

Product name

High-pressure screw pump

Product line: LMP...



Original installation instruction with included operating manual in accordance with EC-Machinery Directive 2006/42/EC

Version 03

**Spandau
pumpen**

Imprint

This original installation instruction with included operation manual complies with EC-Machinery Directive 2006/42/EC and is an integral part of the described product. It must be kept for future use.

This original installation instruction with included operation manual was created in accordance with the valid standards and regulations on documentation, VDI 4500 and EN 292.

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We reserve the right to make content and technical changes.

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Information concerning the EC Declaration of Conformity and the EC Declaration of Incorporation

For the product(s) designated below:

High-Pressure
Screw Pump

Product line:
LMP

SKF herewith certifies that it conforms to the pertinent safety requirements set forth in the following Council Directive(s) for the harmonisation of the laws of the Member States...

- **Machinery Directive 2006/42/EC**
- **Low-voltage Directive 2006/95/EC**
- **Electromagnetic compatibility 2004/108/EC**

Notes:

- (a) This declaration certifies conformity with the aforementioned directive(s), but does not contain any assurance of properties.
- (b) The safety instructions in the documentation included with the product must be observed.
- (c) The certified product must not be started up until it is assured that the machine, vehicle or the like in which the product was installed meets the provisions and requirements of the national directives to be applied. This is in par-

ticular important for the implementation of the Use of Work Directive.

- (d) Operation of the products on non-standard mains voltage as well as nonobservance of installation instructions can affect the EMC properties and electrical safety.

SKF further declare that the above mentioned product:

- is meant for integration into a machine / for connection to other machinery according to the **EC-Machinery Directive 2006/42/EC, Appendix II Part B**. Starting up the product is not admissible until it is assured that the machine, vehicle or the like in which the product was installed meets the provisions and requirements of the regulations set forth in the EC Directive 2006/42/EC.
- with reference to the **EC Directive 97/23/EC concerning apparatus subjected to pressure** this product must only be used as intended and according to the notes in the documentation. Especially observe the following:

Products of SKF Lubrication Systems Germany GmbH must not be used in conjunction with fluids, group I (hazardous fluids), according to the definition of article 2 paragraph 2 of the Directive

67/548/EC dtd. 27th June, 1967; and are not approved for application with such.

None of the products manufactured by SKF Lubrication Systems Germany GmbH are approved for application in connection with gases, liquefied gases, gases dissolved under pressure, steams or fluids that will reach a steam pressure of more than 0.5 bar above the normal atmospheric pressure (1013 mbar) in the admissible application temperature range.

When used as intended, the products supplied by SKF Lubrication Systems Germany GmbH do not reach the limit values listed in the Article 3 par. 1, sections 1.1 to 1.3 and par. 2 of the Pressure Equipment Directive 97/23/EC. Therefore they do not come under the requirements set forth in annex I of that Directive. They are not labelled with the CE mark with reference to the Directive 97/23/EC. They are classified by us to come under Article 3 par. 3 of the Directive.

The EC Declaration of Conformity and EC-Declaration of Incorporation is part of the product documentation. These documents are delivered with the product.





General information

Meaning of symbols and corresponding information

In this installation instruction, these symbols are used to highlight safety information that communicates a particular risk to persons, material assets, or the environment.

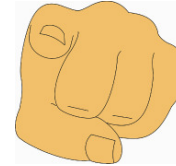
Pay attention to this information and be especially careful in situations where a risk is indicated. Pass on all safety instructions to other people as appropriate.

Hazard symbols

	DIN 4844-2 W000	General risk
	DIN 4844-2 W008	Voltage
	DIN 4844-2 W026	Hot surface
	DIN 4844-2 W028	Slip hazard

Information that is attached directly to the product - such as the examples below - must be observed. Such signs must be kept in a legible state.

- Rotational direction arrow
- Fluid connection label



The responsibility is yours!

Read this installation instruction thoroughly and pay attention to the safety information.

Information symbols



Note



Prompts you to take action



Used for bulleted lists



Indicates other issues, causes or circumstances



Provides additional information

Keywords in safety information and their meanings

Keyword	Use
Danger!	Indicates a danger of injury to persons
Caution!	Indicates a danger of damage to property or the environment
Note!	Indicates additional information

Product name

For use in centralized lubrication systems

Product line: LMP...

Original installation instruction in accordance with
EC-Machinery Directive 2006/42/EC

1. Safety information

Please observe the following safety instructions to ensure trouble-free functioning of the unit and prevent damage.



The operator of the described product must ensure that this installation instruction is read and understood by all persons who are involved with the assembly, operation, maintenance, and repair of the product. This installation instruction must be kept close at hand.



Note that this installation instruction is an integral part of the product. It must be handed over to the new operator of the product if the product is sold.

The described product was manufactured in accordance with all generally acknowledged regulations pertaining to technology, occupational safety, and accident prevention. However, dangers that can cause physical injury to persons or damage to other material assets might still occur during the use of the product. This product should therefore only be used if it is in a technically perfect state and with full observance of the information provided in this installation instruction. In particular, malfunctions that might affect the safety of the product must be rectified immediately.

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 Lubrication Systems Germany GmbH.



In addition to the information provided in the installation instruction, all generally valid regulations on accident prevention and the environment must be observed.

1.1 Intended use



All SKF Lubrication Systems Germany GmbH products may only be used for their intended purpose and in accordance with the specifications of the installation instruction for the product in question.

