Albany Pumps
AN EMPLOYEE OWNED COMPANY

## OPERATING AND MAINTENANCE

# Heated gear pumps

- Electrically heated
- Oil heated
- Steam heated

**THIS MANUAL SHOULD BE USED ALONGSIDE THE ALBANY STANDARD INSTALLATION, OPERATION AND MAINTENANCE MANUAL**

**Albany's 24-page brochure is available as a download at www.albany-pumps.co.uk**


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**IMPORTANT:**

**THESE PUMPS SHOULD NEVER BE STARTED UP COLD.**
**A TEMPERATURE OF 120/130'C IS REQUIRED TO RUN THE PUMPS AT ALL TIMES**

This manual is a supplement to the standard Albany operating & maintenance manual and contains general instructions for the storage, installation, operation and maintenance of the following Albany gear pumps.

- Electrically Heated
- Oil Heated
- Steam Heated

To get the best from the pump, carefully read and understand this manual before installation and start-up. Albany cannot anticipate all of the situations a user may encounter while installing and using Albany products. Therefore, the user of an Albany product **MUST** know and follow all applicable industry specifications on the safe installation and use of these products.

Albany Engineering Company Limited will not be held responsible for any consequence due to the improper installation and use of the pump.

## *USING THIS MANUAL*

- Read and understand the manual. Contact us if anything is not clear.
- Keep the manual for the life of the pump.
- If pump maintenance is necessary use this manual for safety and technical information.
- For safe working, observe the operating and maintenance instructions for associated motors, engines, couplings and relief valves.

The following are general safety precautions not related to any specific procedure, however, the United Kingdom Health and Safety At Work Act 1974 Section 6(a) requires manufacturers to advise their customers on the safety and the handling precautions to be observed when installing, operating, maintaining and servicing their products.

Personnel must understand and apply these precautions during both operating and maintenance of the pump. The user's attention is therefore drawn to the following:

1. The appropriate sections of this manual must be read before working on the equipment.
2. Installation and servicing must only be carried out by suitably trained or qualified personnel.
3. Normal safety precautions must be taken and appropriate procedures observed to avoid accidents

The following symbols are used throughout this manual to draw attention

| | |
|---|---|
|  | *Warning – non compliance with this point could result in injury/harm* |
|  | *Refers to electrical safety points which can cause injury/harm* |
|  | *Cautions, Safe operation of pump* |

## LIMITS OF USE

| | |
|---|---|
|  | *The pump/pump sets must not be subjected to pressures and temperatures in excess of those for which it was originally quoted and supplied. It must not be subjected to extremes of temperature and/or humidity for which it was not designed.* |

- Never use heat to disassemble the pumps due to risk of explosion from trapped liquid.
- Never operate the pump without all guards correctly installed.
- Never operate the pump beyond the rated conditions for which the pump was originally sold.
- Never run the pump when dry.
- Always lock out and post a permit on the power to the driver before performing any pump maintenance.
- Never operate the pump with discharge valve closed.
- Never operate the pump with suction valve closed.

## NOISE

On certain installations, pump models and at certain operation points shown on the pump curves a noise level of 80 dB, can be exceeded.

When working in a pump house check the noise.
Above 70 dBA, wear ear defenders.
Above 85 dBA, wear ear defenders and limit your time working in this area.

Remove the pump to somewhere quieter to carry out any maintenance.

## *PUMP INSTALLATION / MAINTENANCE*

Please install your pump in accordance with the latest National Safety Regulations.

Before working on an installed pump:
1) Hazardous liquid – drain and clean the system
2) Depressurise the pump and all lines
3) Disconnect the power supply. Lock it off, post a permit
4) Disconnect the shaft coupling

It is hazardous to:
1) Run the pump without the coupling guard fitted
2) Change the use of the pump or modify it without Albany approval
3) Fail to maintain the pump, as this can cause injury or fire

The pump user is responsible for the safe use of the pump.

Alterations to your pump are not allowed.

*Pumps can be dangerous if they are:*
- *incorrectly installed*
- *incorrectly used*
- *not serviced*

*Restrict access to the pump to competent people.*

*Use the correct tools for maintenance.*

*Lock off the electric starter; post a permit to prevent unauthorised starting. Switch off and isolate any electrical heating system.*

*Do not touch rotating parts.*

*Wear your PPE and goggles, leather apron.*

*Assume that the pump is hot, check; allow to cool before starting work.*

*In the case of pumps for hot liquids allow to cool. Shut off all oil or steam heating systems, vent them when cool.*

*Consider whether the pump or its parts may topple over. Take care to avoid injury from falling parts, especially if the pump is large or heavy.*

## WORK ON ELECTRICAL EQUIPMENT

Take extra care when working with any electrical equipment associated with the operation of the pump; check that the motor terminals are not live even after switching off the supply. Earthing - ensure the pump has a proper ground connection.

