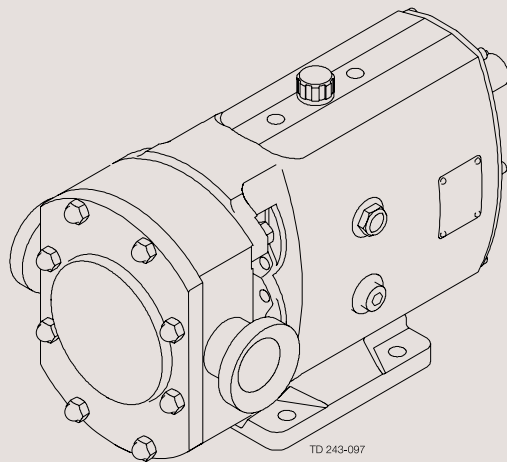


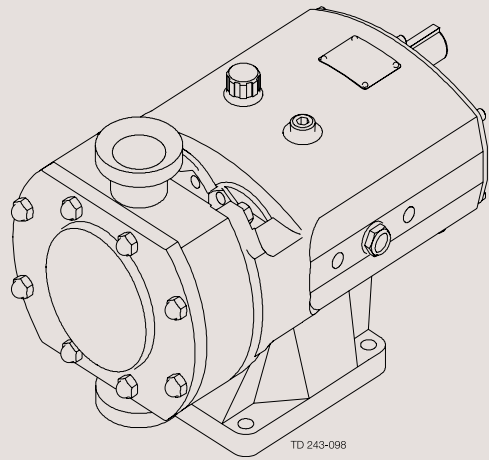


# Instruction Manual

## Rotary Lobe Pumps – SRU Range



TD 243-097



TD 243-098

ESE00693-EN15 2022-10

Original manual



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The information herein is correct at the time of issue but may be subject to change without prior notice

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# 1 Declarations of Conformity

## 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

SRU1, SRU2, SRU3, SRU4, SRU5, SRU6

Type

Serial number from E10.000 to E1.000.000

Serial number from AAX000000001 to AAX999999999

is in conformity with the following directives with amendments:

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

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

Global Product Quality Manager

Title

Lars Kruse Andersen

Name

Kolding, Denmark

Place

2022-10-01

Date (YYYY-MM-DD)



Signature

This Declaration of Conformity replaces Declaration of Conformity dated 2013-12-03



# 1 Declarations of Conformity

## 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

SRU1, SRU2, SRU3, SRU4, SRU5, SRU6

Type

Serial number from E10.000 to E1.000.000

Serial number from AAX000000001 to AAX999999999

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

Global Product Quality Manager

Title

Lars Kruse Andersen

Name

Kolding, Denmark

Place

2022-10-01

Date (YYYY-MM-DD)

Signature

DoC Revison\_01\_102022

**UK  
CA**



## 2 General information

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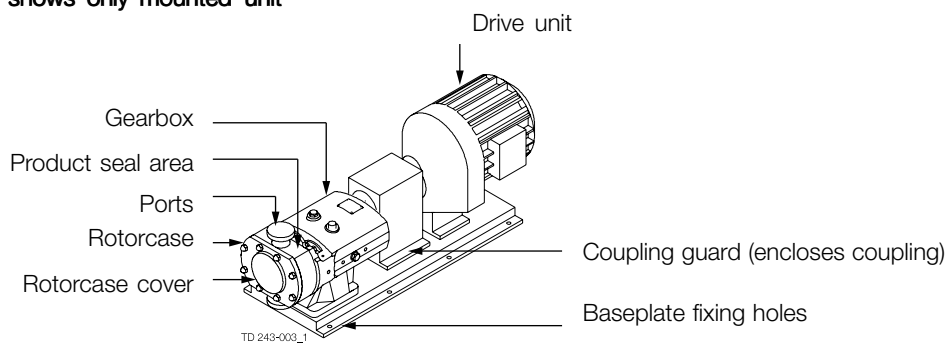
### 2.1 General information

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The SRU pump supplied is a positive displacement rotary lobe pump; it may be supplied with or without a drive unit (see drawing). The drawing shown indicates various parts of the pump unit.

The SRU range has a universal gearbox design which enables the flexibility of mounting pumps with the inlet and outlet ports in either a vertical or horizontal plane. The port orientation, vertical or horizontal, may be changed by moving one of two available bolt-on feet on the gearbox. Port orientation should be specified when ordering, but the alternative foot design allows pumps that are already installed being changed should the need arise.

#### 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.

#### Noise levels

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.

#### External Cleaning

Use cleaning fluids below PH 8. Cleaning fluids above PH 8 may cause some paint discolouration.

---

*Unsafe practices and other important information are emphasized in this manual.  
Warnings are emphasized by means of special signs.*

---

### 3.1 Important information

---

**Always read the manual before using the pump!**

**WARNING**

Indicates that special procedures must be followed to avoid serious personal injury.

**CAUTION**

Indicates that special procedures must be followed to avoid damage to the pump.

**NOTE**

Indicates important information to simplify or clarify procedures.

---

### 3.2 Warning signs

---

General warning:



Dangerous electrical voltage:



Caustic agents:



Not applicable for Atex applications



## 3 Safety

---

*Unsafe practices and other important information are emphasized in this manual.  
Warnings are emphasized by means of special signs.*

---

### 3.3 Safety precautions

---

#### Installation:

**Always** read the technical data thoroughly. (See chapter 6 Technical data)

**Never** start in the wrong direction of rotation with liquid in the pump.

**Never** put your hands or fingers inside the port connections or anywhere close to rotating parts.



**Always** have the pump electrically connected by authorized personnel. (see the motor instructions supplied with the drive unit)



#### Operation:

**Always** read the technical data thoroughly. (See chapter 6 Technical data)

**Never** touch the pump or the pipelines when pumping hot liquids or when sterilising.

**Never** stand on the pump or pipelines.

**Never** run the pump with both the suction side and the pressure side blocked.

**Never** put your hands or fingers inside the port connections or anywhere close to rotating parts.

**Never** run the pump unless fully assembled, i.e. pump head must not be removed from gearcase.



Only handle toxic and acidic liquids in accordance with the manufacturers instructions and recommendations.



#### Maintenance:

**Always** read the technical data thoroughly. (See chapter 6 Technical data)

**Never** service the pump when it is hot.

The pump and the pipelines must **never** be pressurised when the pump is serviced.

**Never** put your hands or fingers inside the port connections or anywhere close to rotating parts.

**Always** disconnect the power supply when servicing the pump.



#### Transportation:

##### Transportation of the pump or the pump unit:

**Never** lift or elevate in any way other than described in this manual

**Always** drain the pump head and accessories of any liquid

**Always** ensure that no leakage of lubricants can occur

**Always** transport the pump in it's upright position

**Always** ensure that the unit is securely fixed during transportation

**Always** use original packaging or similar during transportation

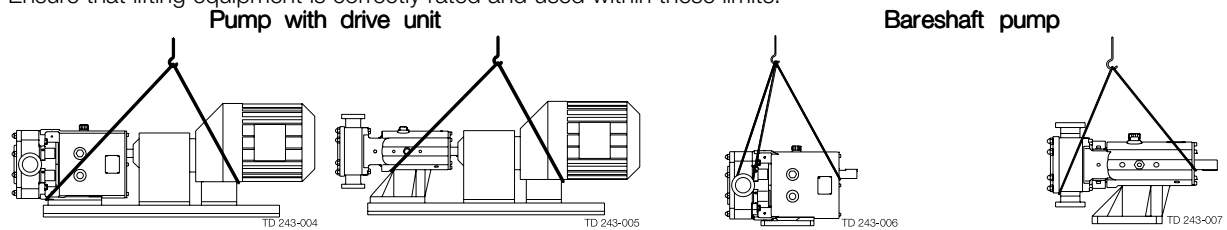


### 4.1 Unpacking, handling and storage

#### Step 1

Refer to the pump weights guide (6 Technical data) before selecting and using any lifting gear. The drawings show how the pump should be lifted.

Ensure that lifting equipment is correctly rated and used within these limits.



#### Step 2

##### On receipt always:

- Check the delivery note against the goods received.
- If motorised, check that the drive instructions are available.
- Be careful not to discard any manuals that may be enclosed with the packaging.
- 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.
- Report any damage immediately to the carrier.

#### Step 3

**After receipt and inspection, if the pump is not to be installed immediately, the pump should be repacked 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.
- Rotate the pump/pump unit by hand weekly, to prevent bearing damage.
- All associated ancillary equipment should be treated similarly.

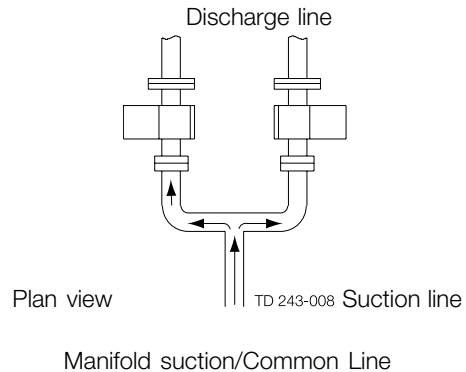
## 4 Installation

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 System design and installation

#### 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.



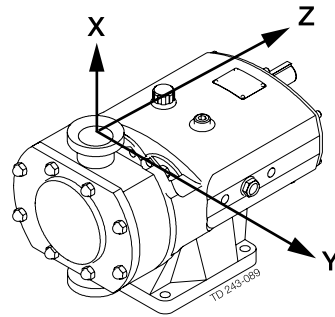
#### Pipework:

All pipework must be supported. The pump must not be allowed to support any of the pipework weight beyond the limits set as shown in the following table.

#### Remember:

Pipework supports must also support the weight of the product being pumped.

- Design short straight suction lines to reduce friction losses in the pipework thereby improving the NPSH available from the system.
- Avoid bends, tees and any restrictions close to either suction or discharge side of pump. Use long radius bends wherever possible.
- Provide isolating valves on each side of the pump when necessary.
- Keep pipework horizontal where applicable to reduce air locks. Include eccentric reducers on suction lines.



## 4 Installation

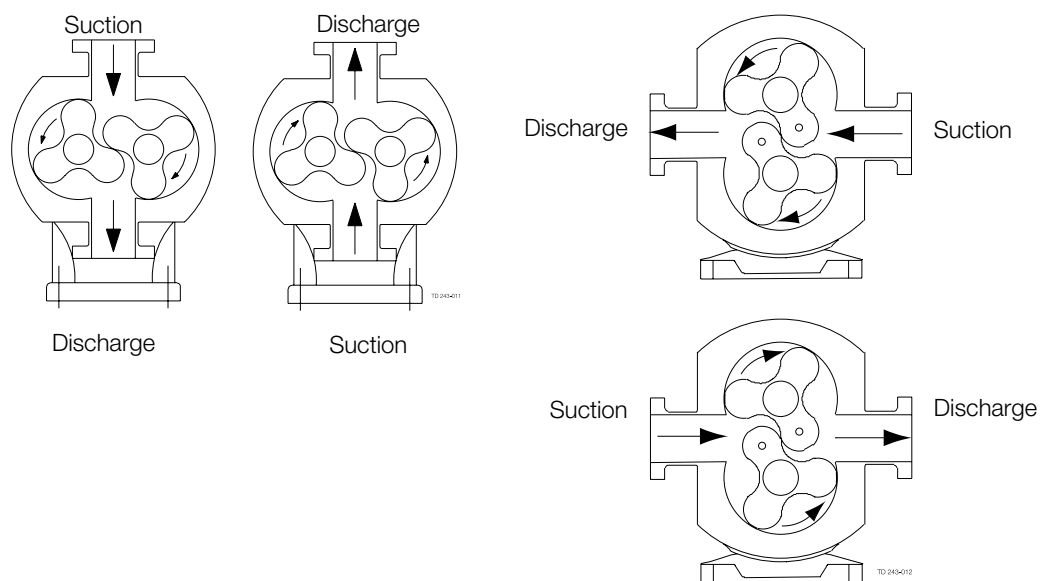
To ensure optimum operation it is important that any pump unit is installed correctly. When designing a pumping system the following should be taken into consideration.

**Table of Maximum Forces and Moments**

| Pump Model | Units | Forces |     |     |     | Moments |     |     |     |     |
|------------|-------|--------|-----|-----|-----|---------|-----|-----|-----|-----|
|            |       | FZ     | FY  | FX  | EF  | MZ      | MY  | MX  | EM  |     |
| SRU1       | N     | 80     | 60  | 70  | 120 | Nm      | 75  | 90  | 115 | 165 |
|            | lbf   | 18     | 13  | 16  | 27  | lbft    | 55  | 66  | 85  | 122 |
| SRU2       | N     | 125    | 100 | 110 | 195 | Nm      | 90  | 105 | 130 | 190 |
|            | lbf   | 28     | 22  | 25  | 44  | lbft    | 66  | 77  | 96  | 140 |
| SRU3/4     | N     | 165    | 135 | 150 | 260 | Nm      | 100 | 115 | 140 | 205 |
|            | lbf   | 37     | 30  | 34  | 58  | lbft    | 74  | 85  | 103 | 151 |
| SRU5/6     | N     | 300    | 250 | 250 | 460 | Nm      | 125 | 145 | 175 | 260 |
|            | lbf   | 67     | 56  | 56  | 103 | lbft    | 92  | 107 | 129 | 192 |

### 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 Installation

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.

### Pump Lubrication:

The pump will not be supplied pre-filled with oil therefore this table must be used to select recommended oil.

Oil changing: Oil level must be checked with the pump static.

First change: After 150 hours of operation, thereafter every 3000 hours of operation.

Oil filling: Fill with oil through the filler plug to the level indicated in the sight glass.

### NOTE!

On horizontally ported pumps the sight glass must be fitted to the upper hole on the side of the gearcase. Refer to 6 Technical data for oil approximate quantities required

| Recommended Oils                    |                                      |   |
|-------------------------------------|--------------------------------------|---|
| Pump Operating Temperature          |                                      | Food grade oils (USDA H1)                   |
| -20°C to +130°C<br>(-4°F to +266°F) | +130°C to 200°C<br>(+266°F to 392°F) | -20°C to +130°C<br>(-4°F to +266°F)         |
| BP Energol GR - XP150               | BP Enersyn SG-XP150                  | Bel-Ray No-Tox HD Food Grade Oil 150 #62686 |
| Castrol Alpha SP150                 | Castrol Alphasyn PG150               | Mobil SHC Cibus 150                         |
| Mobil Mobilgear 600 XP150           | Mobil Glygoyle 30                    | Castrol Optileb GT150                       |
| Shell Omala S2 G150                 | Shell Omala S4 WE150                 |   |
| Texaco Meropa 150                   | Texaco Synlube CLP220                |   |
| Esso Spartan EP150                  | Mobil Glygoyle 22                    |   |

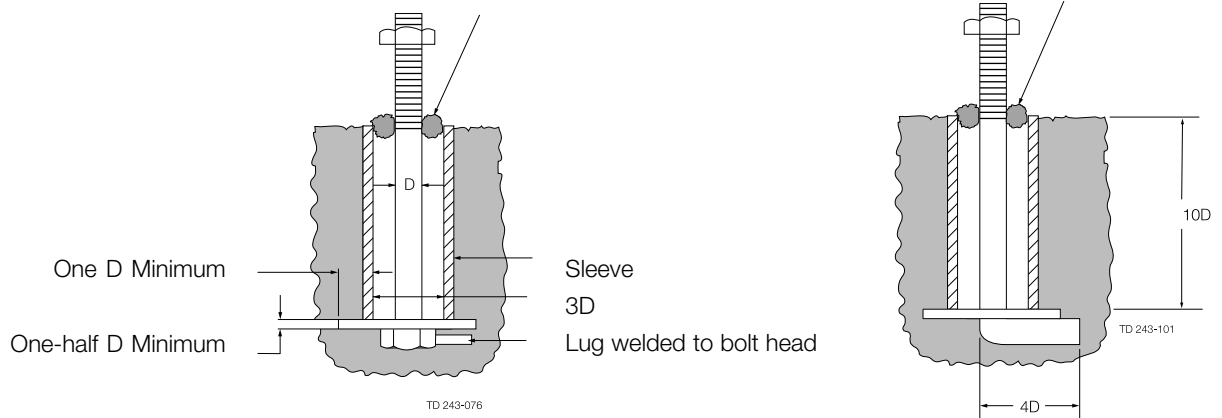
For ATEX applications refer to ATEX addendum manual.

### 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.

Waste put around bolt before pouring concrete

Foundation surface left through to anchor ground



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.

## 4 Installation

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.

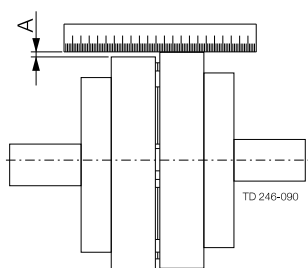
### Coupling alignment:

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

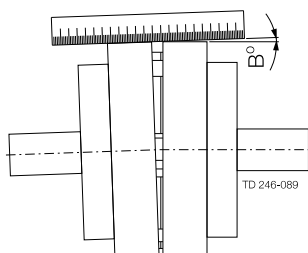
Measure 4 positions at 90° around coupling



| 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              |

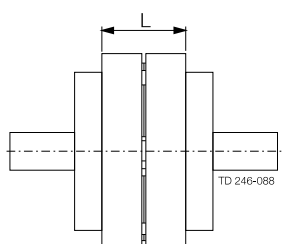
### Angular misalignment

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 ± 1.0mm |
|---------------|---------------------|
| 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 Installation

*This page is not applicable for ATEX applications.  
For ATEX application see ATEX addendum*

### 4.3 Flushing seal arrangement and pre-start up checks

#### Step 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 Step 5).
- 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.

#### Step 2

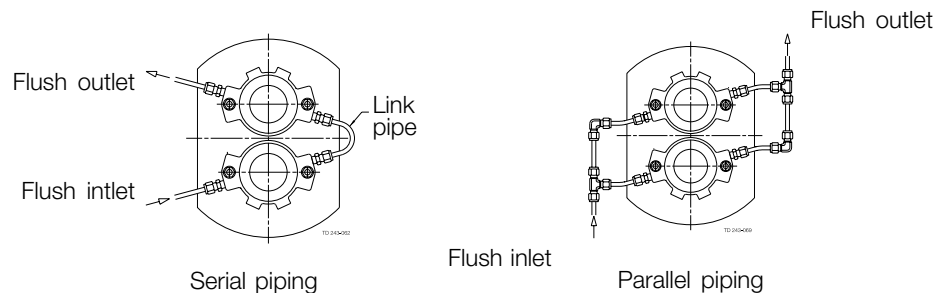
##### Connecting the flush

**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.

#### Step 3

##### Flushing arrangements in principle



#### Step 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 both single and flushed mechanical seal arrangements the temperature of flush media should never be allowed to exceed the maximum temperature of the pumped media. For advice on selecting a suitable flushing fluid please contact pump supplier.

