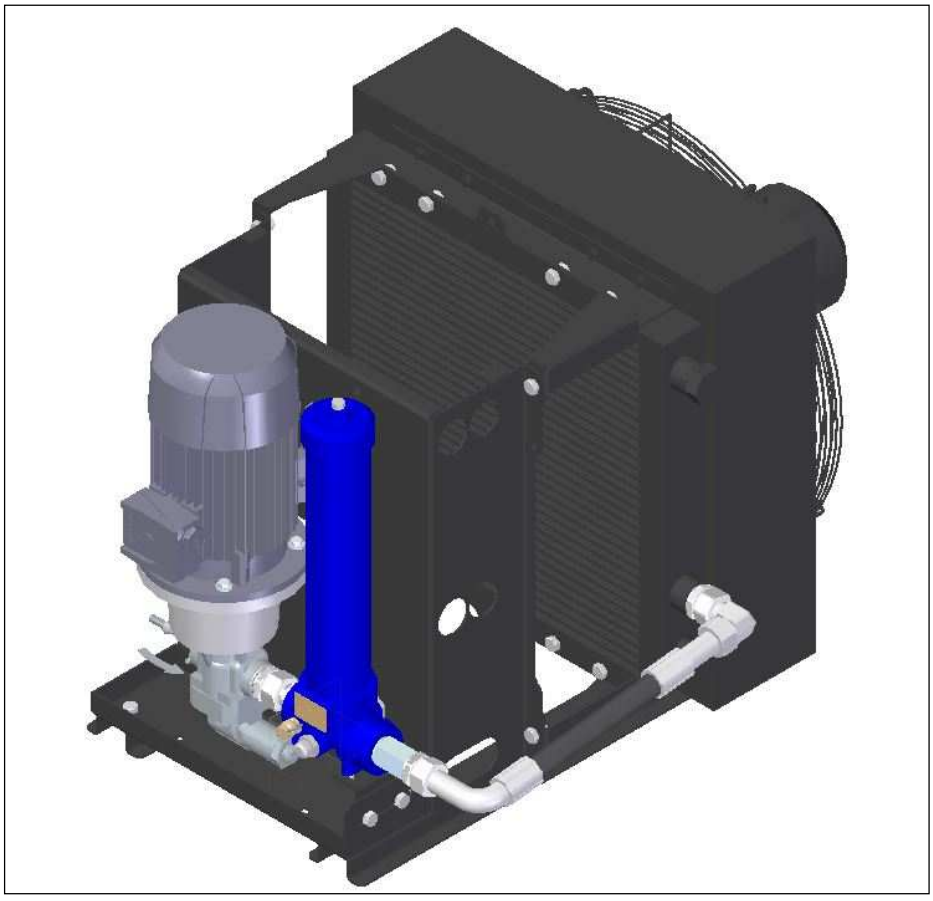
# SKF Oil Conditioning Unit

**(Assembly instructions according to Directive 2006/42/EC)**



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# 1 EC Declaration of incorporation

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

The manufacturer
Oy SKF Ab, P.O.Box 80 FIN-40951 MUURAME FINLAND
hereby declares that the partly completed machinery:

| | |
|---|---|
| Designation: | Oil Conditioning Unit for oil circulation systems |
| Type: | SKF-OCU-X-X-X-X |
| Type designations: | SKF-OCU-05-P-400-WAC , SKF-OCU-10-P-400-WAC , SKF-OCU-30-P-400-WAC , SKF-OCU-05-P-400-AIC , SKF-OCU-10-P-400-AIC , SKF-OCU-30-P-400-AIC |

Date of manufacture: [The model indicated in the type identification plate] complies with the following basic safety and health requirements of the EC machinery directive 2006/42/EC at the time when first being launched in the market.
1.1.2. 1.1.3, 1.1.5, 1.3.1, 1.3.2, 1.3.4, 1.3.7, 1.5.4, 1.5.8, 1.6.1, 1.6.4, 1.7.1, 1.7.2, 1.7.3, 1.7.4

The relevant technical documentation has been compiled in accordance with Annex VII part B of the directive. Upon justifiable request, these special technical documents can be forwarded electronically to the respective national authorities. The person empowered to assemble the technical documentation on behalf of the manufacturer is Manager RD Nordic. See the manufacturer's address.

Furthermore, the following directives and harmonized standards were applied in the respective applicable areas:

2006/42/EC Machinery Directive: EN ISO 12100-1/A1, EN ISO 12100-2/A1

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

In Muurame, 03 April 2017

Juha Kärkkäinen
R&D Manager, Production Development Nordic
SKF Lubrication Business unit

# 2 Legal disclosure

### Manufacturer

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### Training courses

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

### Copyright



### Warranty

The instructions do not contain any information concerning warranties. Warranties and guarantees are described in our general terms and conditions. The instructions are part of the described products and must be kept in an accessible location for further use.

### Disclaimer

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

- accidents, or negligent or inappropriate use, assembly, operation, configuration, maintenance or repairs
- improper or late response to malfunctions
- unauthorised modifications to the product
- intent or negligence
- 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.

# 3 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, be sure that all operators read this manual and all safety instructions.

| | | | |
|---|---|---|---|
|  | General warning |  | Risk of electric shock |
|  | Risk of falling |  | Hot surface |
|  | Fire hazard |  | Wear personal protective equipment (goggles) |
|  | General notes |  | Disposal, recycling |
|  | 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 |
| | NOTICE | Property damage | possible |

| Symbol | Meaning |
|---|---|
| ● | Chronological guidelines |
| ○ | List items |
| ✓ | Indicates conditions which must be met before the activities described in the title clause can be completed |
| ☞ | Also indicates other factors, causes or consequences |

| | | | | | |
|---|---|---|---|---|---|
| re. | regarding | °C | degrees Celsius | °F | degrees Fahrenheit |
| approx. | approximately | K | Kelvin | Oz. | Ounce |
| i.e. | that is | N | Newton | ≥ | Equal to or greater then |
| etc. | et cetera | h | hour | ≤ | Equal to or less then |
| poss. | possibly | s | second | $mm^2$ | square millimetre |
| if appl. | if applicable | d | day | fl. oz. | fluid ounce |
| a.a.r. | as a rule | Nm | Newtonmeter | in. | inch |
| incl. | including | ml | millilitre | Pa | Pascal newton per squar meter $N/m^2$ |
| min. | minimum | l/min | Liter per minute | bar | bar, 100 kPa |
| max. | maximum | gal/min | Gallons per minute | PSI | pounds per square inch |
| min | minute | pint/min | Pints per minute | sq.in. | square inch |
| etc. | et cetera | cc | cubic centimetre | cu. in. | cubic inch |
| e.g. | for example | mm | millimetre | mph | miles per hour |
| kW | kilowatt | l | litre | rpm | revolutions per minute |
| V | volt | dB (A) | sound pressure level | gal. | gallon |
| W | watt | > | greater than | lb. | pound |
| AC | alternating current | < | less then | hp | hirsi power |
| DC | direct current | ± | plus/minus | kp | kilopound |
| A | ampere | Ø | diameter | fpsec | feet per second |
| Ah | ampere hour | kg | kilogram | cwt. | centistoke |
| Hz | frequency (hertz) | RH | relative humidity | µm | micron |
| NC | normally closed | ≈ | approximately | | |
| NO | normally open | = | equal to | | |
| | | % | per cent | | |
| | | ‰ | per mille | | |
| | | | | | |

