Component Lifecycle Manual (CLM)

EN

SKF MonoFlex
Pre-lubrication metering device OI-AL-SR

for oil single-line centralized lubrication systems

in the glass industry

Version 03

LINCOLN

SKF

Legal Disclosure

The component lifecycle manual has been drawn up following the pertinent rules and standards for technical documentation of VDI 4500 and DIN EN ISO 1100.

Warranty

The instructions do not contain any information on the warranty. This can be found in the general terms and conditions. To view these go to: www.skf.com/lubrication.

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Explanation of symbols and signs

You will find these symbols, which warn of specific dangers to persons, material assets, or the environment, next to all safety instructions in these operating instructions.

Please read these instructions completely and heed the instructions and warning and safety notes.

Warning level		Consequences	Probability
⚠	DANGER	Death/ serious injury	Imminent
⚠	WARNING	Serious injury	Possible
⚠	CAUTION	Minor injury	Possible
	ATTENTION	Property damage	Possible

Symbols	
Symbol	**Meaning**
●	prompts an action
○	Used for itemizing
☞	Refers to other facts, causes, or consequences
→	Provides additional information within procedures

Symbols used	
Symbol	**Meaning**
	Note
	Electrical component hazard Electrical shock hazard
	Slipping hazard
	Hazard from hot surfaces
	Hazard of unintended drawing-in
	Crushing hazard
	Hazard from suspending load
	Pressure injection hazard
	Explosion-protected component
	Electrostatically sensitive components
	Wear personal protective equipment (goggles)
	Secure the machine against being turned on unintendedly (lock)
	Environmentally sound disposal

Observe notes and signs attached to units, machines or systems, for example:

- Arrow showing the sense of rotation
- The markings of the fluid connections must strictly be observed and be maintained in a completely legible condition.
- Warnings

Read and observe the instructions carefully.

Abbreviations and conversion factors

Abbreviations

re.	regarding	oz.	Ounce
approx.	approximately	psi	pounds per square inch
°C	degrees Celsius	rh	relative humidity
cu.in	cubic inch	s	second
dB (A)	sound pressure level	sq.in.	square inch
i.e.	that is	e.g.	for example
etc.	et cetera	>	greater than
poss.	possibly	<	less than
°F	degrees Fahrenheit	±	plus or minus
fl.ou	fluid once	Ø	diametre
fpsec	feet per second	mph	miles per hour
gal.	gallon	assy.	assembly
hp	horse power		
in.	inch		
incl.	including		
K	Kelvin		
kg	kilogram		
kp	kilopond		
kW	kilowatt		
l	litre		
lb.	pound		
max.	maximum		
min.	minimum		
min	minute		
ml	millilitre		
ml/d	millilitre per day		
mm	millimeter		
N	Newton		
Nm	Newtonmeter		

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/cm^3 = 8.3454 lb./gal(US)
	1 kg/cm^3 = 0.03613 lb./cu.in.
Force	1 N = 0.10197 kp
Speed	1 m/s = 3.28084 fpsec.
	1 m/s = 2.23694 mph
Acceleration	1 m/s^2 = 3.28084 $ft./s^2$
Pressure	1 bar = 14.5 psi
Temperature	°C = (°F-32) x 5/9
Power	1 kW = 1.34109 hp

Safety instructions

1.1 General safety instructions

The described product, i.e. the pre-lubrication metering devices of the OI-AL-SR series, was manufactured according to the state of the art.
Risks may, however, arise from its usage 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 the lifecycle manual, general statutory regulations and other regulations for accident prevention and environmental protection must be observed and applied.

1.2 General behaviour when handling the product

- The product may only be used in awareness of the potential dangers, in proper technical condition, and according to the information in these instructions.
- Technical personnel must familiarize themselves 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 from the product.
- Responsibilities for different activities must be clearly defined and observed. Uncertainty seriously endangers safety.
- Protective and safety mechanisms cannot be removed, modified, or disabled during operation and must be checked for proper function and completeness at regular intervals.
  If protective and safety mechanisms must be removed, they must be installed immediately following conclusion of work and then checked for proper function.
- Any malfunctions that occur must be resolved according to responsibility. The operator of the system/ machine must be notified in case of malfunctions outside the scope of responsibility.
- Wear personal protective equipment.
- Observe the particular safety data sheets when handling lubricants.

1.3 Qualified technical personnel

Only qualified technical personnel may install, maintain, and repair the product described in this document.
Qualified technical personnel are persons who have been trained, assigned, and instructed by the operator of the final product into which the described product is incorporated.
Such persons are familiar with the relevant standards, rules, accident prevention regulations, and assembly conditions as a result of their training, experience, and instruction. They are qualified to carry out the required activities and in doing so recognize and avoid any potential hazards.
The definition of qualified personnel and the prohibition against employing non-qualified personnel are laid down in DIN VDE 0105 and IEC 364.
Relevant country-specific definitions of qualified technical personnel apply for countries outside the scope of DIN VDE 0105 or IEC 364.

