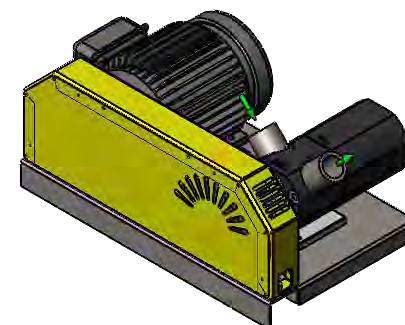


# *BearCat Pumps*

## F-Pump Manual, 2023



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# General Safety Precautions

- This manual should be read entirely prior to the commencement of installation and operation.
- Only qualified personnel should install, operate and maintain this pump and associated equipment.
- Check pump for specific safety warnings/labels.
- Prior to start-up, ensure complete cleanliness and integrity of the system in which the pump is installed.
- In most cases the relief valve is factory set during performance test. In cases where the type of duty is not known (such as distributors or stock orders) or where the components containing the relief valve come from pre-tested stock batches, it is not possible to factory set the relief valve. In this case it is the installer's responsibility to set the relief valve in accordance with the specific application.
- Pumps with heat tracing or jacketing necessary to prevent solidification of the product should be brought up to working temperature prior to start-up.
- All electrical work must be done in accordance with the manufacturers recommended procedures by qualified personnel.
- Ensure all guards are securely in place before operating the equipment. Do not remove guards at any time during operation.
- For pumps operating under 'flooded' suction, when venting the pump through a plug or valve, care should be taken not to completely remove vent plugs or completely open any vent as this could result in liquid being discharged from the openings under pressure.
- Prior to start-up, ensure that the system valves and associated equipment are correctly set.
- Wear appropriate safety attire including long sleeves, face shield, and gloves, whenever starting or operating the pump.

# Start-up and Relief Valve

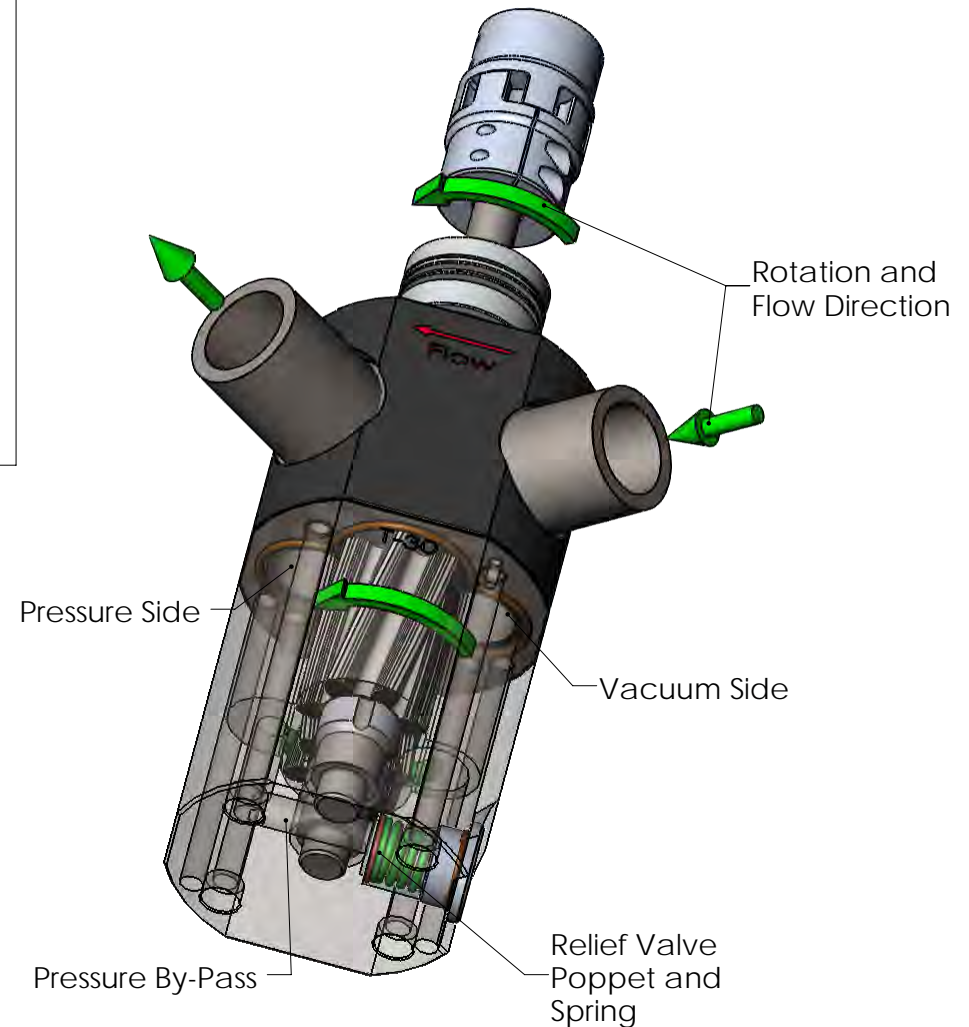
## Start-up Procedure

1. Pump should turn freely by hand. Ensure all guards are in place.
2. Gradually open valves, and check for signs of leakage before starting pump.
3. If possible, add some of the liquid directly to the pump. This helps lubricate and prime during the first start-up.
4. Check the rotation by flicking starter 'ON' then 'OFF'. (Correct rotation shown in diagram)
5. Start pump slowly - check for leaks - gradually increase speed.

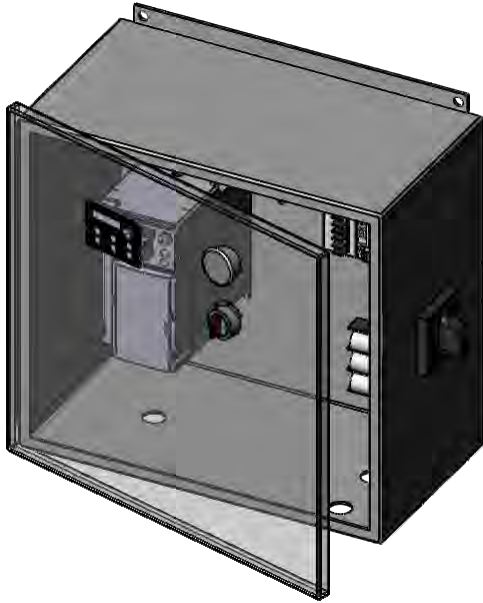
## Relief Valve Operation:

The F\_Pump can be built with an optional relief valve. The valve is built in the end housing as shown in the diagram.

If discharge pressure exceeds the acceptable limit, the fluid will compress the poppet valve, allowing the fluid to return to the vacuum side of the pump.



# Flow Speed Control

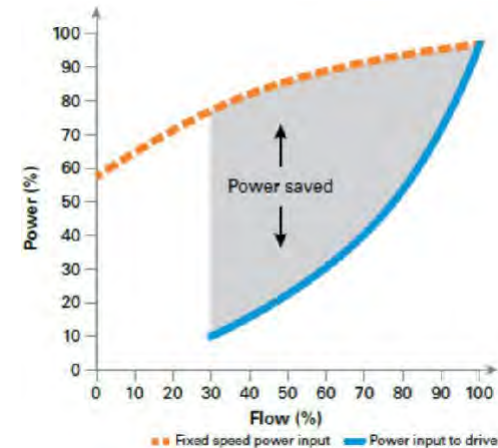


## Flow Speed Control:

Pump speed control, either in the form of a Variable Frequency Drive (VFD) or hydraulic control valve is a valuable feature. Many factors can contribute to a situation where pump speed would need to be decreased for cautionary reason, or increased for efficiency gains. These controls have other built in features such as motor protection and pressure control. They also provide valuable information when trouble shooting. Without control, one is left with limited options when problems occur. This can lead to damage, shortened life, or compromised safety.

## Energy Savings from a VFD

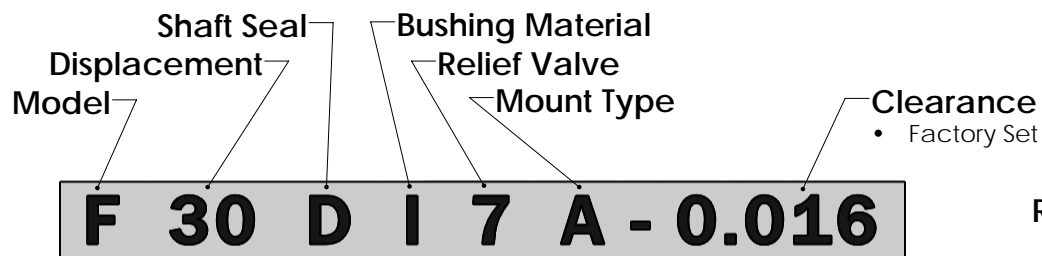
The graph to the right shows the energy comparison of Fixed Speed\* with a VFD. Initially, fixed speed would certainly be the least expensive. However, energy savings should be considered during the cost analysis. At some point this alone would cover the cost.



