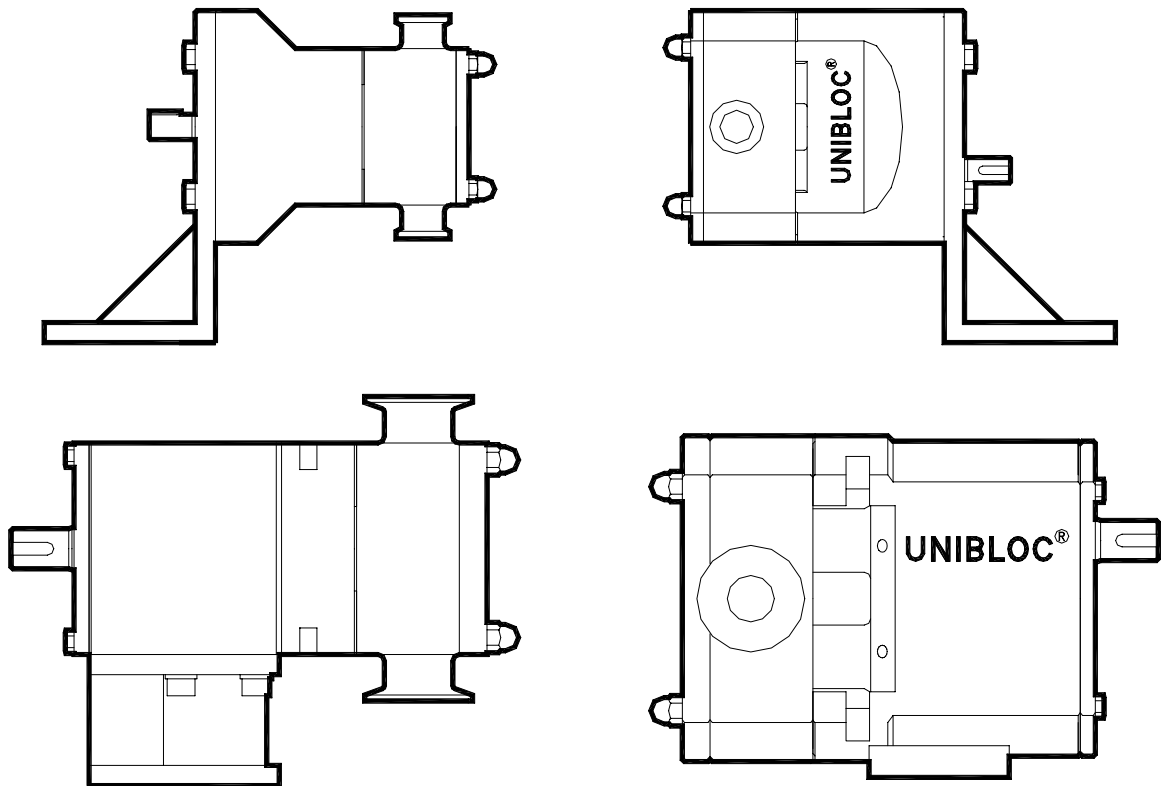




UNIBLOC® -PD

OPERATION AND SERVICE MANUAL (MODELS 200-575)



 **FLOWTECH** DIV.
TEKNOFLOW, INC. ATLANTA, GEORGIA-USA

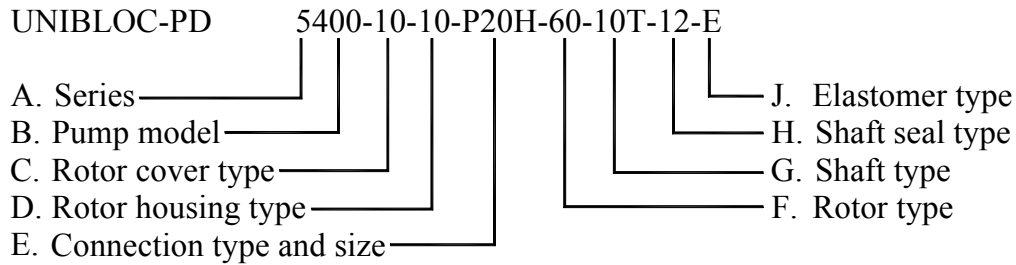
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Each pump has a unique serial number machined into the gearbox and stamped on the rotor housing. The type of pump is further described by the series number machined into the gearbox, i.e. 5000, 4000 or 3000. A pump may be described by a part number, as shown below, that indicates its features.



A. Series:

- 5000 - all stainless
- 4000 - stainless rotor housing, aluminum gearbox
- 3000 - stainless rotor housing, steel gearbox

B. Pump Model:

- 200 - UNIBLOC 200 (1/2" & 3/4" connections)
- 250 - UNIBLOC 250 (3/4" connections)
- 275 - UNIBLOC 275 (1.0" connections)
- 300 - UNIBLOC 300 (1.0" connections)
- 350 - UNIBLOC 350 (1.5" connections)

C. Rotor Cover Type:

- 10 - standard cover
- 15 - standard cover with cooling/heating jacket
- 20 - vented cover

E. Connection Type & Size:

- P - Clamp
- L - ACME thread
- K - NPT male
- D - DIN thread
- AF - 150# ANSI flange
- DF - DIN flange
- 04 - 3/8 inch
- 05 - 1/2 inch
- 07 - 3/4 inch
- 10 - 1.0 inch
- 15 - 1.5 inch
- 20 - 2.0 inch
- 25 - 2.5 inch
- 30 - 3.0 inch
- 40 - 4.0 inch
- 60 - 6.0 inch
- 80 - 8.0 inch
- H - horizontal port configuration
- V - vertical port configuration

G. Shaft Type:

- 10 - standard 316L stainless steel shaft for metallic rotor
- 11 - standard 316L stainless steel shaft with hardened seal area for metallic rotor

- 400 - UNIBLOC 400 (1.5" connections)
- 450 - UNIBLOC 450 (2.0" connections)
- 500 - UNIBLOC 500 (2.5" connections)
- 550 - UNIBLOC 550 (3.0" connections)
- 575 - UNIBLOC 575 (4.0" connections)

D. Rotor Housing Type:

- 10 - standard sanitary housing
- 15 - standard housing with cooling/heating jacket

F. Rotor Type:

- 20 - Class A, polymer (PET)
- 21 - Class B, polymer (PET)
- 50 - Class A, polymer (PEEK)
- 51 - Class B, polymer (PEEK)
- 60 - Class C, 316 stainless steel
- 61 - Class D, 316 stainless steel
- 62 - Class E, 316 stainless steel
- 63 - Class F, 316 stainless steel
- 64 - Class G, 316 stainless steel
- 70 - Class A, polymer (PTFE)
- 71 - Class B, polymer (PTFE)
- 80 - Class C, nongalling stainless steel
- 81 - Class D, nongalling stainless steel
- 82 - Class E, nongalling stainless steel
- 83 - Class F, nongalling stainless steel
- 84 - Class G, nongalling stainless steel
- X - customized

- 12 - standard 316L stainless steel shaft with wear sleeve for metallic rotor
- 15 - standard 316L stainless steel shaft for nonmetallic rotor
- 16 - standard 316L stainless steel shaft with hardened seal area for nonmetallic rotor
- 17 - standard 316L stainless steel shaft with wear sleeve for nonmetallic rotor
- 20 - standard 316L stainless steel drive shaft for metallic rotor and for Charlynn hydraulic motor
- 21 - standard 316L stainless steel drive shaft with hardened seal area for metallic rotor and for Charlynn hydraulic motor
- 25 - standard 316L stainless steel drive shaft for nonmetallic rotor and for Charlynn hydraulic motor
- 26 - standard 316L stainless steel drive shaft with hardened seal area for nonmetallic rotor and for Charlynn hydraulic motor
- 30 - standard 316L stainless steel drive shaft for metallic rotor and for Danfoss hydraulic motor
- 31 - standard 316L stainless steel drive shaft with hardened seal area for metallic rotor and for Danfoss hydraulic motor
- 35 - standard 316L stainless steel drive shaft for nonmetallic rotor and for Danfoss hydraulic motor
- 36 - standard 316L stainless steel drive shaft with hardened seal area for nonmetallic rotor and for Danfoss hydraulic motor
- T - top mounted drive shaft
- B - bottom mounted drive shaft

H. Shaft Seal Type:

- 10 - single mechanical carbon vs. stainless steel
- 11 - single mechanical carbon vs. tungsten carbide
- 12 - single mechanical silicone carbide vs. tungsten carbide
- 13 - single mechanical carbon vs. tungsten carbide
- 20 - single mechanical #10 with retaining ring
- 21 - single mechanical #11 with retaining ring
- 22 - single mechanical #12 with retaining ring
- 30 - double mechanical #10 primary & #10 secondary with flush housing
- 31 - double mechanical #11 primary & #10 secondary with flush housing
- 32 - double mechanical #12 primary & #10 secondary with flush housing
- 40 - single mechanical #10 with flush housing
- 41 - single mechanical #11 with flush housing
- 42 - single mechanical #12 with flush housing
- 50 - gland packing PTFE
- 51 - gland packing with lantern ring
- 60 - single o-ring
- 61 - double o-ring
- 70 - double O-LIP™ Seal
- 71 - flushed double O-LIP™ Seal
- 72 - triple O-LIP™ Seal

J. Elastomer Type:

- E - EPDM
- K - Kalrez
- N - Buna N
- S - Silicone
- T - Teflon encapsulated viton
- V - Viton

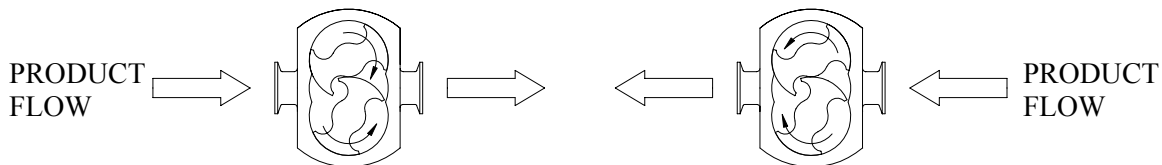
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1.0 BEFORE START-UP

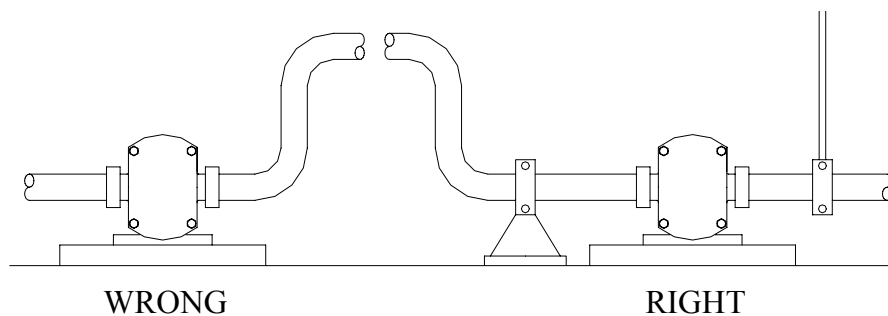


QUICK CHECK LIST

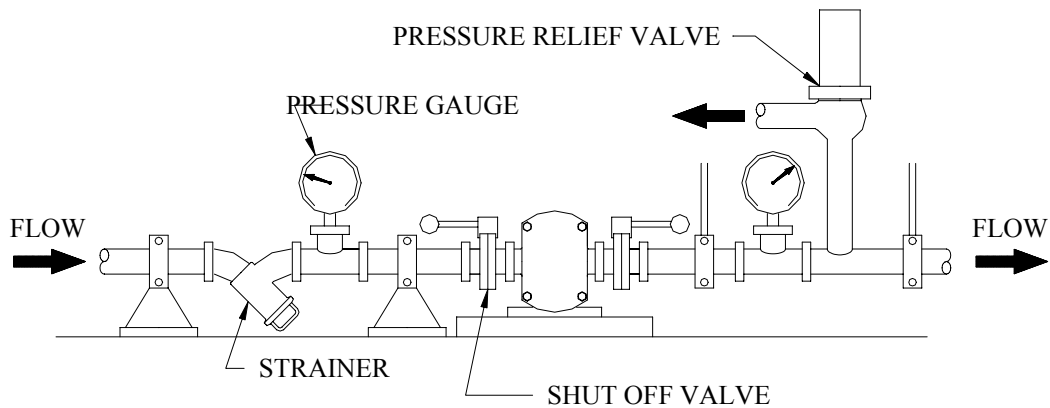
- A. Is pump and motor alignment within proper tolerances? (see section 1.5)
 - B. Does motor and pump gearboxes have adequate amounts of oil? (see section 3.3)
 - C. Are flushed seals, if applicable, connected to proper flushing systems? (see sections 1.7 and 1.8)
 - D. Has the flushing system, if applicable, been activated before the pump is started?
 - E. Has the piping to the pump been installed correctly? (see section 1.3)
 - F. Has the system and all pipes been flushed and cleaned of all debris including weld slag and particles resulting from polishing and grinding?
- 1.1** Remove the front cover and make sure that no particles are trapped inside the rotor housing. Check that the rotor bolts have been securely tightened, if design provides such an option. If possible, make sure pump turns freely. Put back cover, making sure o-ring remains in place, and securely tighten the four front cover nuts.
- 1.2** The pump is designed to operate in both directions without modifications. Make sure that the proper direction of rotation applies.