*Do not attempt any inspection or repair before disconnecting the pump set from the electric supply.*

*Where possible lock off the switch gear and post a permit on it, yourself.*
*Test that the motor terminals are not live before starting work.*

*Do not work on wet equipment*

*Only use a qualified electrician*

Refer to original manufacturer of motor / engine for maker's installation manual.

## WORKING ON PRESSURISED SYSTEMS

Check and observe the system pressure regularly.

*Liquids under pressure can cause injury, wear goggles and PPE*

*Vent all pressure containing parts to atmosphere, taking care in case the system is under pressure.*

First close all valves.

Bleed the pump and system; this includes any thermal oil heating system.

Take great care with toxic/hazardous liquids.

## COSHH

Control Of Substances Hazardous To Health
As far as we are aware there are no hazardous substances present in this Albany pump when it leaves our works. However, we cannot confirm that product to be handled by the pump, or any reaction of those products that are pumped and any adjacent materials are not hazardous.

## MAGNETIC COUPLINGS

If fitted, when each half of the coupling is separated, any magnetic or electronic device in the vicinity of the couplings can be affected. Items such as watches, credit cards and heart pacemakers are especially vulnerable. During assembly on the two halves, great care is required to ensure fitting takes place with the minimum of impact.

## TECHNICAL / DESCRIPTION

The Albany gear pump is an external gear positive displacement pump which consists of two counter-rotating shafts. The gears (rotors) which are attached to these shafts mesh together and rotate freely inside the pump casing bores.

The pumping rotors are contained within a rigid housing which is securely fixed together with mating faces being sealed by the use of a gasket to prevent leakage of fluid under pressure.

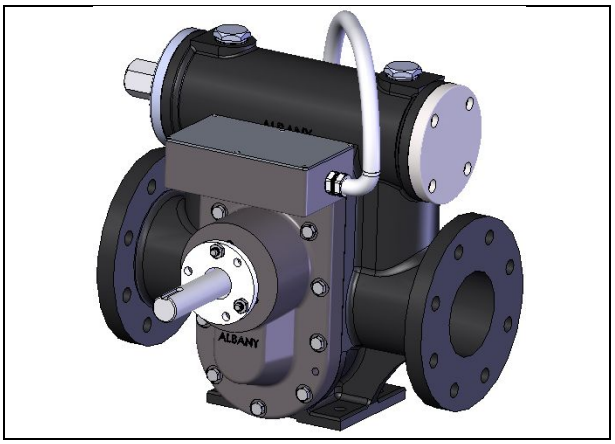
The driving shaft of the pump which protrudes from the pump casing is sealed to prevent leakage of the pumped fluid by means of either a packed gland or lip seal (pressure relieved) or mechanical seal.

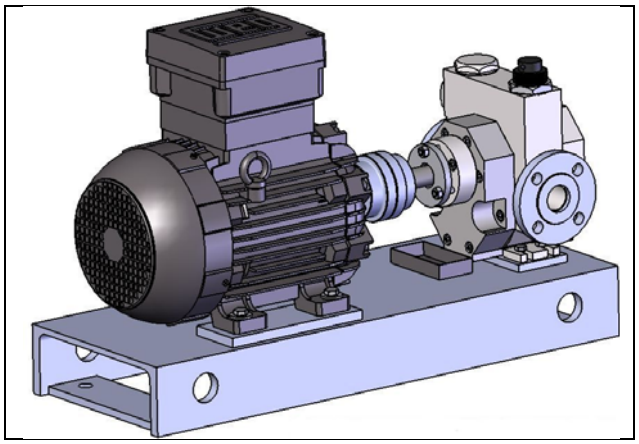
Drive to the pump is achieved via a prime mover (electric motor, engine etc.) being connected to the pumps drive shaft using a coupling. This unit is normally mounted on a combination base plate.

The coupling is in turn covered by a securely mounted guard for safety purposes (not shown in picture).