Spandau High-pressure screw pumps, are self-priming, rotating displacement pumps used to pump mineral oil based oils and emulsions and emulsions of synthetic cooling and lubrication agents without abrasive or long-fibered constituents.



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



Unauthorized modifications to the pumps and the use of unauthorized spare parts and aids are prohibited and void the warranty.

Worn-out systems must be made inoperable and disposed of properly.

Products of SKF Lubrication Systems Germany AG must not be used in conjunction with fluids, group I (hazardous fluids), according to the definition of article 2 paragraph 2 of the Directive 67/548/EC

dtd. 27th June, 1967; and are not approved for application with such.

None of the products manufactured by SKF Lubrication Systems Germany AG are approved for application in connection with gases, liquefied gases, gases dissolved under pressure, steams or fluids that will reach a steam pressure of more than 0.5 bar above the normal atmospheric pressure (1013 mbar) in the admissible application temperature range.

If it is not shown separately products of SKF Lubrication Systems Germany GmbH must not be used in areas exposed to explosion hazards as described in the ATEX Directive 94/9/EC.

1.2 Authorized personnel

The products described in the installation instruction may only be installed, operated, maintained, and repaired by qualified experts. Qualified experts are persons who have been trained, instructed, and familiarized with the end product into which the

described product is installed. These persons are considered capable of such tasks due to their education, training, and experience with valid standards, conditions, accident prevention

regulations, and assembly measures. They are entitled to carry out the required tasks and to recognize - and thus avoid - any dangers that might otherwise occur.

A definition of what constitutes a qualified person and information on the prohibition on allowing work to be carried out by unqualified personnel are stipulated in DIN VDE 0105 and IEC 364.

1.3 Danger relating to electric current

The electrical connection for the described product may only be established by qualified, instructed persons who have been authorized to carry out the task at hand by the operator. All local electrical operating conditions and regulations such as DIN and VDE must be observed. Improperly connected products can result in considerably damage to property and injury to persons.



Working on products that have not been disconnected from the power supply can cause injury to persons. Assembly, maintenance, and repair work may only be carried out by qualified experts on products that have been disconnected from the power supply. The supply voltage must be turned off before any product components are opened.

1.4 Danger relating to hydraulic pressure



The described product is under pressure when it is being operated. The product must therefore be depressurized before starting assembly, maintenance, or repair work and before making any changes to the system.

Depending on the construction, the product may be operated with hydraulic pressure.

2. Fluids delivered

Spandau High-pressure screw pumps, are self-priming, rotating displacement pumps used to pump mineral oil based oils and emulsions (minimum oil content 3%) and emulsions of synthetic cooling and lubrication agents (minimum oil content 5%) without abrasive or long-fibered constituents.

Generally permissible contamination:

- max. solids content: 40mg/l
- max. grain size: 0,05mm (50µm) with metal-cutting operations (turning, drilling, milling)

Values for specific applications are available on request.

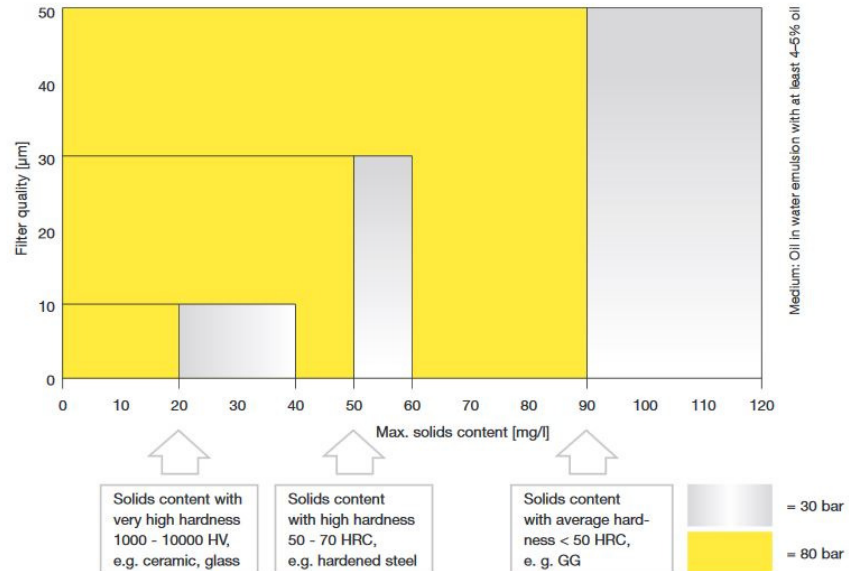
Kinematic viscosity:

1-2500 mm²/s
more than 2500 mm²/s
on request

Delivery temperature: 0°C to +80°C

Other use or use beyond this purpose is considered unintended. Spandau Pumpen will not accept liability for damages resulting from such unintended use

Recommended filter quality with use of LMP-pumps



1-2500 mm

3. Assemblies and type designation

The Spandau high-pressure screw pump, type LMP, is offered in 8 different sizes. The individual sizes mainly differ in dimensions and output, but not in function.

The respective size or designation of your pump as well as further important identification data is given on the nameplate

size	10,11, 20-22, 12-17, 27-29, 37-38	
supply pressure	10 - 120	10 to 120 bar
Material	G	Cast iron
Seal types	K T F	SAE-flange + pressure regulating valve SAE flange + pressure regulating valve + foot flange SAE-flange
pump version	R F	Pipe thread SAE flange
Immersion depth	219 - 435	219 to 435 in mm

Table 1 Type key

Designation	LMP	11	40	G	W	K	219	L	01	CA
Series										
Size										
Maximum supply pressure in bar										
Material										
Seal type										
Pump version										
Dipping depth in mm										
Motor output ¹⁾										
Voltage/frequency ¹⁾										
Motor versions ¹⁾										

¹⁾ The motor data can be extracted from the motor's nameplate.

