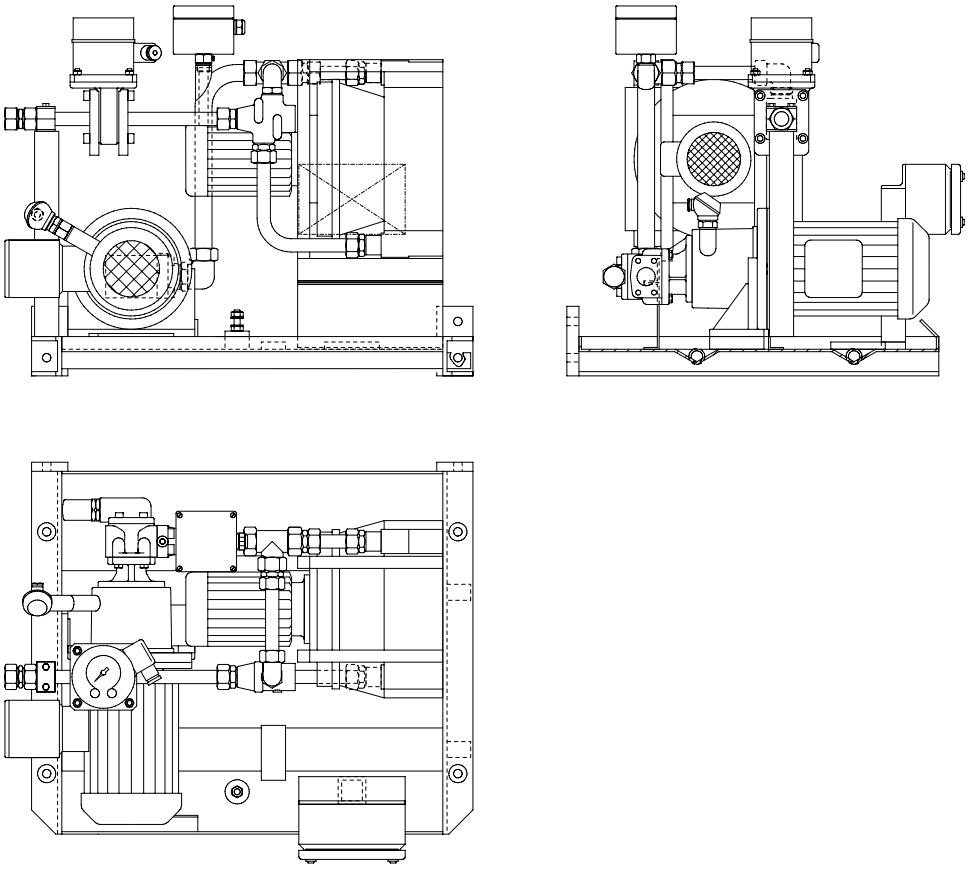
Operating instructions

BA 9751 EN 03.09

Oil supply systems of type **OLGE**

in design in accordance with Directive 94/9/EC



FLENDER

A. Friedr. Flender AG • D-46393 Bocholt • Tel. 02871/92-0 • Telefax 02871/92-2596 • www.flender.com

Translation of the original operating instructions

Notes and symbols used in these operating instructions

WARNING! Imminent **explosion!**

The information indicated by this symbol must always be observed to avoid **explosion damage**.

WARNING! Imminent **personal injury!**

The information indicated by this symbol is given to prevent **personal injury.**

WARNING! Imminent **damage to the product!**

The information indicated by this symbol is given to prevent **damage to the product**.

WARNING! Hot surfaces!

The information indicated by this symbol is given to prevent **risk of burns due to hot surfaces** and must always be observed.

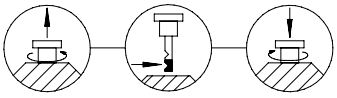
NOTE!

The information indicated by this symbol must be treated as general **operating information**.

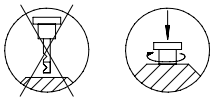
Earth connection point:		Air relief point:	 yellow
Oil filling point:	 yellow	Oil drain point:	 white
Oil level:	 red	Oil level:	 red
Lubrication point:	 red	Apply grease:	
Lifting eye:		Eye bolt:	
Do not unscrew:		Connection for vibration monitoring device:	

Alignment surfaces:

Horizontal:		Vertical:	



These symbols indicate the oil-level checking procedure using the oil dipstick.



These symbols indicate that the oil dipstick must always be firmly screwed in.

Note: The term "Operating instructions" will in the following also be shortened to "instructions" or "manual".

Contents

1. Technical data

1.1 General technical data

The most important technical data on the oil-supply system are shown on the rating plate. These data and the contractual agreements between FLENDER and the customer for the oil-supply system determine the limits of its correct use.