| 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 pint (US), 0,264 gallons (US) |
| mass | 1 kg = 2,205 lbs |
| | 1 g = 0,03527 oz. |
| density | 1 $kg/cm^3$ = 8,3454 lb./gal (US) |

| | |
|---|---|
| | 1 kg/cm³ = 0.03613 lb./cu.in. |
| force | 1 N = 0,10197 kp |
| pressure | 1 bar = 14,5 psi, 100 kPA |
| temperature | °C = (°F-32) x 5/9 |
| output | 1 kW = 1,34109 hp |
| acceleration | 1 m/s² = 3,28084 ft./s² |
| speed | 1 m/s = 3,28084 f/s |
| | 1 m/s = 2,23694 m/h |

# 4 Safety instructions

## 4.1 General instructions

- These safety instructions should be read and followed by any persons 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.
- These instructions must be kept near these products for periodic review and for review by new users of these products.
- 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 new risks that arise 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


## 4.2 General behaviour when handling the product

- Please follow these instructions whenever you use the product. If the product is not in proper and safe technical condition or you are unaware of the potential hazards, do not use the product.
- Familiarize yourself with the functions and operation of the product. All specified assembly and operating steps must be competed in the indicated order.
- Any points regarding proper and safe condition or correct assembly/operation that you do not understand must be clarified. Operation is prohibited until issues have been clarified.
- Keep unauthorized persons away.
- Always wear appropriate personal protective equipment.
- 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, discon-

nected 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 and before using the product.
- Remedy any faults included in your area of responsibility. If the fault is beyond your competence, notify your supervisor immediately of the fault.
- Do not stand on or climb on any parts of the centralised lubrication system or of the machine.

## 4.3 Intended use

This SKF Oil Conditioning Unit is used for filtering and cooling of lubricants within a lubrication system in accordance with the specifications, technical data and limits stated in these instructions:
Usage is allowed exclusively for professional users in commercial and economic activities.

## 4.4 Forseeable 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
- Use without adequate pressure relief valve
- Use in continuous operation excluding oil circulation lubrication systems.
- Use in areas with aggressive or corrosive materials (e.g. high ozone pollution)
- Use in areas with harmful radiation (e. g. ionizing radiation)
- Feeding, forwarding, or storing hazardous substances and mixtures described in annex I part 2-5 of the CLP regulation (EG 1272/2008)
- Feeding, forwarding or storing gases, liquefied gases, dissolved gases, vapours or fluids whose vapour pressure exceeds normal atmospheric pressure (1013 mbar) by more than 0.5 bar at the maximum permissible operating temperature
- Use in an explosion protection zone

## 4.5 Painting of plastic parts prohibited

Painting of any plastic parts or seals of the described products is expressly prohibited. Remove or completely tape the relevant parts before painting the machine in which the product is installed.

## 4.6 Unauthorized modifications to the product

Unauthorised conversions or modifications may result in unintended effects on product safety and functionality. Therefore, any unauthorized conversions or modifications are expressly prohibited.

## 4.7 Prohibition of certain activities

Due to potential sources of faults that may not be visible, or due to legal regulations, the following activities may be carried out only by the manufacturer’s specialists or persons authorised by the manufacturer:
- Safety valve adjustment, repair or removal

# 4.8 Compliance with 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 (SDS) of the lubricant used
- 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.

# 4.9 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

_____


# 4.10 Persons authorized to operate the device

## 4.10.1 Operators

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.

## 4.10.2 Mechanical specialist

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

## 4.10.3 Electrician

Person with appropriate professional education, knowledge and experience to detect and avoid electrical hazards.

## 4.10.4 Providing briefing for external technicians

Prior to commencing any activities, external technicians must be informed by the operator of the company's safety policies, the applicable accident prevention procedures and the functions of the machine, in which the product is installed, and of its protective devices.

### 4.10.5 Provision of personal protective equipment

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

## 4.11 Operation

The following must be observed during commissioning and operation:

- Any safety-related information within this manual and the information within the referenced documents
- All laws and regulations that the operator must observe

### 4.11.1 Emergency stopping of the Oil Conditioning Unit

In case of an emergency, stop the oil conditioning unit by:
switching off the superior machine or system in which the oil conditioning unit has been integrated.

### 4.11.2 Transport, installation, maintenance, malfunctions, repair, shutdown, disposal

- 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, depressurize the product or superior machine into which the product will be integrated and secure it against unauthorised activation.
- Ensure through suitable measures that movable or detached parts are immobilized 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.
- Cover hot or cold surfaces.
- Work on electrical components must be carried out by electrical specialists using voltage insulated tools only. Observe any waiting periods for discharging, if necessary.
- 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.
- Fuses must not be bypassed. Replace fuses with same type and rating only.
- Undertake drilling at non-critical, nonload bearing parts only. It is preferable to use existing boreholes. Be careful not to damage lines and cables when drilling.
- Identify 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 twisting, shearing, or bending.
- Before using any parts, check them for contamination; clean if necessary.
- Lubricant lines should be primed with lubricant prior to installation. 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 dismantled parts or assembling parts in the wrong order by marking the parts accordingly.

## 4.12 Commissioning and daily start-up

Ensure that:

- All safety devices are completely installed 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.

## 4.13 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 clean using a steam jet or pressure washer, as these may damage electrical components. Observe the IP protection class.
- Cleaning work on energised components may be carried out by electrical specialists only.
- Mark damp areas accordingly.

## 4.14 Residual risk

| 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, apply tightening torques according to the screw size characteristics for 8.8 screws. |
| Personal injury / material damage due to electric shock from a damaged connection cable | B, C, D, E, F, G, H | Check that the connection cable is intact before using it for the first time and, after that, at regular intervals. Do not mount the cable to moving parts or at a friction 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 | Be careful when filling and connecting or disconnecting lubricant feed lines. Always use suitable hydraulic screw connections and lubrication lines suitable for use in the stated pressures. Do not mount lubrication lines to moving parts or friction 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 | | |

# 5 Delivery, returns and storage

## 5.1 Delivery

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

## 5.2 Returns

Clean all parts and pack them properly (i.e. following the regulations of the recipient country) before returning them. Protect the product against mechanical stress (knocks, impacts). Land, sea or air transport can be used for returns. Mark returns on the packaging as follows.