4. Design and function

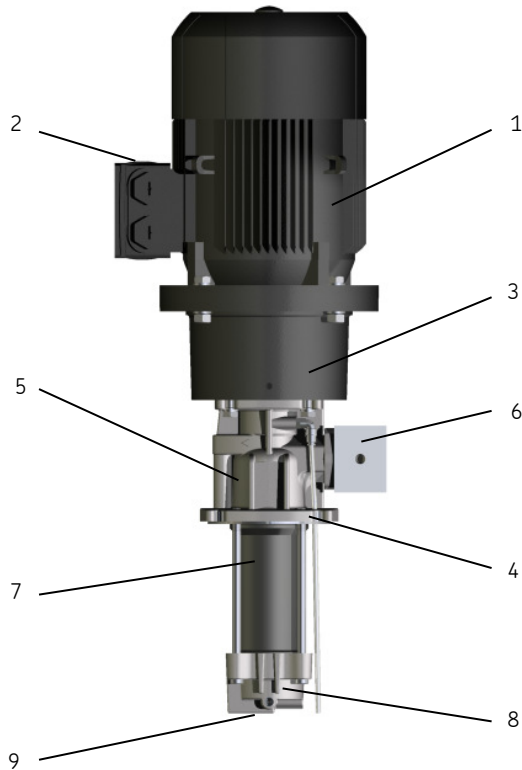


Figure 2.
(schematic, the exact
dimensions are given in the
documents supplied)

- 1 Drive
- 2 Terminal box
- 3 Pump support
- 4 Connecting flange
- 5 Pressure housing
- 6 Pressure connection
- 7 Running housing
- 8 Intake housing
- 9 Intake opening

Figure 2 shows the principle design of the pump. The electrical drive (1) is installed on a pump support (3), which in turn is connected to the pressure housing (5). Drive and pump are connected by a gear coupling installed inside the pump support. The pressure housing contains the bearing for the drive spindle and the seals. The pressure connection (6) is located above the connecting flange (4). Above the pressure connection, a small inspection opening (10) is located. It must not be closed. If the supplied medium should leak from this opening during operation, which may indicate that the seal is defective.

High-pressure pumps, type LMP, are self-priming displacement pumps. The medium is pumped by a spindle assembly inside the running housing (7). Medium present in the intake housing (8) is supplied to the pressure connection by means of the rotating screw spindles.

Optionally, the pump can be equipped with an intake pipe to allow use of deeper medium tanks.

5. Installation instruction

The product described in the installation instruction may only be installed, operated, maintained, and repaired by qualified experts. Qualified experts are persons who have been trained, instructed, and familiarized with the end product into which the described product is installed. These persons are considered capable of such tasks due to their education, training, and experience with valid standards, conditions, accident prevention regulations, and operating measures. They are entitled to carry out the required tasks and to recognize - and thus avoid - any dangers that might otherwise occur.

A definition of what constitutes a qualified person and information on the prohibition on allowing work to be carried out by unqualified personnel are stipulated in DIN VDE 0105 and IEC 364.

Before assembling/positioning the product, remove the packaging material and any transportation safety devices such as sealing plugs. Keep the packaging material until you are sure that there are no delivery discrepancies that need to be clarified.



The product must not be tipped up or dropped.

Regional accident prevention regulations and the operating and maintenance instructions of the operator must be observed when carrying out all assembly work on machines.

5.1 Positioning and mounting

To allow installation of the pump on the container housing, the pump has a 4-hole installation flange with standard dimensions (technical data).

Before installing the pump, remove packing materials and transport safety devices (e.g. blind plugs in the intake and pressure connections).

When selecting the installation site, ensure sufficient space for installation, cabling, inspection and ventilation. The distance between the air intake of the motor and walls, components etc. must be at least $\frac{1}{2}$ of the diameter of the air intake opening.

The air flow direction is from the air intake opening to the pump.

The product should be mounted in a way that protects it from humidity and vibrations. It should also be easily accessible so that all other installation work can be carried out without problems. Make sure that there is a sufficient amount of circulating air to prevent the excessive heating of

the product. For information on the maximum permitted ambient temperature, see the technical data.

The product must be installed vertically in accordance with the specifications of the customer documentation.

Optional can a foot flange installed on the pump support for horizontal installation next to the reservoir (dry installation).

On request can ordered the pumps with intake pipe. It must be screwed seal proof into the conical thread on the intake housing before the pump is installed. Select the sealing material in harmony with the operating conditions and temperatures. When installing the intake pipe, ensure that the sealing material does not enter the interior of the pump or the pipe.



If no customer documentation is available, customer documentation can be requested directly from SKF Lubrication Systems Germany GmbH.

The manometer, oil sight glasses, temperature indicators, and all other optical monitoring devices must be clearly visible.

5.2 Connecting dimensions

Flange and connecting dimensions are dependent by pump version and their size. (more information see technical data).

