

AS

Motor-driven pump AS

EN

Operating manual



Imprint

The operating manual is part of the scope of the SKF's motor-driven pump unit AS for dual-line centralized lubrication systems.

The manual has been edited in conformity with applicable standards and rules for technical documentation.

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Introduction

The motor-driven pump units AS are remarkable in their operational reliability and long service lives. The lubrication systems are made in conformity with the generally recognized rules of technology and the applicable safe working practices and the rules for accident prevention. Still hazards may be involved in their use, which can lead to injury of operators or other persons or damage the machine or other property.

To ensure trouble-free operation and prevent hazard, we kindly ask you to read the present manual carefully and observe the notes contained in it.

The present manual gives the instructions for operating and servicing standard motor-driven pump units AS (→ **page 6**). In the case of a special pump unit AS, read carefully the technical sheet delivered with the pump with all specific technical data (motor, level switch, etc...).

Notes on the operating manual



Text marked with this sign alerts to special hazards or work that must be performed with caution.

Keep the operating manual in a safe place so that it is always available wherever the unit is in use.

This operating manual is part of the unit, and it must be given to the operating company upon sale of the unit.

Safety instructions

Please comply with the following safety instructions in order to prevent possible damage and to ensure that the motor-driven pump units AS work properly.

Use the motor-driven pump units only in technically perfect condition for their intended use. Be aware of hazards and observe the operating manual.

Especially errors that could affect safety must be resolved without delay. Safety measures corresponding to the parameters of the lubricant supplied must be stipulated.

The safety mechanisms must not be damaged, dismantled, or in any way made inoperable, nor must they be replaced by parts which have not been expressly approved of by SKF.

The electrical connection and all interventions such as repairs, component replacement, etc. may be carried out only by properly qualified and instructed personnel.



If units are improperly connected, substantial material or personal damage may be the consequence.

Repair work must only be performed after a trained specialist has disconnected the unit from power.



Working on systems under electrical voltage could lead to personal injury.

The dual-line centralized lubrication system connected to the motor-driven pump unit may be under pressure. Before extension work, changes, repairs, etc. it must be depressurized.




Working on systems under pressure could lead to personal injury.



Unauthorized modifications to the motor-driven pump unit and the use of unauthorized spare parts and aids are prohibited and disqualify the warranty.

Worn-out motor-driven pump units must be made inoperable and disposed of properly.


Applications

 **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 (1013 mbars) 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.

The motor-driven pump units AS serve to supply lubricant to centralized lubrication systems. Other use or use beyond this purpose is considered unintended. SKF will not accept liability for damages resulting from such unintended use.

 **Only authorized lubricants for the pump type may be supplied. Unsuitable lubricants could lead to the pump failing and possibly severe properly damage and personal injury.**

Lubricants

The motor-driven pump unit AS can supply lubricants with the following NLGI grade:

- greases up to NLGI grade 2

A list of authorized lubricants can be found on the Internet at www.skf.com/lubrication. The lubricants recommended correspond in their composition to customary safety regulations, and they are suitable for use in centralized lubrication systems.

Whenever using other lubricants, keep in mind that there are lubricants which, although within the authorized limits, nevertheless are unsuitable for dual-line centralized lubrication systems because of their characteristics.

Keep in mind that lubricants are environmentally unfriendly substances and that their transport, storage and processing require that special safety measures be taken.

Version

Table 1 lists the standard versions of the motor-driven pump unit AS.



If a motor-driven pump unit is not listed in table 1, please refer to the delivered technical sheet to know the specific technical data of the unit.