#### Step 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. Double mechanical seal/flushed packed gland 1.0 bar (14 psi) higher pressure than the discharge of the pump. If the discharge pressure fluctuates set the pressure to suit maximum condition.

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**

#### Step 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 Recycling information

---

#### **Recycling information.**

##### **• Unpacking**

- Packing material consists 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 and wear parts in the machine are replaced.
- All metal parts should be sent for material recycling.
- Worn out or defective electronic parts should be sent to a licensed handler for material recycling.
- Oil and all non metal wear parts must be taken care of in agreement with local regulations.

##### **• Scrapping**

- At end of use, the equipment shall be recycled according to relevant, local regulations. Beside 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 the local Alfa Laval sales company.
-

## 5 Maintenance

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### 5.1 Cleaning in place (CIP)

---

The pump can be manually cleaned or cleaned in place (CIP). The following is an example of a typical CIP procedure. However specific advice for each application should be sought from the pump supplier.

#### Typical CIP procedure

1. Flush through the system with cold water or bore water (6°C) (43°F).
  2. Run hot caustic soda (70-80°C) (158-176°F) at 2.5% dilution through the system for 20-30 minutes.
  3. Final flush through with cold water again.
- 

#### Warnings

**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.





## 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 oil level in the gearcase with the pump stationary.
- Checking the seals for leakage.
- Checking the oil 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.

Oil should be changed every 3000 hours of operation or a period of 2 years, whichever is the soonest.

### Recommended Spare Parts

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

| Part description               | Quantity |
|--------------------------------|----------|
| Lip seal drive end             | 1        |
| O-ring rotorcase cover         | 1        |
| Lip seal gland end             | 2        |
| O-ring rotor sealing shaft end | 2        |
| O-ring rotor sealing nut 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 discoloration, 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 5.3 Dismantling, step Step 1).
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 table 6.1.3 on page 38).
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 thru 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 Maintenance

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### 5.3 Dismantling

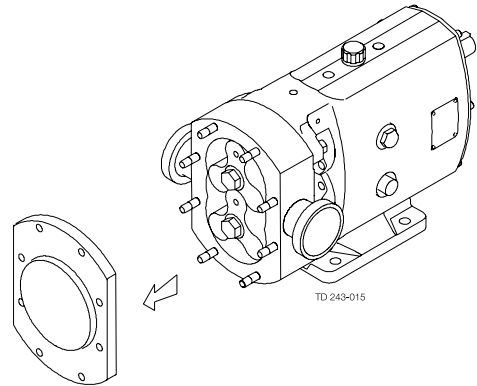
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#### Step 1

Before dismantling the pump refer to safety precautions. See exploded view drawings (chapter 7 Parts list).

#### Removing rotorcase cover

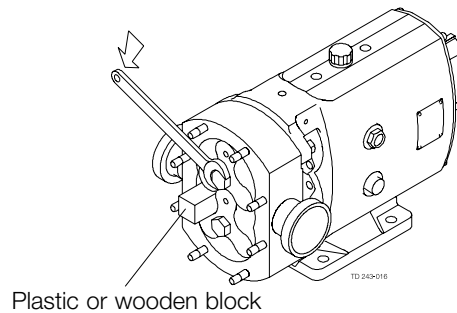
1. Remove rotorcase cover nuts (13) and cover (12).



#### Step 2

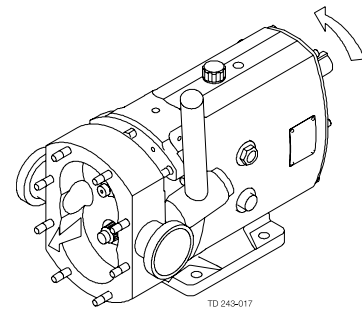
#### Removing rotors

1. Insert a plastic/wooden block between the two rotors (17) to stop them turning.
2. Remove rotor retention nuts (22) and rotors. Pump series 6 rotors are retained by torque locking assemblies, TLA's (19) and can be removed by:
  - Remove the rotor cap to reveal the TLA.
  - The screws now visible are unscrewed and the TLA is removed.



#### Step 3

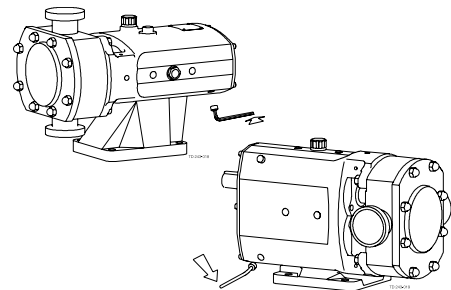
1. For packed gland seals loosen the gland followers to relieve the packing pressure on the shaft. For flushed mechanical seal arrangements, remove the seal housing retaining nuts and ease the seal housings from the rotorcase.
2. Remove rotorcase retaining nuts (4) and washers (4A).
3. Tap both sides of the rotorcase (9) with a soft mallet.
4. Take care not to damage mechanical seals. The rotorcase must not be allowed to drop onto the shafts (24 and 25) during the removal process.
5. Shims (8) should not be removed unless rotor clearances require resetting.



#### Step 4

#### Draining pump lubrication

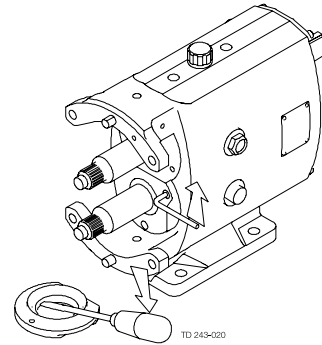
1. Place a tray under the gearcase to collect the waste lubricating oil.
2. Remove the lower drain plug (45) at the side of the gearcase (1).



### Step 5

#### Removing seal retainers

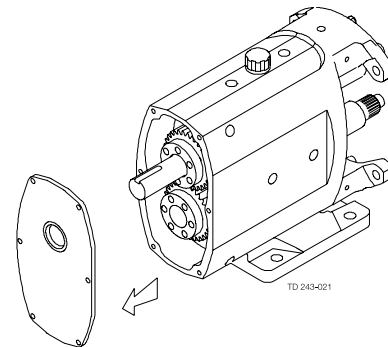
1. Remove screws (15).
2. Then remove seal retainers (14) - as a liquid sealant has been used a lever may be required to remove retainers.
3. The lip seals (16) can be removed using a screwdriver/ lever once the seal retainers are removed. It is essential to renew the lip seals and it is recommended that new gaskets or sealant be used prior to reassembly.



### Step 6

#### Removing Gearcase Cover

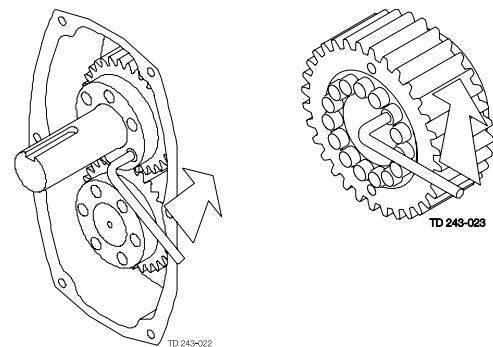
1. Remove screws (6).
2. Remove gearcase cover (5) after breaking the gasket seal then press out the lip seal (7). It is essential to renew the lip seal prior to reassembly.



### Step 7

#### Removing timing gears

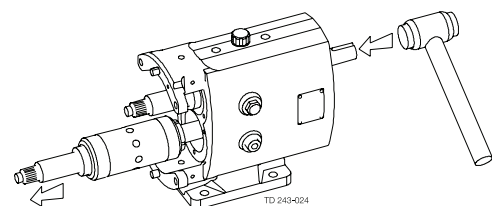
1. Release clamp plate screws (40) and remove clamp plate (39) on pump series 1,2 and 3. For pump series 4,5 and 6 remove the torque locking assembly screws in several stages.
2. Remove gears (36) using the tapped extraction holes provided, or remove shaft assembly as shown in step 8 below.



### Step 8

#### Shaft assembly removal

1. Using a soft mallet gently tap the rear end of each shaft (24 and 25), to remove through the front of the gearcase (1).
2. Support each shaft during removal from the gearcase.
3. Remove the shaft abutment spacer (27).
  - For vertically ported pumps this is placed in the right hand bearing bore when viewed on the front face of the gear case.
  - For horizontally ported pumps the shaft abutment spacer is placed in the top bearing bore.



## 5 Maintenance

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### Step 9

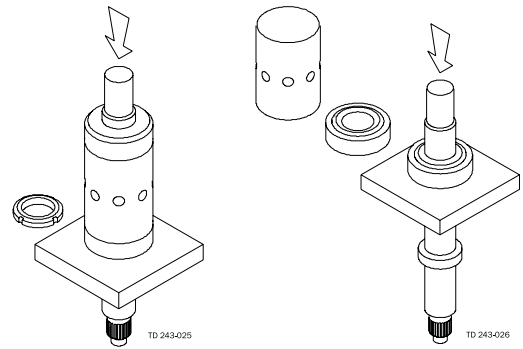
#### Bearing removal

1. Hold the shafts (24 and 25) in a vice using soft jaws to protect the areas where the seals will be located.
2. Remove the bearing nuts (30) with a 'sharp tap' on a 'C' spanner. The nuts may be tight all the way off as they are fitted with thread locking adhesive.
3. Mount the shaft vertically in a press with a tool positively located against the bearing inner as shown and apply pressure to the top of the shaft so that the shaft moves through the bearings (26 and 31).
4. Remove each bearing set (inner and outer). Good engineering practice suggests that if bearings are removed from the shafts for any reason they should be renewed.

**Clean and examine all components for wear or damage.**

**Renew where necessary.**

---



## 5.4 Assembly

### 5.4.1 Fitting bearings to shafts

Take care not to damage shaft surfaces, in particular where the seals will be located. Ensure all fastenings are tightened to torque settings as shown in 6 Technical data.

On series 1, 2 and 3 pumps, bearings do not require heating. For series 4, 5 and 6 pumps, heat the bearing inner cones to 110°C (230°F).

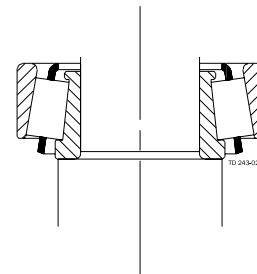
**Do not use any form of live flame when heating, as this will damage bearings.**

#### Step 1

Position shaft (24 and 25) vertically in a vice using soft jaws and apply anti-seize compound to the bearing diameters.

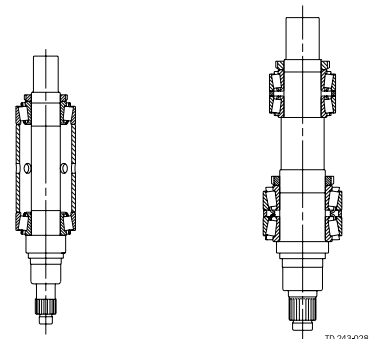
#### Step 2

Place the inner cone on the shaft ensuring a positive fit against the shaft shoulder.



#### Step 3

Locate outer cup, bearing spacer (32) and rear bearing cup.



#### Step 4

Allow bearings to cool (series 4, 5 and 6 pumps only). Failure to do so will result in incorrectly set bearings.

1. Apply Permabond Grade 145 or equivalent locking compound to the bearing nut thread.
2. Tighten the bearing nut (30), whilst at the same time rotating the bearings (26 and 31) and spacer (32). The bearings are correctly adjusted when the spacer can only be moved with a light tap of a mallet.
3. Repeat the above for double bearing assemblies.
4. Apply oil to the bearings.

## 5 Maintenance

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### 5.4.2 Fitting Shaft Assemblies

#### Step 1

Replace the shaft abutment spacer (27).

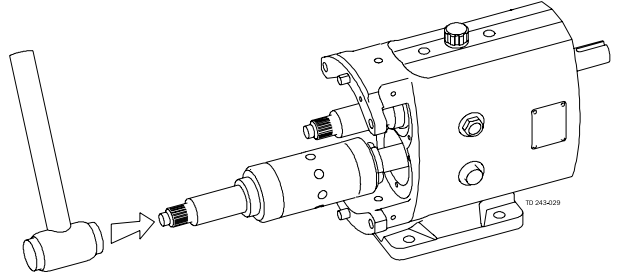
- For vertically ported pumps this is placed in the right hand bearing bore when viewed on the front face of the gearcase.
- For horizontally ported pumps the shaft abutment spacer is placed in the top bearing bore.

#### Step 2

Identify drive and auxillary shaft positions according to gearcase cover (5) orientation.

#### Step 3

1. Using a soft faced mallet tap the shafts (24 and 25) into the gearcase (1).
2. If the bearings have been replaced, a new abutment spacer will probably be needed. It is vital to ensure the rotor alignments is within the limits set in section 5.4.4.



### 5.4.3 Fitting seal retainers

#### Step 1

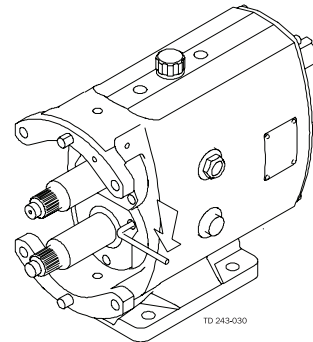
Clean the rear face of the seal retainers (14), fit in position and tighten.

#### Step 2

1. Check rotor alignment is correct by referring to the rotor abutment alignment in section 5.4.4.
2. When rotor alignment is correct remove seal retainers and press new lip seals (16) into seal retainers. For temperatures greater than 130oC (266oF) FPM lipseals are fitted.
3. Apply liquid sealant onto the front of the gearcase (1) and push the seal retainers into position. Make sure lip seals are not damaged when sliding them onto the shafts.

#### Step 3

Replace and tighten the screws (15).



### 5.4.4 Checking rotor abutment alignment

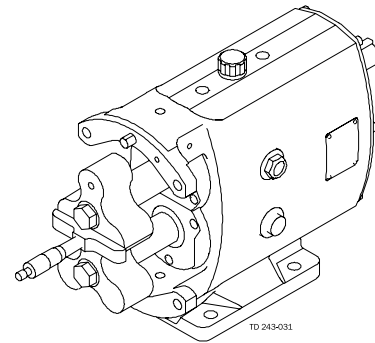
#### Step 1

**Incorrect setting of rotor alignment will damage the pump.**

Fit rotors onto shafts (24 and 25) and tighten rotor retention nuts (22).

#### Step 2

1. Using a depth micrometer ensure axial alignment is within tolerance of 0.012mm (0.0005 in).
2. If the alignment is incorrect, the shaft abutment spacer (27) must be replaced/machined.



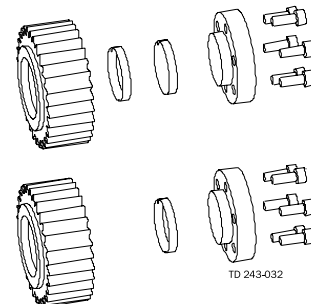
### 5.4.5 Fitting timing gears

#### Step 1

Slide timing gears (36) onto shafts (24 and 25), realigning timing marks.

#### Step 2

1. Before fitting the torque locking devices (38) lubricate them with gear oil. Series 1, 2 and 3 high pressure pumps (i.e. LD and HD models) have two sets of elements.
2. Series 4, 5 and 6 pumps have torque locking assemblies.



#### Step 3

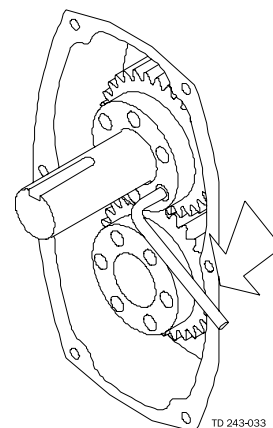
Fit timing gear clamp plates (39) - series 1, 2 and 3 only.

Fit torque locking assemblies (37) - series 4, 5 and 6 only.

#### Step 4

Timing adjustment is now required:

Tighten one clamp plate/torque locking assembly only, allowing rotation of the shaft in the other gear for timing adjustment. See Adjusting Rotor Timing section 5.4.6.



## 5 Maintenance

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### 5.4.6 Adjusting rotor timing

#### Step 1

If the rotor timing requires adjustment (and assuming the pump has not yet been re-built), it is important to establish the cause for the rotors mistiming before proceeding.

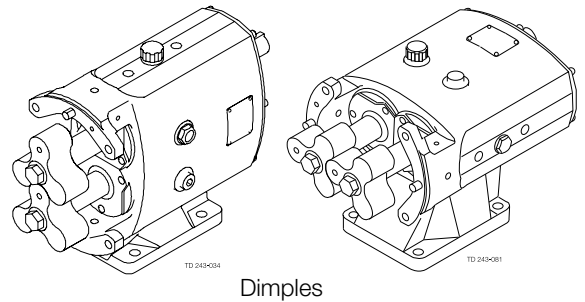
To allow timing adjustment ensure that one shaft is able to rotate within the torque locking assembly/element. The other torque locking assembly/element should be tightened to the recommended torque.

---

#### Step 2

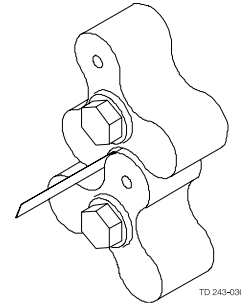
Set the rotors (17) to the positions shown with the rotor dimples in the 6-12 o'clock plane (horizontally ported pumps) or 3-9 o'clock plane (vertically ported pumps).

For the rotor on the drive shaft the rotor dimple should be aligned with the drive shaft keyway.



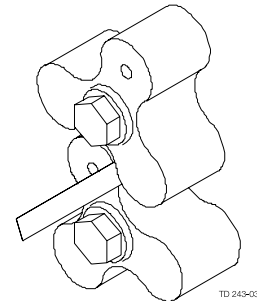
#### Step 3

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



#### Step 4

Using feeler gauges measure between the points indicated, turning the shaft as required.



#### Step 5

If the measurement points are unequal tap the rotor which is on the free turning shaft until equal measurement through 6 points is achieved.

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#### Step 6

Tighten the torque locking assemblies or clamp plate screws. Confirm timing is still correct. Remove the rotors.



### 5.4.7 Fitting gearcase cover

#### Step 1

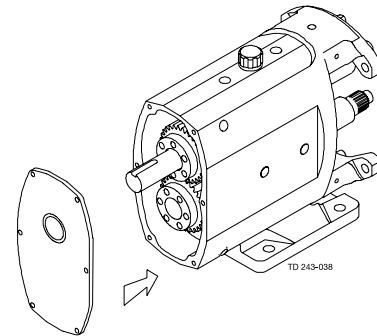
Clean the gearcase cover bore and remove all gasket material from the face. Press a new lip seal (7) into the cover (5). For temperatures greater than 130°C (266°F) FPM lip seals are fitted.