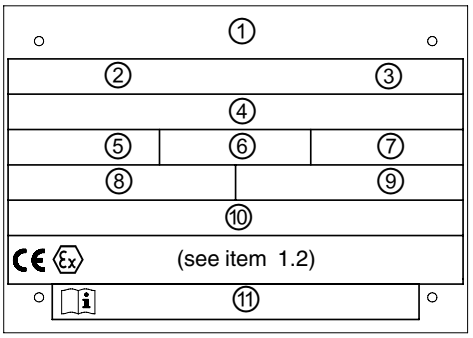


Fig. 1: Rating plate

① Company logo and place of manufacture

② Material number

③ Total weight

④ Production order no. / Year of construction of the oil-supply system

⑤ Type

⑥ Size

⑦ Variant

⑧ $p_{Oil\ max}$ = max. permissible oil operating overpressure

⑨ $t_{min.}$ = minimum starting temperature

⑩ $t_{u\ max.}$ ... °C / ... °F: max. permiss. ambient temperature

⑪ Number of the instruction manual

☞ These instructions generally include a list of equipment and drawings of the oil-supply system as well as the operating instructions relating to the accessory components.

For further technical data, refer to the list of equipment and the drawings.

1.2 Marking of the oil-supply system in design in accordance with Directive 94/9/EC

Table 1: ATEX identification

Equip-ment group	Equipment category	"Ex" atmosphere	Explosion group [1]	Temperature class [2]	Marking [4]
II	3	Gas (G)	IIA, IIB, IIC	T3, T4	CE Ex II 3 G IIA T4 bc T_a.. [3]
		Gas (G) and Dust (D)	IIA, IIB, IIC	T3, T4	CE Ex II 3 G IIA T4 D 120 °C bc T_a.. [3]
		Dust (D)			CE Ex II 3 D 120 °C bc T_a.. [3]

1) The explosion groups relate to the gaseous atmosphere (G).
Always only one explosion group can be indicated.

2) Always only one temperature class can be indicated.

3) $T_{a\,min.} \leq T_a \leq T_{a\,max.}$ = permissible ambient temperature range in °C:
$T_{a\,min.}$ = minimum permissible ambient temperature range
$T_{a\,max.}$ = maximum permissible ambient temperature range
T_a = symbol for ambient temperature in °C

4) The indications relating to explosion group and temperature class are to be understood as an example.

With oil-supply systems not equipped with electrical explosion-hazard monitoring device (such as temperature, oil level) no ignition protection "b" is available.

The rating plate on the oil-supply system indicates the marking for the applicable case of application.

1.3 Oil viscosity, oil type

For the oil viscosity and oil type, refer to the gear-unit instructions manual and rating plate.

The oil-supply systems are designed for oil viscosities < 5000 cSt at very low starting temperature (see rating plate ⑨).

1.4 Ambient temperature

The specifications of Directive 94/9/EC apply to the ambient temperature range of from - 20 °C to + 40 °C. By adopting various suitable measures the oil-supply system may be used at ambient temperatures of up to + 60 °C. However, this must always be approved by FLENDER.
In individual cases the permissible ambient temperature range specified on the rating plate always applies.

2. General notes

2.1 Introduction

These instructions are an integral part of the delivery of the oil-supply system and must be kept in its vicinity for reference at all times.

The instructions manual of the gear unit must be observed!

All persons carrying out work on the oil-supply unit must have read and understood these instructions and must adhere to them. FLENDER accepts no responsibility for damage or disruption caused by disregard of these instructions.

The **"FLENDER oil-supply system"** dealt with in these instructions (BA) has been developed for use as an oil-supply system of gear units. Possible applications for oil-supply systems of this series are the chemical, rubber, food processing, plastics and other industries.

The oil-supply system is designed only for the application described in section 1, "Technical data", and the List of Equipment.

The oil-supply system described in these instructions reflects the state of technical development at the time these instructions went to print.

In the interest of technical progress we reserve the right to make changes to the individual assemblies and accessories which we regard as necessary to preserve their essential characteristics and improve their efficiency and safety.

2.2 Copyright

Technical enquiries should be addressed to the following works or to one of our customer services:

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3. Safety instructions

The instructions manual of the gear unit must be observed!

3.1 Proper use

- The oil-supply system has been manufactured in accordance with the state of the art and is delivered in a condition for safe and reliable use. It complies with the requirements in Directive 94/9/EC.
- The oil-supply system must be used and operated strictly in accordance with the conditions laid down in the contract governing performance and supply agreed by FLENDER and the customer.

Any changes on the part of the user are not permitted. This applies equally to safety features designed to prevent accidental contact.

3.2 Obligations of the user

- The operator must ensure that everyone carrying out work on the oil-supply system has read and understood these instructions and is adhering to them in every point in order to:
  - avoid injury or damage,
  - ensure the safety and reliability of the oil-supply system,
  - avoid disruptions and environmental damage through incorrect use.
- During transport, assembly, installation, dismantling, operation and maintenance of the unit, the relevant safety and environmental regulations must be complied with at all times.
- The oil-supply system must be operated, maintained and/or repaired only by authorised, duly trained and qualified personnel.
- The gear unit must not be cleaned using high-pressure cleaning equipment.
- All work must be carried out with great care and with due regard to safety.
- Unauthorized access to the oil-supply system is not permissible.

All work on the oil-supply system must be carried out only when it is at a standstill.
The drive unit must be secured against being switched on accidentally (e.g. by locking the key switch or removing the fuses from the power supply). A notice should be attached to the start switch stating clearly that work is in progress.