## 5.3 Storage

The products must be stored as follows:

- Store in a closed, dry, dust- and vibration- free place.
- Make sure there are no corrosive, aggressive materials at the place of storage (e. g. UV rays, ozone).
- Protect against pests and animals (insects, rodents, etc.).
- Can be stored in original product packaging.
- Shield the product against heat and cold.
- in case of high temperature fluctuations or high humidity, take adequate measures (e. g. heater) to prevent condensation.
- The product's acceptable storage temperature range is the same as its operating temperature (see Technical data).
- Do not store the product for more than 24 months.

| | |
|---|---|
|  | Before using the products, inspect them for damage sustained in storage. This applies to parts made of plastic and rubber (embrittlement) as well as components primed with lubricant (ageing) in particular. |

# 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
- Meeting economic and ecological goals Immediately

## 6.2 Lubrication selection

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

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

If 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 assist 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.

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

| | NOTICE |
|---|---|
| | Do not mix lubricants. This may result in unforeseeable effects on the usability and therefore on the functionality of the centralised lubrication system. |

| | NOTICE |
|---|---|
| | 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, are not in fact suitable for use in centralised lubrication systems (e.g. incompatibility between synthetic lubricants and materials). In order to avoid this, always use lubricants tested by SKF. |

### 6.2.1 Material compability

Lubricants must generally be compatible with the following materials:

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

### 6.2.2 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 downtime of one week. If you suspect the lubricant is no longer suitable, replace it prior to recommissioning and, if necessary, perform the initial lubrication manually. It is possible for lubricants to be tested in the company's laboratory for their suitability in 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.

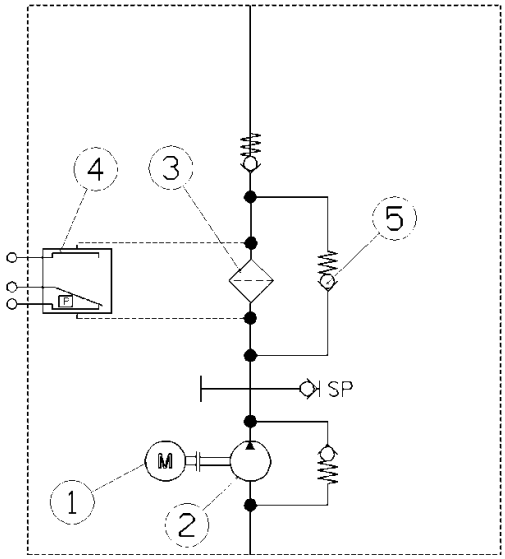
# 7 Purpose of the system

SKF Oil Conditioning Unit circulates the oil in the system and removes external contaminants, e.g. abraded particles and oxidized particles. SKF-OCU-XX models are used in applications where only filtration properties are required.
SKF-OCU-WAC and SKF-OCU-AIC –models contain also a cooler which can be used to cool the oil in the system. Typical applications are e.g. presses, wind generators and gear boxes.

# 8 Design and operation of the system

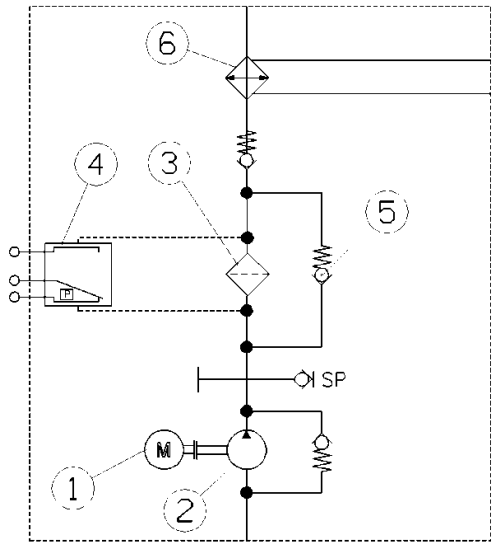
| | |
|---|---|
| | SKF-OCU unit a pump (2) has internal relief valve. It´s opening pressure is 10 Bar. |

## 8.1 SKF-OCU-XX



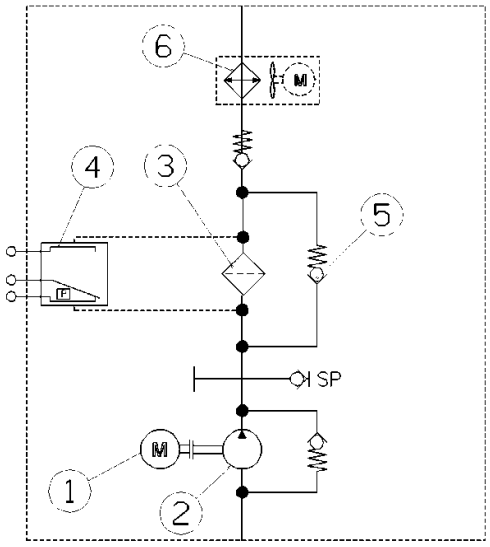

SKF-OCU-XX Pump-Filter unit consists of a motor (1), a pump (2), a filter (3), a filter clogging indicator (4) and a safety valve ( Relieve pressure 4,5 Bar) (5). The pump circulates the system oil through the filter. A safety valve is located between the pump and the filter. It opens if the filter has clogged. The cleanness of the filter is monitored by electrical/visual clogging indicator. The alarm limit is 3,4 bar.

## 8.2 SKF-OCU-WAC




SKF-OCU-WAC Pump-Filter-Water cooler unit consists of a motor (1), a pump (2), a filter (3), a filter clogging indicator (4), a safety valve ( Relieve pressure 4,5 Bar) (5) and a water heat exchanger (6). The pump circulates the system oil through the filter and the cooler. A safety valve is located between the pump and the filter. It opens if the filter has clogged. The cleanness of the filter is monitored by electrical/visual clogging indicator. The alarm limit is 3,4 bar.

## 8.3 SKF-OCU-AIC




SKF-OCU-AIC Pump-Filter-Air cooler unit consists of a motor (1), a pump (2), a filter (3), a filter clogging indicator (4), a safety valve( Relieve pressure 4,5 Bar) (5) and an air heat exchanger(6). The pump circulates the system oil through the filter and the cooler. A safety valve is located between the pump and the filter. It opens if the filter has clogged. The cleanness of the filter is monitored by electrical/visual clogging indicator. The alarm limit is 3,4 bar.