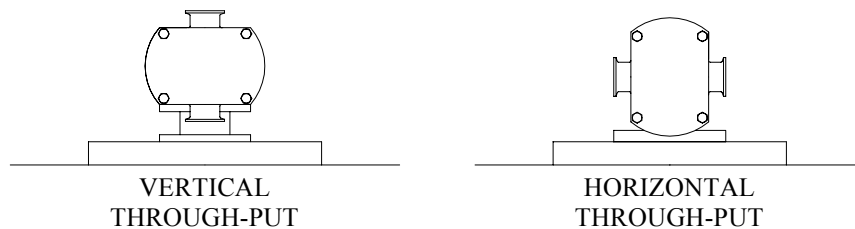
- 1.3 PIPE LAYOUT** When connecting pipes to the pump, make sure they are well supported, as the pump is not meant to serve this purpose. Keep in mind that pipes filled with liquid are very heavy.



The following schematic illustrates the components required for safe and proper operation of the pump. All devices shown are available from Flowtech.

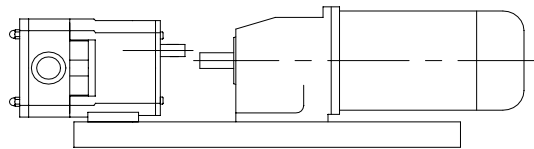


1.4 PORT POSITIONING UNIBLOC-PD is designed to accommodate both vertical and horizontal product through-puts. On models 200-275, the bracket, which has an integral foot can be rotated 90° to change port orientation. The drive shaft oil seal and plug must also be switched. On models 300-575, the gearbox is predrilled to accommodate custom installation or to use standard feet for horizontal port orientation or pedestals for vertical orientation.

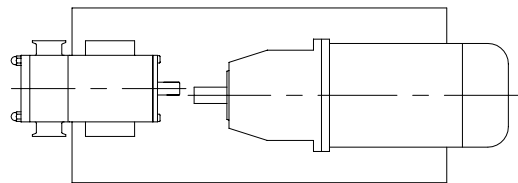


1.5 ALIGNMENT It is imperative that the pump and drive train are properly aligned before start-up. Misalignment can lead to excessive wear and can cause the coupling to rupture. It can also create abnormal stresses on bearings and gears.

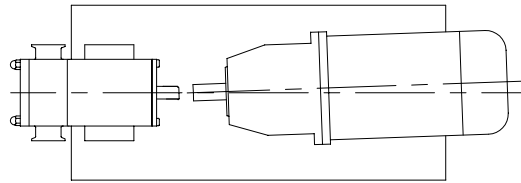
Vertical Misalignment: place shims under pump or drive; 0.01 in. (0.25 mm) max. deviation



Horizontal Misalignment: move pump or drive horizontally; 0.01 in. (0.25 mm) max. deviation



Angular Misalignment: rotate drive or pump; 1° max. deviation

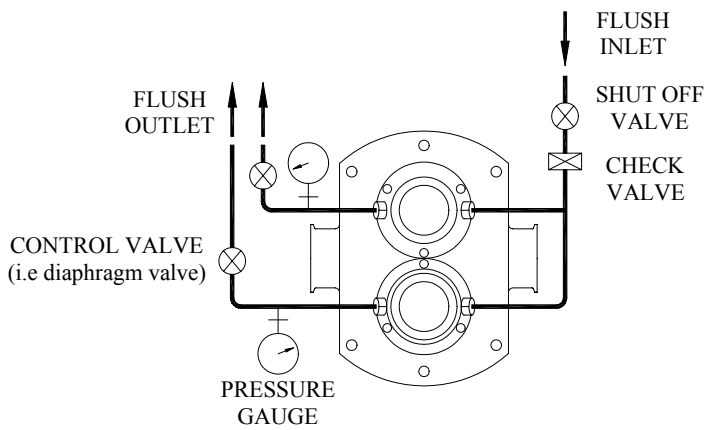


1.6 CLEAN SYSTEM OF ALL DEBRIS BEFORE FINAL STARTUP. Any remaining particles larger than 0.002 in. (0.05 mm) can damage the pump if they enter it. A filtering device installed before the pump inlet is highly recommended to insure safe and proper operation. Since such a device will restrict the flow in to the pump, it is necessary to verify that the net positive suction head (NPSH) available is not reduced below that required by the pump. Flowtech stocks in-line strainers which will prevent hazardous objects from entering the pump and will capture them for easy removal from the system.

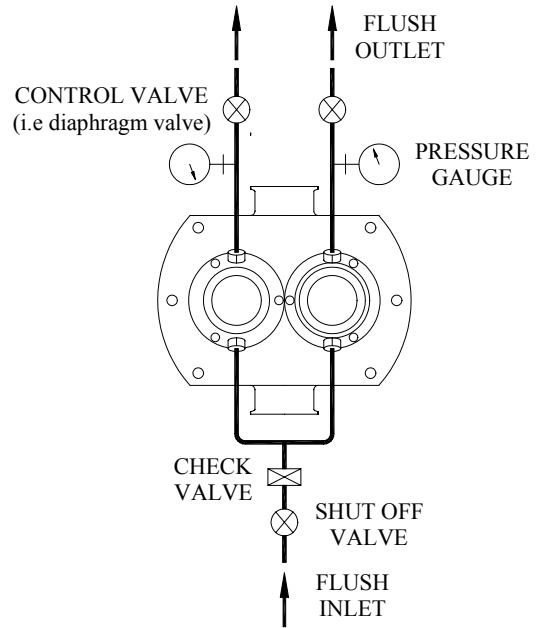
1.7 SINGLE AND DOUBLE MECHANICAL SEAL FLUSHING/COOLING

Double mechanical shaft seals must be fitted with flushing systems that will cool and lubricate them, otherwise the seals will NOT OPERATE CORRECTLY. Single mechanical shaft seals are provided with flush housings as an option. The flushing system also provides a barrier of protection between the environment and the pumped media. The fluid in this system must be flowing before or at the same time the pump is engaged. It must also be stopped after or at the same time the pump is disengaged.

Flushing systems are normally not included with the pump. The following piping arrangements and system components are recommended for satisfactory operation of the seals and to insure containment of the pumped liquid. Connections to the seal housings are 1/8" NPTF. The minimum flow rate for the flushing system is 1 lpm (0.3 gpm) or a rate that will keep the temperature of the seals within 5⁰C (9⁰F) of the pumped media. The pressure of the flushing system is dependent upon the requirements of the pumping application. As a guide, when the flushing system pressure is higher than that of the pumped media, the flushed liquid will enter into the media if the seal fails. Likewise if the pumped media has a higher pressure than the flushing system, the media will enter into the flushing system if the seals fail. This is usually beneficial in cases when the pumped media is extremely hazardous, as it may be safely contained and disposed of properly.



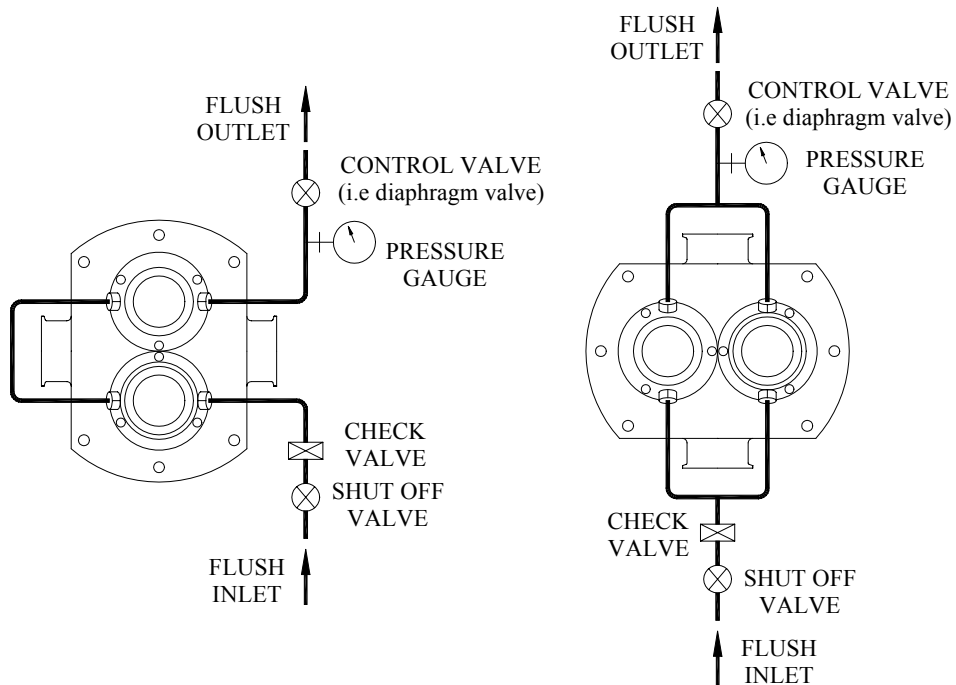
HORIZONTAL PUMP PORTS
(recommended piping arrangement)



VERTICAL PUMP PORTS
(recommended piping arrangement)

TYPICAL PIPING ARRANGEMENTS

The illustrations below show alternative methods of arranging the flushing system and its components. Although not ideal, they are adequate for less critical pump applications.



ALTERNATE PIPING ARRANGEMENTS

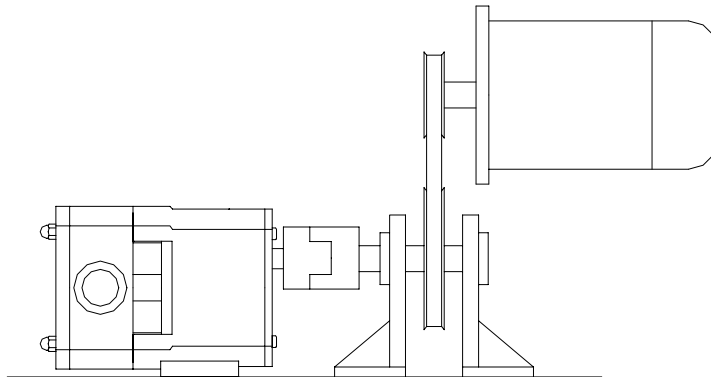
1.8 DOUBLE O-RING SEAL FLUSHING/COOLING

Double o-ring shaft seals, like the double mechanical seals, must also be fitted with flushing systems that will cool and lubricate them, otherwise the seals will NOT OPERATE CORRECTLY. The flushing system also provides a barrier of protection between the pumped media and the environment. The fluid in this system must be flowing before or at the same time the pump is engaged. It must also be stopped after or at the same time the pump is disengaged.

The flushing system may be arranged the same as the double mechanical seals, shown in Section 1.7. 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 an 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 in to 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, should be checked several times every 24 hour period.

1.9 OPERATION WITH PULLEY

The drive shaft and gearbox on all UNIBLOC pump models have been designed for use with in-line couplings and motors. When pulley driven systems are to be used, external supports, as illustrated below, must be provided to prevent excessive bearing wear and bending of the drive shaft.



2.0 SHAFT SEAL SERVICE

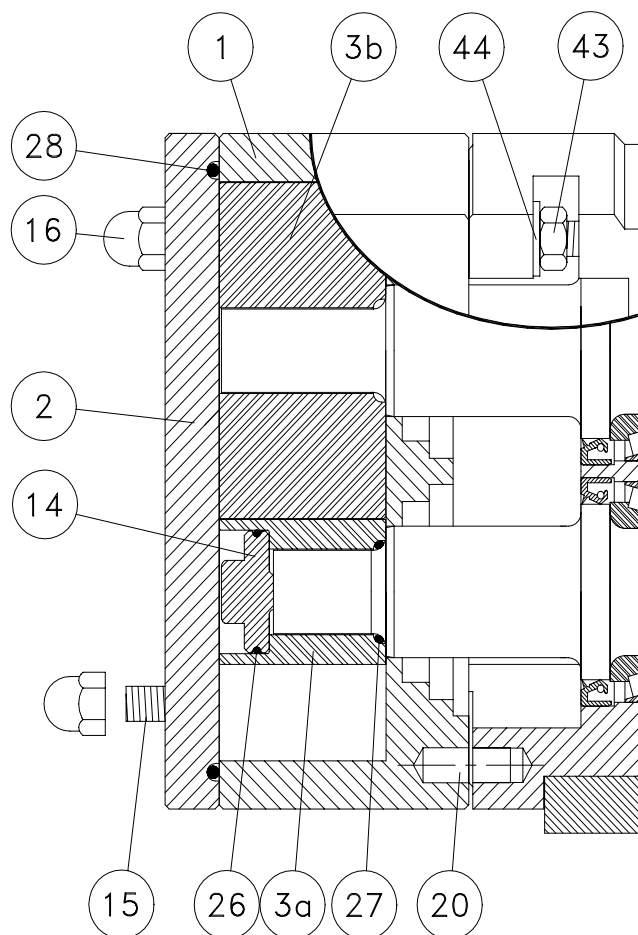
To aid in the removal and installation of the shaft seals, Flowtech has available plastic mounting sleeves that are the same diameter as the shafts at the seal area. They also protect the seals from the shaft splines. Contact an authorized service center, or Flowtech, to obtain these tools.

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 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.

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 (14) 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.



