating range of moving parts, at an adequate distance from sources of heat or cold. Be careful not to damage other units in the machine or vehicle or impair their function during 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 work on electrical components using voltage insulated tools only.
 - Make 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.
 - Do not bypass any fuses. Replace fuses with same type and rating only.
 - Do not drill holes to critical, load-bearing parts. Use existing boreholes whenever possible. Be careful not to damage lines and cables when drilling.
 - Observe possible abrasion points. Protect the parts accordingly.
 - All components used must be suitable for use in:
 - the system's maximum operating pressure, and
 - the system's minimum and maximum ambient temperature range.
 - No parts of the centralised lubrication system may be subjected to torsion, shear or bending.
 - Before using any parts, check them for contamination, clean if necessary.
 - Before installation, prime the hoses between the doser group and the lubrication point with lubricant. This makes it easier to bleed the system of air afterwards.
 - Observe the specified tightening torques. 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.

5.10 Commissioning and daily start-up

Ensure that:

- All safety devices are complete and work properly.
- All connections are correctly connected.
- All parts have been correctly installed.
- All warning labels on the machine are complete, highly visible and undamaged.
- Replace illegible or missing warning labels without delay.

5.11 Cleaning

- There is a risk of fire and explosion when using flammable cleaning agents. Use only non-flammable cleaning agents suitable for the purpose.
- Do not use aggressive cleaning agents.
- Do not use steam jet or high pressure cleaners. Electrical components may be damaged. Observe the IP protection class.
- Cleaning work on energised components may be carried out by electrical specialists only.
- Mark damp areas accordingly.

Residual risk	Possible in lifecycle stage	Prevention/remedy
Personal injury / material damage due to falling of raised parts	A, B, C, G, H, K	Keep unauthorised people away. Make sure no one remains under suspended parts or loads. Lift parts with suitable and tested lifting devices.
Personal injury / material damage due to tilting or falling of the product because of non-observance of the stated tightening torques	B, C, D, G	Observe the specified tightening torques. Fasten the product to components with adequate load-bearing capacities only. If no tightening torques are stated, tightening torques for grade 8.8 screws apply.
Personal injury / material damage due to electric shock from a damaged connection cable	B, C, D, E, F, G, H	Check that the low level switch connection cable is intact before using the switch for the first time and, after that, at regular intervals. Do not mount the cable to moving parts or at an abrasion point. If this cannot be avoided, use either spring coils or protective conduits depending on the circumstances.
Personal injury / damage to material due to spilled or leaked lubricant	B, C, D, F, G, H, K	When replacing the barrel, detach and reattach lubricant feed lines with care. Always use appropriate hydraulic screw connections and lubrication lines suitable for use in the stated pressures. Do not mount lubrication lines to moving parts or abrasion points. If this cannot be avoided, use either flexible hose lines, spring coils or protective conduits depending on the circumstances.
Lifecycle stages: A = transport, B = installation, C = commissioning, D = operation, E = cleaning, F = maintenance, G = fault, repair, H = decommissioning, K = disposal		

6 Lubricants

6.1 General information

Different lubricants are used in different applications. In order to fulfil their tasks, lubricants must fulfil various requirements to varying extents. The most important requirements for lubricants are:

- reduction of abrasion and wear
- corrosion protection
- noise minimisation
- protection against contamination and entry of foreign objects
- cooling (primarily for oils)
- longevity (physical/chemical stability)
- compatibility with as wide range of materials as possible
- economic and ecological aspects

6.2 Lubricant selection

SKF considers lubricants to be an element of system design. A suitable lubricant is selected already when designing the machine and it forms the basis for centralised lubrication system planning.

The selection is made by the manufacturer/end-user of the machine, preferably together with the lubricant supplier based on a defined requirement profile.

Should you have little or no experience with the selection of lubricants for centralised lubrication systems, please contact SKF.

If required, we will be glad to support customers in selecting suitable components for feeding the selected lubricant and planning and designing their centralised lubrication system.

You will avoid possible costly downtimes caused by damage to your machine/system or the centralised lubrication system.

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

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

	Due to the multitude of possible additives, it is possible that individual lubricants, which according to the manufacturer's data sheets match the system's specification, might not in fact suitable for use in centralised lubrication systems (e.g. incompatibility between synthetic lubricants and materials). To avoid this problem, always use lubricants tested by SKF.
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6.3 Material compatibility

Lubricants must generally be compatible with the following materials:

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

6.4 Ageing of lubricants

After a prolonged downtime of the machine, the lubricant may no longer be suitable for use due to chemical or physical ageing and must therefore be inspected before the system is recommissioned. We recommend inspecting the lubricant already after a week's downtime.

If you suspect that the lubricant is no longer suitable, replace it prior to recommissioning and, if necessary, perform initial lubrication manually.

It is possible for lubricants to be tested in the company's laboratory for their suitability for being pumped in centralised lubrication systems (e.g. no "bleeding").

Please contact SKF if you have further questions regarding lubricants.

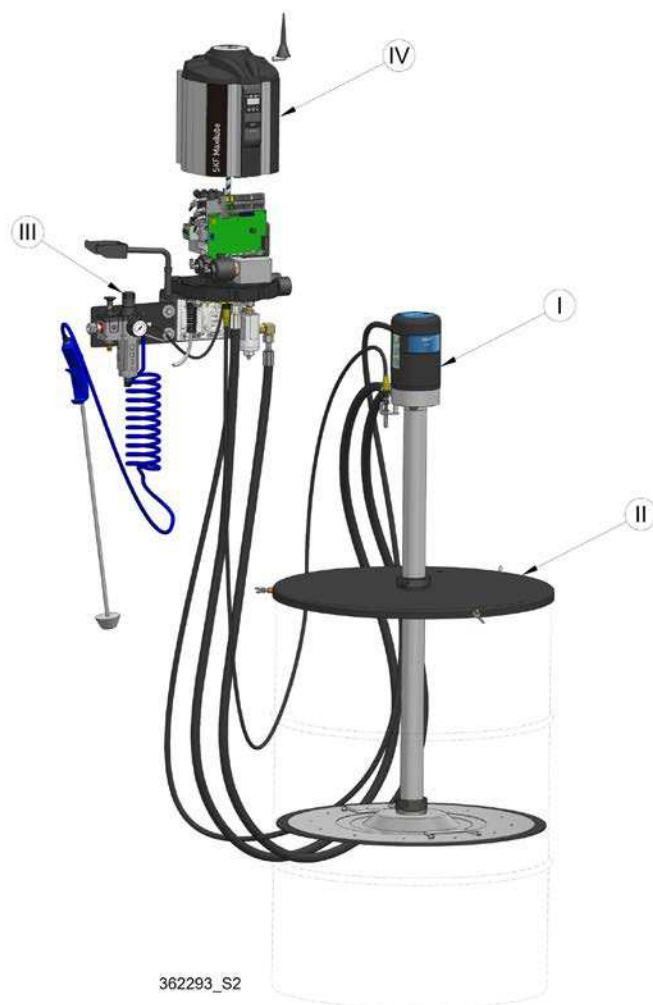
An overview of the lubricants tested by SKF is also available upon request.

7 General description

7.1 Maxilube pumping centre

The pumping centre of the SKF MaxiLube central lubrication system is designed for pumping lubricant into a centralised lubrication system. The pumping centre can be controlled and monitored using the control unit integrated in the changeover valve unit, using external control or by sending SMS messages.

The Maxilube pumping centre consists of a pump (I), a lid set (II), a pressure air regulator (III) and a change over valve unit (IV) with accessories.



Item	Description
I	Pump
II	Lid set (ECO or STA)
III	Pressure air regulator
IV	Changeover valve unit

Figure 1: Construction of SKF Maxilube pumping centre

7.2 SKF Maxilube changeover valve unit

The changeover valve unit includes a solenoid valve group (4) and a control valve group (2), pressure gauges (7) and a fixing plate which contains a bracket for the pump during the changing of the barrel. The Maxilube pumping centre includes a user interface (5) and a circuit board (3).