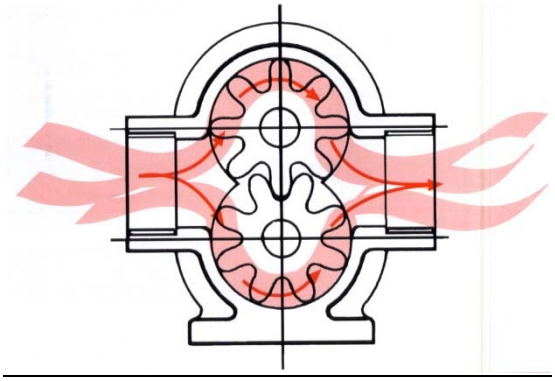
*Guards can only be removed with the use of tools and must be replaced as soon as any work that requires the guard to be removed has been completed.*

*Guards are not designed to support any weight.*



## OPERATING PRINCIPLE



Liquid flows into the pump through the inlet (suction) branch (screwed or flanged connection); is carried round by the rotating rotors and pumped out of the outlet (delivery) port (screwed or flanged connection). Contact between the gear teeth separates and seals the suction side from the delivery side of the pump. This creates the vacuum which allows atmospheric pressure or a positive suction head to get the liquid into the pump.
All the time the pump is rotating, liquid will be moved from the suction side to the discharge side.

## *RECIEVING THE PUMP*

*Read this manual before installing, operating or working on the pump*.

Before reaching you, Albany will have run in, tested and recorded the pump performance in accordance with your enquiry and order.

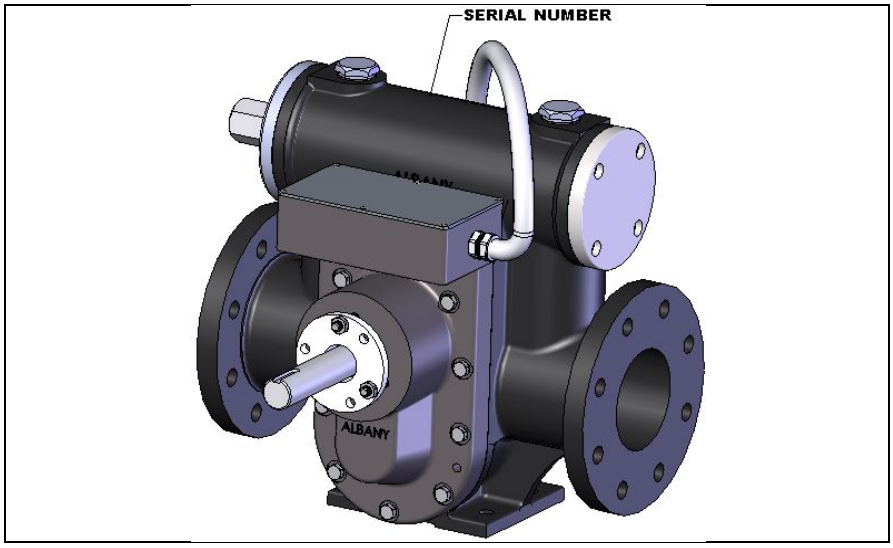
Albany has over 100 years of history in gear pumps. This means that the design, materials, and workmanship incorporated in the construction of Albany pumps make them capable of giving, trouble-free service. The life and reliability of any pump, however, is enhanced by:

- correct application
- proper installation
- periodic inspection, condition monitoring
- careful maintenance/servicing

Should any problems occur with the pump in its lifetime we have a spares and repair service. The use of genuine Albany parts will provide the safest and most reliable operation of your pump. ISO certification and quality control procedures ensure the parts are manufactured to the highest quality and safety levels. Please contact Albany for details on genuine pump parts.