2.1 SINGLE MECHANICAL SEAL

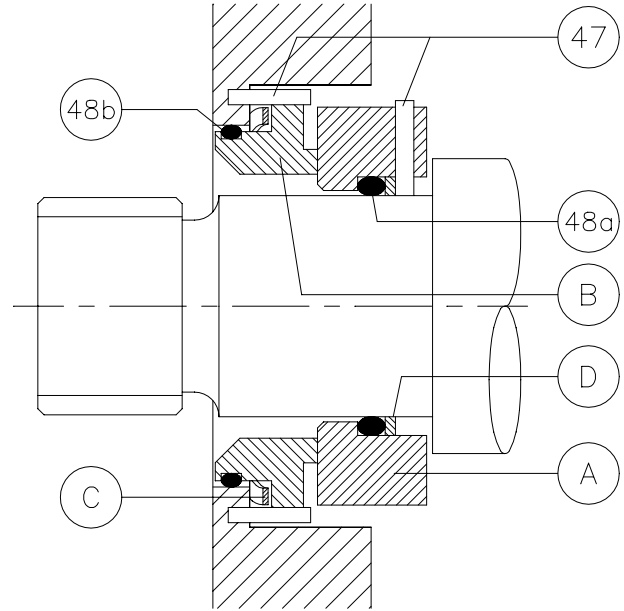
This type of shaft seal is used in most applications with products that have a viscosity of less than 1,000 cPs. The maximum rotational speed of this seal is 1500 rpm and the maximum service pressure is 13.5 bar (195 psig). The seal materials available are stainless steel, carbon, silicone carbide, and tungsten.

The standard o-rings supplied in these seals are viton or EPDM, either food or FDA grade, but may be replaced with other materials.

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2.1.1a UNIBLOC 200, 250, 275 SINGLE MECHANICAL SEAL REMOVAL

Remove the four studs (15) by locking two M6 nuts against each other on the threaded stud end. Remove the rotor housing (1) by pulling on the ports or by tapping gently with a rubber mallet. Do not rock the housing back and forth excessively. The seals may break. Remove the seal nose rings (B) and o-rings (48b) by pulling them out of the housing. Remove the mating rings (A), the o-rings (48a), and the washers (D) by sliding them off the shafts. 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.



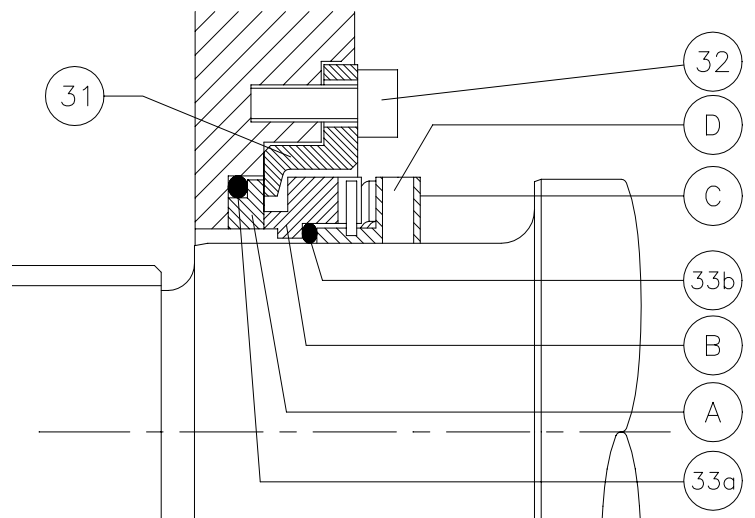
2.1.1b UNIBLOC 200, 250, 275 SINGLE MECHANICAL SEAL INSTALLATION

If missing, insert the dowel pins (47) in the shafts and rotor housing. Coat the shafts and rotor housing bores with a product compatible lubricant. Place the o-rings (48a) in the mating rings (A) first, and then the washers (D). Slide the mating rings, slotted side first, on the shafts. Place the spring washers (C) between the pins (47) in the rotor housing. Place the o-rings (48b) in the groove of the mating rings (B). Align the slots of the mating rings with the pins in the rotor housing. Push the mating rings 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 2.8 to complete the installation.

2.1.2a UNIBLOC 300-575 SINGLE MECHANICAL SEAL REMOVAL

Loosen the stud nuts (43). Remove the tapping gently with a rubber mallet. Do not rock the housing back and forth excessively. The seals may break. The retainer rings (31), if used, the bolts (32), the mating rings (A), and the mating ring o-rings (33a) will all come off with the housing.

Unscrew the bolts (32) to remove the optional retainer rings (31), the mating rings (A), and the mating ring o-rings (33a). Slide the seal nose rings (B) and the seal nose o-rings (33b) off the shafts. To avoid damage, handle and store the loose seal nose rings and the mating rings so that their lapped sealing surfaces do not get scratched. If not being replaced, the drive collars (C) may remain on the shafts, otherwise loosen the set screws (D) and slide them off the shafts.



2.1.2b UNIBLOC 300-575 SINGLE MECHANICAL SEAL INSTALLATION

The shafts and the rotor housing bores should be cleaned before installing the seal components. Slide the drive collars (C) on the shafts. Moisten the seal nose o-rings (33b) with water or coat them with a lubricant that is acceptable for use with the product. Slide the seal nose o-rings on the shafts

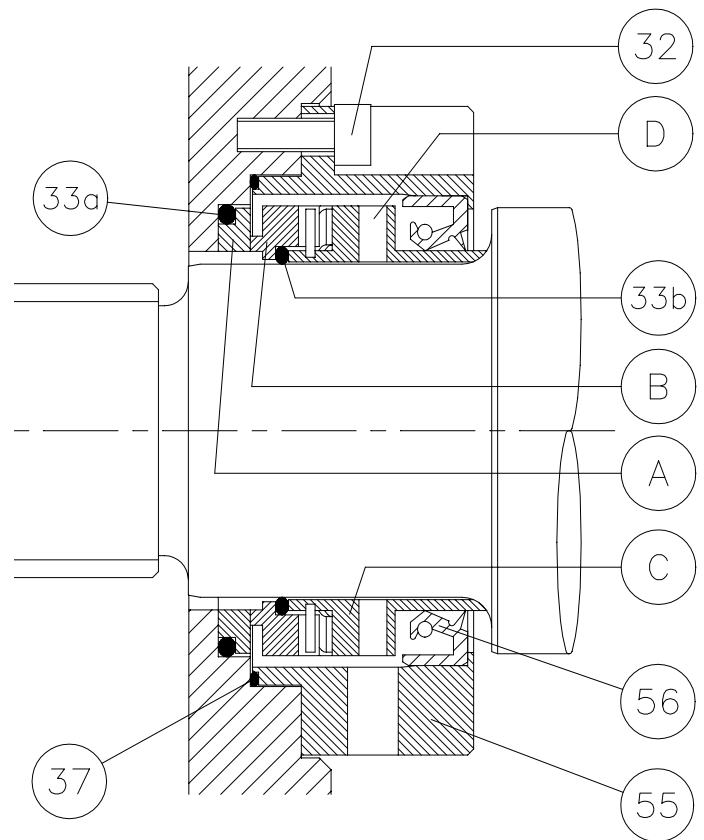
and then the seal nose rings (B), slotted sides first. Align the slots in the seal nose rings with the pins in the drive collar. Push the seal nose rings against the drive collars so that the o-rings seat properly. Place the mating ring o-rings (33a) in the rotor housing seal bores. Only lubricate these 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. Some applications require pins to be used in the mating rings. 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 mating rings' seal surface to push them in. Place a product compatible lubricant on the sealing surfaces. If retainer rings (31) were supplied with the pump, bolt them to the rotor housing. Proceed to section 2.8 to complete the installation. After installing the housing push the drive collars toward it compressing the wave springs and leaving a 2-3mm (0.08"-0.12") gap between the collar and the seal nose rings (B). Tighten the set screws (D).

2.2 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 2.1. The drive collar is different, however. The flushed single mechanical is not available for UNIBLOC 200, 250, and 275. See section 1.7 for more information about flushing systems.

2.2a 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) flush housings, after all other seal parts have been removed, Push or tap the lip seals with a tube to remove them.

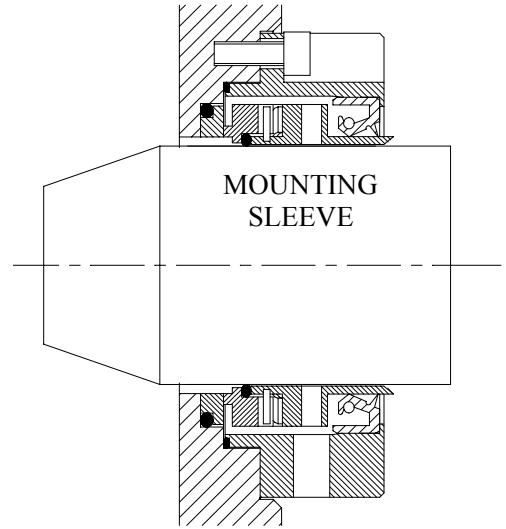


location. This can be done by placing the back into the rotor housing seal bores.

2.2b FLUSHED SINGLE MECHANICAL SEAL INSTALLATION

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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.



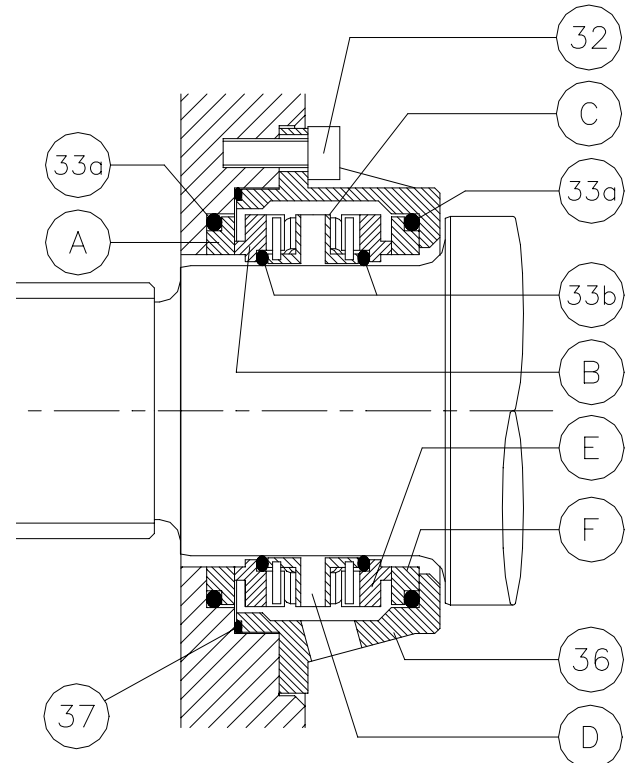
Rotate the flush housings so that its port holes align with at least one set screw. Lubricate the o-rings (37) and mount the seal cartridge assemblies on the rotor housing. Tighten the bolts (32). See section 2.8 to complete the installation.

2.3 DOUBLE MECHANICAL SEAL

The flushed double mechanical seal uses the same stationary mating rings (A, F) and o-rings (33a, 33b) as the single mechanical seals discussed in section 2.1.2. The drive collar (D) and seal nose rings (B, E) are different, however. The flushed double mechanical seal is not available for UNIBLOC 200, 250, and 275. See section 1.7 for more information about flushing systems.

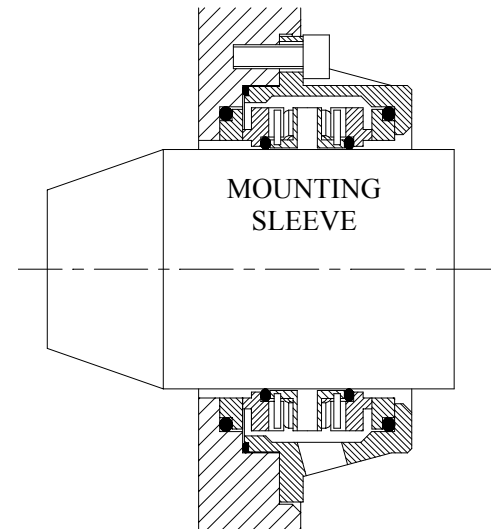
2.3a DOUBLE MECHANICAL SEAL REMOVAL

Disconnect the flush tubing from the flush housings (36). Loosen the set screws (C) 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 (36), the secondary mating ring (F), and the o-rings (37, 33a). The remaining seal components may now be removed. To avoid damage, handle and store the loose seal nose rings (B, E) and the mating rings (A, F) so that their lapped sealing surfaces do not get scratched. Remove the primary mating rings (A) by pulling it out of the rotor housing seal bores. Remove the secondary mating rings (F) by pushing them out of the flush housings.