Item	Description
1	Control valve
2	CHV-100 control cartridge (1 or 2 pcs)
3	Circuit board ST105A
4	Solenoid valve 24 V
5	User interface IF-105
6	Power supply 115/230VAC
7	Pressure gauge

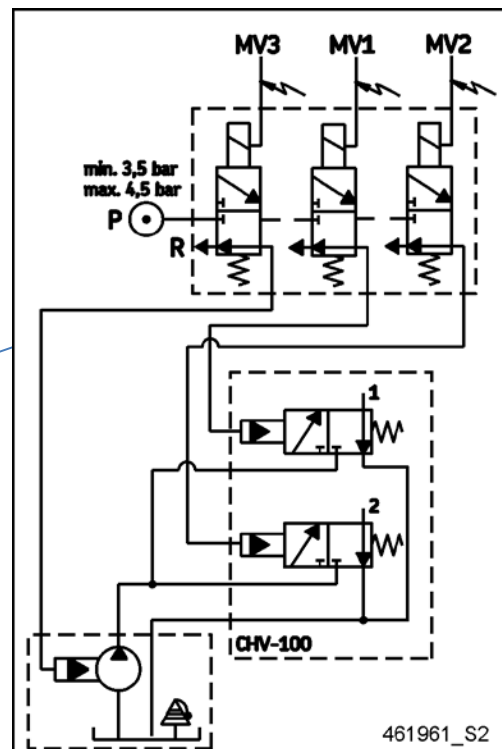
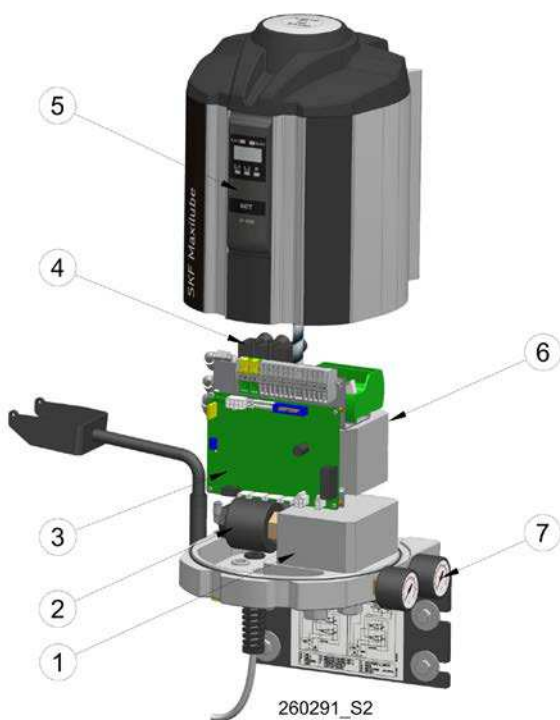
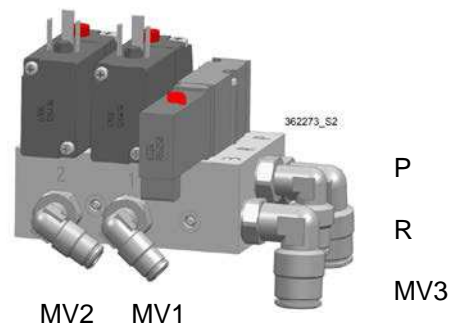


Figure 2: Construction & PI diagram of Maxilube

8 Operation

8.1 Operation of the pumping centre

When pressurisation starts, control unit opens both the line to be pressurised and the pump solenoid valves. Pneumatic system starts the pump and opens the line control valve. Pressurisation continues until the pressure at the pressure monitoring unit reaches a pre-set acknowledgement level. After acknowledgement, the control unit closes the solenoid valves, the pump stops and pressure discharges from the line to the lubricant barrel.

If the lubricant level in the barrel reaches the low limit level during pumping, the low-level switch sends an alarm to the control unit and pumping is stopped. The alarm can be reset by replacing the lubricant barrel and resetting the alarm at the control unit.



The numbers in brackets are the position numbers for Figure 2.

8.2 Commissioning

DANGER



Electrical shock

Electrical connections must only be made by qualified electricians. Minimise the risk of electric shock by making sure that the pumping centre is turned off before making connections. Power must be turned off before work involving handling of conductive parts or opening any part of the system or product.

WARNING



Pressurised lubricant

Make sure that the system is depressurised. Remove pressure from the grease filter before opening it with the help of a venting screw located in the filter plug (11, Figure 5). Turn off the air supply by lifting the shut-off valve button (1, Figures 7 & 8) or set air pressure to 0 bar using the pressure regulator (2, Figures 7 & 8) and the pressure gauge (3, Figures 7 & 8). Disconnect the M12 cable (7, Figures 5 & 6) from the pump. Any residual pressure in the system when opening or disconnecting components may cause components to be thrown or lubricant to spray, causing injury to people or damage to the environment.

WARNING



Pressurised lubricant

The pressure in the pneumatic system must be regulated so that the pressure at the pumping centre cannot under any circumstances exceed 300 bar (4,350 psi/30 MPa). A higher pressure may damage the system components and cause injury to people or damage to the environment.

ATTENTION

Make sure that the surroundings are clean. Make sure that no impurities enter the pump, the follower plate or the lubricant barrel. Impurities may cause damage to the lubrication system or the machine or device being lubricated.



8.2.1 Maxilube with ECO lid set

- 1 Ensure that the surroundings of the pumping centre are clean. Impurities in the system prevent trouble-free operation and cause damage at the lubrication point.
- 2 Check the condition of the lubricant barrel. Damages on the surface prevent the follower plate from being lowered (3, Figure 5).
- 3 Remove the barrel's original lid and press the follower plate (3, Figure 5) closely on top of the lubricant in the barrel. Make sure that air is removed from below the follower plate and that the central unit (suction head) of the follower plate starts to fill with lubricant.
- 4 Place the lid (1, Figure 5) on top of the lubricant barrel. Fasten the lid onto the lubricant barrel with wing screws.
- 5 Pass the pump through the lid onto the suction port of the follower plate. Make sure that the pump is firmly attached to the air follower plate.
- 6 Fasten the pressure air hose from the pressure air regulator to the bottom plate connection A1 (Figure 12).
- 7 Fasten the lubricant tank hose (5, Figure 5) to the bottom plate and pump connection T (Figure 12).
- 8 Fasten the grease filter (10, Figure 5) to the bottom plate connection P (Figure 12).
- 9 Fasten the pressure hose (4, Figure 5) to the pump connection P (Figure 2).
- 10 Fasten the plug to the tank connection (T) of the pump (Figure 2).
- 11 Fasten the low-level switch (9 & 10, Figure 2) to the pump.
- 12 Connect the low-level switch cable (7, Figure 5) to the bottom plate connection D (Figure 12) and the cables of the channel pressure control units and shut-off valves to the pumping centre as described in the electrical drawings.
- 13 Fasten the pressure air hose (6, Figure 5) to the bottom plate connection A2 (Figure 12) and the pressure air connection (4, Figure 2) of the pump.
- 14 Set the pressure of the pumping centre's pressure air to 4 bar (60 psi) with the pressure air control device (2, Figure 7) of the pressure air regulator.
- 15 Start the pump in manual operation mode of the control unit or with pressure air manual control screw of pumping centre's solenoid valve group (see *Paragraph 9.5 Manual operation*). When manual control screws are used, remove the cover plate and the nut below the plate. After this remove the pumping centre cover.
- 16 After the pressure hose is filled, stop the pump and connect the hose to the grease filter (10, Figure 5).
- 17 Fill the main header with lubricant by starting the pump in manual operation mode of control unit or with pumping centre's solenoid valve group's manual control screws for pressure air and lubrication lines. Stop the pump when the header piping has been filled and air has been removed.
- 18 Remove the plug from the tank connection (6, Figure 2) of the pump and fasten the tank hose (5, Figure 5) to the tank inlet of the line valve T (6, Figure 2).
- 19 Ensure before connecting the tank hose (5, Figure 5) to the bottom plate connection T that only grease (no air) is coming out of the hose. If needed, pressurise the system again. Air in the system prevents its trouble-free operation.
- 20 Do a test pressurisation of the header piping by increasing the pressure with the pressure control device at the pumping centre to up to 250 bar (3,600 psi). The pump will stop due to backpressure in 250 bar (3,600 psi) if there is no air or leakage in the header piping.
- 21 Set the maximum pressure of the pumping centre with a pressure control device (2, Figure 7). The maximum pressure of the pumping centre should be set approximately 20% higher than the pressure by which the pressure control unit acknowledgement pressure is reached. For example, if the acknowledgement pressure level is reached when the pressure of pumping centre is 170 bar (2,500 psi), the maximum pressure should be set at 200 bar (3,000 psi).
- 22 Fasten the lid of the pumping centre (Figure 9).