Table 1 Standard motor-driven pump units AS

Order No.	Half-cycle indicator	Reservoir capacity	Level monitoring
AS-1Q-1T05KA4+140	visual	5	min.
AS-1Q-1T05KB4+140	visual	5	min. + max.
AS-1Q-1R15KA4+140	visual	15	min.
AS-1Q-1R15KB4+140	visual	15	min. + max.
AS-1Q-1R30KA4+140	visual	30	min.
AS-1Q-1R30KB4+140	visual	30	min. + max.
AS-1Q-3T05KA4+140	electric	5	min.
AS-1Q-3T05KB4+140	electric	5	min. + max.
AS-1Q-3R15KA4+140	electric	15	min.
AS-1Q-3R15KB4+140	electric	15	min. + max.
AS-1Q-3R30KA4+140	electric	30	min.
AS-1Q-3R30KB4+140	electric	30	min. + max.

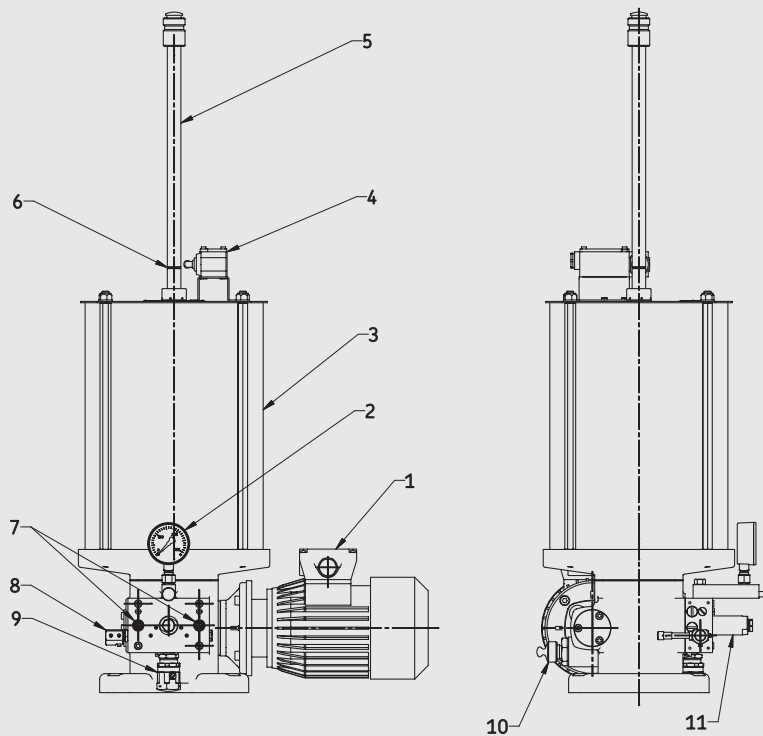


Fig. 1 Pump AS-1Q-3R15KA4+140

1. motor
2. manometer
3. reservoir (15 kg)
4. level switch
5. level indicating rod
6. max. level mark
7. outlet ports
8. half-cycle indicator
9. pressure regulator
10. filling
11. filter

Design

Figure 1 shows the essential design of the motor-driven pump unit AS.

The lubricant reservoir is located on the pump housing. It is equipped with a follower plate in order to prevent any dust or air penetration and cavitation. According to the model it has different level controls (min. level, min. and max. level). The user refills the reservoir with the filler coupling on the back side of the pump housing. This coupling has a filter to ensure the cleanliness of the lubricant.

The high resistance wheel and worm couple permit to have a ration of 1/40. The pump cannot discharge until the drive shaft has carried out a number of revolutions at least equal to the reduction.

A standard changeover block (→ **fig. 2**) is mounted on the pump housing. It is relatively compact but it is the core of the AS unit. The standard changeover block consists of a pump, changeover valve, filter element and pressure control valve.

The pump is a double-action piston pump with one piston and 2 automatically actuated valves. The changeover valve (**1**) is activated by overpressure. It has 2 pilot pistons serving the

main piston, thus avoiding a dead point. The delivery filter (**2**) is protecting the system. It is located on the circuit before the changeover unit. This fine filter is very easy to remove and clean up. The pressure regulator (**3**) makes it possible to set the pressure in the two lines. In order to ensure the security of the system, the pressure regulator can be sealed in order to avoid any accidental modification.