5.3 Installation of pipes

When installing pipes, observe the following notes to ensure trouble-free function of the pumping circuit:

- All elements of the pumping circuit, such as pipes, shut-off armatures, valves etc., which come in contact with the medium must be cleaned carefully. Inside the lines, seals must not protrude toward the interior, to prevent contaminants from reaching the interior of the pump and causing damage or destroying the pump.
- Use only pipes or hoses which are suitable for the operating pressure of the respective pump, the prevailing temperatures and the media to be pumped.
- The lines must be connected so that no force is transmitted to the pump (unconstrained connection).
- The flow of the medium in the lines should not be obstructed by sharp bends, edge valves and return flaps. Unavoidable reductions of the line's cross-section must be softened by sloping transitions.
- Sudden changes of the flow direction must be avoided in any case.
- The lines must be seal tight and installed in such a way that air may not be shut in at any point.
- The pipes should always be laid out rising. It should be possible to vent pressure lines at the highest spot.
- The cross-section of the pressure line should at least reach the cross-section of the pressure connection.
- When the pumping height is high, or the lines are long, and when the pump operates in suction operation, the installation of backflow prevention is recommended. It prevents that the pump runs dry upon shut-off.



The pump must not run dry.

5.4 Connecting of pipes

The pipes are connected to the pressure housing of the pump at the connection provided. Ensure that no force is transmitted to the pump.

Before connecting the lines, remove the blind plugs at the connection of the pump.

Then clean the connection and the pipe end to be connected. When making the connection, ensure that the sealing material does not reach into the interior of the pipe.



Since the pump operates according to the displacement principle, it must be protected from bursting by means of a pressure relief valve.

The valve should be installed immediately downstream of the pressure output.



It is not allowed to operate the pump when the pressure output is blocked. Such operation would damage the pump.

5.5 Electrical connection



The pump may be connected only by properly qualified and instructed personnel. Comply with the notes in this operating manual.

Connect the pump motor according to the information on its nameplate considering the supply voltage available on site.

For installation, observe the applicable standards, such as VDE 0100, VDE 0101, and VDE 0165, as well as the requirements of the local energy supplier.

Cables and lines must be fastened to the terminal box with a cable fitting including strain relief.

Connect the motor according to the electric diagram in the terminal box of the motor.

If the pump has been stored for a longer period in a humid room, the isolation resistance between motor winding and pump housing should be measured.

At a winding temperature of about 20 °C the minimum resistance for low voltage motors is 1 kΩ per Volt rated voltage. If the resistance is lower, the motor must be dried in a warm room or with heating devices, until the required isolation resistance is reached.

5.6 Sense of rotation

The sense of rotation of the motor must agree with the arrow on the pump. To check the sense of rotation, open the valves in the pressure and intake lines and switch the motor on for a short time (approx. 1 s).



Wrong sense of rotation will damage the pump.

Product name

High-pressure screw pump

Product line: LMP...

Operating manual

6. Transport, delivery and storage

SKF Lubrication Systems Germany GmbH products are packaged as is usual in the trade in accordance with the regulations of the recipient country and in accordance with DIN ISO 9001. Our products must be transported with care. Products must be protected against mechanical influences such as impacts. Transport packaging must be labelled with the information 'Do not drop!'.



The product must not be tipped up or dropped.

There are no restrictions relating to land, air, or sea transportation.

Following receipt of the shipment, the product or products must be checked for damage and the shipping documents should be used to make sure that the delivery is complete. Keep the packaging material until you are sure that there are no delivery discrepancies that need to be clarified.

The following conditions apply to the storage of SKF Lubrication Systems Germany GmbH products:

6.1 Pump units

- The pump must be transported only by means of the transport eyes.
- For storage ensure dry, dust-free and low-vibration ($v_{eff} \leq 0.2$ mm/s) environment. If stored for longer periods, the usability period of the grease in the bearings is reduced.
- If the unit is stored for more than 12 months, the condition of the grease must be checked before the unit is taken into operation. Also, the isolation resistance between motor winding and housing must be measured. If the resistance is ≤ 1 k Ω per Volt rated voltage, the motor winding must be dried.

6.2 Electronic and electrical devices

- Ambient conditions: Dry, dust-free environment; storage in well-ventilated, dry area
- Storage time: 24 months max.
- Permitted air humidity: < 65%
- Warehouse temperature: 10 - 40°C
- Light: Direct sunlight/UV radiation must be avoided; nearby sources of heat must be screened

6.3 General information

- Ensure that no dust gets into stored products by wrapping them in plastic film
- Store products on racks or pallets to protect them from rising damp
- Before placing products into storage, protect uncoated metal surfaces - and drive parts and mount surfaces in particular - from corrosion using long-term corrosion protection
- At 6-monthly intervals: Check products for corrosion. If signs of corrosion are found, improve the corrosion protection measures.
- Drives must be protected against mechanical damage

7. Operation and start-up

7.1 Filling the pump

Before taking it into service, all connections at the pump must be checked. Be sure, the intake and pressure connections of the pump are unstopped.



It is not allowed to operate the pump when the pressure output is blocked. Such operation would damage the pump.

The medium container must be filled with the medium to be pumped and the intake housing or intake pipe of the pump must dip deep enough into the fluid.

If the pump is installed dry, it must be filled with the medium. The same applies to operating modes that differ from permanent operation.

Fill reservoir and prime pump; to do so, must filled the pumps discharge port with min. $\frac{1}{2}$ litres of fluid. (Figure 3)



The pump must not run dry.

Check the sense of rotation of the pump upon start-up. It must agree with the direction indicated by the arrow on the pressure housing.



The pump must be operated only within the defined output range.

The respective identification data is given on the nameplate of the pump.


If the pump is to be operated intermittently at short intervals, please contact the supplier for consultation.