\*Fixed Speed; Not everyone will choose some type of speed control. As a cautionary measure, we advise all fixed drive systems start at a reduced speed. This should be as much as 50% below the pumps maximum. At initial start-up, this slower speed is more forgiving when conditions are not as expected. Once the issues are corrected, the motor pulley can be replaced with a larger pulley to increase speed as conditions allow.



# Model Number



## Relief Valve

- A = Anode Plug (No Relief)
- 7 = #70 Relief Setting

## Bushing Material

- I = Iron Bushing
- B = Bronze Bushing
- S = Hardened Steel

## Model

- F = Pump (Steel)
- FA = Pump (Aluminum)
- M = Meter
- R = Rebuild Kit

## Mount Type (Face)

- K = 145TC Face
- L = 185TC Face
- M = 4F-17 Hydraulic
- N = SAE AA 4-Bolt Hydraulic
- P = Meter Encoder

## Displacement

- 04 = .004 Gal/Rev
- 07 = .007 Gal/Rev
- 15 = .015 Gal/Rev
- 30 = .030 Gal/Rev

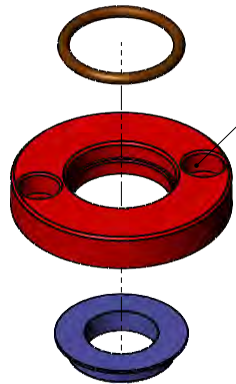
## Shaft Seal

- M = Single Seal Modified
- P = Hi-Temp Packing
- D = Double Seal Bearing

## Mount Type (Base)

- A = 1/2" Plate (3.5" Shaft Center)
- B = 1.17" Plate (4.17" Shaft Center)
- C = 0.543 Plate (90mm Shaft Center)
- D = 1-1/2" Plate (4.5" Shaft Center)

# Option Selection



## M = Modified Lip Seal

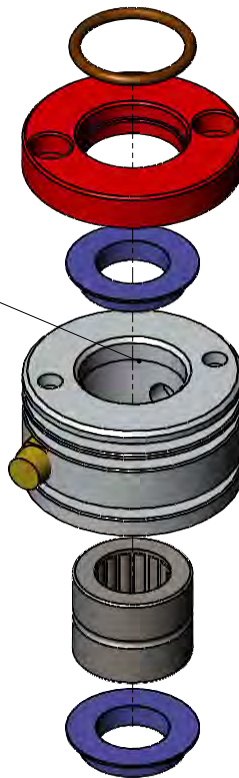
Basic Seal design. Low Maintenance. Good choice for Low to medium pressure, pumping material with good lubricating properties.

- 375°F
- Lip Seal

## D = Double Seal Bearing

Excellent all-around seal design. Best choice for High temp, abrasion, or corrosive conditions. Excellent choice for viscous material requiring High Vacuum.

- 550°F
- Grease-able Cavity
- Cooling Fins
- Double Seal
- Needle Bearing

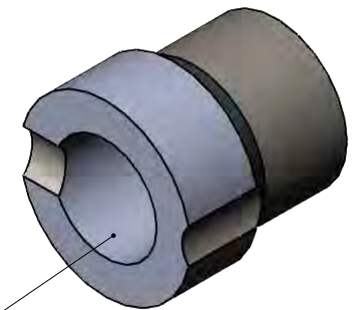


## Relief Valve Selection

- A = Anode
- 7 = HIGH Pressure

Relief pressure is a function of flowrate, actual PSI will vary.

The ANODE option is a blocked Relief passage (NO relief). The cover of the relief is replaced with an aluminum anode. This option is used primarily in salt water applications.

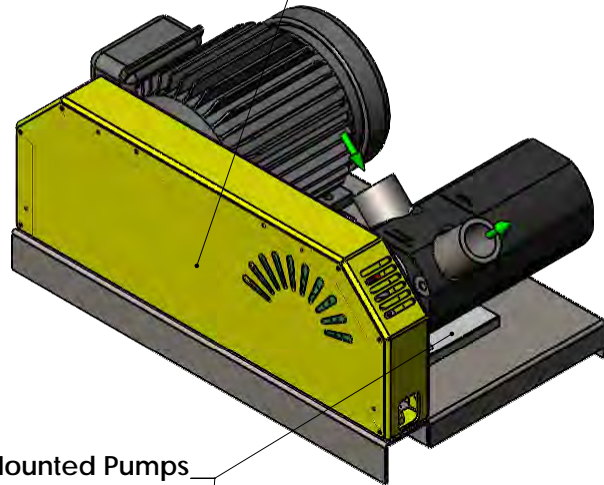


## Bushing Selection

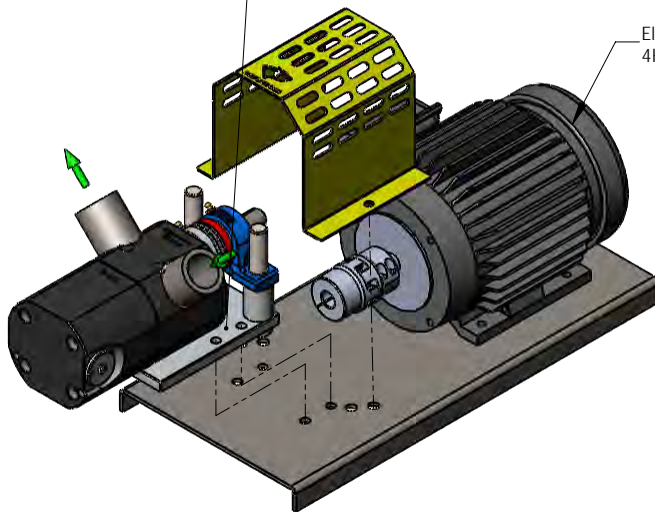
- I = Pearlitic Iron. Excellent lubricity. 700°F. Best choice for high temp.
- B = Aluminum Bronze. Good Lubricity. 500°F
- S = Hardened Steel. Good choice for low RPM, high abrasion applications

# Motor Configurations

Base Type = BD

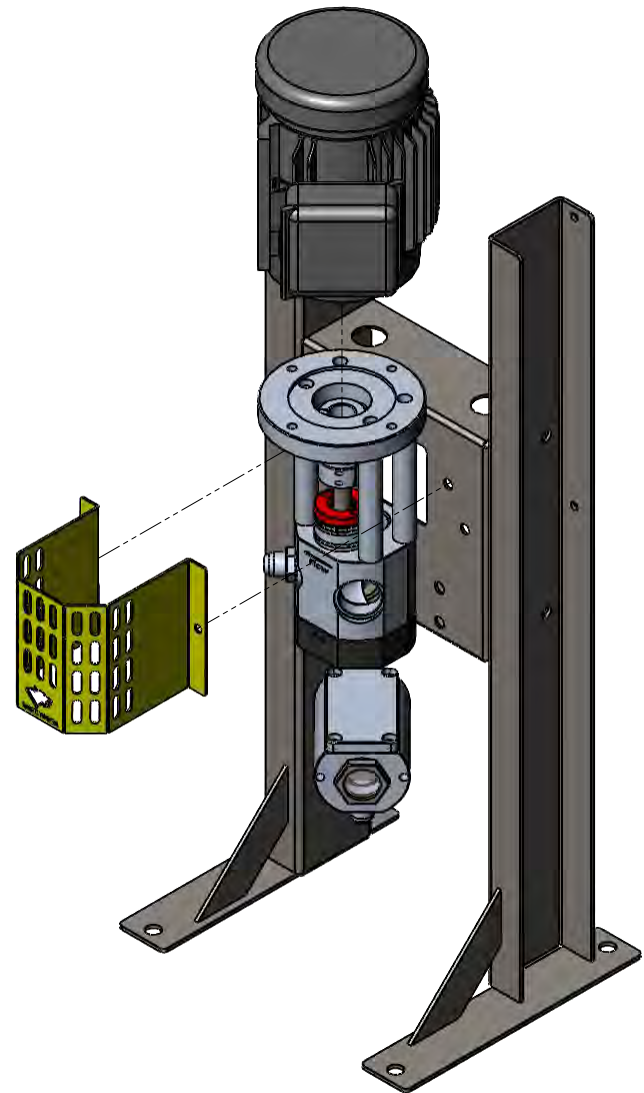


Base Mounted Pumps  
Mount types 'A-F'