2.3b DOUBLE MECHANICAL SEAL INSTALLATION

Place the mating ring o-rings (33a) in the rotor housing seal bores and the flush housings (36). Only lubricate these o-rings with water or alcohol. Push the primary mating rings (A) into the rotor housing so that they seat flat with the step in the housing. Push the secondary mating rings (F) into the flush housings making sure the o-rings seat properly. Do not use objects that will scratch the mating rings' seal surface to push them in. Place a product compatible lubricant on the sealing surface of the mating rings. Place the o-rings (37) into the o-ring grooves. While the rotor housing is lying flat with the rotor bores facing up, stack the seal components on the primary mating rings (A). Begin with the primary seal nose rings (B), slotted sides up. Place the o-rings (33b) into the seal nose rings (B, E). Place the drive collars (C) into the seal nose rings, align the slots with the pins, and push gently to seat the o-rings. Place the secondary seal nose rings (E) on the drive collars, align the slots with the pins, and push gently to seat the o-rings. Place the flush housings (36) 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 and screw in the bolts (32) hand tight only. Lubricate the plastic mounting sleeves and slide them, tapered end first, into the seals. Tighten the bolts (32). Leave the sleeves in the seals and proceed to section 2.8 to complete the installation.

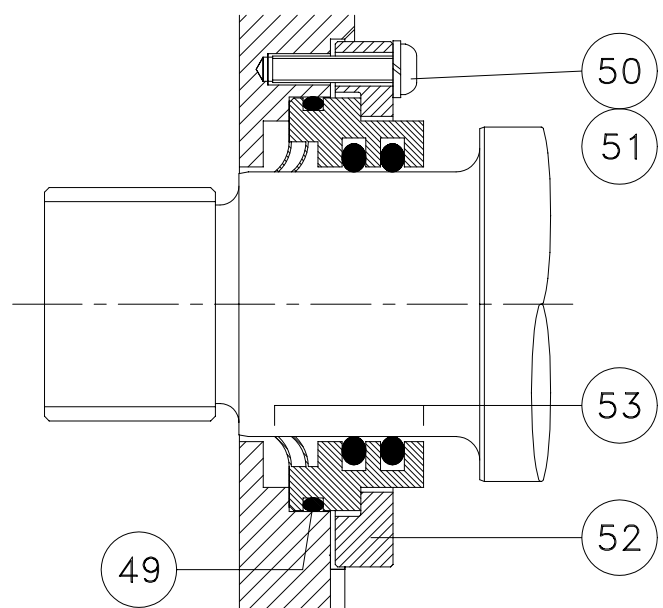


2.4 DOUBLE O-LIP™ SEAL

This type of seal is most frequently used with liquids that are very difficult to seal because of high viscosity. The seal comes as a single cartridge that is easily serviced. The maximum shaft rotational speed for this seal is 1.5 m/s (4.9 ft/s) and the maximum service pressure should not exceed 10 bar (150 psig). The seal does not require external lubrication and can be run dry for short periods. It is not available for UNIBLOC 200, 250, and 275.

2.4a DOUBLE O-LIP™ SEAL REMOVAL

Loosen the stud nuts (43). Remove the rotor housing (1) by pulling on the ports or by tapping gently with a rubber mallet. The entire seal with all components will come off attached to the rotor housing. Remove the bolts (50), the split washers (51), and the retainer rings (52). Pull the cartridges (53) out of the rotor housing bores.



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2.4b DOUBLE O-LIP™ SEAL INSTALLATION

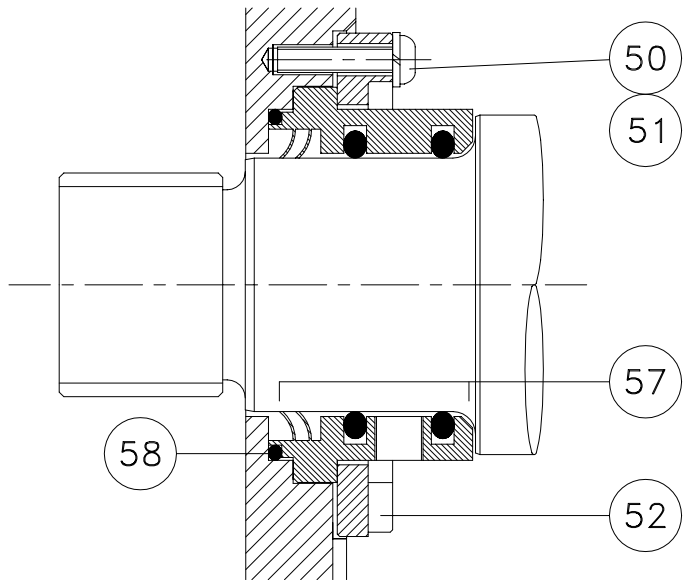
Check the shafts for wear. If grooves are noticeable, they may have to be replaced. Place new o-rings (49) into the groove of the seal cartridges. Clean the rotor housing seal bores. Apply product compatible lubricant to the bores and the shafts. Place the rotor housing so that the seal bores are pointing up, push the seal cartridges (53) in, lip side first. Attach the retainer rings (52) to the rotor housing with the split washers (51) and the bolts (52). See section 2.8 for completing the installation.

2.5 FLUSHED DOUBLE O-LIP™ SEAL

This type of seal has the same features as the unflushed seal described in section 2.4. Its ability to be flushed provides an added barrier of protection. It is not available for UNIBLOC 200, 250, and 275. See section 1.7 for more information about flushing systems.

2.5a FLUSHED DOUBLE O-LIP™ SEAL REMOVAL

Disconnect the flush tubing from the seal cartridge housings. Loosen the gearbox stud nuts (43). Remove the rotor housing (1) by pulling on the ports or by tapping gently with a rubber mallet. The entire seal with all components will come off attached to the rotor housing. Remove the bolts (50), the split washers (51), and the retainer rings (52). Pull the cartridges (57) out of the rotor housing bores.



2.5b FLUSHED DOUBLE O-LIP™ SEAL INSTALLATION

Check the shafts for wear. If grooves are noticeable, they may have to be replaced.

Place new o-rings (58) into the step of the seal cartridges.

Apply product compatible lubricant to the bores and the shafts.

With the rotor housing lying so that the seal bores are pointing up, push the seal cartridges (57) in, lip side first.

Attach the retainer rings (52) to the rotor housing with the split washers (51) and the bolts (52).

See section 2.8 for completing the installation.

Clean the rotor housing seal bores.

With the rotor housing lying so that the seal bores are pointing up, push the seal cartridges (57) in, lip side first.

Attach the retainer rings (52) to the rotor housing with the split washers (51) and the bolts (52).

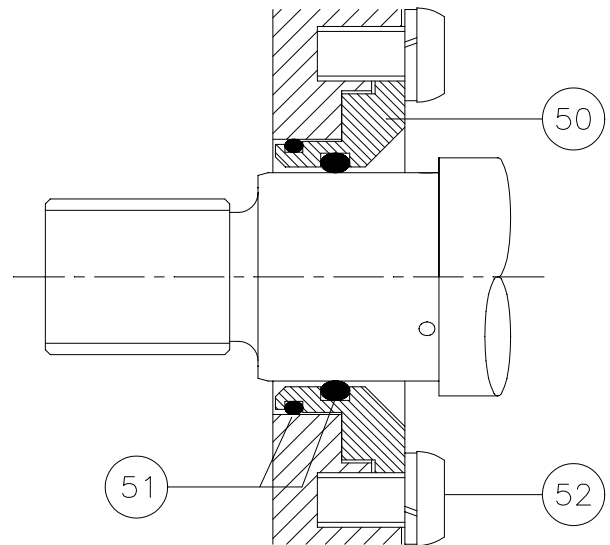
See section 2.8 for completing the installation.

2.6 SINGLE O-RING SEAL

This type of seal uses one o-ring, or optional quad ring, to seal against a rotating shaft. It is most frequently used when the liquid viscosity is greater than 2,000 cPs or is sticky. The seal is the least expensive of all shaft seals, but requires more frequent replacement. The maximum shaft rotational speed for this seal is 350 rpm and the maximum service pressure should not exceed 8 bar (115 psig). The o-ring seal must never be allowed to run dry as they will be damaged. This seal uses the pumped product as a lubricant.

2.6.1a UNIBLOC 200-275 SINGLE O-RING SEAL REMOVAL

Loosen the stud nuts (15) by locking two M6 nuts against each other on the threaded stud ends. Remove the rotor housing (1) by pulling on the ports or by tapping gently with a rubber mallet. All seal parts will come off with the housing. Remove the retainer rings (50) by unscrewing the bolts (52). The o-rings (51) can now be removed.

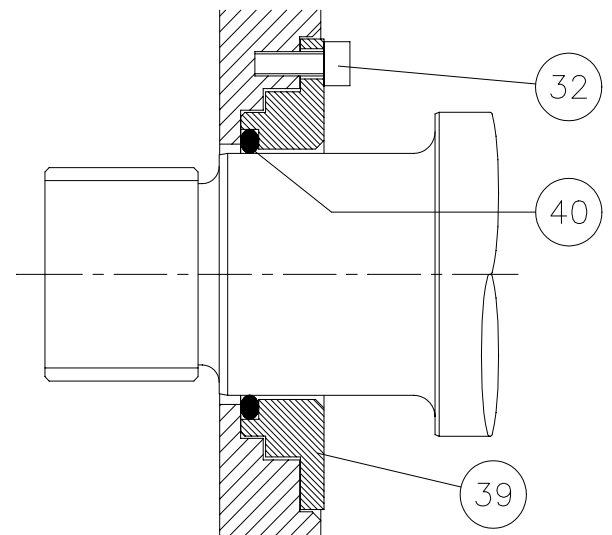


2.6.1b UNIBLOC 200-275 SINGLE O-RING SEAL INSTALLATION

Check the shafts for wear. If grooves are noticeable, they may have to be replaced. Otherwise, the o-ring may not seal properly or may fail prematurely. Place new o-rings into the grooves of the retainer rings (50). Apply a lubricant on the shafts, o-rings, and the rotor housing bores with a lubricant approved for use with the pumped product. Attach the retainer rings to the rotor housing with the bolts (52). See section 2.8 for completing the installation.

2.6.2a UNIBLOC 300-575 SINGLE O-RING SEAL REMOVAL

Loosen the stud nuts (43). Remove the rotor housing (1) by pulling on the ports or by tapping gently with a rubber mallet. All seal parts will come off with the housing. Remove the retainer rings (39) by unscrewing the bolts (32). The o-rings (40) can now be removed.



2.6.2b UNIBLOC 300-575 SINGLE O-RING SEAL INSTALLATION

Check the shafts for wear. If grooves are noticeable, they may have to be replaced. Otherwise, the o-ring may not seal properly or may fail prematurely. Place a new o-ring into the groove of the retainer ring (39). Attach the retainer ring to the rotor housing with the bolts (32). Coat the o-ring and the shafts with a lubricant approved for use with the pumped product. See section 2.8 for completing the installation.

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2.7 DOUBLE O-RING SEAL

This type of seal uses two o-rings, or optional quad rings, to seal against a rotating shaft. It is most frequently used when the liquid viscosity is greater than 2,000 cPs or is sticky. The maximum shaft rotational speed for this seal is 350 rpm and the maximum service pressure should not exceed 8 bar (115 psig). This seal must never be allowed to run dry because the o-rings will be damaged. It must also be lubricated by an external method such as grease or a flushing system as discussed in section 1.8. This seal also uses the pumped product as a lubricant.

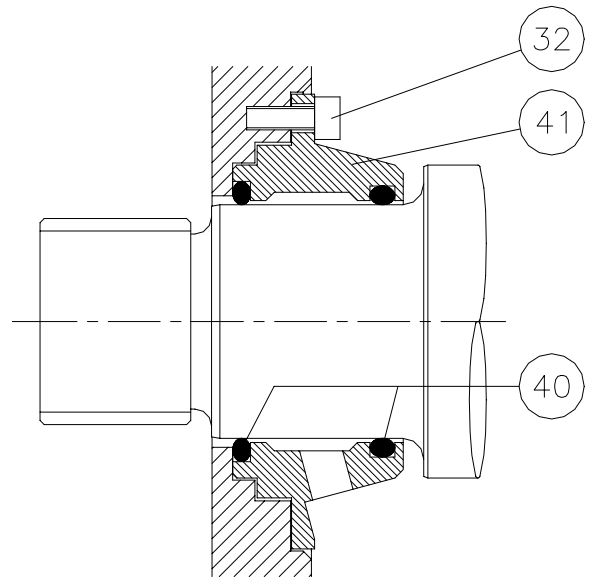
2.7a DOUBLE O-RING SEAL REMOVAL

If using a flushing system as discussed in section 1.7, disconnect it from the flush housings (41). Loosen the stud nuts (43). Remove the rotor housing (1) by pulling on the ports or by tapping gently with a rubber mallet. All seal parts will come off with the housing. Remove the flush housings (41) by unscrewing the bolts (32). The o-rings (40) can now be removed.

2.7b DOUBLE O-RING SEAL INSTALLATION

Check the shafts for wear. If grooves are noticeable, they may have to be replaced. Otherwise, the o-rings may not seal properly or may fail prematurely. Place new o-rings into the grooves of the flush housings (41). Attach the flush housings to the rotor housing with the bolts (32). Coat the o-rings and the shafts with a lubricant approved for use with the pumped product.