- If any changes are noticed during operation of the oil-supply system (e.g. increased operating temperature or unusual noises), the drive assembly must be switched off immediately.

The control instructions in section 8 must always be observed.

All add-on parts must satisfy the requirements in Directive 94/9/EC.

Simple electrical means (such as monitoring devices, switches, Pt 100 resistance) without identification in accordance with Directive 94/9/EC are to be connected intrinsically safely by suitable isolation amplifiers.

The oil-supply system must be protected against falling objects.

If the oil-supply system is intended for mounting on plant or equipment, the manufacturer of such plant or equipment must ensure that the contents of the present instructions are incorporated in his own instructions.

- When removing the safety equipment the fixation means should be stored for later use. Removed safety equipment must be re-installed prior to starting up.
- Notices attached to the oil-supply system, e.g. rating plate, direction arrows etc. must always be observed. They must be kept free from dirt and paint at all times. Missing plates must be replaced.
- Screws which have been damaged during assembly or disassembly work must be replaced with new ones of the same strength class and type.
- All spare parts must be obtained from FLENDER.

3.3 Environmental protection

- Dispose of any packaging material in accordance with regulations or separate it for recycling.
- When changing oil, the used oil must be collected in suitable containers. Any pools of oil which may have collected should be removed at once with an oil binding agent.
- Preservative agent should be stored separately from used oil.
- Used oil, preservative agents, oil-binding agents and oil-soaked cloths must be disposed of in accordance with environmental legislation.
- Disposal of the oil-supply system after its useful life:
  - Drain all the operating oil, preservative agent and/or cooling agent from the oil-supply system and dispose of in accordance with regulations.
  - Depending on national regulations, oil-supply system components and/or add-on parts may have to be disposed of in different manners or be separated for recycling.

3.4 Special dangers and personal protective equipment

The oil-supply system complies with the requirements in Directive 94/9/EC.

When carrying out assembly and disassembly work, ensure that no explosive gas mixtures and dust concentrations are present.

- Depending on operating conditions, the surface of the gear unit and oil-supply system may heat up considerably.

In the case of hot surfaces (> 55 °C) there is a risk of burns!

In the case of cold surfaces (< 0 °C) there is a risk of frost injury (pain, numbness, frostbite)!

During oil changes there is a risk of scalding from escaping oil!

Small foreign matter such as sand, dust, etc. can get into the cover plates of the rotating parts and be thrown back by these.
Risk of eye injury!

In addition to any generally prescribed personal safety equipment (such as safety shoes, safety clothing, helmet) handling the oil-supply system requires wearing **suitable safety gloves** and **suitable safety glasses**!

4. Handling and storage

Observe the instructions in section 3, "Safety instructions"!

The instructions manual of the gear unit must be observed!

4.1 Scope of supply

The products supplied are listed in the despatch papers. Check immediately on receipt to ensure that all the products listed have actually been delivered. Parts damaged and/or missing parts must be reported to FLENDER in writing immediately.

If there is any visible damage the oil-supply system must not be put into operation.

4.2 Handling

When handling FLENDER products, use only lifting and handling equipment of sufficient load-bearing capacity!
Observe the notes regarding load distribution on the packaging.

The oil-supply system is delivered in the fully assembled condition. Additional items are delivered separately packaged, if applicable. Depending upon the individual application, the gear unit can also be assembled to the oil-supply system and delivered with it as an assembled unit.

Different forms of packaging may be used depending on the size of the oil-supply system or assembled unit and the method of transport. Unless otherwise agreed, the packaging complies with the **HPE Packaging Guidelines.**

The symbols marked on the packaging must be observed at all times. These have the following meanings:

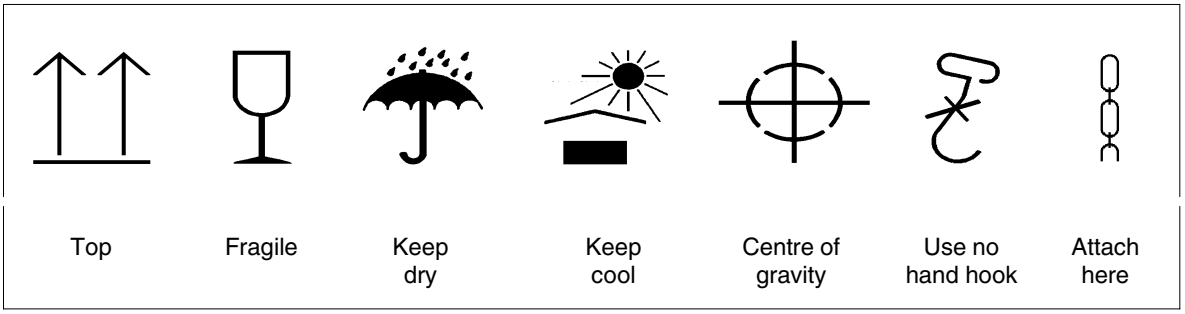

Fig. 2: Transport symbols

The oil-supply system or assembled unit must always be transported with due care to avoid injury to persons and damage to the unit.

