



## Operation and Service Manual

**Labtop®** Series 200-450  
**Operating Instructions**

REV202306



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**PLEASE REGISTER YOUR LABTOP TO RECEIVE UP-TO-DATE SOFTWARE FOR CONTROLLER.**

**REGISTRATION CAN BE DONE WITH ENCLOSED FORM OR FROM OUR WEBSITE  
WWW.I B-6 @C7 DI AD.COM**

LABTOP SIZE: \_\_\_\_\_

PUMP S.N.: \_\_\_\_\_

VFD S.N.: \_\_\_\_\_

# 1.0 General

## 1.1 Declaration of Conformity



### EC DECLARATION OF CONFORMITY

We hereby declare that the following machinery is intended for installation into a machine or to be assembled with other machines into a machine. It must **not** be put into service until the machinery into which it is incorporated has been declared in conformity with the provisions of the Machinery Directive 2006/42/EC, 09/392/EEC, amendments 91/368/EEC, 93/44/EEC, 93/68/EEC.

Manufacturer	Manufacturer
Unibloc Hygienic Technologies, LLC 1650 Airport Road Kennesaw, GA 30144 USA	UNIBLOC-RH GmbH Stromberger Strasse 197 Beckum 59269 Germany

Machine Description: Rotary Lobe Pump

Type: UNIBLOC-PD  
UNIBLOC-GP

Size: PD200-677  
GP200-450

Serial Number: \*\*\*\*\*

These machines have been designed and manufactured in accordance with the following transposed harmonized European Standards.

EN292 Parts 1 and 2: 1991 Safety of Machinery – Basic Concepts, general principles for design.

EN294: 1992 Safety distances to prevent danger zones being reached by the upper limbs.

Amendment: CR NO 2023/2006: GMP for materials and articles in contact with food

Amendment: EC NO 1935/2004: Materials and articles in contact with food

Amendment: CR NO 10/2011: Plastic materials and articles in contact with food

A technical construction file for this machinery is retained at the above address.

Signed:  Date: January 12, 2021

Bhavesh Patel, Operations Manager

## 1.2 General Description

**LABTOP®** Pump System features **UNIBLOC®-PD** and is a positive displacement rotary lobe pump. It is supplied with a drive unit and controller within common Stainless Canopy (figure 1.0). **UNIBLOC-PD** can be supplied in the 5000 series with stainless steel bearing housing. Different models are available from each series. Table 1.0 shows the pump bearing housing and model relation. The Pump Models 200-0 - 275 are available in Vertical Position, Pump Models 300-350 are available in Horizontal Position and Pump Models 400-450 are available in either Vertical or Horizontal Position. The orientation can be modified using either a foot for horizontal or pedestal for vertical. Port orientation should be specified when ordering.

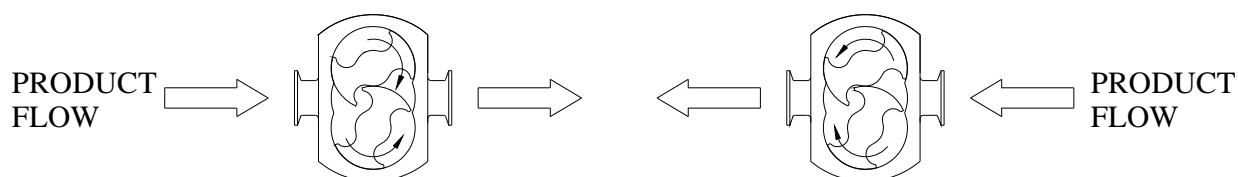


*Figure 1.0*

Bearing housing	Pump Model	Bearing housing	Pump Model	Bearing housing	Pump Model
200 Size	200-0	300 Size	300	400 Size	400
200 Size	200	300 Size	350	400 Size	450
200 Size	250				
200 Size	275				

*Table 1.0*

The **LABTOP** Model 200-0-275 is equipped in the Vertical Mounting position. The **LABTOP** Model 300-350 is equipped in the Horizontal Mounting position. The **LABTOP** Model 400-450 is equipped in either Horizontal or Vertical Mounting positions. The pump is designed to operate in both directions without modifications. See figure 1.2



*Figure 1.2*

### 1.2.1 Limitation

The pump should 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 BE ADHERED TO**. These details are stated on the original order documentation. If not available, documentation may be obtained from your supplier by referencing the pump serial number and/or invoice number.

### 1.2.2 Noise Emission

Under certain operating conditions, pumps and/or drives and/or the systems within which they are installed can produce sound pressure levels that exceed 80dB. In such cases ear protection should be used.

### 1.2.3 Marking – CE

Figure 1.3 shows the tag that is attached on the pump bearing housing.  
If the tag were to be lost for any reason you can find the pumps serial number machined on the side of the bearing housing. See figure 1.4  
Always state the pump model and/or serial number when asking for assistance.


 <small>A COMPANY OF 100% QUALITY PUMPING PUMPING PUMPING PUMPING PUMPING PUMPING PUMPING PUMPING PUMPING</small>	<b>LABTOP®</b> SERIES: 5000 <b>CE</b>	
	MODEL: <input type="checkbox"/> 200 <input type="checkbox"/> 250 <input type="checkbox"/> 275 <input type="checkbox"/> 300 <input type="checkbox"/> 350	
	SERIAL No.:	BUILD CODE:
	Max press. @ ambient temp. Bar: _____ Year: _____	
	Max temp. @ 1 Bar, °C: _____ Mass. kg: _____	
	Hertz: 50/60 Hz Max. Supply Amp: <input type="checkbox"/> 10 <input type="checkbox"/> 8.3 <input type="checkbox"/> 4.4	
	Input Volts: <input type="checkbox"/> 115 <input type="checkbox"/> 230 Phase: <input type="checkbox"/> 1 <input type="checkbox"/> 3	
	Drive Unit: <input type="checkbox"/> SK177 <input type="checkbox"/> SK1850 Inverter: <input type="checkbox"/> X2C <input type="checkbox"/> XFC <input type="checkbox"/> X4	
	MADE IN USA	
	<small>Disconnect power source before performing any maintenance. Power supply must not be GFCI protected</small>	

Figure 1.3

### 1.2.4 Marking – Standard

Standard marking is machined on the side of pumps' bearing housing.  
See figure 1.4 for details. Pump size is machined on rotor housing next to the ports.

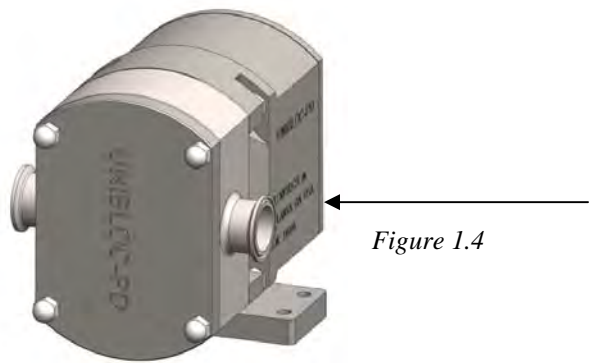


Figure 1.4

## 2.0 Safety

### 2.1 General

This information must be read carefully before installation, operation or servicing. The safety instruction must always be available for the pump operator. The following symbols are used.



**WARNING:** Indicates instructions that can affect personal safety if not followed.



**WARNING:** Indicates electrical voltage instructions that can affect personal safety if not followed.

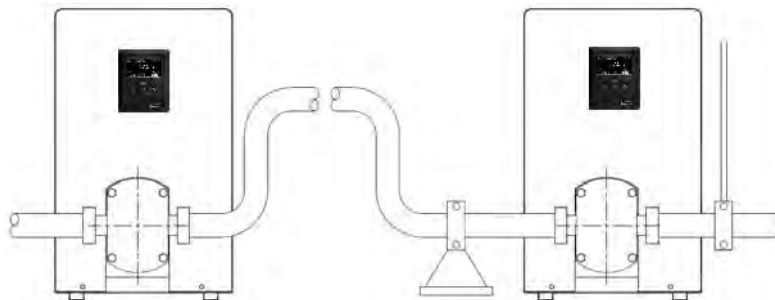
**ATTENTION**

**ATTENTION:** Indicates instructions to be considered for safe operation and to protect the pump and pump unit.

### 2.3 Safety Instructions



Incorrect installation, operation or maintenance of the equipment can cause serious personal injury and/or damage to the equipment and will invalidate the warranty. Make sure the pipes are well supported as the pump is not meant to serve this purpose. Keep in mind that pipes filled with liquid are very heavy. See figure 2.3.1 for recommended pipe layout.



*Figure 2.3.1*



Pump or pump assembly must be electrically connected by authorized personnel, follow the motor instructions supplied in case of assembly.



Never operate the pump if the front cover and/or suction/discharge pipe-work are not in place. Make sure they are properly installed, see figure 2.3.1. Likewise, never operate the pump if other protection such as coupling and shaft guards are missing or incorrectly installed.



Never stick your appendages or other foreign objects inside the rotor housing, connections to the rotor housing, or in the back cover if there is any possibility that the pump shafts may rotate.



Do not exceed the pump's maximum operating pressure, speed or temperature. Do not modify the operating parameters/system for which the unit was originally supplied for without first consulting your local supplier.



Pump installation and operation must always comply with prevailing health and safety regulations.



Always make sure the alignment with the drive unit is within proper tolerances. Misalignment between the pump, drive and coupling will result in premature wear, increased operating temperature and noisier environment.

See figure 2.3.2 for vertical misalignment: Place shims under pump or drive; 0.25mm (0.01inch) max deviation.

See figure 2.3.3 for horizontal misalignment: Move pump or drive horizontally; 0.25mm (0.01inch) max deviation.

See figure 2.3.4 for angular misalignment: Rotate pump or drive; 1° max deviation

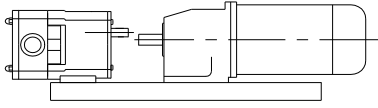


Figure 2.3.2

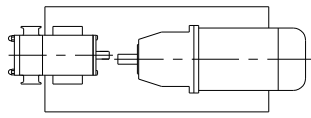


Figure 2.3.3

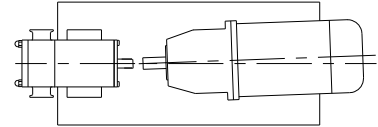


Figure 2.3.4



Avoid any direct contact with hot surfaces of the pump or drive unit. If the surface temperature of the system exceeds 68°C, the system must be marked with a warning sign for “hot surface”.



**ALWAYS DISCONNECT THE POWER SUPPLY** when performing any kind of maintenance. Make sure the power cannot be switched by locking it. Allow the pump and associated parts to cool down to a safe handling temperature.



Never operate the pump with either the suction side or the pressure side blocked.



Never operate the pump without the front cover installed properly



Always make sure any safety/relief valves are depressurized or relieved before dismantling.



Always ensure correct rotation of pump with flow direction before start.

**ATTENTION**

Installation of safety equipment to prevent pump from exceeding maximum allowable pressure is recommended. If an integrated safety relief valve is installed, do not allow extended periods of recirculation through the valve. **UNIBLOC-PUMP** can either integrate a safety valve with the front cover, or supply one as a separate unit. Please contact your supplier.

**ATTENTION**

Installation of a non-return device is recommended to prevent reverse flow in the pump when it is being turned off. **UNIBLOC-PUMP** can supply a check valve as non-returning device. Please contact your supplier.

**ATTENTION**

Check the pump and motor assembly for adequate oil prior startup.

**ATTENTION**

Make sure the pump and pipe systems are clean and free from debris or any foreign material before start up.

**ATTENTION**

Do not install the pump into a system where it may run dry (i.e. without a supply of pumped media) unless it is assembled with a flushed shaft seal that is properly installed with a fully operational flushing system.

**ATTENTION**

Installation of pressure gauges/sensors in conjunction with the pump's suction and discharge connections is recommended to be able to monitor the pumps pressure.

**ATTENTION**

When cleaning manually or by CIP, SIP methods, the operator must ensure that a suitable procedure is used in accordance with the systems requirements.

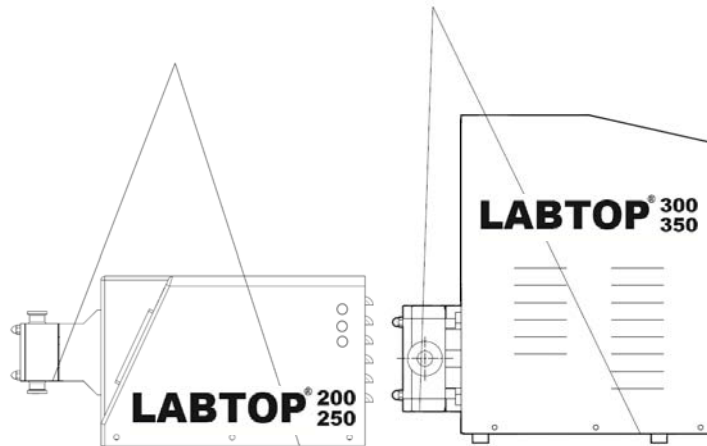


## 3.0 Installation

### 3.1 Handling and Storage



Caution must be taken when lifting the pump or pump unit. For all parts over 20kg we recommend the use of a lifting device or lifting arrangement when unpacking or moving. Check the weight guide in section 5.0 for details. See figure 3.0 and 3.1 for lifting guidance.



LABTOP 200 Series  
*Figure 3.0*

LABTOP 300/400 Series  
*Figure 3.1*

When you receive your product please follow these steps.

- Check packaging for any damage in transit
- Check the packing slip against received goods
- If an assembly, make sure the manual for the drive unit is included
- Visually inspect the product for any signs of damage
- Report any damage immediately to the carrier

If installation of the pump is delayed, store and protect the unit properly by:

- Not removing plastic port protectors.
- Selecting a clean, dry storage location free from vibration. In a moist or dusty atmosphere, further protect the pump/assembly with suitable cover.
- Rotating the pump or pump assembly by hand every week, to prevent bearing damage.

## 3.2 System Design

When a pump is to be incorporated in a system, it is considered good practice to minimize the length of the pipes and the number of fittings and any other restrictions to product flow. Always consider the following when designing a system:

- Confirm the Net Positive Suction Head-NPSH available from the system exceeds the NPSH required from the pump to ensure smooth operation and avoid 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 from unintended blockage from nuts, bolts, welding slag, etc, by installing a strainer. Also protect the pump from unintended operation against a closed valve by installing a safety/pressure relief valve. Strainers and relief valves can be provided by **UNIBLOC-PUMP**.
- Install monitoring equipment on suction and pressure side of pump for diagnostic purposes.
- Install shut-off valves on suction and pressure side to isolate pump when service is necessary.
- Make sure the pipes are well supported. Do not use the pump to support the piping. See figure 2.3.1
- Make the necessary piping arrangement if pump is supplied with a flushed seal or if the housing is jacketed for heating/cooling.
- Do not expose pump to rapid temperature changes, this may seize the pump as a result from thermal shock.
- Allow at least 1m (3feet) free space around the pump for easy maintenance access.