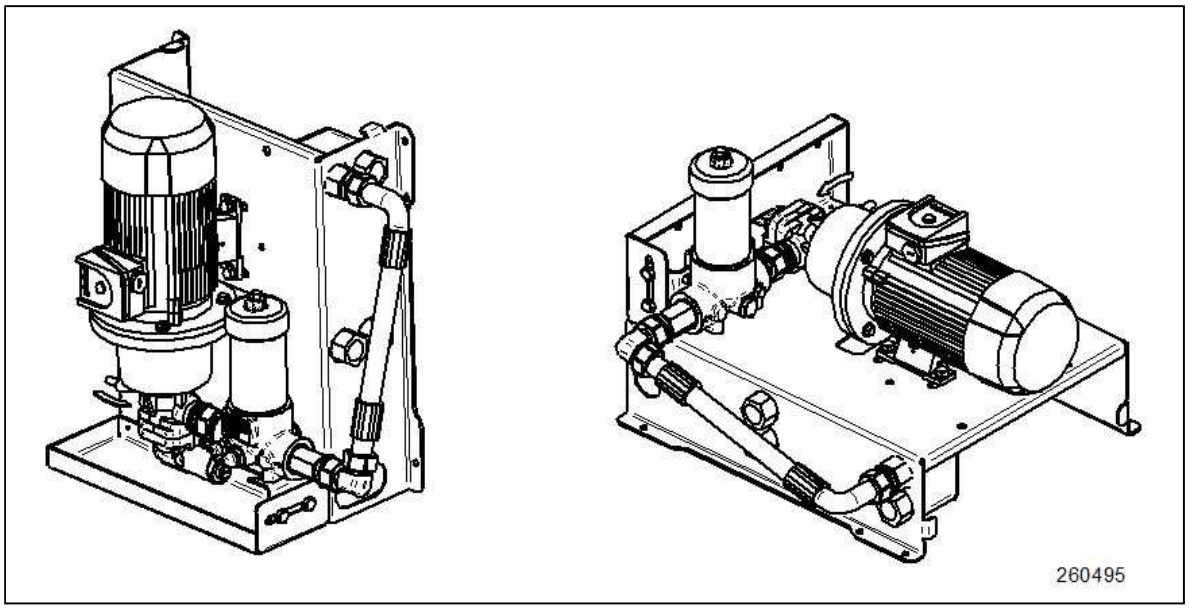
# 9 Installation

| | |
|---|---|
| | WARNING |
| | Electrical connections may only be made by a qualified electrician. The supply voltage must be switched off before accessing any current-carrying parts of the unit. The supply voltage must be turned off before any product components are opened. |

## 9.1 SKF-OCU-XX and SKF-OCU-WAC

SKF-OCU-XX and SKF-OCU-WAC units can be installed horizontally or vertically. The units are always delivered to be installed vertically. For horizontal installation the filter bowl has to be turned 90° so that the cover of the filter bowl is facing up.

The unit should be placed below tank oil level (max 5 meters) and as close to the tank as possible. When placing the unit, it must be observed that there is sufficient space for replacing the filter element.




- The diameter of inlet and outlet pipes cannot be smaller than the pump connections. Max. flow rate in the pump inlet line is 1 m/s.
- The flow direction of cooling fluid must be reverse to oil flow direction.
- Ensure that the pipes do not cause tension or vibration to the cooler. Connections are marked in the unit.
- The unit must only be used in dry locations.
- Operation temperature must be 10 °C – 40 °C.

## 9.2 SKF-OCU-AIC

The unit should be placed so that the suction connection of the pump is always below the oil level (max 5 m) and as close to the tank as possible. When placing the unit, it must be observed that there is sufficient space for replacing a filter element as well as sufficient free space for cooler air flow.

# 10 Operation

## 10.1 Start-up

### 10.1.1 Before unit start-up

Make sure that:

- there is oil in the system.
- pump inlet is always filled with oil. Air in the inlet line can cause problems at initial start-up.
- all connections are at right locations and tightened properly.
- valves are open
- hoses/pipes and couplings are not damaged.
- the pump rotates to correct direction. Direction of rotation is marked on the motor.
- the electric motor is not overloaded due to cold start conditions or operation with high oil viscosity.
- the oil used is within 15 – 800 cSt which is the recommended operating viscosity range considering the pump, motor power, filter element size etc.

| | |
|---|---|
|  | Max. viscosity at cold start is 2000 cSt for 5 min. |

### 10.1.2 Unit in operation

Make sure that:

- the fluid flows freely through the connections and that the connections does not leak.
- the system is free from abnormal noise and vibrations.
- the system is securely fixed.
- the system is clean (not clogged).
- the filter clogging indicator is not activated.

# 11 Maintenance

## 11.1 Electric motor and pump

Electric motor and pump are maintenance free.

## 11.2 Filter

A visual clogging indicator indicates when the filter element must be replaced. With optional electrical indicators the signal can also be transferred to desired location to indicate dirty filter. If the clogging indicator triggers an alarm during a cold start only, it is possible that the element does not need to be replaced yet.

**WARNING**

The hydraulic system must be switched off before any work is carried out on the filter. Ensure that there is no pressure in the filter. Whenever work is carried out on the filter, be prepared for oil leakage which can cause injury due to high pressure or high temperature.

**WARNING**

Risk of burns. Do not touch the hot surfaces of the unit.

**WARNING**

Risk of slippery because of lubricant. Clean machine surroundings for lubricant.

### 11.2.1 Replacing the filter element

1. Switch off the hydraulic system and release pressure from the filter.
2. Open the vent plug on the filter unit cover approximately two turns.
3. Unscrew and remove cover counterclockwise.
4. Remove the filter element. Collect the oil in a suitable container and dispose of it in accordance with environmental regulations.
5. Moisten the thread and sealing surfaces on the filter bowl and filter head as well as the O-rings on the bowl and element with the oil, if necessary.
6. Install a new filter element. Ensure that the type code corresponds with the type of the old element.
7. Carefully close the filter housing cover.
8. Start the unit with vent plug open approximately two turns.
9. Tighten the vent plug when only oil bleeds through.
10. Check the filter for leakage, tighten if necessary.

## 11.3 Water heat exchanger

Always clean the cooler before it becomes completely clogged. Clean the strainer by flushing with water. In general, all light deposits can be removed by back flushing the cooler. Rinse the cooler with a lot of water.