It is possible to control the good operation of the changeover unit by means of two different control devices: a sight indicator (indicating rod) of half-cycle or an electric indicator (switch with LED) of half-cycle .

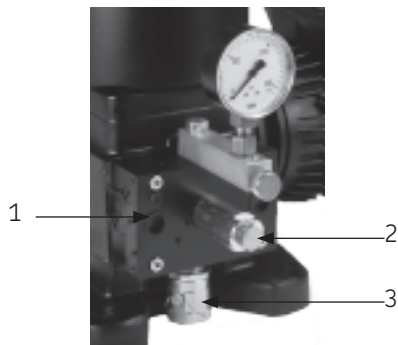


Fig. 2 Changeover block

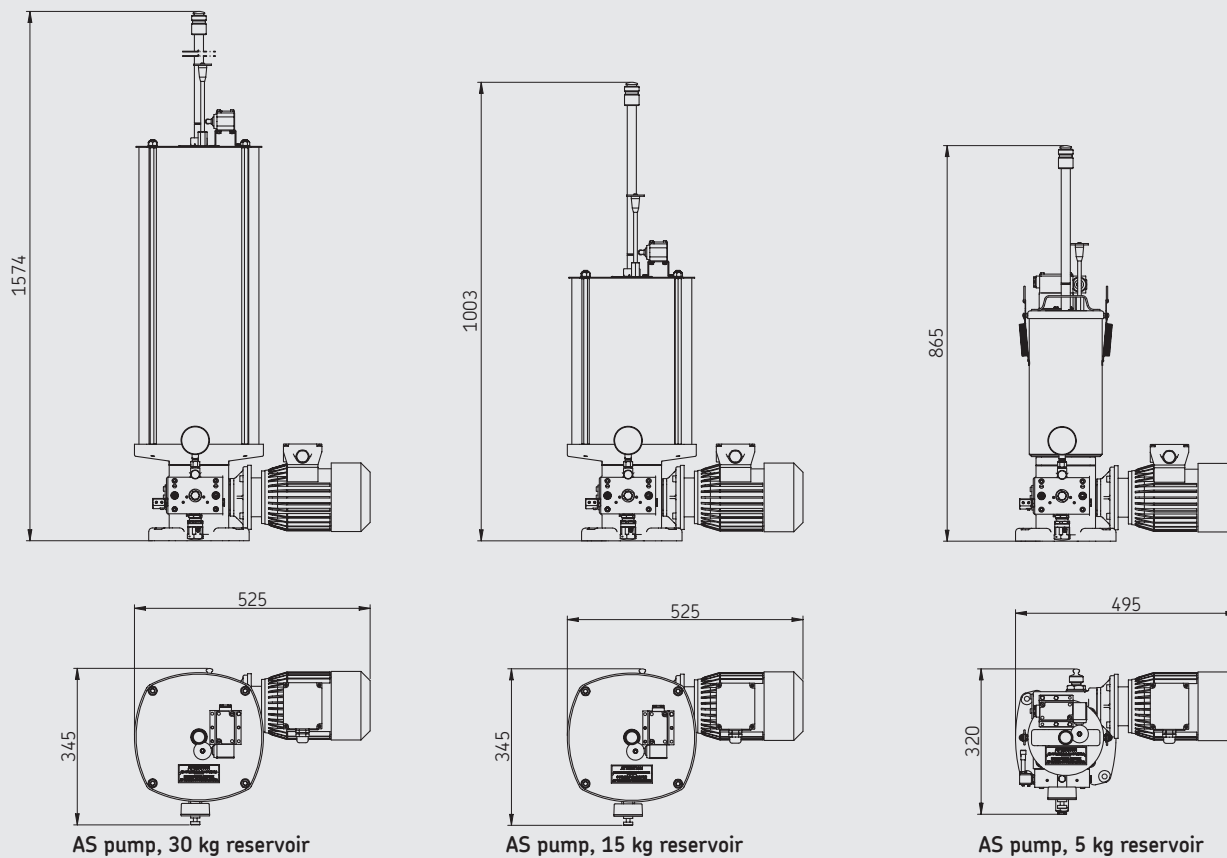


Fig. 3 Dimensions of the AS pumps

Function

When the motor-driven unit is switched on, the primary shaft is driving via a reduction gear (1/40) a catch, which is actuating a piston pump.