Figure 3.2.1 shows a typical recommended design and required components for safe operation of the pump. All components are available from **UNIBLOC-PUMP**. Contact your supplier.

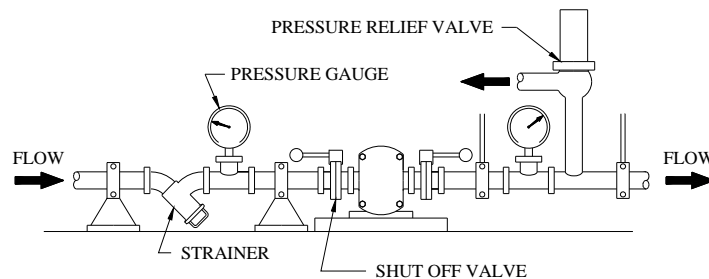


Figure 3.2.1

## 3.3 Flushed Seal Arrangement

The flushed seal arrangement cools and lubricates the shaft seal area. All flushed seals must be installed in a proper system; otherwise the seal will NOT OPERERATE CORRECTLY. The flushing system also works as a barrier between the environment and the pumped media.

### 3.3.1 Single and Double Mechanical Seal Flushing/Cooling

Flushing systems are normally not included with the pump. Connections to the seal housings are 1/8" NPTF

It is important that:

- The flush system is correctly installed and connected, see figure 3.3.1 and 3.3.2 for recommendations.
- A compatible flushing fluid is used and supplied at the correct pressure and flow rate. If the discharge pressure fluctuates set the pressure to suit maximum condition.

**ATTENTION**

Double mechanical flushed seal pressure: 1bar (15psi) higher than the discharge pressure of the pump  
Single mechanical with flushed housing max pressure: 0.5bar (7psi)

Minimum flow rate required per seal: 1lpm (0.3gpm) or a rate that keeps seal temperature within 5°C (9°F)

- It includes shut-off valves and check valves in the system so that the flush can be turned off and stop unwanted substance from flowing in the wrong direction.
- It includes monitoring equipment such as a pressure gauge in the system to ensure correct pressure is obtained.
- The flushed fluid is flowing before or at the same time the pump is engaged, and turned off after or at the same time the pump is disengaged.

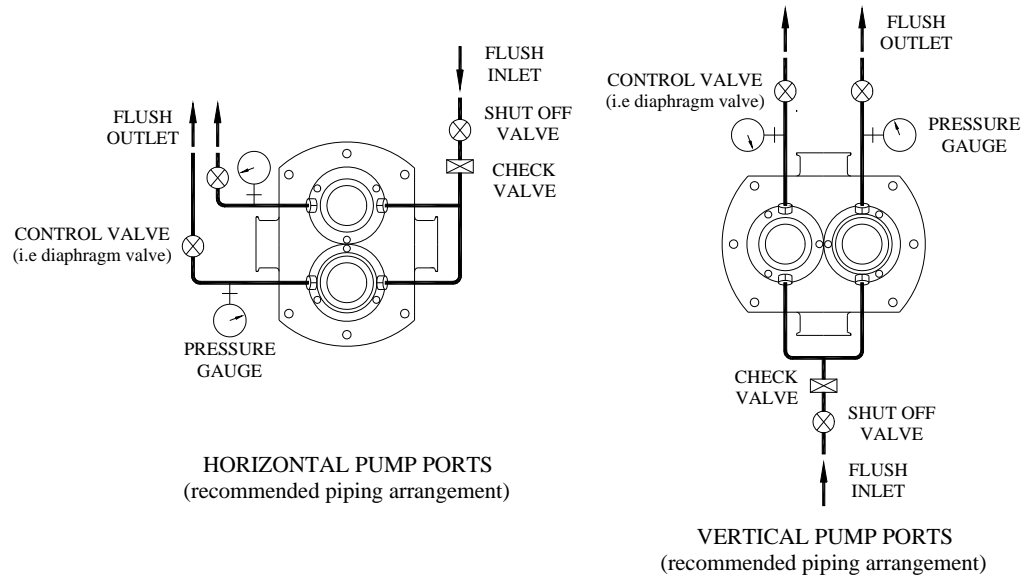
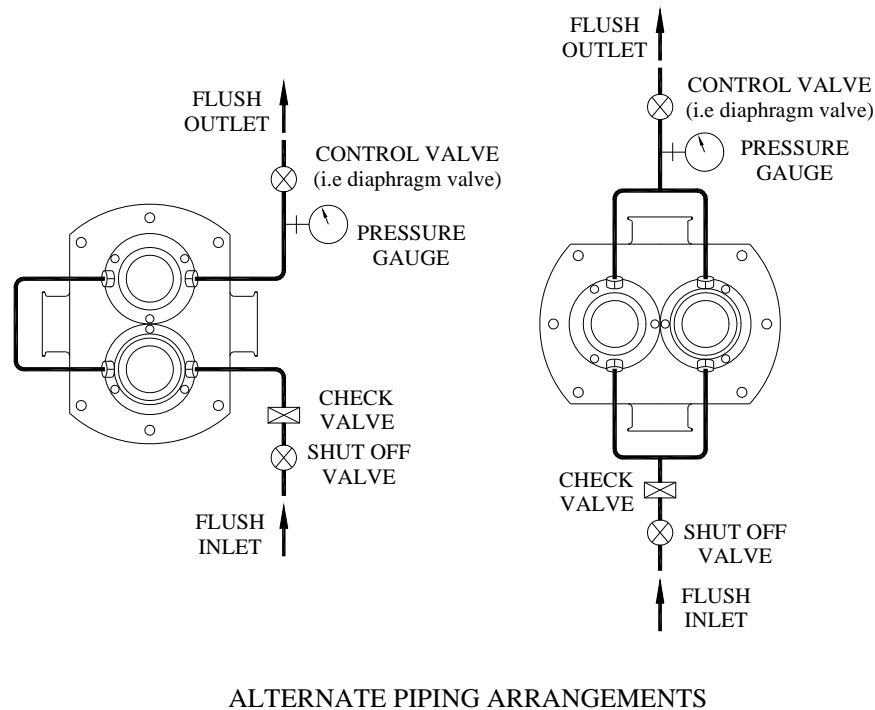


Figure 3.3.1



ALTERNATE PIPING ARRANGEMENTS

Figure 3.3.2

### **3.3.2 Double O-Ring Seal Flushing/Cooling**

The flushing system may be arranged the same as the double mechanical seals, shown in figure 3.3.1 and 3.3.2. The double o-ring seals may also be lubricated with grease if the pump application justifies doing so. In this case, the seal flush chambers are filled through grease nipples with approved grease that is suitable for use with the pumped media. The chambers must be filled completely for proper operation. This can be accomplished by over pressurizing the chambers such that grease will be squeezed out of the seals along the shafts and into the rotor housing. The amount of grease in the seal chambers must be monitored daily, and if the pump is used in constant duty applications, it should be checked several times every 24 hour period.

### **3.4 Pre-Start Check List**

- Check the pipes to make sure they have been purged of debris.
- Check all obstructions to make sure they have been removed from pipe or pump.
- Check pump connections and make sure they are tight.
- Check lubricant levels to make sure they are correct.
- Check that safety guards are in place.
- Check inlet and outlet valve to make sure they are open and functional.
- Check the seal flushing is connected and activated, if applicable.

## 4.0 Maintenance



BEFORE ANY MAINTENANCE TAKE PLACE: TURN OFF POWER SUPPLY TO THE MOTOR.

### 4.1 Clean In Place, CIP

The pump can be manually cleaned or by Cleaned In Place (CIP). The following is an example of suggested CIP procedure. However, specific advice for each application can be obtained from your pump supplier.

If the temperature difference between the process liquid, or the pump, and the cleaning media is greater than 10<sup>0</sup>C (18<sup>0</sup>F), stop the pump and then introduce the cleaning liquid. If the liquid is not gravity fed and the pump must draw the liquid from a supply vessel, run the pump until it is filled and then stop. Allow the pump to adjust to the cleaning liquid temperature and then continue running the pump at normal speed. If the pump has double mechanical seals, they must be continued to be flushed during the CIP process. The length of time necessary to clean the pump and the type of liquid used is dependent on the type of process liquid and its characteristics.



Never touch the pump or the pipelines as they can be extremely hot.



Always use rubber gloves and protective goggles if handling caustic substances.

#### ATTENTION

The rotors and shaft seals in the pump have been selected for specific temperature and pressure conditions. Verify with **UNIBLOC-PUMP** or the documentation supplied with the pump that the operating parameters are not exceeded.

#### ATTENTION

Always rinse well with clean water after using cleaning agent.

### 4.2 Steam In Place, SIP

The pump can be manually cleaned or cleaned with Steam In Place (SIP). Following is an example of suggested SIP procedure. However, specific advice for each application can be obtained from your pump supplier.

Stop the pump and introduce steam into the system. If the pump must be operated, allow it to adjust to the steam temperature and then run it between 50-100 rpm. If the pump has double mechanical seals, they must be continued to be flushed during the SIP process. The length of time necessary to steam the pump is dependent on the type of process liquid used and its characteristics. After the SIP process is complete, allow the pump to return to ambient temperature or to the temperature of the process liquid. Resume normal operation to remove condensate or to begin pumping another media.



Never touch the pump or the pipelines as they can be extremely hot.



Always use rubber gloves and protective goggles if handling caustic substances.

#### ATTENTION

The rotors and shaft seals in the pump have been selected for specific temperature and pressure conditions. Verify with **UNIBLOC-PUMP** or the documentation supplied with the pump that the operating parameters are not exceeded.

#### ATTENTION

Always rinse well with clean water after using cleaning agent.

## 4.3 Maintenance Schedule and Recommended Spare Parts

It is recommended to install pressure gauges on both sides of the pump so that any problems with the pump or pipelines can be monitored. It is also recommended to have shut-off valves on both sides for easy isolation of pump if manual service is required.

The **UNIBLOC** bearing housing is supplied permanently lubricated with nitrile seals. However, for certain applications and at the user's request, drain plugs and a vent will be supplied. When applications exceed constant service temperatures of 180°C (356°F) a vent and high temperature lubricant must be used. For such cases, contact **UNIBLOC-PUMP** or your supplier for an adequate service schedule.

### Recommended weekly maintenance control to include:

- Control of oil levels in pump bearing housing and gear reducer. (Change once per year or after 2000 hours of operation, whichever comes first)
- Control of oil seal leakage
- Control of shaft seal leakage
- Control of pump medium leakage

#### ATTENTION

Allow the pump to cool down after shut down prior to inspection.

### Recommended spare parts

- |                            |                   |
|----------------------------|-------------------|
| • 1 set of shaft seals     | Qty 2             |
| • 1 set of front oil seals | Qty 2             |
| • 1 set of rear oil seals  | Qty 1             |
| • 1 wet-end o-ring kit     | Qty 1 (5 o-rings) |

## 4.4 Shaft Seal Service



**DISENGAGE POWER TO THE MOTOR** before proceeding with the following steps. If the pump is connected to piping, depressurize the system and close valves on both the suction and discharge sides to isolate the pump from the rest of the system. Disconnect the piping from the pump. If service is to be performed while the pump is still mounted to the system, disconnect the motor drive coupling or the electrical connection to the motor.

#### ATTENTION

To aid in the removal and installation of the shaft seals, use plastic mounting sleeves with the same diameter as the shafts seal area. The sleeves also protect the seals from the shaft splines. They can be obtained from **UNIBLOC-PUMP**. Contact your supplier for details.

Remove the front cover nuts (16) and the front cover (2). If the pump has polymer rotors (3b) they can be removed by sliding them off the shafts. If the rotors are stainless steel (3a), place a nonmetal object between the rotors to keep them from turning. Unscrew the rotor bolts (14a) and then slide the rotors off the shafts. If the rotors will not slide off they can be removed simultaneously with the rotor housing (1). Unless they are being replaced, **DO NOT USE PLIERS OR CHANNEL LOCKS TO REMOVE THE ROTORS**. They will be damaged. See the following sections for further instructions to remove the rotor housing.

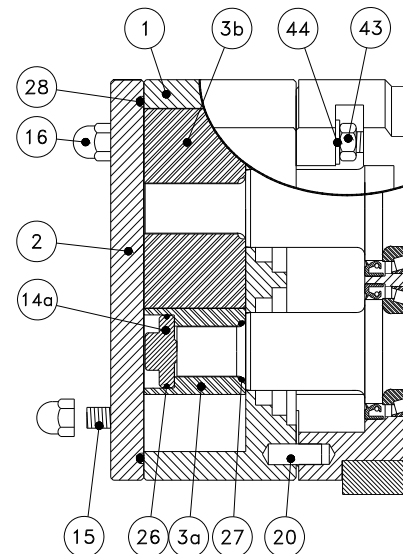


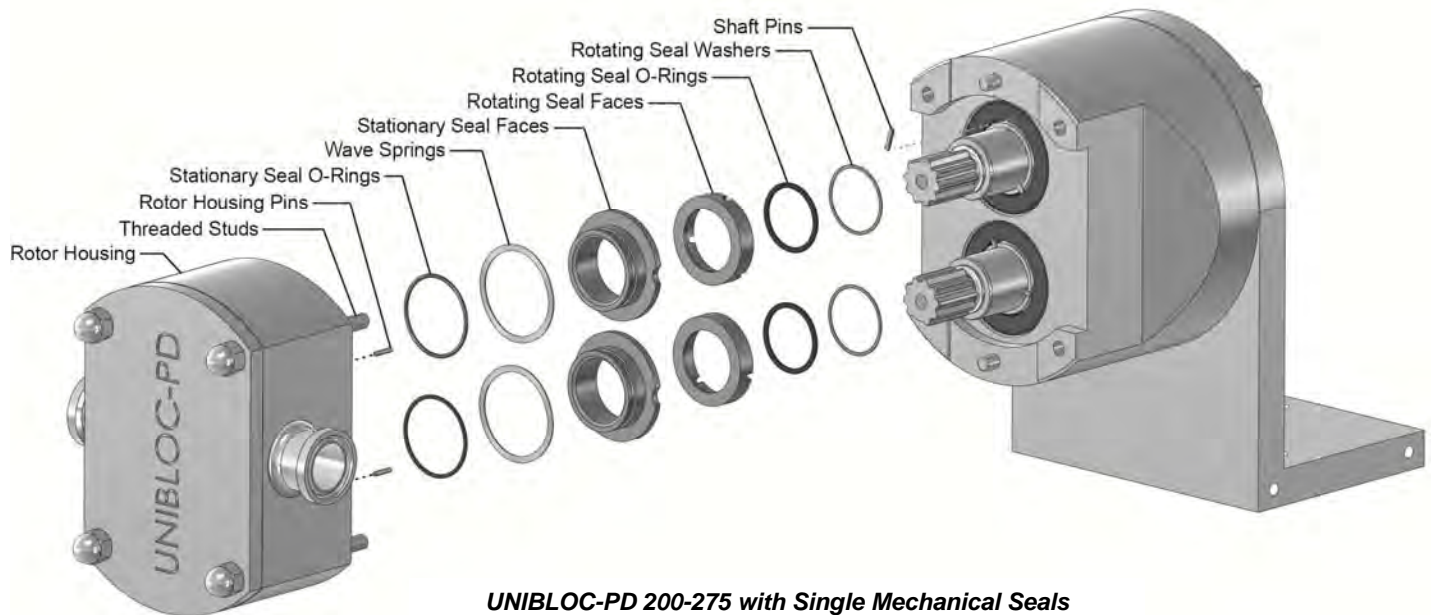
Figure 4.4.1

## 4.4.1 Single Mechanical Seal

This type of shaft seal is used in most applications with products that have a viscosity of less than 1,000 cPs. The maximum rotational speed of this seal is 1500 rpm and the maximum service pressure is 13.5 bar (195 psig). The seal materials available are stainless steel, carbon, silicone carbide, and tungsten. The standard o-rings supplied in these seals are FDA-viton or FDA-EPDM. These can be replaced with other materials upon request.