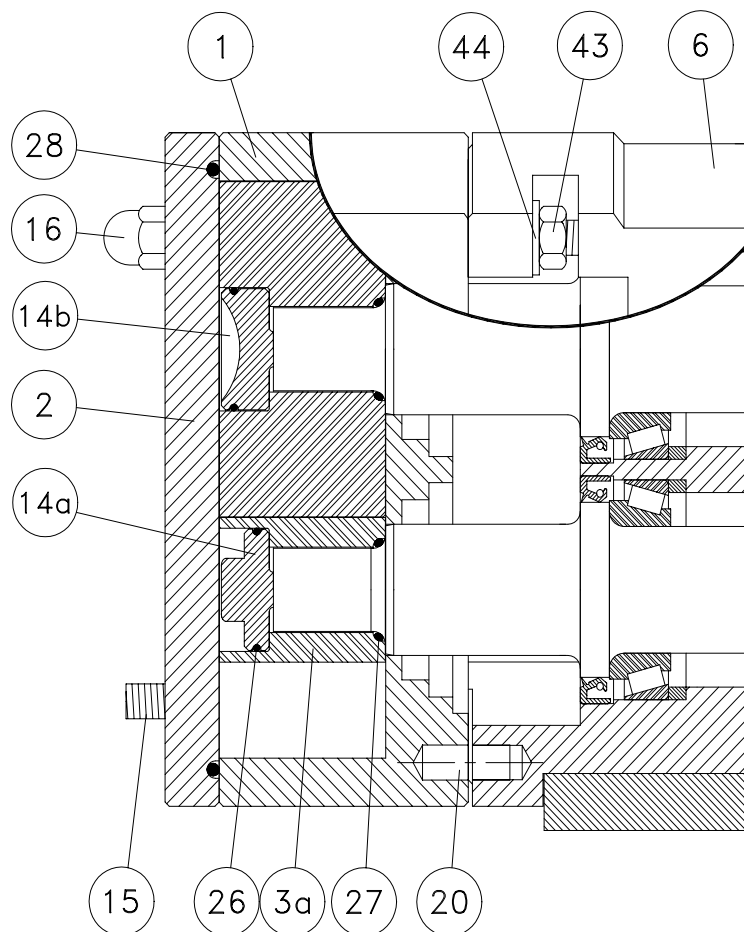
See section 2.8 for completing the installation. It is imperative that the cavity between the o-rings is filled with grease or the flushing system is reconnected before operation is resumed.



2.8 SEAL INSTALLATION - FINAL STEPS

See section 3.4 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 gearbox (6). The rotor housing must make firm contact with the gearbox. On UNIBLOC models 300-575, 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 gearbox. 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 housings' 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 (14). If the rotors are metal, slide the rotor shaft o-rings (27) over the splined shaft ends and on the step, if applicable. One rotor and one shaft have been marked with the same symbol. 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 (14). 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 4.0. 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 gearbox, as instructed in section 3.0, and changing the shims (11).

Place the front cover (2) and the o-ring (28) on the studs. Tighten the front cover nuts (16). Check the oil level in the gearbox as described in section 3.3. The pump is now ready to be installed in the system. If flushed seals were installed, reconnect the flush tubing. Refer to section 1.0 before starting the pump.

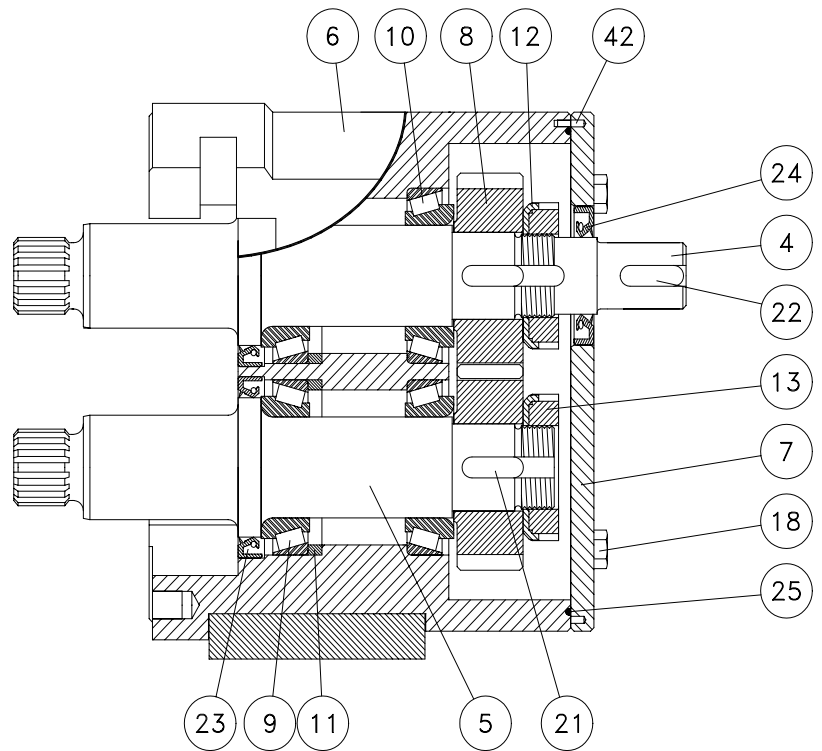
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3.0 GEARBOX MAINTENANCE AND SERVICE

The UNIBLOC gearbox 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 180⁰C (356⁰F) a vent and high temperature lubricant must be used. For such cases, contact Flowtech 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 gearbox.

The method of removing these parts is dependent upon the type of shaft seals the pump has and is outlined in section 2.0.



3.1 GEARBOX DISASSEMBLY

Remove the front cover, rotors, housing and shaft seals as described in section 2. Drain oil from the gearbox 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 gearbox. 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 gearbox. Behind cup (9) are the shim rings (11) which can now be removed.

3.2 GEARBOX ASSEMBLY

The following steps for assembly assumes 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.

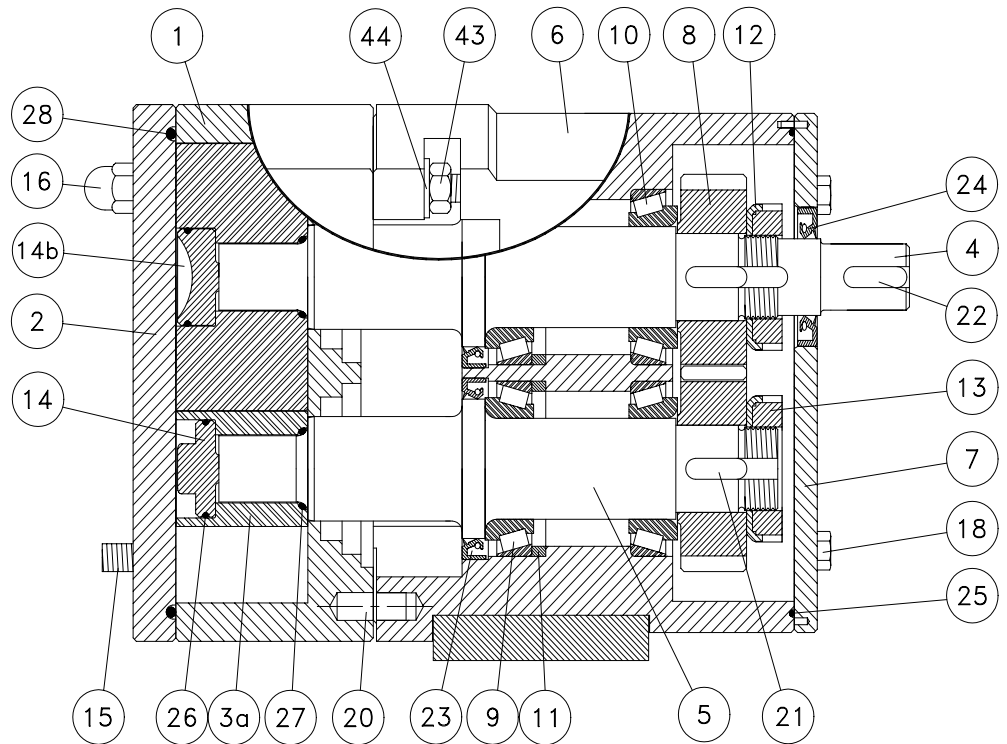
3.2.1a PUMP ASSEMBLY (STAINLESS STEEL ROTORS)

Insert the shim rings (11) into the front bores of the gearbox (6). Oil the front (9) and rear (10) bearing cones and tap them into the gearbox so that the tapered edge can be seen when looking into the gearbox. 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 gearbox. 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 (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 3.4 are achieved. The torque can be measured by inserting the rotor bolts (14) 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 gearbox 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 gearbox. Tap out the front



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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 3.2.1b.

3.2.1b PUMP ASSEMBLY (STAINLESS STEEL ROTORS) - FINAL STEPS

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 gearbox. The text on the seals should face out. Push the seals on with a sleeve flush with the gearbox. Stand the pump on the splined ends and fill the gearbox cavity with an approved oil listed in section 3.3. Place the oil seal(s) (24; 24 & 45 for UNIBLOC 200-275) in the gearbox cover, text side out. Place the o-ring (25) into the groove on the rear side of the gearbox. 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 shaft seals and rotor housing as described in section 2.

3.2.2 PUMP ASSEMBLY (POLYMER ROTORS)

Insert the shim rings (11) into the front bores of the gearbox (6). Oil the front (9) and rear (10) bearing cones and tap them into the gearbox so that the tapered edge can be seen when looking into the gearbox. 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 gearbox. Oil the shafts at the bearing seat

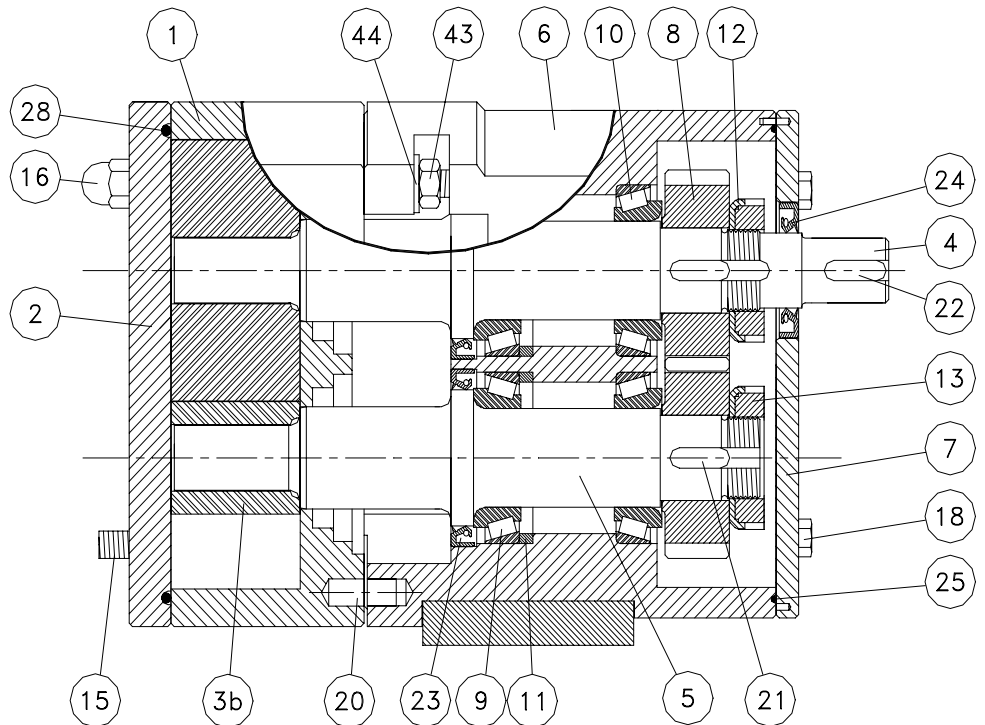
location and slide the bearings on so that the text on the bearing shoulder will make contact with the shaft shoulder.

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 3.4 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 gearbox. The text on the seals should face out. Push the seals on with a sleeve flush with the gearbox. Stand the pump on the splined ends and fill the gearbox cavity with an approved oil listed in section 3.3. Place the oil seal(s)



(24; 24 & 45 for **UNIBLOC** 200-275) into the groove on the rear side of the not to damage the oil seal lips. Secure the Install the shaft seals and rotor housing as

in the gearbox cover, text side out. Place the o-ring (25) gearbox. Slide the cover onto the drive shaft taking care cover with the bolts (18). Tap key (22) into place. described in section 2.

3.3 LUBRICANTS AND GEARBOX VOLUMES

The **UNIBLOC** pumps come supplied with a synthetic oil, MOBIL 1 15W-50, applicable for service temperatures in the range of -23⁰C (-10⁰F) to 221⁰C (430⁰F). The following is a list of other synthetic lubricants that may be used.

MANUFACTURER	LUBRICANT NAME	TEMP. RANGE, ⁰ C (⁰ 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)

UNIBLOC MODEL	OIL CAPACITY, ml (oz.)
200, 250, 275	50 (1.7)
300, 350	150 (5.1)
400,450	350 (11.8)
500, 550, 575	1700 (57.5)

When checking the oil level in permanently lubricated gearboxes, the pump must be removed from the system as described in section 3.0. After removing it, stand the pump on the front cover nuts so that the drive shaft points up. Remove the gearbox cover bolts and rotate the cover without sliding it off the drive shaft. Oil should be even with the top of the gears. If not, 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 1.0 before starting the pump. When checking the oil level in gearboxes 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.