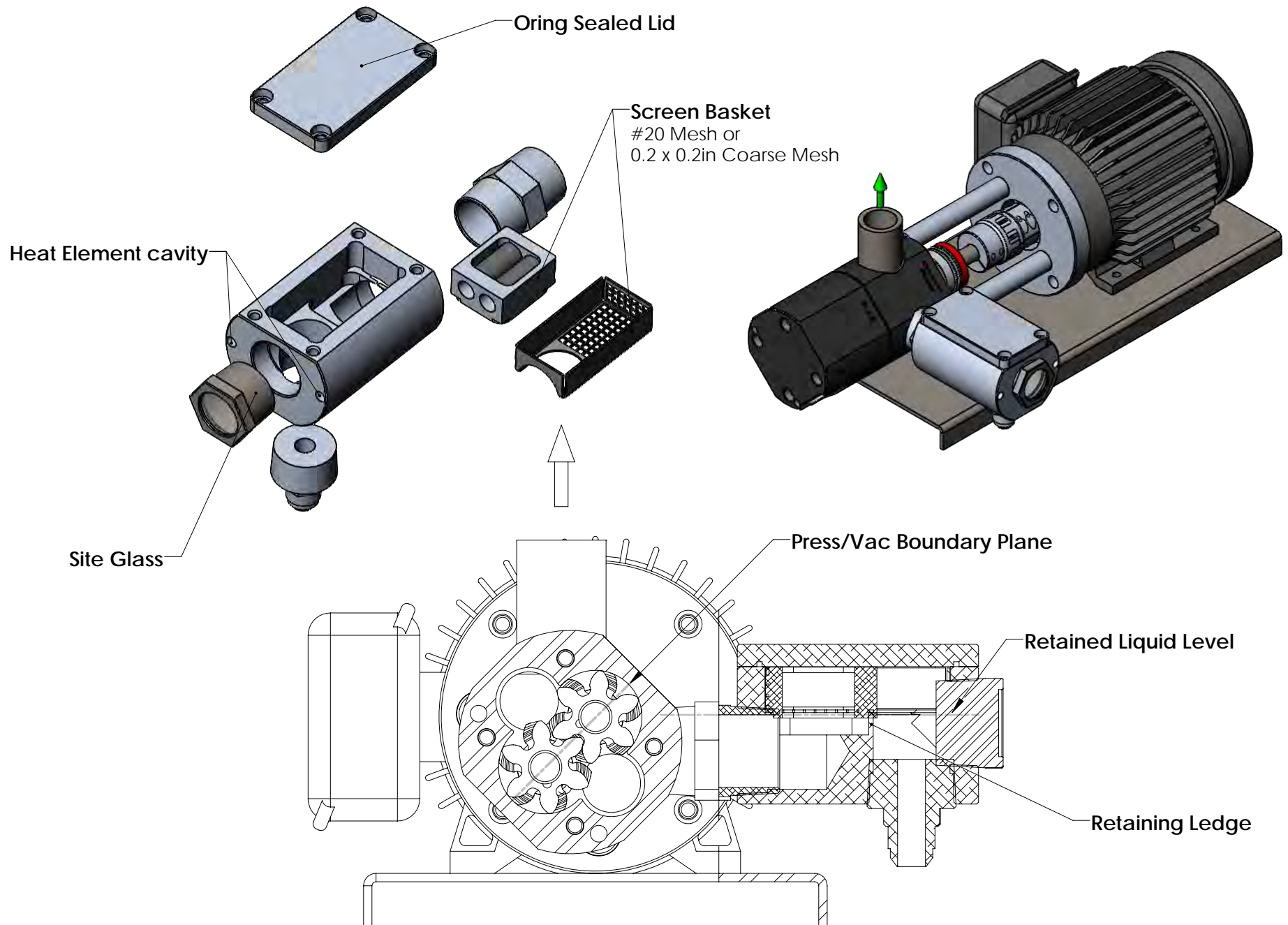
Electric Motor (shown)  
4HP Gas Honda Motor also available

Base Mounted Pumps



Face Mounted Pumps

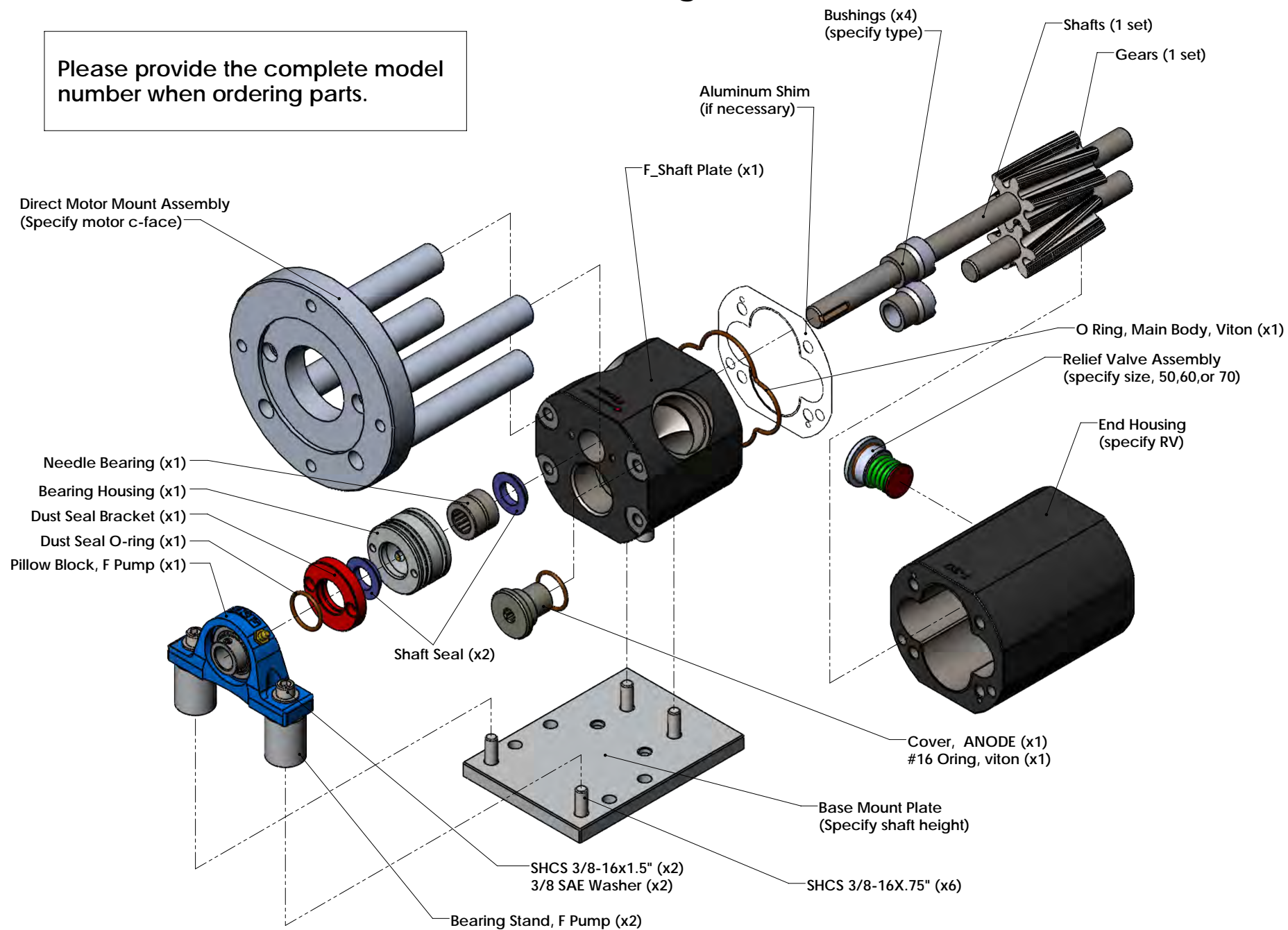
# Screen Box\_Priming Chamber



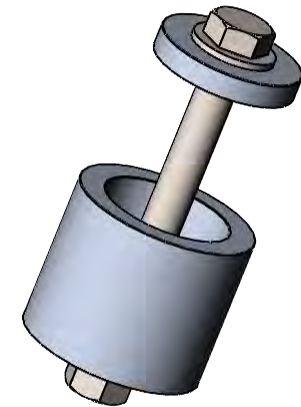
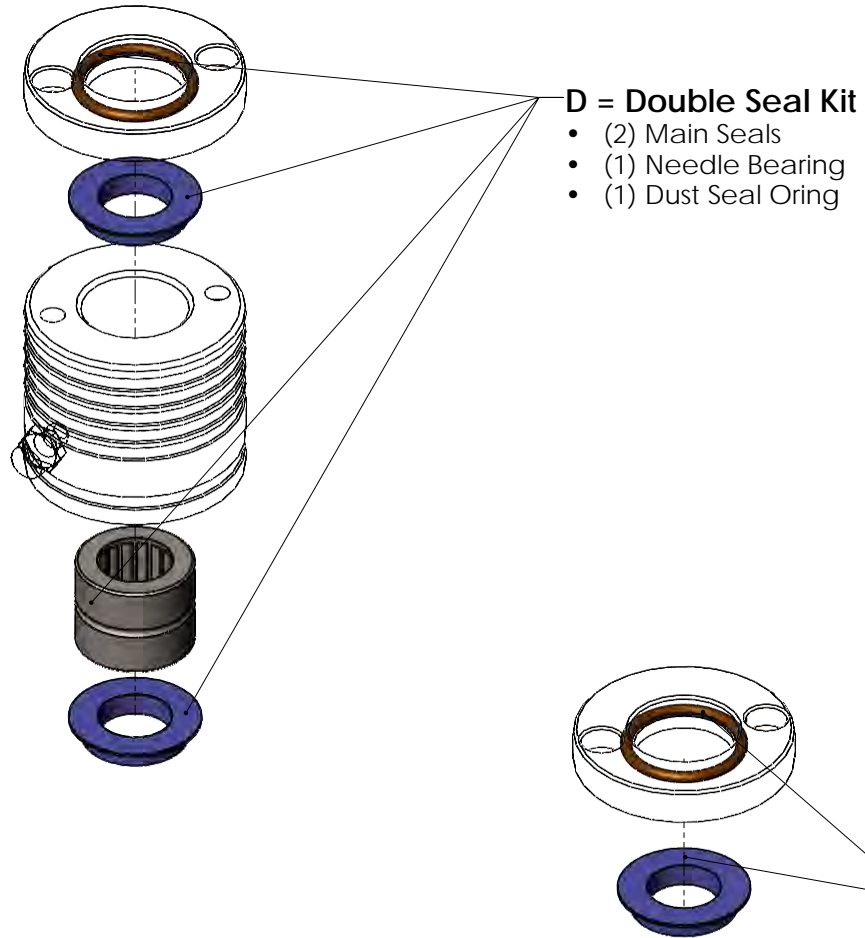


# Parts Diagram

Please provide the complete model number when ordering parts.