### 4.4.1.1 UNIBLOC-PD 200-275 Single Mechanical Seal Removal

Loosen and remove the acorn nuts from the **Rotor Housing**. Loosen the **Threaded Studs** by locking two M6 nuts against each other on the exposed threaded stud ends. Remove the **Rotor Housing** by pulling on the ports or by tapping gently with a rubber mallet. Do not rock the housing back and forth excessively. This can cause the seals to break. Remove the **Stationary Seal Faces** and **Stationary Seal O-Rings** by pulling them out of the rotor housing. Remove the **Rotating Seal Faces**, the **Rotating Seal O-Rings**, and **Rotating Seal Washers** by sliding them off the shafts. To avoid damage, carefully handle and store the loose **Stationary Seal Faces** and the **Rotating Seal Faces** so that their lapped sealing surfaces do not get scratched.

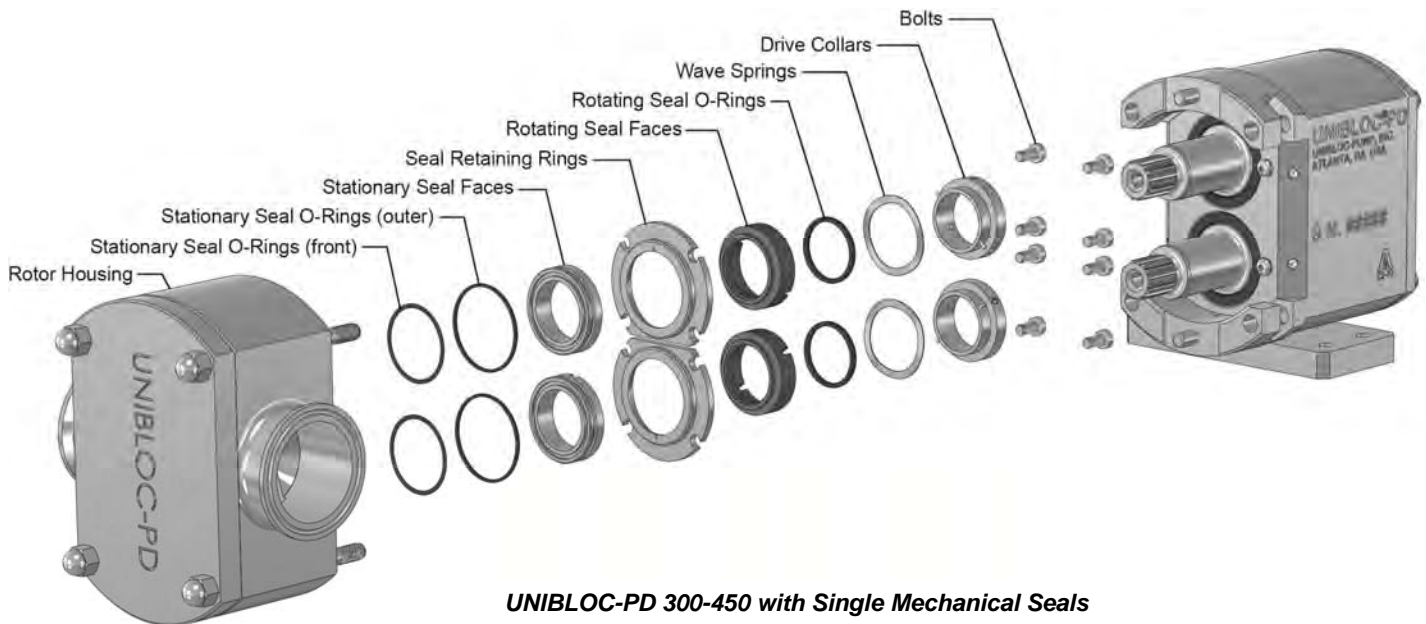


### 4.4.1.2 UNIBLOC-PD 200-275 Single Mechanical Seal Installation

If missing, insert the **Rotor Housing Pins** into the rotor housing and the **Shaft Pins** into the shafts. Coat the shafts and rotor housing bores with a product compatible lubricant. Place the **Rotating Seal O-Rings** in the **Rotating Seal Face** first, and then the **Rotating Seal Washers**. Slide the **Rotating Seal Rings**, slotted side first, onto the shafts. Place the **Wave Springs** between the **Rotor Housing Pins**. Place the **Stationary Seal O-Rings** in the groove of the **Stationary Seal Faces**. Align the slots of the **Stationary Seal Faces** with the **Rotor Housing Pins** in the rotor housing. Push the **Stationary Seal Faces** into the rotor housing, o-ring side first. Press several times to make sure they slide easily. Place a product compatible lubricant on the sealing surfaces. **Proceed to section 4.4.5 to complete the installation.**

#### 4.4.1.3 UNIBLOC 300-450 Single Mechanical Seal Removal

Loosen the **Stud Nuts** (item 43 in Figure 4.4.1). Remove the **Rotor Housing** by pulling on the ports or by tapping gently with a rubber mallet. Do not rock the Rotor Housing back and forth excessively. The seals may break. The **Seal Retaining Rings**, the **Bolts**, the **Stationary Seal Faces**, and the **Stationary Seal O-Rings** will all come off with the Rotor Housing. Unscrew the **Bolts** to remove the **Seal Retaining Rings**, the **Stationary Seal Faces**, and the **Stationary Seal O-Rings**. Slide the **Rotating Seal Faces** and the **Rotating Seal O-Rings** off the shafts. To avoid damage, handle and store the loose **Stationary Seal Faces** and **Rotating Seal Faces** so that their lapped sealing surfaces do not get scratched. If not being replaced, the **Drive Collars** may remain on the shafts, otherwise loosen the set screws and slide them off the shafts. UNIBLOC-PD 500 Series may use wear sleeves, See section 4.4.4.1 sketch.



#### 4.4.1.4 UNIBLOC 300-450 Single Mechanical Seal Installation

The shafts and the rotor housing bores should be cleaned before installing the seal components. Slide the **Drive Collars** on the shafts. Moisten the **Rotating Seal O-Rings** with water or coat them with a lubricant that is acceptable for use with the product. Slide the **Rotating Seal O-Rings** onto the shafts and then the Rotating Seal Faces, slotted sides first. Align the slots in the **Rotating Seal Faces** with the pins in the **Drive Collars**. Push the **Rotating Seal Faces** against the **Drive Collars** so that the **Rotating Seal O-Rings** seat properly. Place the **Stationary Seal O-Rings (front & outer)** on the **Stationary Seal Faces**. Only lubricate these o-rings with water or alcohol. Push the **Stationary Seal Faces** into the rotor housing so that they seat flat with the step in the housing. Some applications require pins to be used in the **Stationary Seal Faces**. When placing them in the rotor housing align the pins with the holes in the rotor housing and press them in. Do not use objects that will scratch the **Stationary Seal Faces'** seal surface to push them in. Place a product compatible lubricant on the sealing surfaces. If **Seal Retaining Rings** were supplied with the pump, bolt them to the rotor housing. **Proceed to section 4.4.7 to complete the installation.** After installing the housing push the **Drive Collars** toward it. Compress the **Wave Springs** while leaving a 2-3mm (0.08"-0.12") gap between the **Drive Collars** and the **Rotating Seal Faces**. Tighten the Drive Collar set screws.

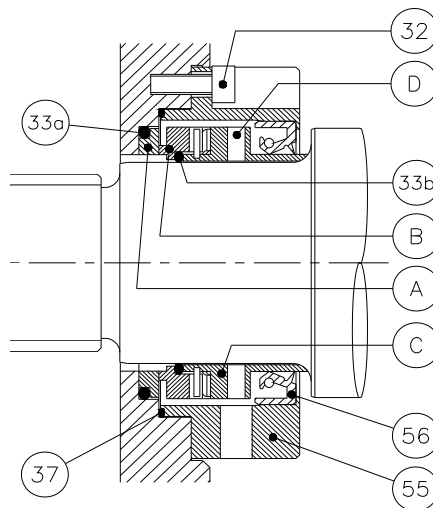


## 4.4.2 Flushed Single Mechanical Seal

The flushed single mechanical seal uses the same stationary mating ring, rotating seal nose ring, spring, and o-rings as the single mechanical seal discussed in section 4.4.1. The drive collar is different, however. The flushed single mechanical is not available for UNIBLOC 200-0, 200, 250, and 275. See section 3.3 for more information about flushing systems.

### 4.4.2.1 Flushed Single Mechanical Seal Removal

Disconnect the flush tubing from the flush housings (55). Loosen the set screws (D) by inserting an allen wrench into the flush housing port holes. Loosen the stud nuts (43). Remove the rotor housing (1) by pulling on the ports or by tapping gently with a rubber mallet and lay it rotor cavity down so that the seals face up. Do not rock the housing back and forth excessively or let it come in contact with the shaft splines. The seals may break. The entire seals with the flush housings will come off intact with the rotor housing. Unscrew the bolts (32) to remove the flush housings (55), the lip seals (56), and the flush housing o-rings (37). The remaining seal components may now be removed. To avoid damage, handle and store the loose seal nose rings (B) and the mating rings (A) so that their lapped sealing surfaces do not get scratched. To remove the lip seals (56), place the flush housings so that they are supported at the bolt holes not at the o-ring (37) location. This can be done by placing the flush housings, after all other seal parts have been removed, back into the rotor housing seal bores. Push or tap the lip seals with a tube to remove them.

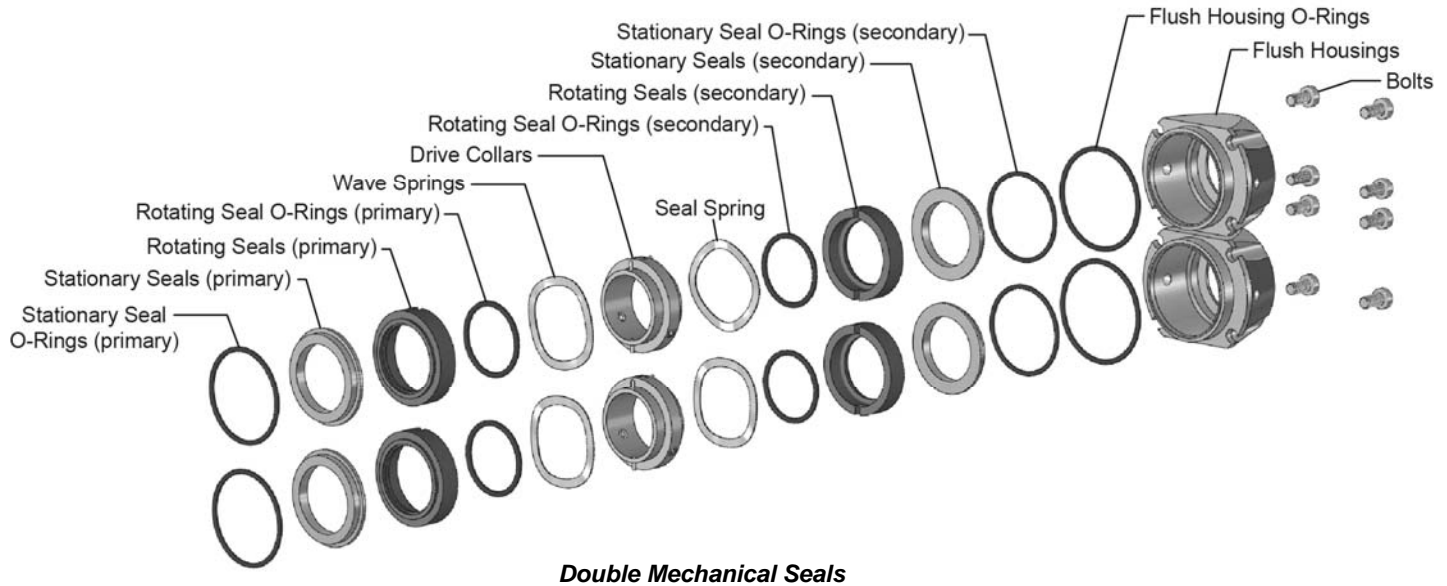


### 4.4.2.2 Flushed Single Mechanical Seal Installation

Place the mating ring o-rings (33a) in the rotor housing seal bores. Only lubricate these o-rings with water or alcohol. Push the mating rings into the rotor housing so that they seat flat with the step in the housing. Do not use objects that will scratch the mating rings' seal surface to push them in. Check the drive collars (C) for wear at the lip seal location. If a groove is present, the drive collars may need to be replaced. If the lip seals (56) have been removed, place the flush housings (55) so that the o-ring groove edges face up. Lubricate the lips and the outer diameters of the lip seals. Push the lip seals, spring sides facing up, into the flush housings with a tube that is the same diameter as the lip seals. Place the o-rings (37) into the o-ring grooves. Lubricate the shafts, the outside of the plastic mounting sleeves, and the drive collars at the lip seal location. Slide the flush housings on the drive collars. Slide the flush housings with the drive collars, seal nose o-rings (33b), and the seal nose rings (B), slotted sides first, on the plastic mounting sleeves. Align the slots with the pins in the drive collars and push the seal nose rings so that the o-rings (33b) seat properly. Place a product compatible lubricant on the sealing surfaces. Rotate the flush housings so that its port holes align with at least one set screw. Lubricate the o-rings (37) and mount the seal cartridge assemblies on the rotor housing. Tighten the bolts (32). **See section 4.4.5 to complete the installation.**

### 4.4.3 Double Mechanical Seal

The flushed Double Mechanical Seal uses the same **Stationary Seal Faces (primary & secondary)** and **Stationary Seal O-rings (primary & secondary)** as the Single Mechanical Seals discussed in section 2.1.2. The Drive Collar and Rotating Seal Face are different, however. The flushed Double Mechanical Seal is not available for UNIBLOC 200-0, 200, 250, and 275. See section 3.3 for more information about flushing systems.