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3.4 TORQUE REQUIREMENTS AND LIMITS

UNIBLOC MODEL	ROTOR HOUSING STUDS (15), N-m (ft-lbs.)	ROTOR BOLTS (14), N-m (ft-lbs.)	FRONT COVER NUTS (16) , N-m (ft-lbs.)
200, 250, 275	8 (6)	20 (15)	10 (7)
300, 350	8 (6)	20 (15)	15 (11)
400,450	20 (15)	35 (26)	30 (22)
500, 550, 575	40 (30)	140 (103)	50 (37)

UNIBLOC MODEL	GEARBOX COVER BOLTS, N-m (ft-lbs.)	ROTATING SHAFT, N-m (ft-lbs.)
200, 250, 275	20 (15)	2 (1.5)
300, 350	15 (11)	4 (3)
400,450	15 (11)	6 (4.5)
500, 550, 575	40 (30)	10 (7.5)

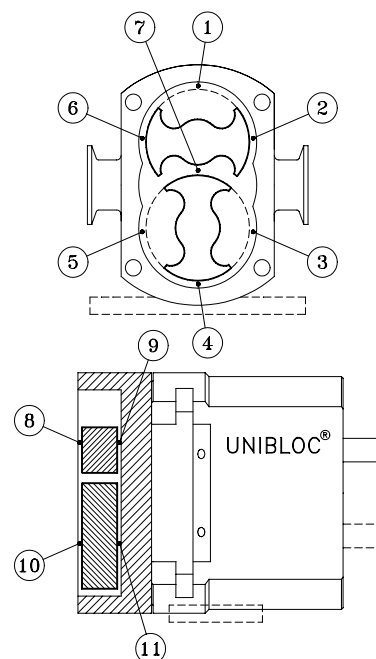
4.0 ROTOR CLEARANCES

The following tables list the clearances between the rotor housing and the rotors. The rotors are stamped with the rotor class letter underneath the rotor bolt on the spline ends of the rotor.

CLEARANCES FOR CLASS C STAINLESS STEEL ROTORS, x0.01 mm (x0.001in.)				
UNIBLOC MODEL	POSITION			
	1-6	7	8 & 10	9 & 11
200	10-12 (3.9-4.7)	6-8 (2.4-3.1)	12-14 (4.7-5.5)	4-6 (1.6-2.4)
250	12-14 (4.7-5.5)	6-8 (2.4-3.1)	14-16 (5.5-6.3)	4-6 (1.6-2.4)
275	12-14 (4.7-5.5)	6-8 (2.4-3.1)	16-18 (6.3-7.1)	4-6 (1.6-2.4)
300	12-14 (3.9-5.5)	10-12 (3.9-4.7)	12-14 (3.9-5.5)	6-8 (2.4-3.1)
350	16-18 (6.3-7.1)	12-14 (4.7-5.5)	12-14 (3.9-5.5)	6-8 (2.4-3.1)
400	18-20 (7.1-7.8)	16-18 (6.3-7.1)	12-14 (4.7-5.5)	7-9 (2.8-3.5)
450	20-22 (7.9-8.7)	16-18 (6.3-7.1)	14-16 (5.5-6.3)	7-9 (2.8-3.5)
500	22-24 (8.7-9.4)	22-24 (8.7-9.4)	18-20 (7.1-7.9)	10-12 (3.9-4.7)
550	26-28 (10.2-11.0)	22-24 (8.7-9.4)	18-20 (7.1-7.9)	10-12 (3.9-4.7)
575	24-26 (9.4-10.2)	22-24 (8.7-9.4)	18-20 (7.1-7.9)	10-12 (3.9-4.7)

CLEARANCES FOR CLASS D STAINLESS STEEL ROTORS, x0.01 mm (x0.001in.)				
UNIBLOC MODEL	POSITION			
	1-6	7	8 & 10	9 & 11
200	10-12 (3.9-4.7)	6-8 (2.4-3.1)	15-17 (5.9-6.7)	4-6 (1.6-2.4)
250	12-14 (4.7-5.5)	6-8 (2.4-3.1)	18-20 (7.1-7.9)	4-6 (1.6-2.4)
275	14-16 (5.5-6.3)	6-8 (2.4-3.1)	22-24 (8.7-9.4)	4-6 (1.6-2.4)
300	15-17 (5.9-6.7)	12-14 (4.7-5.5)	14-16 (5.5-6.3)	6-8 (2.4-3.1)
350	17-19 (6.7-7.5)	16-18 (6.3-7.1)	14-16 (5.5-6.3)	6-8 (2.4-3.1)
400	20-22 (7.9-8.7)	20-22 (7.9-8.7)	16-18 (6.3-7.1)	7-9 (2.8-3.5)
450	22-24 (8.7-9.4)	20-22 (7.9-8.7)	16-18 (6.3-7.1)	7-9 (2.8-3.5)
500	26-28 (10.2-11.0)	31-33 (12.2-13.0)	24-26 (9.4-10.2)	10-12 (3.9-4.7)
550	30-32 (11.8-12.6)	31-33 (12.2-13.0)	24-26 (9.4-10.2)	10-12 (3.9-4.7)
575	30-32 (11.8-12.6)	31-33 (12.2-13.0)	24-26 (9.4-10.2)	10-12 (3.9-4.7)

CLEARANCES FOR CLASS E STAINLESS STEEL ROTORS, x0.01 mm (x0.001in.)				
UNIBLOC MODEL	POSITION			
	1-6	7	8 & 10	9 & 11
300	18-20 (7.1-7.9)	20-22 (7.9-8.7)	18-20 (7.1-7.9)	6-8 (2.4-3.1)
350	20-22 (7.9-8.7)	20-22 (7.9-8.7)	18-20 (7.1-7.9)	6-8 (2.4-3.1)
400	28-30 (11.0-11.8)	28-30 (11.0-11.8)	23-25 (9.0-9.8)	7-9 (2.8-3.5)
450	25-27 (9.8-10.6)	28-30 (11.0-11.8)	20-22 (7.9-8.7)	7-9 (2.8-3.5)
500	32-34 (12.6-13.4)	38-40 (15.0-15.7)	22-24 (8.7-9.4)	17-19 (6.7-7.5)
550	38-40 (14.9-15.7)	39-41 (15.3-16.1)	22-24 (8.7-9.4)	17-19 (6.7-7.5)
575	36-38 (14.2-15.0)	39-41 (15.3-16.1)	22-24 (8.7-9.4)	17-19 (6.7-7.5)

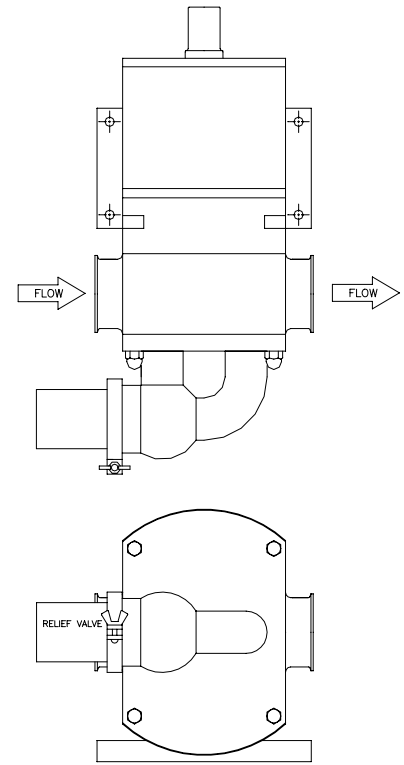


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5.0 RELIEF VALVE COVER SETTING AND MAINTENANCE

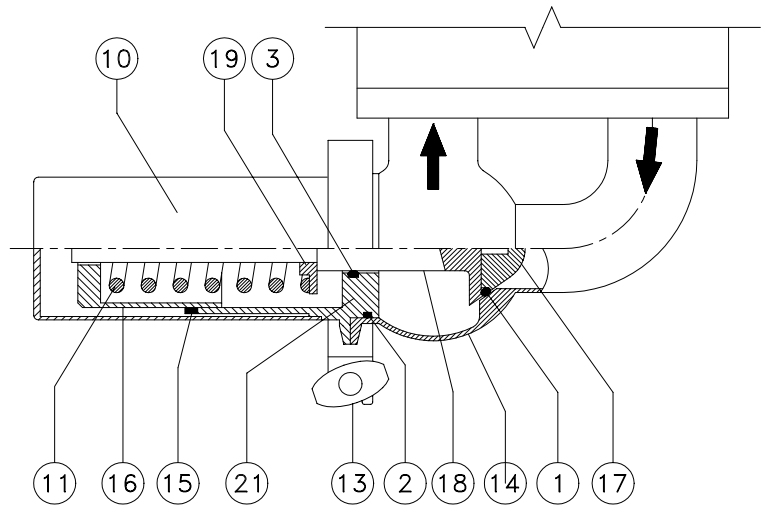
UNIBLOC® pumps may be supplied with a relief valve cover, shown at right, that will minimize or eliminate problems associated with overpressurizing the pump. Although a complete external relief system is recommended, the type illustrated in this section is useful when such systems are not practical. This type, however, functions only in one direction and must be oriented such that the high pressure, or discharge, side of the pump is always at the inlet of the relief valve.

The pressure is set in conjunction with a pressure gauge installed on the discharge side of the pump. By compressing or decompressing the spring inside the valve, the pressure at which the valve will open can be adjusted. This must be done while the pump is operating at the desired flow rate. Extreme caution should be used to prevent damage to the pump or other equipment that is pressure sensitive. If the pump is used to handle hot liquids, do not touch the pump or the valve without protection. Unscrew the housing (10) to reveal the adjusting mechanism. Release the lock ring (15) and turn it and the adjusting sleeve (16) clockwise until they bottom out. Turn the sleeve counterclockwise until the pressure gauge begins to drop. Lock this position with the lock ring (15). Keep in mind that this pressure must be approximately 0.3- 0.7 bar (5-10 psig) lower than the desired relief pressure, since the pump will continue to build pressure open. Return the housing (10) and tighten.



even though the valve may be

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.



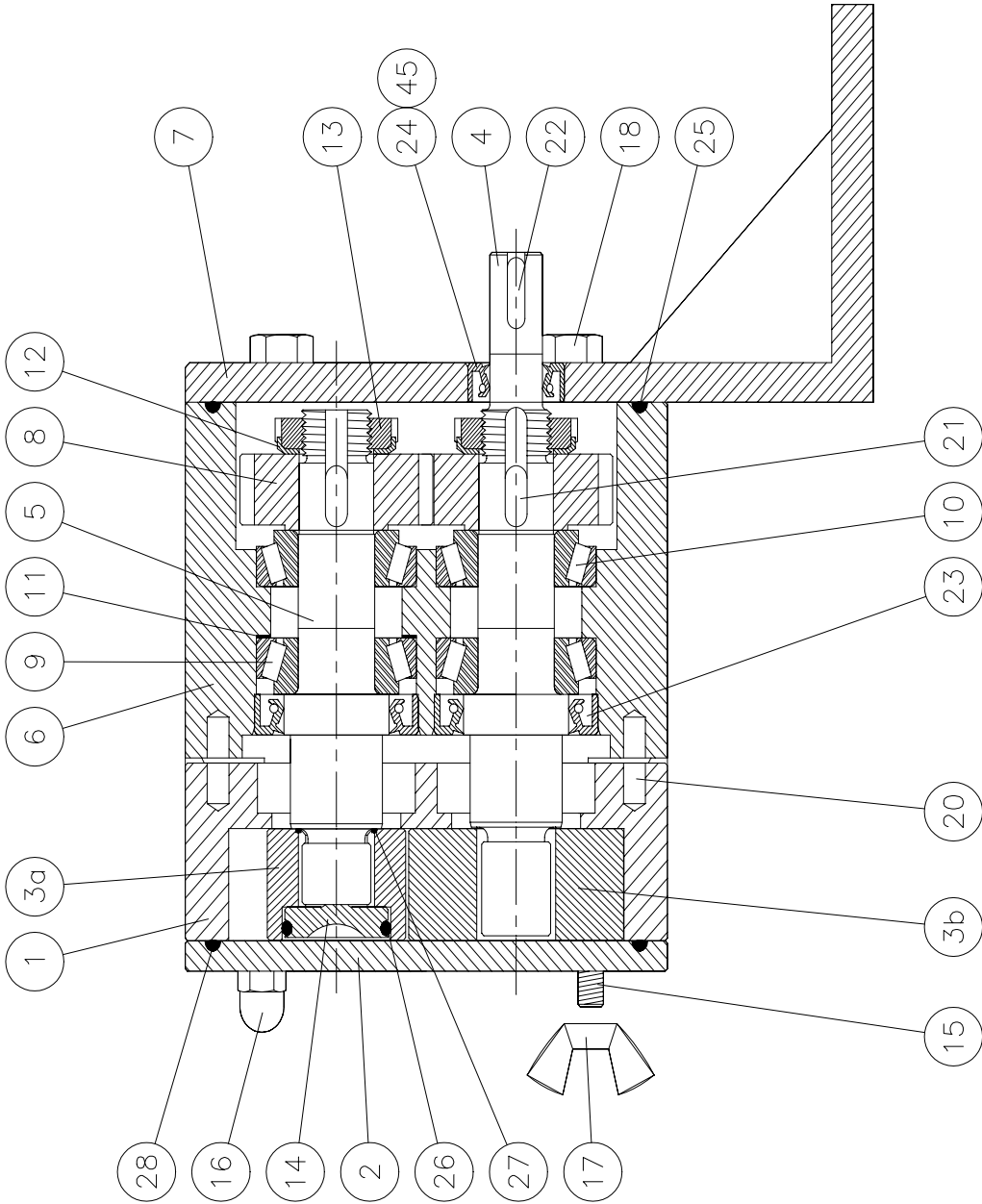
PROBLEM	POSSIBLE CAUSE	SOLUTION
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<p>A. No flow, but pump turns. Pump does not prime.</p>	<ol style="list-style-type: none"> 1. Motor turning in wrong direction 2. Air pocket in pipe or pump. 3. NPSHA too low. 4. Pump runs too slow. 5. Viscosity too high. 6. Obstruction in discharge piping, valve closed. 	<ol style="list-style-type: none"> 1. Reverse motor. 2. Fill pipe and pump with liquid. Check pipe fittings for leaks. 3. Increase suction pipe diameter or shorten suction pipe length. Decrease pump speed. Raise feed tank or supply liquid level. 4. Increase speed. 5. Lower viscosity if possible. 6. Remove obstruction, open valve.
<p>B. Capacity too low, but pump turns.</p>	<ol style="list-style-type: none"> 1. NPSHA too low. 2. Pump runs too slow. 3. Increased slip in pump. 4. Discharge pressure higher than expected. 4. Front cover not tight. 	<ol style="list-style-type: none"> 1. See A-3 2. Increase speed. 3. Check rotor clearances; replace worn parts if necessary. 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. 4. Tighten cover nuts to torques specified in section 3.4.
<p>C. Pump is noisy, cavitating.</p>	<ol style="list-style-type: none"> 1. Collapsed suction hose. 2. Liquid temperature too high. 3. Speed too high. 4. Viscosity higher than expected. 5. NPSHA too low. 6. Suction side valve closed. 	<ol style="list-style-type: none"> 1. Use reinforced hose or rigid piping. 2. Reduce speed, increase NPSHA. 3. Decrease speed. 4. Decrease speed, increase pump size. 5. See A-3. 6. Open valve, check suction side piping for obstructions.
<p>D. Rotors gall, pump seizes</p>	<ol style="list-style-type: none"> 1. Liquid temperature too high. 2. Rotor clearances incorrect. 3. Loose rotor bolts/housing studs. 4. Bearings worn. 5. Gears worn. 6. Foreign particles in pump. 7. Particles in product too large. 8. Discharge pressure too high. 	<ol style="list-style-type: none"> 1. Lower temperature or increase rotor clearances. 2. Adjust to factory recommended clearances. 3. Tighten or replace if necessary. 4. Replace bearings. 5. Replace gears. 6. Install suction side filter. 7. Increase rotor clearances. Use plastic rotors. Increase pump size. 8. See B-4.