The oil-supply system or assembled unit must be transported using suitable transport equipment only.
The oil-supply system is to be transported without an oil charge.

To transport and handle gear units with attached oil-supply systems, use only the lifting eyes specially provided for this purpose on the gear units. The position of the attachment points is shown in the documentation of the gear unit for each specific order.

When handling the separate oil-supply system, exercise special care to avoid damage due to the use of force or careless loading and unloading.
To transport and handle the oil-supply system, use ropes or chains. Only the designated lifting eyes on the base frame must be used for fastening.
Care must be taken that the carrier ropes do not damage fittings and piping. A cross-beam is therefore required for protection. The lengths of the ropes must be set to ensure that the base frame is suspended horizontally.

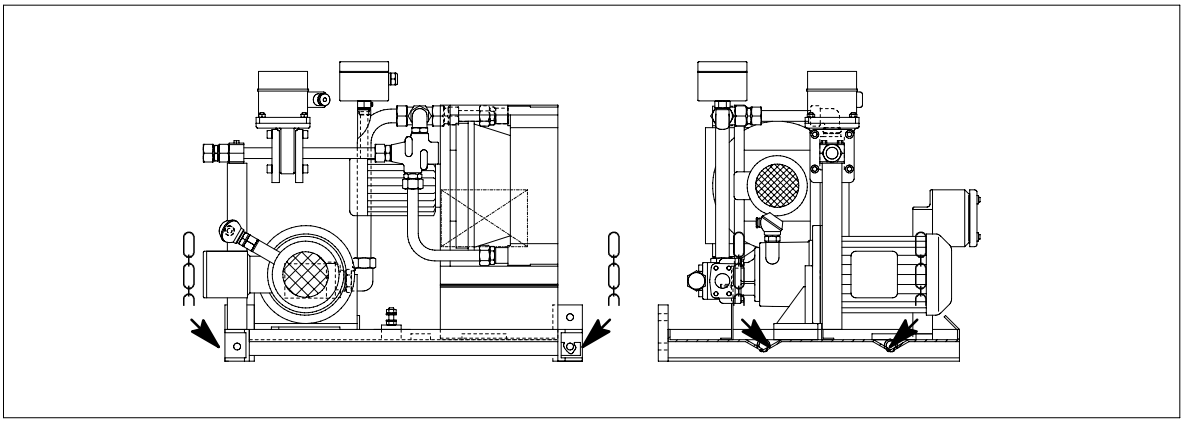

Fig. 3: Attachment points

4.3 Storage of the oil-supply system

The oil-supply system or assembled unit must be stored in the position of use on a vibration-free, dry base in a sheltered place and covered over.

Do not stack oil-supply systems or assembled units one on top of another.

If the oil-supply system or assembled unit is being stored out of doors, it must be very carefully covered over and care must be taken that neither moisture nor foreign material can collect on the unit. Waterlogging should be avoided.

Provision for special environmental conditions during transport (e.g. transport by ship) and storage (climate, termites, etc.) must be contractually agreed.

The openings must be sealed with plugs or flanged covers.

4.4 Standard coating and preservation

The oil-supply system is provided with an internal preservation.

The characteristics of the external coat depend on the ambient conditions stipulated in the order relating to method of transport and area of application.

Oil-supply systems are normally delivered completely finished, with a priming and finish coat.

They comply with the requirements for the conductivity of the coating and the limitation of the layer thickness of the applied coating in accordance with DIN EN 13463-1. The permissible maximum coating thickness depends on the indicated explosion group (IIA or IIB or IIC) in accordance with DIN EN 50014. Where lacquer coatings have a thickness less than 200 µm, no electrostatic charge is to be expected.

Where oil-supply systems are delivered with a priming coat only it is necessary to apply a finish coat in accordance with directives applying to the specific case of application.
The priming coat is not suitable to provide a sufficient long-term corrosion protection.

The coating must not carry an impermissibly high electrostatic charge!
The operator must ensure that highly effective mechanisms which can set up a charge in the coating are safely avoided.

Examples of highly effective mechanisms are:
- the rapid passage of heavily dust-laden air near by
- the sudden escape of particle-laden compressed gases
- other heavy friction action (not manual cleaning/rubbing with cleaning cloths)

Ensure that the coat is not damaged!

Any damage may cause failure of the external protective coating and corrosion.

Unless otherwise contractually agreed, the interior preservation is guaranteed for 6 months, provided that storage is in dry, frostfree sheds.

The guarantee period starts on the date of delivery.

For longer periods of storage (> 6 months) we advise regular checking and, if necessary, renewal of the interior preservation (see section 7, "Start-up").

5. Technical description

Observe the instructions in section 3, "Safety instructions"!

5.1 General

☞ The instructions manual of the gear unit must be observed!

The oil-supply system specified below serves to cool the oil and/or lubricate gear units (see section 1, "Technical Data").

Before starting up the monitoring devices must in all cases be connected.