The double effect piston pump is delivering lubricant into the changeover block. The changeover block is normally delivering alternatively lubricant to two main lines. The changeover valve is first delivering lubricant to the first main line as the second main line is relieving (lubricant is returning to the reservoir). The pressure is building up into the first line until reaching a preset changeover pressure. The pressure can be monitored at any time with a manometer. When the preset pressure is reached, the changeover valve is switching from the first main line to the second main line. Then the AS unit is delivering lubricant to the second main line, as the first one is relieving. The half-cycle indicator is showing the changeover process between the two lines.

Half-cycles are carried out the one after the other until the AS unit is switched off. When the unit will be switched on again, it will restart its operation exactly where it has been stopped.

Installation

The motor-driven pump AS has to be installed on a horizontal surface with the reservoir pointing vertically upward. Maintain safe distance above and all around the unit.

! When drilling installation holes always pay attention to any supply lines or other units as well as further sources of dangers such as moving parts.

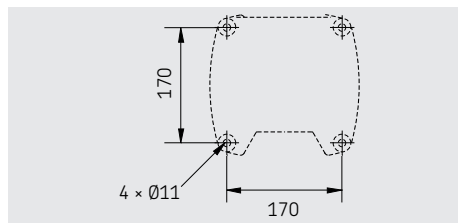


Fig. 4 Drilling template for motor-driven pump AS

! The supply voltage on site must agree with the information on the nameplate. Check the fusing of the circuit. Use only the original fuse with the required ampere value. If other fuses are used, damage to property or personal injury may be the consequence.

Outlet connection

The changeover block of the motor-driven pump unit has two outlets dispensing lubricant to the two main lines. Tubes of diameter 8×10 can be connected to these outlets.

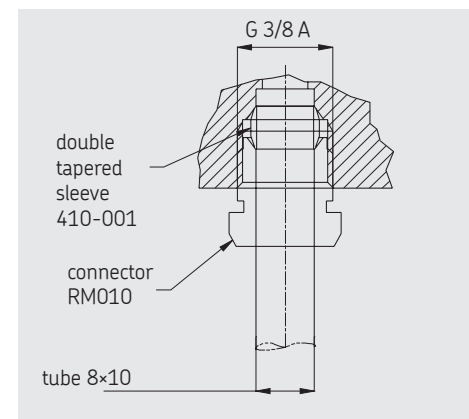


Fig. 5 Outlet connection on changeover block

Half-cycle indicator

The motor-driven pump unit can have two different devices to indicate the good function of the half-cycle changeover.

This can be a mechanical device. A rod on the side of the changeover block is indicating when the changeover has been carried out. The indicating rod is out when the first half-cycle is in operation and it is drawing in when the second half-cycle is starting.

This can also be an electric device. An electric sensor is sending a signal to a control unit every time the half-cycles are switching and a LED on the sensor is also signaling every changeover. This sensor makes it possible to monitor at distance the good function of the motor-driven pump AS.

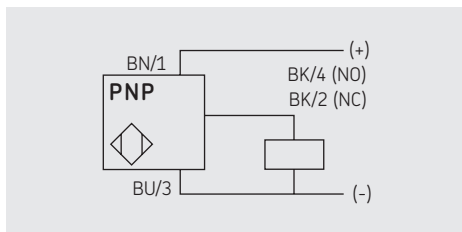


Fig. 6 Wiring diagram of the half-cycle indicator

Level monitoring

The motor-driven pump AS can have a level switch with two different function mode according to the unit model. In both cases it is a NO + NC level switch.

