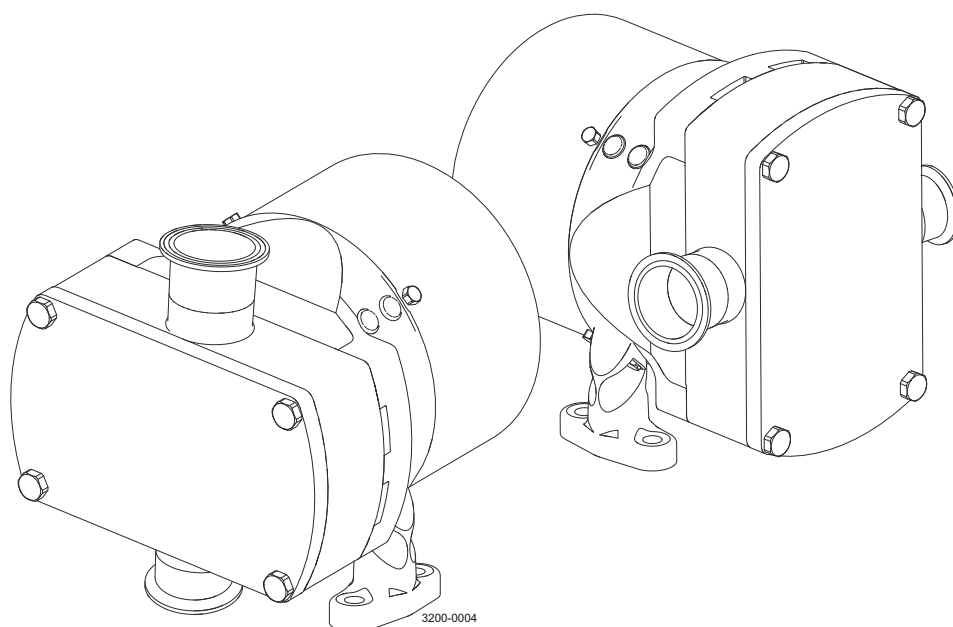


Alfa Laval OptiLobe

Rotary lobe pumps



Lit. Code

200007892-1-EN-GB

Instruction Manual

Published by
Alfa Laval Kolding A/S
Albuen 31
DK-6000 Kolding, Denmark
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The original instructions are in English

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1 Declarations of Conformity

1.1 EU Declaration of Conformity

The designated company

Alfa Laval Kolding A/S, Albuen 31, DK-6000 Kolding, Denmark, +45 79 32 22 00

Company name, address and phone number

Hereby declare that

Pump

Designation

OptiLobe 12/13, OptiLobe 22/23, OptiLobe 32/33, OptiLobe 42/43, OptiLobe 52/53

Type

E10.000-E1.000.000, AAX000000001-AAX999999999.

Serial number

is in conformity with the following directives with amendments:

- Machinery Directive 2006/42/EC
- RoHS Directive 2011/65/EU and amendments

The person authorised to compile the technical file is the signer of this document.

Vice President BU Hygienic Fluid Handling

Head of Product Management

Title

Mikkel Nordkvist

Name

Kolding, Denmark

Place

2025-05-01

Date (YYYY-MM-DD)



Signature

DoC Revison_ 01_052025 / This Declaration of Conformity replaces Declaration of Conformity dated 2022-10-01



1.2 UK Declaration of Conformity

The designated company

Alfa Laval Kolding A/S, Albuen 31, DK-6000 Kolding, Denmark, +45 79 32 22 00

Company name, address and phone number

Hereby declare that

Pump

Designation

OptiLobe 12/13, OptiLobe 22/23, OptiLobe 32/33, OptiLobe 42/43, OptiLobe 52/53

Type

E10.000-E1.000.000, AAX000000001-AAX999999999.

Serial number

is in conformity with the following directives with amendments:

- The Supply of Machinery (Safety) Regulations 2008
- The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

Signed on behalf of: Alfa Laval Kolding A/S.

Vice President BU Hygienic Fluid Handling
Head of Product Management

Title

Mikkel Nordkvist

Name

Kolding, Denmark

Place

2025-05-01

Date (YYYY-MM-DD)



Signature

DoC Revison_ 02_052025



2 Safety

Read this first



This Instruction Manual is designed for operators and service engineers working with the supplied Alfa Laval product.

Operators must read and understand the **Safety, Installation and Operating** instructions of the supplied Alfa Laval product before carrying out any work or before you put the supplied Alfa Laval product into service!

Not following the instructions can result in serious accidents.

This documentation describes the authorized way to use the supplied Alfa Laval product. Alfa Laval will take no responsibility for injury or damage if the equipment is used in any other way.

This Instruction Manual is designed to provide the user with the information to perform tasks safely for all phases in the lifetime of the supplied Alfa Laval product.

The operator shall always read the chapter **Safety** first. Hereafter the operator can skip to the relevant section for the task to be carried out or for the information needed.

Always read the chapter **Technical Data** thoroughly.

This is the complete Instruction Manual for the supplied Alfa Laval product.

NOTE

The illustrations and specifications in this Instruction Manual were effective at the date of printing. However, as continuous improvements are our policy, we reserve the right to alter or modify the Instruction Manual without prior notice or any obligation.

The English version of the Instruction Manual is the original manual. Alfa Laval cannot be held responsible for incorrect translations. In case of doubt, the English version applies.

2.1 Safety Signs

Mandatory Action Signs

	General mandatory action sign.
	Refer to instruction manual.
	Use eye protection - safety glasses.
	Use protective hand wear - safety gloves.
	Wear protective equipment - safety helmet.
	Use ear protection in noisy environments - noise protector.
	Wear protective equipment - safety shoes.

Warning Signs

	General warning.
	Corrosive substance.
	Hot surface and burning danger.
	Cutting danger.
	Heavy object lifting.

	Transportation with forklift truck or other industrial vehicles if heavy.
	Electricity.
	Sharp element.
	Crushing of hands.

2.2 Safety precautions

All warnings in the manual are summarised on this page. Pay special attention to the instructions below so that severe personal injury and/or damage to the Supplied Alfa Laval Product is avoided.

General

	To prevent unexpected start and contact with electrical live and moving parts. Always disconnect the power supply safely: • The power supply disconnecting device must be disconnected (in off position) and locked. • In case the pump is capable of being plugged into an electrical supply, removal of the plug is sufficient, provided that the operator can check from any of the points to which he has access that the plug remains removed. Always refer to the motor Instruction Manual for installation and maintenance of the motor. Never touch the rotors through the inlet/outlet during start/stop as this can cause serious injury.
---	---

Transportation and Lifting

	General: Never lift or elevate in any way other than described in this manual. Always use the original packaging or similar during transportation. Always use suitable transport device ie. forklift or pallet lifter. Always ensure that personnel must have experience with lifting operations. Always ensure that no leakage of lubricants can occur. Always drain the pump head and accessories of any liquid. Always ensure that compressed air is released. Always transport the pump in its upright position. Always use predesigned lifting points if defined. Ensure that the lifting equipment is suitable for the supplied Alfa Laval product. Always ensure that the unit is securely fixed during transportation. Always ensure the lifting point to be in line with center of gravity. Adjust lifting point if necessary. Always use appropriate lifting equipment for heavy parts when relevant. Use lifting logs when available. Always keep an eye on the load and stay clear during the lifting operation.
	
	
	
	

Installation

	If the local safety regulations prescribe that the installation has to be inspected and approved by responsible authorities before the pump is put into service, consult with such authorities before installing the equipment and have the projected installation approved by them.
	Always ensure all pipe lines (product, air, and water) are depressurized and emptied before installation, inspection, assembling and disassembling.
	Always check direction is as required for the system design during installation.
	Never start the pump with the front cover removed.

Operation

	Never touch the pump or the pipelines when pumping hot liquids or when sterilising.
	Never run the pump with both the suction side and the pressure side blocked.
	Never run the pump when partially installed or not completely assembled.
	Necessary precautions must be taken if leakage occurs as this can lead to hazardous situations.
	Always handle lye and acid with great care.
	Never use the pump for products not mentioned in the Alfa Laval pump selection program.
	Always follow the instructions in the safety data sheets from the suppliers of cleaning agents, detergents, oils etc.
	The Alfa Laval pump selection program can be acquired from your local Alfa Laval sales company.

Maintenance

	In order to optimise the operation of the supplied Alfa Laval product and to minimize the down time due repair activities, the maintenance should consist of: • Inspection and maintenance of the supplied Alfa Laval product: strictly follow the technical documentation • Preventive maintenance: visual inspection of the supplied Alfa Laval product followed by necessary adjustments and planned periodic replacement of wear and tear parts • Repairs: unscheduled break-down of a component, often causing the system to stop. Damaged components shall be replaced or repaired • Stock of Alfa Laval genuine spare parts: Alfa Laval recommend keeping a stock of genuine spare parts facilitating preventive maintenance and reducing down time in case of unplanned break-downs Never service the pump when it is hot. Never service the pump if pressurised. Always use Alfa Laval genuine spare parts. Always lubricate according to the motor/geared motor manufacturers recommended procedures, schedule and recommend lubricants. Always ensure any vent plugs, if fitted, are clean and free from blockage.
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Storage

	Alfa Laval recommend: • Store the supplied Alfa Laval product as supplied in original packaging • Port opening(s) should be protected against any ingress • Bare steel (not stainless) should be lightly oiled/greased • Store in a clean, dry place without direct sunlight or UV light • Temperature range -5 °C to 40 °C (23 °F - 104 °F) • Relative humidity less than 60% • No exposure to corrosive substances (including contained air)
---	--

Noise

	Under certain operating conditions pumps and/or drives and/or the systems within which they are installed can produce sound pressure levels in excess of 80dB[A]. When necessary, protection against noise should be taken.
---	--

Hazards

	Burn Hazard Lubrication oil, machine parts and various machine surfaces can be hot and cause burns. Wear protective gloves
	Corrosive Hazard Always handle cleaning liquids, lye and acid with great care and in accordance with separate instructions for those fluids - When using chemical cleaning agents and lubricants, make sure you follow the general rules and suppliers recommendation regarding ventilation, personnel protection etc.

Safety check

	A visual inspection of any protective device (shield, guard, cover or other) on the supplied Alfa Laval product shall be carried out at least every 12 months. If the protective device is lost or damaged, especially when this leads to deterioration of safety performance, it shall be replaced. The fixing of the protective device should only be replaced with fixings of the same or an equivalent type. Inspection acceptance criteria: - It should not be possible to reach moving parts originally protected by a protective device - The protective device must be securely mounted - Ensure that screws for the protective device are securely tightened Procedure in case of non-acceptance: - Fix and/or replace the protective device
---	--

2.3 Warning Signs in Text

Pay attention to the safety instructions in this Instruction Manual.