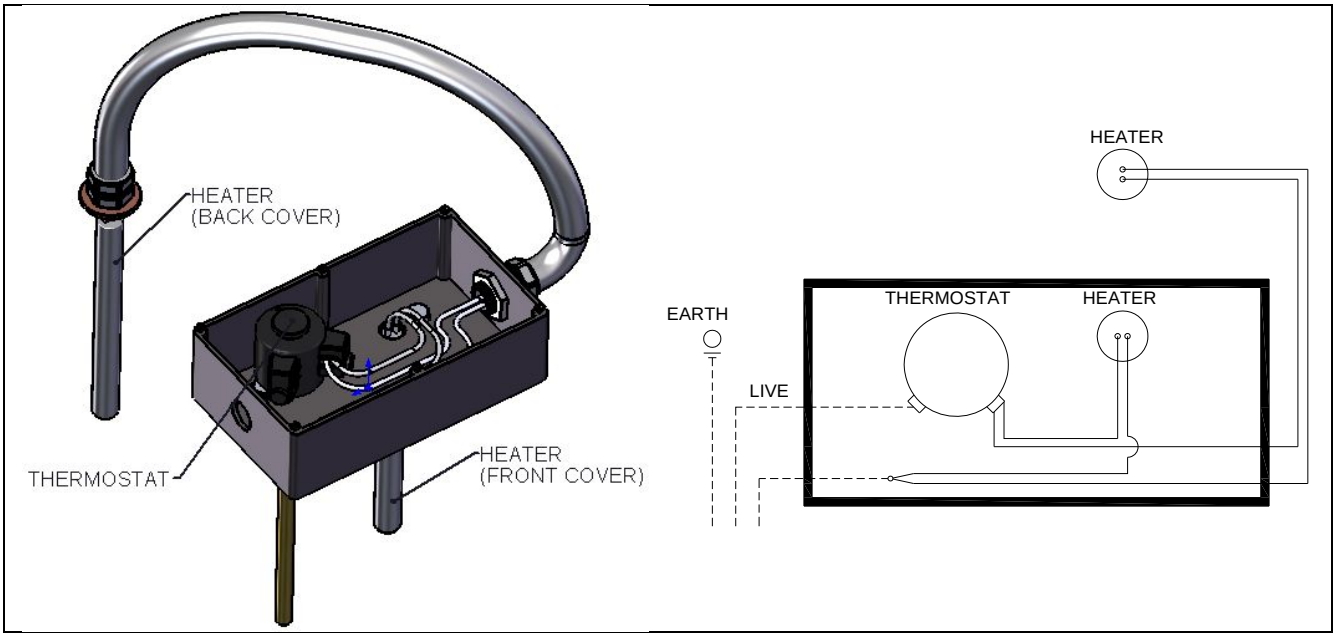
Please e-mail: sales@albany-pumps.co.uk

To help us identify the pump Albany will need to know the pump serial number which is stamped into the pump casing. Typical positions for serial number are shown below.



## *ELECTRICALLY HEATED PUMPS*

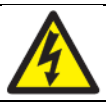
Electrically heated pumps are supplied with cartridge heaters, fitted into the front and back covers of the pump. To control the heater operating temperature on start up, a thermostat is provided which is housed in a aluminium terminal box.




The heaters have to be connected to the thermostat together with the incoming electrical supply. Albany fit either 240 volt or 110 volt heaters to pumps, make sure to check which is supplied with the pump before connection to supply.

The pump must not be started until all bitumen is in liquid form. To avoid delays in start-up a time switch can be used. Start the heaters about one hour before the pump is to start.

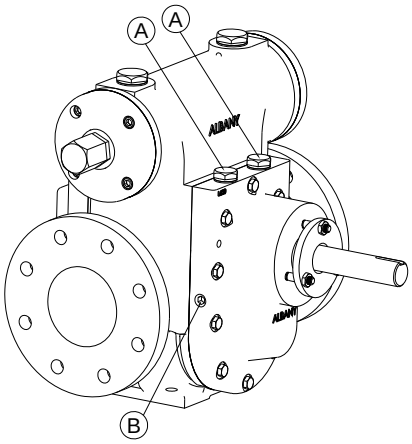
If an adjustable type thermostat is fitted to the pump, on completion of wiring, the thermostat should be set to the required operating temperature. As bitumen is fluid at approx 90'c, the recommended thermostat setting is between 120'c and 130'c. Under no circumstances must the setting exceed 180'c.

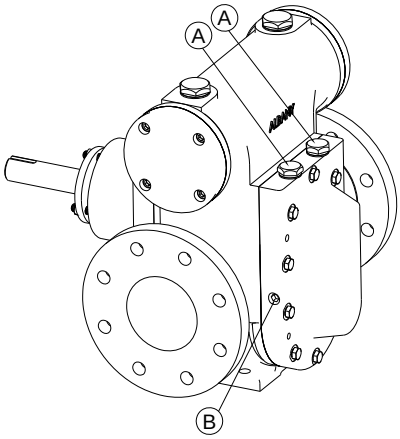
| | |
|---|---|
|  | *If the pump installation is to be lagged, the lagging is not to include the thermostat housing. This item must be air cooled or damage to the thermostat will result for which Albany will disclaim any liability.* |
|  | *The insulation material used in the manufacture of the electric cartridge heaters is hydroscopic and will absorb moisture when not hot. If the pump is stored, shipped or left in-operative in a wet, moist or humid environment we advise the following. Prior to energising, remove the heaters from the pump and place them in an oven at 120'c – 180'c for a few hours in order to dry them out. Failure to do this will cause them to short circuit when energised.* |
|  | *Electrically heated pumps are not suitable for flameproof areas.*<br>*All electrical connections should be carried out by competent personnel.* |

## *OIL / STEAM HEATED PUMPS*

| | |
|---|---|
| A | Inlet or Outlet for Oil / Steam |
| B | Not to be Used |

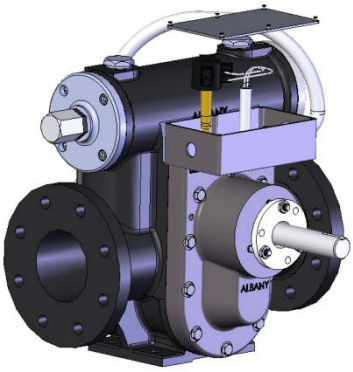
Oil / steam connections will be either ½“ BSP or ¾“ BSP.