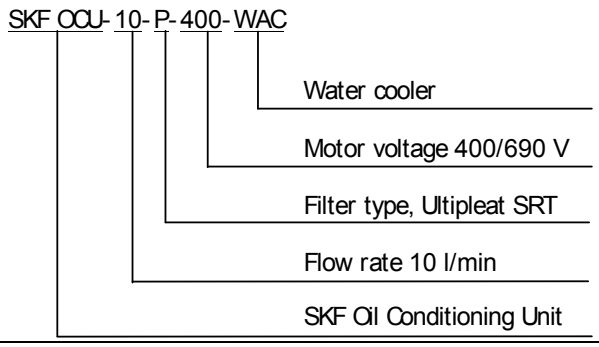
Requirements for cooling water:

- The maximum amount of particles (< 0.6 mm) should be less than 10 mg/l. Thread-like particles cause a rapid increase in pressure loss.
- Corrosion: critical values
  - free chlorine: CL 2 < 0.5 ppm
  - chloride ions: CL < 700 ppm at t=20 °C; CL < 200 ppm at t=50 °C
- Other critical values:
  - pH 7 -10
  - sulphate SO4 2<100 ppm
  - [ H CO3 -] / [SO4 2-] > 1
  - ammonia, NH3 < 10 ppm
  - free CO < 10 ppm
- The following ions are not corrosive under normal conditions:
  - phosphate, nitrate, iron, manganese, sodium and potassium

## 11.4 Air cooler

The air fins of the cooler matrix can be cleaned by blowing through with compressed air. If necessary, a high pressure washing system and degreasing agent can be used. When using a high-pressure washing system, point the jet parallel to the air fins.

# 12 Symbols

| Sym. | Abbrevia-tion | Description | Example: SKF-OCU-A-B-C-D |
|---|---|---|---|
| | SKF-OCU | SKF Oil Conditioning Unit |  |
| A: | 5 | Oil flow 5 l/min | |
| | 10 | Oil flow 10 l/min | |
| | 30 | Oil flow 30 l/min | |
| B: | P | Filter type Ultipleat SRT | |
| C: | 400 | Motor voltage 400/690 WAC | |
| D: | XX | Unit without cooler | |
| | WAC | Unit with water cooler | |
| | AIC | Unit with air cooler | |

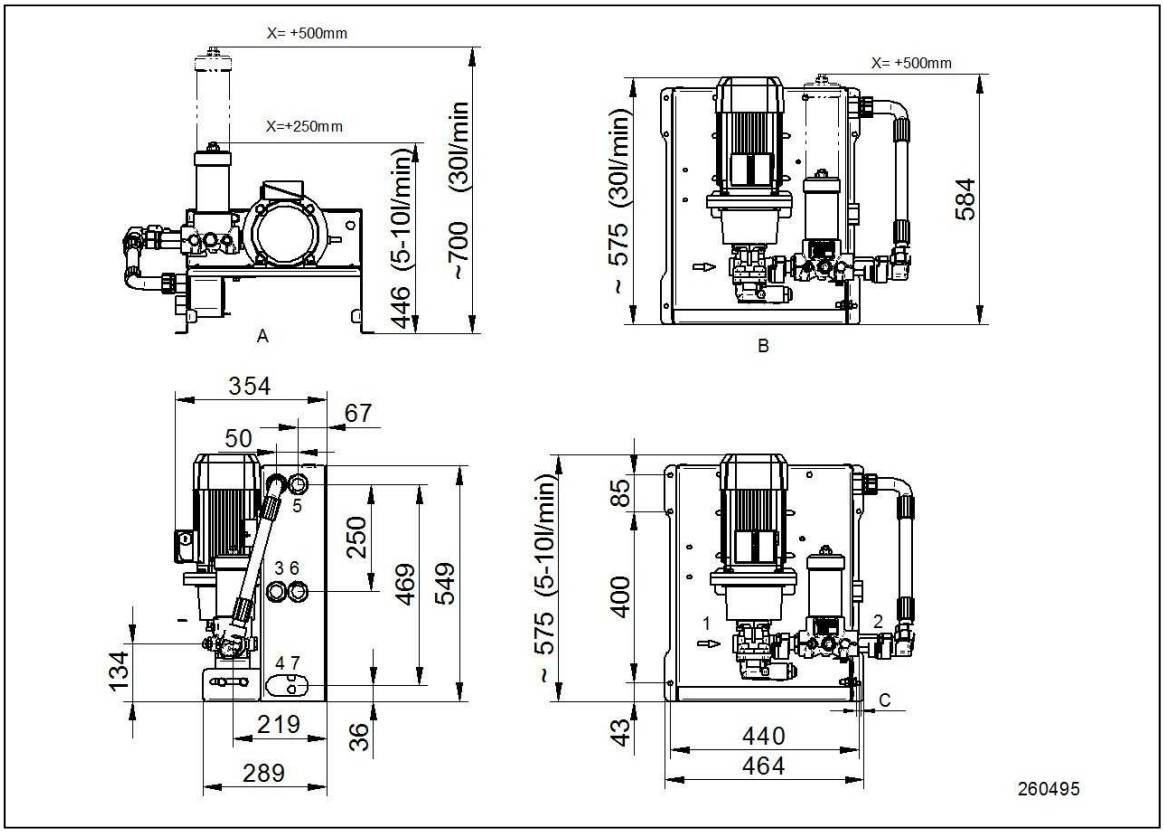
# 13 Technical specification

| Description | Unit | OCU-5 | OCU-10 | OCU-30 |
|---|---|---|---|---|
| Oil flow | l/min | 5 | 10 | 30 |
| Max. operating pressure | bar | 10 | 10 | 10 |
| Oil viscosity | cSt | 15-800 | 15-800 | 15-800 |
| Oil max. viscosity at start up | cSt | 2000 | 2000 | 2000 |
| Oil temperature range | °C | 10-80 | 10-80 | 10-80 |
| Ambient temperature | °C | -10…+40 | -10…+40 | -10…+40 |
| Operation temperature | °C | 10…+40 | 10…+40 | 10…+40 |
| Motor power, oil pump | kW | 0,55 | 0, 75 | 1,1 |
| Motor rotation speed, oil pump | r/min | 935 | 1450 | 1440 |
| Motor voltage (3-phase) | V, Hz | 400/690, 50 | 400/690, 50 | 400/690, 50 |
| Filtration rating β1000=20 µ | µm | 20 | 20 | 20 |
| Alarm limit for clogging indicator (type P/H) | bar | 3,4 | 3,4 | 3,4 |
| Opening pressure, safety valve | bar | 10,00 | 10,00 | 10,00 |
| Cooling capacity, water heat exchanger | kW | 3,00 | 3,00 | 15,00 |
| Cooling capacity, air heat exchanger | kW/°C | 0,6 | 0,6 | 0,8 |
| Motor power, air cooler | kW | 0,37 | 0,37 | 0,75 |
| Motor voltage (3-phase) | V, Hz | 230/400, 50 | 230/400, 50 | 230/400, 50 |
| SKF-OCU-XX unit weight | kg | 33 | 33 | 36 |
| SKF-OCU-WAC unit weight | kg | 38 | 38 | 53 |
| SKF-OCU-AIC unit weight | kg | 60 | 60 | 76 |

SKF-OCU unit protection class is IP55..