Minimal level

The level contact switches when the minimal lubricant level has been reached and switches back when the user starts to refill the reservoir.

Minimal and maximal level

The level contact switches when the minimal lubricant level has been reached and switches back when the maximal level has been reached.

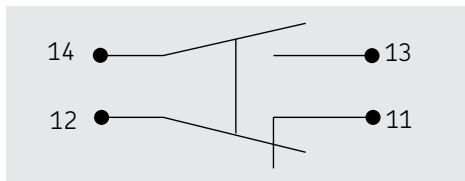


Fig. 7 Wiring diagram of the level switch

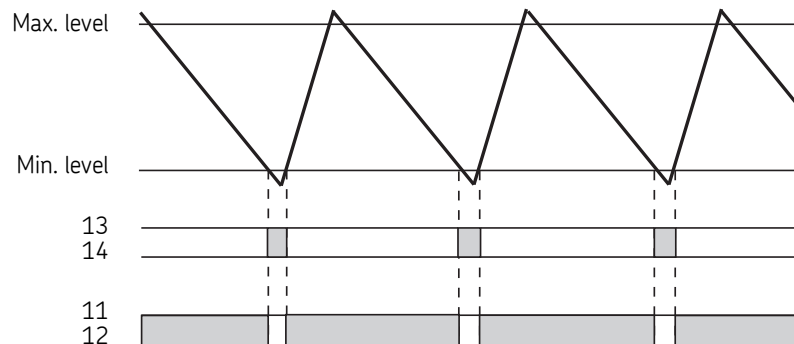


Fig. 8 Pulse diagram of the min. level monitoring

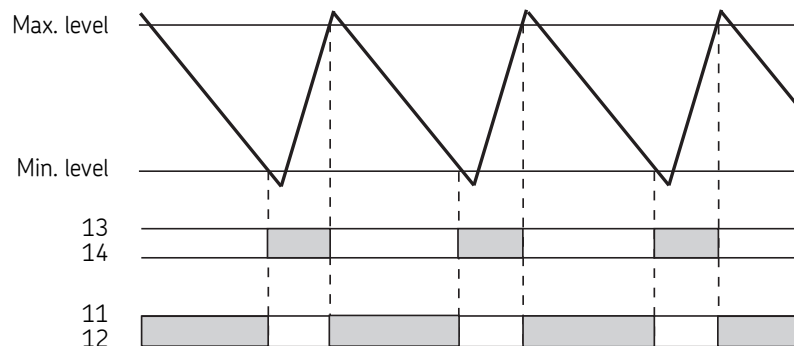


Fig. 9 Pulse diagram of the min. and max. level monitoring

Adjustment of the flow rate

The motor-driven pump AS might have a flow regulator directly fitted to the pump block. According to the model the regulator has one or two adjusting screw(s).

- Remove the protective cap from the adjusting screw.
- Screw in to increase the flow rate.
- Screw off to reduce the flow rate.