## *STRIP & REBUILD A TYPICAL PUMP WITH ELECTRICAL HEATING*

Cold bitumen pumps can be difficult to dismantle. To ease disassembly, gently heat the pump with a blow torch or soak in solvent. Alternatively, with the help of an electrician you can operate the heaters to warm the pump.

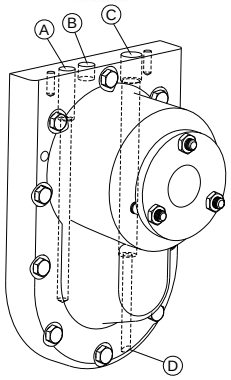


1. Remove the terminal box lid and disconnect all electrical supplies.

2. Take pump from the base-plate and clean away all bitumen.

3. Remove electrical heaters by using an extraction rod pushed into the base of the covers.

| | |
|---|---|
| A | Thermostat – Adjustable type |
| B | Thermostat – Non Adjustable type |
| C | Heater |
| D | Heater Extraction Hole |

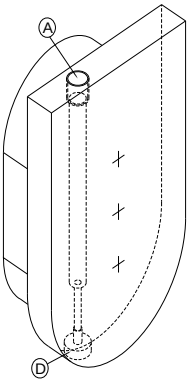



4. When pump is ready to dismantle, mark the covers and body so the correct mating faces are aligned on reassembly.

5. Remove all set-bolts from front and back covers.

6. Remove lip seals or gland and packing.

7. Knock end of drive shaft with hide mallet or rubber hammer to remove pump back cover. Tap non drive end of drive shaft to remove pump front cover. Alternatively, most pump back covers have jacking screws holes to help removal.




8. Remove rotors and shafts from front cover.

9. The relief valve and dowels can now be removed from the pump body.

10. The pump parts can now be cleaned for inspection and measurement.

**On Inspection**

1. If the body bores are found to have more than 0.63mm (0.025”) wear then a replacement body is required.

2. If rotors have wear of 0.50mm (0.020”) on O/D or heavy scoring on ends, they will need replacing.

3. If a shaft journal has more than 0.20mm (0.008”) wear and the bushes have 0.10/0.13mm (0.004/0.005”) wear then replace. If the bush has it’s PTFE coating (grey) worn away replace it.

4. It is advisable on a strip down to replace the relief valve spring and re-seat the relief valve before re-fitting the pump.

5. Always renew gaskets and the gland packing or refurbish the seal.

The shaft seal is often the most sensitive component in a pump as it must seal between a rotating shaft and the stationary pump housing. In general Albany provides two types of shaft sealing for heated pumps:

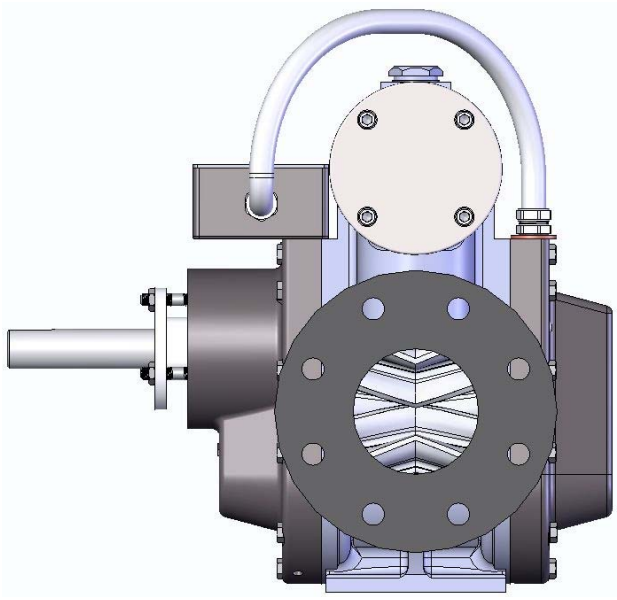
- Packed Gland
- Lipseal

## *PACKED GLAND SEAL*

Please refer to our standard installation, operating & maintenance manual.