#### Step 2

Apply liquid gasket to the face of the cover where it mates with the gearcase.

#### Step 3

Smear oil on the inner lip of the lip seal and carefully slide the cover over the shaft ensuring the lip seal is centred and not cut or damaged. Tighten the screws (6).



### 5.4.8 Fitting and shimming rotorcase

The rotorcase may require re-shimming if new components have been fitted. Back clearances must be checked before operating the pump. See 5.2 Pumphead Clearance information.

#### NOTE!

Your supplier can advise the correct clearances from the pump serial number. Should they need adjustment follow steps below. Any incorrect setting of clearances is likely to damage the pump in operation. Plastic shims vary in colour for different thickness, and are grouped in packs at the top and bottom of the rotorcase held in place by shim retainers. For temperatures greater than 130°C (266°F) and/or for ATEX stainless steel shims are fitted. Shims can be stacked unequally providing the clearances are achieved.

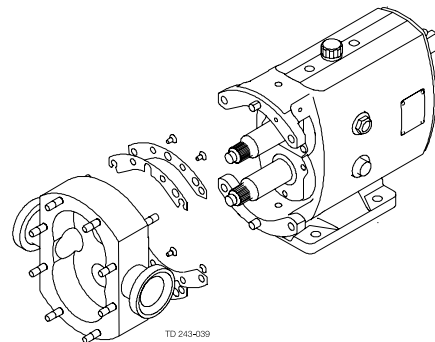
#### Step 1

1. Remove the shim retainers (8A) and fit one of the thinnest shims (8) to top and bottom position.
2. Replace shim retainers and screws (8B).
3. Fit the rotorcase (9) to the gearcase (1), tighten the rotorcase retaining nuts (4) and fit the rotors (17).

The back clearances can now be measured using feeler gauges. The additional shimming required to bring the clearances within tolerance can be determined, fit additional shims and re-check the clearances.

#### Step 2

Remove the rotorcase to allow fitting of product seals.



## 5 Maintenance

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### 5.4.9 Fitting primary seals

#### Step 1

Refer to section 5.5 for seal fitting instructions.

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### 5.4.10 Fitting rotors

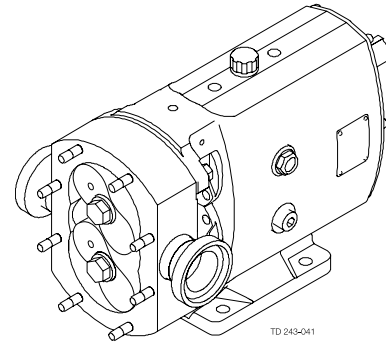
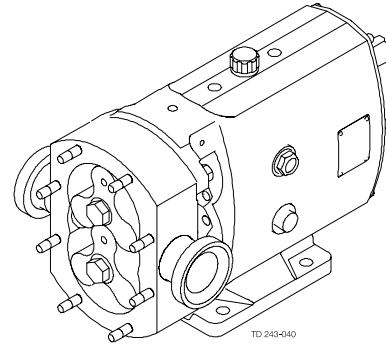
#### Step 1

1. Fit new rotor O rings (18).
2. Fit rotors (17) onto the shafts (24 and 25) with both dimpled rotor master lobes in the 6 -12 o'clock position (horizontally ported pumps) or 3-9 o'clock position (vertically ported pumps). For the rotor on the drive shaft the rotor dimple should be aligned with the drive shaft keyway.

For series 6 pumps the rotors are retained by torque locking assemblies, TLA's. Slide the TLA assembly onto the shaft. Locate the clamp plate tool and tighten to the recommended torque figure. Tighten the TLA screws to the recommended torque figure. Unscrew the clamp plate tool and remove. Replace the rotor cap and tighten to the recommended torque figure.

#### For Bi-lobe rotors:

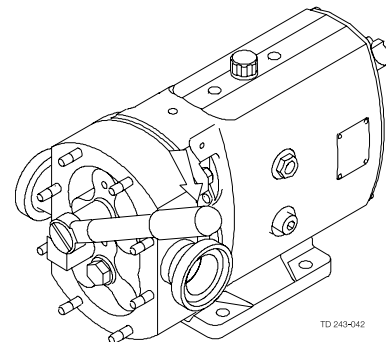
Fit rotors (17) onto the shafts (24 and 25) at an angle of 45° as shown. Rotate pump one full revolution ensuring there is no rotor contact.



#### Step 2

Fit new O rings (20) to rotor retention nuts (22).

Use a wooden/plastic block between the rotors to stop them turning whilst tightening the rotor retention nuts to the recommended torque settings shown in Technical Data (chapter 6 Technical data).



#### Step 3

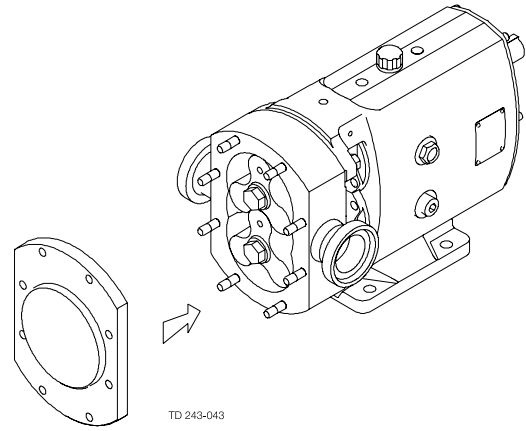
To check rotors are correctly synchronised turn the drive shaft (24) by hand and check meshing clearances with feeler gauges against recommended clearance figures as shown in 6.2 Pumphead Clearance information.

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### 5.4.11 Fitting rotorcase cover

#### Step 1

1. Lightly smear new O-ring (11) in grease and fit to rotorcase cover (12).
2. Fit rotorcase cover onto rotorcase (9) and tighten rotorcase cover nuts (13).
3. Refer to pump start up checks prior to operation.



## 5 Maintenance

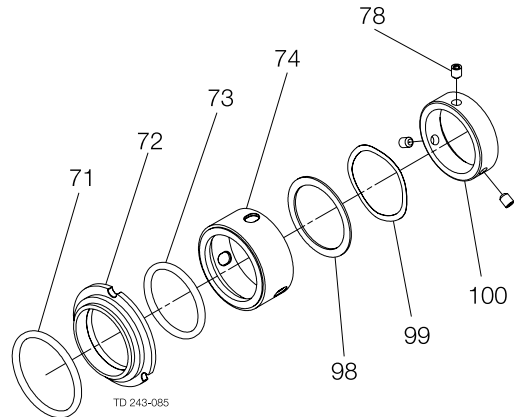
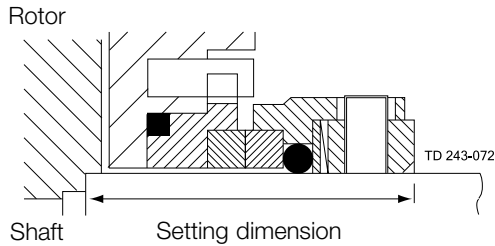
This page is not applicable for ATEX applications.  
For ATEX application see ATEX addendum



### 5.5 Primary seals removal and fitting

#### 5.5.1 R90 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 elastomeric parts should be fitted during assembly.



| Pump | Setting Dimension |      |
|------|-------------------|------|
|      | mm                | in   |
| SRU1 | 33.6              | 1.32 |
| SRU2 | 35.6              | 1.40 |
| SRU3 | 38.1              | 1.50 |
| SRU4 | 39.6              | 1.56 |
| SRU5 | 47.6              | 1.87 |
| SRU6 | 50.7              | 2.00 |

| Item | Description  |
|------|--|
| 71   | Stationary seal ring O-ring  |
| 72   | Stationary seal ring   |
| 73   | Rotary seal ring   |
| 74   | Rotary seal assembly comprising of rotary seal ring, washer (98), wave spring (99), drive ring (100) and grub screw (78) |

#### Seal removal

1. Remove rotorcase cover, rotors and rotorcase.
2. Extract the stationary seal ring (72) and O-ring (71) from the rotorcase.
3. Loosen the grub screws (78).
4. Remove the rotary seal assembly (74) from the shaft.
5. Remove abutment spacer if fitted.
6. Extract the rotary seal O-ring (73) from the rotary seal assembly.

#### Seal fitting

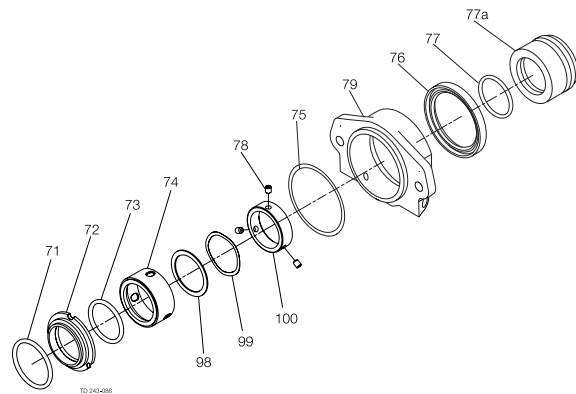
1. Mark the shaft to indicate the seal setting length, shown in table above.
2. Lightly lubricate O-rings (71) with appropriate grease and fit to stationary seals (72).
3. Press the stationary seal rings into the rotorcase seal bores by aligning cut outs with the anti-rotation pins.
4. Wipe clean the stationary seal faces with solvent.
5. Lightly lubricate shafts and if fitted, replace seal abutment spacers pressing them over shafts against the shaft shoulder.
6. Lightly lubricate O-rings (73) and fit to rotary seal ring (74).
7. Adjust rotary seal assembly grub screws (78) to ensure that screws do not foul on shafts when fitted.
8. Slide rotary seal assembly on to the shafts until aligned with the setting dimension mark.
9. Tighten the grub screws to the recommended torque figure in table 6.1.3.
10. Wipe clean the rotary sealing faces with solvent.
11. Refit the rotorcase, rotors and front cover.

*This page is not applicable for ATEX applications.  
For ATEX application see ATEX addendum*



### 5.5.2 R90 Single flushed/quench mechanical seal

| Item | Description                 |
|------|-----------------------------|
| 71   | Stationary seal ring O-ring |
| 72   | Stationary seal ring        |
| 73   | Rotary seal ring O-ring     |
| 74   | Rotary seal ring assembly   |
| 75   | Seal housing O-ring         |
| 76   | Seal housing lip seal       |
| 77   | Spacer O-ring               |
| 77a  | Spacer                      |
| 79   | Seal housing                |



The Rotary Seal Assembly (74) comprises of rotary seal ring, washer (98), wave spring (99), drive ring (100) and grub screw (78)

#### Seal removal:

1. Ensure the flush media is turned off and disconnect the flushing pipework.
2. Remove rotorcase cover and rotors.
3. Remove the seal housing nuts and separate the seal housings (79) from the rotorcase.
4. Remove the rotorcase.
5. Extract the seal housing O-ring/gasket (75), stationary seal ring (72) and O-ring (71) from the rotorcase.
6. Remove the seal housing and extract the lip seal (76) using a screwdriver or lever taking care not to damage the seal housing.
7. Remove the rotary seal assembly (74) from the shaft by loosening the grub screws (78).
8. Slide off shaft the abutment spacer (77A).
9. Extract the rotary seal O-ring (73) from the rotary seal assembly.

#### Seal fitting:

1. Lightly lubricate O-rings (71) with appropriate grease and fit to stationary seal rings (72)
2. Press the stationary seal rings into the rotorcase seal bores by aligning cut outs with the anti-rotation pins.
3. Wipe clean the stationary seal faces with solvent.
4. Lightly lubricate lip seal (76) and seal housing bore with appropriate grease.
5. Press lip seals into seal housings (79).
6. Lightly lubricate spacer O-ring (77) and fit into groove in spacer (77A).
7. Lightly lubricate shafts and fit spacer pressing them over shafts against the shaft shoulder.
8. Slide seal housing over spacer (for SRU1-3 only).
9. Lightly lubricate O-rings (73) and fit to rotary seal ring (74).
10. Adjust rotary seal assembly grub screws (78) to ensure that screws do not foul on shafts when fitted.
11. Slide rotary seal assemblies on to the shafts up to the spacers.
12. Tighten the grub screws to the recommended torque figure in table 6.1.3..
13. Wipe clean the rotary sealing faces with solvent.
14. Fit O-ring/gasket (75) into rotorcase bores.
15. For SRU4-6 only, fit seal housings with retaining nuts and washers to back of rotorcase and refit the rotorcase.
16. For SRU1-3 only, carefully align all 8 studs and pull seal housings on to the 4 seal housing studs with retaining nuts and washers to back of rotorcase and refit the rotorcase.
17. Refit the rotors and rotorcase cover

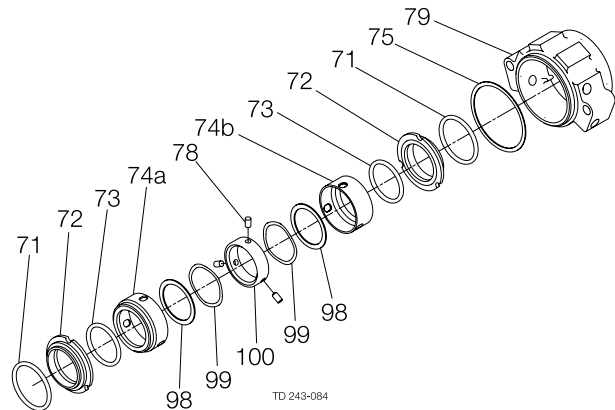
## 5 Maintenance

This page is not applicable for ATEX applications.  
For ATEX application see ATEX addendum



### 5.5.3 R90 Double flushed mechanical seal

| Item | Description                          |
|------|--------------------------------------|
| 71   | Stationary seal ring O-ring          |
| 72   | Stationary seal ring                 |
| 73   | Rotary seal ring O-ring              |
| 74a  | Rotary seal ring assembly - inboard  |
| 74b  | Rotary seal ring assembly - outboard |
| 75   | Seal housing O-ring                  |
| 79   | Seal housing                         |



The Rotary Seal Assembly Inboard (74A) comprises of rotary seal ring, washer (98), wave spring (99) and drive ring (100). The Rotary Seal Assembly Outboard (74B) comprises of rotary seal ring, grub screw (78), washer (98) and wave spring (99).

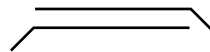
#### Seal removal:

1. Ensure the flush media is turned off and disconnect the flushing pipework.
2. Remove rotorcase cover and rotors.
3. Turn the drive shaft until the drive ring grub screws (78) are visible through the flushing connections.
4. Loosen the grub screws.
5. Remove the rotorcase.
6. Remove seal housings (79) complete with rotary seal assemblies (74A and 74B) and outboard stationary seals.
7. Extract the seal housing O-ring (75), stationary seal ring (72) and 'o' ring (71) from the rotorcase.

#### Seal fitting:

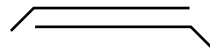
Ensure seal orientation is correct.

Outboard



Series 1, the outboard seal fits over the inboard seal.

Inboard  
Inboard



Series 2-6, the inboard seal fits over the outboard seal.

Outboard

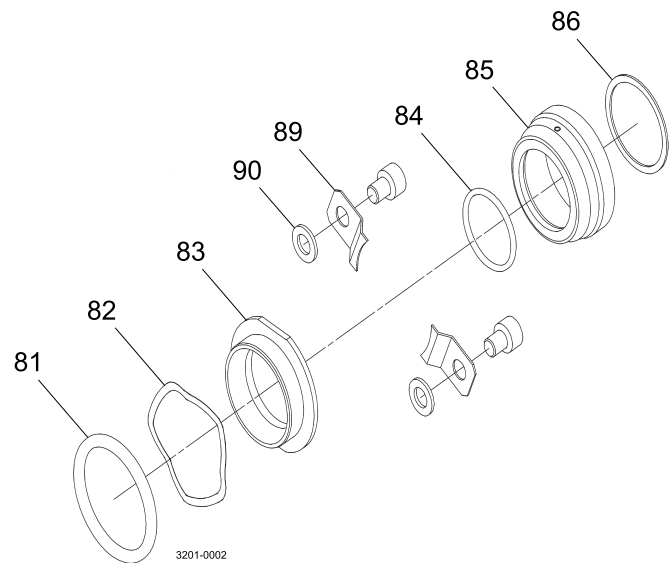
1. Lightly lubricate O-rings (71 and 73) with appropriate grease and fit to rotary seal assemblies and stationary seal rings (74A, 74B and 72).
2. Fit stationary seals into the rotorcase bores and seal housings (79).
3. Fit O-ring (75) into the rotorcase bores.
4. Wipe clean the sealing faces with solvent.
5. Locate rotary seal assemblies and fit the seal housings to the rotorcase ensuring that the grub screws (78) are accessible so they can be tightened.
6. Refit the rotorcase.
7. Turn the drive shaft until the grub screws are visible through the flushing connections.
8. Tighten the grub screws to the recommended torque figure in .
9. Refit the rotors and rotorcase cover.

*This page is not applicable for ATEX applications.  
For ATEX application see ATEX addendum*



#### 5.5.4 Hyclean single mechanical seal

| Item | Description          |
|------|----------------------|
| 81   | Rotorcase O-ring     |
| 82   | Wave spring          |
| 83   | Stationary seal ring |
| 84   | Shaft O-ring         |
| 85   | Rotary seal ring     |
| 86   | Washer               |
| 89   | Clip                 |



#### Seal removal:

1. Remove rotorcase cover, rotors and rotorcase.
2. Undo screws and remove clips (89) and washers (90) from the rotorcase.
3. Remove the stationary seal rings (83), wave springs (84) and rotorcase O-rings (81) from the rotorcase.
4. Remove the rotary seal rings (85) and rubber washers (86) from the shafts.
5. Remove the shaft O-rings (84) from the shafts.

#### Seal fitting:

1. Lightly lubricate shaft O-rings (84) with appropriate grease and fit to shafts.
2. Lightly lubricate both sides of rubber washer (86) and fit to rotary seal rings (85) ensuring location under the drive pin.
3. Slide the rotary seal rings on to the shafts lining up pins to slots on the shafts.
4. Lightly lubricate rotorcase O-rings (81) with appropriate grease and fit to rotorcase.
5. Fit wave springs (82) into the rotorcase seal bores.
6. Press the stationary seal rings (83) into the rotorcase, lining up slots.
7. Replace clips (89) and washers (90) by tightening screws.  
Note: For SRU1-5 pump models the washer is placed underneath the clip but for SRU6 pump models the washer is placed on top of the clip.
8. Wipe clean the sealing faces with solvent.
9. Refit the rotorcase, rotors and rotorcase cover.