Below are definitions of the four grades of warning signs used in the text where there is a risk for injury to personnel or damage to the supplied Alfa Laval product.

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate damage to the supplied Alfa Laval product.

NOTE

Indicates important information to simplify or clarify procedures.

2.4 Requirements of Personnel

Operators

The operators shall read and understand this Instruction Manual.

Maintenance personnel

The maintenance personnel shall read and understand this Instruction Manual. The maintenance personnel or technicians shall be skilled within the field required to carry out the maintenance work safely.

Trainees

Trainees can perform tasks under the supervision of an experienced employee.

People in general

The public shall not have access to the supplied Alfa Laval product.

In some cases, specially skilled personnel may need to be hired (i.e. electricians, welders). In some cases the personnel has to be certified according to local regulations with experience of similar types of work.

2.5 Recycling Information

Unpacking

Packing material may consist of wood, plastics, cardboard boxes and in some cases metal straps.



- Wood and cardboard boxes can be reused, recycled or used for energy recovery
- Plastics should be recycled or burnt at a licensed waste incineration plant
- Metal straps should be sent for material recycling

Maintenance

During maintenance, oil (if used) and wear parts in the supplied Alfa Laval product should be replaced.

- Oil and all non-metal wear parts must be disposed of in accordance with local regulations
- Rubber and plastics should be burnt at a licensed waste incineration plant. If not available they should be disposed of in accordance with local regulations
- Bearings and other metal parts should be sent to a licensed handler for material recycling
- Seal rings and friction linings should be disposed of to a licensed land fill site. Check your local regulations
- All metal parts should be sent for material recycling
- Worn out or defected electronic parts should be sent to a licensed handler for material recycling

Scrapping

At end of use, the equipment must be recycled in accordance with the relevant local regulations. Besides the equipment itself, any hazardous residues from the process liquid must be considered and dealt with in a proper manner. When in doubt, or in the absence of local regulations, please contact your local Alfa Laval sales company.

How to contact Alfa Laval

Contact details for all countries are continually updated on our website.

Please visit www.alfalaval.com to access the information directly.

3 Introduction

The Alfa Laval OptiLobe Rotary Lobe Pump is a cost-effective alternative for general applications that require gentle product treatment and easy serviceability. Versatile, dependable and energy efficient, this hygienic positive displacement pump enhances both process flexibility and operational reliability.

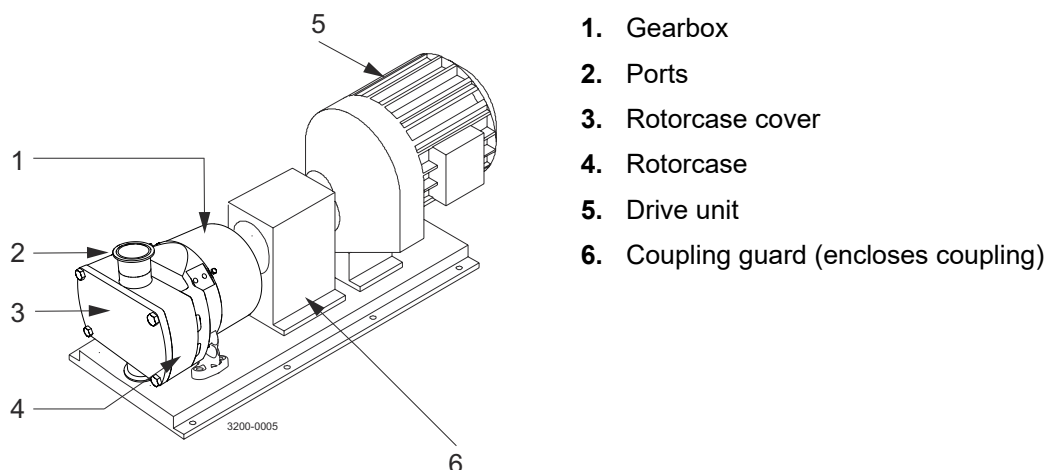
The pump is designed according to the most stringent hygienic design standards and with verified, effective Cleaning-in-Place.

3.1 General Description

The Alfa Laval OptiLobe range of pumps is of conventional rotary lobe pump design with the positive displacement being provided by non-contacting, contra rotating tri-lobe rotors within a fully swept pump chamber.

The OptiLobe pump range has a universal gearbox design which gives the flexibility of mounting pumps with the inlet and outlet ports in either a vertical or horizontal plane by changing the foot position.

Handling from low to high viscosity pumped media, the pump's characteristic smooth, low shear pumping action is ideal in application areas such as Brewing, Dairy, Food industries, and is suitable for CIP (Cleaning In Place).



Drawing shows only mounted unit

Pump Duty Conditions

The pump should only be used for the duty for which it has been specified. The operating pressure, speed and temperature limits have been selected at the time of order and **MUST NOT** be exceeded. These details are stated on the original order documentation and if not available may be obtained from your supplier quoting pump model and serial number.

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4 Installation

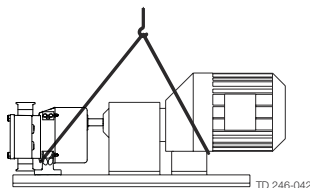
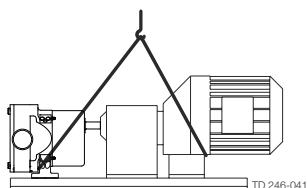
4.1 Unpacking, Handling and Storage

! NOTE

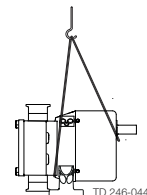
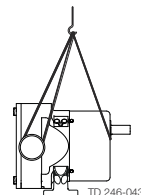
Refer to the pump weights guide (See [Weight](#) on page 51) before selecting and using any lifting gear.

The drawing show how the pump should be lifted. Ensure that lifting equipment is correctly rated and used within these limits.

Pump with drive unit



Bareshaft pump



On receipt always:

- Check the delivery note against the goods received
- If motorised, check that the drive instructions are available
- Inspect the packing for signs of damage in transit
- Carefully remove the packing away from the pump
- Inspect the pump for any visible signs of damage
- Clean away the packing from the pump port connections
- Be careful not to discard any manuals that may be enclosed with the packaging
- Report any damage immediately to the carrier

After receipt and inspection, if the pump is not to be installed immediately, the pump should be re-packed and placed in suitable storage. The following points should be noted:

- Plastic or gasket type port covers should be left in place
- Pumps received wrapped with corrosion inhibiting treatment material should have wrapping replaced
- A clean, dry storage location free from vibration should be selected. If a moist or dusty atmosphere is used for storage, further protect the pump or unit with a suitable cover
- If a moist or dusty atmosphere is used for storage, further protect the pump or unit with a suitable cover
- No exposure to corrosive substances, including those contain in the air
- Rotate the pump/pump unit by hand weekly, to prevent bearing damage
- All associated ancillary equipment should be treated similarly

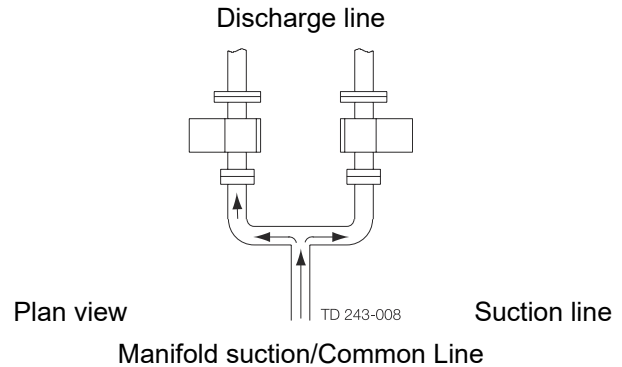
4.2 System Design and Installation

NOTE

To ensure optimum operation it is important that any pump unit is installed correctly. When designing a pumping system the following should be taken into consideration.

4.2.1 System Design

- Confirm the Net Positive Suction Head (NPSH) available from the system exceeds the NPSH required by the pump, as this is crucial for ensuring the smooth operation of the pump and preventing cavitation
- Avoid suction lifts and manifold/common suction lines for two pumps running in parallel, as this may cause vibration or cavitation
- Protect the pump against blockage from hard solid objects e.g. nuts, bolts welding slag etc. Also protect the pump from accidental operation against a closed valve by using relief valves, pressure switches or current limiting devices
- Fit suction and discharge monitor points for diagnostic purposes
- Fit valves, if two pumps are to be used on manifold/common discharge lines
- Make the necessary piping arrangements if flushing is required for the seal or if a media is required for heating/ cooling jackets and saddles
- Allow at least 1 m for pump access/maintenance all around the pump
- Do not subject rotary lobe pumps to rapid temperature changes, as pump seizure can result from thermal shock

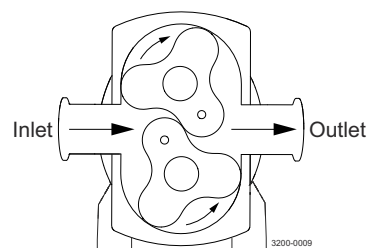
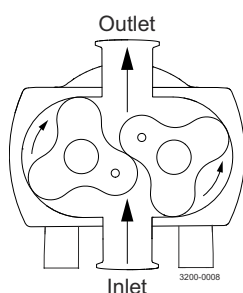
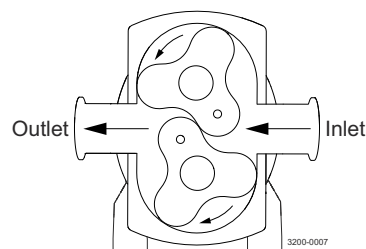
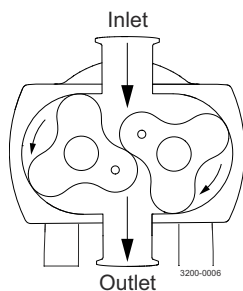


4.2.2 Pipework

The pump must not be used to support piping. All inlet and outlet piping on the pump unit must be independently supported. Failure to observe this may distort the pump head components or pump assembly and cause serious permanent damage.

4.2.3 Direction of Flow

The direction of flow is dictated by the direction of rotation of the drive shaft. Reversing the direction of rotation will reverse the flow direction.