Special Points for bitumen glands:
Do not over tighten the gland. Bitumen can turn to carbon and cause shaft scoring if the gland gets very hot.

| | |
|---|---|
|  | *Overheating and fire risk can be caused by over tightening the gland or by failure to re-pack the gland when needed.* |
|  | *Glands need to be repacked as soon as the packing has been fully compressed.* |



## *LIP SEALS*

Pumps are fitted with seals to prevent outflow of Bitumen.
A cartridge design lip seal assembly with hardened sleeves is available for heated pumps.
Lip seals retain the pumping liquid within the pump while keeping air, dust and dirt from entering along the rotating shaft.

In general, lip seals are more sensitive, than packed gland, to shaft run out and surface irregularities.

**Maintenance**

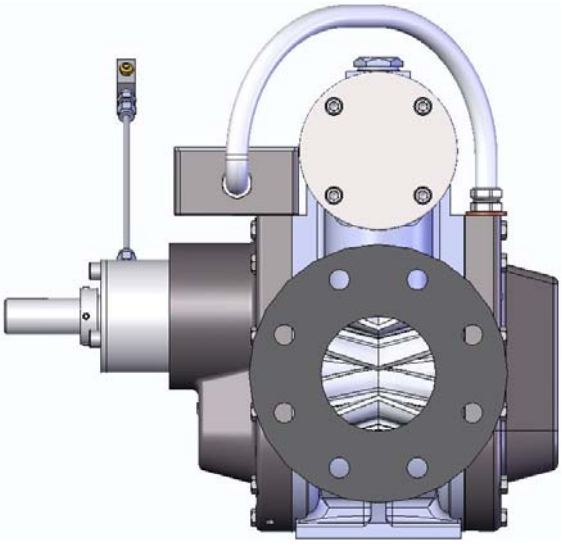
Regularly checking and replacing the lip seal cartridge is critical to successful preventive maintenance programs. Albany recommends lubricating with grease once a month. Look for obvious signs of leakage. Weekly lubrication minimizes wear and maximizes service life.

During maintenance/overhauling of equipment we strongly recommend that a new or service exchange seal be fitted. Under no circumstances should the old seal be removed and then replaced in the same housing, the interference fit cannot be repeated.

When refitting a seal:

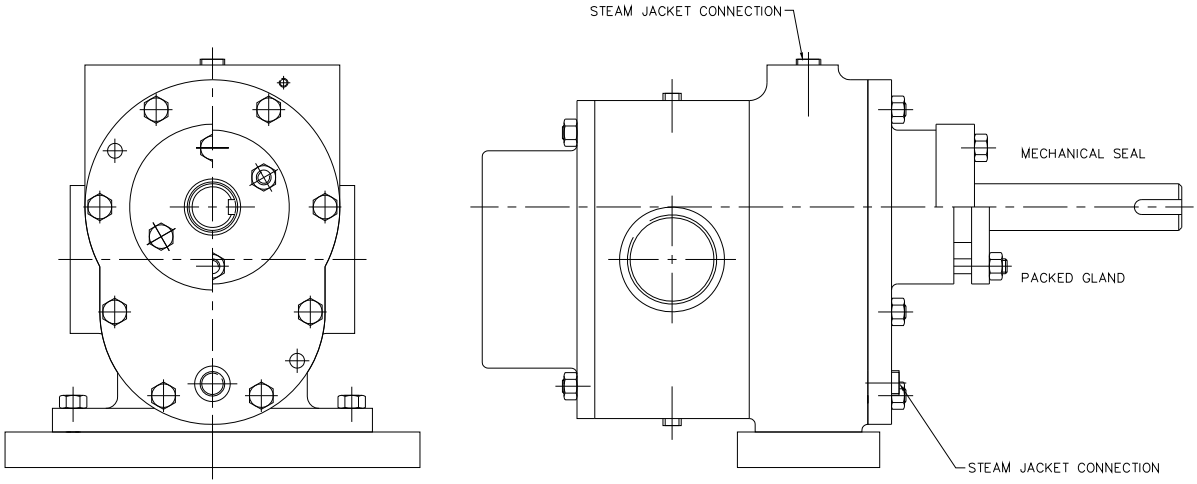
- Make sure that the sealing edge is not damaged in any way.
- Check the shaft for wear / marks. Make sure that the area on which the seal is to run is in good condition.
- Check that there are no burrs on shaft prior to fitting the new lipseals
- Apply a liberal amount of clean grease or mineral oil to the sealing edge before offering the shaft back through.