# 14 Dimensional drawings

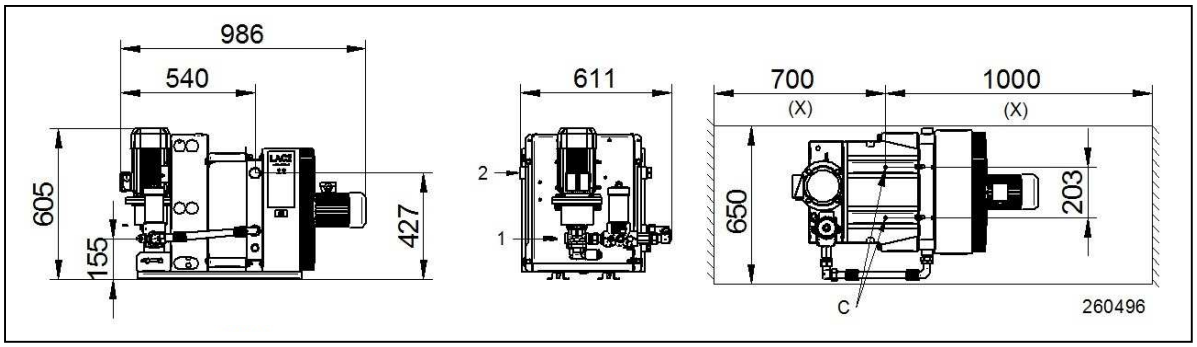
## 14.1 SKF-OCU-XX, SKF-OCU-WAC




| Item | Size | Connection |
|---|---|---|
| 1 | G 3/4” | Oil suction connection for models SKF-OCU 5/10 l/min |
| 1 | G 1" | Oil suction connection for models SKF-OCU 30 l/min |
| 2-7 | G 1" | Oil and water connections SKF-OCU 5/10/30 l/min |

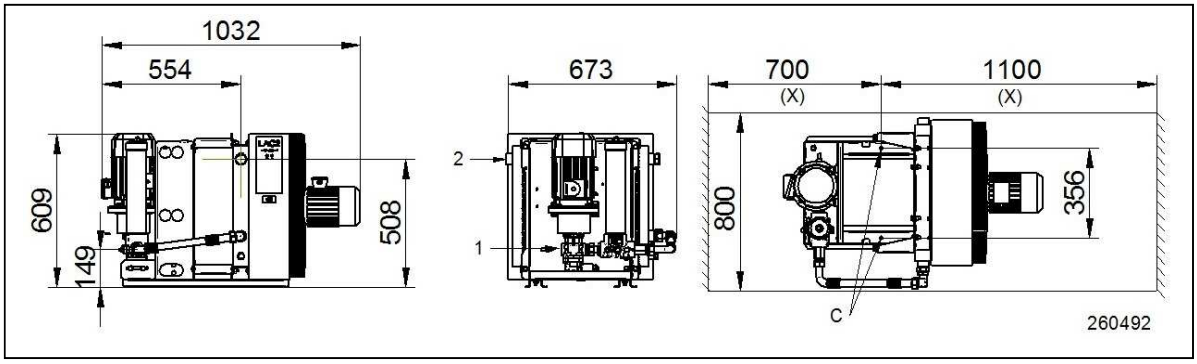
| Letter | Explanation |
|---|---|
| A | Floor mounted |
| B | Wall mounted |
| C | Installation point Diameter/amount pcs: Ø10,5 / 6 |
| X | Free space for filter element exchange |

## 14.2 SKF-OCU-AIC, 5 & 10 l/min




| Item | Size | Connection |
|---|---|---|
| 1 | G 3/4” | Oil suction connection for models SKF-OCU-AIC-5/10 l/min |
| 2 | G 1” | Oil pressure connection for models SKF-OCU-AIC-5/10 l/min |
| **Letter** | | **Explanation** |
| C | | Installation point Diameter/amount pcs: Ø13mm / 2 |
| X | | Free space for air heat exchanger proper operation |

## 14.3 SKF-OCU-AIC, 30 l/min




| Item | Size | Connection |
|---|---|---|
| 1 | G 1" | Oil suction connection for model SKF-OCU-AIC-30 l/min |
| 2 | G 1” | Oil pressure connection for model SKF-OCU-AIC-30 l/min |
| **Letter** | | **Explanation** |
| C | | Installation point Diameter/amount pcs: Ø13mm / 2 |
| X | | Free space for air heat exchanger proper operation |

# 15 Shutdown and decommissioning

## 15.1 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 5.3: *Storage.* For further information, please refer to relevant components' operating and service manuals. When recommissioning the equipment, please refer to sections *Commissioning* and *Technical specification* in the relevant components' operating and service manuals.