4.2.4 Pump Lubrication

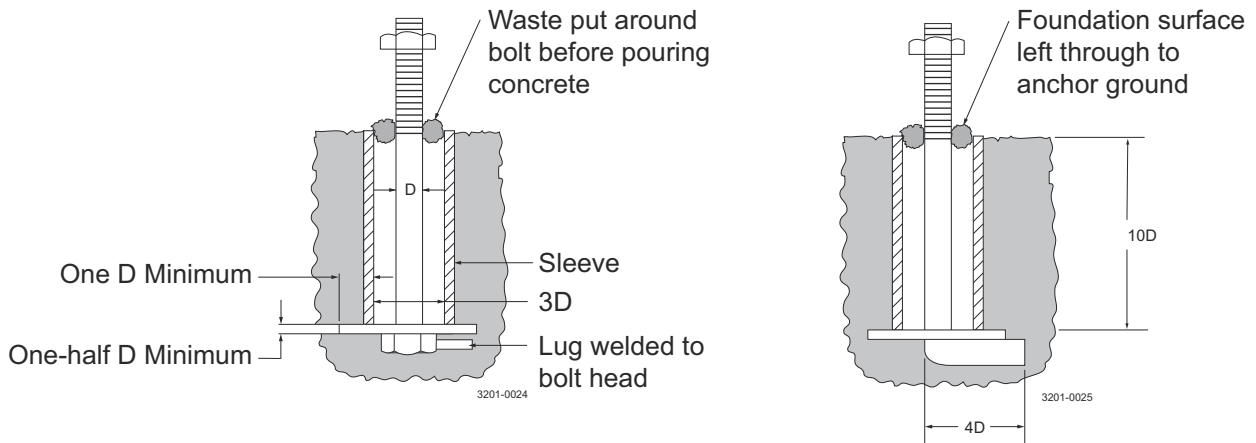
The pump will be supplied filled with grease as standard.

It is recommended to change the grease every 20,000 hours of pump operation. When changing the grease, one of the recommended greases listed must be used:

- Mobilux EP004
- Castrol Tribol GR 100-00 PD
- BP Energrease PR-EP00
- Petro Canada Purity FG 00
- Kluber KulberSynth UH1 14-1600

4.2.5 Baseplate Foundations

Pumps when supplied with a drive unit are normally mounted on a baseplate. Our standard baseplates have pre-drilled fixing holes to accept base retaining bolts. To provide a permanent rigid support for securing the pump unit, a foundation is required which will also absorb vibration, strain or shock on the pumping unit. Methods of anchoring the baseplate to the foundation are varied, they can be studs embedded in the concrete either at the pouring stage as shown below, or by use of epoxy type grouts. Alternatively mechanical fixings can be used.



The drawing above shows two typical methods for foundation bolt retaining. The sleeve allows for "slight" lateral movement of the bolts after the foundation is poured. Rag or waste paper can be used to prevent the concrete from entering the sleeve while the foundation is poured. A minimum of 14 days is normally required to allow the curing of the concrete prior to pump unit installation.

Ball Foot Baseplate with Adjustable Feet

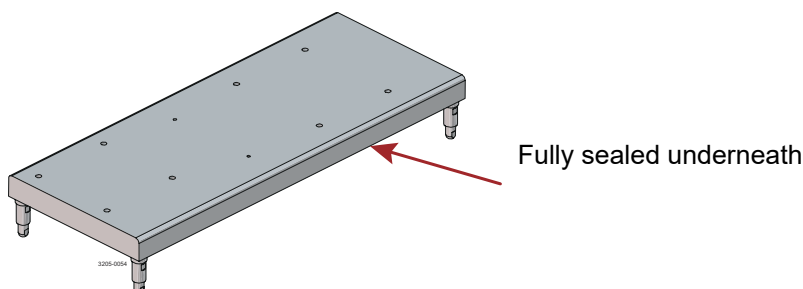
The pump can be supplied with an optional ball foot baseplate with height adjustable feet.

When used:

- **Ensure** the floor is level and is able to support the weight of the complete unit
- **Ensure** the unit is supported by all feet equally

3A Approved Ball Foot Baseplate with Adjustable Feet

For 3A approved mounted pumps a 3A approved ball foot baseplate is required which has additional sealant applied to the underside.



4.2.6 Coupling Alignment

Before the pump unit is installed it is important to ensure that the mounting surface is flat to avoid distortion of the baseplate, which may cause pump/motor shaft misalignment and pump/motor unit damage.

Once the baseplate has been secured, the pump shaft to motor shaft coupling alignment should be checked and adjusted as necessary. This is achieved by checking the maximum angular and parallel misalignment for the couplings as stated below.

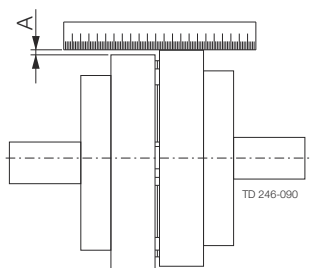
Shaft alignment that is outside the stated tolerances can be corrected by applying shims under the motor or pump foot, or, by moving the pump or drive sideways on the baseplate.

All bolts that have been loosened should be re-tightened to the stated torque figure.

The following dimensions and tolerances apply to standard supply couplings only.

Parallel misalignment

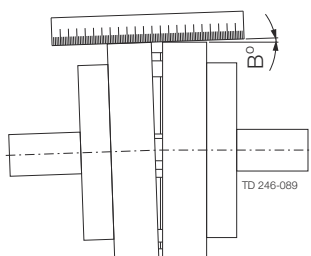
Measure 4 positions at 90° around coupling



Coupling size	Dimension A Maximum
70	0.3 mm
90	0.3 mm
110	0.3 mm
130	0.4 mm
150	0.4 mm
180	0.4 mm
230	0.5 mm
280	0.5 mm

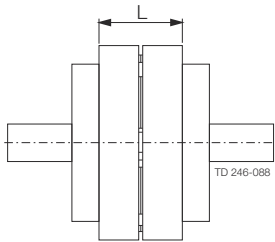
Angular misalignment

Measure 4 positions at 90° around coupling



Coupling size	Dimension B Maximum
70	1°
90	1°
110	1°
130	1°
150	1°
180	1°
230	1°
280	1°

Assembled length



Coupling size	Dimension L ± 1.0 mm
70	25
90	30.5
110	45
130	53
150	60
180	73
230	85.5
280	105.5

Recommended bolt torques

Thread Diameter	M6	M8	M10	M12	M16	M20	M24
Torque (Nm)	6	15	30	50	120	250	200

4.3 Flushing seal arrangement and pre-start up checks

- 1 A flushed seal arrangement is fitted in order to cool or clean the seal area.

It is important that:

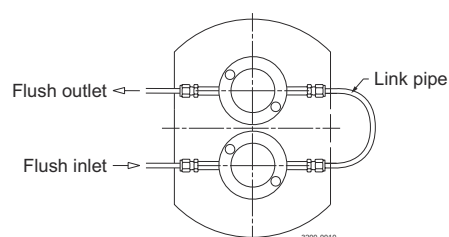
- The flush is correctly connected (see below)
- A compatible flushing fluid is used and supplied at the correct pressure and flow rate (See [Technical Data](#) on page 49)
- The flush is turned on at the same time/ prior to starting the pump, and turned off at the same time/after stopping the pump

- 2 Connecting the flush.

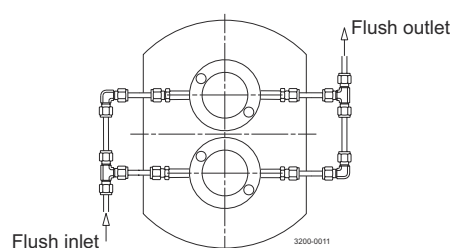
The following equipment is strongly recommended when using a flushing system:

- Control valve and pressure gauge, to enable the correct flushing pressure to be obtained and monitored
- Isolation valve and check valve, so that the flush can be turned off, and to stop any unwanted substances flowing in the wrong direction
- A method of visibly indicating flushing fluid flow

- 3 Flushing arrangements in principle.



Serial piping



Parallel piping

4 Flushing fluid

The choice of flushing fluid is dependent upon the fluid being pumped and duty conditions i.e. pressure and temperature. Usually water is used for cooling or flushing water soluble products. For single flushed mechanical seal arrangements the temperature of flush media should never allowed to exceed the maximum temperature of the pumped media. For advice on selecting a suitable flushing fluid please contact pump supplier.

5 Flushing pressure and flow rate

Single flushed mechanical seal 0.5 bar / 7 psi maximum. Any further increase in pressure will result in lip seal failure.

The flushing flow rate must be adequate to ensure that the temperature limitation of the seals is not exceeded. Contact your pump supplier for further information on the recommended flow.

Minimum flow rate required per shaft seal is 30 l/hr

6 Pre-start up checks:

- Check the pipework system has been purged to remove debris
 - Check all obstructions have been removed from pipework and pump
 - Check pump connections and pipework joints are tight
 - Check lubrication levels are correct
 - Check seal flushing is connected if applicable
 - Check all safety guards are in place
 - Check that inlet and outlet valves are open
-

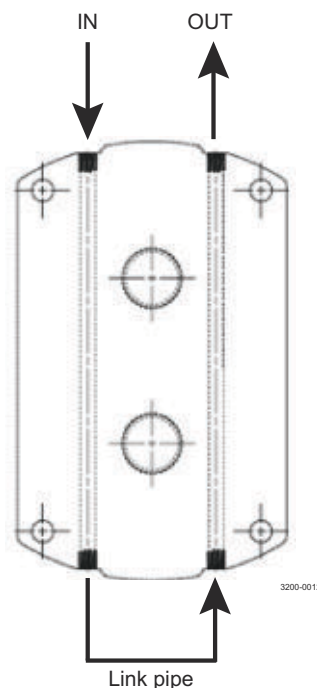
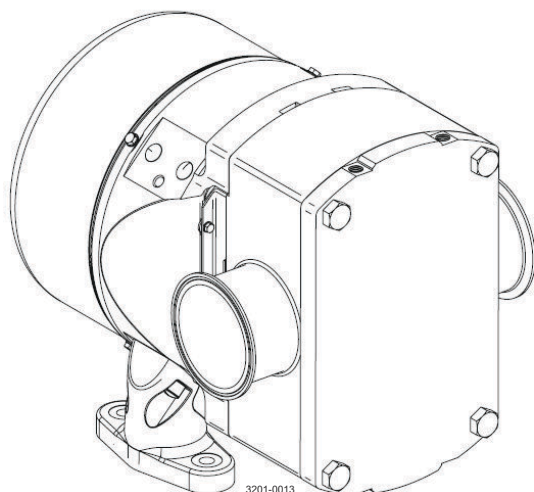
4.4 Pump Head Heating

The OptiLobe range of pumps have the option of being fitted with a heating/cooling device.

They are primarily used for heating the pumphead so as to maintain the pumped media viscosity and reduce risk of any crystallisation/solidification.

They may also be used for cooling purposes.