Figure 3 Example for fill the high-pressure screw pump

7.2 Setting the pressure relief valve


Screw pumps of sizes 10 to 17 are equipped with a pressure relief valve that protects the system against destruction (rupture) and protects the motor against overload. Each valve must be set specifically to the permissible pressure before the system is commissioned.

 The pump may only be operated with a correctly set valve.

To set the valve to the permissible pressure limit, use a 6 mm hexagon socket screw key for the setting screw. Secure the nuts (locknut B and cap nut) with an open-jawed wrench size of 22 mm. Perform the following steps at full operation:

1. Remove the cap nut with the open-jawed wrench and loosen the locknut of the setting screw.
2. Switch on the pump and throttle up to the maximum permissible operating pressure. If this is not possible using the downstream pressure relief valve, screw in the setting screw clockwise until no further outflow (bypass) is visible.

3. Throttle the pump to a further approx. 3-4 bar above max. pressure so that no interference occurs at the maximum permissible operating pressure.

 The valve may only activate **above** the maximum permissible working point.

4. Now reduce spring pressure by slowly rotating the setting screw (A) counterclockwise until outflow via the valve (bypass) is detected.



Pressure in the line must be monitored using a pressure gauge on the valve or just behind the pump during the entire adjustment procedure.

5. After setting the limit of the valve, secure the setting screw (A) using the locknut (B) and reapply the cap nut.

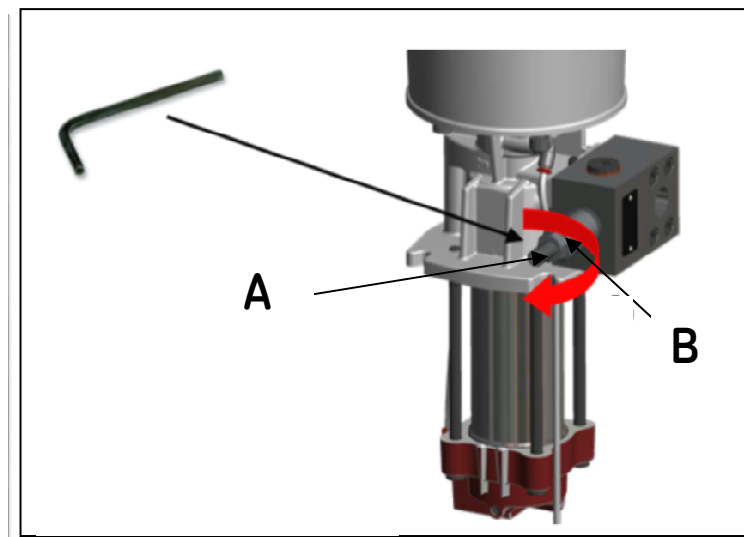


Figure 4 Setting the valve

8. Shutdown

8.1 Temporary shutdown

You temporarily shut down the described product by disconnecting the electrical, pneumatic, and/or hydraulic supply connections. For more information, see the section 'General information' in this installation instruction.

If the pump is taken out of service for some time, the pump should be conserved with oil to prevent the screws from rusting inside the pump housing.

If you wish to shut down the product for a longer period of time, refer also to the instructions in the section 'Transport, delivery, and storage' of this installation instruction.

When placing the product back into operation, pay attention to the information in the sections 'Assembly' and 'start-up of this installation instruction.

8.2 Definitive shutdown

All regional legal guidelines and legislation on the disposal of contaminated equipment must be observed when shutting down the product for the final time.



Lubricants can contaminate the ground and watercourses. Lubricants must be used and disposed of properly. Regional regulations and laws on the use and disposal of lubricants must be observed.

In exchange for the incurred costs, SKF Lubrication Systems Germany GmbH can take back the product and arrange for its disposal.

9. Maintenance

9.1 General notes



Working on products that have not been disconnected from the power supply can cause injury to persons. Assembly, maintenance, and repair work may only be carried out by qualified experts on a product that is not connected to a power supply. The supply voltage must be disconnected before any product components are opened.



The described product is under pressure when it is being operated. The product must therefore be depressurized before starting assembly, maintenance, or repair work and before making any changes to the system.

Spandau high-pressure screw pumps, are largely maintenance-free. To ensure perfect function, you should check the pump regularly for exterior damage or leakage.

The medium pumped as well as intake filters and screens should be checked regularly for contamination and should be cleaned or replaced as needed.

Also, ensure that the housing of the pump motor remains free from dust, foreign objects etc., to ensure good heat exchange between motor and ambient air for unhindered surface heat dissipation.

All electrical connections and lines must be checked regularly for damage and to ensure that they are firmly in place.

Any faults found must be properly rectified before the pump is activated again.