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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 mech. 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.

REVISIONS		DATE	BY
SYMBOL	DESCRIPTION		



NO.	PCS.	DESCRIPTION
45	1	BLIND REAR OIL SEAL
28	1	ROTOR COVER O-RING
27	2	ROTOR-SHAFT O-RING
26	2	ROTOR BOLT O-RING O-RING
25	1	REAR OIL SEAL
24	1	FRONT OIL SEAL
23	2	DRIVE SHAFT KEY
22	1	KEY
21	2	DOWEL PIN
20	2	COVER BOLT
18	4	HAND NUT
17	4	DOME NUT
16	4	HOUSING STUD
15	4	ROTOR BOLT
14	2	SLOTTED NUT
13	2	TAB WASHER
12	2	SHIM RING
11	2	REAR BEARING
10	2	FRONT BEARING
9	2	GEAR
8	2	BEARING HOUSING
7	1	LAY SHAFT
6	1	DRIVE SHAFT
5	1	PLASTIC ROTOR
3b	2	METAL ROTOR
3a	2	ROTOR COVER
2	1	ROTOR HOUSING
1	1	ROTOR HOUSING

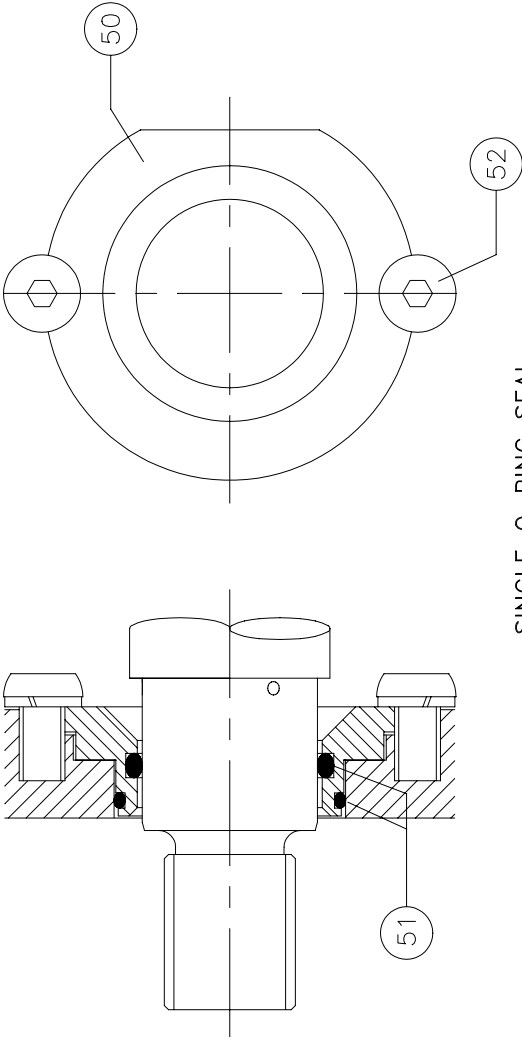
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UNIBLOC® -PD	
FLOWTECH DIV. ATLANTA, GA USA	
DWG. TITLE	UNIBLOC-PD PUMP PARTS LIST
SIZE	200,250,275
DWG. NO.	G805
RELEASE DATE	MAR. 28, 1996
SHEET	1 OF 1

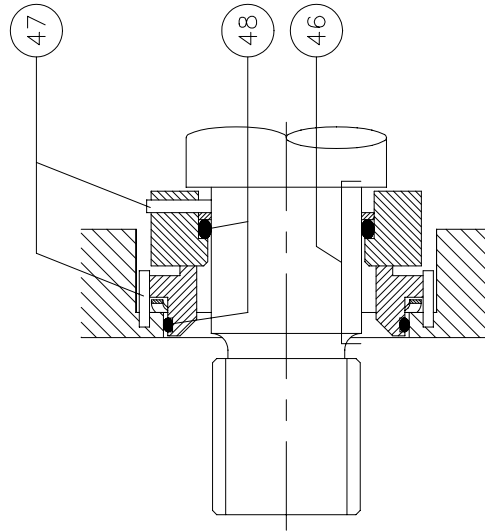
MATERIAL	BY	DATE
FINISH (UNLESS NOTED ON DWG.)	JPZ	
WEIGHT	CHECKED	
	APP'D	
	SCALE	NONE
ALL DIMENSIONS IN MM		

REGISTERED DESIGN; PATENTS PENDING

SYMBOL	REVISIONS	DESCRIPTION	DATE	BY



SINGLE O-RING SEAL



SINGLE MECHANICAL SEAL

NO.	PCS.	DESCRIPTION
52	2	BOLT (P.N. 4301-2)
51	1	O-RING SET (4204 & 4213)
50	1	RETAINER RING (P.N. 4901-1L)
48	1	O-RING SET (4204 & 4205)
47	5	DOWEL PIN (P.N. 4601-2)
46	1	SINGLE MECH. SHAFT SEAL

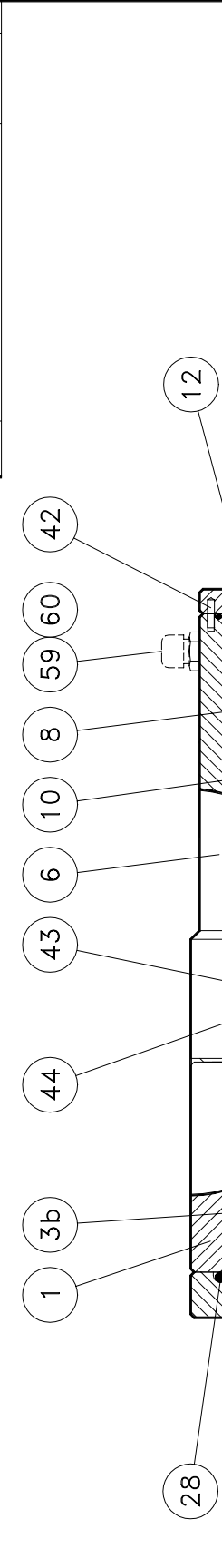
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UNIBLOC® -PD
 FLOWTECH DIV. ATLANTA, GA USA

DWG. TITLE	UNIBLOC-PD PUMP SHAFT SEAL PARTS LIST
SIZE	200-275
DWG. NO.	G806
RELEASE DATE	APRIL 29, 1993
SHEET	1 OF 1

BY	DATE
JPZ	
CHECKED	
APPD	
SCALE	NONE

REVISIONS	
SYMBOL	DESCRIPTION



60	2	OIL PLUG (OPTIONAL)
59	1	VENT (OPTIONAL)
44	4	WASHER
43	4	HEX NUT
42	1	DOWEL PIN
29	1	FOOT
28	1	ROTOR COVER O-RING
27	2	ROTOR-SHAFT O-RING
26	2	ROTOR BOLT O-RING
25	1	O-RING
24	1	REAR OIL SEAL
23	2	FRONT OIL SEAL
22	1	DRIVE SHAFT KEY
21	2	KEY
20	2	DOWEL PIN
19	4	BOLT
18	4	COVER BOLT
17	4	HAND NUT
16	4	DOVE NUT
15	4	HOUSING STUD
14a	2	ROTOR BOLT (HEX)
14b	2	ROTOR BOLT (SLOTTED)
13	2-4	SLOTTED NUT
12	2	TAB WASHER
11	2	SHIM RING
10	2	REAR BEARING
9	2	FRONT BEARING
8	2	GEAR
7	1	BEARING HOUSING COVER
6	1	BEARING HOUSING
5	1	LAY SHAFT
4	1	DRIVE SHAFT
3b	2	PLASTIC ROTOR
3a	2	METAL ROTOR
2	1	ROTOR COVER
1	1	ROTOR HOUSING

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UNIBLOC®-PD
 FLOWTECH DIV. ATLANTA, GA USA