Heating is provided with an optional front cover



All flush connections are Female

Model	Thread Specification
OptiLobe 12/13	Rp 1/8"
OptiLobe 22/23	Rp 1/8"
OptiLobe 32/33	Rp 1/8"
OptiLobe 42/43	Rp 1/4"
OptiLobe 52/53	Rp 1/4"

The maximum pressure and temperature of heating/cooling fluid is 3.5 bar / 50 psi and 150 °C / 302 °F respectively.

OptiLobe 12/13/22/23/32/33:

Heating/cooling should be in operation approximately 30 minutes prior to pump start up and remain in operation 30 minutes after pump shut down.

OptiLobe 42/43/52/53:

Heating/cooling should be in operation approximately 45 minutes prior to pump start up and remain in operation 45 minutes after pump shut down.

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5 Maintenance

5.1 Cleaning In Place (CIP)



Never touch the pump or the pipelines as they will be extremely hot!

Do not subject the pump to rapid temperature changes during CIP procedures, as pump seizure can result from thermal shock.

A suitable by-pass is recommended.



Always rinse well with clean water after using a cleaning agent.

Always use rubber gloves and protective goggles when handling caustic agent.

Always store/discharge cleaning agents in accordance with current rules/directives.



A suitable by-pass is recommended.

The pump has been designed for Clean in Place (CIP) operation with both 3A and EHEDG certification. However, due to variations in pumped products, system design, cleanliness requirements and chemicals used we recommend that users develop suitable CIP processes during commissioning on normal operating conditions and products and verify these meet the required levels of cleanliness ensuring a minimum flow velocity of 1.5 m/s (4.92 ft/s).

To ensure optimum drainability of the rotorcase we recommend the pump is specified with vertical porting (top/bottom).

Thermal Shock

Where metallic components are subjected to sudden changes in temperature the differing rates of contraction / expansion experienced, especially where there are very small clearances, can allow contact between the rotating and static parts potentially causing surface damage and pump seizure.

To minimise the risk of thermal shock occurring it is recommended that, if during process steps, the pumped media and/or seal flush media have a differential temperature of more than 50 °C (90 °F), the pump should be stationary and allowed to stabilise for a minimum of 15 minutes before operating.

5.2 Maintenance schedule

It is advisable to install pressure gauges on both sides of the pump so that any problems within the pump/pipework can be monitored.

Maintenance schedule

Your weekly schedule should include:

- Checking the seals for leakage
- Checking the lip seals for leakage
- Check pumping pressures

In certain operational circumstances the pump will pose a thermal hazard and as such should not be touched during operation.

After shutdown the pump unit should be allowed time to cool.

Any loss or damage to any guards or covers, especially if this leads to a deterioration of safety performance, shall be replaced immediately. The fixings of any guards or covers should only be replaced with fixings of the same type and specification.

Recommended Spare Parts

The table shows recommended spare parts that should be retained within your maintenance schedule.

Part description	Quantity
O-ring rotorcase cover	1
O-ring rotor sealing shaft end	2
O-ring rotor sealing rotor retainer end	2
Primary seals	2

Rotor nut O-ring Seal Replacement Interval:

It is recommended that the rotor nut O-ring seal is replaced every 12 months to maintain a bacteria tight seal.

Rotor Nut Seal Inspection:

Periodically inspect the rotor nut O-ring seal for any discolouration, nicks, or cracks. If any of the defects above are noticed, the O-ring seal must be replaced. Inspection and replacement refer to the seal replacement procedure below.

Seal Replacement Procedure

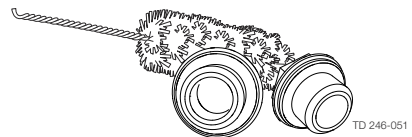
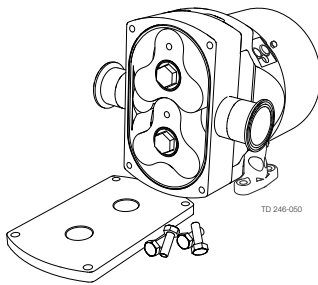
1. Remove rotor case cover (see [Dismantling, Step1](#)).
2. Undo rotor nuts and ensure components are dry before servicing.
3. With a penlight, inspect rotor nut blind tapped hole for contamination. If soiled, refer to cleaning procedure below.
4. Remove and discard rotor nut O-ring seal.
5. Fit new rotor nut O-ring seal.

6. Fit rotor nut and use a torque wrench to tighten to correct torque value (see [Tool Requirements](#) on page 51).
7. Fit the rotor case cover.

Cleaning Procedure for Soiled Rotor Nut Tapped Hole

1. Remove rotor nut from the shaft.
2. Submerge and soak nut for 5 minutes in COP tank with 2% caustic wash.
3. Scrub the hole with internal thread vigorously by plunging a clean sanitary bristle pipe brush in and out of the hole for two minutes while submerged.
4. Soak nut in acid sanitizer for 5 minutes, and then scrub the hole again with the pipe brush for two minutes.
5. Rinse well with clean water and blow-dry blind tapped hole with clean air.
6. Swab test the inside of the tapped hole to determine cleanliness.
7. Should the swab test fail, repeat steps 2 through 6 above until swab test is passed.

Should swab testing continue to fail, or time is of the essence, install a new rotor nut.



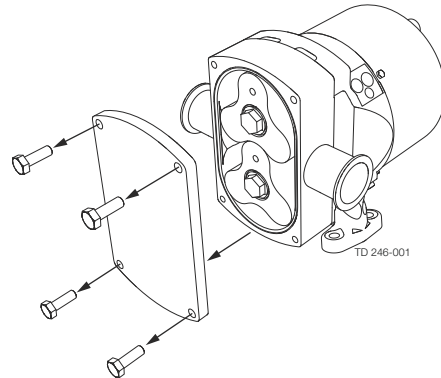
5.3 Dismantling

NOTE

Before disassembling the pump refer to safety precautions. See [Parts Lists and Exploded Views](#) on page 57.

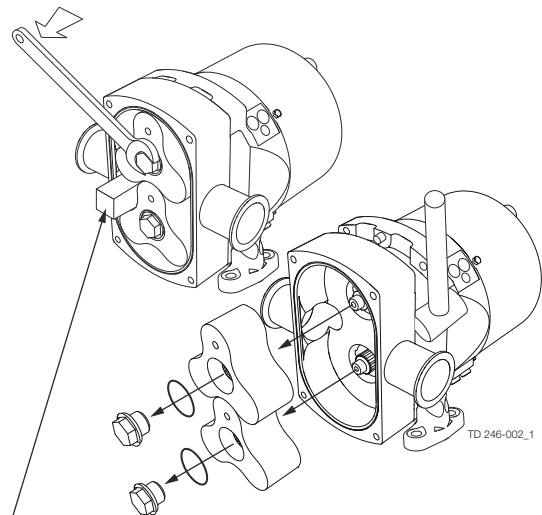
1 Removing rotorcase cover:

Remove rotorcase cover screws (10) and cover (12).



2 Removing rotors:

- Insert a plastic/wooden block between the two rotors (17) to stop them turning.
- Remove rotor nuts (22), rotor nut O-rings (20) and rotors.
- Remove the rotorcase cover O-ring (11) and spline sealing O-rings (18) if these are to be replaced.



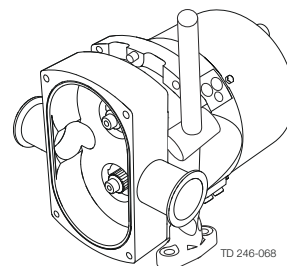
Plastic or wooden block

3 Removing primary seal components:

Please see [Primary seals removal and fitting](#) on page 41 for seal removal.

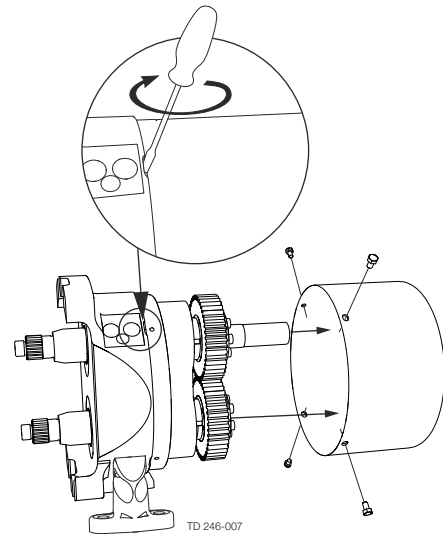
4 Removing rotorcase:

- Remove the rotorcase retention screws (3).
- Tap both sides of the rotorcase (9) with a soft hammer.
- Take care not to allow the rotorcase to drop onto the shafts during the removal process.



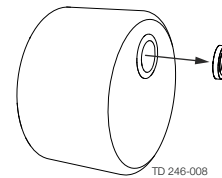
5 Removing canister:

- Place a tray under the canister (5) to collect the waste lubricant.
- Remove the four canister retaining screws (6) and allow lubricant to drain.
- Remove canister from the bearing housing (1) which is sealed with an O-ring (21). To assist in removal a suitable lever can be used in the slots provided.
- Remove the canister O-ring (21) if this needs to be replaced.



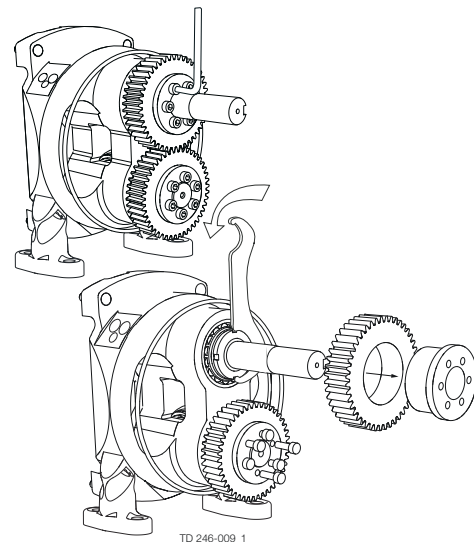
6 Canister lip seal removal:

Extract the lip seal (7) from the seal retainer. It is essential to renew the lip seal prior to assembly.