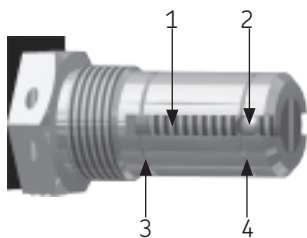


Fig. 10 Flow rate adjusting screw

1. Adjusting screw
2. Position ball
3. Groove – max. flow rate
4. Groove – min. flow rate

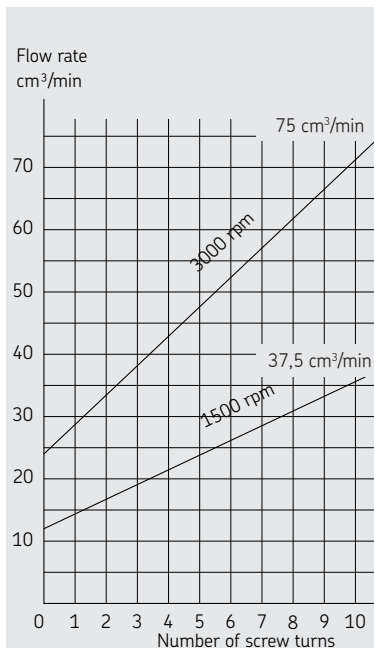


Fig. 11 Flow rate, regulator with one adjusting screw

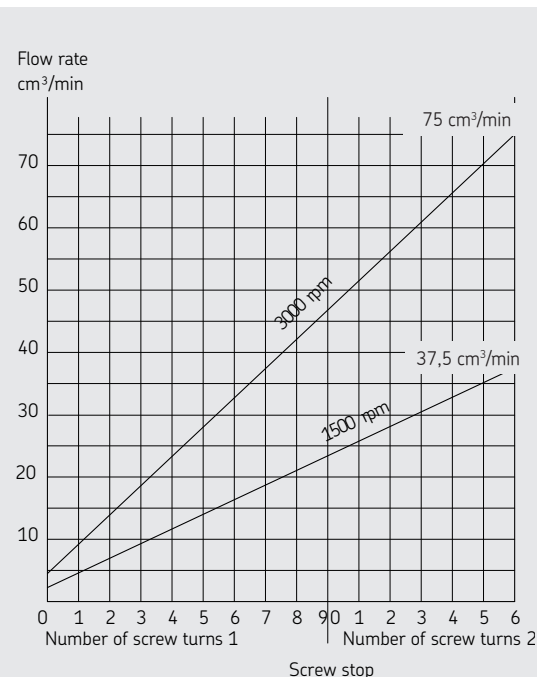




Fig. 12 Flow rate, regulator with two adjusting screws

Commissioning

 **Before starting the motor-driven pump unit check if all connections have been well mounted and tightened.**

 **Respect the rotation direction of the motor, which is indicated by an arrow on the pump housing.**

To ensure the good function of the dual line lubrication system, it is recommended to prefill the different lubrication line before to connect them to the motor-driven pump unit.

Bleeding


Bleeding the pump

- Fill the reservoir
- Loosen the plug from the filter element
- Operate the motor-driven pump unit until clean and bubble-free lubricant is coming out
- Tighten the plug from the filter element

Bleeding the circuit


- Open the ends of the main lines
- Operate the pump unit until lubricant is coming regularly out at the ends of the first main line.
- Close the ends of the first main line.
- Continue to operate the pump unit until lubricant is coming regularly out at the ends of the second main line.
- Close the ends of the second main line.
- Operate the pump unit until lubricant is coming out at every lubrication point, metering unit being set at their maximum delivery rate.

Reservoir filling

 **Only authorized lubricants for the pump type may be supplied. Unsuitable lubricants could lead to the pump failing and possibly severe properly damage and personal injury.**

Filling with lubricant has to be done with the grease nipple on the side of the pump housing.

- Remove the protective cap and connect the filling pump to the grease nipple (filler coupling G 1/2).

 **Fill the reservoir with lubricant free of air bubbles.**

- Fill the pump until the red marks on the indicating rod of the reservoir appear.
- Disconnect the filling pump and put back the protective cap. Bleed the pump unit and the dual line lubrication system. It is also possible to bleed the steel reservoir. Therefore press the button on the top of the indicating rod.

Maintenance



Maintenance work may be carried out only by qualified and trained specialists instructed to do so.



Maintenance work may be carried out only after a trained specialist has disconnected the unit from power.

Working on systems under electrical voltage could lead to personal injury.



The lubrication system may be under pressure. Before extension work, changes, repairs, etc. it must be depressurized.