DWG. TITLE: UNIBLOC-PD PUMP PARTS LIST

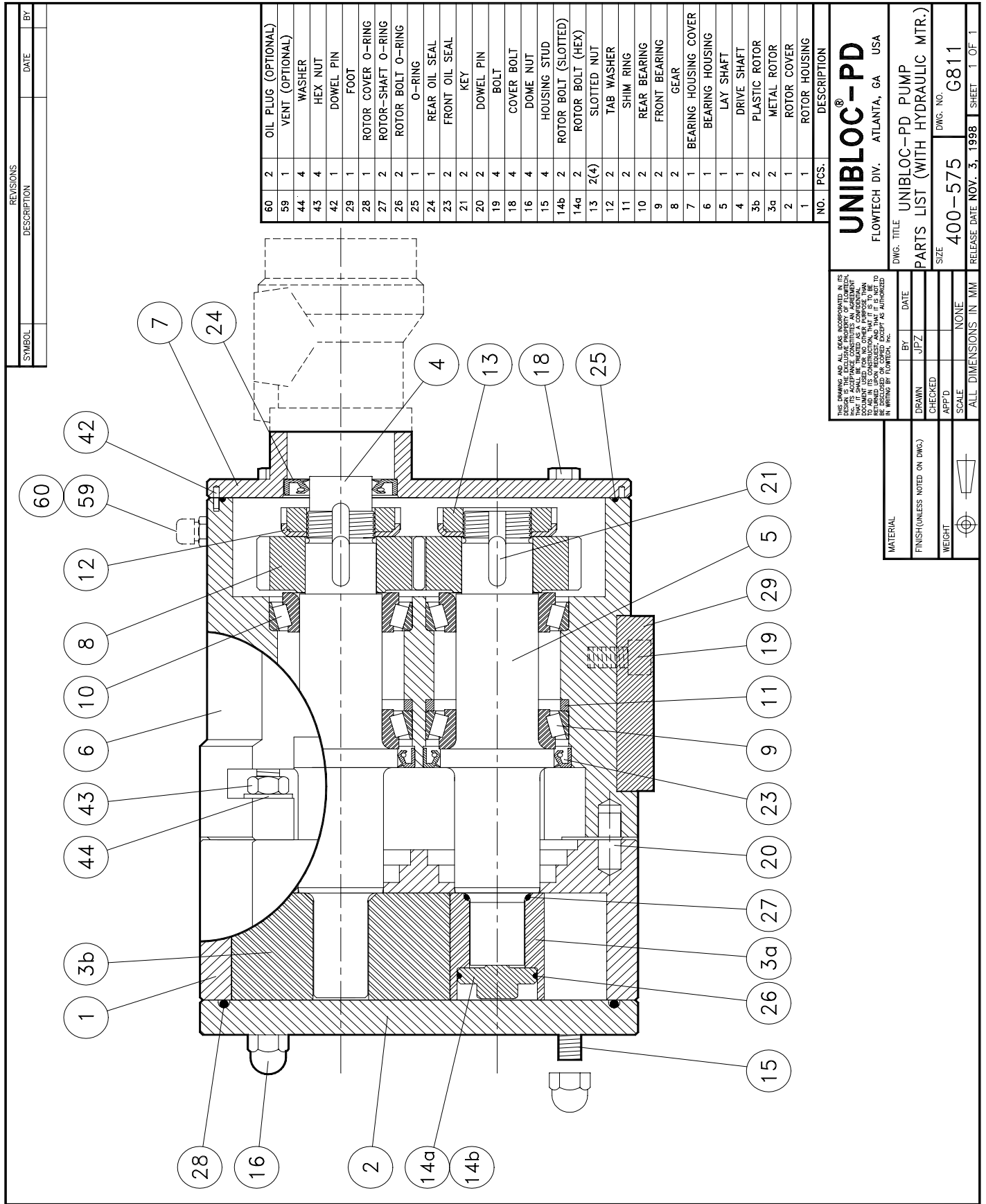
SIZE: 300-575 DWG. NO. G803

RELEASE DATE: NOV. 11, 1998 SHEET 1 OF 1

MATERIAL	BY	DATE
	JPZ	

FINISH(UNLESS NOTED ON DWG.)	CHECKED

WEIGHT	SCALE	ALL DIMENSIONS IN MM
	NONE	



NO.	PCS.	DESCRIPTION
60	2	OIL PLUG (OPTIONAL)
59	1	VENT (OPTIONAL)
44	4	WASHER
43	4	HEX NUT
42	1	DOWEL PIN
29	1	FOOT
28	1	ROTOR COVER O-RING
27	2	ROTOR-SHAFT O-RING
26	2	ROTOR BOLT O-RING
25	1	O-RING
24	1	REAR OIL SEAL
23	2	FRONT OIL SEAL
21	2	KEY
20	2	DOWEL PIN
19	4	BOLT
18	4	COVER BOLT
16	4	DOVE NUT
15	4	HOUSING STUD
14b	2	ROTOR BOLT (SLOTTED)
14a	2	ROTOR BOLT (HEX)
13	2(4)	SLOTTED NUT
12	2	TAB WASHER
11	2	SHIM RING
10	2	REAR BEARING
9	2	FRONT BEARING
8	2	GEAR
7	1	BEARING HOUSING COVER
6	1	BEARING HOUSING
5	1	LAY SHAFT
4	1	DRIVE SHAFT
3b	2	PLASTIC ROTOR
3a	2	METAL ROTOR
2	1	ROTOR COVER
1	1	ROTOR HOUSING

UNIBLOC®-PD
 FLOWTECH DIV. ATLANTA, GA USA

DWG. TITLE: UNIBLOC-PD PUMP
 PARTS LIST (WITH HYDRAULIC MTR.)

SIZE: 400-575
 DWG. NO.: G811

RELEASE DATE: NOV. 3, 1998
 SHEET 1 OF 1

ALL DIMENSIONS IN MM

SCALE: NONE

FINISH (UNLESS NOTED ON DWG.):

WEIGHT:

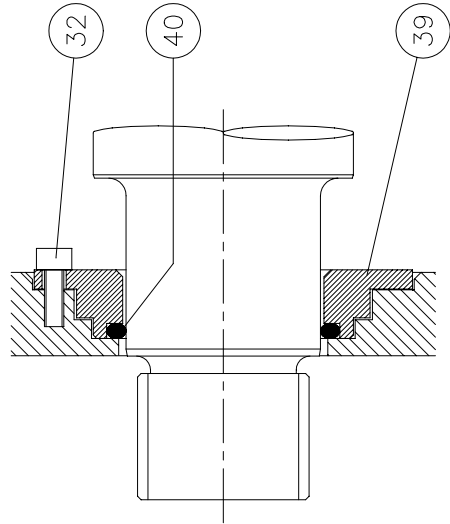
MATERIAL:

BY: JFZ
 DATE:

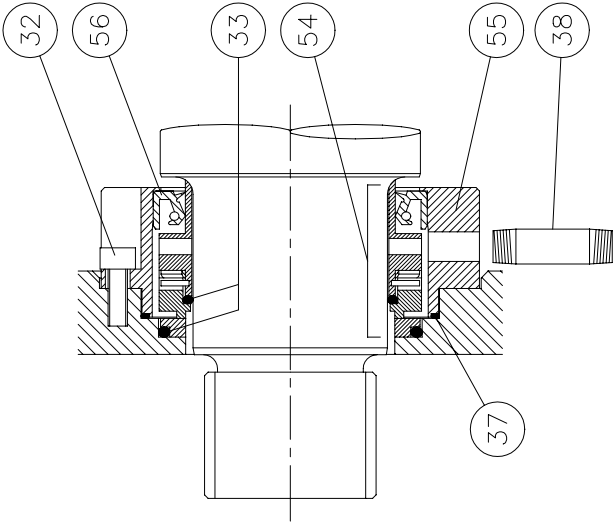
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 APP'D:

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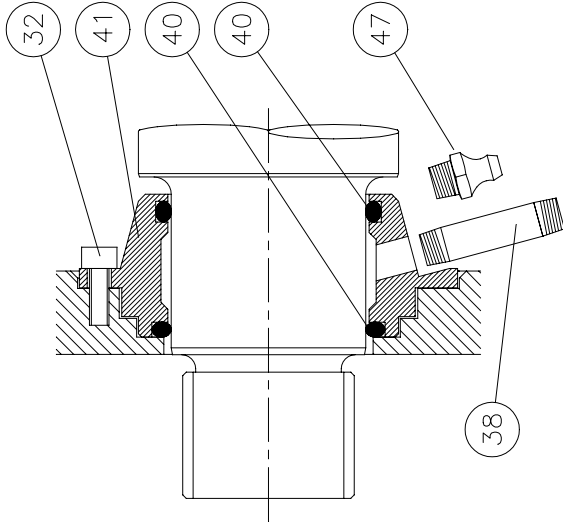
REVISIONS		DATE	BY
SYMBOL	DESCRIPTION		



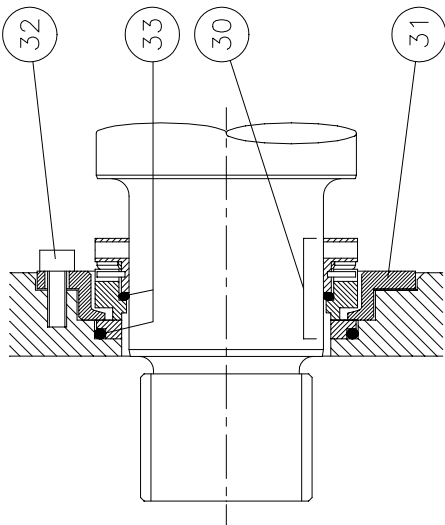
SINGLE O-RING SEAL



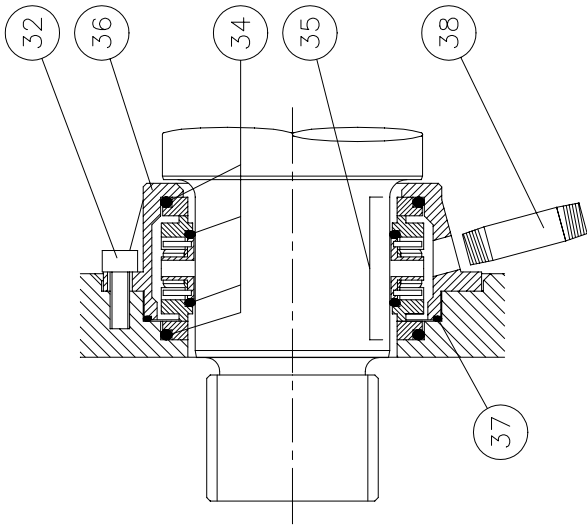
FLUSHED SINGLE MECHANICAL SEAL



DOUBLE O-RING SEAL



SINGLE MECHANICAL SEAL



DOUBLE MECHANICAL SEAL

56	2	LIP SEAL
55	2	FLUSH HOUSING
54	2	SINGLE MECHANICAL SHAFT SEAL
47	4	FLUSH HOUSING NIPPLE
41	2	FLUSH HOUSING
40	2-4	O-RING
39	2	RETAINING RING
38	4	FLUSH HOUSING PIPE TUBE
37	2	FLUSH HOUSING O-RING
36	2	FLUSH HOUSING
35	2	DOUBLE MECHANICAL SHAFT SEAL
34	2	O-RING SET
33	2	O-RING SET
32	6-8	BOLT
31	2	RETAINER RING
30	2	SINGLE MECHANICAL SHAFT SEAL
NO.	PCS.	DESCRIPTION

UNIBLOC®-PD
 FLOWTECH DIV. ATLANTA, GA USA

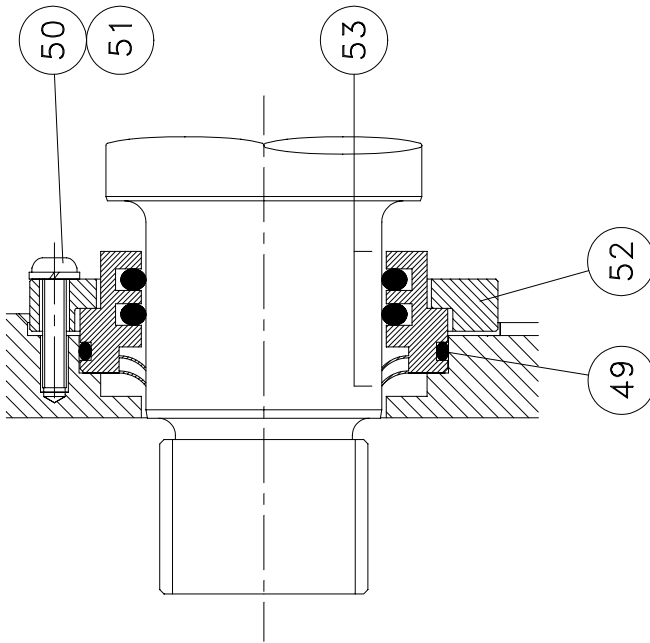
DWG. TITLE UNIBLOC-PD PUMP
 SHAFT SEAL PARTS LIST
 SIZE 300-575
 DWG. NO. G804

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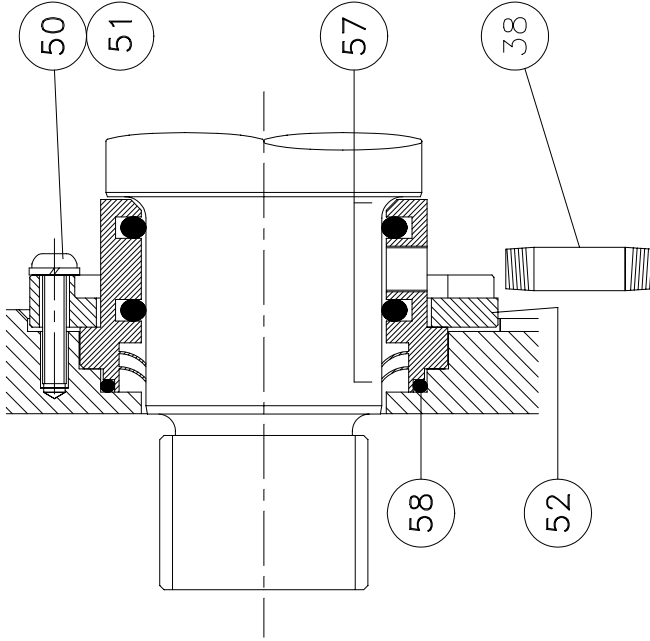
BY DATE
 JFZ
 CHECKED
 APP'D
 SCALE NONE
 ALL DIMENSIONS IN MM

RELEASE DATE SEP. 18, 1993 SHEET 1 OF 1

REVISIONS		DATE	BY
SYMBOL	DESCRIPTION		



DOUBLE O-LIP SEAL



FLUSHED DOUBLE O-LIP SEAL

58	2	O-RING
57	2	FLUSHED O-LIP SEAL CARTRIDGE
53	2	O-LIP SEAL CARTRIDGE
52	2	RETAINER RING
51	6-8	SPLIT WASHER
50	6-8	BOLT
49	2	O-RING
38	4	FLUSH TUBE
		NO. PGS.

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UNIBLOC® -PD	
FLOWTECH DIV. ATLANTA, GA USA	
DWG. TITLE	UNIBLOC-PD PUMP
DWG. NO.	SHAFT SEAL PARTS LIST
SIZE	300-575
SCALE	NONE
ALL DIMENSIONS IN MM	RELEASE DATE NOV. 4, 1998
	SHEET 1 OF 1

WARRANTY

Teknoflow Inc.\Flowtech Div. warrants every part of our product against poor workmanship and defective materials for a period of one (1) year from the date of shipment. If during this period the item does not conform to its performance parameters as a result of poor workmanship and/or defective materials, return the faulty item, shipping prepaid and fully insured, to an authorized Flowtech service facility. If, upon inspection of the item in question, poor workmanship or defective materials are revealed, Flowtech will repair or replace it, at Flowtech's option, and will return it by shipping it F.O.B. the service facility. This warranty is void if the item 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 Flowtech are warranted only to the extent of the warranty of the respective manufacturers.

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