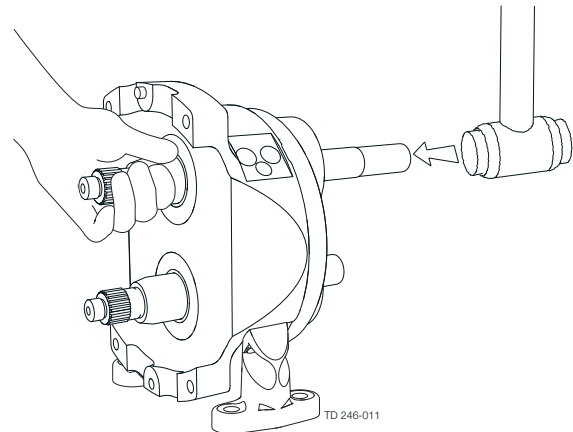
7 Removing timing gears:

- Loosen the bearing nuts (30) with a 'C' spanner by tapping sharply.
- Remove the torque locking assembly screws (40) in several stages (do not fully undo each screw on the first stage of screw removal).
- Insert the screws into the threaded holes in the assembly flange and gradually tighten in a crossed sequence until the back cone is released.
- Slide timing gears (36) off the shafts (24 and 25).



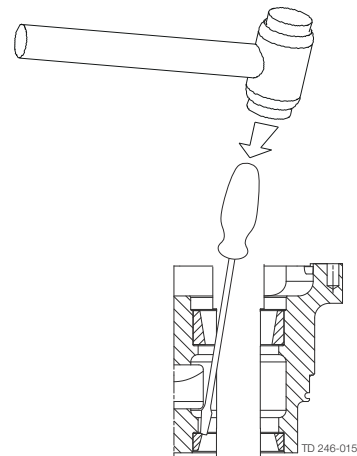
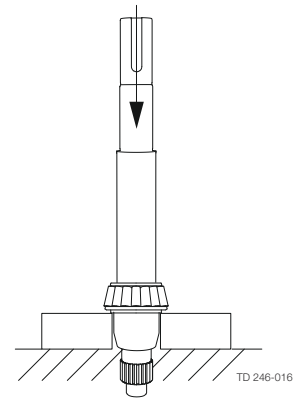
8 Shaft assembly removal:

- a) Remove bearing nuts (30) with a 'sharp tap' on a 'C' spanner (see also drawing shown in step 7).
- b) Using a soft hammer gently tap the rear end of each shaft to remove through the front of the bearing housing, supporting each shaft during removal. As the shaft is removed the bearing housing lip seal (16) and rear bearing (26) will also be removed.
- c) Remove lip seal from shaft. It is essential to renew the lip seal prior to assembly.



9 Bearing removal:

- a) Mount the shaft vertically in a press (rotor part of the shaft down) with a tool positively located against the front bearing inner ring with rolling elements as shown, and apply pressure to the top of the shaft so that the shaft moves through the bearings.
- b) From bearing housing tap the outer bearing rings (front and back) and remove shims (27). Renew bearings if removed from the shafts for any reason.



5.4 Assembly

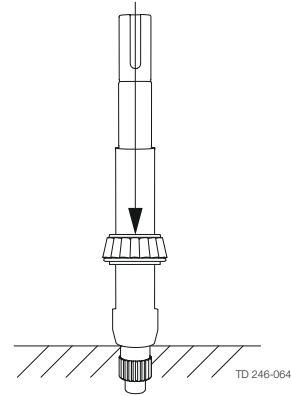
NOTE

Take care not to damage shaft surfaces, in particular where bearings and lipseals will be located.

Ensure all fastenings are tightened to the torque settings as shown in Technical Data (See [Technical Data](#) on page 49).

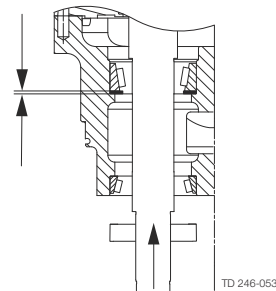
1 Fitting bearings to shafts:

- a) Apply an anti-seize compound to the shaft bearing surfaces.
- b) Place each shaft vertically in a press and fit the front bearing inner ring with rolling elements.



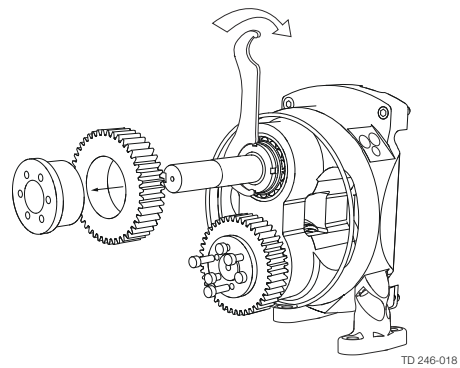
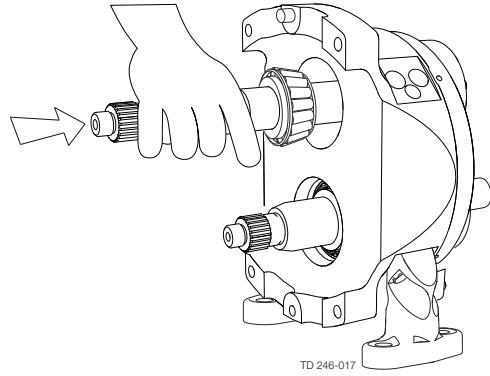
2 Fitting bearings to housing:

- a) Apply an anti-seize compound to the bearing bores in the bearing housing.
- b) Press or gently tap the rear bearing outer rings into the rear bearing bores.
- c) Turn the bearing housing over and place one shim (27) of 0.10 mm thickness against the abutment shoulder of each front bearing bore.
- d) Press or gently tap the front bearing outer rings into the front bearing bores.



3 Fitting shaft assemblies:

- a) Pass the shaft through the front of the top bearing bores (rear part of the shaft first), so front bearing inner ring with rolling elements fits into front bearing outer ring placed in bearing housing.
- b) Hold in place and slide the rear bearing inner ring with rolling elements over the shaft and into the rear bearing outer ring placed in bearing housing (see drawings above).
- c) Apply a locking compound to the bearing nut thread.
- d) Fit the bearing nut (30) using a 'C' spanner and tighten to remove all axial and radial movement.
- e) Rotate the shafts several times to seat the bearings and check rolling torque to the recommended torque value as follows:
 Model 22/23 is 2 - 3 lbin (0.23 - 0.34 Nm)
 Model 32/33 is 4.5 - 5.5 lbin (0.51 - 0.62 Nm)
 Model 42/43 is 5 - 6 lbin (0.57 - 0.68 Nm)
- f) Repeat steps 1, 2, 3 & 4 for the other shaft.

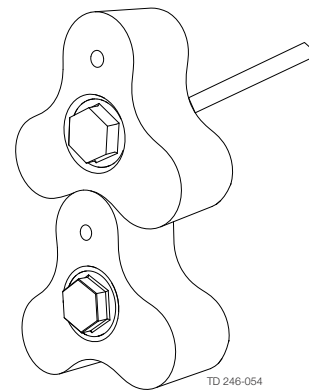
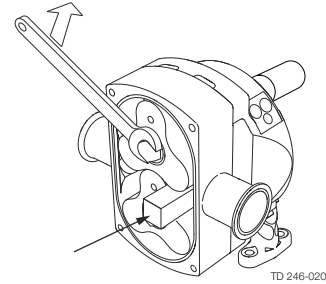
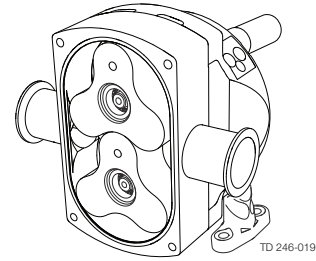


4 Fitting rotorcase:

- Fit the rotorcase (9) to the bearing housing (1) and tighten the rotorcase retention screws (3) to the recommended torque value.

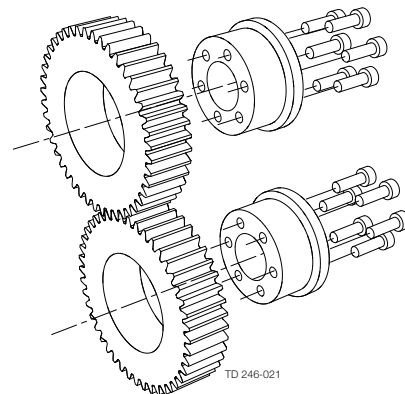
5 Fitting rotors

- a) Fit rotors (17) onto the shafts with both dimpled rotor master lobes in the 6 - 12 o'clock position for horizontally ported pumps or the 3 - 9 o'clock position for vertically ported pumps. It is recommended for the rotor on the drive shaft (24) that the rotor dimple aligns with the drive shaft keyway.
- b) Fit rotor nuts (22) to shafts - Use a plastic/ wooden block between the rotors to stop them turning and tighten the rotor nuts (22) to the recommended torque value (see [Tool Requirements](#) on page 51).
- c) Using feeler gauges measure the back clearance behind each rotor lobe and rotorcase. Refer to Pumphead Clearance Information (section 5.2). If incorrect, remove rotors, rotorcase, shafts and front bearings, and adjust shim (27) thickness to give correct back clearance.



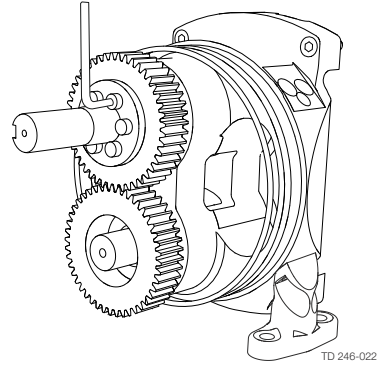
6 Fitting timing gears:

- a) Lightly lubricate with oil both rear shaft diameters.
- b) Lightly lubricate torque locking assemblies (40) with oil and fit to timing gears.
- c) Slide timing gear assemblies (36 and 40) onto shafts.



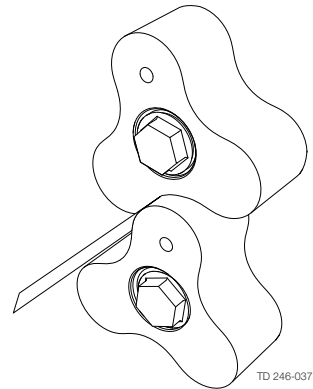
7 Setting timing:

Tighten one torque locking assembly only to the recommended torque figure, allowing rotation of the shaft in the other gear for timing adjustment. Screws should be tightened gradually in a diametrically opposite sequence.

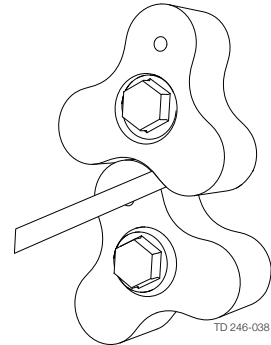


8 Adjusting rotor timing:

- Turn the shaft so that the rotors are in new positions as shown.