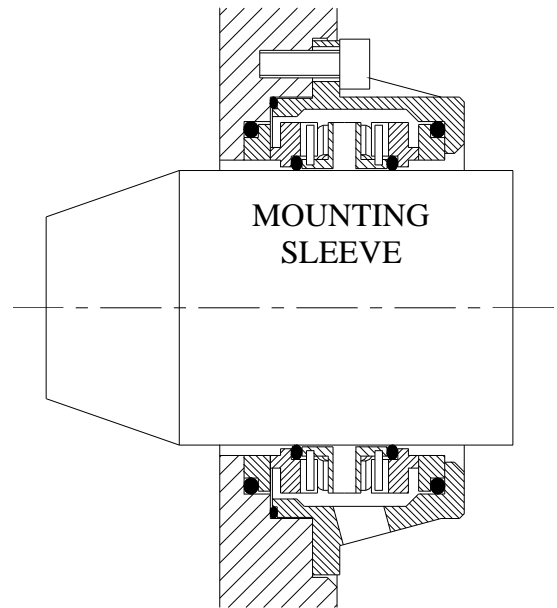
#### 4.4.3.1 Double Mechanical Seal Removal

Disconnect the flush tubing from the **Flush Housings**. Loosen the **Drive Collar** set screws by inserting an allen wrench into the flush housing port holes. Loosen the stud nuts (item 43 in Figure 4.4.1). Remove the rotor housing (item 1 in Figure 4.4.1) by pulling on the ports or by tapping gently with a rubber mallet and lay it rotor cavity down so that the seals face up. Do not rock the housing back and forth excessively or let it come in contact with the shaft splines. The seals may break. The entire Seal Package, with the Flush Housings attached, will come off with the rotor housing. Unscrew the **Bolts** to remove the **Flush Housings**, the **Stationary Seal Faces (secondary)**, **Flush Housing O-Rings**, and **Stationary Seal O-Rings (secondary)**. The remaining seal components may now be removed. To avoid damage, handle and store the loose Seal Faces so that their lapped sealing surfaces do not get scratched. Remove the **Stationary Seal Faces (primary)** by pulling them out of the rotor housing seal bores. Remove the **Stationary Seal Faces (secondary)** by pushing them out of the **Flush Housings**.

#### 4.4.3.2 Double Mechanical Seal Installation

Place the **Stationary Seal O-Rings (primary & secondary)** in the rotor housing seal bores and the **Flush Housings**. Only lubricate these o-rings with water or alcohol. Push the **Stationary Seal Faces (primary)** into the rotor housing so that they seat flat with the step in the housing. Push the **Stationary Seal Faces (secondary)** into the **Flush Housings** making sure the o-rings seat properly. Do not use objects that will scratch the Stationary Seal Faces' seal surface to push them in. Place a product compatible lubricant on the sealing surface of the **Stationary Seal Faces**.

While the rotor housing is lying flat with the cavity facing down, stack the seal components on the **Stationary Seal Faces (primary)**. Begin with **Rotating Seal Faces (primary)**, slotted sides up. Place the **Rotating Seal O-Rings (primary)** into the **Rotating Seal Faces (primary)**. Next, place the **Drive Collars** into the the **Rotating Seal Faces (primary)**. Making sure to align the slots with the pins, push the **Drive Collar** gently to seat the o-rings. Place the **Rotating Seal O-Rings (secondary)** on the **Drive Collars**. Align the slots with the pins, and push gently to seat the o-rings. Place the **Flush Housings** over the stacked components, rotating them to make sure one set screw will be visible through the port holes in the Flush Housings. Push the housings down gently. Screw in the **Bolts** and hand tighten. Lubricate the plastic mounting sleeves and slide them, tapered end first, into the seals. Tighten the **Bolts**. Leave the sleeves in the seals and **proceed to section 4.4.5 to complete the installation**.



#### 4.4.5 UNIBLOC 200-450 Seal Installation – Final Step

See section 5.3 for torque limits. If not part of the shaft seal assembly, slide the plastic mounting sleeves over the splined ends of the shafts. Slide on the rotor housing (1) tap it with a rubber mallet to seat it properly on the dowel pins (20). Make sure the alignment mark on the rotor housing lines up with the one on the bearing housing (6). The rotor housing must make firm contact with the bearing housing. On **UNIBLOC models 300-450**, fasten the hex nuts (43) with the split washer (44) on the stud ends and tighten in a cross pattern.

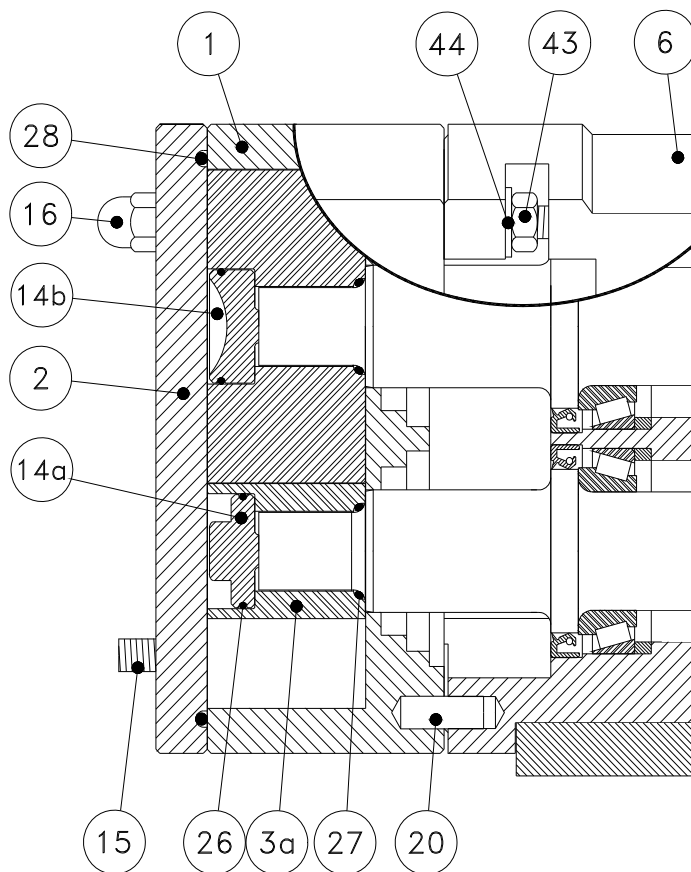
On **UNIBLOC models 200-275**, insert the one piece studs (15) through rotor housing and thread into the bearing housing. Tighten them in a cross pattern by locking two M6 nuts against each other on the protruding stud ends. Remove the plastic sleeves from the shaft ends. If the shaft seals are either flushed single or flushed double mechanical, tighten the set screws through the flush housing's port holes. If the rotors are made from a polymer (nonmetal) material, slide them on the shafts and turn the drive shaft to make sure the rotors turn freely. They do not require o-rings (26) and (27) or the rotor bolts (14a, 14b). If the rotors are metal, slide the rotor shaft o-rings (27) over the splined shaft ends and on the step, if applicable.

One of the rotors will have a small marking on the rear end. This indicates that this rotors match with the drive shaft.

Slide the rotors over the corresponding shafts and push them making sure the o-rings seat properly. The rotors must make contact with the shafts. Place o-rings (26) on the rotor bolts (14a, 14b). Lubricate them and the rotor bores. Place a nonmetal object between the rotors to keep them from turning. Thread the rotor bolts in to the shaft ends. Turn the drive shaft to make sure the rotors turn freely. Measure the

clearances between the rotor housing and the rotors. Compare these values with those listed in section 5.4. If the measured clearances at positions 1-7, 8, and 10 are smaller than those listed, the rotors must be ground and polished to achieve the correct values. If the measured clearances at positions 9 and 11 are not within the tolerances listed the shafts must be adjusted by disassembling the bearing housing, as instructed in section 4.5 and changing the shims (11).

Place the o-ring (28) in the groove on the cover (2). Slide the cover on the studs (15). Tighten the front cover nuts (16). Check the oil level in the bearing housing as described in section 5.2. The pump is now ready to be installed in the system. If flushed seals were installed, reconnect the flush tubing. Refer to section 2.3 before starting the pump.



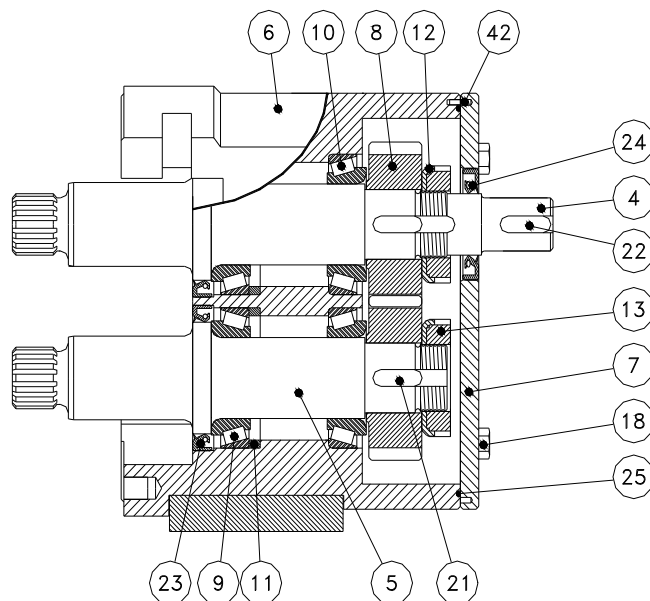
## 4.5 Pump Bearing Housing Service

The UNIBLOC bearing housing is supplied permanently lubricated with nitrile seals. However, for certain applications and at the user's request, drain plugs and a vent will be supplied. The oil level should be checked at regular intervals and the seals should be changed once per year or after 2000 hours of service, whichever occurs first. When applications exceed constant service temperatures of 180°C (356°F) a vent and high temperature lubricant must be used. For such cases, contact **UNIBLOC-PUMP** or an authorized service center for an adequate service schedule.

Before proceeding with the following steps, **DISENGAGE POWER TO THE MOTOR**. If the pump is connected to piping, depressurize the system and close valves on both the suction and discharge sides to isolate the pump from the rest of the system. Disconnect the piping and remove the pump from the system. Removal of the wet end of the pump (i.e. the cover, rotors, rotor housing, and shaft seals) must be completed first before disassembly of the pump bearing housing. The method of removing these parts is dependent upon the type of shaft seals the pump has and is outlined in section 4.4. Remove Stainless Canopy from baseplate to de-couple between pump and electric drive.

### 4.5.1 Bearing housing Disassembly

Remove the front cover, rotors, housing and shaft seals as described in section 4.4. Drain oil from the bearing housing by removing the drain plug, if available, or by removing the cover (7). Open the tab on the tabwashers (12) and remove them and the slotted nuts (13). With a rubber mallet, strike the ends of the shafts where the tabwashers were located to loosen the gears (8) and remove them. Be sure not to damage the threads on the shafts. The keys (21) will now be exposed and can be removed with a flat tipped screwdriver. Continue striking the shafts with the rubber mallet to push the shafts and the oil seals (23), which will get damaged and will have to be replaced, out of the bearing housing. Each shaft will have one bearing (9) located next to a shoulder. To remove them, if necessary, do so with a hydraulic press or tap with a punch or sleeve on the edge closest to the shoulder. Use caution to prevent damage to the shaft shoulder. Tap the bearing cups, (9) and (10), in a circular pattern to remove them from the bearing housing. Behind cup (9) are the shim rings (11) which can now be removed.

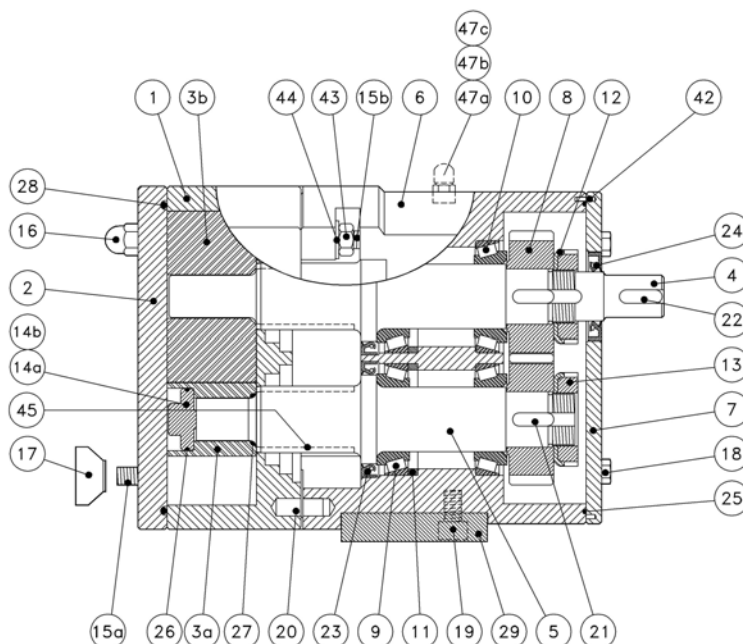


### 4.5.2 Bearing housing Assembly

See section 4.5.2.1 for complete pump assembly. The steps for assembly assume that the pump has been completely disassembled. Make sure all parts are clean and free of debris before proceeding. New oil seals are required to complete the assembly.