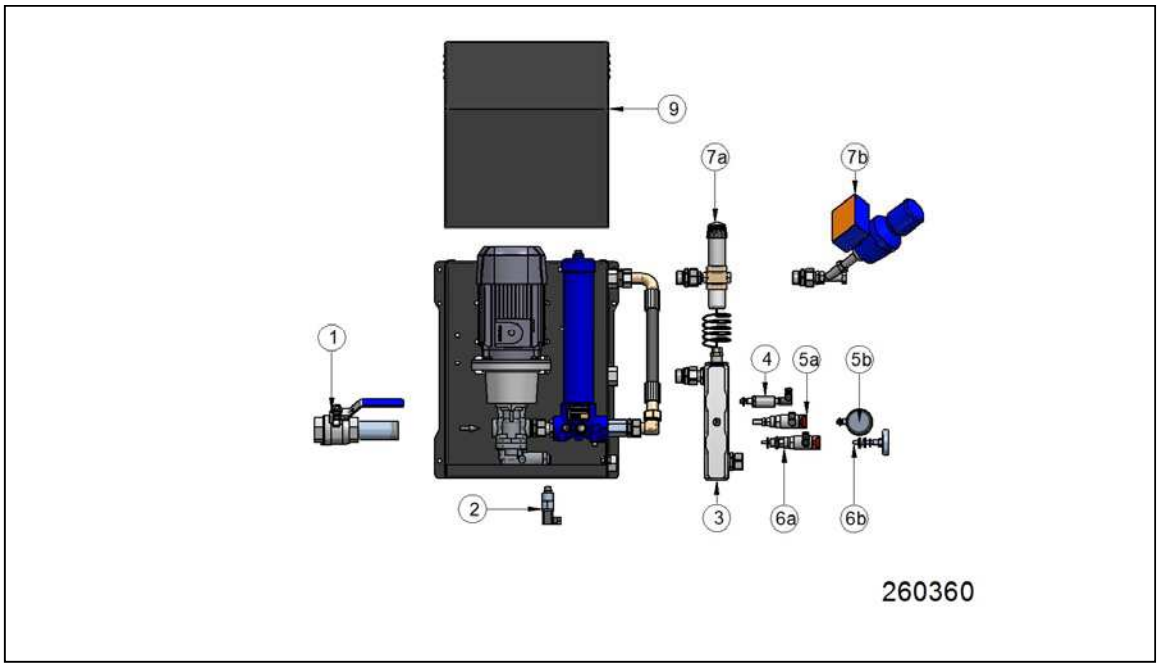
## 15.2 Final decommissioning

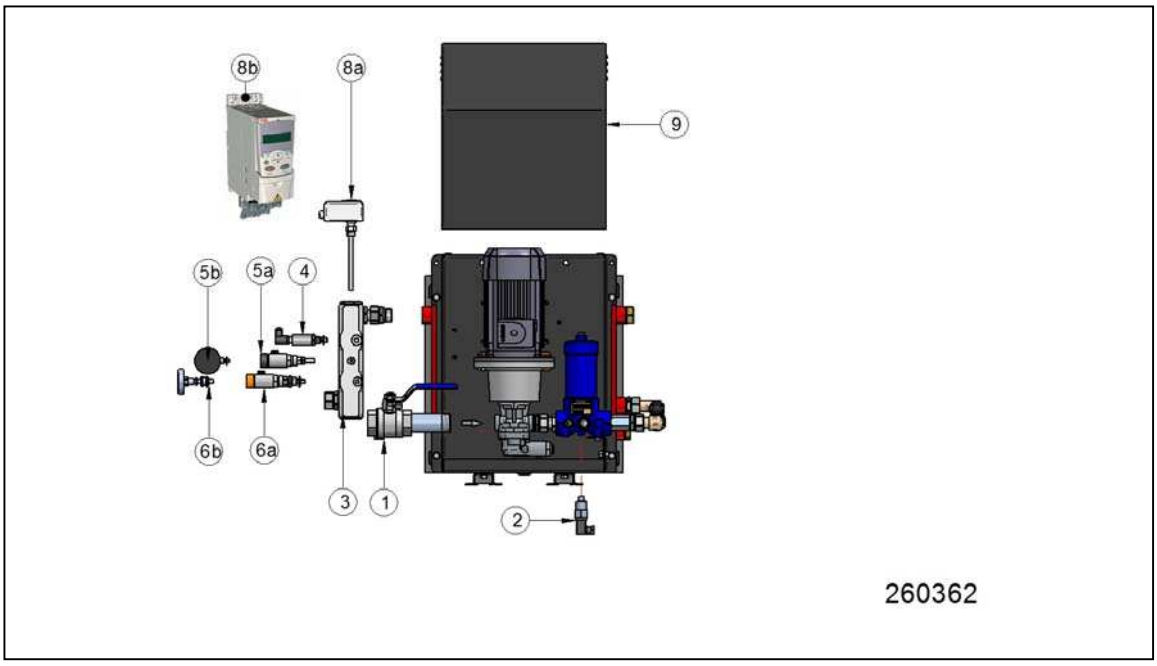
Used equipment filled with lubricant must be decommissioned and disposed of in accordance with national legislation and the procedures indicated in this operating and service manual.

| | |
|---|---|
|  | 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.

# 16 Options and spare parts



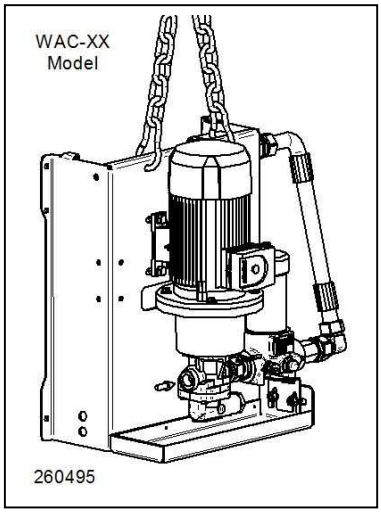



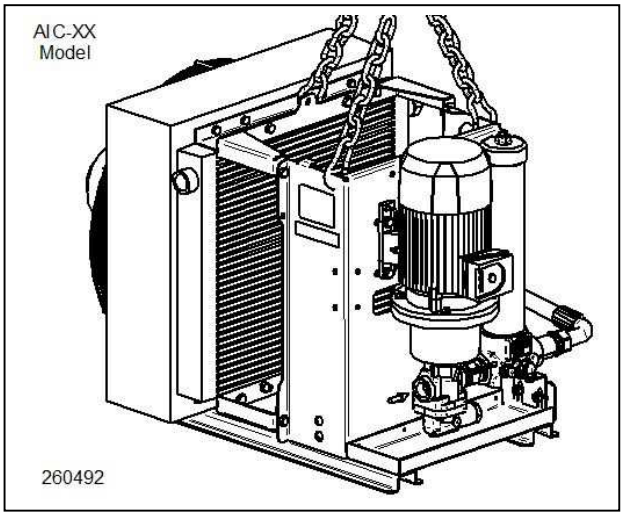
| Nro | Item number | Option description |
|---|---|---|
| 1 | 13396105 | Shut-off valve, 5-10 l/min models |
| | 13396100 | Shut-off valve, 30 l/min models |
| 2 | 13608504 | Electrical clogging indicator, filter P |
| 3 | 13401895 | Measurement block |
| 4 | 13396160 | Moisture transmitter |
| 5a | 13396180 | Pressure transmitter |
| 5b | 13396200 | Pressure gauge |
| 6a | 13396220 | Temperature transmitter with display |
| 6b | 13396240 | Thermometer |
| 7a | 13396260 | Self-acting water control valve |
| 7b | 13396280 | PID controlled water control valve |
| 8a | 13396300 | Thermostat |
| 8b | 13396320 | Frequency converter 0,55kW |
| | 13396340 | Frequency converter 1,1 kW |
| 9 | 260480 | OCU COVER |

| Item number | Spare part description |
|---|---|
| 13613155 | Motor for models SKF-OCU-**5**-XX/WAC/AIC |
| 13613156 | Motor for models SKF-OCU-**10**-XX/WAC/AIC |
| 13613157 | Motor for models SKF-OCU-**30**-XX/WAC/AIC |
| 13607302 | Pump for models SKF-OCU-**5**-XX/WAC/AIC |
| 13607304 | Pump for models SKF-OCU-**10**-XX/WAC/AIC |
| 13607306 | Pump for models SKF-OCU-**30**-XX/WAC/AIC |
| 13608202 | 22 µm filter element for models SKF-OCU-**5/10-P**-XX/WAC/AIC |
| 13608206 | 22 µm filter element for models SKF-OCU-**30-P**-XX/WAC/AIC |
| 13601568 | Water heat exchanger for models SKF-OCU-**5/10-WAC** |
| 13601572 | Water heat exchanger for models SKF-OCU-**30-WAC** |
| 13601556 | Air heat exchanger for models SKF-OCU-**5/10-AIC** |
| 13601557 | Air heat exchanger for models SKF-OCU-**30-AIC** |