ALBANY uses the following grease for lubrication.
***Shell Albida RL2*** *is recommended for use over the temperature range -20°C to 150°C*
*or*
***AeroShell Grease 22*** *covers the operating temperature from –65 °C to + 204 °C. (a fully synthetic grease designed for severe operating conditions).*

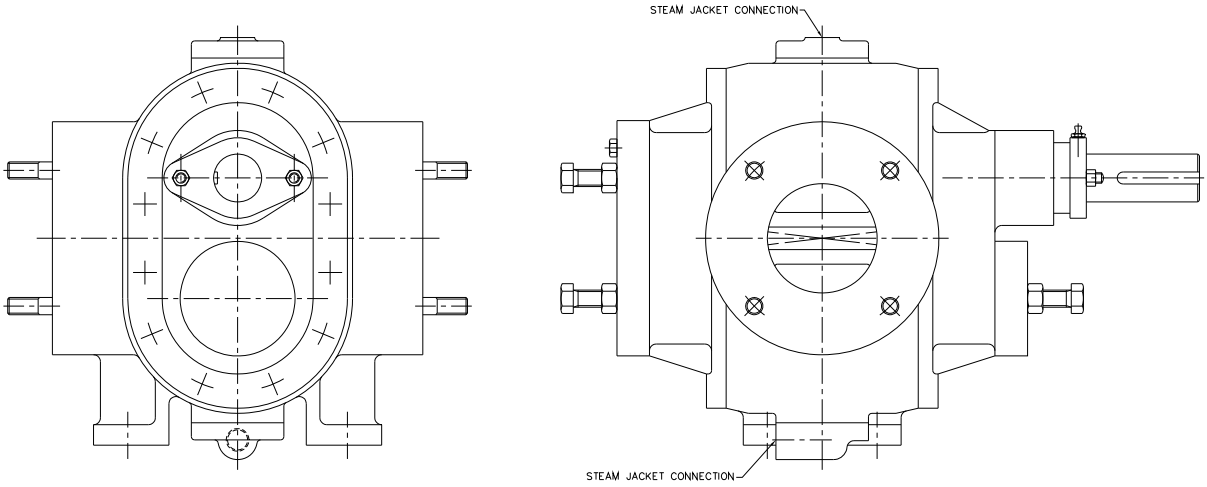


**For non cartridge lip seals please refer to page 26 of the Albany standard installation operation and maintenance manual for more information.**