# Shaft Seal Kits



**F-Pump Bushing and Seal Removal TOOL:**  
Bushing/Bearing/Seal removal and installation tool



# Rebuild Kits

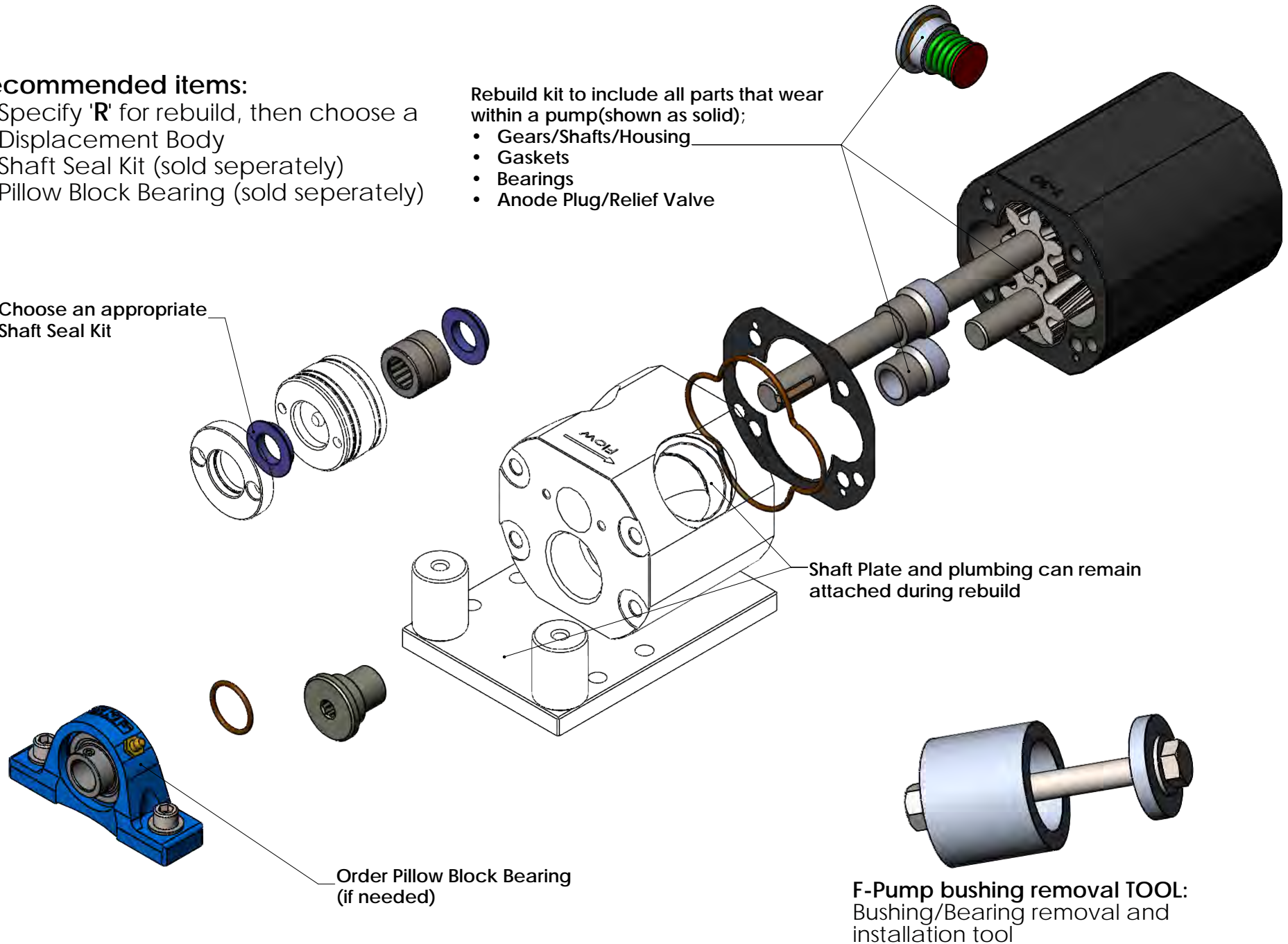
## Recommended items:

- Specify 'R' for rebuild, then choose a Displacement Body
- Shaft Seal Kit (sold separately)
- Pillow Block Bearing (sold separately)

Rebuild kit to include all parts that wear within a pump (shown as solid);

- Gears/Shafts/Housing
- Gaskets
- Bearings
- Anode Plug/Relief Valve

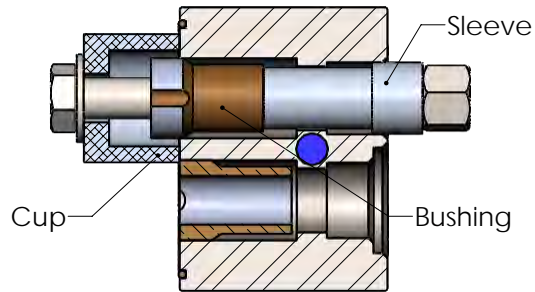
Choose an appropriate Shaft Seal Kit



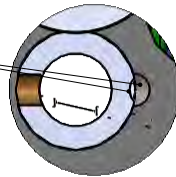
# Rebuild, Bushing Removal

## Bushing Removal and Installation

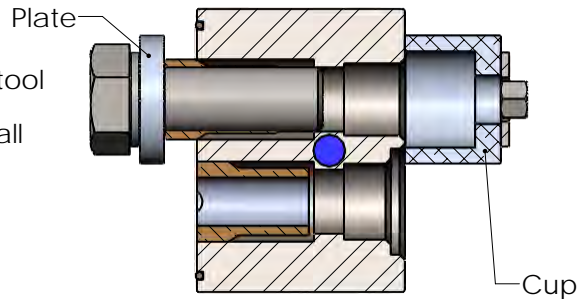
1) Use Rebuild tool as shown in drawing to remove both bushings



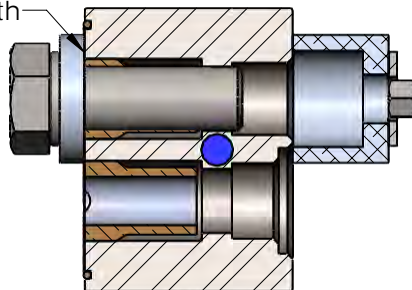
2) Align lubrication slot on bushing with feed chamfer on housing face



3) Use Rebuild tool as shown in drawing to install both bushings.

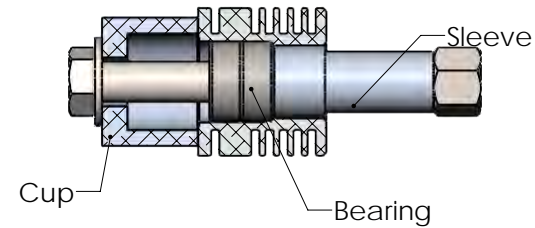


4) Bushing face should be flush with housing face.

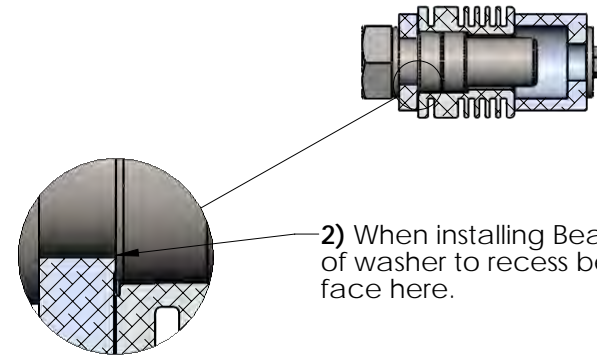


## Needle Bearing

1) Use Rebuild tool as shown in drawing to remove bearing

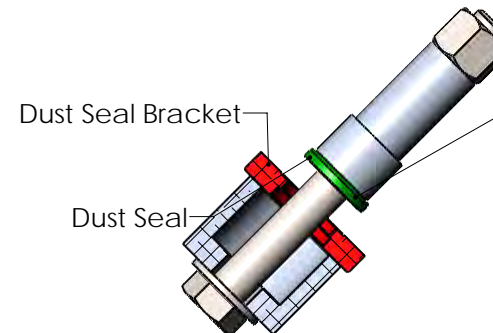


2) When installing Bearing, use piloted side of washer to recess bearing .01" below face here.