The core principles of these country-specific qualification requirements for technical personnel cannot be below those of the two standards mentioned above.
The operator of the final product is responsible for assigning tasks and areas of responsibility and for the responsibility and monitoring of the personnel. These areas must be precisely specified by the operator.
The personnel must be trained and instructed if they do not possess the requisite knowledge.
Product training can also be performed by SKF in exchange for costs incurred.
In addition, the owner must also ensure that the relevant personnel are fully familiar with and have understood the contents of the assembly/ operating instructions.

1.4 System pressure or hydraulic pressure hazard

WARNING

System pressure
The product is pressurized during operation. Therefore it must be depressurized before starting assembly, maintenance, or repair work, or any system modifications or system repairs.

WARNING

Hydraulic pressure
The product is pressurized during operation. Therefore it must be depressurized before starting assembly, maintenance, or repair work, or any system modifications or system repairs.

1.5 Operation

The following must be observed during commissioning and operation:

- o All information within this manual and the information within the referenced documents.
- o All laws/regulations that the operator must observe.

1.6 Assembly, maintenance, malfunctions, shutdown, disposal

- o All relevant persons (e.g., operating personnel, supervisors) must be informed of the activity prior to the start of work. Precautionary operational measures/ work instructions must be observed.
- o Ensure through suitable measures that moving/ detached parts are immobilized during the work and that no body parts can be pinched by unintended movements.
- o Assemble the product only outside the operating range of moving parts, at an adequate distance from sources of heat or cold.
- o Prior to performing work, the product and the machine/ system in which the product is or will be integrated must be depressurized and secured against unauthorized activation.
- o Drill required holes only on non-critical, non-load bearing parts.
- o Other units of the machine/the vehicle must not be damaged or impaired in their function by the installation of the product.
- o No parts of the centralized lubrication system may be subjected to torsion, shear, or bending.
- o Use adequate lifting devices when working with heavy components.
- o Avoid mixing up or wrong assembly of disassembled parts. Mark parts accordingly.

1.7 Intended use

The SKF MonoFlex pre-lubrication metering devices of the OI-AL-SR series are designed for the progressive distribution of mineral oils and synthetic oils with a viscosity of 22-1000 mm^2/s in single-line centralized lubrication systems.
The OI-AL-SR pre-lubrication metering devices are available in three versions that differentiate in their firmly adjusted output only.
The maximum admissible operating pressure of the OI-AL-SR metering devices is at 100 bar, the relief pressure is at 5 bar.
The OI-AL-SR metering devices are mounted on Lincoln mounting bars or on customer-specific base plates, into which the oil input and output channels are integrated. Here, Lincoln offers corresponding versions (chapter 11) an.
In case of an individual production of divider bars and base plates, these must be designed following the conditions of construction and installation of the OI-AL-SR metering devices and their parameters.
The admissible range of temperature of the OI-AL-SR metering devices is from +5 to 120 °C.
The lubricant to be used must be suitable for elastomers (FPM).
The technical requirements for the assembly of the OI-AL-SR pre-lubrication metering devices are fixed in chapter 6 „Assembly“ and must be complied with. The same applies for the technical data listed in chapter „Technical data“.
Any other or exceeding usage of the SKF MonoFlex pre-lubrication metering devices of the OI-AL-SR series is considered as inappropriate use.

1.8 Foreseeable misuse

- Any usage of the product differing from the aforementioned conditions and stated purpose is strictly prohibited. Particularly prohibited are:

- Use in an explosive atmosphere

- Use to feed/ forward/ store Group 1 dangerous fluids according to Directive 67/548/EG

- Use to feed/ forward/ store gases, liquefied gases, dissolved gases, vapors, or fluids whose vapor pressure exceeds normal atmospheric pressure (1013 mbar) by more than 0.5 bar at their maximum perimissible operating temperature.

1.9 Disclaimer of liability

The manufacturer shall not be held responsible for damages:

- caused by non-observing these instructions
- caused by using lubricants/ material not admitted for the type of unit
- caused by contaminated or unsuitable lubricants
- caused by the installation of non-original Lincoln components or Lincoln parts
- caused by inappropriate usage
- resulting from improper assembly, configuration, or filling
- resulting from improper response to malfunctions.
- as a result of non-compliance with maintenance intervals
- caused by unauthorized modification of system components

1.10 Referenced documents

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

- Operational instructions and approval rules
- Instructions from suppliers of purchased parts
- Safety data sheet (MSDS) of the lubricant/material used
- Project planning documents and other relevant documents.

The operator must supplement these documents with applicable national regulations for the country of use.

1.11 Residual risks

Residual risk, life cycle	Remedy
Assembly/ Start-up/ operation/ Adjustment/ modification/ Malfunction, troubleshooting, repair, maintenance Shutdown, disposal	
Lubrication oil spraying out during disassembly of the metering devices due to pressurized metering devices	• Before starting any assembly or maintenance works, switch off the pump unit and depressurize the single-line centralized lubrication system
Lubricating oil spraying out due to faulty component fitting/ line connection	• Secure all components hand-tight or by using the specific tightening torques. Use hydraulic fittings and lines suitable for the indicated pressures. These must be checked for proper connection and for damage prior to commissioning
People slipping due to floor contamination with spilled/ leaked lubricant	• Exercise caution when disconnecting the product's hydraulic connections • Promptly apply suitable binding agents to remove the leaked/ spilled lubricant • Follow operational instructions for handling lubricants and contaminated parts
Tearing/ damaging of lines when installed on moving machine parts	• If possible, do not install on moving parts; if this cannot be avoided, use flexible hose lines
Contamination of the environment by lubricant and parts wetted with lubricant	• Dispose of contaminated parts following the legal/ operational prescriptions in place

2. Lubricants

2.1 General information

ATTENTION

All products may be used only for their intended purpose and in accordance with the lifecycle instructions.