8.2.2 Maxilube with STA lid set

1. Ensure that the surroundings of the pumping centre are clean. Impurities in the system prevent trouble-free operation and cause damage at the lubrication point.
2. Check the condition of the lubricant barrel. Damages on the surface prevent the follower plate from being lowered (3, Figure 6).
3. Remove the barrel's original lid and press the follower plate closely on top of the lubricant in the barrel. Ensure that air is being removed under the follower plate.
4. Place the lid (1, Figure 6) on top of the lubricant barrel. Fasten the lid onto the lubricant barrel with wing screws.
5. Pass the pump through the barrel lid and follower plate into the barrel. Lock the pump with a barrel nut (2) so that the lower part of the pump is approximately 2 cm above the bottom of the barrel.
6. Fasten the pressure air hose (6, Figure 6) from the pressure air regulator to the bottom plate connection A1 (Figure 12).
7. Fasten the lubricant tank hose (5, Figure 6) to the bottom plate and pump connection T.
8. Fasten the grease filter (10, Figure 6) to the bottom plate connection P (Figure 12).
9. Fasten the pressure hose (4, Figure 6) to the pump connection P.
10. Fasten the plug to the tank connection T of the pump.
11. Fasten the low level switch (8 & 9, Figure 6) to the pump.
12. Connect the low level switch cable (7, Figure 6) to the bottom plate connection D (Figure 12) and the cables of the channel pressure control units and shut-off valves to the pumping centre as described in the electrical drawings.
13. Fasten the pressure air hose (6, Figure 6) to the bottom plate connection A2 (Figure 12) and the pressure air connection (A, Figure 13) of the pump.
14. Set the pressure of the pumping centre's pressure air to 4 bar (60 psi) with the pressure air control device (2, Figure 6) of the pressure air regulator.
15. Start the pump in manual operation mode of the control unit or with pressure air manual control screw of pumping centre's solenoid valve group (*see Paragraph 9.5 Manual operation*). When manual control screws are used, remove the cover plate and the nut below the plate. After this remove the pumping centre cover.
16. After the pressure hose is filled, stop the pump and connect the hose to the grease filter (10, Figure 6).
17. Fill the main header with lubricant by starting the pump in manual operation mode of control unit or with pumping centre's solenoid valve group's manual control screws for pressure air and lubrication lines. Stop the pump when the header piping has been filled and air has been removed.
18. Remove the plug from the tank connection of the pump and fasten the tank hose to the pump connection T.
19. Ensure before connecting the tank hose (5, Figure 6) to the bottom plate connection T that only grease (no air) is coming out of the hose. If needed, pressurise the system again. Air in the system prevents its trouble-free operation.
20. Do a test pressurisation of the header piping by increasing the pressure with the pressure control device at the pumping centre to up to 250 bar (3,600 psi). The pump will stop due to backpressure in 250 bar (3,600 psi) if there is no air or leakage in the header piping.
21. Set the maximum pressure of the pumping centre with a pressure control device. The maximum pressure of the pumping centre should be set approximately 20% higher than the pressure by which the pressure control unit acknowledgement pressure is reached. For example, if the acknowledgement pressure level is reached when the pressure of pumping centre is 170 bar (2,500 psi), the maximum pressure should be set at 200 bar (3,000 psi).
22. Fasten the lid of the pumping centre (Figure 9).

8.3 Replacing the lubricant barrel

 WARNING
<p>Pressurised lubricant</p> <p> Ensure that the system will not start during barrel replacement. Turn off the air supply by lifting the shut-off valve button (1, Figures 7 & 8) or set air pressure to 0 bar using the pressure regulator (2, Figures 7 & 8) and the pressure gauge (3, Figures 7 & 8). Any residual pressure in the system when opening or disconnecting components may cause components to be thrown or lubricant to spray, causing injury to people or damage to the environment.</p>

ATTENTION
<p>Make sure that no impurities can enter the pump, follower plate or the lubricant barrel when the barrel is being replaced.</p>

ATTENTION
<p>Clean or replace the grease filter cartridge when you are replacing the barrel.</p>

8.3.1 Maxilube ECO

- 1 Ensure that the surroundings of the pumping centre are clean. Impurities in the system prevent trouble-free operation and cause damage at the lubrication point.
- 2 Switch off the power on the pumping centre when replacing the barrel.
- 3 Lift out the pump from the lubricant barrel and place it on the pump bracket or on a clean, e.g. plastic base. Be careful not to damage the suction inlet at the bottom of the pump.
- 4 Remove the lid (1, Figure 5) from the top of the barrel.
- 5 Remove the follower plate (3, Figure 5) from the bottom of the barrel with the help of an air gun (4, Figure 7). Loosen the follower plate by feeding pressure air under the follower plate through the central unit.
- 6 Use the handles to lift the follower plate out of the barrel.
- 7 Replace the lubricant barrel.
- 8 Press the follower plate closely on top of the lubricant in the barrel. Make sure that air is removed from below the follower plate and that the central unit (suction head) of the follower plate starts to fill with lubricant.
- 9 Place the lid on top of the lubricant barrel. Fasten the lid onto the lubricant barrel with wing screws.
- 10 Pass the pump through the lid onto the suction port of the follower plate. Make sure that the pump is firmly attached to the air follower plate.
- 11 Remove pressure from the grease filter (10, Figure 5) by opening the bleed screw (11, Figure 5) in the filter plug.
- 12 Clean the grease filter and the filter cartridge (10 & 12, Figure 5) and replace them if necessary.
- 13 Switch on the power to the pumping centre. Reset the possible low-level alarm by pressing the "Alarm acknowledgement" button on the control unit.
- 14 Make a pumping centre operation test run by pressing the "Extra lubrication" button on the control unit.



8.3.2 Maxilube STA

1. Ensure that the surroundings of the pumping centre are clean. Impurities in the system prevent trouble-free operation and cause damage at the lubrication point.
2. Switch off the power on the pumping centre when replacing the barrel.
3. Lift the rod (9, Figure 6) of the low-level switch from the barrel.
4. Lift out the pump from the lubricant barrel and place it on the pump bracket or on a clean, e.g. plastic base. Be careful not to damage the suction inlet at the bottom of the pump.
5. Remove the lid (1, Figure 6) from the top of the barrel.
6. Lift the follower plate (3, Figure 6) from the bottom of the barrel.
7. Replace the lubricant barrel.
8. Press the follower plate (3, Figure 6) closely on top of the lubricant in the barrel. Ensure that air is being removed under the follower plate.
9. Place the lid (1, Figure 6) on top of the lubricant barrel. Fasten the lid onto the lubricant barrel with wing screws.
10. Pass the pump through the barrel lid and follower plate into the barrel. Lock the pump with a barrel nut (2, Figure 6) so that the lower part of the pump is approximately 2 cm above the bottom of the barrel.
11. Pass the rod of the low-level switch (12, Figure 6) through the hole in the lid, placing it on top of the follower plate.
12. Remove pressure from the grease filter (9, Figure 6) by opening the bleed screw (11, Figure 6) in the filter plug.
13. Clean the grease filter and the filter cartridge (10 & 12, Figure 6) and replace them if necessary.
14. Switch on the power to the pumping centre. Reset possible low level alarm by pressing the "Alarm acknowledgement" button on the control unit.
15. Make a pumping centre operation test run by pressing the "Extra lubrication" button on the control unit.

8.4 Manual operation

SKF Maxilube pumping centre can be operated by a manual procedure in the event of an electrical malfunction or when commissioning before electrification. Pressurise the system by using the manual control screws of the pumping centre's solenoid valve group.

If the system is designed with shut-off valves, open the shut-off valve of the channel to be pressurised before the pressurisation of the piping so that the lubricant can be distributed to the lubrication points after the shut-off valve. See *SKF DuoFlex / CLV-2 shut-off valve*.

 WARNING
 Electrical shock Ensure that the pumping centre / control centre is turned off during manual operation. Power must be turned off before work involving handling of conductive parts or opening any part of the system or product.

One lubrication cycle is performed in manual operation in the following way (see Figure 9):

1. Turn the manual control screw of solenoid valve MV1 90° clockwise so that the directional valve directs pressurisation to line 1.
2. Turn the manual control screw of solenoid valve MV3 also 90° clockwise, after which the pump starts.
3. When the pressure reading in line 1 pressure gauge of the pumping centre rises to 200–250 bar (3,000–3,600 psi), turn the manual control screw of solenoid valve MV3 to its initial position (90° counter-clockwise) to stop the pump. Then the pump stops.
4. Let the pressure act in line 1 for about 2 minutes. Maintain the pressure so that all the dosers have sufficient time to operate.
5. Turn the manual control screw of solenoid valve MV1 to its initial position (90° counter-clockwise). Then pressure in line 1 discharges.
6. Line 2 can be pressurised after pressure reading has fallen under 50 bar (700 psi) in the pressure gauge of the line 1 pressure control unit.
7. Turn the manual control screw of solenoid valve MV2 90° clockwise so that the directional valve directs pressurisation to line 2.
8. Turn the manual control screw of solenoid valve MV3 also 90° clockwise, after which the pump starts.
9. When the pressure reading in line 2 pressure gauge of the pumping centre rises to 200–250 bar (3,000–3,600 psi), turn the manual control screw of solenoid valve MV3 to its initial position (90° counter-clockwise) to stop the pump. Then the pump stops.
10. Let the pressure act in line 2 for about 2 minutes. Maintain the pressure so that all the dosers have sufficient time to operate.
11. Turn the manual control screw of solenoid valve MV2 to its initial position (90° counter-clockwise). Then pressure in line 2 discharges.
12. Line 1 can be pressurised again after pressure reading has fallen under 50 bar (700 psi) in the pressure gauge of line 2 pressure control unit
13. Repeat the steps 1–5.