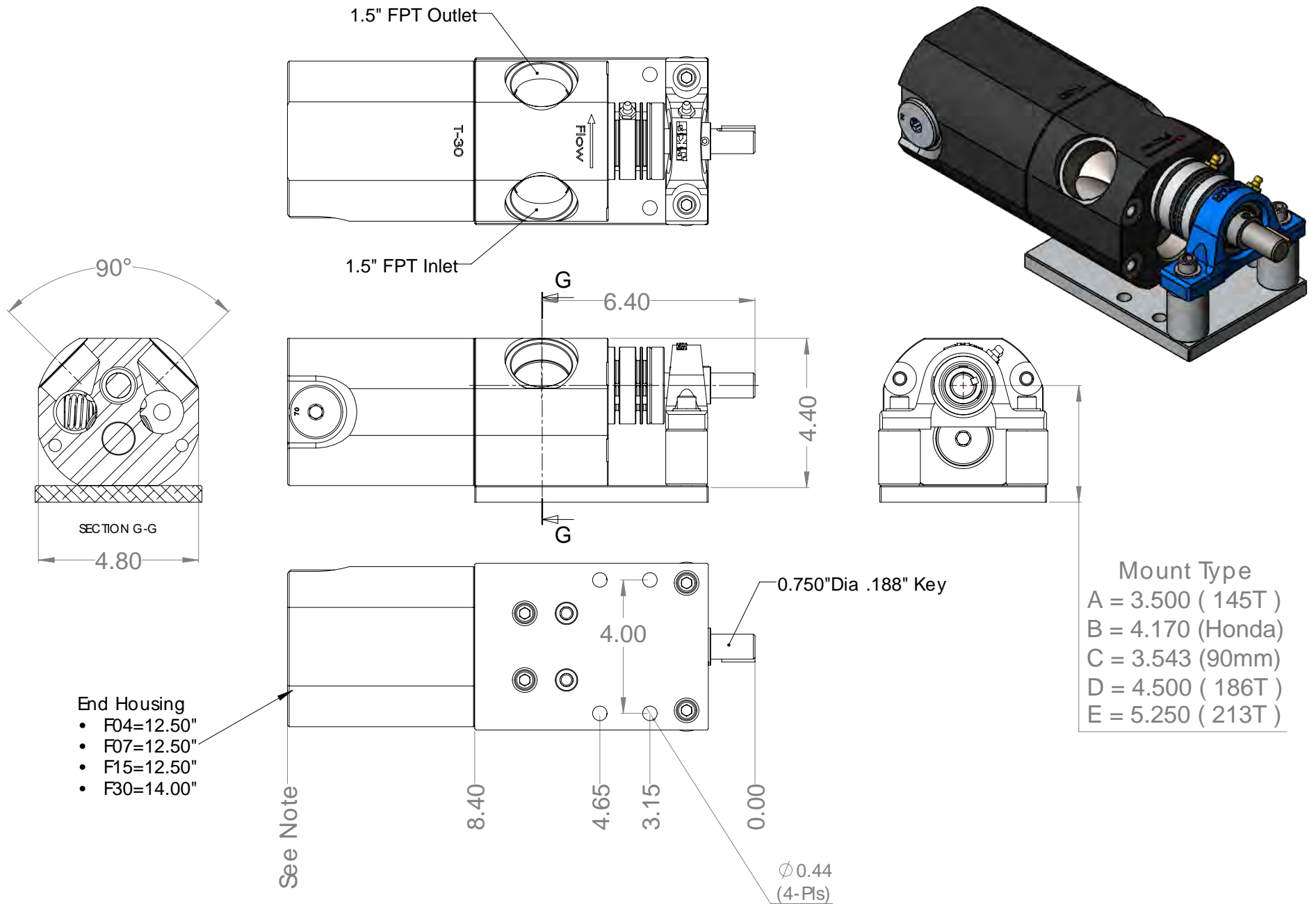
## Dust Seal Removal

1) Use the same method to remove and replace dust seal

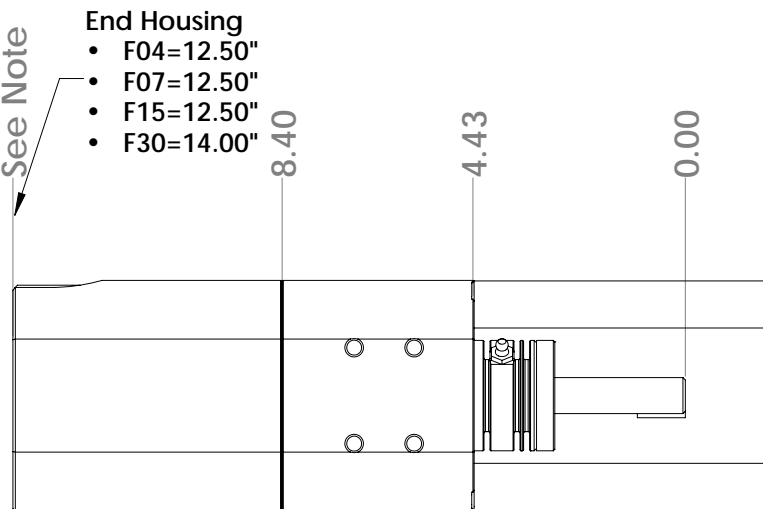
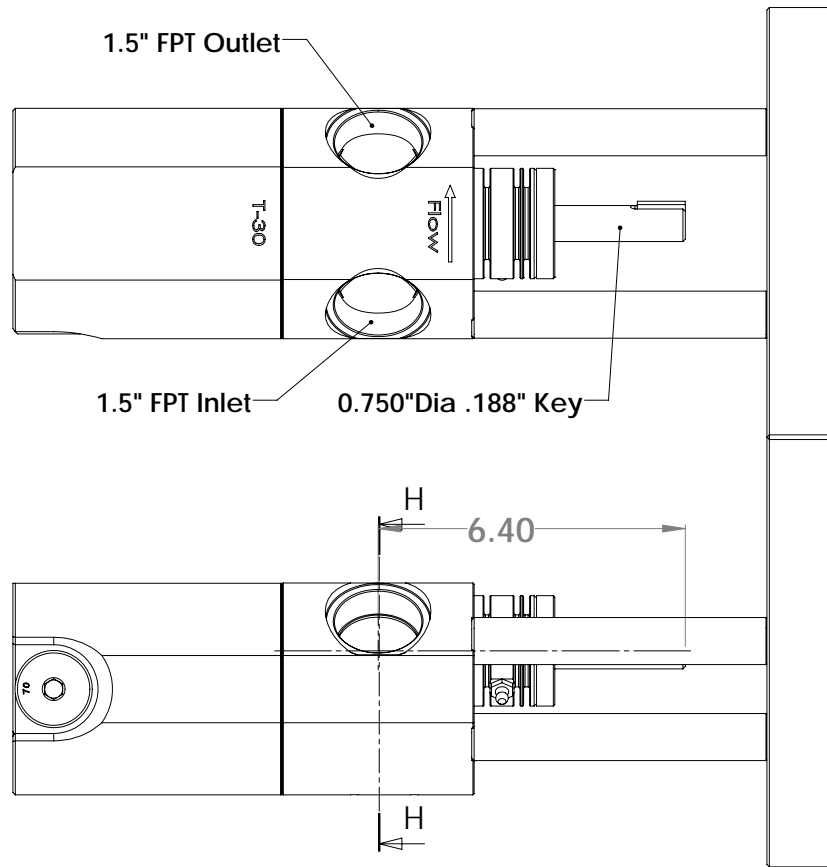


Tip: When installing dust seal, Tighten until it bottoms out, No need to recess as done in above with needle bearing