Intended use is the use of the products for the purpose of providing centralized lubrication/ lubrication of bearings and friction points with
lubricants within the physical usage limits which can be found in the documentation for the device, e.g., operating instructions and the product descriptions, e.g. technical drawings and catalogs. Particular attention is called to the fact that hazardous materials of any kind, especially those materials classified as hazardous by EC Directive 67/548/ EEC, Article 2, Para. 2, may only be filled into Lincoln centralized lubrication systems and components and delivered and/ or distributed with such systems and components after consulting with and obtaining written approval from Lincoln.
No products manufactured by Lincoln are approved for use in conjunction with gases, liquefied gases, pressurized gases in solution, vapors, or such fluids whose vapor pressure exceeds normal atmospheric pressure (1013 mbar) by more than 0.5 bar at their maximum permissible temperature.
Other media which are neither lubricant nor hazardous substance may only be fed after consultation with and written approval from Lincoln.
SKF considers lubricants to be an element of system design and must always be factored into the selection of components and the design of centralized lubrication systems. The lubricating properties of the lubricants are critically important in making these selections.

2.2 Selection of lubricants

ATTENTION

Observe the instructions from the machine manufacturer regarding the lubricants that are to be used. The amount of lubricant required at the lube point is specified by the bearing or machine manufacturer. It must be ensured that the required lubricant volume is provided to the lubrication point. The lubrication point may otherwise not receive adequate lubrication, which can lead to damage and failure of the bearing.

Selection of a lubricant suitable for the lubrication task is made by the machine/ system manufacturer and/or the operator of the machine/ system in cooperation with the lubricant supplier.
When selecting a lubricant, the type of bearings/ friction points, the expected load during operation, and the anticipated ambient conditions must be taken into account. All economic and environmental aspects must also be considered.

2.3 Approved lubricants

ATTENTION

If required Lincoln can help customers to select suitable components for feeding the selected lubricant and to plan and design their centralized lubrication system

Please contact SKF if you have further questions regarding lubricants. It is possible for lubricants to be tested in the company's laboratory for their suitability for pumping in centralized lubrication systems (e.g. „bleeding"). You can request an overview of the lubricant tests offered by SKF from the company's service department.

ATTENTION

Only lubricants approved for the product may be used. Unsuitable lubricants can lead to failure of the product and to property damage.

ATTENTION

Different lubricants must not be mixed. Doing so can cause damage and require costly and complicated cleaning of the product/ lubrication system. It is recommended that an indication of the lubricant in use be attached to the lubricant reservoir in order to prevent accidental mixing of lubricants.

The product described here can be operated using lubricants that meet the specifications in the technical data. Depending on the product design, these lubricants may be oils, fluid greases, or greases.
Mineral, synthetic, and/ or and rapidly biodegradable oils and base oils can be used.
Consistency agents and additives may be added depending on the operating condi tions.
Note that in rare cases there may be lubricants whose properties are within permissible limit values but whose other characteristics render them unsuitable for use in centralized lubrication systems. For example, synthetic lubricants may be incompatible with elastomers.

2.4 Lubricants and the environment

ATTENTION

Lubricants may pollute ground and waters. Lubricants have to be handled and disposed of properly. Relevant applicable regulations and laws regarind the disposal of lubricants must be observed.

It is important to note that lubricants are environmentally hazardous, flammable substances which require special precautionary measures during transport, storage, and processing. Consult the safety data sheet from the lubricant manufacturer for information regarding transport, storage, processing, and environmental hazards of the lubricant that will be used.
The safety data sheet for a lubricant can be requested from the lubricant manufacturer.

2.5 Lubricant hazards

WARNING

Risk of slipping and injury
Leaking lubricant is hazardous due to the risk of slipping and injury. Beware of any lubricant leaking out during assembly, operation, maintenance, or repair of centralized lubrication systems. Leaks must be sealed off without delay.

Leaking lubricant is extremely hazardous as it may cause a source of risk that may result in personnel injury or affect other material values.

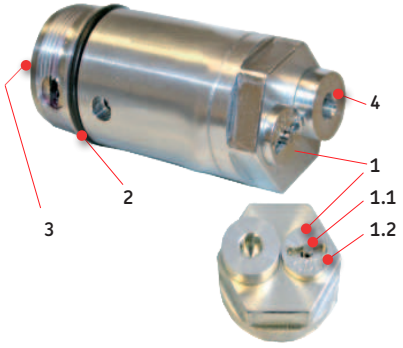
ATTENTION

Observe the safety notes stated on the safety data sheed.