9 IF-105 user interface

9.1 General information

IF-105 is the user interface for the internal control unit of SKF Maxilube change over valve unit. Lubrication programming, alarm resetting and lubrication event monitoring can be performed with the user interface.

9.2 Design

The IF-105 user interface includes a display(1), LED-signals for lubrication lines and pressurisation (2), browsing buttons (3), a setting / function button SET (4) and LED-signals for lubrication channels (5).



9.3 LED-signals for channels

Note LED-signals **CH1** and **CH2** for lubrication channels are in use only in systems with two channels.

LED-signal	Description
CH1	Red LED-signal is lit, when channel 1 is in alarm mode. Green LED-signal is lit, when channel 1 is in normal mode. LED-signal is blinking when channel 1 is selected on the display.
CH2	Red LED-signal is lit, when channel 2 is in alarm mode. Green LED-signal is lit, when channel 2 is in normal mode. LED-signal is blinking when channel 2 is selected on the display.

9.4 LED-signals for operation

Note The LED-signals indicate the operation of the channel which is selected on the display.

LED-signal	Description
L1	Green LED-signal is lit, when main line 1 is pressurized. Green LED-signal is lit during interval, when main line 1 has been pressurized last. Red LED-signal is blinking, when main line 1 is in pressure alarm mode.
L2	Green LED-signal is lit, when main line 2 is pressurized. Green LED-signal is lit during interval, when main line 2 has been pressurized last. Red LED-signal is blinking, when main line 2 is in pressure alarm mode.
P	Green LED-signal is lit, when the pressurization phase is in progress. Red LED-signal is blinking, when the pumping center is in low level alarm mode.

9.5 Buttons

Note The buttons affect only the channel which is selected on the display.

Button	Description
↑	In normal mode, the button is used to browse set values on the display. In setting mode, the button is used to change the value on the display.
→	In normal mode in a MonoFlex- and a DuoFlex-system the button is used to browse the pressure displays of the lines. In normal mode in a ProFlex system the button is used to go to the pulse counter display. In setting mode, the button is used to move to the next character of the display. When browsing the set values, the button is used to return to normal mode.
SET	In normal mode, the button is used to start extra lubrication, to stop pressurization or re-set an alarm. In setting mode, the button is used to save the changed value. When browsing the set values, the button is used to go to the setting mode.

When a button is pressed, all green LED-signals are lit for a moment. This indicates that the information about a button being pressed has been transmitted forward.

9.6 Display

Note The display indicates the operation of the channel which is selected on the display.

User interface has a display of 3 characters and 3 decimal points.

The display shows the time and, in pressure transmitter operation, also pressure.

Time and pulse display

The set value for the lubrication cycle and the elapsed interval are displayed as hours and minutes. Decimal point is used to separate hours and minutes.

Time displayed	Display format	Example
0 min - 59 min	H.MM	12 min = 0.12
1 h - 9 h 59 min	H.MM	1 h 20 min = 1.20
10 h - 99 h 50 min	HH.M	12 h 50 min = 12.5
100 h - 999 h	HHH.	120 h = 120.

The set value for the maximum pressurization time and elapsed pressurization time are displayed as seconds without the decimal point.

The set pulse amount and the counted pulses are displayed as integers, without a decimal point.

10 IF-105 operation

10.1 Normal mode

10.1.1 Functions

Display power saving mode

In normal mode, the display shifts to power saving mode when no buttons have been used for ten (10) minutes. In power saving mode only the decimal points are blinking on the display. Lubrication events are performed according to the set values. The display returns to normal mode if any button is pressed or if there is an alarm.

Interval counting

In normal mode the display shows the time elapsed since the last pressurization as hours and minutes. Green LED-signal for line **L1** or **L2** shows which line has been pressurized last.

Interval time is counted always, except when

- channel is in alarm mode
- interlocking switch of the channel is closed
- channel is closed (maximum pressurization time = 0)

Pressurization

Pressurization time is displayed as seconds. Green LED-signal for line **L1** or **L2** shows the line to be pressurized. Green LED-signal **P** indicates that pressurization is in progress.

Pressurization can be stopped with the **SET** button.

Pressurization time display and setting can be changed from seconds to minutes with factory setting parameter **Prt**. When the pressurization time is displayed as minutes all the decimal points are lit on the display.

Extra lubrication

Extra lubrication can be started if the channel is not currently in alarm mode, closed or pressurizing.

Extra lubrication is started in normal mode with the **SET** button, when the display shows the time elapsed since the last pressurization.

In a DuoFlex lubrication system both lines are pressurized once. The next line in the set pressurization sequence is pressurized first. In a MonoFlex and a ProFlex lubrication system the line is pressurized once.

Extra lubrication can be stopped with the **SET** button.

In pressure transmitter operation, the line pressure discharge is measured. New pressurization starts only after pressure in the lines is below the set low limit value.

In pressure switch operation, the system waits for line pressure discharge. New pressurization starts only after

the set delay time.

During pressure discharge phase code **dC** is displayed.

10.1.2 Phase codes for normal mode and alarm mode

In normal or alarm mode, the phase code corresponding to the program phase is displayed.

Phase code	Description
dC	Pressure discharge waiting time (disCharge)
Loc	Interlocking switch is closed (Locked)
OFF	The channel is closed
AGr	Lubricant reservoir low level alarm (Alarm, Grease)
ALP	Pressure low alarm (line pressure does not rise high enough during pressurization time) (Alarm, Low Pressure) Pulse amount alarm in a ProFlex system (Alarm Low amount of Pulses)
AHP	Pressure high alarm (line pressure is not low enough when pressurization phase starts) (Alarm, High, Pressure)
Aln	Alarm from doser operation indicator (SKF Doser monitor). The code is displayed only if SKF Doser monitors are in use. (Alarm, Indicator)
Air	Alarm from the air pressure switch of the grease spray system. The code is displayed only if air pressure switch is in use. (Alarm, Air)
APC	Warning message for pump change when doubled pumping center (Dualset) is in use. (Alarm, Pump Changed)

10.1.3 Normal mode displays, MonoFlex and DuoFlex lubrication systems

Normal mode displays, which show the set values for the lubrication program, can be browsed with the **↑**-button.

Display codes change in the following order when **↑**-button is pressed.

Display code	Description
CH	The lubrication channel selected on the display. The code is in use only in systems with two (2) channels. Press the SET button to go to another channel when the code is displayed. (Channel)
Cou	Lubrication cycle counter. (Cycle C ounter) Counter reading is added by one unit when lubrication ends. Decimal point is used to separate thousands.
C	Lubrication cycle setting value as time [h.mm] or pulses depending on the factory setting parameter CYC . Can be set between 0 min – 999 h or 000...999 pulses. (Lubrication C ycle)
P	Maximum pressurization time set value [s]. Can be set between 0 s – 999 s. Set value can be changed to minutes with factory setting parameter Prt . Can be set between 0 min – 999 min. (Lubrication, P ressurization time)
PLo	Low limit pressure set value [bar/psi]. Can be set between 0-200 bar/0-2900 psi. (P ressure, L ow limit) Code is in use only in pressure transmitter operation.
PHi	High limit pressure set value [bar/psi]. Can be set between 0-200 bar/0-2900 psi. (P ressure, H igh limit) Code is in use only in pressure transmitter operation.
dEL	Pressure discharge delay multiplier [n] (DEL ay) Delay = P * n [s] Code is in use only in pressure switch operation.
HL	Manual operation setting On : manual operation mode OFF : automatic mode
PU	Pump in use when doubled pumping center (Dualset) is in use: 1: Pump 1 is in use. 2: Pump 2 is in use. This parameter is visible only when the factory setting parameter dUA has been set to YES .

Decimal points are used to separate thousands on lubrication cycle counter reading. Counter max. reading is **49.9** = 49 999.