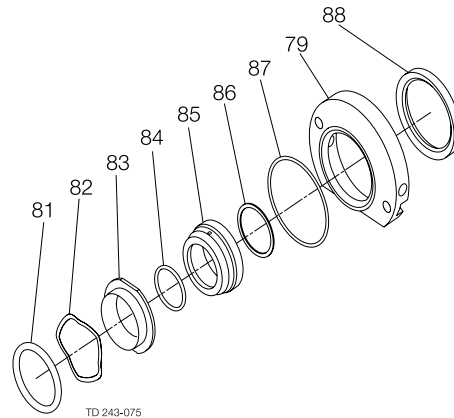
## 5 Maintenance

*This page is not applicable for ATEX applications.  
For ATEX application see ATEX addendum*



### 5.5.5 Hyclean single flushed/quench mechanical seal

| Item | Description          |
|------|----------------------|
| 79   | Seal housing         |
| 81   | Rotorcase O-ring     |
| 82   | Wave spring          |
| 83   | Stationary seal ring |
| 84   | Shaft O-ring         |
| 85   | Rotary seal ring     |
| 86   | Washer               |
| 87   | Seal housing O-ring  |
| 88   | Lip Seal             |



#### Seal removal:

1. Ensure the flush media is turned off and disconnect the flushing pipework.
2. Remove rotorcase cover, rotors and rotorcase.
3. Undo the seal housing screws and remove the seal housings (79) and lip seals (88).
4. Remove the stationary seal rings (83), seal housing O-rings (87) and wave springs (82) from the rotorcase.
5. Remove the rotorcase O-rings (81) from the rotorcase.
6. Remove the rotary seal rings (85), rubber washers (86) and shaft O-rings (84) from the shafts.

#### Seal fitting:

1. Lightly lubricate shaft O-rings (84) with appropriate grease and fit to shafts.
2. Lightly lubricate both sides of rubber washer (86) and fit to rotary seal rings (85) ensuring location under the drive pin.
3. Slide the rotary seal rings on to the shafts lining up pins to slots on the shafts.
4. Lightly lubricate rotorcase O-rings (81) with appropriate grease and fit to rotorcase.
5. Fit wave springs (82) into the rotorcase seal bores.
6. Press the stationary seal rings (83) into the rotorcase, lining up slots.
7. Lightly lubricate the lip seal outside diameter and press lip seals into seal housings (79).
8. Fit seal housing O-rings (87) to seal housings.
9. Fit seal housings to the rotorcase and tighten screws.
10. Push firmly on stationary seal faces to check they are still moving freely. If not, then they are not fitted correctly. Take apart, re-lubricate and refit.
11. Wipe clean the sealing faces with solvent.
12. Refit the rotorcase, rotors and rotorcase cover.

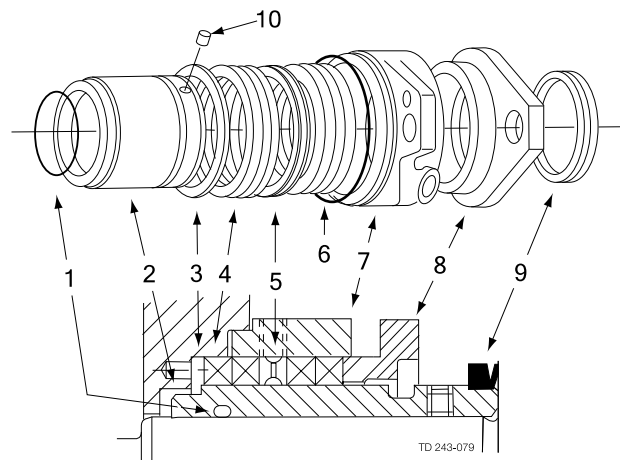


*This page is not applicable for ATEX applications.  
For ATEX application see ATEX addendum*



### 5.5.6 Packed gland

| Item | Description              |
|------|--------------------------|
| 1    | Shaft sleeve O-ring      |
| 2    | Shaft sleeve             |
| 3    | Spacer                   |
| 4    | Packing rings            |
| 5    | Lantern ring (if fitted) |
| 6    | Gasket                   |
| 7    | Gland housing            |
| 8    | Gland follower           |
| 9    | Ring slinger             |
| 10   | Screw                    |



#### Packed gland removal:

1. Loosen gland follower nuts.
2. Remove rotorcase with gland housing (7), packing (4) and gland follower (8) still assembled.
3. Loosen shaft sleeve screws (10) and remove sleeves (2) from shafts.

#### Packed gland fitting:

Check condition of all components replacing as necessary.

1. Lubricate the O-rings (1), fit to shaft sleeves (2) and locate on shafts.
2. Tighten screws (10) and fit slingers (9).
3. Fit gland spacer (3), gasket (6) and gland housing (7) to rotorcase.
4. Insert the packing rings (4), and lantern ring (5) if fitted, as shown ensuring joints are correctly spaced.
5. Loosely locate the gland follower (8) and nuts.
6. Refit rotorcase with packed assemblies over shaft sleeves.
7. Adjust the packed gland.

#### Packed gland adjustment: Important:

To prolong gland life some leakage is necessary.

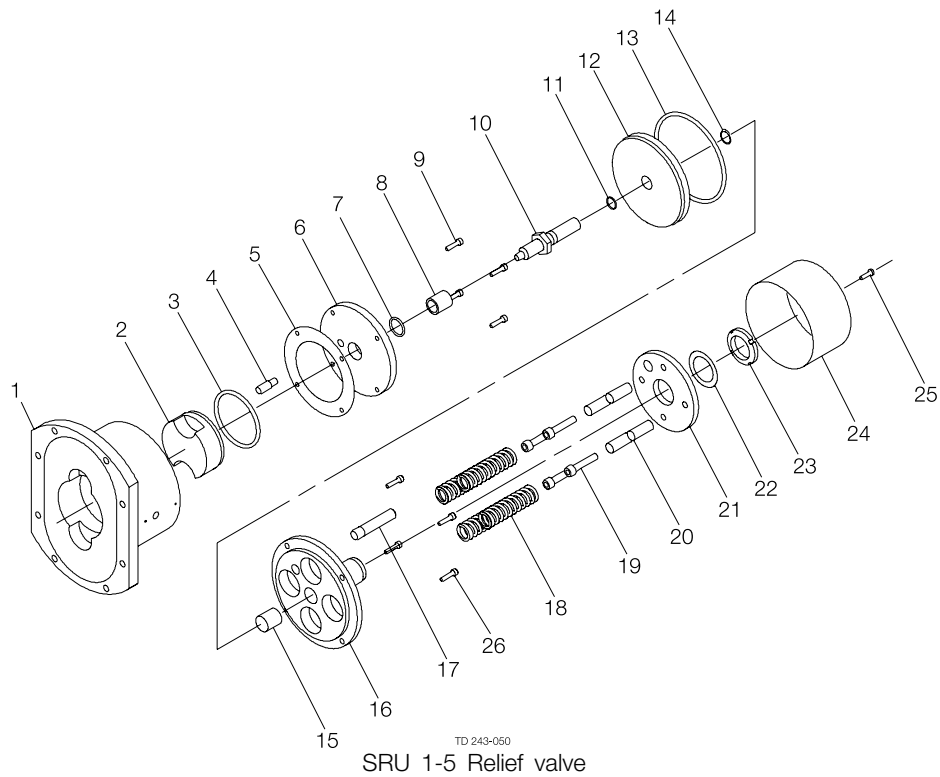
1. Lightly and evenly tighten gland follower nuts.
2. Start pump. Run for 10 minutes, monitoring gland housing temperature and leakage. Gland housing temperatures should be equal.
3. Adjust gland follower nuts by a of a turn until leakage is at an acceptable rate. Always replace gland guard after adjustment.

## 5 Maintenance

### 5.6 Pressure relief valve

The relief valve must not be disassembled whilst the pump is in operation. Always observe the safety precautions detailed at the front of this manual.

Take extreme care when removing the springs as they may be compressed.



| Item | Description              |
|------|--------------------------|
| 1    | Rotorcase cover          |
| 2    | Hydraulic piston         |
| 3    | O-ring, hydraulic piston |
| 4    | Valve pin                |
| 5    | Shim                     |
| 6    | Backstop disc            |
| 7    | O-ring, backstop disc    |
| 8    | Bush                     |
| 9    | Screw, backstop disc     |
| 10   | Valve shaft              |
| 11   | O-ring, pneumatic piston |
| 12   | Pneumatic piston         |
| 13   | O-ring, pneumatic piston |

| Item | Description            |
|------|------------------------|
| 14   | Circlip                |
| 15   | Bush                   |
| 16   | Valve guide            |
| 17   | Valve pin              |
| 18   | Spring                 |
| 19   | Screw                  |
| 20   | Valve spring guide     |
| 21   | Spring adjuster        |
| 22   | Washer                 |
| 23   | Notched nut            |
| 24   | Valve housing          |
| 25   | Screw                  |
| 26   | Screw, spring adjuster |

### 5.6.1 Relief Valve Disassembly

1. Remove manual override lever if fitted.
2. Remove screws (25) and valve housing (24).
3. Remove notched nut(s) (23) and spring adjuster (21). If springs are still compressed when the notched nut reaches end of thread, release the spring adjuster screws (26).
4. Remove springs (18) (series 1-5), spring stacks (series 6), screws and valve guide (16).
5. Remove circlip (14) and pneumatic piston (12).
6. Remove screws, backstop disc (6) and hydraulic piston (2)
7. Unscrew hydraulic piston (2) from valve shaft (10) and remove O-rings (3, 7, 11 and 13).

### 5.6.2 Relief Valve Assembly

New O-rings should be fitted during assembly. Clean components before fitting; check there is no damage to faces.

1. Lubricate all O-rings.
2. Fit O-ring (7) to backstop disc (6) and fit backstop disc to valve shaft (10)
3. Fit O-ring (3) to hydraulic piston (2) and screw onto valve shaft.
4. Locate assembly into rotorcase cover, replace backstop disc screws (9).
5. Fit pneumatic piston O-rings (11 and 13) and locate assembly on valve shaft. Replace circlip (14) and springs (18). (Series 6 pumps only - each spring stack should contain an equal amount of springs, noting correct orientation). Place valve guide (16) over springs and replace screws (26).
6. Fit spring adjuster (21) and notched nut (23), valve housing (24) and screw (25).
7. Replace manual override lever if applicable.

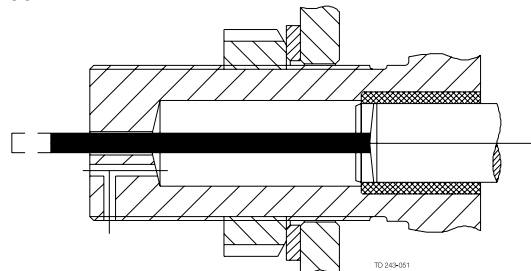
### 5.6.3 Valve Adjustment

The relief valve will require setting to suit duty requirements.

Note: A gauge is required to measure discharge pressure during adjustment

1. Stop the pump
2. Remove valve housing (24).
3. Release notched nut(s) (23) to end of thread.
4. Insert a thin rod into valve guide (16) and mark to indicate closed position.
5. Start pump and increase pressure noting pressure gauge reading when the rod starts to move. This indicates the valve is beginning to open.
6. Tighten the notched nut gradually until desired system pressure is achieved. (Series 6 pump only - evenly tighten the spring stack nuts after adjusting the notched nut).
7. Apply thread locking adhesive to the notched nut after relief valve is set.
8. If pneumatic override is required connect air supply and adjust pressure until valve opens. Check piston reseats when air supply is disconnected.
9. Replace valve housing and screws.

Thin rod



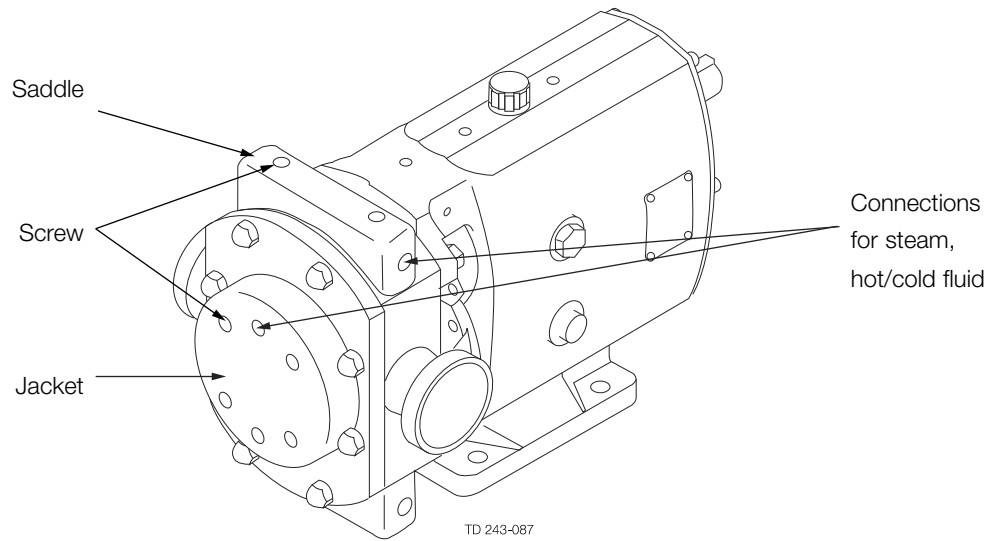
## 5 Maintenance

### 5.7 Heating/Cooling devices

The SRU pumps have the option of being fitted with heating/cooling devices.

These 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.



Jackets can be fitted to the rotorcase cover and/or saddles can be fitted to the rotorcase.

The maximum pressure and temperature of heating/cooling fluid is 3.5 bar (50 psi) and 150°C (302°F) respectively. Heating/cooling jackets and saddles should be in operation approximately 15 minutes prior to pump start up and remain in operation 15 minutes after pump shut down.

#### Assembly

1. Clean faces where sealant is to be applied
2. Apply Loctite 5970 silicone sealant or equivalent to face of heating jacket/saddle allow to dry for approx. 5-10 minutes.
3. Locate cap screws in jacket/saddle, and align screws with tapped holes in rotorcase/front cover and tighten evenly.
4. Allow instant gasket to cure fully before operation

|                         | SRU1    | SRU2    | SRU3     | SRU4     | SRU5      | SRU6     |
|-------------------------|---------|---------|----------|----------|-----------|----------|
| <b>Screw</b>            |         |         |          |          |           |          |
| Saddle (size/torque)    | M4/2Nm  | M6/8 Nm | M6/8 Nm  | M6/18 Nm | M6/35 Nm  | M6/35 Nm |
| Jacket (size/torque)    | M8/8 Nm | M8/8 Nm | M10/8 Nm | M8/18 Nm | M10/18 Nm | M8/18 Nm |
| <b>Flush connection</b> |         |         |          |          |           |          |
| Saddle (BSPT)           | 1/8"    | 1/4"    | 1/4"     | 1/4"     | 1/4"      | 1/4"     |
| Jacket (BSPT)           | 1/4"    | 1/4"    | 1/4"     | 1/4"     | 1/4"      | 1/4"     |

All flush connections are Female

5.8 Troubleshooting

| Problem |                |                     |                        |                     |                           |                           |                |                 |                          |                     |                   | Probable Causes | Solutions |           |         |  |   |
|---------|----------------|---------------------|------------------------|---------------------|---------------------------|---------------------------|----------------|-----------------|--------------------------|---------------------|-------------------|-----------------|-----------|-----------|---------|--|---|
| No flow | Under capacity | Irregular discharge | Low discharge pressure | Pump will not prime | Prime lost after starting | Pump stalls when starting | Pump overheats | Motor overheats | Excessive power absorbed | Noise and vibration | Pump element wear |                 |           | Syphoning | Seizure | Mechanical seal leakage                          | 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.<br>Increase suction head.<br>Simplify suction line configuration and reduce length.<br>Reduce pump speed.             |
|         |                | ✓                   | ✓                      | ✓                   | ✓                         |                           |                |                 |                          | ✓                   |                   |                 |           |           |         | Fluid vaporising in suction line.                | Increase suction line diameter.<br>Increase suction head.<br>Simplify suction line configuration and reduce length.<br>Reduce pump speed.             |
| ✓       | ✓              | ✓                   | ✓                      | ✓                   | ✓                         |                           |                |                 |                          |                     |                   |                 | ✓         |           |         | Air entering suction line.                       | Remake pipework joints.   |
|         | ✓              | ✓                   | ✓                      | ✓                   | ✓                         |                           |                |                 |                          | ✓                   |                   |                 |           |           |         | Strainer or filter blocked.                      | Service fittings.   |
|         | ✓              |                     |                        |                     | ✓                         | ✓                         | ✓              | ✓               | ✓                        | ✓                   |                   |                 |           | ✓         |         | Fluid viscosity above rated figure.              | Increase fluid temperature.<br>Decrease pump speed.<br>Check seal face viscosity limitations.   |
| ✓       | ✓              | ✓                   | ✓                      |                     |                           |                           |                |                 |                          |                     |                   |                 |           |           |         | Fluid viscosity below rated figure.              | Decrease fluid temperature.<br>Increase pump speed.   |
|         |                |                     |                        |                     |                           | ✓                         |                | ✓               | ✓                        | ✓                   |                   |                 | ✓         | ✓         |         | Fluid temp. above rated figure.                  | Cool the pump casing.<br>Reduce fluid temperature.<br>Check seal face and elastomer temp. limitations.  |
|         |                |                     |                        |                     |                           | ✓                         |                | ✓               | ✓                        |                     |                   |                 |           |           |         | Fluid temp. below rated figure.                  | Heat the pump casing.<br>Increase fluid temperature.  |
|         |                |                     |                        |                     |                           |                           |                |                 |                          | ✓                   | ✓                 |                 |           | ✓         | ✓       | Unexpected solids in fluid.                      | Clean the system.<br>Fit strainer to suction line.<br>If solids cannot be eliminated, consider fitting double mechanical seals.                       |
| ✓       | ✓              | ✓                   |                        |                     | ✓                         | ✓                         | ✓              | ✓               | ✓                        | ✓                   | ✓                 |                 |           | ✓         | ✓       | Discharge pressure above rated figure            | Check for obstructions i.e. closed valve.<br>Service system and change to prevent problem recurring.<br>Simplify discharge line to decrease pressure. |
|         |                | ✓                   | ✓                      |                     | ✓                         |                           | ✓              | ✓               | ✓                        |                     |                   |                 |           | ✓         |         | Gland over-tightened                             | Slacken and re-adjust gland packing.  |
|         |                | ✓                   | ✓                      |                     | ✓                         |                           |                |                 |                          | ✓                   |                   |                 |           | ✓         |         | Gland under-tightened                            | Adjust gland packing.   |
|         |                |                     |                        |                     |                           |                           |                |                 |                          |                     |                   |                 |           | ✓         | ✓       | Seal flushing inadequate.                        | Increase flush flow rate.<br>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.<br>Fit flexible pipes or expansion fittings.<br>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.<br>Refer to pump maker.   |
| ✓       | ✓              | ✓                   |                        |                     |                           |                           |                |                 |                          |                     |                   |                 |           |           |         | Worn pumping element.                            | Fit new components.   |
| ✓       | ✓              |                     |                        |                     |                           |                           |                |                 |                          | ✓                   |                   |                 |           |           |         | Rotorcase cover relief valve leakage.            | Check pressure setting and re-adjust if necessary.<br>Examine and clean seating surfaces.<br>Replace worn parts.                                      |
| ✓       |                |                     |                        |                     |                           |                           |                |                 |                          | ✓                   |                   |                 |           |           |         | Rotorcase cover relief valve - chatter.          | Check for wear on sealing surfaces, guides etc.<br>Replace if necessary.  |
| ✓       | ✓              |                     |                        |                     |                           |                           |                |                 |                          |                     |                   |                 |           |           |         | Rotorcase cover relief valve incorrectly set.    | Re-adjust spring compression - valve should lift approx. 10% above duty pressure.   |
| ✓       |                |                     |                        | ✓                   |                           |                           |                |                 |                          |                     |                   |                 |           |           |         | 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.<br>Ensure system operation prevents this.   |
|         |                |                     |                        |                     |                           |                           |                |                 |                          |                     |                   |                 | ✓         | ✓         |         | Pump allowed to run dry.                         | Fit single or double flushed mechanical seals.<br>Fit flushed packed gland.   |
|         |                |                     |                        |                     |                           |                           |                |                 | ✓                        | ✓                   |                   |                 |           |           |         | Faulty motor.                                    | Check and replace motor bearings.   |
| ✓       |                |                     |                        |                     |                           |                           |                |                 |                          |                     |                   |                 |           |           |         | Pumping element missing                          | Fit pumping element.  |