3. Overview/ functional description

3.1 Overview: OI-AL-SR metering device

Overview, Fig. 1



Legend of Fig. 1

Item	Description
1	Metering screw with 1.1 Indicator pin 1.2 Stamp of metering volume optionally: 0,02 cm³/stroke 0,05 cm³/stroke 0,10 cm³/stroke
2	Lateral O-ring
3	Frontside O-ring
4	Closure screw of supply piston

3.2 General system description

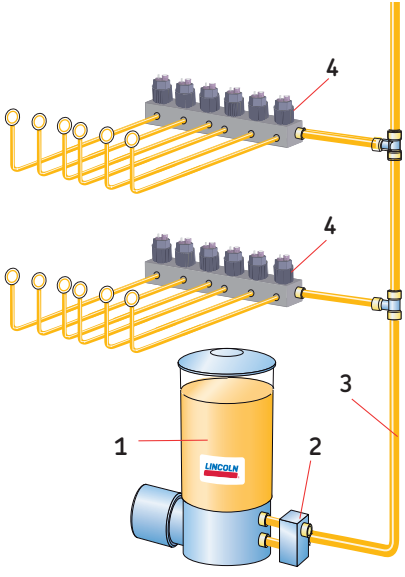
☞ see Fig. 2

In general a single-line system consists of the following components: pump unit (**1**), relief valve (**2**), main lubrication line (**3**), as well as pre-lubrication metering devices (OI-AL-SR) (**4**).

When switching on the pump motor, the pump supplies lubricant out of its reservoir to the lubricant outlet. The pump element connected there meters the lubricant and continues to supply it via a relief valve to the main line. Via the main line the lubricant reaches the pre-lubrication metering devices. There the lubricant is metered and transported further to the lubrication points. In case of the OI-AL-SR metering devices this is done during the pump runtime (pre-lubrication metering devices).

Upon completion of the pressurization the pressure relief of the main lubrication feed line is effected by changing-over the relief valve. After a successful pressure relief the pump unit is ready for the next lubrication cycle.

Single-line centralized lubrication system Fig. 2



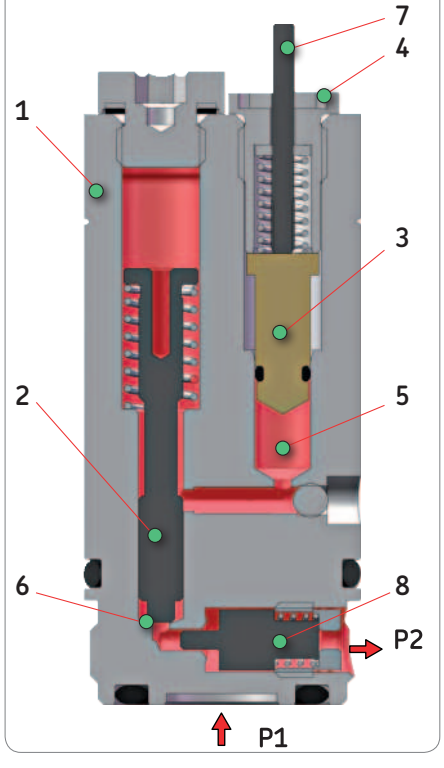
3.3 Functioning of the OI-AL-SR

Lubricating stage (metering device under pressure)
☞ see Fig. 3
Initial condition:
The metering chamber (**6**) is already filled with oil from the previous lubrication cycle.

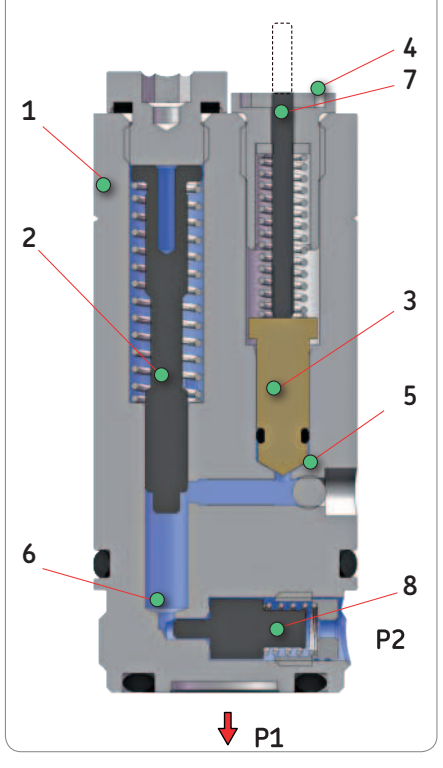
When switching on the pump motor, the pump unit supplies oil from the reservoir to the lubricant outlet. The pump element connected there meters the lubricant and supplies it via the connected relief valve to the main line and further to the metering devices. As soon as the oil pressure at the metering device inlet (**P1**) exceeds 30 bar, the supply piston (**2**) is activated by the pressure built up. The supply piston (**2**) displaces the oil in the provisioning chamber (**6**) via a downstream check valve (**8**) to the outlet (**P2**). From there the lubricant reaches the lube point via the lubricant feed line.
As soon as the supply piston (**2**) has passed the passage opening towards the metering chamber (**5**), the metering chamber (**5**) is filled with oil under pressure. Thereby the metering piston (**3**) is pressed upwards against its own spring force (pressure spring). Now the indicator pin (**7**) extracts and allows a visual control of the meterering device functions. The stroke of the metering piston (**3**) is limited by the metering screw (**4**).
As soon as the supply piston (**2**) has completed its stroke and an operating pressure of 30 bar has been built up in the main line, pressure in the main line and in the metering devices is relieved by a relief valve.