# Base Mount, F\_Pump Dimensions

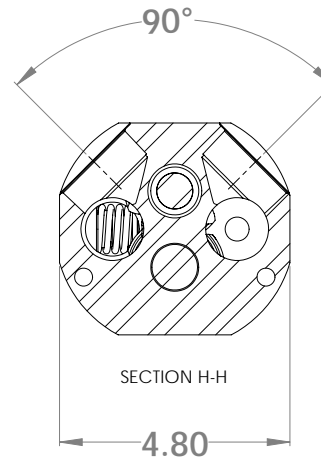


# Face Mount, F\_Pump Dimensions



## Mount Type

- K = 145T
- L = 184T

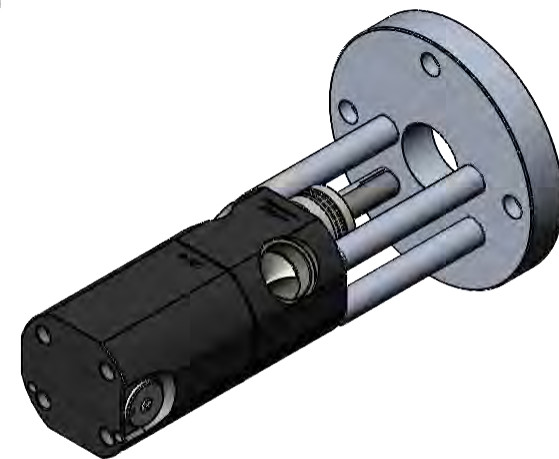


## Mount Type

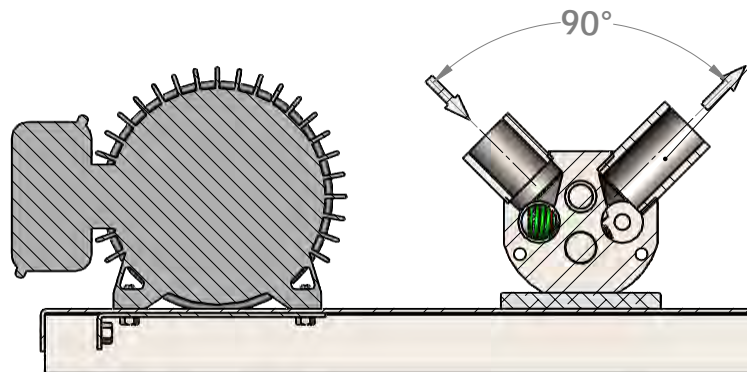
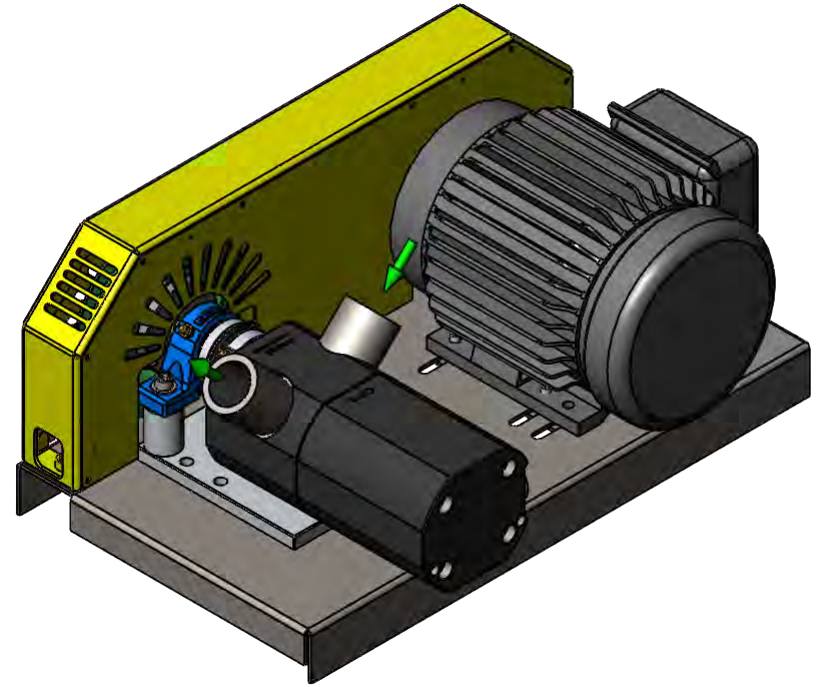
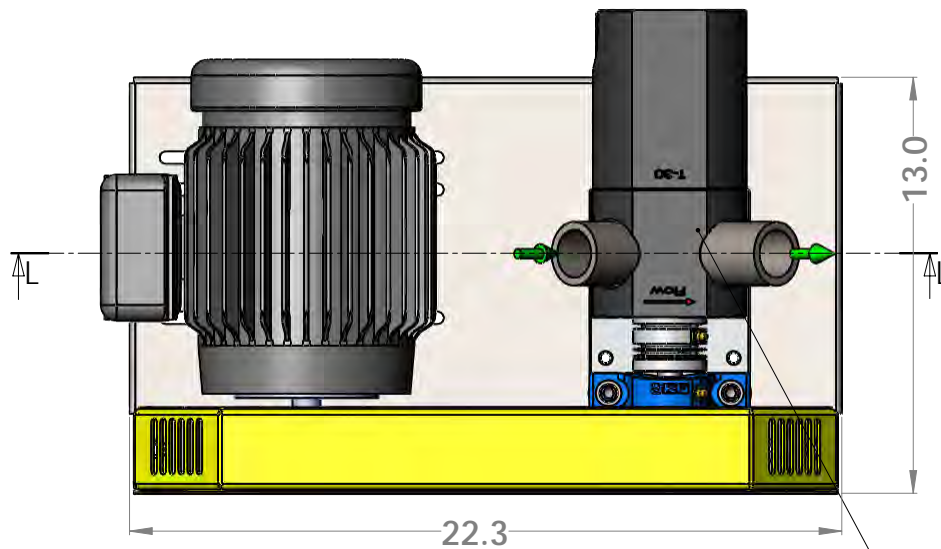
- M = SAE 4F-17 Hydraulic
- N = SAE AA 4-Bolt Hydraulic
- P = Meter Encoder

## Mount Type

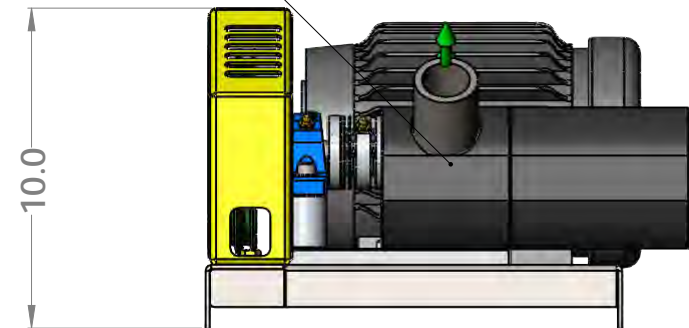
- K = 2.65"
- L = 3.40"
- M = 1.70"
- N = 1.70"
- P = 1.70"



