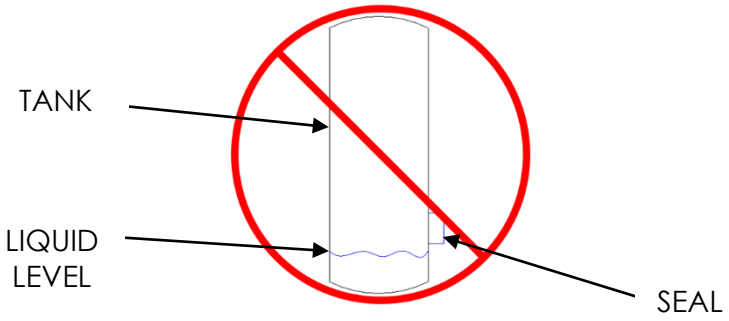
RT153 Side Entry Mechanical Seal Installation

CAUTION:

- **DISCONNECT AND LOCK OUT POWER SOURCE BEFORE SERVICING MIXER. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN DEATH, PERSONAL INJURY OR PROPERTY DAMAGE.**
- **HEAVY COMPONENTS. HANDLE PROPERLY.**
- **EXCESSIVE PRESSURE HAZARD: MAKE CERTAIN INTERNAL PRESSURE OF THE MIXING VESSEL IS RELIEVED BEFORE BEGINNING. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY OR DEATH, OR PROPERTY DAMAGE.**
- **DO NOT RUN THE SEAL DRY**
  - **IF YOUR MIXER IS EQUIPPED WITH A SINGLE SEAL, THEN THE LIQUID LEVEL IN THE TANK MUST BE ABOVE SEAL BODY BEFORE RUNNING MIXER.**
  - **IF YOUR MIXER IS EQUIPPED WITH A DOUBLE SEAL, THEN THE BUFFER OR BARRIER SYSTEM MUST BE IN OPERATION BEFORE RUNNING MIXER.**
- **IF YOUR SEAL IS EQUIPPED WITH A FLUSH PORT, THE SEAL WILL LEAK IF NOT PLUGGED OR IF VALVE INSTALLED ON SEAL FLUSH SUPPORT SYSTEM IS NOT CLOSED.**



DO NOT RUN MIXER IF LIQUID IN THE TANK IS BELOW THE SEAL

Begin Seal Installation

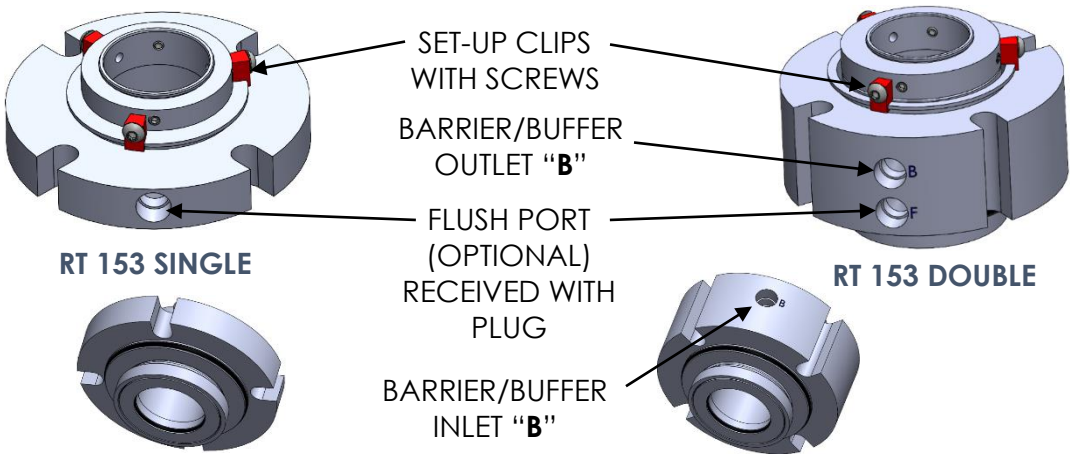
If your mixer is equipped with a RT153 mechanical seal, follow the Seal Manufacturer's Instructions for Seal Installation and Removal. The following steps are generic and assume use of a piloted seal. Here is the basic process:

Basic Seal Installation Process

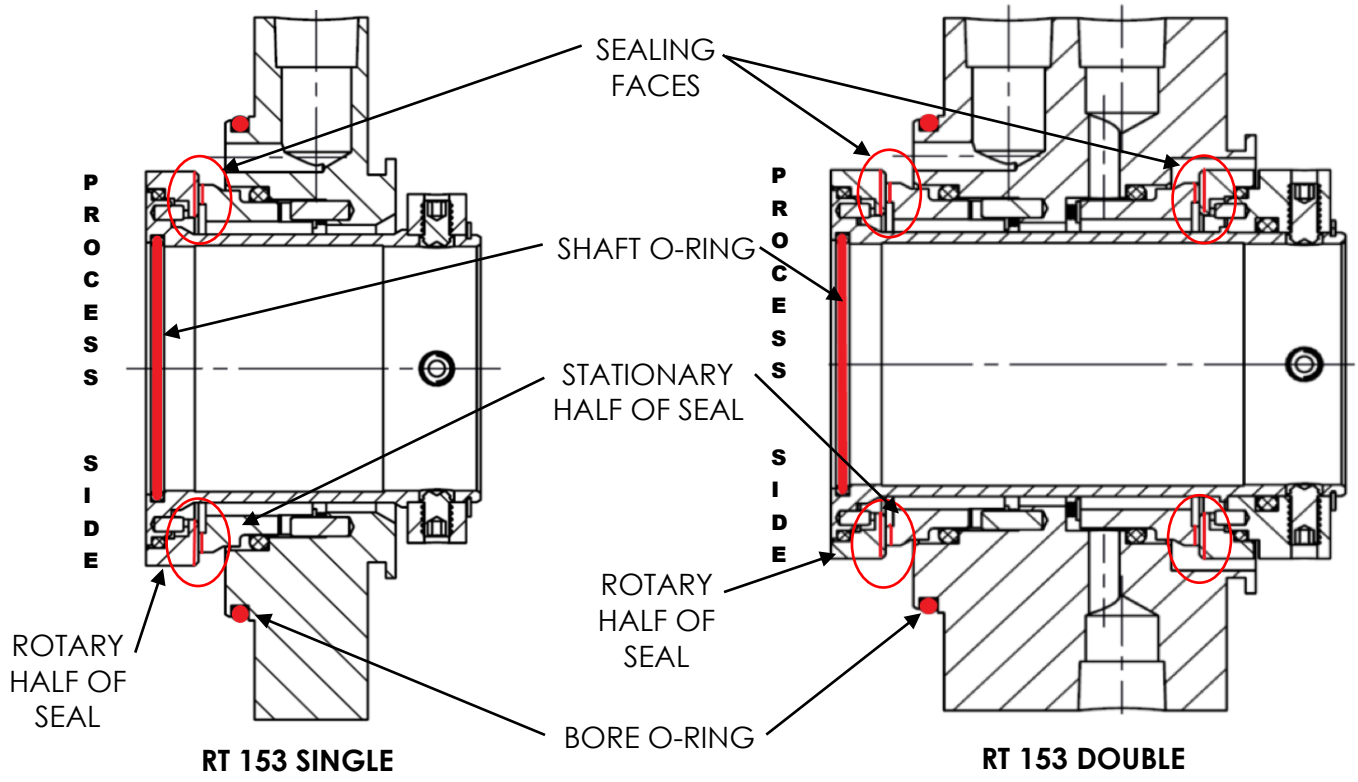
- ☐ Float the Seal
- ☐ Install the Shaft
- ☐ Mount the Seal
- ☐ Tighten Set Screws onto Shaft
- ☐ Remove Set-up Clips