Pressure relief stage (metering devices depressurized)
☞ see Fig. 4
For the metering device to change over the main line must be relieved from pressure after each completed lubrication cycle. Thereby the oil pressure on the metering device inlet (**P1**) must fall below 5 bar. The supply piston (**2**) is pushed back into its initial position by its pressure spring. The check valve (**8**) prevents the oil in the main line from flowing back into the provisioning chamber (**6**).
As soon as the supply piston (**2**) opens the passage opening to the metering chamber (**5**), the spring-loaded metering piston (**3**) displaces the metered amount of oil into the provisioning chamber (**6**).
Then the metering device is ready for the next lubrication cycle.
The indicator pin remains extracted. If during the next lubrication cycle a control is desired, it must be pushed back again by hand. By doing so also during lubrication pause times failures of the metering devices remain visible.

Lubrication stage OI-AL-SR Fig. 3



Pressure relief stage OI-AL-SR Fig. 4



Legend of Figures 3 and 4

P1	Inlet (Oil mainline to pump unit)
P2	Outlet (Oil pressure line to lube point)
1	Metering device body
2	Supply piston
3	Metering piston
4	Metering screw
5	Metering chamber
6	Provisioning chamber
7	Indicator pin (after manual activation and the following next stroke the indicator pin remains extracted - no automatic reset)
8	Check valve

4. Technical data

	Technical data
Output:	0.02 cm³/stroke 0.05 cm³/stroke 0.10 cm³/stroke
Operating pressure	max. 100 bar
Working pressure:	min. 30 bar
Relief pressure:	≤5 bar
Viscosity of lubricant:	22 - 1000 mm²/s
Operating temperature:	+5° to +120°C
Material	
Housing	Aluminium
Sealing material:	FPM

	Order no. OI-AL-SR
Output:	**Order number:**
0,02 cm³/stroke	547-33924-1
0,05 cm³/stroke	547-33925-1
0,10 cm³/strple	547-33926-1

5. Delivery, returns, and storage

5.1. Checking the delivery

After receipt of the shipment, the product must be inspected for damage and for completeness according to the shipping documents. Transport damages must be reported to the forwarding agency immediately. Keep the packaging material until any discrepancies are resolved.

5.2. Returns

Before returning, all parts must be cleaned and packed properly, i.e. following the regulations of the recipient's country. There are no restrictions for land, air, or sea transport.

Returns are to be marked on the packaging as follows.

- Do not burden / This side up
- Protect against humidity
- Handle with care. Fragile. Do not throw.

There apply the following conditions for the storage:

5.3. Storage

- Ambient conditions: dry and dust-free surroundings, storage in a well-ventilated and dry area
- Storage time: max. 24 months
- Relative humidity: < 65%
- Storage temperature: + 10 - +40°C
- Avoid direct exposure to sun or UV rays
- Shield nearby sources of heat and coldness

5.3.1 General information

- The product can be wrapped in plastic film to avoid low-dust storage
- Protection against ground moisture by storing on a shelf or wooden pallet
- Use corrosion protection agent to protect bare metal surfaces. Check and renew corrosion protection every 6 months.
- Protect motors agains mechanical damage. Never store motors on the fan guard.

6. Assembly

6.1 General information

Only qualified technical personnel may install, operate, maintain, and repair the SKF MonoFlex pre-lubrication metering devices described in the lifecycle manual. Qualified technical personnel are persons who have been trained, assigned, and instructed by the operator of the final product into which the SKF MonoFlex pre-lubrication metering devices are incorporated.
Such persons are familiar with the relevant standards, rules, accident prevention regulations, and operating conditions as a result of their training, experience, and instruction. They are qualified to carry out the required activities and in doing so recognize and avoid potential hazards.

The definition of qualified technical personnel and the prohibition of the employment of unqualified personnel are regulated in DIN VDE 0105 or IEC 364.
Before assembling/setting up the product, the packaging material must be removed.

6.2 Set-up and attachment

The product should be protected against humidity and vibration and should be installed in an easily accessible position to ensure all other installations can be carried out without any problem. Make sure there is adequate air circulation, so as to prevent overheating. For indications on the maximum admissible ambient temperature see the technical data. The installation position of the product must be effected following the indications in the assembly drawing.

WARNING

Personal injuries/ damage to property
When drilling mounting holes, make sure that lines, units or moving parts are not damaged or impaired in their functions.
Observe safety distances as well as guidelines for the installation and prevention of accidents.