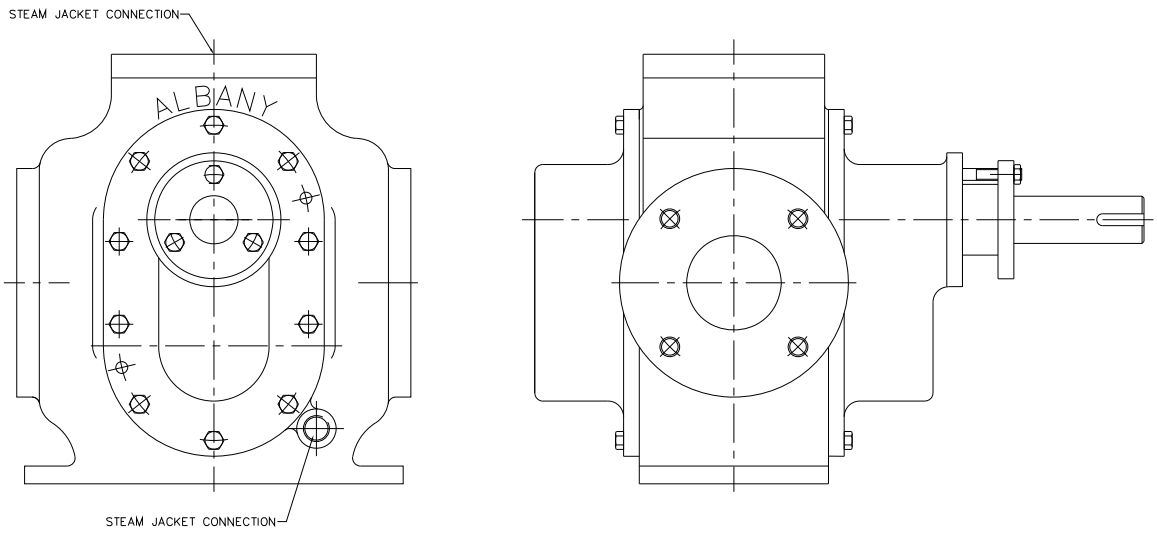
## 'FATS' DESIGN PUMP




## STEAM JACKETED PUMP - BK DESIGN




## STEAM JACKETED PUMP - ALBANY DESIGN

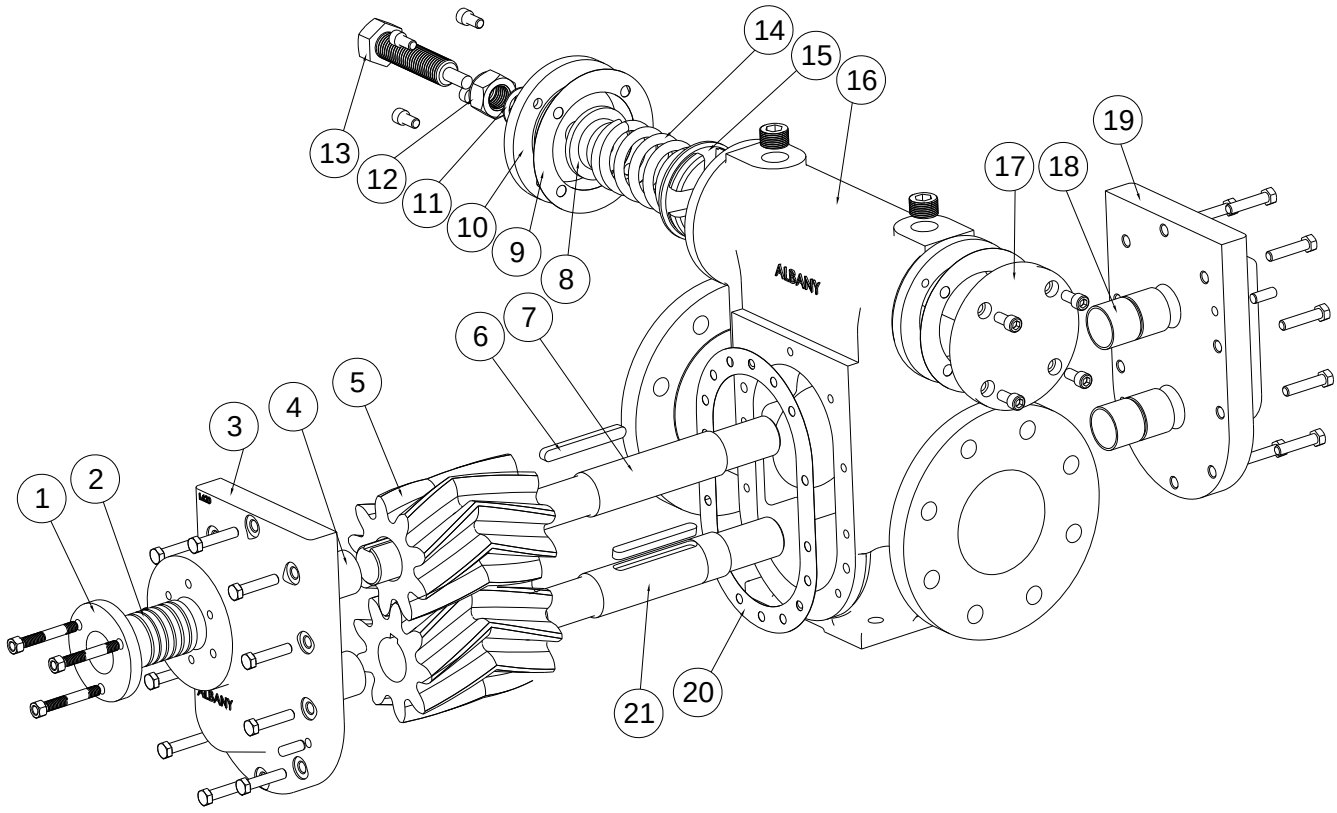


SPARES

To ensure the correct spares are supplied we need to know the pump serial number which is stamped into the metal of the pump body, or cover, in a prominent position on the top area of the pump.

Recommended spares (*)

| | | | |
|---|---|---|---|
| 1 | Gland / Seal Housing | 12 | Locknut |
| 2 | Shaft Sealing * | 13 | Adjusting Screw |
| 3 | Front cover | 14 | Spring |
| 4 | Bushes – Front Cover* | 15 | Relief Valve |
| 5 | Rotors (2) * | 16 | Body |
| 6 | Key (2) | 17 | RV Flange |
| 7 | Driving shaft* | 18 | Bushes – Back Cover* |
| 8 | Spring Seat | 19 | Back cover |
| 9 | Gasket* | 20 | Body Gaskets * |
| 10 | Adjusting Screw Flange | 21 | Following Shaft * |
| 11 | Sealing Washer | | |




Make sure that the correct spares are to hand before starting work on the pump.
Contact our works if you need assistance before starting the job.