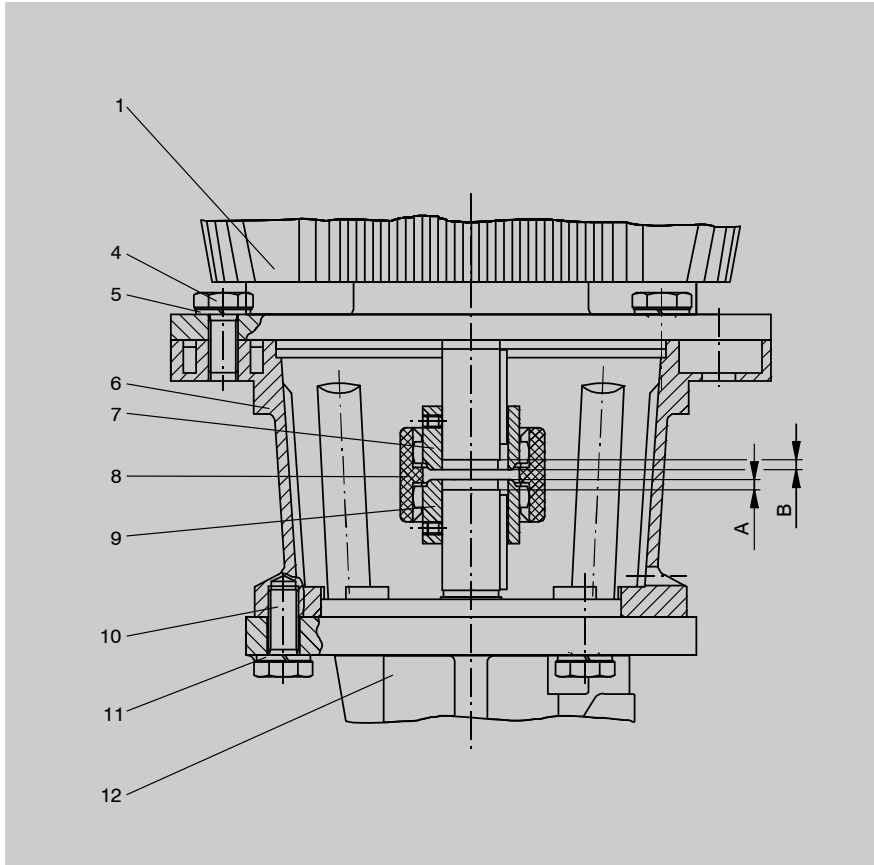
You must not dismantle the product or parts therefore during the statutory guarantee period. Doing so invalidates all guarantee claims.



Only original SKF Lubrication Systems Germany GmbH spare parts may be used. You must not carry out alterations to the product or use non-original spare parts or resources. Doing so invalidates the statutory guarantee.

SKF Lubrication Systems Germany GmbH is not liable for damage caused by improper assembly, maintenance, or repair work.

9.2 Disassembly and assembly hydraulic unit



! During disassembly and assembly handle all parts with greatest care. Avoid impact and shock.

Clean all parts thoroughly and rework or replace them by spare parts.

! Unauthorized modifications to the pumps and the use of unauthorized spare parts and aids are prohibited and void the warranty.

Perform all work on the basis of the sectional drawing (**Figure 4**). The design principle of all Spandau high-pressure screw pumps is identical. The drawing is therefore applicable to all types.

Figure 4. Sectional drawing for disassembly / assembly of pump

- | | |
|----|--|
| 1 | Motor |
| 4 | Motor bolts |
| 5 | Split washers |
| 6 | Pump support |
| 7 | Motor coupling half |
| 8 | Coupling sleeve |
| 9 | Pump coupling half |
| 10 | Bolts for fastening of pump support and pressure housing |
| 11 | Split washers |
| 12 | Pressure housing of pump |

9.3 Disassembly of the hydraulic unit

First turn off the main switch.

To remove the motor (1) including pump support (6), loosen the screws (10) and remove the package (consisting of motor and pump support) from the pressure housing of the pump (12).

The coupling sleeve (8), if it remained on the pump-side half of the coupling, can now be removed.

Next, measure and write down the setting dimension (A). Alternatively, the dimension for the subsequent installation of the new hydraulic unit can be found in Table 2.

The pump-side half of the coupling (9) is loosened by loosening the setting screw and then pulled from the pump shaft.

Then close off the delivery line of the pump and separate it from the pump. The hydraulic unit (the pump) can then be screwed out of the reservoir cover and pulled upwards out of the tank.

Remove the intake tube, if present, from the intake housing.

9.4 Assembly of the hydraulic unit

!!!Important!!! Clean before installation of filtration system (clean medium tank)

First, screw the intake pipe, if provided, into the intake housing. The intake pipe must by all means be seal tight and free from burrs.

Then move the hydraulic unit into the medium container and screw.

Check the seating of the shear key on the pump's drive shaft. Slide on the pump coupling half (9). Observe the setting dimensions (**Table 2**). Then fix the coupling half (9) on the pump's drive shaft using the set screw.

Now slide the pump support (6) over the pump's centring rim and fasten it with the bolts (10) and split washers (11), tightening it evenly. Install the coupling sleeve (8) to the pump coupling half (9).

Now check the seating of the shear key on the motor shaft. Then slide on the motor coupling half (7). Observe the setting dimensions (**Table 2**).

Fix the coupling half (7) on the motor shaft using the set screw.

Fasten motor (1) and pump support (6) with the bolts (4) and split washers (5).

When taking the pump back into operation, please observe the notes in chapter "operation and start-up".

Table 2 Setting dimensions A / B (Figure 4)

Baugröße	Motor size							
	80	90	100 / 112	132	160	180	200	225
10-13, 20-22	13/13	8/8	9/8	10/11	11/24	-	-	-
14 bis 15	-	-	10/12	5/6	12/12	12/12	15/6	-
16 bis 17	-	-	-	5/6	12/12	12/12	15/6	15/2
27-29, 37-38	on demand							

10. Faults



You must not dismantle the product or parts thereof during the statutory guarantee period. Doing so invalidates all guarantee claims.



All other work relating to assembly, maintenance, and repair must only be carried out by SKF Lubrication Systems Germany GmbH Services.