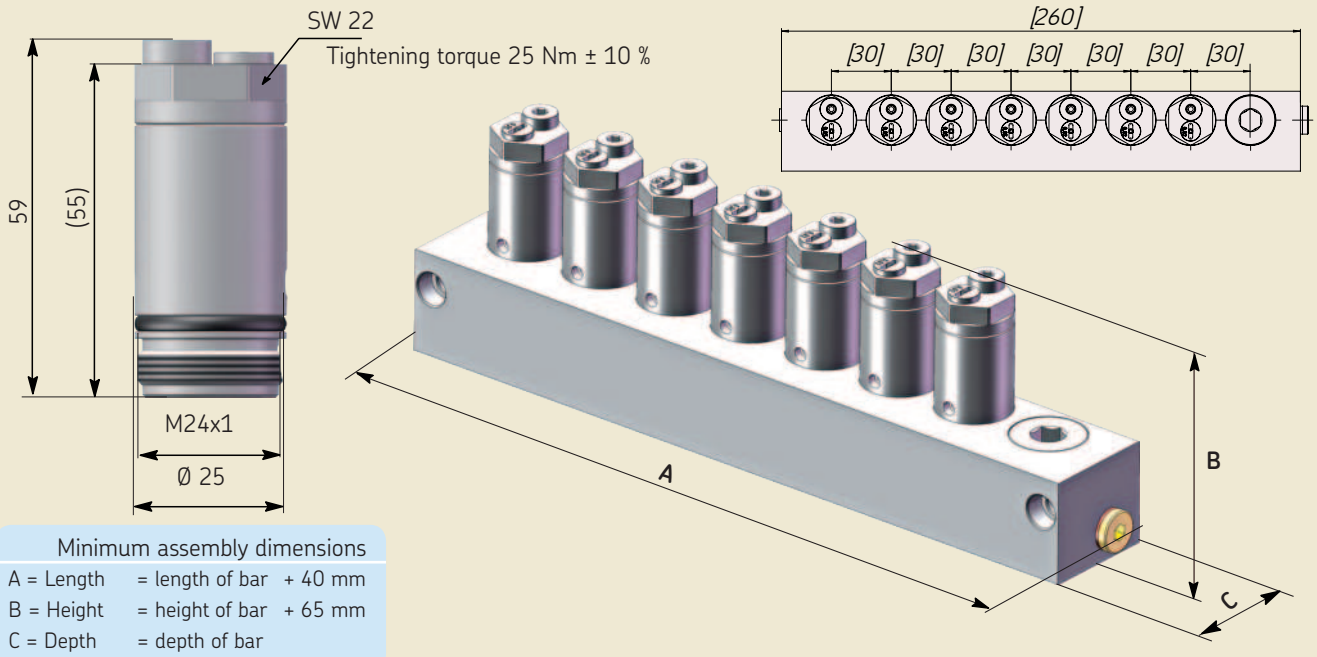
During assembly and during any drilling work for the base plate, always pay attention to the following:
- Other lines must not be damaged.
- Other units must not be damaged.
- The product must not be installed within the range of moving parts.
- The product must be installed at an adequate distance from sources of heat and coldness.
- Maintain safety clearances and comply with local regulations for assembly and accident prevention.

ATTENTION

Always protect the centralized lubrication system, i.e. the metering devices, by means of a pressure relief valve.

6.2.1 Attaching measures, mounting bores

Dimensions for mounting bars **Fig. 5**



Minimum assembly dimensions		
A = Length	= length of bar	+ 40 mm
B = Height	= height of bar	+ 65 mm
C = Depth	= depth of bar	

6.2.2 Minimum assembly dimensions

To ensure enough space for maintenance works and for any disassembly of the product, adhere to the minimum assembly dimenisons (Fig. 5).

CAUTION

Risk of slipping
During assembly, maintenance, and repair works on the centralized lubrication system, special attention must be paid to leaking lubricant. Immediately identify and seal leaking points.

WARNING

System pressure
During operation the described product is pressurized.
Depressurize the product before starting any assembly, maintenance, and repair works.

6.3 Assembly of the OI-AL-SR metering devices

Preconditions:
The divider bar (or base plate) used for assembly of the IO-AL-SR metering devices must be fixed in a level manner and free from tension and vibration. The mounting surface must be free from residuals such as chips or dust particles.

- Check the OI-AL-SR metering devices for correct seat of the two O-rings
- Position the OI-AL-SR metering devices at the female thread of the divider bar (or base plate) and screw in metering devices by hand
- Tighten OI-AL-SR metering devices by means of a torque wrench (AF 22) at a **tightening torque of 25 Nm ± 10 %**

6.4 Routing of the lubrication lines

To ensure troublefree functioning of the entire centralized lubrication system, when routing the lubrication lines observe the following:

Dimension the lubricant mainline according to the maximum pressure and the output volume of the pump unit to be used. Starting from the pump unit the lubrication mainline should be laid with an upward gradient, if possible, and should have a venting option at the highest point of the lubrication line system.

Lubricant metering devices at the end of the lubricant mainline should be mounted in such way that the outlets of the lubricant metering devices show upward. If lubricant metering devices have to be mounted below the lubricant mainline due to system-related conditions, then mounting should not be done at the very end of the lubricant mainline.

The tube lines, hoses, shut-off and way valves, fittings, etc. to be used must be designed for the maximum operating pressure of the pump unit, the admissible temperatures, and the lubricants to be supplied. Furthermore, the lubrication line system must be secured against inadmissibly high pressure by means of a pressure relief valve.

All components of the lubrication line system, such as tube lines, hoses, shut-off and way valves, fittings, etc. must be thoroughly cleaned before assembly. In the lubrication line system there must not project any seals towards the inside as these would impede the lubricant from flowing and contamination could enter the lubrication line system.