## Belt Drive Skid Dimensions

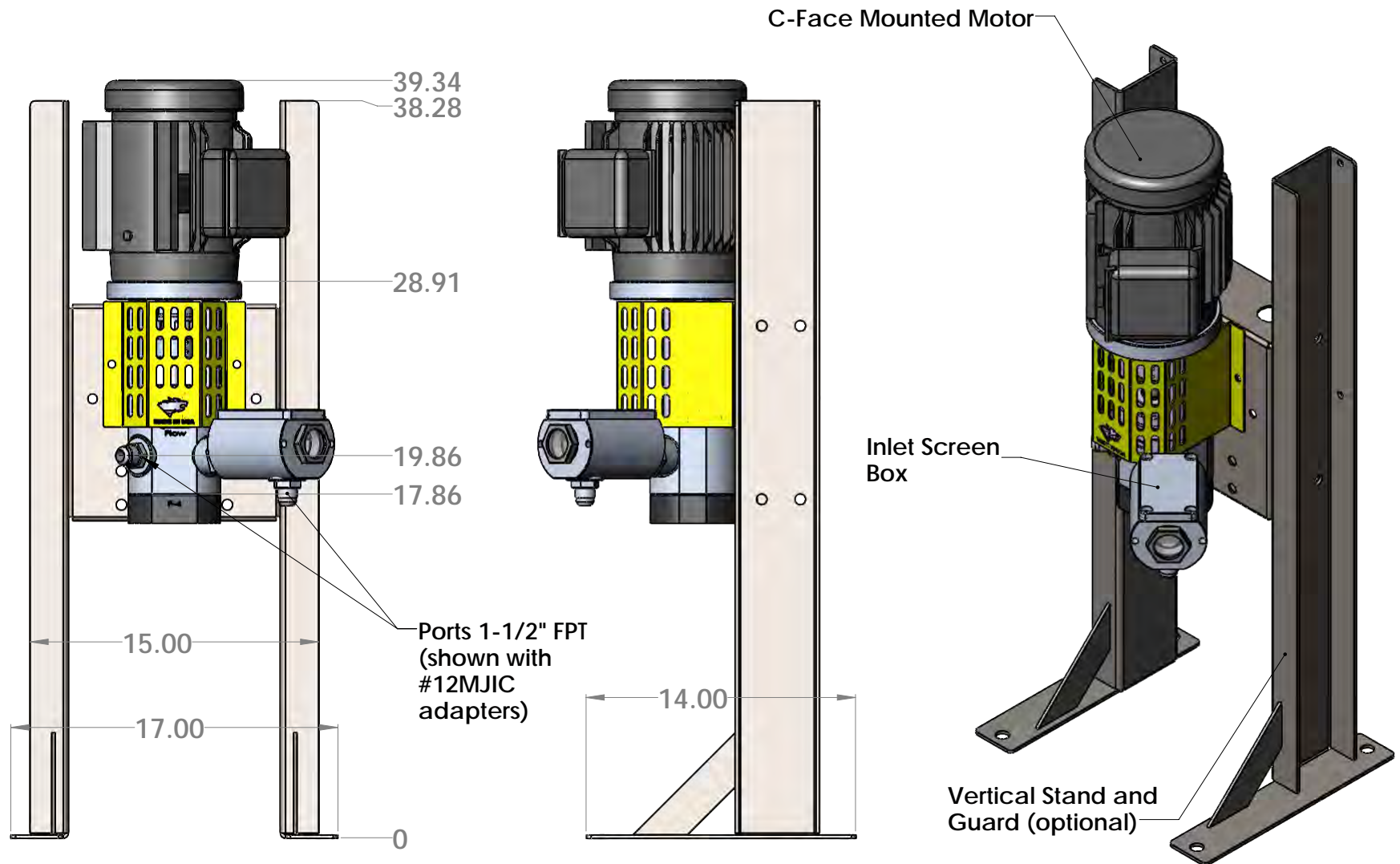


Pipe Shown for display purpose. Ports are 1.5" FPT





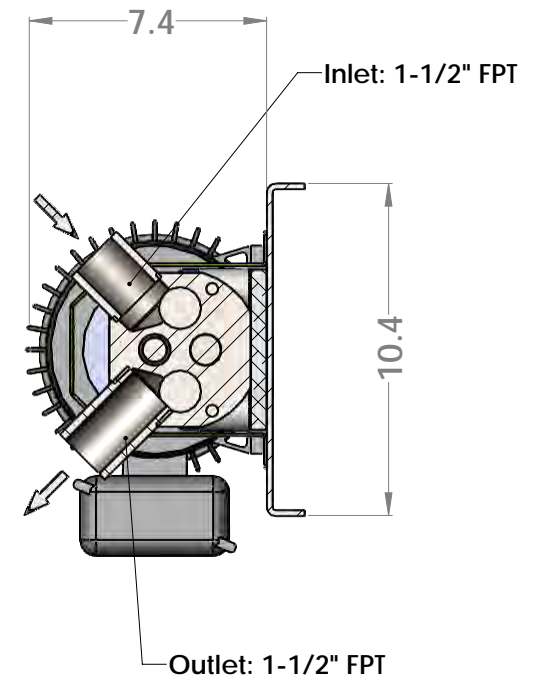
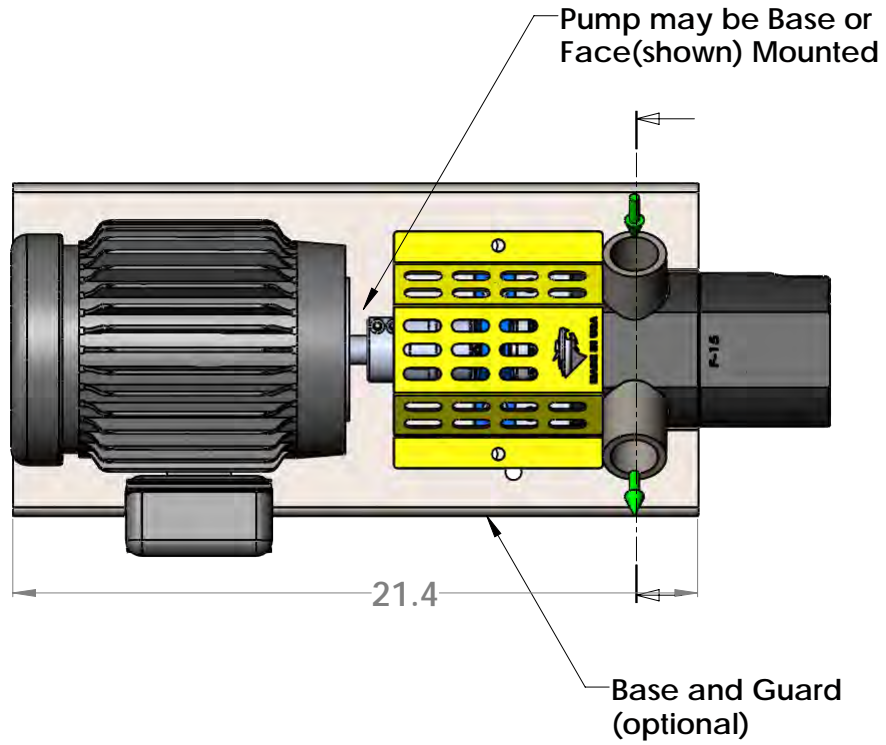
# Vertical Pump, C-Face





# Direct Couple Skid Dim, Base

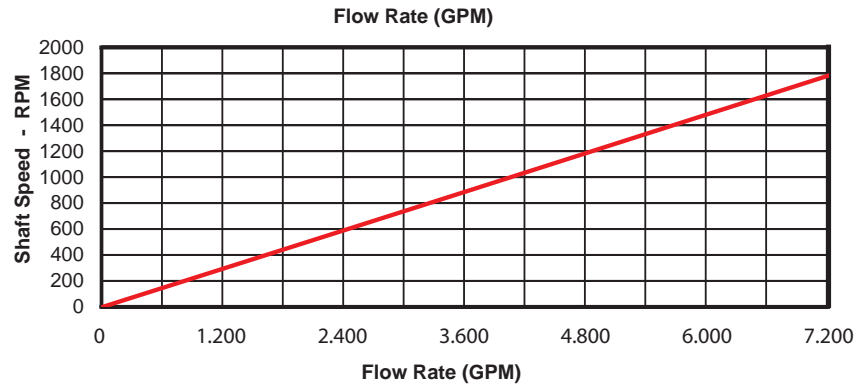
Base mounted pump



# 04-07 Curves

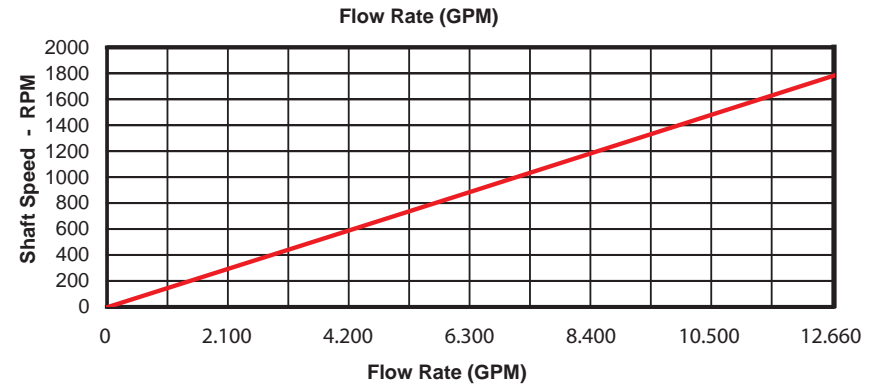
**04**

Pump Disp. **4.00**  
Max RPM 1800  
Max GPM 7.2  
Port Size 1.5in FPT



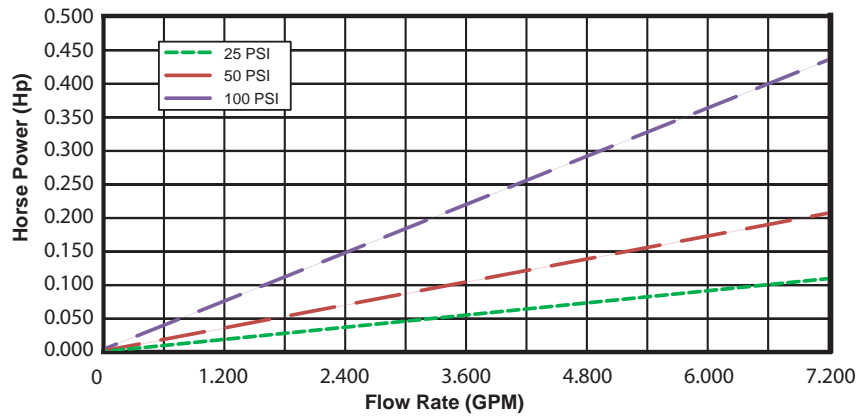
**07**

Pump Disp. **7.00**  
Max RPM 1800  
Max GPM 12.6  
Port Size 1.5in FPT



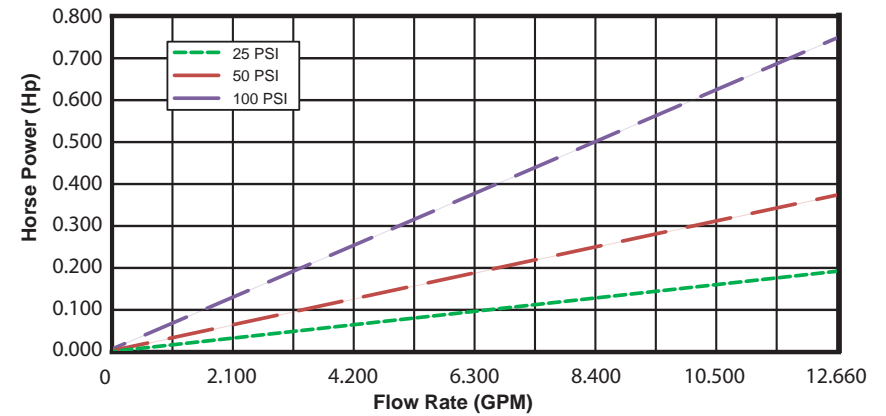
**Power (neglecting viscosity)**

Graph uses 1.0 service factor. This value can vary based on conditions.