- The oil supply is ensured by a battery of pumps.
- The pump sucks the oil out of the gear unit oil sump via a suction pipe.
- A filter to filter the circulating oil is installed in the oil circuit (exception: variant 3).
- Heat generated by losses and not removable by convection is removed via an air oil-cooler.
- Filtered and recooled oil is then resupplied to the gear unit via a pressure line.
- The above described components are mounted on a base frame of the oil-supply system.

☞ For control instructions, refer to section 8, "Operation".

Observe for this the drawings and the list of equipment. The components specified in the list of equipment can also be found on the drawings with the part number.

The direction of discharge of the pump used is dependent upon the direction of rotation.

The direction of rotation of the motors must correspond to the direction of the arrow on the pump.

5.2 Marking the oil-supply system for explosion protection

☞ Oil-supply systems which are intended for use in potentially explosive environments must bear the following markings on the rating plate:

CE (see item 1.2)

5.3 Service conditions

The oil-supply system is suited for service conditions in accordance with Directive 94/9/EC.

Equipment group II (use above ground) of categories 2 and 3 for areas where there are explosible gas, vapour, mist, air mixtures as well as for areas where dust can form explosible atmospheres.

The permissible temperature class and/or the maximum surface temperature of the oil-supply system are assigned according to the max. ambient temperature in the direct vicinity of the oil-supply system.

Table 2: Temperature classes and surface temperature

Ambient temperature	Temperature class	max. surface temperature
max. 40 °C	T3 / T4	< 120 °C

☞ Observe also item 1.4.

6. Mounting

Observe the instructions in section 3, "Safety instructions"!

During the installation of the oil-supply system there must not be an explosible environment.
Unauthorized access to the oil-supply system is not permissible.

6.1 General

The instructions manual of the gear unit must be observed!

All preserved flange surfaces must be washed down with a solvent, e.g. petroleum ether.

Environmental protection requirements must be observed.

- If connection pipes are not supplied with the system, seamlessly drawn and bright normalised (NBK) pipes of at least ST 35.4 in accordance with DIN 2391 c (hydraulic tubing, quality grade C) must be used.
- The interfaces must be provided with the appropriate flanges or screw connections.
- For connection pipes we recommend using compensators to insulate against vibration and compensate for stretching.
- Pipe fastenings (plastic clips) must be used to install piping. The distance between clips must be less than 2 m / 78.7".
- Make sure the piping is not twisted.
- After installation the pipes must be flushed out. Welded pipes must be pickled.
- The motors and monitoring equipment must be connected up electrically in accordance with terminal diagrams, lists of equipment and regulations. Check voltage and circuits.
- Before connecting the water oil-cooler remove the plugs from the water connection and flush the water oil-cooler well to remove any dirt.
- Install the cooling-water in- and outflow pipes. For the flow direction of the cooling water and the location of the connections please refer to the dimensioned drawing.

6.2 Check before start-up

- Observe rating plate indication!
- Check that voltage and frequency of the motor correspond to the mains supply values!
- Check that the motor is properly protected!
- Check that the electrical connections are properly tightened and the monitoring equipment is properly connected and set!
- Check that air inlet holes and cooling surfaces are clean!
- Check that protective measures have been taken!
- Execute EARTH acc. to DIN EN 50014!
- Check that the terminal box cover is closed and the line inlets are properly sealed!

Connections must be carried out by a specialist in accordance with the current safety regulations. The relevant installation and operating requirements and the usual national and international requirements must be observed.

6.3 General notes on add-on components

For operation and maintenance of the components specified in the list of equipment, observe the specified operating instructions.
For technical data, refer to the list of equipment.

6.4 Final installation work

After the gear unit has been installed with the oil-supply system, check that all visible screw connections are correctly tightened and, if necessary, retighten.

Mount necessary safety equipment!

The oil-supply systems as well as the adjacent piping must be protected against falling objects.

7. Start-up

Observe the instructions in section 3, "Safety instructions"!

The oil-supply system must not be started up without the required instructions being available.

If there is any visible damage the oil-supply system must not be put into operation!

7.1 Oil viscosity, oil type

For the oil viscosity and oil type, refer to the gear-unit instructions manual and rating plate.

The oil-supply systems are designed for oil viscosities < 5000 cSt at very low starting temperature (see rating plate ⑨).

7.2 Oil filling

The instructions manual of the gear unit must be observed!

7.2.1 Flushing before initial start-up

To remove preservative residues, which could cause the oil to foam, the oil-supply system must be flushed out together with the gear unit before starting up.

Before starting up the gear unit and/or oil-supply system oil must be filled in. After filling the filling holes must be correctly closed and sealed.

For the oil viscosity and oil type, refer to the gear-unit instructions manual and rating plate.

The oil must then be carefully drained out of the oil-supply system, the monitoring equipment and the oil chambers in the gear unit, while it is warm. It may be re-used only as flushing oil. The flushing oil must be cleaned before re-use.

There is a danger of scalding from the hot oil emerging from the housing.
Wear protective gloves.

Remove any oil spillage immediately with an oil-binding agent.

7.2.2 Filling with oil for operation

Oil must be poured in into the oil-supply system via the gear unit (see instruction manual for the "Gear Unit"). Care must be taken that no dirt can get into the oil circuit.