Lubrication lines must be routed in such way that there won't be any air inclusions. Avoid modifications of the cross-section of the lubrication line from smaller to larger diameters in the flow direction of the lubricant. Unavoidable changes in cross-sections should be done in a smooth manner.

The lubricant flow through the lubrication lines must not be impeded by installing sharp bends, angle valves, and check valves. Avoid sudden changes of direction.

6.5 Venting of the OI-AL-SR metering devices

To ensure full functioning of the OI-AL-SR metering devices, these must be primed with oil immediately after the assembly by initiating a filling run of at least 200 strokes per metering device.

Preconditions:
The product/ machine into which the single-line centralized lubrication system is integrated is shut down. The single-line centralized lubrication system is fully assembled.

- Switch on pump unit and let it run until all OI-AL-SR metering devices have executed at least 200 supply strokes

- Switch off pump unit

7. Start-up

ATTENTION

Observe the information by the machine manufacturer regarding the lubricants to be used.

ATTENTION

Fill in clean lubricant only using a suitable filling device. Contaminated lubricants may result in system failure.

7.1 Initial start-up

The pre-lubrication metering device of the OI-AL-SR product series is supplied ready for operation and can be started up immediately after proper assembly. Ensure that the metering device and its connections are properly sealed.

8. Shutdown and disposal

8.1 Temporary shutdown

To temporarily shut down the pre-lubrication metering device OI-AL-SR it is necessary to shut down the single-line centralized lubrication system, into which the metering device is integrated.

8.2 Final shutdown

If the product will be permanently shut down, the local regulations and laws regarding the disposal of contaminated equipment must be observed.

ATTENTION

Lubricants must be used and disposed off appropriately following the local regulations and laws regarding the disposal of lubricants.

The product can also be returned to the manufacturer for disposal, in which case the customer is responsible for reimbursing the costs incurred.
The parts are recyclable.

9. Maintenance

9.1 General

The pre-lubrication metering device of the OI-AL-SR product series works free of maintenance. Still the following points have to be observed.

WARNING

System pressure
During operation the described product is pressurized.
Depressurize the product before starting any assembly, maintenance, and repair works.

WARNUNG

Hot surface
For reasons of assembly the metering device can reach a surface temperature corresponding to the operating temperature.
Always wear protective gloves.

To ensure proper functioning the metering device and all connections and ports should be checked for tight seat. If necessary, the metering device can be cleaned from outside with mild material-compatible cleaning agents (not alkaline, no soap).
During the cleaning procedure ensure that the cleaning agent does not get inside of the metering device. An inside cleaning of the metering device is not intended.

ATTENTION

The disassembly of the OI-AL-SR metering device into single parts is not admissible and will result in the voiding of all warranties.

ATTENTION

Make sure to use original Lincoln spare parts only. The use of non-original Lincoln spare parts and auxiliaries is not allowed and will result in a loss of the legal warranty.

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10. Troubleshooting

The following tables give an overview on possible malfunctions and their causes.
If it is not possible to remedy a malfunction with the help of these tables, please contact the Lincoln Customer Service.

WARNING

System pressure
During operation the described product is pressurized.
Depressurize the product before starting any assembly, maintenance, and repair works.

WARNING

Hot surfaces
Under certain assembly conditions the metering device can reach a surface temperature corresponding to the operating temperature.
Always wear protective gloves.

10.1 Start-up, product and system failures

Malfunction	Cause	Elimination
No lubricant supply	o Insufficient system pressure (operating pressure) at the metering device inlet	• Check system pressure (min. 30 bar) at the metering device inlet, if necessary, increase system pressure
	o Blockade of the metering device	• Push in the indicator pin of the metering device in question, then trigger an additional lubrication cycle *in case of extracted indicator pin* - Check subsequent lubrication lines for crushes, leakage or torsion of the bearing seat *in case of retracted indicator pin* - Check intake volume and operating pressure - Carry out pressure relief, if necessary, replace metering devices

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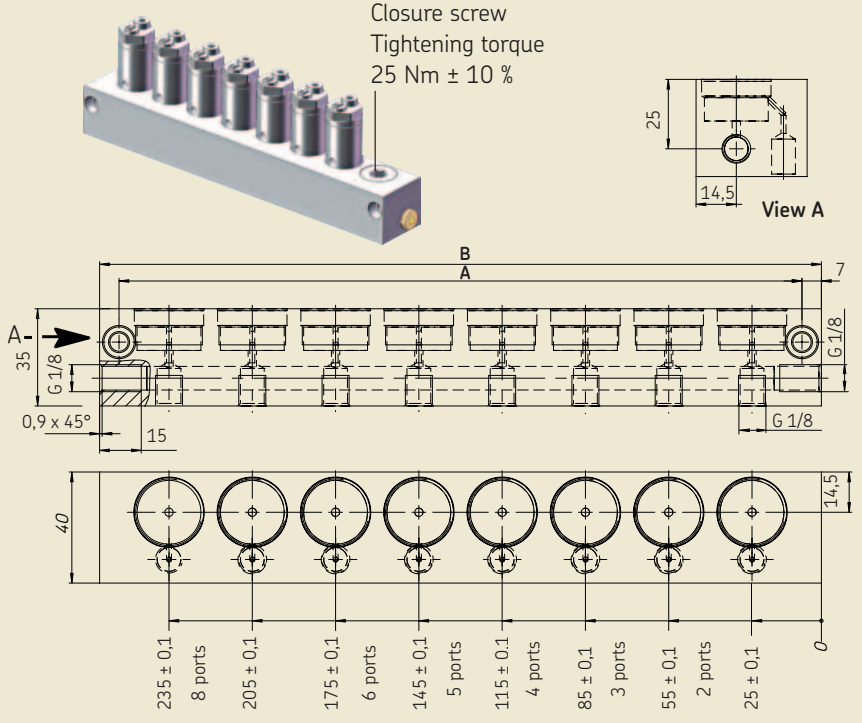
11. Accessories