Only original SKF Lubrication Systems Germany GmbH spare parts may be used. It is prohibited for the operator to make alterations to the product or to use non-original spare parts and resources.

Table 3 gives an overview of possible malfunctions and their causes. If you are unable to rectify the malfunction, please contact SKF Lubrication Systems Germany GmbH Services.

Table 3 Error analysis and remedy

Problem	Possible cause	Remedy
Pump does not start	Power supply defective	Check the power supply.
	Fuse tripped	Check the fuse or the motor overload switch.
	Motor overload switch tripped	Ensure that: <ul style="list-style-type: none"> the values on the nameplate agree with the local power supply, the resistance between winding and housing is at least 1 kΩ per Volt rated voltage. If that is the case, switch the motor overload switch back on.
	PTC limit temperature exceeded	Ensure that: <ul style="list-style-type: none"> the surface heat dissipation is not hindered, the ambient temperature is below the maximum value admissible, the pump is not overloaded ¹⁾ If that is the case, switch the motor overload switch back on.
	Switching contacts or coil of motor defective	Replace defective parts.
Motor overload switch cuts out immediately upon power-up	Fuse tripped, because one phase is missing	Check the connection at the terminal box. Check the fuse and replace it, if necessary.
	Motor overload switch defective	Replace motor overload switch.

¹⁾The motor data can be extracted from the motor's nameplate.

Table - 3 (contin.) Error analysis and remedy

Problem	Possible cause	Remedy
Motor overload switch cuts out immediately upon power-up	Motor overload switch set too low	Set the motor overload switch to the value indicated on the nameplate and ensure that the pump is not overloaded. ¹⁾
	Motor shaft blocked	Loosen the blocking. Ensure that the pump's drive shaft can be turned smoothly and evenly.
	Pump overloaded ¹⁾	Check the pump and voltage parameters.
Motor overload switch sometimes cuts out	Motor overload switch set too low	Set the motor overload switch to the value indicated on the nameplate and ensure that the pump is not overloaded. ¹⁾
	Power supply not continuous	Check the connection at the terminal box. Check the fuse and replace it, if necessary.
	Line voltage sometimes too low	Ensure that the values indicated on the nameplate agree with the available line supply. Select a supply source with continuous voltage.
Pump output not stable	Intake line too narrow	Install intake line with larger diameter.
	Intake line partly clogged	Check the intake line and clean it, if necessary.
	Pump draws in air	Check the filling level and correct it, if necessary. Check intake lines and seal them, if required.
	Wrong installation	See chapter "Assembly".
Pump runs, but does not supply medium	Intake line clogged	Check the intake line and clean it, if necessary. The medium may be contaminated. Replace it.
	Intake line not tight	Check the intake line and repair leaks, if necessary.
	Pump cannot draw in medium	Check the filling level and correct it, if necessary.

¹⁾ The motor data can be extracted from the motor's nameplate.

Table - 3 (contin.)

Error analysis and remedy

Problem	Possible cause	Remedy
Pump runs, but does not supply medium	Air bubble in intake line or pump	Vent intake line or pump.
	Wrong sense of rotation	Correct sense of rotation according to the electric diagram.
Noise, vibration or leaks	Pump draws in air	Check the filling level and correct it, if necessary. Check intake lines and seal them, if required.
	Intake height too low	Increase medium level to intake height.
	Shaft bearing defective	Replace shaft bearing.
	Shaft seal defective	Replace shaft seal.
	Pump not installed firmly	Fasten connecting flange.
Pump shaft moves hard	Pump blocked	Check the intake opening and clean it, if necessary.
	Shaft bearing defective	Replace shaft bearing.



Working on products that have not been disconnected from the power supply can cause injury to persons. Assembly, maintenance, and repair work may only be carried out by qualified experts on a product that is not connected to a power supply. The supply voltage must be turned off before any product components are opened.



Hot surfaces of an electrical motor can cause burn of skin. The surfaces of a motor should only be touched with protection gloves or when motor is cold after a period of standstill.



Centralized lubrication systems are under pressure when they are being operated. Centralized lubrication systems must therefore be depressurized before starting assembly, maintenance, or repair work and before making any changes to the system

11. Technical data

11.1 Performance range

Delivery pressures up to $p_{max}=100$ bar (120 bar in oil)

Delivery rate up to $Q_{max}=652$ l/min

11.2 Design features

Shaft seal type

- standard version for "wet" installation: with rotary shaft seal (max. inflow pressure 1,5bar)
- standard version for "dry" installation: with mechanical seal (max. inflow pressure 10bar)

Characteristics

- Spindles with high-strength surface >1000 HV
- Axial thrust compensation
- Screw housing with specially hardened EN-GJL-250
- Pressure port located above reservoir cover
- External leakage feed-back system

11.3 Mechanical design

Component	Material
Spindles (screw and drive spindles)	High performance steel specially hardened
Screw housing	Cast iron with lamellar graphite EN-GJL-250 surface-treated
Pressure housing	Cast iron with lamellar graphite EN-GJL-250
Intake housing	Cast iron with lamellar graphite EN-GJL-250
Rotary shaft seal	PTFE
Mechanical seal	Hard metal / FKM (FPM)
O-ring seal	FKM (FPM)
Rolling bearing	with permanent lubrication
Pump support	Aluminum
Intake tube	Steel
Suction and pressure port	
Size 10-22	Standard pipe thread acc. to DIN 3852
Size 27-38	SAE flange

11.4 Electrical design

The drive motors meet VDE regulations and European motor standards (DIN EN 60034-1), as well as the requirements for the CE mark.