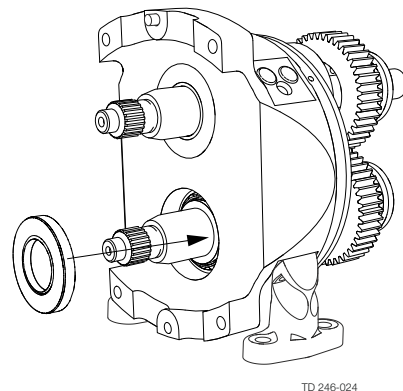


- Squeeze the rotors together and using feeler gauges check the minimum mesh clearance is within specification. Refer to Pumphead Clearance Information (section 5.2).
- Tighten the other torque locking assembly to the recommended torque figure.
- Confirm timing is correct as described in step 8.5.
- Remove rotor nuts and rotors.



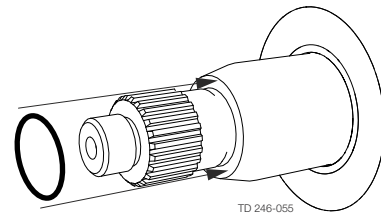
9 Fitting bearing housing lip seals:

- Lightly lubricate lip seals (16) with compatible lubricant.
- Slide lip seals over shafts and tap into bearing bore.
- Ensure lip seals are not damaged when sliding them onto the shafts.



10 Fitting spline sealing O-rings:

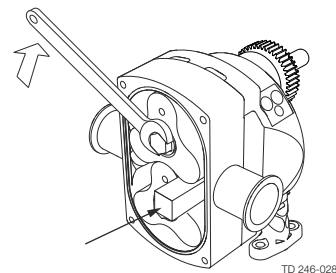
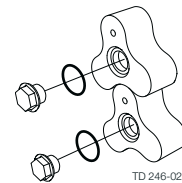
Lightly lubricate spline sealing O-rings (18) and fit over shaft splines to locate against the rotor abutment shoulder.

**11 Fitting mechanical seals:**

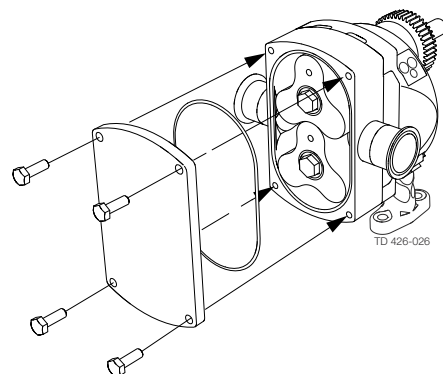
Refer to section 4.5 for seal fitting instructions.

12 Fitting rotors:

- a) Fit rotors onto the shafts with both dimpled rotor master lobes in the 6 - 12 o'clock position for horizontally ported pumps or the 3 - 9 o'clock position for vertically ported pumps. For the rotor on the drive shaft the rotor dimple should be aligned with the drive shaft keyway.
- b) Lightly lubricate the rotor nuts O-rings (20) and fit to rotors.
- c) Fit rotor nuts to shafts. Use a plastic/ wooden block between the rotors to stop them turning and tighten the rotor retention nuts to the recommended torque figure.
- d) Check clearances. Refer to [Pumphead Clearance Information](#) on page 53).

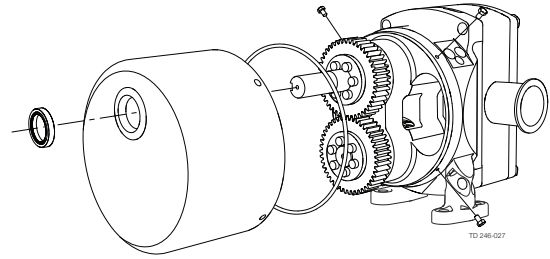
**13 Fitting rotorcase cover:**

- a) Lightly smear rotorcase cover O-ring (11) with compatible lubricant and fit to rotorcase.
- b) Fit rotorcase cover onto rotorcase and tighten rotorcase cover screws (3) to the recommended torque value.



14 Fitting canister and lip seal:

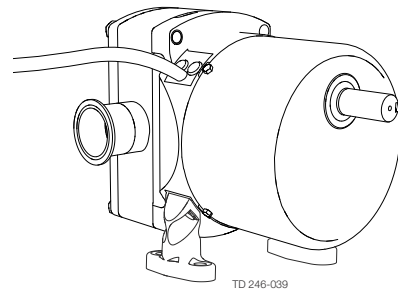
- a) Lightly lubricate canister O-ring (21) and fit into O-ring groove of bearing housing (1).
- b) Fit lip seal (7) into the seal retainer that is fitted to the canister.
- c) Smear oil on the inner lip of the lip seal and carefully slide the canister over the shaft to locate with the bearing housing by aligning screw holes. Fit and tighten screws (6) to the recommended torque figure.

**NOTE**

To assist with canister fitting, one of the drain/filler plugs on the bearing housing can be removed to vent any air build up.

15 Adding lubrication:

- a) Remove both plastic blanking plugs on the bearing housing to expose screws to be removed.
- b) Pour the recommended grease lubricant into the tapped hole.
- c) Replace screws and plastic blanking plugs.



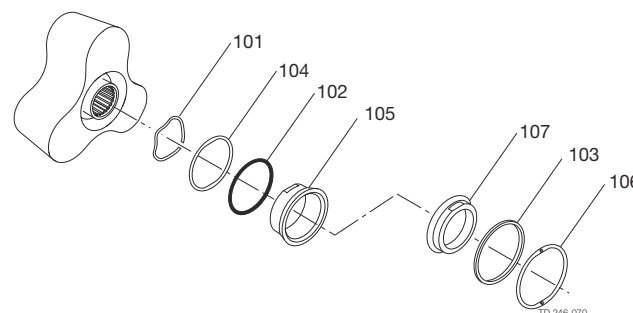
5.5 Primary seals removal and fitting

5.5.1 EasyFit Single mechanical seal

Mechanical seals are fragile. Take extreme care when handling. Clean components before fitting, checking there is no damage to sealing faces. New elastomer parts should be fitted during assembly.

The 'EasyFit' mechanical seal is completely front loading without need of removing rotorcase for access or replacement. The seal setting distance is pre-set.

Item	Description
101	Wave spring
102	Rotary seal ring O-ring
103	'L' cup seal
104	Rotary seal drive ring
105	Rotary seal ring
106	Stationary seal drive ring
107	Stationary seal ring



1 Seal removal:

- Remove rotorcase cover, rotor nuts, rotors and gland guards.
- Extract the rotary seal ring (105), rotary seal drive ring (104), wave spring (101) and rotary seal ring O-ring (102) from the rear of the rotor. Take extreme care whilst extracting rotary seal ring.
- Gently ease the stationary seal assembly from the rotorcase using a suitable lever against the stationary seal drive ring (106) extrusions reachable from the back of the rotorcase.

2 Seal fitting:

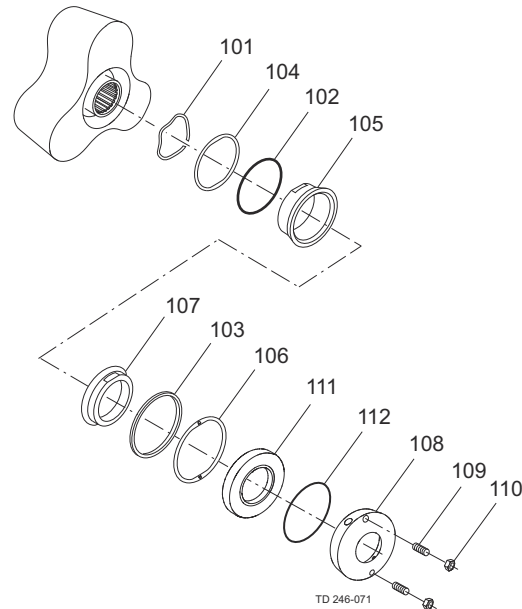
- Lightly lubricate 'L' seal (103) with water and fit onto the stationary seal ring (107).
- Fit drive ring to 'L' cup seal ring assembly by aligning the flats on the stationary seal drive ring (106) and stationary seal ring.
- Gently press the stationary seal ring assembly into the rotorcase bore ensuring that the anti-rotation extrusions in the stationary seal drive ring (106) align with the slots in the rotorcase.
- Fit wave spring (101) into the rear bore of the rotor.
- Fit rotary seal drive ring (104) into rear bore of the rotor ensuring that the anti-rotation extrusions locate in the slots in the rotor.
- Lightly lubricate rotary seal ring O-ring with water and fit into the rear bore of the rotor.
- Align the two flats on the rotary seal ring (105) with the drive flats in the drive ring and gently press the rotary seal ring into the rear bore of the rotor, through the rotary seal ring O-ring (102).
- Wipe clean the sealing faces with solvent and fit gland guards, rotors, rotor nuts and rotorcase cover.

5.5.2 EasyFit Single Flushed mechanical seal

Mechanical seals are fragile. Take extreme care when handling. Clean components before fitting, checking there is no damage to sealing faces. New elastomeric parts should be fitted during assembly.

The 'EasyFit' mechanical seal is completely front loading without need of removing rotorcase for access or replacement. The seal setting distance is pre-set.

Item	Description
101	Wave spring
102	Rotary seal ring O-ring
103	'L' cup seal
104	Rotary seal drive ring
105	Rotary seal ring
106	Stationary seal drive ring
107	Stationary seal ring
108	Seal housing Rp 1/8"
109	Seal housing stud
110	Seal housing nut
111	Lip Seal



1 Seal removal:

- Remove rotorcase cover, rotor nuts, rotors and gland guards.
- Extract the rotary seal ring (105), rotary seal drive ring (104), wave spring (101) and rotary seal ring O-ring (102) from the rear of the rotor. Take extreme care whilst extracting rotary seal ring.
- Drain seal housing (108) for any liquid and dispose drained liquid in accordance to existing legislation.
- If only the mechanical seals are to be replaced, a suitable lever can be used to gently ease the stationary seal assembly from the rotorcase. If complete disassembly of the flushed seal components is necessary, remove the rotorcase complete with seal housing.
- Undo the seal housing retention nuts.
- Remove the seal housings and extract the lip seals from the seal housings.
- Remove the seal housing O-ring from the rotorcase.
- Gently ease the stationary seal assembly from the rotorcase using a suitable lever against the stationary seal drive ring extrusions reachable from the back of the rotorcase.