11.1 Divider bars and closure screws

			Divider bars
Material:	**AlCuMgPb F37 DIN 1796**		
Designation	**Measure A** [mm]	**Measure B** [mm]	**Order No**
Divider bar:			
2 ports	66	80	**447-71901-1**
3 ports	96	110	**447-71902-1**
4 ports	126	140	**447-71903-1**
5 ports	156	170	**447-71904-1**
6 ports	186	200	**447-71905-1**
8 ports	246	260	**447-71906-1**
Option: Closure screw			
M24x1			**447-71898-1**

Overview over divider bars with the maximum number of OI-AL-SR metering devices Fig. 6

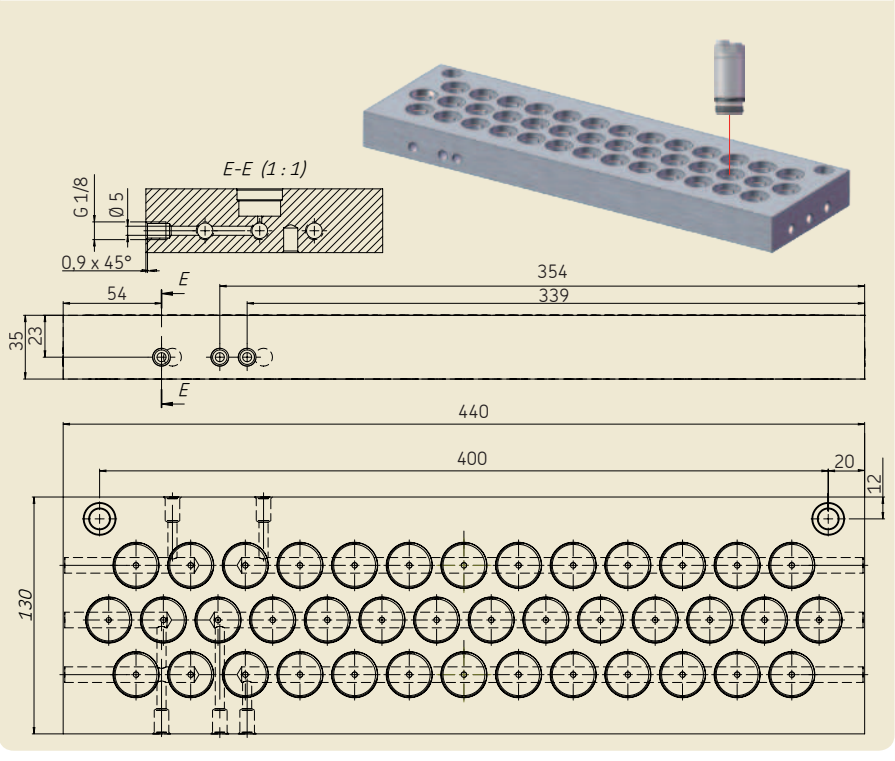


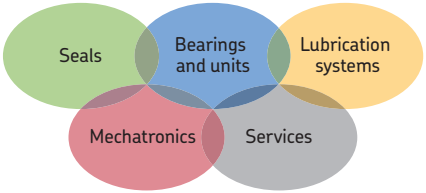
11.2 Base plate

	Accessory
Material:	**AlMgSi1 F28-32**
or:	**AlCuMg1 F28**
Designation	**Order number**
Optional base plate for up to 40 OI-AL-SR pre-lubrication metering devices	**447-71899-1**
Option: closure screw M24x1	**447-71898-1**

Other base plates on request.

Optional base plate **Fig. 7**





The Power of Knowledge Engineering

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 competence areas include bearings and 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 asset management systems. A global presence provides SKF customers uniform quality standards and worldwide product availability.

Important information on product usage

All products from SKF may be used only for their intended purpose as described in this brochure and in any instructions. If operating instructions are supplied with the products, they must be read and followed.

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 system. SKF lubrication systems or their components are not approved for use with gases, liquefied gases, pressurized gases in solution and fluids with a vapor pressure exceeding normal atmospheric pressure (1 013 mbar) by more than 0,5 bar at their maximum permissible temperature.

Hazardous materials of any kind, especially the materials classified as hazardous by European Community Directive EC 67/548/EEC, Article 2, Par. 2, may only be used to fill SKF centralized lubrication systems and components and delivered and/or distributed with the same after consulting with and receiving written approval from SKF.

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