## 6 Technical data

### 6.1 Technical data

#### 6.1.1 Approximate oil capacities

| Pump model | Port orientation |                   | Port orientation  |                     |
|------------|------------------|-------------------|-------------------|---------------------|
|            | Vertical litres  | Horizontal litres | Vertical US pints | Horizontal US pints |
| SRU1       | 0.3              | 0.4               | 0.6               | 0.8                 |
| SRU2       | 0.6              | 0.7               | 1.2               | 1.4                 |
| SRU3       | 1.0              | 1.5               | 2.2               | 3.1                 |
| SRU4       | 1.5              | 2.0               | 3.2               | 4.2                 |
| SRU5       | 3.0              | 4.0               | 6.3               | 8.4                 |
| SRU6       | 4.5              | 7.0               | 9.5               | 14.8                |

#### 6.1.2 Weights

| Pump model | Bare Shaft Pump kg (lb) |           | Typical pump with drive unit kg (lb) |            |
|------------|-------------------------|-----------|--------------------------------------|------------|
|            | Port Orientation        |           | Port Orientation                     |            |
|            | Horizontal              | Vertical  | Horizontal                           | Vertical   |
| SRU1/005   | 15 (33)                 | 16 (35)   | 45 (99)                              | 46 (101)   |
| SRU1/008   | 17 (37)                 | 18 (40)   | 55 (121)                             | 56 (123)   |
| SRU2/013   | 28 (62)                 | 30 (66)   | 75 (165)                             | 77 (170)   |
| SRU2/018   | 29 (64)                 | 31 (68)   | 80 (176)                             | 82 (181)   |
| SRU3/027   | 53 (117)                | 56 (123)  | 145 (320)                            | 148 (326)  |
| SRU3/038   | 56 (123)                | 59 (130)  | 150 (331)                            | 153 (337)  |
| SRU4/055   | 105 (231)               | 111 (245) | 260 (573)                            | 266 (586)  |
| SRU4/079   | 110 (243)               | 116 (256) | 265 (584)                            | 271 (597)  |
| SRU5/116   | 148 (326)               | 185 (408) | 396 (873)                            | 433 (955)  |
| SRU5/168   | 156 (344)               | 193 (425) | 411 (906)                            | 448 (988)  |
| SRU6/260   | 228 (503)               | 260 (573) | 493 (1087)                           | 525 (1157) |
| SRU6/353   | 233 (514)               | 265 (584) | 513 (1131)                           | 545 (1202) |




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

## 6.1.3 Tool requirements

| Description                 | Tool required         | Pump Model |      |      |       |       |       |
|-----------------------------|-----------------------|------------|------|------|-------|-------|-------|
|                             |                       | SRU1       | SRU2 | SRU3 | SRU4  | SRU5  | SRU6  |
| Rotorcase cover nut (13)    | Socket Size (mm)      | 13         | 17   | 17   | 17    | 17    | 19    |
|                             | Torque Setting (Nm)   | 20         | 39   | 39   | 39    | 39    | 105   |
|                             | Torque Setting (lbft) | 14.8       | 28.8 | 28.8 | 28.8  | 28.8  | 77.4  |
| Rotor retention nut (22)    | Socket Size (mm)      | 17         | 24   | 24   | 36    | 36    | 36    |
|                             | Torque Setting (Nm)   | 14         | 77   | 120  | 161   | 161   | 161   |
|                             | Torque Setting (lbft) | 10.3       | 56.8 | 88.5 | 118.8 | 118.8 | 118.8 |
| Rotor TLA (19)              | Key Size (mm)         | -          | -    | -    | -     | -     | 5     |
|                             | Torque Setting (Nm)   | -          | -    | -    | -     | -     | 8     |
|                             | Torque Setting (lbft) | -          | -    | -    | -     | -     | 5.9   |
| Rotorcase retaining nut (4) | Spanner Size (mm)     | 13         | 17   | 17   | 19    | 19    | 24    |
|                             | Torque Setting (Nm)   | 20         | 40   | 40   | 64    | 64    | 175   |
|                             | Torque Setting (lbft) | 14.8       | 29.5 | 29.5 | 47.2  | 47.2  | 129.1 |
| Seal retainer screw (15)    | Key Size (mm)         | 5          | 5    | 5    | 6     | 6     | 6     |
|                             | Torque Setting (Nm)   | 10         | 10   | 10   | 25    | 25    | 25    |
|                             | Torque Setting (lbft) | 7.4        | 7.4  | 7.4  | 18.4  | 18.4  | 18.4  |
| Gearcase cover screw (6)    | Key Size (mm)         | 5          | 5    | 5    | 6     | 6     | 6     |
|                             | Torque Setting (Nm)   | 10         | 10   | 10   | 25    | 25    | 25    |
|                             | Torque Setting (lbft) | 7.4        | 7.4  | 7.4  | 18.4  | 18.4  | 18.4  |
| TLA/Clamp plate screw (40)  | Key Size (mm)         | 5          | 5    | 5    | 5     | 6     | 6     |
|                             | Torque Setting (Nm)   | 12         | 17   | 12   | 14    | 35    | 35    |
|                             | Torque Setting (lbft) | 8.9        | 12.5 | 8.9  | 10.3  | 25.8  | 25.8  |
| Drain plug (45)             | Key Size (in)         | ¼          | ¼    | ¼    | ¼     | ½     | ½     |
| Foot bolt (58)              | Key Size (mm)         | 5          | 6    | 6    | 8     | 10    | 10    |
|                             | Torque Setting (Nm)   | 15         | 30   | 30   | 60    | 50    | 50    |
|                             | Torque Setting (lbft) | 11.1       | 22.1 | 22.1 | 44.3  | 37.0  | 37.0  |
| Grub screw                  | Key size (mm)         | 2.5        | 2.5  | 2.5  | 2.5   | 4.0   | 4.0   |
| Shaft seal, Single          | Torque Setting (Nm)   | 3          | 3    | 3    | 3     | 8     | 13.5  |
|                             | Torque Setting (lbft) | 2.2        | 2.2  | 2.2  | 2.2   | 6     | 10    |
| Shaft seal, Double          | Torque Setting (Nm)   | 3          | 3    | 3    | 3     | 13.5  | 13.5  |
|                             | Torque Setting (lbft) | 2.2        | 2.2  | 2.2  | 2.2   | 10    | 10    |
| Sight glass (46)            | Socket Size (mm)      | 22         | 22   | 22   | 22    | 22    | 22    |
|                             | Torque Setting (Nm)   | 2          | 2    | 2    | 2     | 2     | 2     |
|                             | Torque Setting (lbft) | 0.9        | 0.9  | 0.9  | 0.9   | 0.9   | 0.9   |

## 6 Technical data

6.1.4 Pump Data Table

| Model             | Displacement    |                     |                    | Suction & Discharge |       |          |       | Differential Pressure   |     | Max. Speed<br>rev/min   | Max. Capacity at<br>1000 rpm<br>m <sup>3</sup> /hr                                  |
|-------------------|-----------------|---------------------|--------------------|---------------------|-------|----------|-------|---|-----|---|---|
|                   | litres/r-<br>ev | Imp gal/<br>100 rev | US gal/<br>100 rev | Sanitary            |       | Enlarged |       |  |     |   |   |
|                   |                 |                     |                    | mm                  | inch. | mm       | inch. | bar   | psi |  |  |
| SRU1/005/LD or H  | 0.053           | 1.17                | 1.40               | 25                  | 1.0   | -        | -     | 8   | 115 | 1000  | 3.18  |
| SRU1/008/LD or H  | 0.085           | 1.87                | 2.25               | 25                  | 1.0   | 40       | 1.5   | 5   | 75  | 1000  | 5.10  |
| SRU2/013/LS or HS | 0.128           | 2.82                | 3.38               | 25                  | 1.0   | 40       | 1.5   | 10  | 145 | 1000  | 7.68  |
| SRU2/013/LD or HD | 0.128           | 2.82                | 3.38               | 25                  | 1.0   | 40       | 1.5   | 15  | 215 | 1000  | 7.68  |
| SRU2/018/LS or HS | 0.181           | 3.98                | 4.78               | 40                  | 1.5   | 50       | 2.0   | 7   | 100 | 1000  | 10.86   |
| SRU2/018/LD or HD | 0.181           | 3.98                | 4.78               | 40                  | 1.5   | 50       | 2.0   | 10  | 145 | 1000  | 10.86   |
| SRU3/027/LS or HS | 0.266           | 5.85                | 7.03               | 40                  | 1.5   | 50       | 2.0   | 10  | 145 | 1000  | 15.96   |
| SRU3/027/LD or HD | 0.266           | 5.85                | 7.03               | 40                  | 1.5   | 50       | 2.0   | 15  | 215 | 1000  | 15.96   |
| SRU3/038/LS or HS | 0.384           | 8.45                | 10.14              | 50                  | 2.0   | 65       | 2.5   | 7   | 100 | 1000  | 23.04   |
| SRU3/038/LD or HD | 0.384           | 8.45                | 10.14              | 50                  | 2.0   | 65       | 2.5   | 10  | 145 | 1000  | 23.04   |
| SRU4/055/LS or HS | 0.554           | 12.19               | 14.64              | 50                  | 2.0   | 65       | 2.5   | 10  | 145 | 1000  | 33.24   |
| SRU4/055/LD or HD | 0.554           | 12.19               | 14.64              | 50                  | 2.0   | 65       | 2.5   | 20  | 290 | 1000  | 33.24   |
| SRU4/079/LS or HS | 0.790           | 17.38               | 20.87              | 65                  | 2.5   | 80       | 3.0   | 7   | 100 | 1000  | 47.40   |
| SRU4/079/LD or HD | 0.790           | 17.38               | 20.87              | 65                  | 2.5   | 80       | 3.0   | 15  | 215 | 1000  | 47.40   |
| SRU5/116/LS or HS | 1.160           | 25.52               | 30.64              | 65                  | 2.5   | 80       | 3.0   | 10  | 145 | 600   | 41.76   |
| SRU5/116/LD or HD | 1.160           | 25.52               | 30.64              | 65                  | 2.5   | 80       | 3.0   | 20  | 290 | 600   | 41.76   |
| SRU5/168/LS or HS | 1.680           | 36.95               | 44.38              | 80                  | 3.0   | 100      | 4.0   | 7   | 100 | 600   | 60.48   |
| SRU5/168/LD or HD | 1.680           | 36.95               | 44.38              | 80                  | 3.0   | 100      | 4.0   | 15  | 215 | 600   | 60.48   |
| SRU6/260/LS or HS | 2.600           | 57.19               | 68.68              | 100                 | 4.0   | 100      | 4.0   | 10  | 145 | 500   | 78.00   |
| SRU6/260/LD or HD | 2.600           | 57.19               | 68.68              | 100                 | 4.0   | 100      | 4.0   | 20  | 290 | 500   | 78.00   |
| SRU6/353/LS or HS | 3.530           | 77.65               | 93.25              | 100                 | 4.0   | 150      | 6.0   | 7   | 10  | 500   | 105.90  |
| SRU6/353/LD or HD | 3.530           | 77.65               | 93.25              | 100                 | 4.0   | 150      | 6.0   | 15  | 215 | 500   | 105.90  |

**Please Note:**

Maximum differential pressure capability of the pump does not apply to the pressure rating of the mechanical seals which is 20 bar, and the selected port connection as stated below:

SMS – 10 bar (all sizes)

RJT – 10 bar (all sizes)

DIN11851 – 40 bar (25-40mm), 25 bar (50-100mm), 16 bar (150mm)

IDF/ISS – 16 bar (25-50mm), 10 bar (65-150mm) providing provision for support ring is to be made.

Tri-clamp (BS4825) – Pressure rating is dictated by the clamp band used.

Refer to clamp band supplier.

For size 150mm on SRU6/0353 pumps, only DIN11851, SRJT or Tri-clamp connections are available.

**Note:**



ATEX applications: Differential pressure, Max. speed and Max. capacity are not applicable for ATEX applications.



## 6.2 Pumphead Clearance information



Front Clearance                      Rotor Length                      Back Clearance  
Minimum mesh clearance at any mesh position. All dimensions in millimeters.

**SRU1/005/LD (HD) TRILOBE and BILOBE ST.STL. ROTORS****8 BAR**

| Temperature °C | Rotor Length | Front Clearance (min.) | Back Clearance | Rotor Diameter | Radial Clearance (min.) | Min. TRILOBE | MESH* BILOBE 70°C |
|----------------|--------------|------------------------|----------------|----------------|-------------------------|--------------|-------------------|
| 70°C           | 16.59        | 0.12                   | 0.15           | 64.66          | 0.14                    | 0.12         | 0.28              |
| 130°C          | 16.57        | 0.14                   | 0.15           | 64.64          | 0.15                    | 0.12         | 0.28              |
| 200°C          | 16.55        | 0.16                   | 0.10           | 64.62          | 0.16                    | 0.12         | 0.28              |

**SRU1/008/LD (HD) TRILOBE and BILOBE ST.STL. ROTORS****5 BAR**

| Temperature °C | Rotor Length | Front Clearance (min.) | Back Clearance | Rotor Diameter | Radial Clearance (min.) | Min. TRILOBE | MESH* BILOBE 70°C |
|----------------|--------------|------------------------|----------------|----------------|-------------------------|--------------|-------------------|
| 70°C           | 26.57        | 0.14                   | 0.15           | 64.62          | 0.16                    | 0.12         | 0.28              |
| 130°C          | 26.55        | 0.16                   | 0.10           | 64.60          | 0.17                    | 0.12         | 0.28              |
| 200°C          | 26.53        | 0.18                   | 0.15           | 64.58          | 0.18                    | 0.12         | 0.28              |

**SRU2/013/LS (HS) TRILOBE and BILOBE ST.STL. ROTORS****10 BAR**

| Temperature °C | Rotor Length | Front Clearance (min.) | Back Clearance | Rotor Diameter | Radial Clearance (min.) | Min. TRILOBE | MESH* BILOBE 70°C |
|----------------|--------------|------------------------|----------------|----------------|-------------------------|--------------|-------------------|
| 70°C           | 22.63        | 0.14                   | 0.07           | 86.28          | 0.16                    | 0.08         | 0.24              |
| 130°C          | 22.52        | 0.22                   | 0.10           | 86.22          | 0.19                    | 0.08         | 0.24              |
| 200°C          | 22.35        | 0.32                   | 0.22           | 86.18          | 0.21                    | 0.08         | 0.24              |

**SRU2/013/LD (HD) TRILOBE and BILOBE ST.STL. ROTORS****15 BAR**

| Temperature °C | Rotor Length | Front Clearance (min.) | Back Clearance | Rotor Diameter | Radial Clearance (min.) | Min. TRILOBE | MESH* BILOBE 70°C |
|----------------|--------------|------------------------|----------------|----------------|-------------------------|--------------|-------------------|
| 70°C           | 22.48        | 0.23                   | 0.13           | 86.20          | 0.20                    | 0.20         | 0.24              |
| 130°C          | 22.42        | 0.25                   | 0.16           | 86.14          | 0.23                    | 0.20         | 0.24              |
| 200°C          | 22.30        | 0.33                   | 0.28           | 86.10          | 0.25                    | 0.20         | 0.24              |

**SRU2/018/LS (HS) TRILOBE and BILOBE ST.STL. ROTORS****7 BAR**

| Temperature °C | Rotor Length | Front Clearance (min.) | Back Clearance | Rotor Diameter | Radial Clearance (min.) | Min. TRILOBE | MESH* BILOBE 70°C |
|----------------|--------------|------------------------|----------------|----------------|-------------------------|--------------|-------------------|
| 70°C           | 32.02        | 0.15                   | 0.07           | 86.26          | 0.17                    | 0.08         | 0.34              |
| 130°C          | 31.90        | 0.24                   | 0.10           | 86.18          | 0.21                    | 0.08         | 0.34              |
| 200°C          | 31.72        | 0.35                   | 0.22           | 86.12          | 0.24                    | 0.08         | 0.34              |

**SRU2/018/LD (HD) TRILOBE and BILOBE ST.STL. ROTORS****10 BAR**

| Temperature °C | Rotor Length | Front Clearance (min.) | Back Clearance | Rotor Diameter | Radial Clearance (min.) | Min. TRILOBE | MESH* BILOBE 70°C |
|----------------|--------------|------------------------|----------------|----------------|-------------------------|--------------|-------------------|
| 70°C           | 31.96        | 0.18                   | 0.10           | 86.20          | 0.20                    | 0.11         | 0.34              |
| 130°C          | 31.91        | 0.20                   | 0.13           | 86.12          | 0.24                    | 0.11         | 0.34              |
| 200°C          | 31.82        | 0.22                   | 0.20           | 86.06          | 0.27                    | 0.11         | 0.34              |