2 Seal fitting:

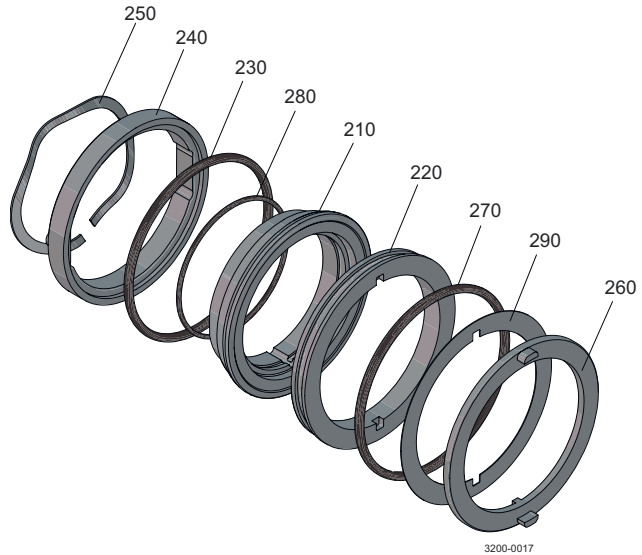
- a) Lightly lubricate 'L' cup seal (103) with water and fit onto the stationary seal ring (107).
 - b) Fit stationary seal drive ring (106) to 'L' cup seal face assembly by aligning the flats on the stationary seal drive ring and stationary seal ring.
 - c) Gently press the stationary seal drive ring assembly into the rotorcase bore ensuring that the anti-rotation extrusions in the stationary seal drive ring align with the slots in the rotorcase.
 - d) If the rotorcase has been removed, lightly lubricate the seal housing O-rings and fit to the rotorcase.
 - e) Press new lip seals into the seal housings.
 - f) Fit seal housings to the rotorcase and tighten the seal housing retention nuts to the recommended torque figure.
 - g) Refit the rotorcase to the bearing housing.
 - h) Fit wave spring (101) into the rear bore of the rotor.
 - i) Fit rotary seal drive ring (104) into rear bore of the rotor ensuring that the anti-rotation extrusions locate in the slots in the rotor.
 - j) Lightly lubricate rotary seal ring O-ring with water and fit into the rear bore of the rotor.
 - k) Align the two flats on the rotary seal ring (105) with the drive flats in the rotary seal drive ring (104) and gently press the rotary seal ring into the rear bore of the rotor, through the rotary seal ring O-ring (102). On the front face of the seal ring there is an alignment mark to show the position of the flats on the rear face.
 - l) Wipe clean the sealing faces with solvent and fit gland guards, rotors, rotor nuts and rotorcase cover.
-

5.5.3 EasyFit Single KnifeEdge mechanical seal

Mechanical seals are fragile. Take extreme care when handling. Clean components before fitting, checking there is no damage to sealing faces. New elastomeric parts should be fitted during assembly.

The 'EasyFit' mechanical seal is completely front loading without need of removing rotorcase for access or replacement. The seal setting distance is pre-set.

Item	Description
210	Rotary Seal Ring
220	Static Seal Ring
230	O-ring, Rotary Seal Ring
240	Rotary Drive Ring
250	Wave Spring
260	Static Drive Ring
270	O-ring, Static Drive Ring
280	O-ring, Inner Rotary
290	Damper



1 Seal Removal:

- Remove the rotorcase cover (12), rotor nuts (22), rotors (17) and gland guards.
- Extract the rotary seal assembly (210, 230, 240, 250 and 280) from the rear of the rotor. Take extreme care when extracting the rotary seal ring (210) not to damage or chip.
- Gently ease the stationary seal assembly (220, 270, 290, 260) through the front side of the rotorcase using a suitable lever against the stationary seal drive ring (220) tabs reachable from the back of the rotorcase.

2 Seal Fitting:

- a) Lightly lubricate the static side o-ring (270) with water or suitable lubricant and fit to static seal ring (220).
 - b) Place damper (290) between the seal ring (220) and the drive ring (260).
 - c) Fit the drive ring assembly to the stationary seal ring assembly by aligning the slots in the stationary drive ring (260) and stationary seal ring (220).
 - d) Holding the static seal assembly together, gently press into the rotorcase seal bore in from the front ensuring that the anti-rotation tabs on the stationary drive ring (260) align with the slots in the rotorcase.
 - e) Fit the wave spring (250) in to the rear bore of the rotor.
 - f) Fit the rotary seal drive ring (240) in to the rear bore of the rotor ensuring that the anti-rotating tabs locate in the slots in the rotor.
 - g) Without lubrication, fit the inner rotary o-ring (280) in to the groove of the rotary seal ring (210).
 - h) Lightly lubricate the rotary seal ring o-ring (230) with water or suitable lubricant and fit in to the bore of the rotor.
 - i) Aligning the 2 flats of the rotary seal ring (210) with the drive flats in the rear bore of the rotor, gently press the rotary seal ring (210) in to the rear bore of the rotor, through the rotary seal o-ring (230).
 - j) Gently clean the sealing faces with a clean lint free cloth and solvent.
 - k) Refit the rotors, rotor nuts, rotorcase cover and gland guards, ensuring all fasteners are tightened to the correct torque as stated in the main operating manual.
-

5.6 Troubleshooting

Problem														Probable Causes	Solutions	
No flow	Under capacity	Irregular discharge	Low discharge pressure	Pump will not prime	Prime lost after starting	Pump stall when starting	Pump overheats	Motor overheats	Excessive power absorbed	Noise and Vibration	Pump element wear	Syphoning	Seizure			Mechanical seal leakage
√				√											Incorrect direction of rotation.	Reverse motor.
√															Pump not primed.	Expel gas from suction line and pumping chamber and introduce fluid.
√	√	√	√		√					√					Insufficient NPSH available.	Increase suction line diameter. Increase suction head. Simplify suction line configuration and reduce length. Reduce pump speed.
	√	√	√		√					√					Fluid vaporising in suction line.	Increase suction line diameter. Increase suction head. Simplify suction line configuration and reduce length. Reduce pump speed.
√	√	√		√	√								√		Air entering suction line.	Remake pipework joints.
	√	√		√	√	√				√					Strainer or filter blocked.	Service fittings.
	√				√	√	√	√	√	√					Fluid viscosity above rated figure.	Increase fluid temperature. Decrease pump speed. Check seal face viscosity limitations.
√	√		√												Fluid viscosity below rated figure.	Decrease fluid temperature. Increase pump speed.
							√			√	√			√	Fluid temp. above rated figure.	Reduce fluid temperature. Check seal face and elastomer temp. limitations.
						√		√	√						Fluid temp. below rated figure.	Increase fluid temperature.
									√	√			√	√	Unexpected solids in fluid.	Clean the system. Fit strainer to suction line.

Problem														Probable Causes	Solutions	
No flow	Under capacity	Irregular discharge	Low discharge pressure	Pump will not prime	Prime lost after starting	Pump stall when starting	Pump overheats	Motor overheats	Excessive power absorbed	Noise and Vibration	Pump element wear	Syphoning	Seizure			Mechanical seal leakage
✓	✓	✓			✓	✓	✓	✓	✓	✓	✓		✓	✓	Discharge pressure above rated figure.	Check for obstructions i.e. closed valve. Service system and change to prevent problem recurring. Simplify discharge line to decrease pressure.
														✓	Seal flushing inadequate.	Increase flush flow rate. Check that flush fluid flows freely into seal area.
	✓							✓	✓	✓					Pump speed above rated figure.	Decrease pump speed.
✓	✓														Pump speed below rated figure.	Increase pump speed.
	✓						✓	✓	✓	✓	✓		✓		Pump casing strained by pipework.	Check alignment of pipes. Fit flexible pipes or expansion fittings. Support pipework.
							✓			✓	✓		✓		Flexible coupling misaligned.	Check alignment and adjust mountings accordingly.
							✓	✓	✓	✓	✓		✓		Insecure pump driver mountings.	Fit lock washers to slack fasteners and re-tighten.
							✓	✓	✓	✓	✓		✓	✓	Shaft bearing wear or failure.	Refer to pump maker for advice and replacement parts.
							✓	✓	✓	✓	✓		✓		Insufficient gearcase lubrication.	Refer to pump maker's instructions.
✓	✓						✓	✓	✓	✓	✓		✓		Metal to metal contact of pumping element.	Check rated and duty pressures. Refer to pump maker.
✓		✓		✓											Worn pumping element.	Fit new components.
✓				✓											Suction lift too high.	Lower pump or raise liquid level.
														✓	Fluid pumped not compatible with materials used.	Use optional materials.
												✓			No barrier in system to prevent flow passing.	Ensure discharge pipework higher than suction tank.

Problem																	
No flow	Under capacity	Irregular discharge	Low discharge pressure	Pump will not prime	Prime lost after starting	Pump stall when starting	Pump overheats	Motor overheats	Excessive power absorbed	Noise and Vibration	Pump element wear	Syphoning	Seizure				Mechanical seal leakage
Probable Causes															Solutions		
														√	Pump allowed to run dry.	Ensure system operation prevents this. Fit single or double flushed mechanical seals.	
									√	√					Faulty motor.	Check and replace motor bearings.	
√															Pumping element missing.	Fit pumping element.	

6 Technical Data

NOTE

Technical data must be observed during installation, operation and maintenance.
All personnel should be informed about the technical data.

6.1 Technical Data

Standard specification

Product wetted steel parts:	W. 1.4404 (316L)
Inside surface finish:	Mech Ra ≤ 0.8 µm / 32 µin
Gear canister:	Stainless steel
Base plate:	Stainless steel
Coupling guard:	Stainless steel
Rotor:	Tri-lobe
Product wetted elastomers:	EPDM
Other elastomers:	NBR
Shaft seal:	Single mechanical EasyFit
Rotary seal face:	Carbon
Stationary seal face:	Stainless steel

Shaft seals

EastFit single, single flush and knife-edge available. All options are fully front loading and interchangeable.

Max. flush pressure, single flush:	0.5 bar / 7.25 psi
Water consumption, single flush:	0.5 l/min / 8 USGPH
Flush connections:	BSPT or NPT

Temperature

Max. process and CIP temperature (dependent on rotor selection): 130 °C / 266 °F

Motor

IEC: Gear motor, 4 poles, to IEC metric standard, 50/60 Hz, suitable for frequency conversion, IP55, insulation class F.

NEMA: Gear motor, 4 poles, to NEMA standard, premium efficiency, suitable for frequency conversion.

6.2 Process Data

Pump Model	Displacement			Inlet/Outlet		Diff. Pressure		Max Speed ¹
	Litres/ rev	Imp gall/100 rev	US gall/ 100 rev	mm	inch	bar	psi	rpm
12	0.06	1.23	1.48	25	1	8	115	1000
13	0.10	2.18	2.61	40	1½	8	115	1000
22	0.17	3.74	4.49	40	1½	8	115	1000
23	0.21	4.62	5.55	40	1½	8	115	1000
32	0.32	7.04	8.45	50	2	8	115	1000
33	0.40	8.80	10.57	50	2	8	115	1000
42	0.64	14.08	16.91	65	2½	8	115	1000
43	0.82	18.04	21.66	80	3	8	115	1000
52	1.17	25.74	30.89	80	3	8	115	750
53	1.72	37.84	45.41	100	4	8	115	750

¹ Maximum pump speed is limited to 250 rpm when fitted with Knife-edge seal option

6.3 Lubrication

Pump Model	Grease capacities litres
12	0.6
13	0.6
22	1.0
23	1.0
32	2.0
33	2.0
42	3.0
43	3.0
52	6.0
53	6.0

6.4 Weight

NOTE

The weights are for guidance purposes only and will vary dependent upon specification of pump, baseplate and drive unit.