Depending on the factory setting parameter **Pre**, the pressure unit on the display is bar or psi. In a psi reading decimal points are used to separate thousands. For example **1.02** = 1020 psi.

10.1.4 Normal mode displays, Progressive lubrication system

Normal mode displays, which show lubrication program set values, can be browsed with the **↑**-button. Display codes change in the following order when **↑**-button is pressed.

Display code	Description
CH	The lubrication channel selected on the display. Press the SET -button to go to another channel when the code is displayed.
Cou	Lubrication cycle counter. (Cycle C ounter) Counter reading is added by one unit when lubrication ends. Decimal point is used to separate thousands.
C	Lubrication cycle setting value as time [h.mm] or pulses depending on the factory setting parameter CYC . Can be set between 0 min – 999 h or 000...999 pulses. (Lubrication C ycle)
P	Maximum pressurization time set value [s]. Can be set between 0 s – 999 s. Set value can be changed to minutes with factory setting parameter Prt . Can be set between 0 min – 999 min. (Lubrication, P ressurization time)
PP1	The pulse count setting (PP1) can be 000...999. If PP1 is set as 0, pressurization takes the maximum pressurization time. The pulse sensor does not need to be connected. Alarms will not be received, except for the low limit alarm. (P ulses p er 1 pressurization)
HL	Manual operation setting On : manual operation mode OFF : automatic mode
PU	Pump in use when doubled pumping center (Dualset) is in use: 1: Pump 1 is in use. 2: Pump 2 is in use. This parameter is visible only when the factory setting parameter dUA has been set to YES .

Decimal points are used to separate thousands on lubrication cycle counter reading. Counter max. reading is **49.9 = 49 999**.

10.1.5 Pressure and pulse displays for lines

Pressure transmitter operation

In pressure transmitter operation, line pressure displays can be selected with the →-button. Pressing the button will show the pressure display for line 1 first. Code **P1** and the pressure display for line 1 are displayed in turns. Pressing the button again will show the pressure display for line 2. Code **P2** and the pressure display for line 2 are displayed in turns. If line 2 does not exist, the program returns to display the phase code. From the pressure display for line 2, the program returns to display the phase code by pressing the →-button. The display returns the phase code automatically to the display after 4 minutes if no buttons have been used.

If a signal from the pressure transmitter is not detected, code **_ _ _** is displayed.

Pressure switch operation

In pressure switch operation, the status of the pressure switches of the lines can be selected with the →-button. Pressing the button will display the status of the pressure switch for line 1 first. Code **P1** and the status of the pressure switch for line 1 are displayed in turns. Pressing the button again will display the status of the pressure switch for line 2. Code **P2** and the status of the pressure switch for line 2 are displayed in turns. The display returns the phase code automatically to the display after 4 minutes if no buttons have been used.

The status closed contact of the pressure switch is displayed with code **on** and the status open contact with code **oF**.

Pulse counter display in the ProFlex system

Counted sensor pulses can be selected on the display with the →-button. Code **P1** and the pulse counter of the selected channel are displayed in turns. →-button is used to return to the time display.

10.2 Power failure

The set values and program status are preserved in the memory also during power failures. Once the power is back on, the operation will resume from the status it was in before power failure occurred. Pressurization that may have been interrupted restarts for the same line. The interval time is not counted during power failures.

10.3 Alarms

System with one (1) channel:

- The system is in alarm mode when the red LED-signal for line **L1**, line **L2** or pressurization **P** is blinking.

System with two (2) channels:

- The system is in alarm mode when the red LED-signal for channel **CH1** or **CH2** is lit.
- When the channel selected on the display is in alarm mode, the red LED-signal for line **L1**, line **L2** or pressurization **P** is blinking.

10.3.1 Low level alarm

The channel triggers a low level alarm, stops pressurization and goes into alarm mode, if the lubricant reservoir is empty. This means that the reservoir's low level switch is closed. Code **AGr** is blinking on the display and the red LED-signal **P** for pressurization is blinking. Pressurization will restart for the same line when the low level switch opens and the alarm has been reset by pressing the **SET**-button.

10.3.2 Pressure alarm, MonoFlex and DuoFlex lubrication systems

The channel triggers a pressure alarm and goes into alarm mode, if the line pressure is not low enough when

pressurization phase starts or if the line pressure does not rise high enough during pressurization time.

Alarm, high pressure

If the line pressure is not low enough at the beginning of the pressurization phase, code **AHP** is blinking on the display and the red LED-signal **L1** or **L2** of the line that triggered the alarm is blinking.

In pressure transmitter operation an alarm is triggered, if the line pressure is above the set low limit when pressurization starts. Pressurization will restart for the same line when the pressure level is below the low limit value and the alarm has been reset by pressing the **SET**-button.

In pressure switch operation an alarm is triggered, if the pressure switch is closed when the pressurization starts. Pressurization will restart for the same line when the pressure switch opens and the alarm has been reset by pressing the **SET**-button.

Alarm, low pressure

If the pressure in the line does not rise high enough during pressurization time, code **ALP** is blinking in the display and the red LED-signal **L1** or **L2** of the line that triggered the alarm is blinking.

In pressure transmitter operation an alarm is triggered, if the line pressure does not reach the set high limit within the set maximum pressurization time. Pressurization will restart for the same line when the alarm has been reset by pressing the **SET**-button.

In pressure switch operation an alarm is triggered if the pressure switch of the line does not close within the set maximum pressurization time. Pressurization will restart for the same line when the alarm has been reset by pressing the **SET**-button.

10.3.3 Pulse alarm, ProFlex lubrication system

The channel triggers a pulse alarm **ALP** (Alarm Low amount of Pulses) and goes into alarm mode if the pulse amount is not reached within the set maximum pressurization time.

10.3.4 Alarm from SKF Doser monitor -doser operation indicator

The SKF Doser monitors are in use when factory settings parameter **LGI** has been set in status **YES**.

An alarm will be triggered when the SKF Doser monitor does not recognize doser operation during a lubrication cycle. Code **Aln** is displayed. Lubrication continues normally despite the alarm. This feature is different from other alarms. The alarm can be reset with the **SET**-button.

10.3.5 Alarm from the air pressure switch of the grease spray system

Air pressure control is in use when factory settings parameter **AC** has been set in status **YES**.

Note In a ProFlex system, the channel spray control starts always when the pump is running. The pump stops when the pulse amount has been reached. The spray control remains on for 10 seconds.

An alarm is triggered if the air pressure switch is not open when pressurization starts or closed when pressurization has stopped. Code **Air** is displayed. Pressurization will restart for the same line when the alarm has been reset by pressing the **SET**-button.

10.3.6 Warning message for pump change (doubled pumping center/Dualset)

When doubled pumping center (Dualset) is in use, a warning message **APC** is displayed when the pump has been changed automatically. Lubrication continues normally despite the warning message. It can be reset with the **SET**-button. Alarm output is not activated in this case.

10.4 Manual operation

Go to manual operation mode in the selected channel by setting the parameter **HL** in status **On**.

Return to automatic operation mode as follows:

- set the parameter **HL** in status **OFF**

or

- automatically when 60 minutes have elapsed since going into manual operation mode

or

- restart SKF Maxilube hydraulic part or SKF ST-1240-IF control center

In manual operation mode **SET**-button is used to:

- start pumping
- stop pumping
- shift pumping to another line

The lubrication program keeps the pressure in the set high limit value in the line being pumped. The oil lubrication system (lubrication system operation mode **O1** or **O2**) and ProFlex-system have no pressure monitoring.

11 IF-105 settings

11.1 General

Set values are lubrication channel basic values, for example lubrication cycle and maximum pressurization time. Set values are channel specific.

All settings are password-protected.

11.2 Entering password

- 15 Select the code for the setting to be changed on the display with the **↑**-button.
- 16 Press the **SET**-button.
- 17 Display shows code **PPP**.
- 18 In a moment the first character of the display starts to blink.
- 19 Select with the **↑**-button the first number of the password on the display.
- 20 Move to the next character with the **→**-button.
- 21 When all three numbers of the password have been entered, press the **SET**-button.
- 22 Once the password has been entered correctly, code **ACC** is displayed and the set values can be changed during the next 10 minutes.
- 23 If the password has not been entered correctly, code **Err** is displayed and the display returns to normal mode.

Note Password for set values is 105 .

11.3 Entering settings

- 24 Select the code for the setting to be changed on the display with the **↑**-button.
- 25 Press the **SET**-button.
- 26 The first number of the value to be set is blinking on the display.
- 27 Select the desired number with the **↑**-button on the display.
- 28 Move to the next character with the **→**-button.
- 29 The set value is saved in the memory with the **SET**-button.
- 30 Exit setting mode with the **→**-button. The display returns to normal mode automatically after 4 minutes if no buttons have been used.