# 17 Safe lifting

| | |
|---|---|
| | WARNING |
| | If you need to lift the oil condition unit, the specified lifting points must be used. These specified lifting points are marked in the picture below. |



# 18 Related CE-declarations

SIEMENS

## EU-Konformitätserklärung / EU Declaration of Conformity

**(nach der EU-Richtlinie 2014/35/EU und Verordnung (EG) Nr. 640/2009)**

Nr. / No A5E33321514A

| | |
|---|---|
| Hersteller / Manufacturer: | Siemens Aktiengesellschaft |
| | Division Process Industries and Drives, Large Drives, PD LD |
| Anschrift / Address: | Vogelweiherstr. 1-15 |
| | D-90441 Nürnberg |
| | Germany |
| Produktbezeichnung / | Niederspannungsmotoren / Low-Voltage Motors |
| Product designation: | Typ / Type: 1LE10, 1LE15, 1LE16, 1PC1, 1PC3, |
| | 1LA9, 1LG6, |
| | 1MB1 |

**Der oben beschriebene Gegenstand der Erklärung erfüllt die einschlägigen Harmonisierungsrechtsvorschriften der Union:**

**Niederspannungsrichtlinie:**

**2014/35/EU** Richtlinie des Europäischen Parlaments und des Rates vom 26. Februar 2014 zur Harmonisierung der Rechtsvorschriften der Mitgliedstaaten über die Bereitstellung elektrischer Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen auf dem Markt, Amtsblatt der EU L96, 29.03.2014, S. 357–374

**ErP Richtlinie:**

**(EG) Nr. 640/2009** Verordnung der Kommission vom 22. Juli 2009 zur Durchführung der Richtlinie 2005/32/EG (2009/125/EG) des Europäischen Parlaments und des Rates im Hinblick auf die Festlegung von Anforderungen an die umweltgerechte Gestaltung von Elektromotoren (wie geändert durch Verordnung **(EU) Nr. 4/2014** vom 06. Januar 2014).

**Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller.**
**Wir bestätigen die Konformität des oben genannten Produktes mit den Normen:**

Referenznummer und Ausgabedatum / Reference number and date of issue

EN 60034-1[1]):2010 + AC:2010

[1]) mit allen relevanten Teilen und Ergänzungen / with all relevant parts and supplements

Unterzeichnet für und im Namen von: / Signed for and on behalf of:

Siemens Aktiengesellschaft
Nürnberg, 01.06.2016

i.V. .....
Klaus Körber
Head of Research and Development Low-Voltage

i.V. .....
Dr. Michael Kulig
Head of LD P Quality Management

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Beschaffenheits- oder Haltbarkeitsgarantie. Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten. /

Siemens Aktiengesellschaft: Chairman of the Supervisory Board: Gerhard Cromme; Managing Board: Joe Kaeser, Chairman, President and Chief Executive Officer; Roland Busch, Lisa Davis, Klaus Helmrich, Janina Kugel, Siegfried Russwurm, Ralf P. Thomas; Registered offices: Berlin and Munich, Germany; Commercial registries: Berlin Charlottenburg, HRB 12300, Munich, HRB 6684; WEEE-Reg.-No. DE 23691322

Parker

## EC Declaration of Conformity

Manufacturer: Parker Hannifin Manufacturing Poland Sp. z o.o.
Accumulator and Cooler Division
54 – 156 Wroclaw, ul. Stargardzka 5
Poland
www.parker.com

Product: Parker LAC Air oil cooler with AC motor

Person authorized to compile the technical file: Erwan Jagueneau, Parker Hannifin Manufacturing Sweden AB.

Parker Hannifin Manufacturing Poland declares, according to Annex VIII of the Machinery Directive 2006/42/EC, under sole responsibility that the product above to which this declaration relates fulfils all the relevant provisions of the Machinery Directive.

The product is in conformity with the requirements in the following standards and directives.

- Safety of machinery – Basic concepts, general principles for design, SS-EN ISO 12100-1/A1:2009 and SS-EN ISO 12100-2/A1:2009.
- Safety of machinery – Safety requirements for fluid power systems and their components – Hydraulics, SS-EN ISO 4413:2010.
- Safety of machinery – Safety distances to prevent hazard zones being reached by upper and lower limbs, SS-EN ISO 13857:2008.
- Electric motors used on the product comply with the Low Voltage Directive (LVD) 2014/35/EU and the Electromagnetic Compatibility Directive (EMC) 2014/30/EC.

The above is valid for a complete product delivered by Parker Hannifin Manufacturing Poland Sp. z o.o. and a complete product is CE-marked by Parker Hannifin Manufacturing Poland Sp. z o.o.

If the product is not delivered complete by Parker Hannifin Manufacturing Poland Sp. z o.o. the product is also not CE-marked by Parker Hannifin Manufacturing Poland Sp. z o.o. and must not be put into service until the product has been declared in conformity with the requirements of the relevant directives and standards.

Spånga, October 25 2016

Erwan Jagueneau
Engineering Manager
Parker Hannifin Manufacturing Sweden AB

**PARKER** Accumulator & Cooler **D**ivision **E**urope

# 19 Oil conditioning units

| Nro | Item number | Description |
|---|---|---|
| 1 | 13140901 | SKF-OCU-05-P-400-WAC |
| 2 | 13140904 | SKF-OCU-10-P-400-WAC |
| 3 | 13140906 | SKF-OCU-30-P-400-WAC |
| 4 | 13140907 | SKF-OCU-05-P-400-XX |
| 5 | 13140908 | SKF-OCU-10-P-400-XX |
| 6 | 13140909 | SKF-OCU-30-P-400-XX |
| 7 | 13140911 | SKF-OCU-05-P-400-AIC |
| 8 | 13140912 | SKF-OCU-10-P-400-AIC |
| 9 | 13140913 | SKF-OCU-30-P-400-AIC |