Designs are possible that conform to non-European regulations, e.g. **CSA**, **UL** or special requirements, e.g. for the USA or Japan.

Protection class (DIN EN 60034-5)	IP55
Direction of rotation*	Clockwise as viewed looking down on the motor's ventilation side
Insulation class	F
Ambient temperature (DIN EN 60034-1)	Max. 40°C At max. 1000 m above sea level
Electrical parameters** (Standard)	≤ 4 kW 230/400V, 50Hz and 265/460V, 60Hz > 4 kW Δ 400V, 50Hz and Δ 460V, 60Hz

* Incorrect direction of rotation (counterclockwise) results in destruction of the pump

** Other electrical parameters on request.

11.5 Dimensions

Abbreviation	Dimensions
k	120 to 515 mm
l	499 to 1557 mm
Øm	163 to 616 mm
Øq	200 to 660 mm
s	247 to 480 mm
t	219 to 435 mm
u	64 to 238 mm

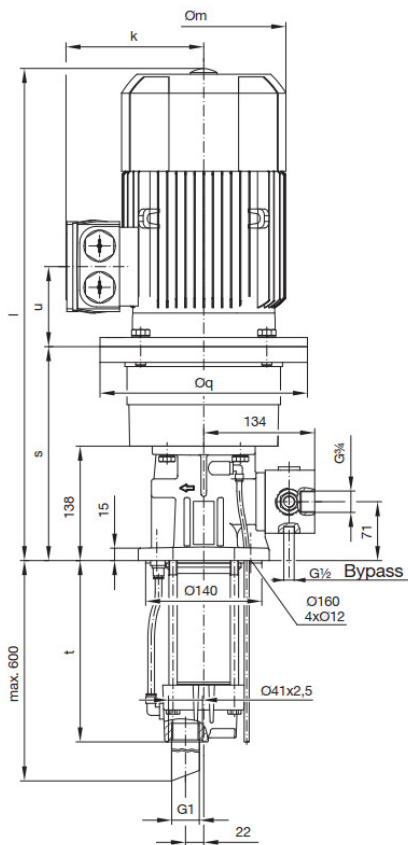


Bild 6: Baugrößen 10-11, 20-22, 12-13

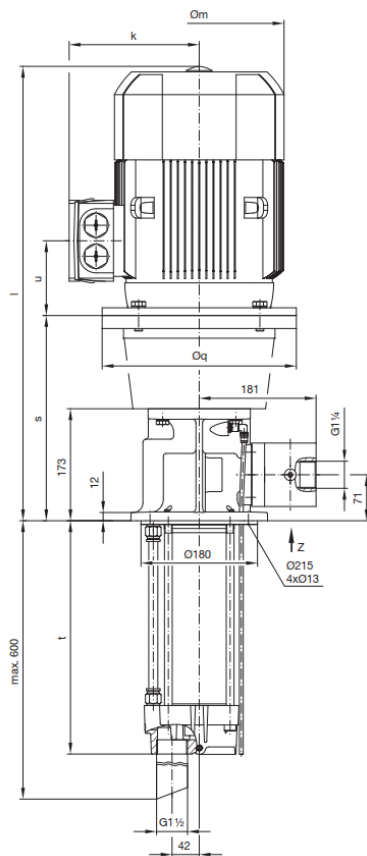


Bild 7: Baugrößen 14-17

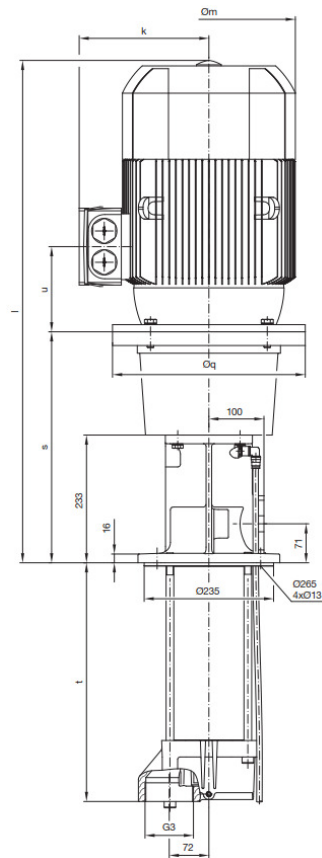


Bild 8: Baugrößen 27-29, 37-38

Order number: 951-170-018

We reserve the right to make changes!

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All SKF Lubrication Systems Germany GmbH products may only be used as intended and as described in the installation instruction. If the installation instruction are delivered with your product, read them carefully and follow them. Not all lubricants can be conveyed with centralized lubrication systems. If required, SKF Lubrication Systems Germany GmbH can check the lubricant selected by the user to make sure that it is suitable for conveyance in centralized lubrication systems. All lubrication systems and components that are manufactured by SKF Lubrication Systems Germany GmbH are not approved for use in conjunction with gases, liquefied gases, gases dissolved under pressure, vapours, and fluids with a vapour pressure of more than 0.5 bar above normal atmospheric pressure (1013 mbar) at the maximum permitted temperature.

Note that hazardous substances of any kind and - in particular - the substances that are classed as hazardous in accordance with EC Directive 67/548/EEC Article 2, Paragraph 2 may only be inserted into and conveyed/distributed by centralized lubrication systems and components following consultation with SKF Lubrication Systems Germany GmbH and with the express written permission of the company.

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