11.3.1 Lubrication cycle counter

Lubrication cycle counter can be reset when needed.

- 31 Select code **Cou** for the lubrication cycle counter on the display with the **↑**-button.
- 32 Reset the counter with the **SET**-button.

11.3.2 Lubrication cycle

Lubrication cycle set value is displayed as hours and minutes. Decimal point is used to separate hours and

minutes. Decimal point of the set value can be moved as follows.

- 33 Select the code for the setting to be changed on the display with the **↑**-button.
- 34 Press the **SET**-button.
- 35 Set the desired value with the **↑**- and **→**-buttons.
- 36 Press the **→**-button.
- 37 The decimal point starts to blink.
- 38 Move the decimal point to the desired location with the **↑**-button.
- 39 The set value is saved in the memory with the **SET**-button.

12 IF-105 technical specification

12.1 Technical data

Value	Unit	Description
-10...+50 14...122	°C °F	Operating temperature range
45 x 140 x 17 (w x h x d)	mm	Dimensions
Polycarbonate		Material, casing
IP67		Protection class

12.2 Symbols

IF-105	Abbreviation	Description
IF:	IF	Interface
105:	105	model

13 Maxilube troubleshooting

Operation disturbance	Cause of operation disturbance	Solution
<i>If internal control unit of SKF Maxilube is in use:</i> Display and LED-signals of the user interface are not lit.	No supply voltage at the pumping center.	Check the supply voltage.
<i>If external control center is in use:</i> The green LED-signal POWER and the user interface of the control center are not lit.	Main switch of the control center is in OFF-position. The fuse has operated.	Turn the main switch to ON-position. Check the fuse.
The user interface displays lubricant low level alarm in a lubrication channel.	Lubricant barrel is empty.	Replace the lubricant barrel. Reset the alarm.
The user interface displays alarm for low pressure in a lubrication channel. The pressure at the pressure control unit is below the set pressure high limit value during pressurization.	The lubricant has stiffened in the piping because of the operating conditions (e.g. cold, heat). Header piping leaks. There is air in the header piping.	Set the maximum pressurization time longer or change the lubricant for an appropriate lubricant. Locate and repair the leakage. Remove air from the header- and branch piping. Reset the alarm.
Considerable grease leakage at the lubrication point. The temperature of the bearing rises.	The lubrication cycle has been set too short.	Check the correct lubrication cycle at the doser setting table of the lubrication system in question or contact Oy SKF Ab.
The pump does not start.	The pressure air supply is closed. The pressure air level is not high enough. Supply voltage is not on.	Turn on the pressure air supply by pressing down the shut-off valve button (→ Figure 4, pos. e) or set the air pressure to 3,5-4,5 bar using the pressure regulator (18) and the pressure gauge (19). Check that the pressure at the pressure air regulator is 3,5-4,5 bar. Check the pressure air supply piping for leaks. Check that the LED-signal of the pump is lit. Check that the supply voltage is on. Check that the M12 cable is connected and the condition of the M12 cable.
The pump starts but the pressure does not rise.	The pressure air level is not high enough.	Check that the pressure at the pressure air regulator is 3,5-4,5 bar. Check the pressure air supply piping for leaks.

Operation disturbance	Cause of operation disturbance	Solution
The user interface displays alarm for high pressure in a lubrication channel. The pressure at the pressure control unit is above the set pressure low limit value when pressurization starts.	<p>The lubricant has stiffened in the piping because of the operating conditions (e.g. cold, heat).</p> <p>The control valve at the hydraulic part does not operate.</p>	<p>Set the maximum pressurization time longer or change the lubricant for an appropriate lubricant. Reset the alarm.</p> <p>Check that the set values for high and low limit pressure are correct. Contact Oy SKF Ab when necessary.</p> <p>Check the pressure of the pressure air.</p> <p>Check the operation of the solenoid valves MV1 and MV2.</p>



Warning Before solving the following operation disturbances, turn off the power at the control and pumping center. Turn off the pressure air supply by lifting up the shut-off valve button (→ **Figure 10, pos. e**). Before opening the grease filter, remove pressure from the system by opening the venting screw in the filter plug.(→ **Figure 11, pos. 11**). If the system is under pressure when the components are being disconnected or opened, the components or lubricant might be flung in the air causing injury to people or damage to the environment.

Operation disturbance	Cause of operation disturbance	Solution
The pump starts but the pressure does not rise.	<p>The grease filter has clogged.</p> <p>There is air in the suction piping of the pump.</p> <p>There are impurities in the suction head of the pump.</p>	<p>Clean or replace the grease filter cartridge.</p> <p>Remove air from the pump by opening the venting screw (→ Figure 5, pos. 11) of the grease filter or the pressure connection (P) of the pump. Make sure that only grease is coming out of the venting screw or pressure connection (not air).</p> <p>Contact Oy SKF Ab.</p>
The user interface displays alarm for high pressure in a lubrication channel. The pressure at the pressure control unit is above the set pressure low limit value when pressurization starts.	The control valve at the hydraulic part does not operate.	Replace control cartridge CHV-100 when necessary.

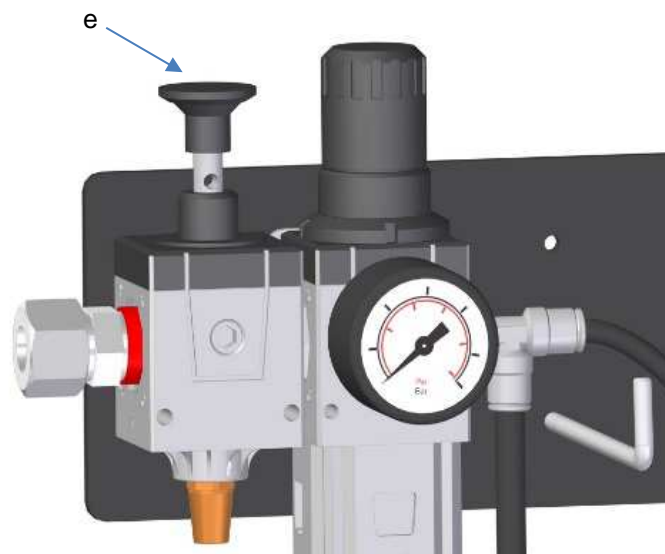


Figure 4 Shut off valve button (e)

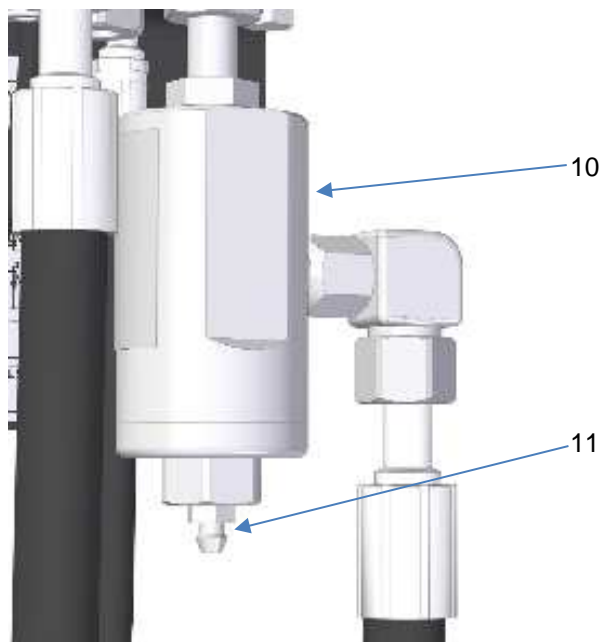


Figure 5 Grease filter (10), venting screw (11)

14 Maxilube technical specification

14.1 Technical specifications Maxilube changeover valve unit

Quantity	Value	Unit	Description
t	0...+50 +32...+122	°C °F	Ambient temperature range
p	2–4.5 40–65	bar psi	Operating air pressure range
U	24 ±10% 115 ±10%; 50/60 230 ±10%; 50/60	V DC V AC; Hz V AC; Hz	Control voltage
U	115 ±10%; 50/60 230 ±10%; 50/60	V AC; Hz V AC; Hz	Power input
P	150	W	Max. power consumption
m	13	kg	Weight