## 6 Technical data



### SRU3/027/LS (HS) TRILOBE and BILOBE ST.STL. ROTORS

10 BAR

| Temperature °C | Rotor Length | Front Clearance | Back Clearance | Rotor Diameter | Radial Clearance | Min. TRILOBE | MESH* BILOBE 70°C |
|----------------|--------------|-----------------|----------------|----------------|------------------|--------------|-------------------|
| 70°C           | 30.13        | (min.)          | 0.15           | 107.88         | (min.)           | 0.13         | 0.32              |
|                | 30.10        | 0.16            | 0.10           | 107.83         | 0.20             |              |                   |
| 130°C          | 29.99        | (min.)          | 0.18           | 107.80         | (min.)           | 0.13         | 0.32              |
|                | 29.96        | 0.27            | 0.13           | 107.75         | 0.24             |              |                   |
| 200°C          | 29.80        | (min.)          | 0.25           | 107.72         | (min.)           | 0.13         | 0.32              |
|                | 29.77        | 0.39            | 0.20           | 107.67         | 0.28             |              |                   |

### SRU3/027/LD (HD) TRILOBE and BILOBE ST.STL. ROTORS

15 BAR

| Temperature °C | Rotor Length | Front Clearance | Back Clearance | Rotor Diameter | Radial Clearance | Min. TRILOBE | MESH* BILOBE 70°C |
|----------------|--------------|-----------------|----------------|----------------|------------------|--------------|-------------------|
| 70°C           | 30.08        | (min.)          | 0.17           | 107.60         | (min.)           | 0.17         | 0.40              |
|                | 30.05        | 0.19            | 0.12           | 107.55         | 0.34             |              |                   |
| 130°C          | 30.02        | (min.)          | 0.20           | 107.56         | (min.)           | 0.17         | 0.40              |
|                | 29.99        | 0.22            | 0.15           | 107.51         | 0.36             |              |                   |
| 200°C          | 29.92        | (min.)          | 0.27           | 107.52         | (min.)           | 0.17         | 0.40              |
|                | 29.89        | 0.25            | 0.22           | 107.47         | 0.38             |              |                   |

### SRU3/038/LS (HS) TRILOBE and BILOBE ST.STL. ROTORS

7 BAR

| Temperature °C | Rotor Length | Front Clearance | Back Clearance | Rotor Diameter | Radial Clearance | Min. TRILOBE | MESH* BILOBE 70°C |
|----------------|--------------|-----------------|----------------|----------------|------------------|--------------|-------------------|
| 70°C           | 43.14        | (min.)          | 0.15           | 107.76         | (min.)           | 0.13         | 0.40              |
|                | 43.11        | 0.17            | 0.10           | 107.71         | 0.26             |              |                   |
| 130°C          | 43.00        | (min.)          | 0.18           | 107.64         | (min.)           | 0.13         | 0.40              |
|                | 42.97        | 0.28            | 0.13           | 107.59         | 0.32             |              |                   |
| 200°C          | 42.79        | (min.)          | 0.25           | 107.52         | (min.)           | 0.13         | 0.40              |
|                | 42.76        | 0.42            | 0.20           | 107.47         | 0.38             |              |                   |

### SRU3/038/LD (HD) TRILOBE and BILOBE ST.STL. ROTORS

10 BAR

| Temperature °C | Rotor Length | Front Clearance | Back Clearance | Rotor Diameter | Radial Clearance | Min. TRILOBE | MESH* BILOBE 70°C |
|----------------|--------------|-----------------|----------------|----------------|------------------|--------------|-------------------|
| 70°C           | 42.99        | (min.)          | 0.26           | 107.48         | (min.)           | 0.17         | 0.40              |
|                | 42.96        | 0.25            | 0.21           | 107.43         | 0.40             |              |                   |
| 130°C          | 43.02        | (min.)          | 0.20           | 107.50         | (min.)           | 0.17         | 0.40              |
|                | 42.99        | 0.24            | 0.15           | 107.45         | 0.39             |              |                   |
| 200°C          | 42.92        | (min.)          | 0.27           | 107.46         | (min.)           | 0.17         | 0.40              |
|                | 42.89        | 0.27            | 0.22           | 107.41         | 0.41             |              |                   |

### SRU4/055/LS (HS) TRILOBE and BILOBE ST.STL. ROTORS

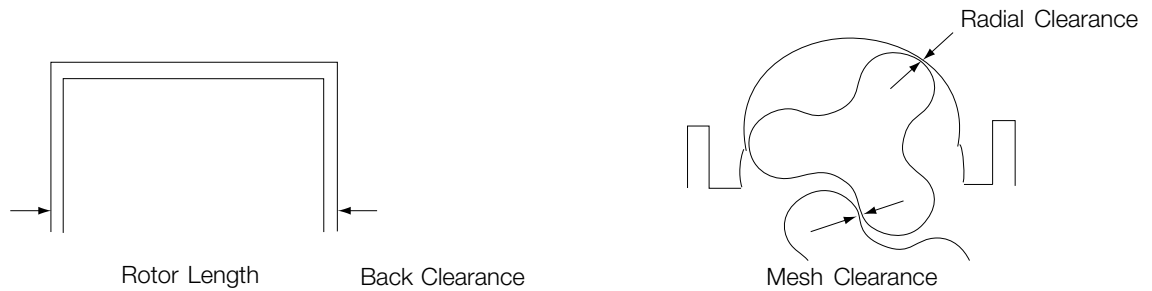
10 BAR

| Temperature °C | Rotor Length | Front Clearance | Back Clearance | Rotor Diameter | Radial Clearance | Min. TRILOBE | MESH* BILOBE 70°C |
|----------------|--------------|-----------------|----------------|----------------|------------------|--------------|-------------------|
| 70°C           | 38.20        | (min.)          | 0.15           | 138.20         | (min.)           | 0.15         | 0.32              |
|                | 38.17        | 0.17            | 0.10           | 138.15         | 0.18             |              |                   |
| 130°C          | 38.07        | (min.)          | 0.20           | 138.10         | (min.)           | 0.15         | 0.32              |
|                | 38.04        | 0.20            | 0.15           | 138.05         | 0.23             |              |                   |
| 200°C          | 38.03        | (min.)          | 0.24           | 138.00         | (min.)           | 0.15         | 0.32              |
|                | 38.00        | 0.25            | 0.19           | 137.95         | 0.28             |              |                   |

### SRU4/055/LD (HD) TRILOBE and BILOBE ST.STL. ROTORS

20 BAR

| Temperature °C | Rotor Length | Front Clearance | Back Clearance | Rotor Diameter | Radial Clearance | Min. TRILOBE | MESH* BILOBE 70°C |
|----------------|--------------|-----------------|----------------|----------------|------------------|--------------|-------------------|
| 70°C           | 38.11        | (min.)          | 0.20           | 137.90         | (min.)           | 0.20         | 0.32              |
|                | 38.08        | 0.21            | 0.15           | 137.85         | 0.33             |              |                   |
| 130°C          | 38.07        | (min.)          | 0.20           | 137.80         | (min.)           | 0.20         | 0.32              |
|                | 38.04        | 0.25            | 0.15           | 137.75         | 0.38             |              |                   |
| 200°C          | 38.03        | (min.)          | 0.20           | 137.70         | (min.)           | 0.20         | 0.32              |
|                | 38.00        | 0.29            | 0.15           | 137.65         | 0.43             |              |                   |



Minimum mesh clearance at any mesh position. All dimensions in millimeters

**SRU4/079/LS (HS) TRILOBE and BILOBE ST.STL. ROTORS**

**7 BAR**

| Temperature °C | Rotor Length | Front Clearance | Back Clearance | Rotor Diameter | Radial Clearance | Min. TRILOBE | MESH* BILOBE 70°C |
|----------------|--------------|-----------------|----------------|----------------|------------------|--------------|-------------------|
| 70°C           | 54.99        | (min.)          | 0.17           | 137.96         | (min.)           | 0.15         | 0.32              |
|                | 54.96        | 0.20            | 0.12           | 137.91         | 0.30             |              |                   |
| 130°C          | 54.88        | (min.)          | 0.22           | 137.82         | (min.)           | 0.15         | 0.32              |
|                | 54.85        | 0.25            | 0.17           | 137.77         | 0.37             |              |                   |
| 200°C          | 54.75        | (min.)          | 0.27           | 137.66         | (min.)           | 0.15         | 0.32              |
|                | 54.72        | 0.30            | 0.22           | 137.61         | 0.45             |              |                   |

**SRU4/079/LD (HD) TRILOBE and BILOBE ST.STL. ROTORS**

**15 BAR**

| Temperature °C | Rotor Length | Front Clearance | Back Clearance | Rotor Diameter | Radial Clearance | Min. TRILOBE | MESH* BILOBE 70°C |
|----------------|--------------|-----------------|----------------|----------------|------------------|--------------|-------------------|
| 70°C           | 54.81        | (min.)          | 0.23           | 137.64         | (min.)           | 0.20         | 0.32              |
|                | 54.78        | 0.32            | 0.18           | 137.59         | 0.46             |              |                   |
| 130°C          | 54.77        | (min.)          | 0.23           | 137.50         | (min.)           | 0.20         | 0.32              |
|                | 54.74        | 0.36            | 0.18           | 137.45         | 0.53             |              |                   |
| 200°C          | 54.73        | (min.)          | 0.23           | 137.34         | (min.)           | 0.20         | 0.32              |
|                | 54.70        | 0.40            | 0.18           | 137.29         | 0.61             |              |                   |

**SRU5/116/LS (HS) TRILOBE and BILOBE ST.STL. ROTORS**

**10 BAR**

| Temperature °C | Rotor Length | Front Clearance | Back Clearance | Rotor Diameter | Radial Clearance | Min. TRILOBE | MESH* BILOBE 70°C |
|----------------|--------------|-----------------|----------------|----------------|------------------|--------------|-------------------|
| 70°C           | 51.07        | (min.)          | 0.18           | 172.58         | (min.)           | 0.20         | 0.31              |
|                | 51.04        | 0.25            | 0.13           | 172.53         | 0.28             |              |                   |
| 130°C          | 50.99        | (min.)          | 0.18           | 172.46         | (min.)           | 0.20         | 0.31              |
|                | 50.96        | 0.33            | 0.13           | 172.41         | 0.34             |              |                   |
| 200°C          | 50.94        | (min.)          | 0.18           | 172.32         | (min.)           | 0.20         | 0.31              |
|                | 50.91        | 0.38            | 0.13           | 172.27         | 0.41             |              |                   |

**SRU5/116/LD (HD) TRILOBE and BILOBE ST.STL. ROTORS**

**20 BAR**

| Temperature °C | Rotor Length | Front Clearance | Back Clearance | Rotor Diameter | Radial Clearance | Min. TRILOBE | MESH* BILOBE 70°C |
|----------------|--------------|-----------------|----------------|----------------|------------------|--------------|-------------------|
| 70°C           | 50.98        | (min.)          | 0.20           | 172.22         | (min.)           | 0.20         | 0.31              |
|                | 51.04        | 0.29            | 0.15           | 172.17         | 0.46             |              |                   |
| 130°C          | 50.93        | (min.)          | 0.20           | 172.10         | (min.)           | 0.20         | 0.31              |
|                | 50.90        | 0.37            | 0.15           | 172.05         | 0.52             |              |                   |
| 200°C          | 50.79        | (min.)          | 0.20           | 171.96         | (min.)           | 0.20         | 0.31              |
|                | 50.76        | 0.51            | 0.15           | 171.91         | 0.59             |              |                   |

**SRU5/168/LS (HS) TRILOBE and BILOBE ST.STL. ROTORS**

**7 BAR**

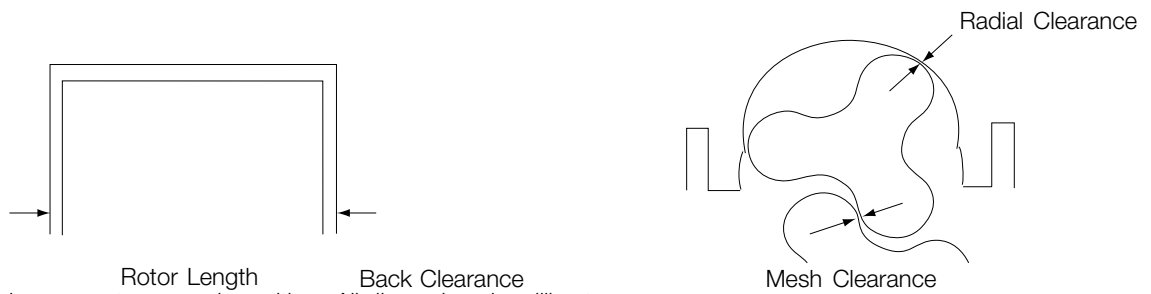
| Temperature °C | Rotor Length | Front Clearance | Back Clearance | Rotor Diameter | Radial Clearance | Min. TRILOBE | MESH* BILOBE 70°C |
|----------------|--------------|-----------------|----------------|----------------|------------------|--------------|-------------------|
| 70°C           | 74.06        | (min.)          | 0.20           | 172.27         | (min.)           | 0.20         | 0.31              |
|                | 74.03        | 0.30            | 0.15           | 172.22         | 0.44             |              |                   |
| 130°C          | 73.93        | (min.)          | 0.20           | 172.09         | (min.)           | 0.20         | 0.31              |
|                | 73.90        | 0.43            | 0.15           | 172.04         | 0.53             |              |                   |
| 200°C          | 73.79        | (min.)          | 0.20           | 171.89         | (min.)           | 0.20         | 0.31              |
|                | 73.76        | 0.57            | 0.15           | 171.84         | 0.63             |              |                   |

**SRU5/168/LD (HD) TRILOBE and BILOBE ST.STL. ROTORS**

**20 BAR**

| Temperature °C | Rotor Length | Front Clearance | Back Clearance | Rotor Diameter | Radial Clearance | Min. TRILOBE | MESH* BILOBE 70°C |
|----------------|--------------|-----------------|----------------|----------------|------------------|--------------|-------------------|
| 70°C           | 73.91        | (min.)          | 0.27           | 171.97         | (min.)           | 0.20         | 0.71              |
|                | 73.88        | 0.38            | 0.22           | 171.92         | 0.59             |              |                   |
| 130°C          | 73.87        | (min.)          | 0.27           | 171.79         | (min.)           | 0.20         | 0.71              |
|                | 73.84        | 0.42            | 0.22           | 171.74         | 0.68             |              |                   |
| 200°C          | 73.82        | (min.)          | 0.27           | 171.59         | (min.)           | 0.20         | 0.71              |
|                | 73.79        | 0.47            | 0.22           | 171.54         | 0.78             |              |                   |

## 6 Technical data



Front Clearance Rotor Length Back Clearance  
Minimum mesh clearance at any mesh position. All dimensions in millimeters

### SRU6/260/LS (HS) TRILOBE and BILOBE ST.STL. ROTORS

10 BAR

| Temperature °C | Rotor Length | Front Clearance | Back Clearance | Rotor Diameter | Radial Clearance | Min. TRILOBE | MESH* BILOBE 70°C |
|----------------|--------------|-----------------|----------------|----------------|------------------|--------------|-------------------|
| 70°C           | 84.34        | (min.)          | 0.25           | 201.27         | (min.)           | 0.30         | 0.39              |
|                | 84.31        | 0.24            | 0.20           | 201.22         | 0.40             |              |                   |
| 130°C          | 84.19        | (min.)          | 0.25           | 201.13         | (min.)           | 0.30         | 0.39              |
|                | 84.16        | 0.39            | 0.20           | 201.08         | 0.47             |              |                   |
| 200°C          | 84.01        | (min.)          | 0.25           | 200.97         | (min.)           | 0.30         | 0.39              |
|                | 83.98        | 0.57            | 0.20           | 200.92         | 0.55             |              |                   |

### SRU6/260/LD (HD) TRILOBE and BILOBE ST.STL. ROTORS

20 BAR

| Temperature °C | Rotor Length | Front Clearance | Back Clearance | Rotor Diameter | Radial Clearance | Min. TRILOBE | MESH* BILOBE 70°C |
|----------------|--------------|-----------------|----------------|----------------|------------------|--------------|-------------------|
| 70°C           | 84.08        | (min.)          | 0.35           | 200.67         | (min.)           | 0.35         | 0.80              |
|                | 84.05        | 0.40            | 0.30           | 200.62         | 0.70             |              |                   |
| 130°C          | 84.03        | (min.)          | 0.35           | 200.53         | (min.)           | 0.35         | 0.80              |
|                | 84.00        | 0.45            | 0.30           | 200.48         | 0.77             |              |                   |
| 200°C          | 83.97        | (min.)          | 0.35           | 200.37         | (min.)           | 0.35         | 0.80              |
|                | 83.94        | 0.51            | 0.30           | 200.32         | 0.85             |              |                   |

### SRU6/353/LS (HS) TRILOBE and BILOBE ST.STL. ROTORS

7 BAR

| Temperature °C | Rotor Length | Front Clearance | Back Clearance | Rotor Diameter | Radial Clearance | Min. TRILOBE | MESH* BILOBE 70°C |
|----------------|--------------|-----------------|----------------|----------------|------------------|--------------|-------------------|
| 70°C           | 113.68       | (min.)          | 0.25           | 201.11         | (min.)           | 0.35         | 0.40              |
|                | 113.65       | 0.40            | 0.20           | 201.06         | 0.48             |              |                   |
| 130°C          | 113.50       | (min.)          | 0.25           | 200.91         | (min.)           | 0.35         | 0.40              |
|                | 113.47       | 0.58            | 0.20           | 200.86         | 0.58             |              |                   |
| 200°C          | 113.30       | (min.)          | 0.25           | 200.67         | (min.)           | 0.35         | 0.40              |
|                | 113.27       | 0.78            | 0.20           | 200.62         | 0.70             |              |                   |

### SRU6/353/LD (HD) TRILOBE and BILOBE ST.STL. ROTORS

15 BAR

| Temperature °C | Rotor Length | Front Clearance | Back Clearance | Rotor Diameter | Radial Clearance | Min. TRILOBE | MESH* BILOBE 70°C |
|----------------|--------------|-----------------|----------------|----------------|------------------|--------------|-------------------|
| 70°C           | 113.23       | (min.)          | 0.45           | 200.47         | (min.)           | 0.40         | 0.55              |
|                | 113.20       | 0.65            | 0.40           | 200.42         | 0.80             |              |                   |
| 130°C          | 113.17       | (min.)          | 0.45           | 200.27         | (min.)           | 0.40         | 0.55              |
|                | 113.14       | 0.71            | 0.40           | 200.22         | 0.90             |              |                   |
| 200°C          | 113.11       | (min.)          | 0.45           | 200.03         | (min.)           | 0.40         | 0.55              |
|                | 113.08       | 0.77            | 0.40           | 199.98         | 1.02             |              |                   |