#### 4.5.2.1 Pump Assembly - Stainless Steel Rotors

Insert the shim rings (11) into the front bores of the bearing housing (6). Oil the front (9) and rear (10) bearing cones and tap them into the bearing housing so that the tapered edge can be seen when looking into the bearing housing. If the bearings have been removed from the shafts, they must be pressed on with a hydraulic press before the shafts are installed into the bearing housing. Oil the shafts at the bearing seat location and



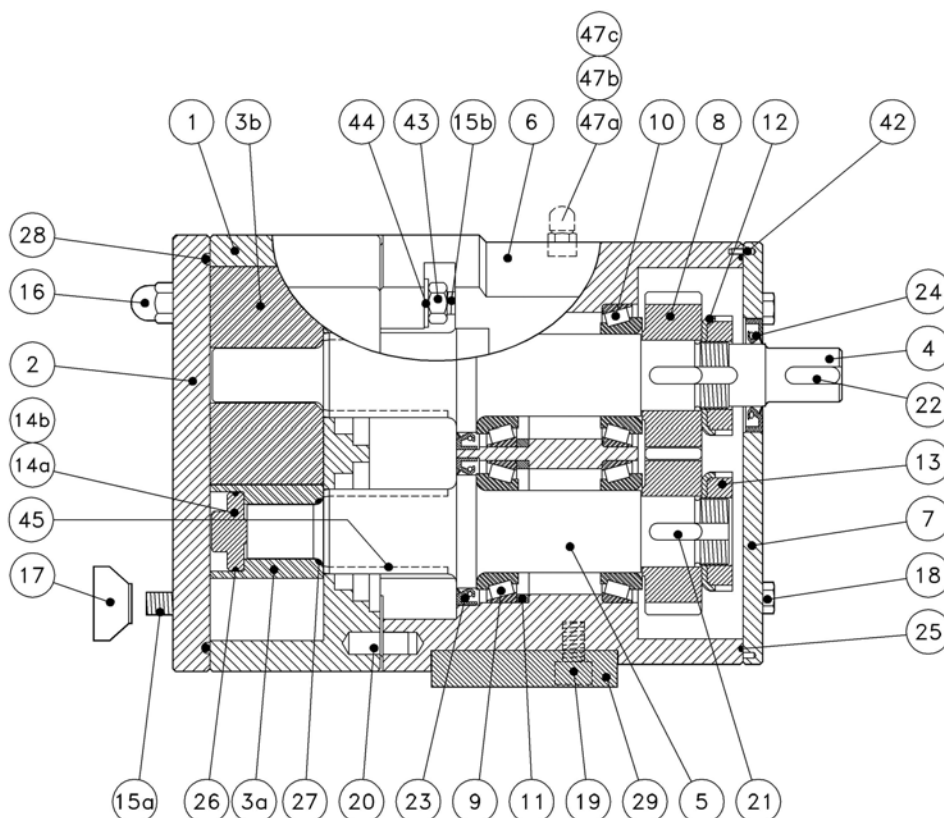
slide the bearings on so that the text on the bearing shoulder will make contact with the shaft shoulder. Use extreme caution to not damage the bearing components or the splined shaft end when using the hydraulic press. Place a non-metal object between the splined shaft end and the hydraulic press to prevent damage to the shaft. Insert both shafts and stand the pump on the splined ends. Slide the rear bearings on, tap the keys (21) into place, and then slide on the gears (8), shoulder side towards the bearings. Make sure the timing marks are aligned. Tap on the gears to seat the bearings properly. Slide on the tabwashers (12) and thread on the slotted nuts (13). Slide on the rotors (3a) and place a nonmetal object between the rotors to keep the shafts from turning. Tighten the nuts so that the shaft rotating torques shown in section 5.3 are achieved. The torque can be measured by inserting the rotor bolts (14a, 14b) in the splined shaft ends with the rotors on. Do not set the tabs on the tabwashers. Remove the rotor bolts and rotors. Push the rotor housing (1) onto the dowels (20) in the bearing housing and tap gently with a rubber mallet to seat it properly. Insert the housing studs (15) and secure them with the split washers (44) and hex nuts (43). The **UNIBLOC** 200, 250, and 275 has one piece studs (15) and does not use items (43) and (44). To tighten these studs lock two M6 nuts against each other on the stud end. Slide the rotors (3a) on to the corresponding shaft. One rotor and one shaft will be marked with identical symbols. Secure the rotors with the rotor bolts (14). Measure the clearances between the rotors and the housing. If the measured values at positions 8-11 do not correspond with those listed in section 5, then the shim ring(s) (11) must be changed. Remove the rotor bolts, rotors, studs, and then the housing. Unscrew the slotted nuts and remove the tabwashers. Remove the shafts, gears, and keys from the bearing housing. Tap out the front bearing cups only to reveal the shim ring(s). Insert an appropriate shim, and then repeat the steps described in this section. If the clearances fall within the ranges specified, then proceed to section 4.5.2.2

### 4.5.2.2 Pump Assembly – Stainless Steel Rotors – Final Step

Lock the nuts in place by bending the tabwasher into the slots in the nut. Install the front oil seals (23) by first lubricating with oil all contact areas on the shafts and bearing housing. The text on the seals should face out. Push the seals on with a sleeve flush with the bearing housing. Stand the pump on the splined ends and fill the bearing housing cavity with approved oil listed in section 5.2. Place the oil seal(s) (24; 24 & 45 for **UNIBLOC** 200-275) in the bearing housing cover, text side out. Place the o-ring (25) into the groove on the rear side of the bearing housing. Slide the cover onto the drive shaft taking care not to damage the oil seal lips. Secure the cover with the bolts (18). Tap key (22) into place. Install the shaft seals and rotor housing as described in section 4.4.

### 4.5.2.3 Pump Assembly – Polymer Rotors

Insert the shim rings (11) into the front bores of the bearing housing (6). Oil the front (9) and rear (10) bearing cones and tap them into the bearing housing so that the tapered edge can be seen when looking into the bearing housing. If the bearings have been removed from the shafts, they must be pressed on with a hydraulic press before the shafts are installed into the bearing housing. Oil the shafts at the bearing seat location and slide the bearings on so that the text on the bearing shoulder will make contact with the shaft shoulder. Use extreme caution to not damage the bearing components or the splined shaft end when using the hydraulic press. Place a nonmetal object between the splined shaft end and the hydraulic press to prevent damage to the shaft. Insert both shafts and stand the pump on the splined ends. Slide the rear bearings on, tap the keys (21) into place, and then slide on the gears (8), shoulder side towards the bearings. Make sure the timing marks are aligned. Tap on the gears to seat the bearings properly. Slide on the tabwashers



(12) and thread on the slotted nuts (13). Slide on the rotors (3b) and place a nonmetal object between the rotors to keep the shafts from turning. Tighten the nuts so that the shaft rotating torques shown in section 5.3 are achieved. Lock the nuts in place by bending the tabwasher into the slots in the nut. Install the front oil seals (23) by first lubricating with oil all contact areas on the shafts and bearing housing. The text on the seals should face out. Push the seals on with a sleeve flush with the bearing housing. Stand the pump on the splined ends and fill the bearing housing cavity with approved oil listed in section 5.3. Place the oil seal(s) (24; 24 & 45 for **UNIBLOC** 200-275) in the bearing housing cover, text side out. Place the o-ring (25) into the groove on the rear side of the bearing housing. Slide the cover onto the drive shaft taking care not to damage the oil seal lips. Secure the cover with the bolts (18). Tap key (22) into place. Install the shaft seals and rotor housing as described in section 4.4.

To service the valve seals the pump must not be operating, the system must be depressurized, and the pump isolated from the remainder of the system. Remove the housing (10) and mark the location of the lock ring (15). Unscrew the adjusting sleeve (16) and remove it. Remove the clamp (13) and separate the valve body and the top containing the spring. Slide the piston, (18) and (17), out and place its stem in a padded vise. Unscrew the tip (17). O-rings (1), (2), and (3) may now be replaced. Screw on the tip (17), roll o-ring (1) into the groove and tighten. Lubricate o-ring (3) and slide in the piston. Place the top with the piston in the valve body (14) and secure with the clamp (13). Turn the lock ring (15) so that it returns to the mark and thread on the adjusting sleeve (16) tight against it. Replace the housing (10) and tighten. The pump may now be returned to service.

## 4.7 Troubleshooting

PROBLEM	POSSIBLE CAUSE	SOLUTION
A. No flow, but pump turns; pump does not prime	<ol style="list-style-type: none"> <li>1. Motor turning in wrong direction</li> <li>2. Air pocket in pipe or pump.</li> <li>3. NPSHA too low.</li> <li>4. Pump runs too slow.</li> <li>5. Viscosity too high.</li> <li>6. Obstruction in discharge piping, valve closed.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reverse motor.</li> <li>2. Fill pipe and pump with liquid. Check pipe fittings for leaks.</li> <li>3. Increase suction pipe diameter or shorten suction pipe length. Decrease pump speed. Raise feed tank or supply liquid level.</li> <li>4. Increase speed.</li> <li>5. Lower viscosity if possible.</li> <li>6. Remove obstruction, open valve.</li> </ol>
B. Capacity too low, but pump turns	<ol style="list-style-type: none"> <li>1. NPSHA too low.</li> <li>2. Pump runs too slow.</li> <li>3. Increased slip in pump.</li> <li>4. Discharge pressure higher than expected.</li> <li>5. Front cover not tight.</li> <li>6. O-ring installed in front cover is too thick.</li> </ol>	<ol style="list-style-type: none"> <li>1. See A-3</li> <li>2. Increase speed.</li> <li>3. Check rotor clearances; replace worn parts if necessary.</li> <li>4. Check discharge piping for closed valves or obstructions. Increase pump speed BUT DO NOT EXCEED PRESSURE LIMITS OF PUMP. Increase discharge pipe size. Increase pump size.</li> <li>5. Tighten cover nuts to torques specified in section 5.3.</li> <li>6. Replace front cover o-ring with correct size.</li> </ol>
C. Pump is noisy, cavitating	<ol style="list-style-type: none"> <li>1. Collapsed suction hose.</li> <li>2. Liquid temperature too high.</li> <li>3. Speed too high.</li> <li>4. Viscosity higher than Expected</li> <li>5. NPSHA too low.</li> <li>6. Suction side valve closed</li> </ol>	<ol style="list-style-type: none"> <li>1. Use reinforced hose or rigid piping.</li> <li>2. Reduce speed, increase NPSHA.</li> <li>3. Decrease speed.</li> <li>4. Decrease speed, increase pump size.</li> <li>5. See A-3.</li> <li>6. Open valve, check suction side piping for obstructions</li> </ol>
D. Rotors gall, pump seizes	<ol style="list-style-type: none"> <li>1. Liquid temperature too high.</li> <li>2. Rotor clearances incorrect.</li> <li>3. Loose rotor bolts/housing studs.</li> <li>4. Bearings worn.</li> <li>5. Gears worn.</li> <li>6. Foreign particles in pump.</li> <li>7. Particles in product too large.</li> <li>8. Discharge pressure too high.</li> </ol>	<ol style="list-style-type: none"> <li>1. Lower temperature or increase Rotor clearances.</li> <li>2. Adjust to factory recommended clearances.</li> <li>3. Tighten or replace if necessary.</li> <li>4. Replace bearings.</li> <li>5. Replace gears.</li> <li>6. Install suction side filter.</li> <li>7. Increase rotor clearances. Use plastic rotors. Increase pump size.</li> <li>8. See B-4.</li> </ol>

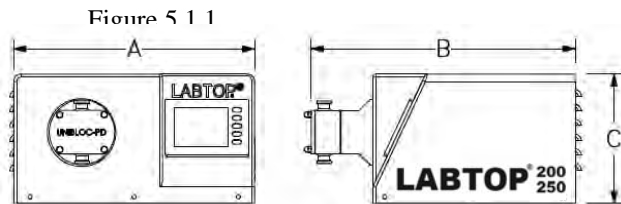


PROBLEM	POSSIBLE CAUSE	SOLUTION
E. Pump is noisy	1. Cavitation. 2. Liquid contains air.  3. Discharge pressure too high.	1. See C. 2. Check pump shaft seals for leaks. Check suction side pipe fittings for leaks. Increase NPSHA. 3. Check suction and discharge piping for closed valves or obstructions. Increase pump size.
F. Motor overheating	1. Motor size too small. 2. Discharge pressure too high.  3. Viscosity higher than expected.  4. Motor & pump misalignment.	1. Increase motor size. 2. Lower pump speed. Lower pressure. Check suction and discharge piping for closed valves or obstructions. 3. Decrease pump speed. Increase pipe size or shorten discharge pipe length. 4. Correct alignment.
G. Shaft seals leak	1. Loose drive collar on single mechanical seals. 2. Worn parts. 3. Seals have been operated without product in pump or without flushing liquid. 4. Seal incompatible with liquid.	1. Reset drive collars.  2. Replace seals and/or o-rings. 3. Operate pump only when liquids Can come in contact with seals. Replace worn seal parts. 4. Contact factory for proper seal selection, operation, and replace if necessary.

## 5.0 Technical Data

### 5.1 General Dimensions and Weights

Drawing below shows overall dimensions for all models, 200-0 to 450 shown in Figure 5.1.1 and Table 5.1.2.



LABTOP® Size	A	B	C
	inch (mm)	inch (mm)	inch (mm)
200-0	15.9 (405)	16.1 (410)	8.6 (219)
200	15.9 (405)	16.4 (416)	8.6 (219)
250	15.9 (405)	16.6 (422)	8.6 (219)
275	15.9 (405)	16.7 (425)	8.6 (219)
300	11.4 (290)	18.5 (469)	18.8 (477)
350	11.4 (290)	19.3 (491)	18.8 (477)
400 (Horizontal)	13.3 (338)	25.3 (643)	25.7 (652)
400 (Vertical)	13.3 (338)	25.7 (653)	25.7 (652)
450 (Horizontal)	13.3 (338)	25.9 (657)	25.7 (652)
450 (Vertical)	13.3 (338)	26.3 (667)	25.7 (652)

### 5.2 Lubricants and Bearing housing Oil Specification

The UNIBLOC-PD pumps are factory shipped with synthetic oil from Royal Purples: Poly-Guard® FDA. The oil is FDA, OSHA and CFR compliant.

#### ATTENTION

Before checking the oil levels DISENGAGE THE POWER SUPPLY TO THE MOTOR.

#### Permanent lubricated bearing housings; Models 200-0 - 275

When checking the oil level in permanently lubricated bearing housings, the pump must be removed from the system as described in section 4.5. After removing it, stand the pump on the front cover nuts so that the drive shaft points up. Remove the bearing housing cover bolts and rotate the cover without sliding it off the drive shaft. One of the oils specified above must be added. Replace the cover making sure the o-ring remains in its groove. Tighten the cover bolts. The pump is now ready to be installed in the system. Refer to section 3.4 before starting the pump.

#### Non-Permanent lubricated bearing housings; Models 300-450

When checking the oil level in bearing housings that are not permanently lubricated, the pump must first be stopped. Remove the oil level check plug. If oil does not come out of this hole, it must be added through the vent hole until it starts to do so. Reattach the vent and oil plug and resume operation.

Table 5.2.1 lists optional manufacturer and oil that may be used.

Table 5.2.2 list recommended fill volume

MANUFACTURER	LUBRICANT NAME	TEMP. RANGE, °C (°F)
Mobil	SHC 627	-23...121 (-10...250)
	SHC 634	121...152 (250...305)
Exxon	Spartan EP 100	-23...121 (-10...250)

	Spartan EP 150	121...152 (250...305)
Shell	Spirax S 75W90	-23...152 (-10...305)
Sentinel	S140	-26...288 (-15...550)
Royal Purple	Poly-Guard® FDA	-26...165 (-15...330)

*Table 5.2.1*

UNIBLOC MODEL	APPROX. OIL CAPACITY, ml (oz.)
200, 250, 275	50 (1.7)
300, 350	150 (5.1)
400,450	350 (11.8)

*Table 5.2.2*

## 5.3 Tools and Torque Requirements

Table 5.3.1 lists required tools and torque.