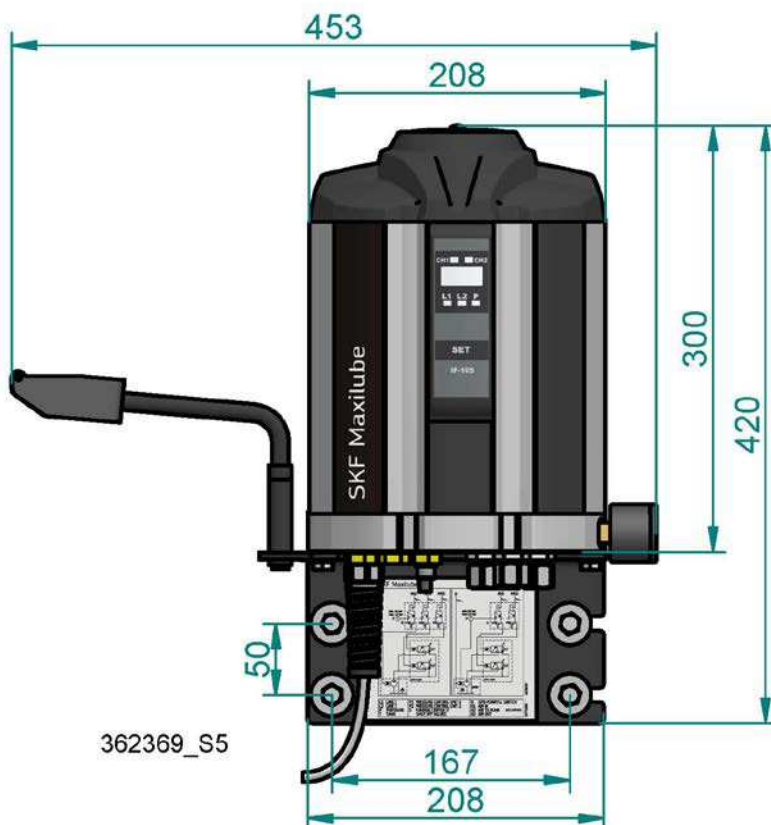


Figure 52: Dimensional drawing of Maxilube

14.2 Connections

14.2.1 SKF Maxilube changeover valve unit

Inputs

- A1: pressure air, $\varnothing 8$ mm push in connector (G1/8)
- D: low level switch, connector M12
- P1, P2: pressure control, 2 pcs, connector M12
- power input, M20x1,5 cable gland

Outputs

- L1, L2: lubricant, 1 or 2 pcs (line 1 out, line 2 out), DIN 2353 connector for $\varnothing 12$ or 1/2" pipe (G1/4)
- S: pumping centre 2 or shut-off valve, 2 pcs, connector M12
- A3: exhaust pressure air $\varnothing 9$ lead-in for pipe $\varnothing 6$

Cable channels in the bottom plate

- M16x1,5 cable gland, 4 pcs, for 4–10 mm cable diameters

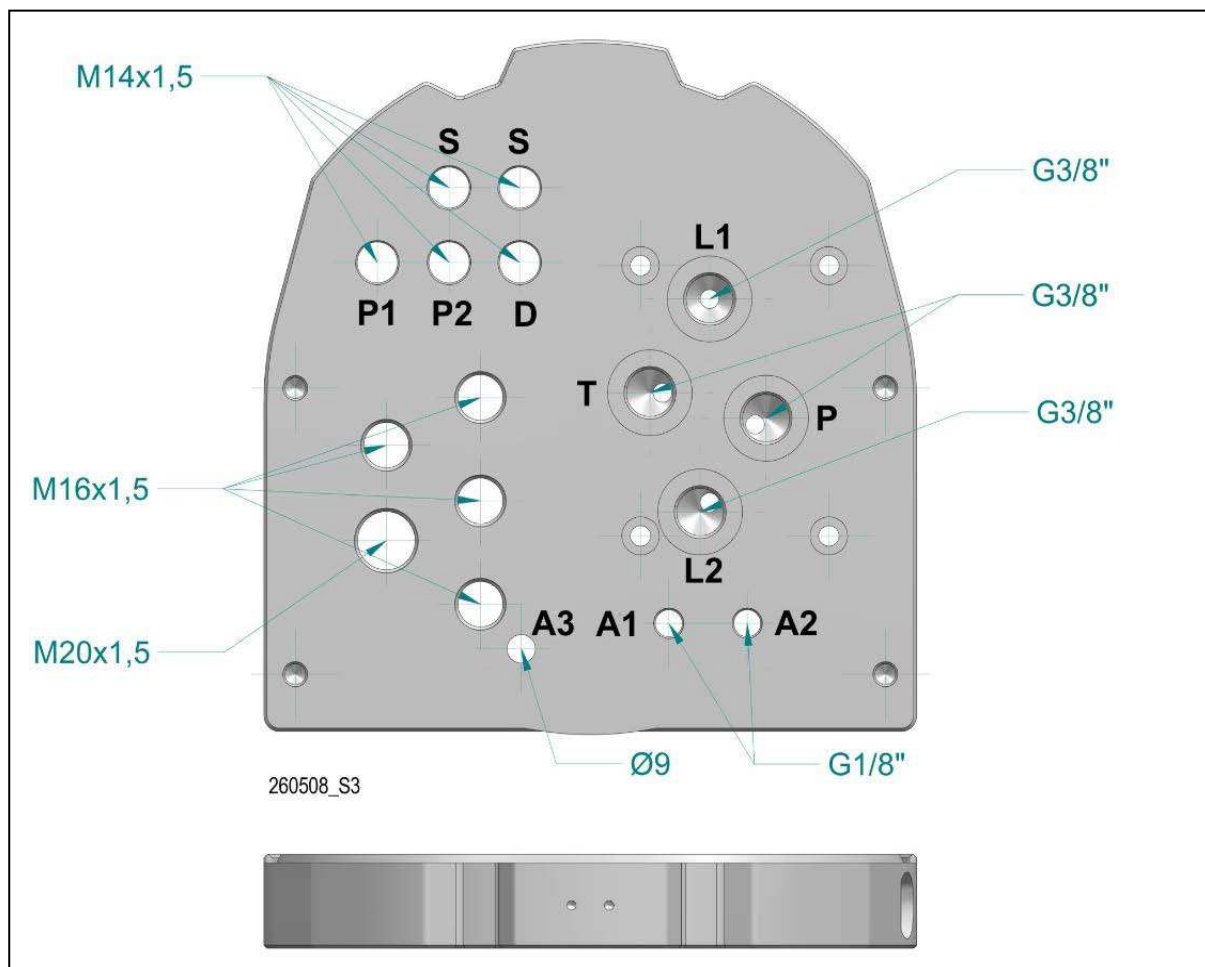


Figure 6: Connections of Maxilube

14.3 Designations – Maxilube changeover valve unit

MAX-A-B-C-D-E-F	Abbreviation	Description
MAX:	MAX	SKF Maxilube changeover valve set
A:	1	Number of channels (1 channel)
	2	Number of channels (2 channels)
B:	1	Number of lines (single-line system)
	2	Number of lines, dual-line system
C:	24	Control voltage 24 V
	115	Power supply: 115 V
	230	Power supply: 230 V
D:	IF105	User interface (IF-105)
	X	External control
E:	R	Lubrication line connections, DIN 2353 connector \varnothing 12 mm pipe
	U	Lubrication line connections, DIN 2353 connector \varnothing 1/2" pipe
F:	V2	Version

Example:

MAX-2-2-230-IF105-R-V2

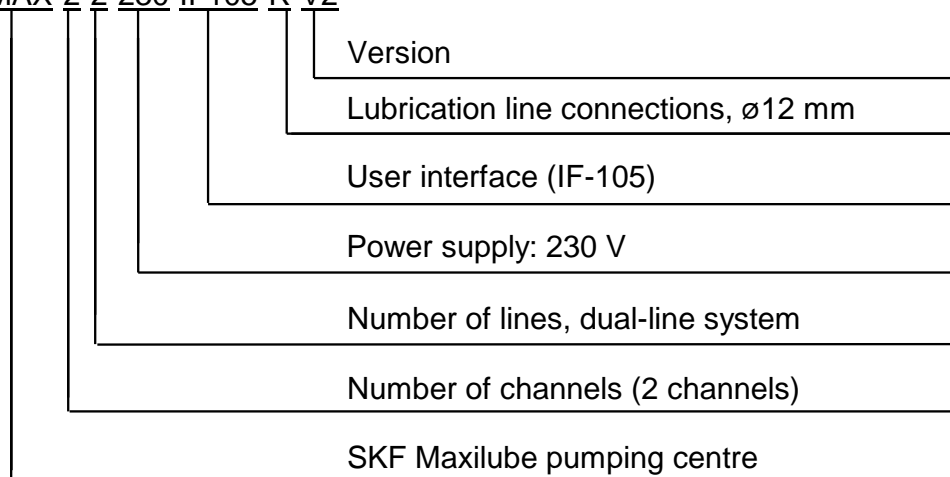


Table 1 Order codes for the SKF Maxilube changeover valve unit with internal control