Oil must be poured in until it is level with the mark on the oil-level indicator, while the pump is not operating (see instruction manual for the "Gear Unit"). The pump can then be started.

Start oil-supply system 1 minute before starting the gear unit.
Never operate the gear unit without the oil-supply system.

Before starting up the gear unit for the first time the oil-supply system must be run for at least 15 minutes to fill all the oil chambers (see instruction manual for the "Gear Unit"). Then shut down the oil-supply system and, if necessary, correct the oil level.

All piping - particularly suction pipes (inadmissible air intake) - as well as all screw connections and flanges must be retightened. Leaks must be resealed.

7.3 Pump

The direction of discharge of the pump used is dependent upon the direction of rotation.

The direction of rotation of the motors must correspond to the direction of the arrow on the pump.

As regards the pump, the specific operating instructions of the manufacturer must be observed!

7.4 Air oil-cooler

For the air oil-cooler, the space required for the intake of cooling air must be adhered to by the purchaser/operator in accordance with the drawings in the oil-supply system documentation.

As regards the air oil-cooler, the specific operating instructions of the manufacturer must be observed.

7.5 General notes on add-on components

For operation and maintenance of the components specified in the list of equipment, observe the specified operating instructions.
For technical data, refer to the list of equipment.

7.6 Start-up

Before starting up the oil-supply system check whether the instructions in this manual and the instructions in the gear-unit manual have been adhered to.

In all cases oil must be put in before starting up.
The cooling water circuit must be checked before starting up!
Shut-off valves must be secured against unintentional closing.

All impurities must be removed from the oil-supply system before starting up and after repair and maintenance work. This applies particularly to water (e.g. rainwater and leakage from the water oil-cooler) to prevent an oil-water mixture.

All pumps, filters and coolers must be vented.

Pressure-relief valve/safety valve pressure settings made by FLENDER at its works must not be altered, as they are not used to control the pressure and the flow rate. They serve only as a protection against overload.

7.7 Removal from service

- To remove the oil-supply system from service, it must be shut off.

Secure the oil-supply system to prevent it from being started up unintentionally. Attach a warning notice to the start switch!

7.7.1 Interior preservation with preservative agent

Oil-supply systems with pressure lubrication should be run idle with preservative prior to any long-term storage.

Table 3: Preservation procedure when using mineral oil or PAO-based synthetic oil

Duration of protection	Preservative agent	Special measures
up to **6** months	Castrol Alpha SP 220 S	none
up to **24** months		Close connection pipes
For storage periods longer than 24 months the oil-supply system must be re-preserved. For storage periods longer than 36 months, FLENDER should be consulted before.		

Table 4: Preservation procedure when using PG-based synthetic oil

Duration of protection	Preservative agent	Special measures
up to **6** months	Special anti-corrosion oil TRIBOL 1390 1)	none
up to **36** months		Close connection pipes
For storage periods longer than 36 months, FLENDER should be consulted before..		

1) Resistant to tropical conditions and sea water; max. ambient temperature 50 °C

7.7.2 Interior preservation procedure

- Remove the oil-supply system from service and drain off the oil.
- Fill the oil-supply system (if necessary, via the connected gear unit) with a sufficient quantity of preservative agent as indicated in Table 3 or 4.
- Start the oil-supply system and allow it to idle for a short time.
- Drain off the preservative agent into a suitable receptacle and dispose of the oil in accordance with the regulations.

There is a risk of scalding from the hot preservative agent draining from the gear unit. Wear protective gloves!

8. Operation

Observe the instructions in section 3, "Safety instructions"!

The instructions manual of the gear unit must be observed!

The oil-supply systems as well as the adjacent piping must be protected against falling objects.

8.1 Lubrication diagram

For the relevant lubrication diagram drawing number, refer to the list of equipment.

8.2 Oil viscosity, oil type

For the oil viscosity and oil type, refer to the gear-unit instructions manual and rating plate.

The oil-supply systems are designed for oil viscosities < 5000 cSt at very low starting temperature (see rating plate ⑨).

8.3 Control information

The part numbers (...) given in the following text have been taken from the list of equipment, assembly drawing and the lubrication diagram.

The following control information must be noted for the individual components:

In addition to this control information, the specifications in the enclosed list of equipment must always be observed.

Only the control information of the part numbers shown in the list of equipment applies to the delivered oil-supply system. For the specific switch points and/or values, refer to the list of equipment.

8.3.1 Pump (10)

When the pump is operating, the system pressure is limited by a pressure-relief valve integrated into the pump.

The factory setting of this valve must not be changed!

The monitoring devices ensure that no overheating occurs due to dry running of the pump.

8.3.2 Temperature monitor (17)

The temperature in the oil-supply system is monitored by means of temperature monitor.

8.3.3 Filter (20)

The filter is monitored visually by means of a differential pressure indicator and electrically by means of a differential pressure monitor.

8.3.4 Temperature-control valve (32)

A temperature control valve is located in the by-pass of the air oil-cooler. At an oil temperature of T = 45 °C (size 9 = 49 °C, size 10 = 52 °C) the valve begins to release the flow to the cooler. At T = 60 °C, the entire oil quantity flows over the cooler.