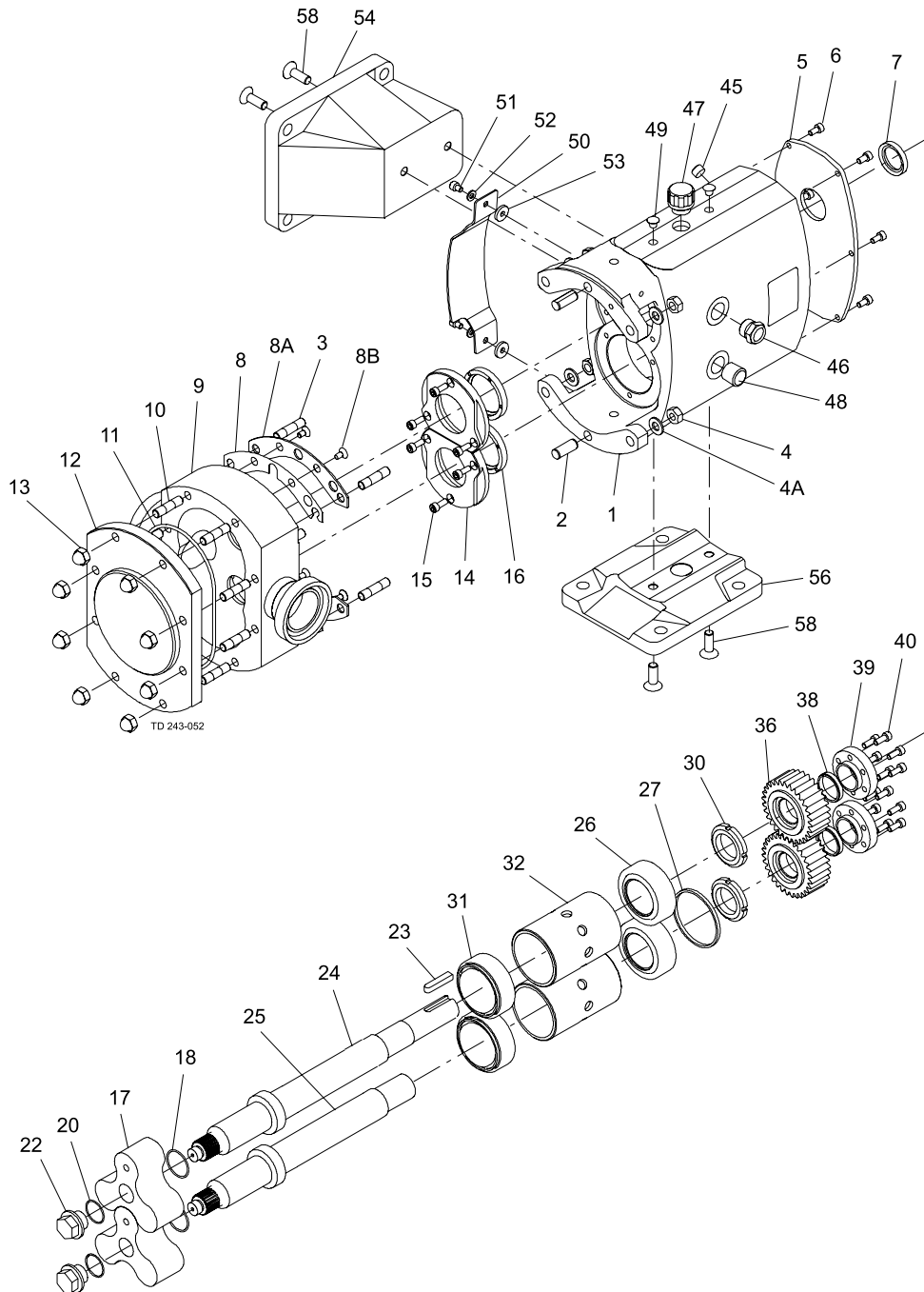


## 7 Parts list

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### 7.1 SRU1 Pump Range

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## Parts list

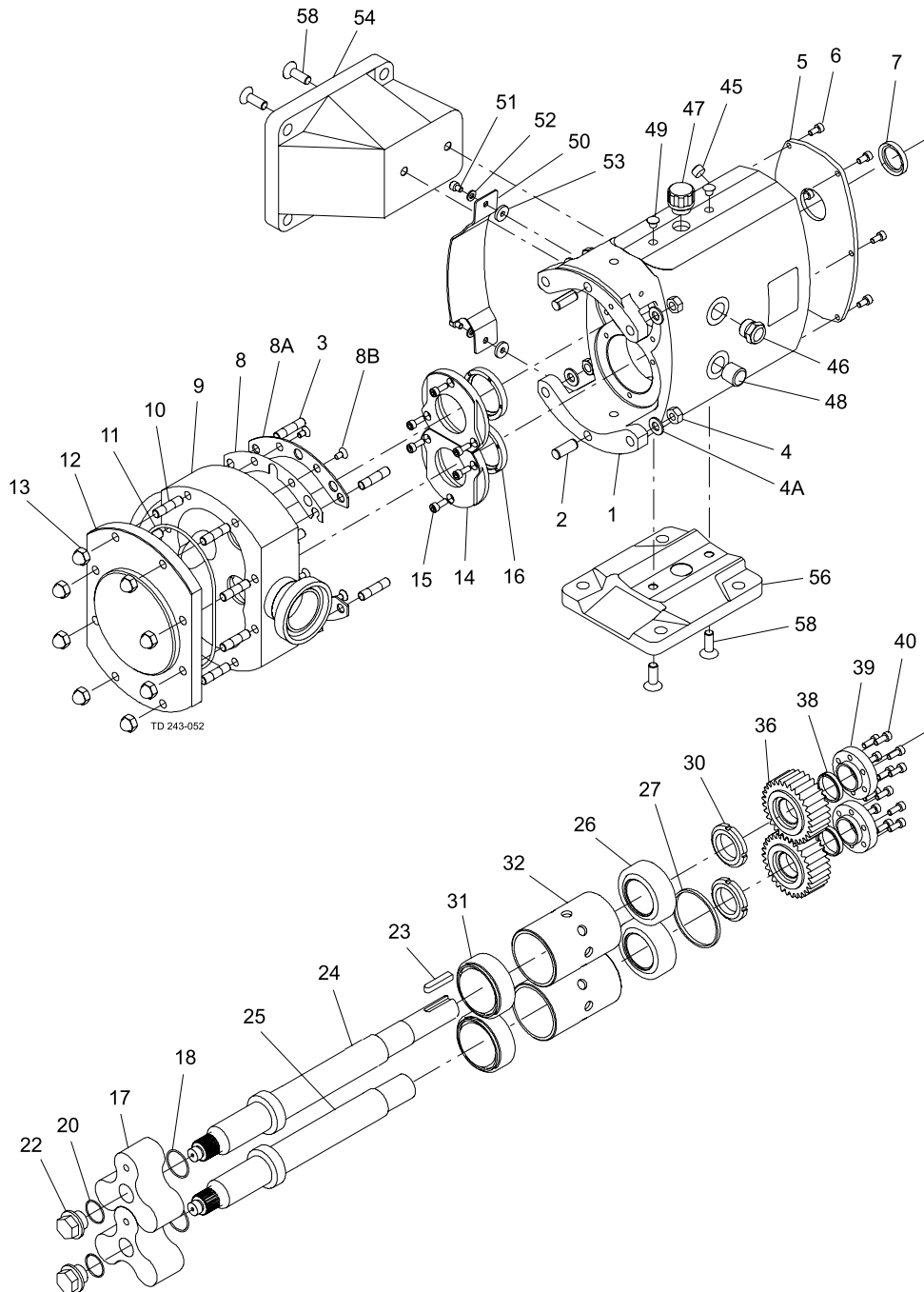
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|-------|-----|---------------------------------|
| 1     | 1   | Gearcase                        |
| 2     | 2   | Dowel                           |
| 3     | 4   | Stud, rotorcase retention       |
| 4     | 4   | Nut, rotorcase retention        |
| 4a    | 4   | Washer, rotorcase retention     |
| 5     | 1   | Cover, gearcase                 |
| 6     | 6   | Screw, gearcase cover           |
| 7     | 1   | Lip seal, drive end             |
| 8     | 2   | Shim                            |
| 8a    | 2   | Shim retainer                   |
| 8b    | 4   | Screw, shim retainer            |
| 9     | 1   | Rotorcase                       |
| 10    | 4   | Stud, rotorcase/cover retention |
| 11 ▲● | 1   | O-Ring, cover - plain           |
| 12    | 1   | Cover, rotorcase                |
| 13    | 4   | Dome nut, rotorcase cover       |
| 14    | 2   | Retainer, seal                  |
| 15    | 6   | Screw, seal retainer            |
| 16    | 2   | Lip seal, gland end             |
| 17    | 2   | Rotor                           |
| 18 ▲● | 2   | O-Ring, rotor sealing shaft end |
| 20 ▲● | 2   | O-Ring, rotor sealing nut end   |
| 22    | 2   | Nut, rotor retention            |
| 23    | 1   | Key                             |
| 24    | 1   | Shaft, drive                    |
| 25    | 1   | Shaft, auxiliary                |
| 26    | 2   | Bearing, rear                   |
| 27    | 1   | Spacer, shaft abutment          |
| 30    | 2   | Nut, bearing                    |
| 31    | 2   | Bearing, front                  |
| 32    | 2   | Spacer, bearing                 |
| 36    | 2   | Timing gear                     |
| 38    | 2   | Torque locking element          |
| 39    | 2   | Clamp plate                     |
| 40    | 12  | Screw, clamp plate              |
| 45    | 2   | Drain plug                      |
| 46    | 1   | Sight glass                     |
| 47    | 1   | Filler plug                     |
| 48    | 2   | Plug                            |
| 49    | 4   | Blanking plug                   |
| 50    | 2   | Gland Guard                     |
| 51    | 4   | Screw, gland guard              |
| 53    | 4   | Washer, gland guard             |
| 54    | 1   | Foot, vertical port             |
| 56    | 1   | Foot, horizontal port           |
| 58    | 2   | Bolt, Foot                      |

## 7 Parts list

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### 7.2 SRU2 Pump Range

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## Parts list

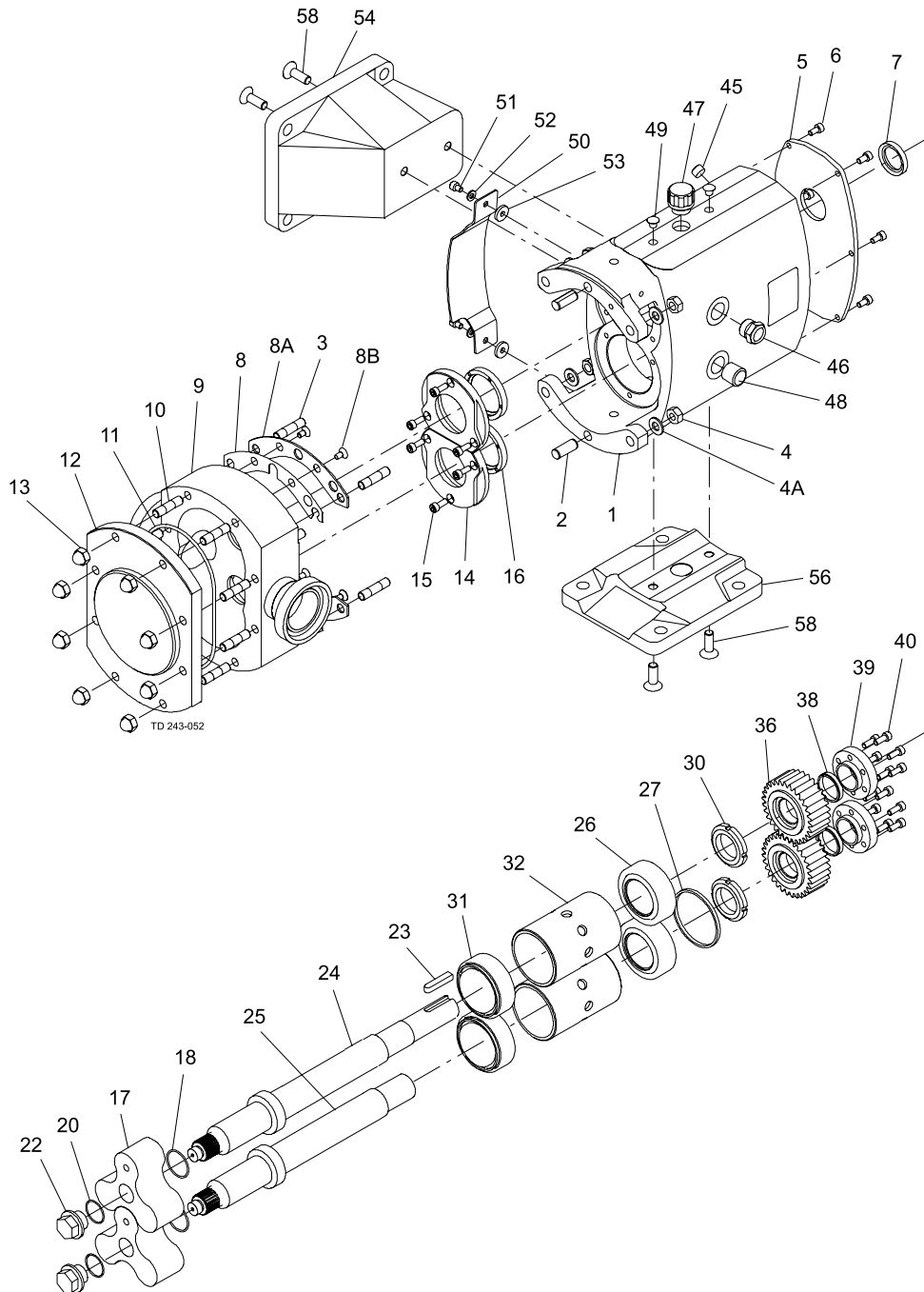
| Pos.  | Qty | Denomination                    |
|-------|-----|---------------------------------|
| 1     | 1   | Gearcase                        |
| 2     | 2   | Dowel                           |
| 3     | 4   | Stud, rotorcase retention       |
| 4     | 4   | Nut, rotorcase retention        |
| 4a    | 4   | Washer, rotorcase retention     |
| 5     | 1   | Cover, gearcase                 |
| 6     | 6   | Screw, gearcase cover           |
| 7     | 1   | Lip seal, drive end             |
| 8     | 2   | Shim                            |
| 8a    | 2   | Shim retainer                   |
| 8b    | 4   | Screw, shim retainer            |
| 9     | 1   | Rotorcase                       |
| 10    | 4   | Stud, rotorcase/cover retention |
| 11 ▲● | 1   | O-Ring, cover                   |
| 12    | 1   | Cover, rotorcase                |
| 13    | 4   | Dome nut, rotorcase cover       |
| 14    | 2   | Retainer, seal                  |
| 15    | 6   | Screw, seal retainer            |
| 16    | 2   | Lip seal, gland end             |
| 17    | 2   | Rotor                           |
| 18 ▲● | 2   | O-Ring, rotor sealing shaft end |
| 20 ▲● | 2   | O-Ring, rotor sealing nut end   |
| 22    | 2   | Nut, rotor retention            |
| 23    | 1   | Key                             |
| 24    | 1   | Shaft, drive                    |
| 25    | 1   | Shaft, auxiliary                |
| 26    | 2   | Bearing, rear                   |
| 27    | 1   | Spacer, shaft abutment          |
| 30    | 2   | Nut, bearing                    |
| 31    | 2   | Bearing, front                  |
| 32    | 2   | Spacer, bearing                 |
| 36    | 2   | Timing gear                     |
| 38    | 2   | Torque locking element          |
| 39    | 2   | Clamp plate                     |
| 40    | 12  | Screw, clamp plate              |
| 45    | 2   | Drain plug                      |
| 46    | 1   | Sight glass                     |
| 47    | 1   | Filler plug                     |
| 48    | 2   | Plug                            |
| 49    | 4   | Blanking plug                   |
| 50    | 2   | Gland Guard                     |
| 51    | 4   | Screw, gland guard              |
| 53    | 4   | Washer, gland guard             |
| 54    | 1   | Foot, vertical port             |
| 56    | 1   | Foot, horizontal port           |
| 58    | 2   | Bolt, Foot                      |