**Power (neglecting viscosity)**

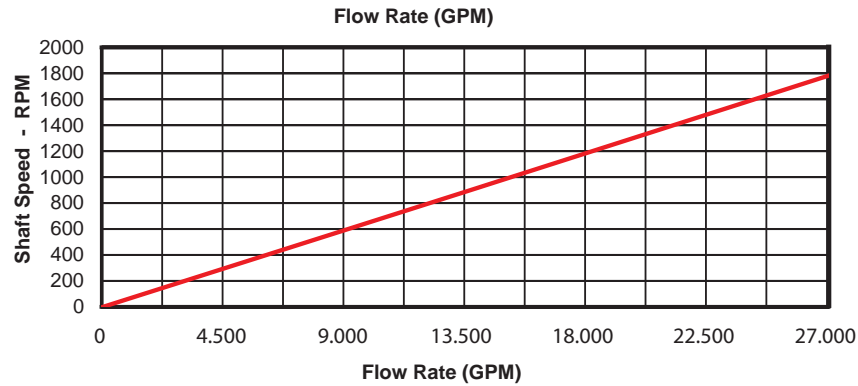
Graph uses 1.0 service factor. This value can vary based on conditions.



# 15-30 Curves

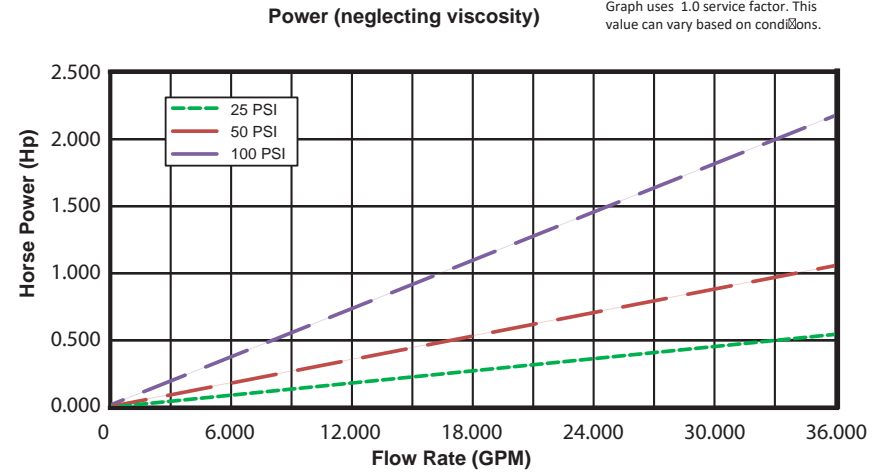
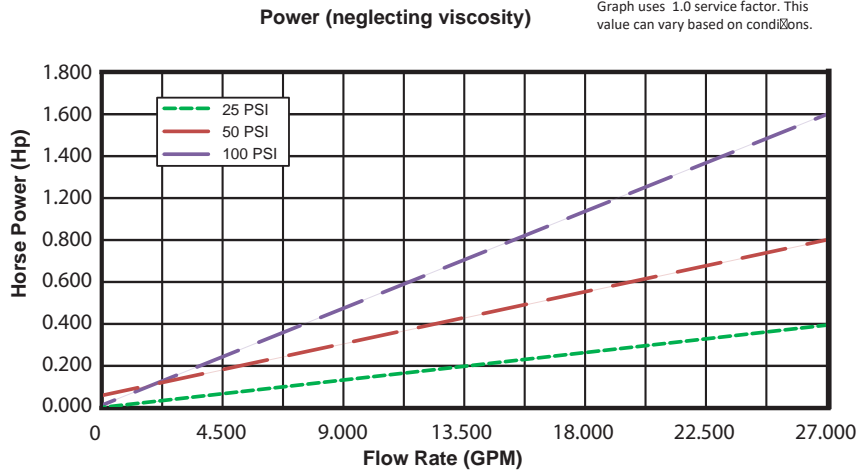
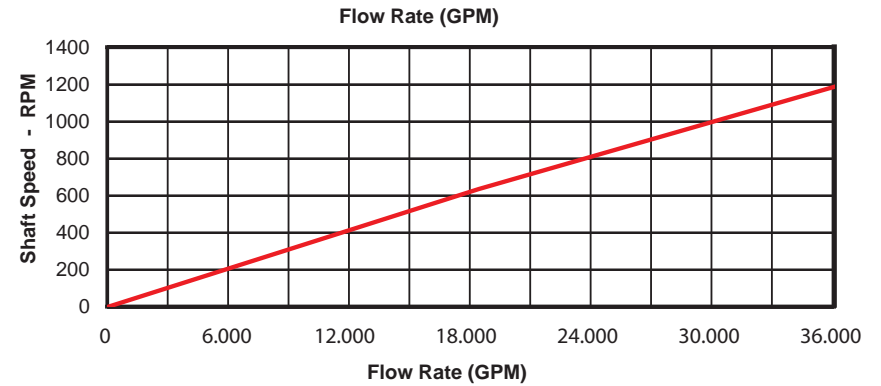
15

Pump Disp. **15.00**  
Max RPM 1800  
Max GPM 27  
Port Size 1.5in FPT

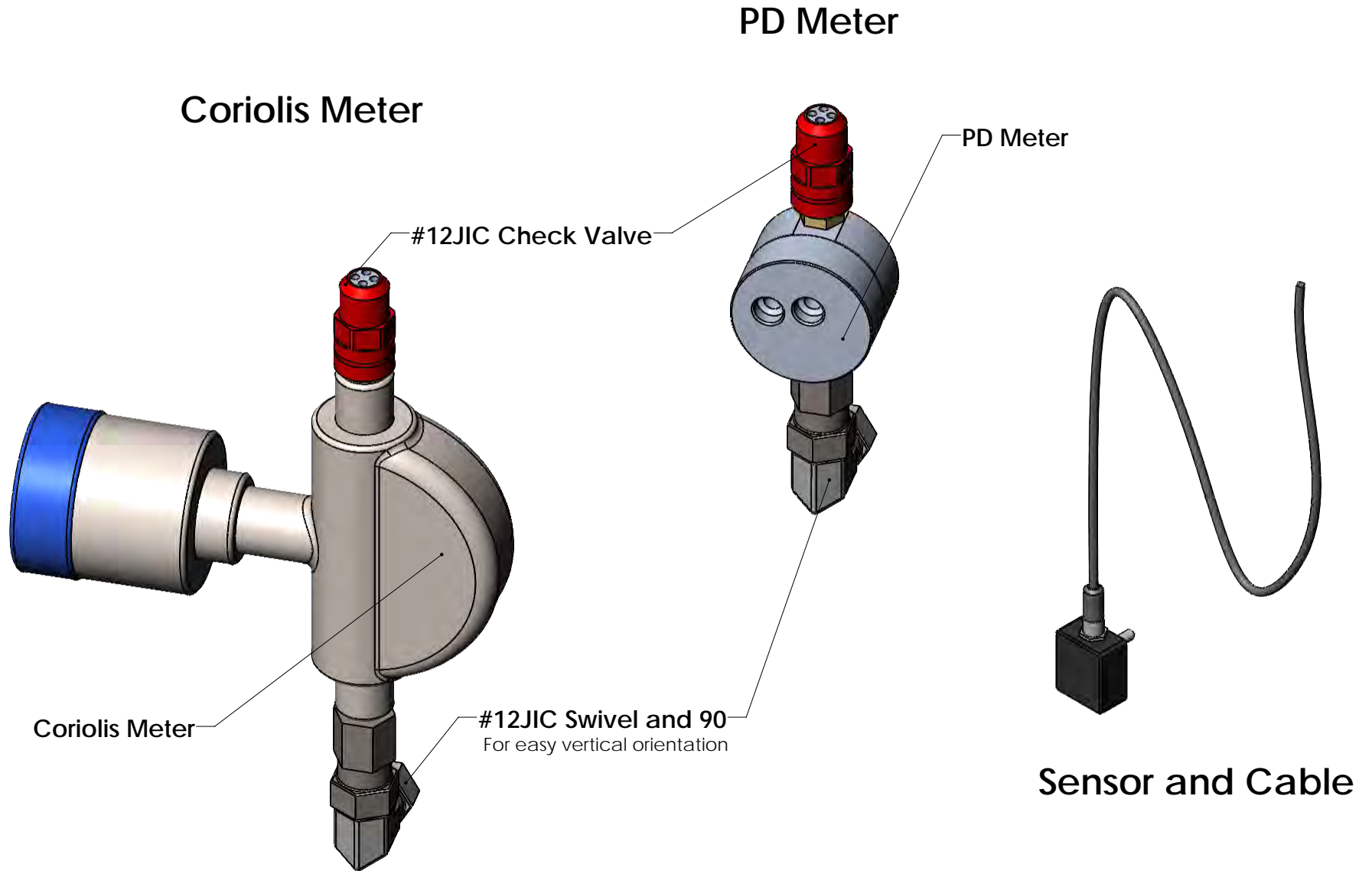


30

Pump Disp. **30.0**  
Max RPM 1200  
Max GPM 36  
Port Size 1.5in FPT



# F-Pump Meter Assemblies



# F-Pump Accessories

## Sample Valve Assembly:

- #12 JIC
- SS Valve



## Gauge Assembly:

- #12 JIC
- Pressure or Vacuum available



## Injection Assembly:

- #12 JIC
- Vertical Check Valve
- J-Tube Back Flow Seal