Pump Model	Bare Shaft Pump		Typical pump and drive unit	
	kg	lb	kg	lb
12	11.5	25	55	121
13	12.5	28	58	128
22	20.5	45	67	148
23	21.5	47	72	157
32	33.5	74	125	276
33	34.5	76	128	282
42	60	132	215	474
43	63	136	218	481
52	116	255	338	745
53	128	282	350	771

6.5 Tool Requirements

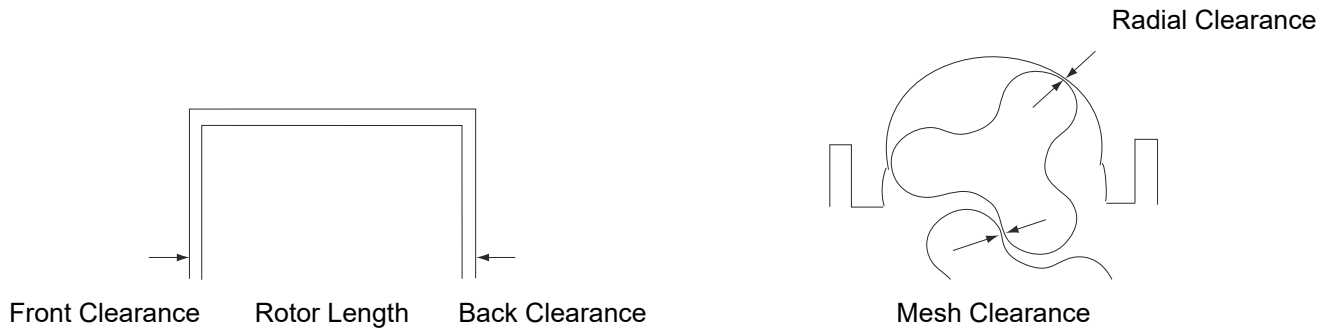
Description	Tool required	Pump Model				
		12/13	22/23	32/33	42/43	52/53
Screw, rotorcase cover (10)	Socket Size (mm)	13	17	17	17	24
	Torque Setting (Nm)	20	30	30	30	90
	Torque Setting (lbft)	14.7	22.1	22.1	22.1	66.3
Nut, rotor retention (22)	Socket Size (mm)	15	24	24	36	36
	Torque Setting (Nm)	30	80	120	160	220
	Torque Setting (lbft)	22.1	59.0	88.5	118.0	162.2
Screw, rotorcase retention (3)	Socket Size (mm)	5	6	6	6	10
	Torque Setting (Nm)	15	20	20	20	65
	Torque Setting (lbft)	11	14.8	14.8	14.8	48
Screw, canister retention (6)	Socket Size (mm)	8	8	8	8	10
	Torque Setting (Nm)	4	4	4	4	6
	Torque Setting (lbft)	3	3	3	3	4.4
Screw, torque locking assembly	Socket Size (mm)	3	5	5	5	6
	Torque Setting (Nm)	4	17	17	17	35
	Torque Setting (lbft)	3	12.5	12.5	12.5	25.8
Screw, foot (58)	Socket Size (mm)	6	6	6	6	10
	Torque Setting (Nm)	20	20	20	20	65
	Torque Setting (lbft)	14.8	14.8	14.8	14.8	48
Drain/Filler plug (45)	Key Size (inch)	3/16	3/16	3/16	3/16	3/16

6.6 EHEDG Certified Units

For units required with EHEDG certification, only the following process connections and gasket (supplied by others) combinations are EHEDG approved:

- DIN11851 with ASEPTO-STAR k-flex or SKS EHEDG gasket system
- Triclamp (BS482 part 3) with Combifit T-Ring gasket

6.7 Pumphead Clearance Information



Minimum mesh clearance at any mesh position. All dimensions are in millimeter.

Pump Model	Rotor Length	Front Clearance Min.	Back Clearance Min.	Rotor Diameter Min.	Radial Clearance Min.	Mesh Clearance Min.
12	16.98	0.085	0.12	71.82	0.06	0.06
	16.93					
13	29.92	0.10	0.16	71.69	0.13	0.08
	29.88					
22	27.13	0.16	0.22	94.74	0.11	0.10
	27.10					
23	36.13	0.18	0.22	94.74	0.10	0.11
	36.10					
32	33.13	0.20	0.22	117.84	0.12	0.11
	33.10					
33	45.13	0.25	0.22	117.80	0.14	0.12
	45.10					
42	50.13	0.17	0.24	139.88	0.15	0.07
	50.10					
43	66.13	0.24	0.24	139.76	0.20	0.10
	66.10					
52	61.55	0.26	0.18	171.35	0.30	0.15
	61.50					
53	89.50	0.28	0.20	171.20	0.37	0.15
	89.45					

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7 Spare Parts

For every delivered Alfa Laval Product, a spare part list is available.

This spare part list contains a range of the most common wear parts for the machinery. If any component not mentioned is required, please contact your local Alfa Laval representative for availability.

You can find our spare part catalogue at <https://hygienicfluidhandling-catalogue.alfalaval.com>.

Always use Alfa Laval genuine spare parts. The warranty of Alfa Laval products is dependent on use of Alfa Laval genuine spare parts.

7.1 Ordering Spare Parts

When ordering spare parts, please always state:

1. Serial number (if available)
2. Item number/spare part number (if available)
3. Capacity or other relevant identification

7.2 Alfa Laval Service

Alfa Laval is represented in all larger countries of the world.

Do not hesitate to contact your local Alfa Laval representative, with any questions or requirement of spare parts for Alfa Laval equipment.

7.3 Warranty - Definition



The rules of Intended use are absolute. Use of the supplied Alfa Laval product is allowed only when in compliance with the technical data supplied with the Intended use.

Differing utilisation, other than agreed with Alfa Laval Kolding A/S, exclude any liability and warranty.

No modification or alteration of the supplied Alfa Laval product is allowed, unless explicit permission is granted by Alfa Laval Kolding A/S.



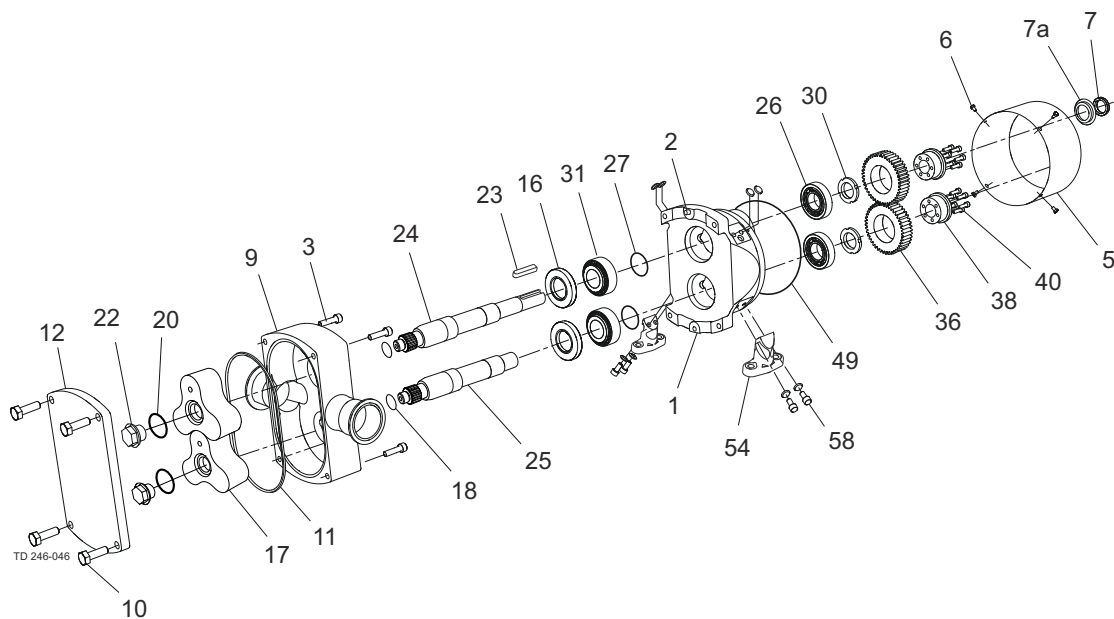
Liability and warranty are excluded:

- If advice and instruction of operating instructions are ignored
- For incorrect operation or for insufficient maintenance of the supplied Alfa Laval product
- For any kind of change of function of the supplied Alfa Laval product without prior written agreement by Alfa Laval Kolding A/S
- If supplied Alfa Laval product is modified by non-authorised persons
- If using the supplied Alfa Laval product without attention of appropriate safety regulations, (see [Safety](#) on page 7)
- If protection equipment is not used and vessel process / ancillary equipment is not brought to a standstill
- If the supplied Alfa Laval product and ancillary parts are not properly maintained (to be executed in intervals and including fitting of prescribed replacement parts)

When exchanging parts, only original replacement parts, released from the manufacturer, must be used.

8 Parts Lists and Exploded Views

8.1 OptiLobe Pump Range



Pos.	Qty.	Denomination
1	1	Bearing housing
2	1	Dowel
3	4	Screw, rotorcase retention
5	1	Canister
6	4	Screw, canister retention
7	1	Lip seal, drive end
7a	1	Carrier, lip seal
9	1	Rotorcase
10	4	Screw, rotorcase cover
11	1	O Ring, rotorcase cover
12	1	Cover, rotorcase
16	2	Lip seal, gland end
17	2	Rotors
18	2	O Ring, rotor sealing shaft end
20	2	O Ring, rotor sealing nut end
21		O Ring, canister

Pos.	Qty.	Denomination
22	2	Nut, rotor retention
23	1	Key
24	1	Shaft, drive
25	1	Shaft, auxiliary
26	2	Bearing, rear
27	2	Shim, shaft abutment
30	2	Nut, bearing
31	2	Bearing, front
36	2	Timing gear
38	2	Torque locking assembly
40	12	Screw, torque locking assembly
45		Drain/Filler plug
49	2	Blanking plug
54	1	Foot
58	2	Screw, foot