Description	Tool Required	Pump Model		
		200-0; 200; 250; 275	300; 350	400; 450
Front Cover Nut #16	Wrench Size (mm)	6	13	17
	Torque Settings (Nm)	10	15	30
	Torque Setting (lbft)	7	11	22
Rotor Bolt #14a	Socket Size (mm)	10 with part# 6006-2	13	17
	Torque Settings (Nm)	20	35	70(110 for HP)
	Torque Setting (lbft)	15	25	50(80 for HP)
Rotor Housing Stud Nut #43	Wrench Size (mm)	10	13	17
	Torque Settings (Nm)	8	8	20
	Torque Setting (lbft)	6	6	15
Retainer Ring Bolt #32	Key Size (mm)	N/A	5	5
	Torque Settings (Nm)	N/A	Hand tight	Hand tight
	Torque Setting (lbft)	N/A	Hand tight	Hand tight
Bearing housing Cover Bolts #18	Socket Size (mm)	13	10	10
	Torque Settings (Nm)	20	15	15
	Torque Setting (lbft)	15	11	11
Mechanical Seal set screw	Key Size (mm)	N/A	2.5	2.5
	Torque Settings (Nm)	N/A	Hand tight	Hand tight
	Torque Setting (lbft)	N/A	Hand tight	Hand tight
Foot/Pedestal Mounting Bolt #19	Key Size (mm)	N/A	6	8
	Torque Settings (Nm)	N/A	Hand tight	Hand tight
	Torque Setting (lbft)	N/A	Hand tight	Hand tight
Rotating/Rotate/Turn Shaft by turning rotors bolt #14a	Socket Size (mm)	10 with part# 6006-2	13	17
	Torque Settings (Nm)	2	4	6
	Torque Setting (lbft)	1.5	3	4.5
Shaft Guard Canopy Bolts	Key Size (mm)	N/A	4	4
	Torque Settings (Nm)	N/A	Hand tight	Hand tight
	Torque Setting (lbft)	N/A	Hand tight	Hand tight
Oil Plug #47b	Key Size (mm)	N/A	6.5	6.5
	Torque Settings (Nm)	N/A	Hand tight	Hand tight
	Torque Setting (lbft)	N/A	Hand tight	Hand tight

Table 5.3.1

### 5.3.1 Special Tools

There are only a few special tools needed to assembly the UNIBLOC in a safe and secure way. Please contact your pump supplier for ordering.

- 1) Bearing housing series 200 (Model 200-0 to 275) requires a socket removal/installation tool. Part# 6006-2
- 2) A plastic spline assembly sleeve is highly recommended when installing the rotor housing.

**UNIBLOC-PUMP** can supply factory assembly sleeves.

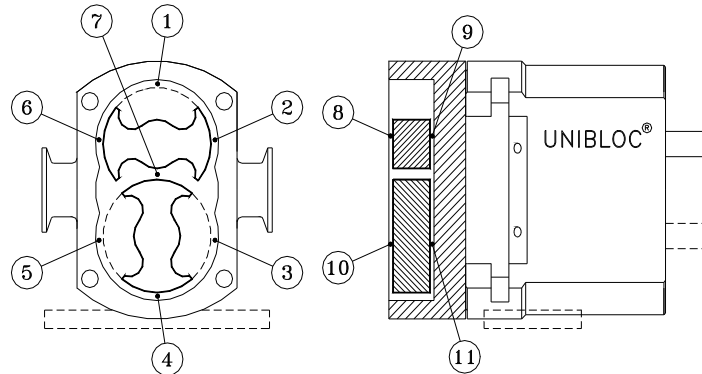
Please contact your pump supplier. Model 300/350 (Part# 6210) Model 400/450 (Part# 6220)

## 5.4 Rotor Clearances

The tables below list the clearances between the rotor housing and the rotors. If the rotor class is not known you must contact your pump supplier to retrieve the correct clearance information. Always refer to pump serial number and/or have process conditions available.

CLEARANCES FOR <b>CLASS C</b> STAINLESS STEEL ROTORS, x0.01 mm (x0.001in.)				
UNIBLOC MODEL	POSITION			
	1-6	7	8 & 10	9 & 11
<b>200</b>	6-12 (2.3-4.7)	6-10 (2.4-3.9)	10-12 (3.9-4.7)	6-8 (2.4-3.1)
<b>250</b>	6-12 (2.3-4.7)	6-10 (2.4-3.9)	10-12 (3.9-4.7)	6-8 (2.4-3.1)
<b>275</b>	7-14 (2.8-5.5)	6-10 (2.4-3.9)	10-12 (3.9-4.7)	6-8 (2.4-3.1)
<b>300</b>	15-17 (5.9-6.7)	12-14 (4.7-5.5)	11-13 (4.3-5.1)	6-8 (2.4-3.1)
<b>350</b>	17-19 (6.7-7.5)	16-18 (6.3-7.1)	11-13 (4.3-5.1)	6-8 (2.4-3.1)
<b>400</b>	20-22 (7.9-8.7)	20-22 (7.9-8.7)	12-14 (4.7-5.5)	7-9 (2.8-3.5)
<b>450</b>	22-24 (8.7-9.4)	20-22 (7.9-8.7)	14-16 (5.5-6.3)	7-9 (2.8-3.5)

CLEARANCES FOR <b>CLASS D</b> STAINLESS STEEL ROTORS, x0.01 mm (x0.001in.)				
UNIBLOC MODEL	POSITION			
	1-6	7	8 & 10	9 & 11
<b>200</b>	10-12 (3.9-4.7)	6-8 (2.4-3.1)	12-14 (4.7-5.5)	6-8 (2.4-3.1)
<b>250</b>	12-14 (4.7-5.5)	6-8 (2.4-3.1)	12-14 (4.7-5.5)	6-8 (2.4-3.1)
<b>275</b>	14-16 (5.5-6.3)	6-8 (2.4-3.1)	12-14 (4.7-5.5)	6-8 (2.4-3.1)
<b>300</b>	15-17 (5.9-6.7)	12-14 (4.7-5.5)	12-14 (4.7-5.5)	8-10 (3.1-3.9)
<b>350</b>	17-19 (6.7-7.5)	16-18 (6.3-7.1)	12-14 (4.7-5.5)	8-10 (3.1-3.9)
<b>400</b>	20-22 (7.9-8.7)	20-22 (7.9-8.7)	14-16 (5.5-6.3)	8-10 (3.1-3.9)
<b>450</b>	22-24 (8.7-9.4)	20-22 (7.9-8.7)	14-16 (5.5-6.3)	8-10 (3.1-3.9)



## 6.0 Pump Identification and Spare Parts

### 6.1 Pump Identification

Each pump has a unique serial number machined into the bearing housing. See detailed description under section 1.2. Each serial number is linked to a unique build code, see example 1.0 below.

Example 1.0

UNIBLOC-PD      5400-10-10-P20H-60-10T-12-E

A. Series	_____	J. Elastomer type	_____
B. Pump model	_____	H. Shaft seal type	_____
C. Rotor cover type	_____	G. Shaft type	_____
D. Rotor housing type	_____	F. Rotor type	_____
E. Connection type and size	_____		

## Product Description

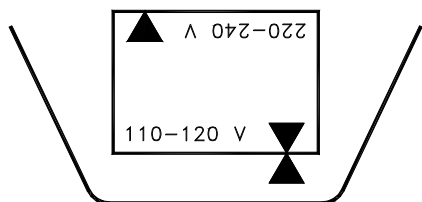
UNIBLOC®-PD 400 Size	(B)
Stainless Pump Bearing Housing	(A)
Standard Front Cover	(C)
316 Stainless Rotor Housing	(D)
1.5" T/C, Horizontal Mounting	(E)
Class C 316L Stainless Rotors	(F)
Standard Shafts, Drive Shaft in Top Position	(G)
Single Mechanical Shaft Seal (SiC vs SiC)	(H)
EPDM Elastomers	(J)

## 7.0 Electronics/Operation

### 7.1 Input Voltage

The **LABTOP®** unit has been marked with the appropriate input voltage on the back side of the unit. Make sure that this voltage corresponds with the voltage of your power source. All **LABTOP® 200, 250, 300 and 350** units are either **110 or 230 volt single phase**, and all **LABTOP® 400 and 450** units are **230 volt three phase**, unless specified otherwise. If this label is not present, contact Flowtech or your nearest service representative for this information. If the unit has been supplied with the optional switch and fuse module, make sure the voltage indicators correspond with your supply voltage (see below). If it does not, contact Flowtech or your nearest service representative to verify the voltage of the unit. **DO NOT SWITCH THE VOLTAGE SELECTOR WITHOUT DETERMINING THE CORRECT VOLTAGE. THE UNIT CAN BE DAMAGED.**

Also make sure that the **LABTOP®**'s current draw will not exceed that allowed by the power source. Fused circuit protection should be installed at the power source as well. However, the units will not function at all if GFCI protection is used. See the **LABTOP® Specifications** section for electrical requirements.



### 7.2 Ventilation

The **LABTOP®** unit has ventilation holes underneath and louvers on the sides. These must not be obstructed in any way or the unit may overheat and be damaged. A minimum clearance of 10 cm (4 in.) must be maintained between all sides and any obstructions. Do not place objects underneath or on top of the unit. Do not spray the unit with liquids. This may cause electrical shorts or shock.

### 7.3 Fuse Replacement

The **LABTOP®** units 200-350 can be furnished with an integrated power module that features an ON/OFF switch, electrical filter, dual voltage selector, and a replaceable fuse. It replaces the direct cord connection supplied on standard units. To replace the

fuse, disconnect power to the unit and pull out the drawer using a small screwdriver blade. Insert a new identical fuse into the same slot and push the drawer in. Before turning the power back on, make sure the voltage selector is set to the correct voltage.

LABTOP	VOLTAGE	FUSE P.N.	AMP RATING	SIZE
200 & 250	1 x 115	813ABC-8	10	¼" x 1¼"
200 & 250	1 x 208 - 230	81411581	10	5 x 20 mm
300 & 350	1 x 115	813ABC-15	10	¼" x 1¼"
300 & 350	1 x 208 - 230	81411641	10	5 x 20 mm
400	1 x 230			
400	3 x 230 <sup>1</sup>			
450	3 x 230 <sup>1</sup>			

<sup>1</sup> Optional 3x380 V and 3x460 V

Table 7.3.1

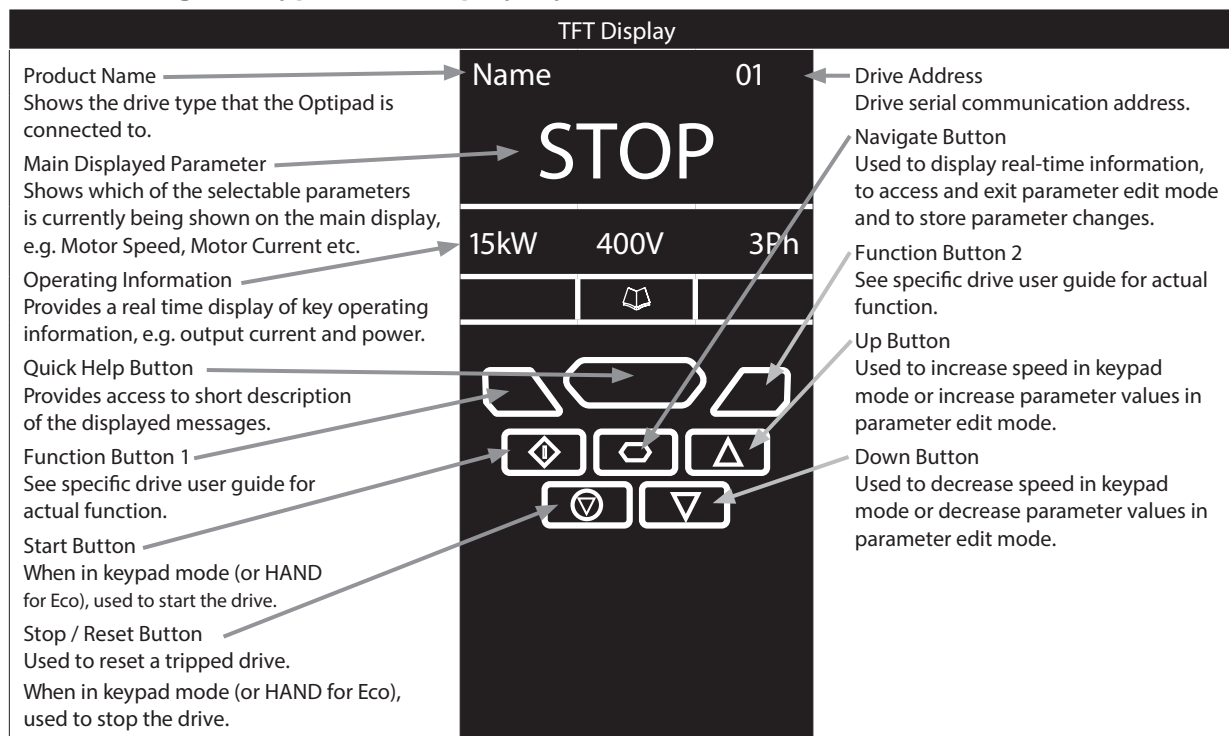
## 7.4 Unit Operation

See Section 1.0 before proceeding. Power may now be applied. If the unit has been shipped with a switch located on the rear side, this must be switched to the ON position. The display will illuminate and the unit is now ready to be operated or programmed. All LABTOP® units come preprogrammed and are ready for operation. If you wish to operate the unit using a 4-20 mA input signal see **Section 7.4.4**.

If the suction line to the pump is empty you may experience some difficulty getting the flow of liquid started. This can be accomplished by increasing the speed until flow is established and then making adjustments to achieve a desired flow rate. If the pump has mechanical shaft seals, **do not run it without liquid for more than fifteen seconds, or the shafts seals may be damaged. If the pump has o-ring shaft seals do not run the pump dry under any circumstances, or the o-rings will be damaged.** If this will not start flow, then force liquid into the discharge side of the pump and try again. If this still does not start flow, then you will have to elevate the supply liquid above the level of the suction port.

## 7.4.1 Digital Key Pad Operation- LAPTOP Models 300/350/400/450

### Standard digital keypad and display layout.



### Changing the Display Language

STOP	Select Language Español Deutsch English	Select Language Español Deutsch English
Hold down the Start and Up keys for >1s	Use the Up and Down arrows to select a language.	Press the Navigate button to select.

### Operating Displays

Inhibit / STO Active	Drive Stopped	Drive Running Output Frequency Display	Drive Running Output Current Display	Drive Running Motor Power Display	Drive Running Motor Speed Display
Name 01 <b>INHIBIT</b> 15kW 400V 3Ph	Name 01 <b>STOP</b> 15kW 400V 3Ph	Output Frequency 01 23.7Hz 15.3A 6.9kW	Motor Current 01 15.3A 6.9kW 23.7Hz	Motor Power 01 6.9kW 23.7Hz 15.3A	Motor Speed 01 718rpm 23.7Hz 15.3A
Drive Inhibited. The STO connections are not made.	Drive Stopped / Disabled.	Drive is enabled / running, display shows the output frequency (Hz). Press the Navigate key to select alternative displays.	Press the Navigate key for < 1 second. The display will show the motor current (Amps).	Press the Navigate key for < 1 second. The display will show the motor power (kW).	If P1-10 > 0, pressing the Navigate key for < 1 second will display the motor speed (Rpm).