8.3.5 Pressure gauge (45)

The oil pressure is indicated visually by means of a pressure gauge.

8.3.6 Pressure monitor (50, 55)

The pressure in the oil-supply system is monitored by means of a pressure monitor.

8.3.7 Thermometer (60)

The oil temperature is indicated visually by means of a thermometer.

8.3.8 Temperature monitor (70)

The temperature of the system is monitored by means of a temperature monitor.

8.3.9 Temperature monitor (75)

The fan motor of the air oil-cooler is switched via a temperature monitor.

8.3.10 Volumetric flow meter (80)

The oil flow is monitored by means of a volumetric flow meter.

8.3.11 General

For the pressure monitors and the flow monitor a delay time of 10 seconds should be provided.

After switching off the main drive the oil-supply system must continue to run until the drive has come to a complete standstill.

8.4 Interlocking specifications when using as a pressure lubrication system

8.4.1 Fan motor

FAN MOTOR ON, when the following condition is fulfilled:

Oil temperature	> switch point (75.1)

FAN MOTOR OFF, when the following condition is fulfilled:

Oil temperature	< switch point (75.1)

8.4.2 Warning

WARNING, when one of the following conditions is fulfilled:

Pump temperature	> temperature value (10.1)
Oil flow quantity	< switch point (80.1)
Oil pressure	< switch point (55)
Oil temperature	> switch point (70.1)
Filter differential pressure	> switch point (20) after a period of 30 s

8.4.3 Switch off oil-supply system

The oil-supply system is to be switched off when at least one of the following conditions is fulfilled:

Pump temperature	> temperature value (10.2)
Motor temperature	> temperature value (10.3)
Motor temperature	> temperature value (30.1)
Oil flow quantity	< switch point (80.2)
Oil pressure	< switch point (50)
Oil temperature	> switch point (70.2)
Oil temperature	> switch point (17.1)

8.5 Response to malfunctions

⚠ **Irrespective of the following information, the local safety requirements will apply in all cases for operation of the oil-supply system!**

Monitoring during operation is essential to identify any malfunctions occurring (see section 9, "Disturbances, reasons and remedy") and thus to implement preventive measures. The operating pressures and oil temperatures should be recorded regularly.

If irregularities at variance with the normal condition are noticed during operation, or if the operating data change, it is essential that the cause be identified immediately. If necessary, shut the system off. If the causes cannot be identified, even with the aid of the Troubleshooting List, inform FLENDER at once (see section 2, "General notes").

⚠ **We urgently recommend that a lockable in situ emergency switch be provided to ensure that the system is secured to prevent accidental switch-on during maintenance, repairs, or malfunctions. In addition, we would draw attention to the relevant accident prevention regulations on site!**

☞ For restart after malfunction, the information in section 7, "Start-up" should be noted.

8.6 Shut-down

If the gear unit and oil-supply system are shut down for longer periods, the following measures are necessary:

a) Gear unit and oil-supply system should remain filled with oil. Every 4 weeks the gear unit and oil-supply system must be run for 1 hour. The necessary prelubrication and lubrication times should be observed.

b) If the measures listed under a) are not possible, the gear unit and the oil-supply system (see section 7, "Start-up") must be preserved.

   Please also observe the instructions relating to the gear unit.

9. Faults, causes and remedy

Observe the instructions in section 3, "Safety instructions"!

9.1 General information on faults and malfunctions

The instructions manual of the gear unit must be observed!

Faults and malfunctions occurring during the guarantee period and requiring repair work on the gear unit must be carried out only by FLENDER Customer Service.
In the case of faults and malfunctions occurring after the guarantee period and whose cause cannot be precisely identified, we advise our customers to contact our customer service.

FLENDER will not be bound by the terms of the guarantee or warranty or otherwise be responsible in cases of improper use of the oil-supply system, modifications on the oil-supply system carried out without FLENDER's agreement, or use of spare parts not supplied by FLENDER.

When remedying faults and malfunctions, the oil-supply system must always be taken out of service.
Secure the drive unit to prevent it from being started up unintentionally.
Attach a warning notice to the start switch!

9.2 Possible faults

Table 5: Faults, causes and remedies

Faults	Causes	Remedy
il temperature too high.	Cooler motor not running.	Check power supply to cooler motor or temperature monitor and, if necessary, repair or replace.
	Air in cooler.	Vent cooler.
	Cooler fouled up.	Clean or replace cooler. See separate instructions manual.
Oil temperature too low.	Gear unit has not yet heated up.	Wait.