## 7 Parts list

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### 7.3 SRU3 Pump Range

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## Parts list

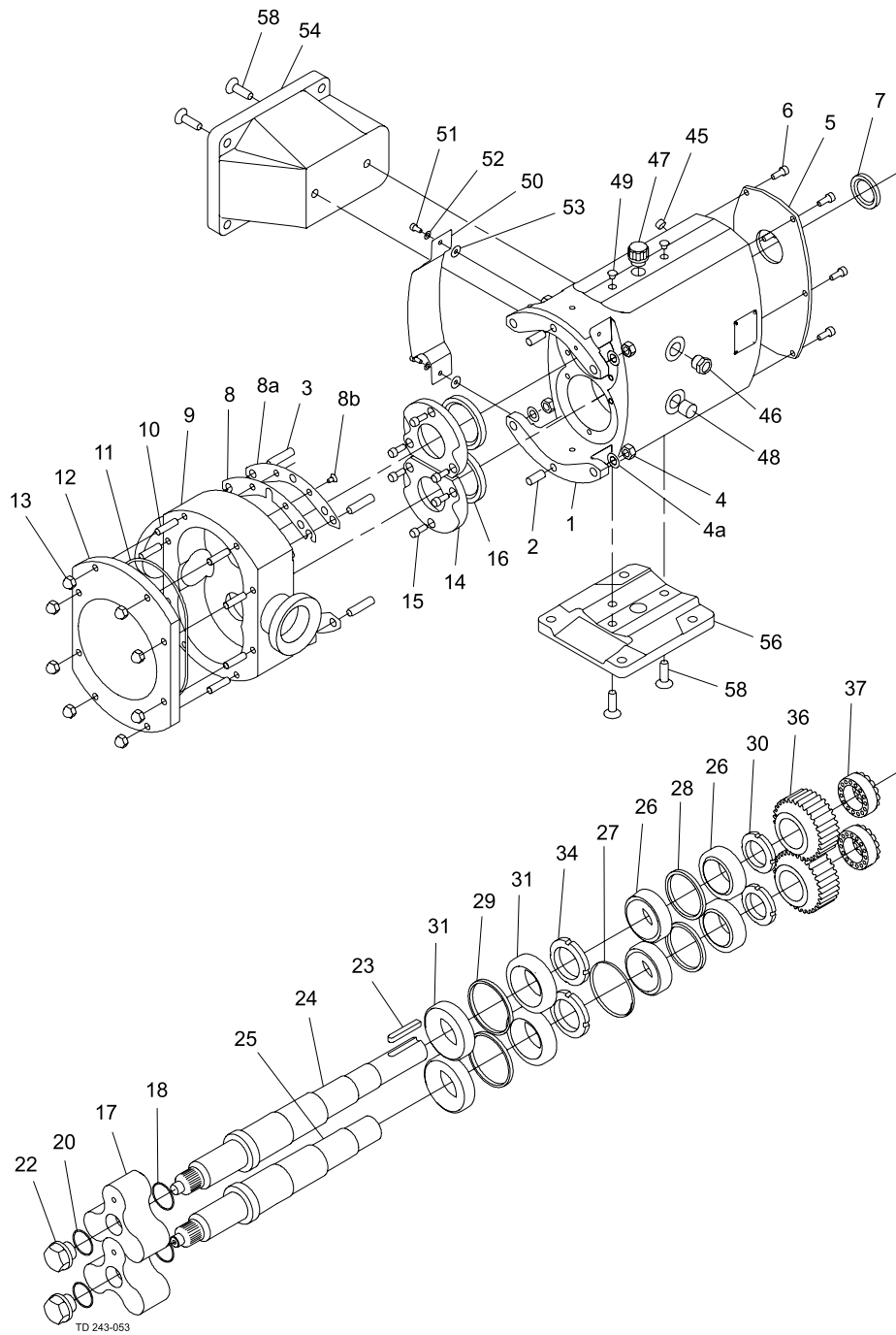
| Pos.  | Qty | Denomination                    |
|-------|-----|---------------------------------|
| 1     | 1   | Gearcase                        |
| 2     | 2   | Dowel                           |
| 3     | 4   | Stud, rotorcase retention       |
| 4     | 4   | Nut, rotorcase retention        |
| 4a    | 4   | Washer, rotorcase retention     |
| 5     | 1   | Cover, gearcase                 |
| 6     | 6   | Screw, gearcase cover           |
| 7     | 1   | Lip seal, drive end             |
| 8     | 2   | Shim                            |
| 8a    | 2   | Shim retainer                   |
| 8b    | 4   | Screw, shim retainer            |
| 9     | 1   | Rotorcase                       |
| 10    | 8   | Stud, rotorcase/cover retention |
| 11 ▲● | 1   | O-Ring, cover                   |
| 12    | 1   | Cover, rotorcase                |
| 13    | 8   | Dome nut, rotorcase cover       |
| 14    | 2   | Retainer, seal                  |
| 15    | 6   | Screw, seal retainer            |
| 16    | 2   | Lip seal, gland end             |
| 17    | 2   | Rotor                           |
| 18 ▲● | 2   | O-Ring, rotor sealing shaft end |
| 20 ▲● | 2   | O-Ring, rotor sealing nut end   |
| 21    | 2   | O-ring, rotor sealing nut end   |
| 22    | 2   | Nut, rotor retention            |
| 23    | 1   | Key                             |
| 24    | 1   | Shaft, drive                    |
| 25    | 1   | Shaft, auxiliary                |
| 26    | 2   | Bearing, rear                   |
| 27    | 1   | Spacer, shaft abutment          |
| 30    | 2   | Nut, bearing                    |
| 31    | 2   | Bearing, front                  |
| 32    | 2   | Spacer, bearing                 |
| 36    | 2   | Timing gear                     |
| 38    | 2   | Torque locking element          |
| 39    | 2   | Clamp plate                     |
| 40    | 12  | Screw, clamp plate              |
| 45    | 2   | Drain plug                      |
| 46    | 1   | Sight glass                     |
| 47    | 1   | Filler plug                     |
| 48    | 2   | Plug                            |
| 49    | 4   | Blanking plug                   |
| 50    | 2   | Gland Guard                     |
| 51    | 4   | Screw, gland guard              |
| 52    | 4   | Washer, gland guard             |
| 53    | 4   | Washer, gland guard             |
| 54    | 1   | Foot, vertical port             |
| 56    | 1   | Foot, horizontal port           |
| 58    | 2   | Bolt, Foot                      |

## 7 Parts list

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### 7.4 SRU4 Pump Range

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## Parts list

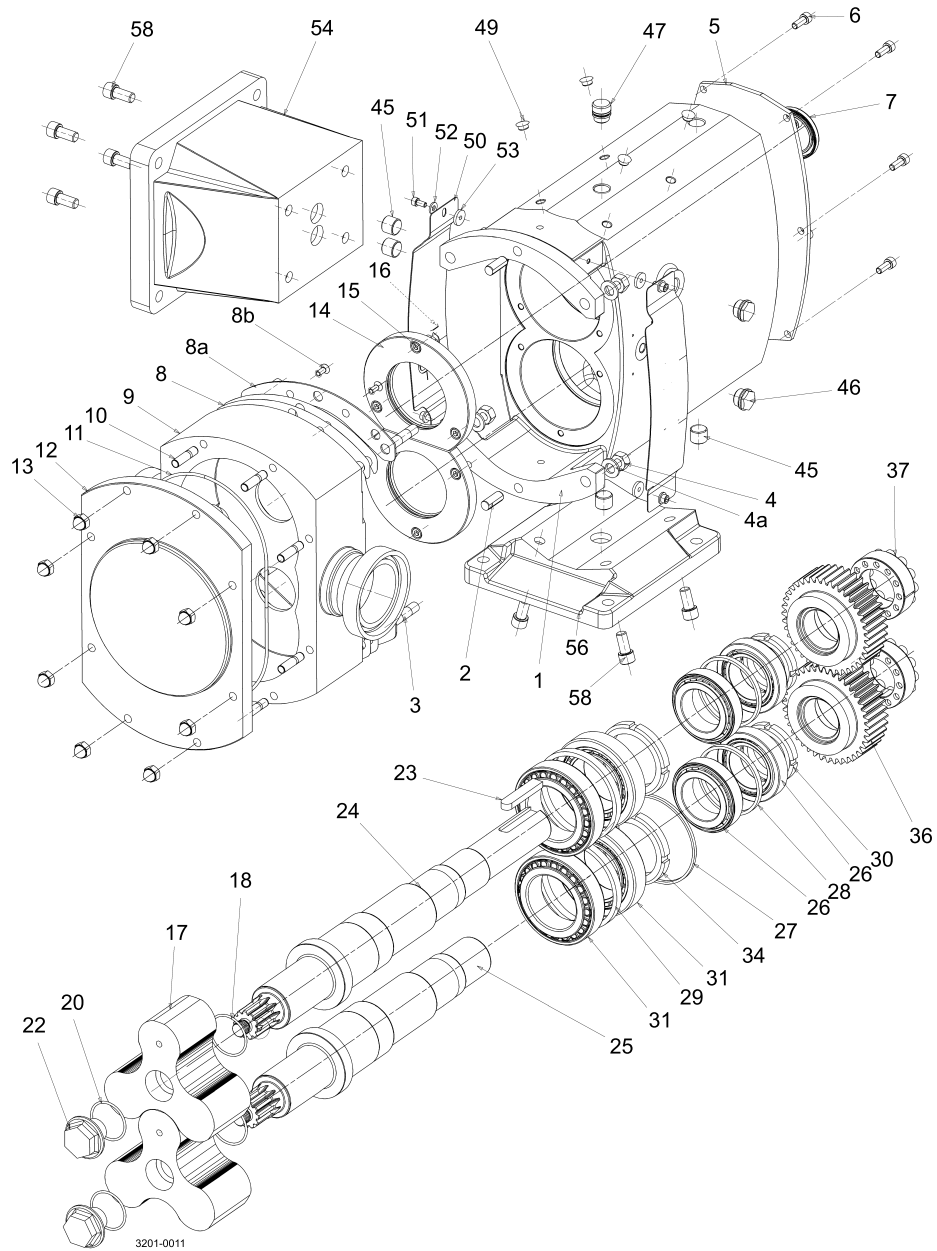
| Pos.  | Qty | Denomination                    |
|-------|-----|---------------------------------|
| 1     | 1   | Gearcase                        |
| 2     | 2   | Dowel                           |
| 3     | 4   | Stud, rotorcase retention       |
| 4     | 4   | Nut, rotorcase retention        |
| 4a    | 4   | Washer, rotorcase retention     |
| 5     | 1   | Cover, gearcase                 |
| 6     | 6   | Screw, gearcase cover           |
| 7     | 1   | Lip seal, drive end             |
| 8     | 2   | Shim                            |
| 8a    | 2   | Shim retainer                   |
| 8b    | 4   | Screw, shim retainer            |
| 9     | 1   | Rotorcase                       |
| 10    | 8   | Stud, rotorcase/cover retention |
| 11 ▲● | 1   | O-Ring, cover                   |
| 12    | 1   | Cover, rotorcase                |
| 13    | 8   | Dome nut, rotorcase cover       |
| 14    | 2   | Retainer, seal                  |
| 15    | 6   | Screw, seal retainer            |
| 16    | 2   | Lip seal, gland end             |
| 17    | 2   | Rotor                           |
| 18 ▲● | 2   | O-Ring, rotor sealing shaft end |
| 20 ▲● | 2   | O-Ring, rotor sealing nut end   |
| 22    | 2   | Nut, rotor retention            |
| 23    | 1   | Key                             |
| 24    | 1   | Shaft, drive                    |
| 25    | 1   | Shaft, auxiliary                |
| 26    | 4   | Bearing, rear                   |
| 27    | 1   | Spacer, shaft abutment          |
| 28    | 2   | Spacer, bearing drive end       |
| 29    | 2   | Spacer, bearing gland end       |
| 30    | 2   | Nut, bearing rear               |
| 31    | 4   | Bearing, front                  |
| 34    | 2   | Nut, bearing front              |
| 36    | 2   | Timing gear                     |
| 37    | 2   | Torque locking assembly         |
| 45    | 2   | Drain plug                      |
| 46    | 1   | Sight glass                     |
| 47    | 1   | Filler plug                     |
| 48    | 2   | Plug                            |
| 49    | 4   | Blanking plug                   |
| 50    | 2   | Gland guard                     |
| 51    | 4   | Screw, gland guard              |
| 52    | 4   | Washer, gland guard             |
| 53    | 4   | Washer, gland guard             |
| 54    | 1   | Foot, vertical port             |
| 56    | 1   | Foot, horizontal port           |
| 58    | 2   | Bolt, Foot                      |

## 7 Parts list

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### 7.5 SRU5 Pump Range

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## Parts list

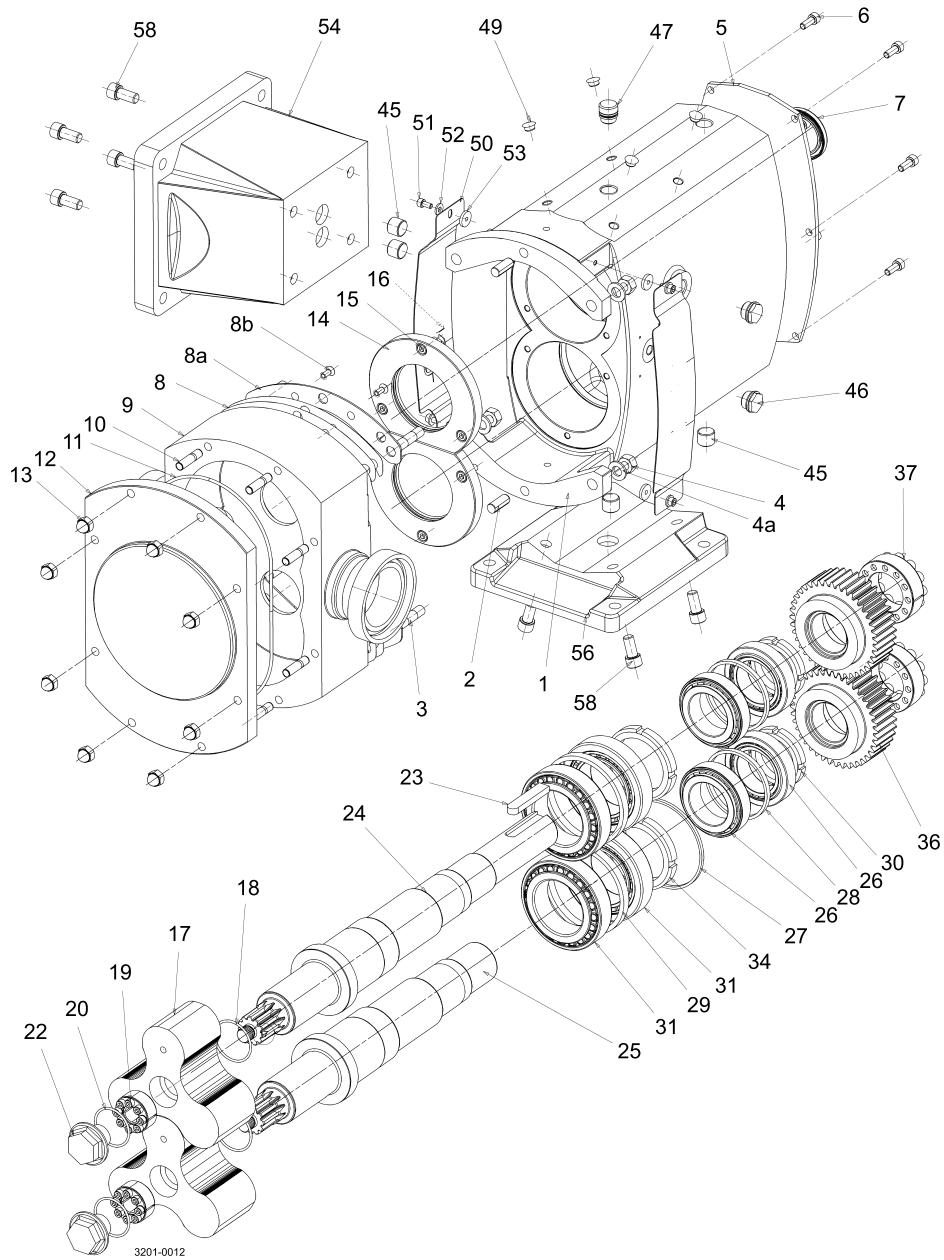
| Pos.  | Qty | Denomination                    |
|-------|-----|---------------------------------|
| 1     | 1   | Gearcase                        |
| 2     | 2   | Dowel                           |
| 3     | 4   | Stud, rotorcase retention       |
| 4     | 4   | Nut, rotorcase retention        |
| 4a    | 4   | Washer, rotorcase retention     |
| 5     | 1   | Cover, gearcase                 |
| 6     | 6   | Screw, gearcase cover           |
| 7     | 1   | Lip seal, drive end             |
| 8     | 2   | Shim                            |
| 8a    | 2   | Shim retainer                   |
| 8b    | 4   | Screw, shim retainer            |
| 9     | 1   | Rotorcase                       |
| 10    | 8   | Stud, rotorcase/cover retention |
| 11 ▲● | 1   | O-Ring, cover                   |
| 12    | 1   | Cover, rotorcase                |
| 13    | 8   | Dome nut, rotorcase cover       |
| 14    | 2   | Retainer, seal                  |
| 15    | 6   | Screw, seal retainer            |
| 16    | 2   | Lip seal, gland end             |
| 17    | 2   | Rotor                           |
| 18 ▲● | 2   | O-Ring, rotor sealing shaft end |
| 20 ▲● | 2   | O-Ring, rotor sealing nut end   |
| 22    | 2   | Nut, rotor retention            |
| 23    | 1   | Key                             |
| 24    | 1   | Shaft, drive                    |
| 25    | 1   | Shaft, auxiliary                |
| 26    | 4   | Bearing, rear                   |
| 27    | 1   | Spacer, shaft abutment          |
| 28    | 2   | Spacer, bearing drive end       |
| 29    | 2   | Spacer, bearing gland end       |
| 30    | 2   | Nut, bearing rear               |
| 31    | 4   | Bearing, front                  |
| 34    | 2   | Nut, bearing front              |
| 36    | 2   | Timing gear                     |
| 37    | 2   | Torque locking assembly         |
| 45    | 7   | Drain plug                      |
| 46    | 1   | Sight glass                     |
| 47    | 1   | Filler plug                     |
| 50    | 2   | Gland guard                     |
| 51    | 4   | Screw, gland guard              |
| 52    | 4   | Washer, gland guard             |
| 53    | 4   | Washer, gland guard             |
| 54    | 1   | Foot, vertical port             |
| 56    | 1   | Foot, horizontal port           |
| 58    | 4   | Bolt, foot                      |

## 7 Parts list

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### 7.6 SRU6 Pump Range

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## Parts list

| Pos.  | Qty | Denomination                    |
|-------|-----|---------------------------------|
| 1     | 1   | Gearcase                        |
| 2     | 2   | Dowel                           |
| 3     | 4   | Stud, rotorcase retention       |
| 4     | 4   | Nut, rotorcase retention        |
| 4a    | 4   | Washer, rotorcase retention     |
| 5     | 1   | Cover, gearcase                 |
| 6     | 6   | Screw, gearcase cover           |
| 7     | 1   | Lip seal, drive end             |
| 8     | 2   | Shim                            |
| 8a    | 2   | Shim retainer                   |
| 8b    | 4   | Screw, shim retainer            |
| 9     | 1   | Rotorcase                       |
| 10    | 8   | Stud, rotorcase/cover retention |
| 11 ▲● | 1   | O-Ring, cover                   |
| 12    | 1   | Cover, rotorcase                |
| 13    | 8   | Dome nut, rotorcase cover       |
| 14    | 2   | Retainer, seal                  |
| 15    | 6   | Screw, seal retainer            |
| 16    | 2   | Lip seal, gland end             |
| 17    | 2   | Rotor                           |
| 18 ▲● | 2   | O-Ring, rotor sealing shaft end |
|       | 2   | Torque locking assembly         |
| 20 ▲● | 2   | O-Ring, rotor sealing nut end   |
| 22    | 2   | Nut, rotor retention            |
| 23    | 1   | Key                             |
| 24    | 1   | Shaft, drive                    |
| 25    | 1   | Shaft, auxiliary                |
| 26    | 4   | Bearing, rear                   |
| 27    | 1   | Spacer, shaft abutment          |
| 28    | 2   | Spacer, bearing drive end       |
| 29    | 2   | Spacer, bearing gland end       |
| 30    | 2   | Nut, bearing rear               |
| 31    | 4   | Bearing, front                  |
| 34    | 2   | Nut, bearing front              |
| 36    | 2   | Timing gear                     |
| 37    | 2   | Torque locking assembly         |
| 45    | 7   | Drain plug                      |
| 46    | 1   | Sight glass                     |
| 47    | 1   | Filler plug                     |
| 50    | 2   | Gland guard                     |
| 51    | 4   | Screw, gland guard              |
| 52    | 4   | Washer, gland guard             |
| 53    | 4   | Washer, gland guard             |
| 54    | 1   | Foot, vertical port             |
| 56    | 1   | Foot, horizontal port           |
| 58    | 4   | Bolt, foot                      |

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