Order code	Designation	Description
12371171	MAX-1-2-230-IF105-R-V2	One channel, dual line, 230 V AC, with control, ø12 mm pipe outlets
12371501	MAX-1-2-230-IF105-U-V2	One channel, dual line, 230 V AC, with control, ø1/2" pipe outlets
12371041	MAX-1-2-115-IF105-R-V2	One channel, dual line, 115 V AC, with control, ø12 mm pipe outlets
12371371	MAX-1-2-115-IF105-U-V2	One channel, dual line, 115 V AC, with control, ø1/2" pipe outlets
12371175	MAX-1-2-24-IF105-R-V2	One channel, dual line, 24 V DC, with control, ø12 mm pipe outlets
12371231	MAX-2-2-230-IF105-R-V2	Two channel, dual line, 230 V AC, with control, ø12 mm pipe outlets
12371561	MAX-2-2-230-IF105-U-V2	Two channel, dual line, 230 V AC, with control, ø1/2" pipe outlets
12371101	MAX-2-2-115-IF105-R-V2	Two channel, dual line, 115 V AC, with control, ø12 mm pipe outlets
12371431	MAX-2-2-115-IF105-U-V2	Two channel, dual line, 115 V AC, with control, ø1/2" pipe outlets
12371141	MAX-1-1-230-IF105-R-V2	One channel, single line or progressive, 230 V AC, with control, ø12 mm pipe outlets
12371471	MAX-1-1-230-IF105-U-V2	One channel, single line or progressive, 230 V AC, with control, ø1/2" pipe outlets
12371011	MAX-1-1-115-IF105-R-V2	One channel, single line or progressive, 115 V AC, with control, ø12 mm pipe outlets
12371341	MAX-1-1-115-IF105-U-V2	One channel, single line or progressive, 115 V AC, with control, ø1/2" pipe outlets
12371201	MAX-2-1-230-IF105-R-V2	Two channels, single line or progressive, 230 V AC, with control, ø12 mm pipe outlets
12371531	MAX-2-1-230-IF105-U-V2	Two channels, single line or progressive, 230 V AC, with control, ø1/2" pipe outlets
12371071	MAX-2-1-115-IF105-R-V2	Two channels, single line or progressive, 115 V AC, with control, ø12 mm pipe outlets
12371401	MAX-2-1-115-IF105-U-V2	Two channels, single line or progressive, 115 V AC, with control, ø1/2" pipe outlets
12371271	MAX-1-2-24-X-R-V2	One channel, dual line, 24 V DC, no control, ø12 mm pipe outlets
12371601	MAX-1-2-24-X-U-V2	One channel, dual line, 24 V DC, no control, ø1/2" pipe outlets

15 Periodic inspections

Monthly inspections

- Inspect the pressure air regulator and drain it of water.
- Check the pump's operation.
- Check the pump and lubrication system for leaks.

When replacing the barrel (in addition to the above):

- Clean the grease filter and the filter cartridge and replace them if necessary.

16 Troubleshooting



WARNING

Before addressing the following malfunctions, turn off the power from the control and pumping centre, isolate the pressurised air supply and depressurise the lubrication line connected to the pump outlet. Any residual pressure in the system when opening or disconnecting components may cause components to be thrown or lubricant to spray, causing injury to people or damage to the environment.

16.1 Malfunctions

In case of a malfunction:

- Check the air pressure and the condition of the air lines.
- Check that the grease filter and the hydraulic lines connected to the pump outlet are not clogged.
- If the problem persists, contact your Oy SKF Ab representative.

16.2 Troubleshooting table

Table 1: Troubleshooting

Description of malfunction	Cause of malfunction	Solution
The pump does not start.	Pressurised air has been cut off. Insufficient air pressure.	Turn on the air supply and set the pressure to 2–4.5 bar. Check that the pressure at the pressure air regulator is 2–4.5 bar. Check the air supply hoses for leaks.
The pump is activated, but stops shortly.	Insufficient air pressure.	Check that the pressure at the pressure air regulator is 2–4.5 bar. Check the air supply hoses for leaks.
A lot of grease leaks from the hole (11) at the bottom of the cylinder block (1) (see Figure 2). Small leaks require no measures.	Damaged seal.	Contact your Oy SKF Ab representative.

Description of malfunction	Cause of malfunction	Solution
The pump starts but pressure does not increase.	The grease filter is clogged. There is air in the suction piping. There are impurities in the pump's suction inlet. Lubrication piping leaks.	Clean or replace the grease filter cartridge. Bleed the pump of air by opening the pump's pressure connection (P). Check that only grease and no air comes out of the bleed screw or the pressure connection. Contact Oy SKF Ab if necessary. Check the lubrication piping and dosers for leaks.

17 Shutdown, decommissioning and storage

17.1 Temporary shutdown

The system can be temporarily shut down by disconnecting it from electrical, pressurised air and hydraulic outlets. If you wish to shut down the product temporarily, see also Section *Storage*. For further information, please refer to relevant components' operating and service manuals in Section *General description*. When recommissioning the equipment, please refer to sections *Commissioning* and *Technical specification* in the relevant components' operating and service manuals.

17.2 Final decommissioning

Used equipment filled with lubricant must be decommissioned and disposed of in accordance with national legislation and the procedures indicated in this operating and service manual.



Lubricants can contain chemicals that can contaminate the soil and the water system. Lubricants must be disposed of appropriately. Observe any local laws and regulations concerning disposal and recycling.

You can also return the product to Oy SKF Ab for disposal. Oy SKF Ab reserves the right to recover any costs arising from the disposal.

17.3 Storage

The products must be stored as follows:

- Store in a dry, dust-free and well-ventilated space.
- Do not store the product for more than 24 months.
- Storage temperature range is +10...40 °C.
- Avoid direct sunlight and heat radiation.
- Store the products clear of the ground or floor.
- Protect the products against impacts, corrosion and dust.

18 Spare parts

Item	Description	Order code
1	Control valve	-
2	CHV-100 control cartridge (1 or 2 pcs)	12386245
3	Circuit board ST105A	12501460
4	Solenoid valve 24 V	12602170
5	User interface IF-105	12501480
6	Power supply 115/230VAC	11501000
7	Pressure gauge	12600850

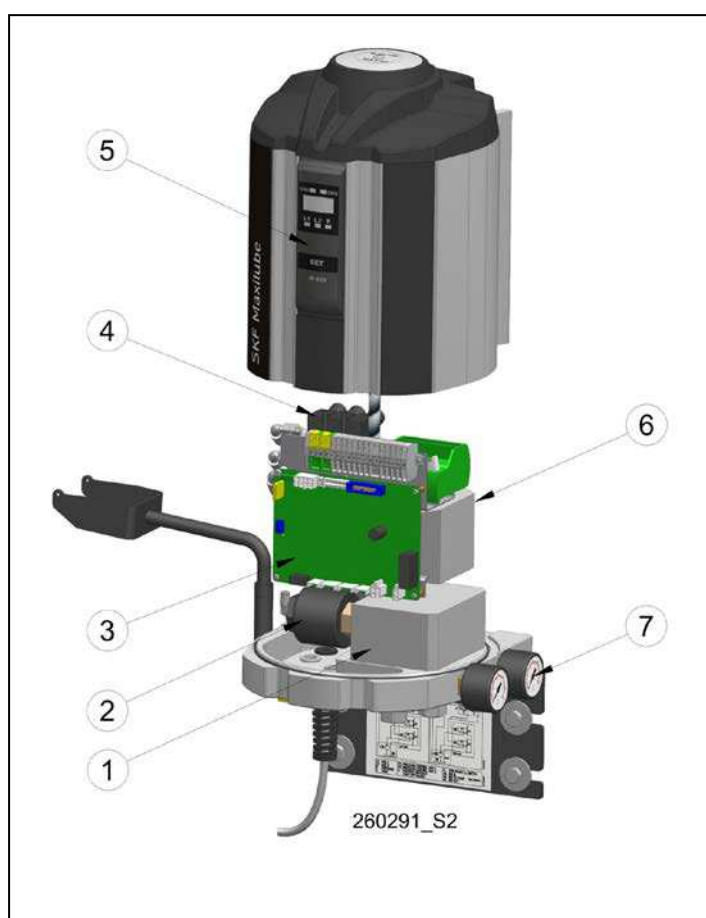


Figure 7: Spare parts for Maxilube