## 7.4.1 Touch Screen Key Pad Operation- LABTOP 200/250

Touch Screen keypad (Figure 7.4.2.1 & Figure 7.4.2.2) is available on select models of LABTOP® units. After start up and information screens, the following base function keypad is shown. Keypad functions are as follows:

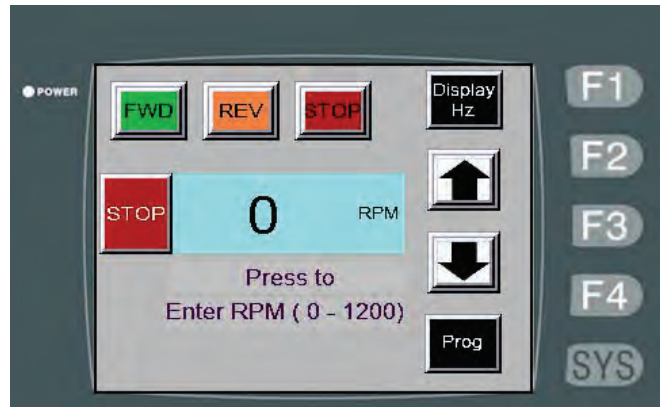


Figure 7.4.2.1

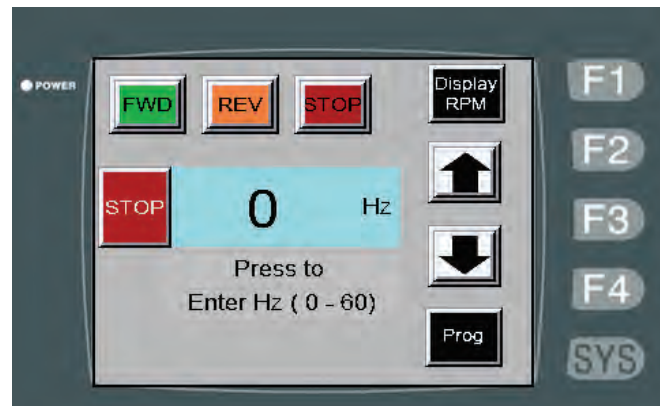


Figure 7.4.2.2

FWD	Initiates forward run. If the pump is running in reverse when FWD is pressed, it will decelerate to zero speed, change direction, and accelerate to a preset speed.
REV	Initiates reverse run. If the pump is running in forward when REV is pressed, it will decelerate to zero speed, change direction, and accelerate to a preset speed.
STOPPED	Decelerates at a preset rate to stop.
UP ARROW	In stop mode this causes the running speed to increase in the display only. The new speed may then be engaged by pressing FWD or REV. In run mode pressing this key increases the speed up to a preset maximum.
DOWN ARROW	In stop mode this causes the running speed to decrease in the display only. The new speed may then be engaged by pressing FWD or REV. In run mode pressing this key decreases the speed down to a preset minimum.
DISPLAY HZ	Toggle to display/control speed in Hz.
DISPLAY RPM	Toggle to display/control speed in RPM.
# DISPLAY	Numeric keypad will appear where exact speed can be entered for quick speed adjustment (Figure 7.4.2.3). In Hz control, value of 6-60 Hz can be entered. In RPM control, 10-1200 RPM can be entered.

**PROG** Toggle to Program Settings screen (see Figure 7.4.2.4) to view factory settings for unit.

**RAMP SET UP** Toggle to Ramp Settings screen (see Figure 7.4.2.5) to change acceleration and deceleration ramp time.

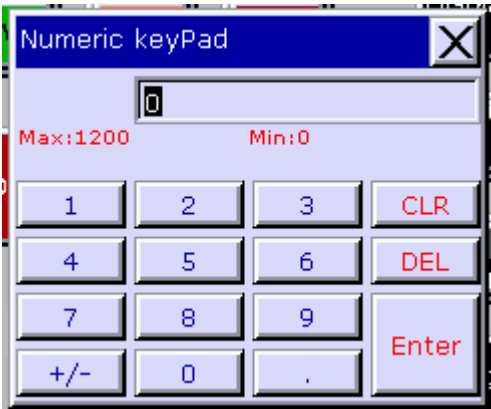


Figure 7.4.2.3

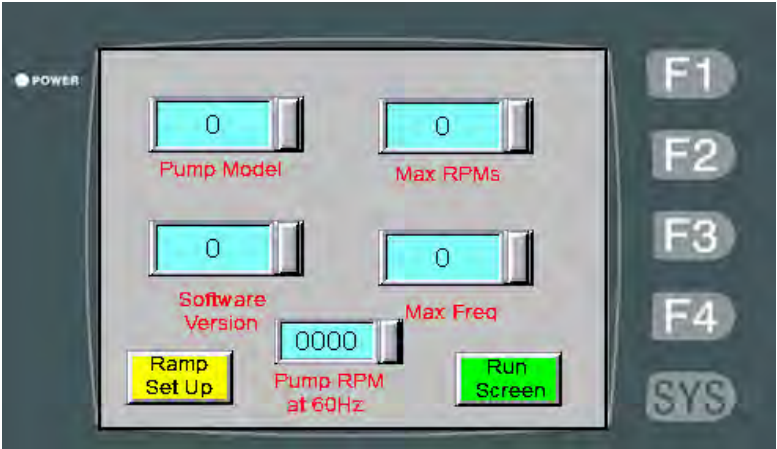


Figure 7.4.2.4

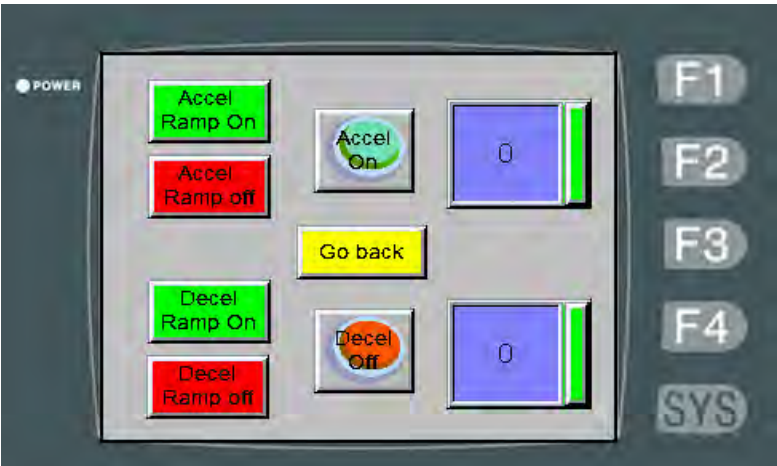


Figure 7.4.2.5

## Function Keys

**F1 Function Key** Emergency Stop

**F2 Function Key** Home Screen (Figure 7.4.2.1)

**F3 Function Key** Non-Functioning

**F4 Function Key** Factory Settings. Password Protected.

**SYS Key** System Settings. Password Protected Code 12345678 (Figure 7.4.2.6)



Figure 7.4.2.6

### 7.4.3 Controller Settings and Update

Adjustments may be made to the inverter which operates the function of the motor. For detailed instructions on Parameter adjustments, please refer to Control Panel Manufacturers Operation Manual. **Distribution of the access codes will void the warranty.**

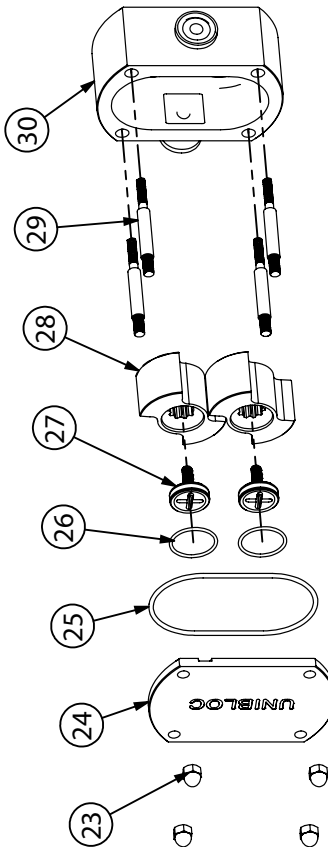
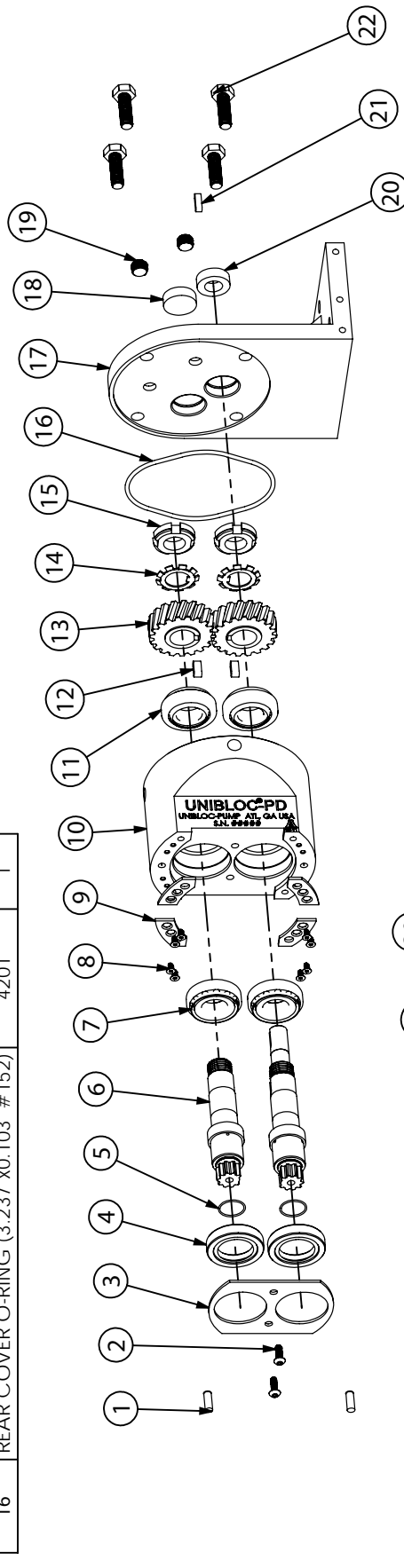
For units with Touch Screen Key Pad, **REGISTER UNIT** through factory for regular software updates. Factory will provide formatted, FAT32 format, USB stick with updated software. To update, press + hold SYS key in Figure 7.4.2.1. On numeric keypad, type code 12345678 to enter System Screen in Figure 7.4.2.6. Insert USB into panel on side of canopy and press Run on keypad. Software will automatically update and restart unit. Once unit has restarted, remove USB from side panel.

### 7.4.4 Remote Operation

The speed of the **LABTOP®** unit may be changed from a remote location by using the 4-20mA input connection found on the rear side of the unit. This is an optional feature that does not come standard on all units. Please contact Flowtech for further details. If the unit has been supplied with this option then all that is required is to connect your 4-20mA device to the connection on the rear side of the unit. The unit has been preprogrammed so that the maximum speed will be produced at the maximum input, 20mA. To begin operation, energize your device, then press FWD or REV on the keypad.

ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
1	DOWEL PIN	DPM5x14	2
2	M5x10 BUTTON HEAD SCREW	BHM5x10	2
3	OIL SEAL RETAINER	3640	1
4	FRONT OIL SEAL	4105	2
5	SHAFT O-RING (16mmx1mm)	4203	2
6	SHAFTS	---	2
7	FRONT BEARINGS	3750	2
8	FLAT HEAD BOLT	FHBM3x6	8
9	SHIM PLATE	3646-075	4
10	BEARING HOUSING	3500	1
11	REAR BEARINGS	3750	2
12	SHAFT KEY FOR TIMING GEARS	4700	2
13	GEAR	3600	2
14	TAB WASHER FOR TIMING GEARS	4500	2
15	SLOTTED NUT FOR TIMING GEARS	4402	2
16	REAR COVER O-RING (3.237"x0.103" #152)	4201	1

ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
17	BEARING HOUSING COVER	3551	1
18	REAR OIL PLUG	4101	1
19	DRAIN PLUG	---	2
20	REAR OIL SEAL	4100	1
21	SHAFT KEY FOR DRIVE	4701	1
22	M8x25 HEX BOLT	4300	4
23	M6 DOME NUT	4400	4
24	ROTOR HOUSING COVER	3200	1
25	FRONT COVER O-RING (2.987"x0.103" #151)	4200	1
26	ROTOR BOLT O-RING (0.799"x0.103" #117)	4213	1
27	ROTOR BOLT	3352	2
28	ROTOR	---	2
29	ROTOR HOUSING STUD	---	4
30	ROTOR HOUSING	---	1

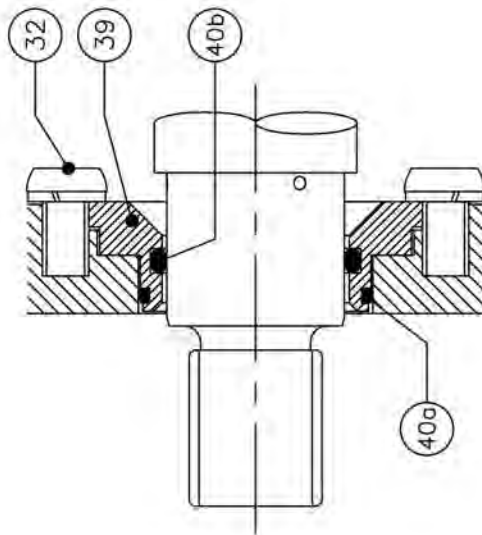


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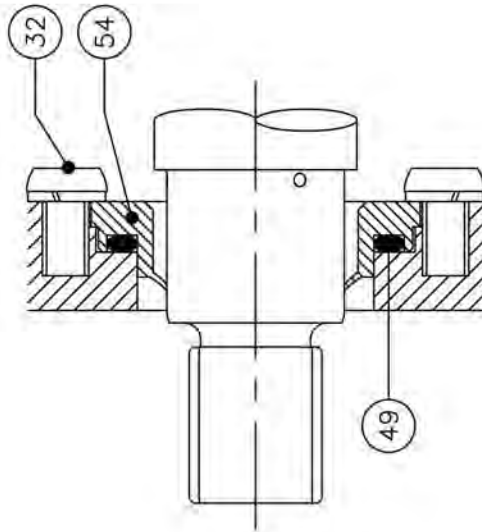


DWG. TITLE		BY	DATE
UNIBLOC-PD PUMP PARTS LIST		JPZ	06/09/15
DRAWN	CHECKED	APPD	SCALE
SIZE	200,250,275	DWG. NO.	G805
REV. NO.	3	RELEASE DATE	JUN. 21, 2021
ALL DIMENSIONS IN MM. (IN.)		SHEET 1 OF 2	

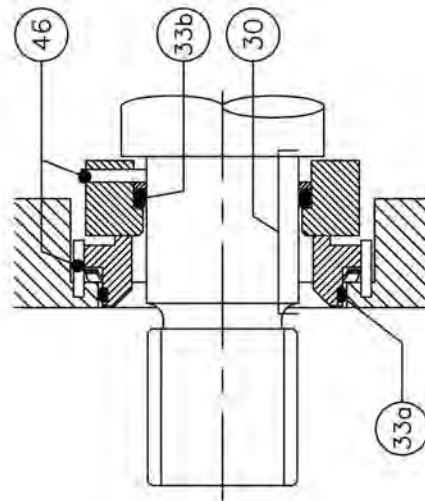
CONTACT UNIBLOC-PUMP IF PART NUMBER IS NOT AVAILABLE