SKF motor-driven pumps AS are for the most part maintenance free. To ensure they work properly, however, please regularly check the following:

- Regularly check the level of lubricant in the reservoir and, if necessary, replace refill the reservoir.
- Check the pump regularly for external damages and leaks.
- All electrical connections and lines must be checked regularly for damage and to ensure that they are firmly in place.

- It is important to clean regularly the filter element of the changeover block.
- Any faults found must be properly rectified before the system is activated again.

Faults

! All interventions such as repairs, component replacement, etc. may be carried out only by properly qualified and instructed personnel.

! Repair work may be carried out only after a trained specialist has disconnected the unit from power. Working on systems under electrical voltage could lead to personal injury.

! The lubrication system may be under pressure. Before extension work, changes, repairs, etc. it must be depressurized.

Table 2 contains an overview of problems, which you can remedy yourself. You should contact the SKF if the problem can not be rectified by taking measures described here.

Table 2 Fault analysis and remedy

Problem	Possible cause	Remedy
Pump pressure and/or delivery rate to low	Air in the pump housing or in the reservoir	Fill the reservoir and bleed
	Grease filter clogged	Clean the filter
	Unsuitable lubricant	Empty the entire centralized lubrication system of unsuitable lubricant and fill it with new lubricant. The old lubricant must be properly disposed of.
Pump does not deliver	Pump not bled	Bleed the pump
	Power supply interrupted	Turn on power
	Motor defective	Replace the motor
	Reservoir empty	Fill the reservoir
No lubricant at the lines ends	Leaks on lines	Check the lines. Replace any defective lines or connectors if necessary
	Lines or lubrication points clogged.	Check the lines. Replace any defective lines or connectors if necessary
Lubricant overflowing from reservoir without being full	Lubricant passing over the follower plate	Remove the cover and take away the lubricant above the follower plate. Remove the follower plate and check the gasket.

Placing out of service

Temporary standstill

Comply with the instructions from the chapter *Transport and Storage* if the motor-driven pump unit AS is to be at a standstill for a longer period of time.

Final standstill

If you want to bring the motor-driven pump unit to a permanent standstill, please comply with the legal stipulations for disposal of grease containing components.

The system can also be taken back by SKF for disposal if the costs are covered.

Spare parts*

Order No.	Designation
GM130AC315	Manometer 0 to 315 bars
UL10.17	Motor 230/400 V AC - 50 Hz, 0,75 KW, shape B14, flange FT115
GM215	Level switch
AC.3507	Electric half-cycle indicator
MS100A-RE	Changeover block + accessories (seals and screws)

*) *Non-exhaustive list*

For further information about the spare parts of the motor-driven pump unit AS, please contact the SKF Service center.

Technical data

Pump

Flow rate	65 cm ³ /min 1,9 cm ³ / stroke
Pressure max.	175 bar
<i>Changeover pressure, adjustable</i>	
<i>and with seal secured</i>	50 to 175 bars
<i>Factory setting</i>	100 bar
Filter	0,8 mm
Operating temperature	-25 to +50 °C
Lubricant (grease)	up to NLGI grade ≤ 2
Filler coupling	G 1/2 male
Outlet	G 3/8

Motor (CE marking)

- Voltage	230/400 V AC – 50 Hz
- Power	0,75 kW
- Speed	1 500 min ⁻¹
- Protection	IP 55
- Insulation class	F

Half-cycle indicator

Function	opens and closes at every half cycle
Type	inductive proximity switch NO, PNP
Voltage	12 – 48 V DC
Current max.	200 mA
Short-circuit strength	
LED for output status	
Body	tubular, Ø 8
Connection	M 12

Level monitoring

Type	NO + NC
Voltage max.	240 V AC 250 V DC
Current max.	3 A for 240 V AC 0,27 A for 250 V DC
Ambient temperature	-25 to +50 °C
Protection	IP 65

Service

Please contact our sales offices or our international representatives if you have any questions or problems.

You can find a list with current addresses on the Internet at:

- www.skf.com/lubrication

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951-130-400-EN Edition 04/2009