Faults	Causes	Remedy
Oil pressure too low.	Filter clogged.	Switch filter over to clean filter and clean or replace filter element. See separate instructions manual.
	Pressure-relief valve incorrectly set.	Contact FLENDER.
	Pressure-relief valve defective.	Repair or replace the pressure-relief valve. See separate instructions manual.
	Suction line clogged.	Clean suction line.
	Pump is drawing in air.	Check suction line and repair any leaks.
	Oil temperature too high.	See "Oil temperature too high" in this table.
	Oil viscosity too low.	Check oil viscosity and, if necessary, put in correct oil.
	Pump defective, pump drive defective.	Repair or replace the pump. See separate instructions manual.
Oil pressure too high.	Gear unit has not yet heated up.	Wait.
	Pressure-relief valve incorrectly set.	Contact FLENDER.
	Pressure-relief valve defective.	Repair or replace the pressure-relief valve. See separate instructions manual.
	Oil pipes to and on gear unit are clogged.	Find and clean the clogged line.
	Oil viscosity too high.	Check oil viscosity and, if necessary, put in correct oil.
Unusual or increased filter residues.	Pipes contaminated. (Scale, welding residues)	Clean the pipes.
	Abraded material from gear unit.	Gear unit. (bearings, teeth, alignment) and repair defects.
	Oil contaminated.	Change oil.
	Abraded material from defective pump.	Repair or replace the pump. See separate instructions manual.
Oil consumption too high.	Leak in pipes, connections, valves or gear unit.	Tighten screws. Reseal.
	Shaft outlets on gear unit leaky.	Replace sealing rings.
	Cooler leaky.	Seal or renew cooler. See separate instructions manual.
	Filter leaky.	Seal filter.

9.2.1 Possible faults when installing the oil-supply system

- Important information for describing the drive and the environment are not communicated.
- Performance data too high.
- Chemically aggressive environment not taken into consideration.
- The ambient temperature is not permissible.
- Components with transport or other damage are being fitted.
- Loosely supplied parts are interchanged.
- Prescribed tightening torques are not being adhered to.
- The coating used is not suitable for operation within the meaning of the explosion protection requirements or of Directive 94/9/EC.
- Operating conditions are being changed without authorisation.

9.2.2 Possible faults in maintenance

- Maintenance intervals are not being adhered to.
- Leakage in the vicinity of the oil-supply system is not being identified and as a result chemically aggressive media are damaging the oil-supply system.

10. Maintenance and repair

Observe the instructions in section 3, "Safety instructions"!

The instructions manual of the gear unit must be observed!

The oil-supply systems as well as the adjacent piping must be protected against falling objects.

10.1 Oil viscosity, oil type

For the oil viscosity and oil type, refer to the gear-unit instructions manual and rating plate.

The oil-supply systems are designed for oil viscosities < 5000 cSt at very low starting temperature (see rating plate ⑨).

For the oil-change intervals, refer to the instructions for the gear unit.

10.2 General notes on add-on components

For operation and maintenance of the components specified in the list of equipment, observe the specified operating instructions.
For technical data, refer to the list of equipment.

10.3 Preservation

Refer to section 7, "Start-up", and section 8, "Operation".

10.4 Cleaning

To prevent the build-up of dust on the oil-supply system, cleaning must be done in accordance with the operating conditions.

11. Spare parts, customer-service addresses

11.1 Stocking spare parts

By stocking the most important spare and wearing parts on site you can ensure that the oil-supply system is ready for use at any time.

We guarantee only the original spare parts supplied by us. Non-original spare parts have not been tested or approved by us. They may alter technical characteristics of the oil-supply unit, thereby posing an active or passive risk to safety. FLENDER will assume no liability or guarantee for damage caused by spare parts and accessories not supplied by FLENDER. The same applies to any accessories not supplied by FLENDER.

Please note that certain components often have special production and supply specifications and that we supply you with spare parts which comply fully with the current state of technical development as well as current legislation.

To order spare parts, refer to the list of equipment.

When ordering spare parts, always state the following:

Material number of the oil-supply system

Production order

Part number

Quantity

11.2 Spare parts and customer-service addresses

When ordering spare parts or requesting a service specialist, please contact FLENDER first (see section 2).

12. Declaration by the manufacturer, declaration of conformity

Declaration by the manufacturer

in accordance with EC Engineering Directive 98/37/EC, Appendix II B

We hereby declare that the components described in these operating instructions:

Oil supply systems of type **OLGE**

in design in accordance with Directive 94/9/EC

are intended for incorporation in a machine, and that it is prohibited to put them into service before verifying that the machine into which they are incorporated complies with the EC Directive (original edition 98/37/EC including any subsequent amendments thereto).

Voerde, 2009-03-25

Franz Schmeink (Director Engineering IDE)

Declaration of conformity

within the meaning of EC Directive 94/9/EC of 23.03.94 and with the legal requirements laid down for its implementation

The manufacturer, A. Friedr. FLENDER AG, D - 46393 Bocholt, declares that the equipment described in these operating instructions

Oil supply systems of type **OLGE**

in design in accordance with Directive 94/9/EC

is equipment in the meaning of Article 1 and Article 8, Paragraph 1 c) of Directive 94/9/EC and complies with the requirements of Directive 94/9/EC and the following standards:

DIN EN 1127-1 : 10-1997
DIN EN 13463-1 : 04-2002
DIN EN 13463-5 : 03-2004
DIN EN 13463-6 : 07-2005
DIN EN 50014 : 02-2000

Voerde, 2009-03-25

Franz Schmeink (Director Engineering IDE)

Voerde, 2009-03-25

Helmut Hochrath (Director Business Subsegment DA)