SINGLE O-RING SEAL



SINGLE O-LIP SEAL



SINGLE MECHANICAL SEAL

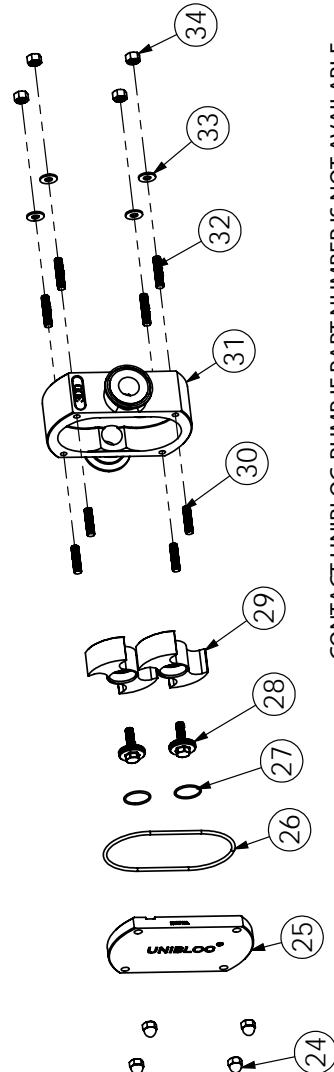
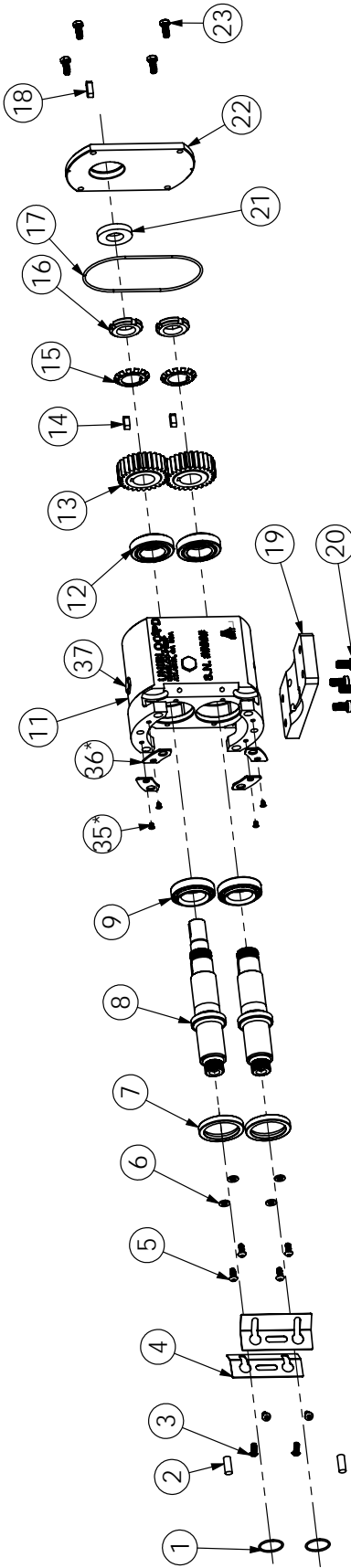
54	1	5106	SINGLE LIP SEAL CARTRIDGE
49	1	4218	O-RING
46	5	4601-2	DOWEL PIN SET
40	1	4204, 4213	SINGLE O-RING SEAL O-RING SET (40a,40b)
39	1	4901-1L	RETAINING RING
33	1	4205, 4206	SINGLE MECH. SEAL O-RING SET (33a,33b)
32	2	4301-2	BOLT
30	1	CALL FACTORY	SINGLE MECHANICAL SHAFT SEAL
NO.	PCS. PER SEAL	PART NO.	DESCRIPTION
<div><div><div><div></div><div>UNIBLOC</div><div>Hygienic Technologies</div></div></div><div><div><div>DWG. TITLE</div><div>UNIBLOC-PD &amp; GP PUMP SHAFT SEAL PARTS LIST</div></div><div><div>SIZE</div><div>200-275</div></div><div><div>DWG. NO.</div><div>G806</div></div></div><div>RELEASE DATE FEB. 23, 2011 SHEET 1 OF 1</div></div> <div><div><div><div>THIS DRAWING AND ALL DATA HEREON ARE THE PROPERTY OF UNIBLOC TECHNOLOGIES, INC. AND ARE NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF UNIBLOC TECHNOLOGIES, INC.</div></div></div><div><div><div>DRAWN</div><div>JFZ</div></div><div><div>CHECKED</div><div></div></div><div><div>APPRO'D</div><div></div></div><div><div>SCALE</div><div>NONE</div></div></div></div>			



ITEM NO.	DESCRIPTION	PART NO.		QTY.
1	O-RING (SHAFT)	4213	4233	2
2	DOWEL PIN	DPM8x20	DPM12x30	2
3	BUTTON HEAD CAP SCREW	BHM6x8	BHM6x8	4
4	SHAFT GUARD	8005	8010	2
5	BUTTON HEAD CAP SCREW	BHM6x8	BHM6x8	4
6	WASHER	OWM6	OWM8	4
7	FRONT OIL SEAL	4115	4125	2
8	SHAFT	---	---	2
9	FRONT BEARING	3755	3760	2
11	BEARING HOUSING	3512	3522	1
12	REAR BEARING	3755	3760	2
13	TIMING GEAR	3606	3611	2
14	SHAFT KEY (TIMING GEAR)	4705	4710	2
15	TAB WASHER (TIMING GEAR)	4505	4510	2
16	SLOTTED NUT (TIMING GEAR)	4412	4422	2
17	O-RING (BEARING HOUSING COVER)	4211	4220	1
18	SHAFT KEY (DRIVE SHAFT)	4706	4711	1
19	FOOT	3806	3810	1
	PUMP SERIES	300-350	400-450	500-575

\* PARTS WILL NOT BE ON SOME PUMP ASSEMBLIES

ITEM NO.	DESCRIPTION	PART NO.		QTY.
20	SOCKET BOLT	SBM8x16	SBM10x25	4
21	REAR OIL SEAL	4110	4120	1
22	BEARING HOUSING COVER	3560	3570	1
23	HEX BOLT	HBM6x16	HBM10x25	4
24	DOVE NUT	DNM8	DNM10	4
25	ROTOR HOUSING COVER	3210	3220	1
26	O-RING (ROTOR HOUSING COVER)	4210	4220	1
27	O-RING (ROTOR BOLT)	4212	4222	2
28	ROTOR BOLT (HEX HEAD/SLOTTED)	3360/3361	3370/3371	2
29	ROTOR	---	---	2
30	STUD (ROTOR HOUSING: FRONT)	SM8x20	SM12x30	4
31	ROTOR HOUSING	---	---	1
32	STUD (ROTOR HOUSING: REAR)	SM8x25	SM12x40	4
33	WASHER	WM8	WM10	4
34	HEX NUT	NM8	NM10	4
35*	FLAT HEAD SCREW: M3x6	FHM3x6	FHM3x6	4 or 8
36*	SHIM (EXTERNAL)	3656	3666	4
37	OIL PLUG	---	---	2
	PUMP SERIES	300-350	400-450	500-575



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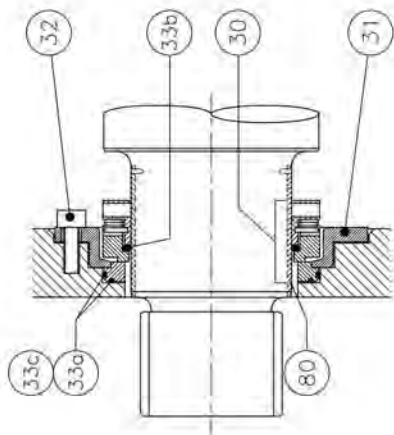


DWG. TITLE  
UNIBLOC-PD PUMP:  
GENERAL PARTS LIST

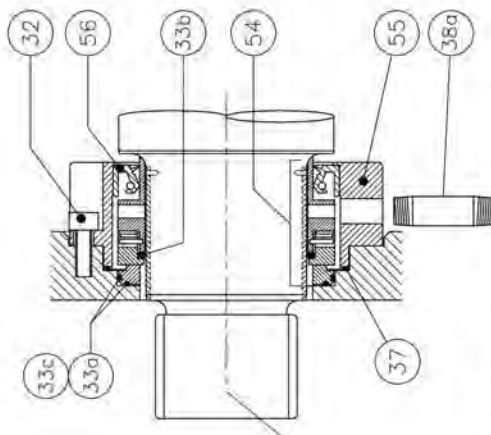
BY	DATE	SIZE	DWG. NO.	REV. NO.
JPZ	6/15/15	300-575	G803	4
CHECKED				
APPROVED				
SCALE				

CONTACT UNIBLOC-PUMP IF PART NUMBER IS NOT AVAILABLE

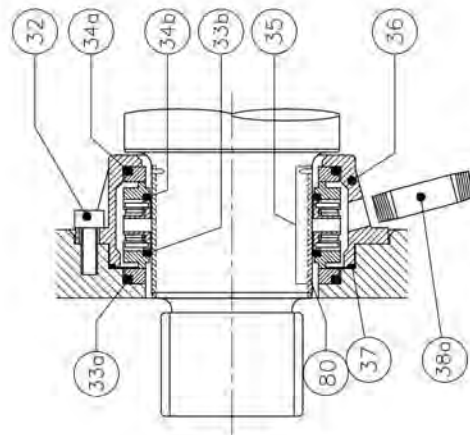
SHEET 1 OF 1



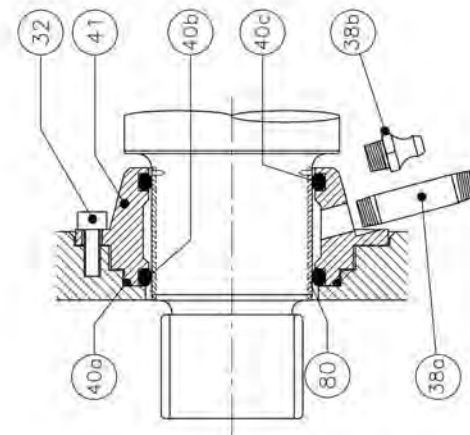
SINGLE MECHANICAL SEAL



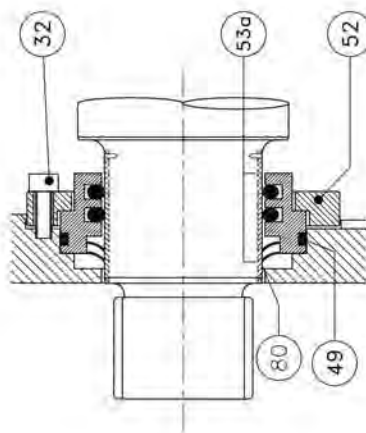
FLUSHED SINGLE MECHANICAL SEAL



DOUBLE MECHANICAL SEAL



DOUBLE O-RING SEAL



DOUBLE O-LIP SEAL

NO.	UNIBLOC 300-350	UNIBLOC 400-450	UNIBLOC 500-550, 575	PCS. PER SEAL	DESCRIPTION
80	N/A	1	1	1	OPTIONAL SHAFT SLEEVE
57	1	1	1	1	DOUBLE O-RING SEAL O-RING SET (40a,40b,40c)
56	1	1	1	1	LIP SEAL
55	1	1	1	1	FLUSH HOUSING
54	1	1	1	1	FLUSHED SINGLE MECHANICAL SHAFT SEAL
53a	1	1	1	1	DOUBLE O-LIP SEAL CARTRIDGE
52	1	1	1	1	RETAINING RING
45	1	1	1	1	O-RING
41	1	1	1	1	FLUSH HOUSING
38b	2	2	2	2	FLUSH HOUSING NIPPLE
38a	2	2	2	2	FLUSH HOUSING PIPE TUBE
37	1	1	1	1	FLUSH HOUSING O-RING
36	1	1	1	1	FLUSH HOUSING
35	1	1	1	1	DOUBLE MECHANICAL SHAFT SEAL
34	1	1	1	1	DOUBLE MECH. SEAL O-RING SET (33a,33b,33c,34a,34b)
33	1	1	1	1	SINGLE MECH. SEAL O-RING SET (33a,33b,33c)
32	4	4	3	3	BOLT
31	1	1	1	1	RETAINER RING
30	1	1	1	1	SINGLE MECHANICAL SHAFT SEAL

THIS DRAWING AND ALL SEALS SUBMITTED IN IT  
ARE THE PROPERTY OF UNIBLOC. IT IS TO BE  
USED ONLY FOR THE PURPOSES FOR WHICH IT  
IS DESIGNED. IT IS NOT TO BE REPRODUCED  
OR COPIED IN ANY MANNER WITHOUT THE  
WRITTEN PERMISSION OF UNIBLOC.



DWG. TITLE		UNIBLOC-PD PUMP SHAFT SEAL PARTS LIST	
DRAWN	BY	DATE	
CHECKED	JPZ		
APPROVED			
SCALE	NONE		
SIZE		300-575	
DWG. NO.		G804	
ALL DIMENSIONS IN MM			
RELEASE DATE FEB. 23, 2011			
SHEET 1 OF 1			

## 8.0 Warranty

### **WARRANTY**

Unibloc Hygienic Technologies, LLC ("Unibloc") warrants that its product will be free from defects in material and workmanship which results in noncompliance with the Specifications for such product. This warranty shall begin upon delivery and continue for a period of one (1) year from such date. If during this period the product does not comply with its specifications as a result of defects in material or workmanship, contact Unibloc to arrange return of the faulty product, shipping prepaid and fully insured, to an authorized Unibloc service facility. If upon inspection of the item in question, defects in workmanship or materials are revealed, Unibloc's sole obligation under this warranty shall be to supply a repair or replacement for any defective part of a product, and to return such product to the customer by shipping it EX WORKS (as defined in Incoterms 2020) the service facility. Unibloc shall not be required to supply any labor for repairs or replacement of parts. This warranty is void if the product has not been used as recommended or instructed, has been altered or used with unauthorized accessories, has been subject to misuse, abuse or accident, or has been damaged due to causes not related to poor workmanship or defective materials. All parts or components not manufactured by Unibloc are warranted only to the extent of the warranty of the respective manufacturers.

THIS LIMITED WARRANTY IS EXPRESSLY GIVEN IN LIEU OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND NON-INFRINGEMENT, ALL OF WHICH ARE HEREBY EXCLUDED. IN NO EVENT SHALL UNIBLOC OR ITS AFFILIATES BE LIABLE TO ANYONE FOR SPECIAL, COLLATERAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER ARISING IN CONTRACT OR IN TORT.

UNIBLOC RESERVES THE RIGHT TO MAKE TECHNICAL CHANGES WITHOUT NOTICE.

#### **Unibloc Hygienic Technologies US, LLC**

1650 Airport Rd, Ste 110 • Kennesaw, GA 30144 • USA

Tel 770-218-8900 • E-Mail [sales@unibloctech.com](mailto:sales@unibloctech.com)



[unibloctech.com](http://unibloctech.com)