CAUTION: PINCH POINTS & SHARP EDGES MAY BE LOCATED IN THIS AREA

RT153 SINGLE & DOUBLE SEALS SHOWN BELOW AS RECEIVED



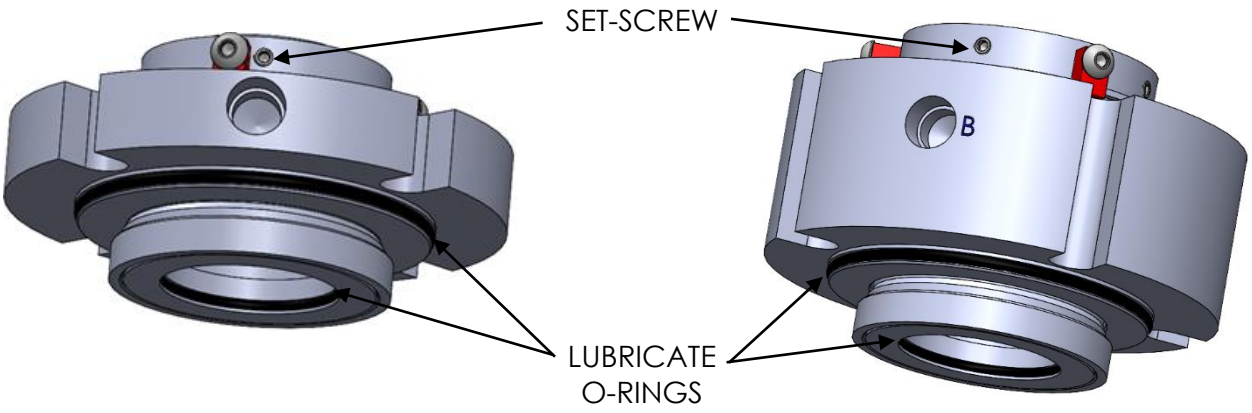
CROSS-SECTION OF SEALING FACES



Float the Seal

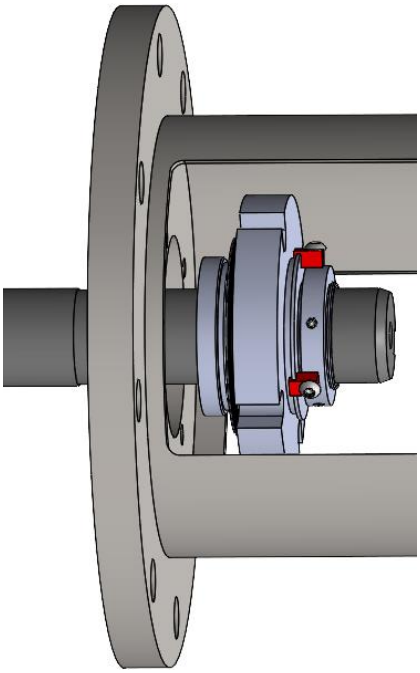
Handle the seal with care to prevent damage to the fragile sealing faces of the seal.

- Back out the set screws on the rotary half of the seal so they are clear of the bore. Use a process-compatible lubricant on the external Bore O-ring & the O-ring located within the bore of the seal as it will help the shaft pass through the O-ring. **Do not apply or allow any grease to contact the mating/sealing faces of the seal**.



- To Float the Seal, position the seal in the pedestal and orient with the mounting face toward the base of the pedestal. Insert the shaft through the pedestal then into the mechanical seal bore. Slide the shaft through the bore of the seal.

Insert the shaft through the pedestal mounting flange and the rotary half of the seal. Now the seal is "floated" on the shaft.



Seal installation will resume after the shaft is properly installed.

Install drive end of shaft to mixer drive. See appropriate shaft installation section for your mixer model.

Complete Seal Installation

Now that the shaft is properly located and securely affixed, complete the mechanical seal installation. Be sure to follow the manufacturer's instructions. Here is the basic process:

Basic Seal Installation Process

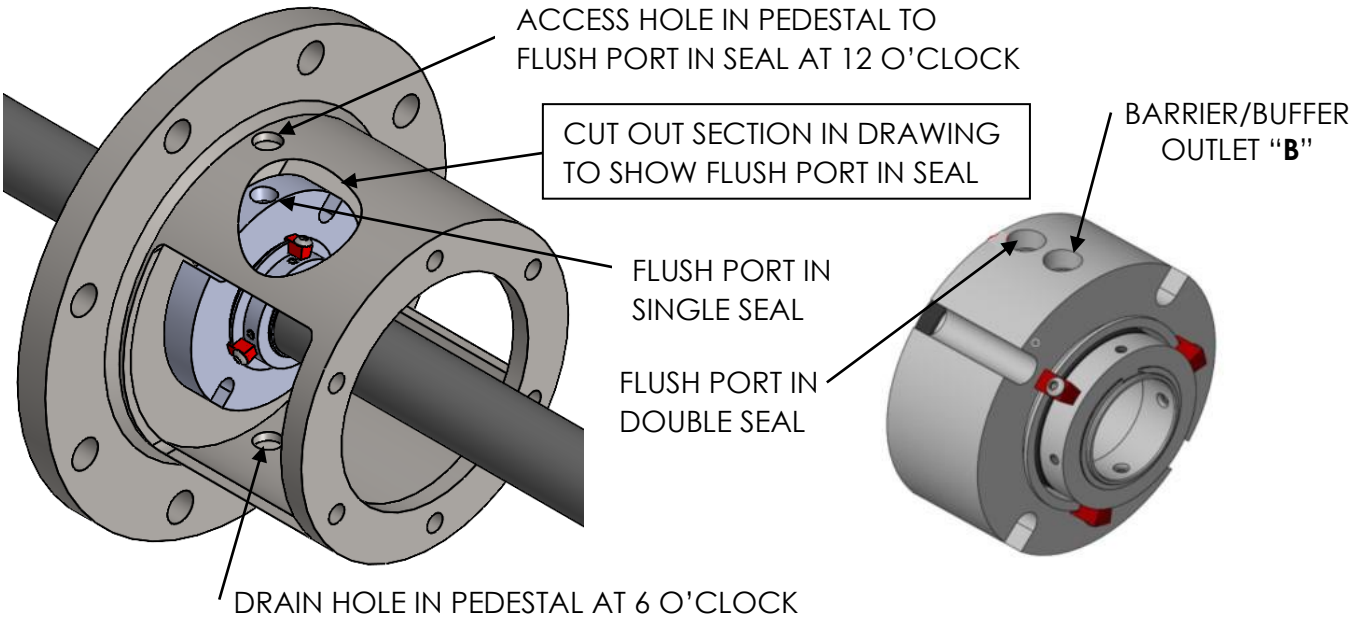
- ✓ Float the Seal *(Previously Completed)*
- ✓ Mount the Shaft *(Previously Completed)*
- ☐ Mount the Seal
- ☐ Tighten Set Screws onto Shaft
- ☐ Remove Set-up Clips

CAUTION: PINCH POINTS & SHARP EDGES MAY BE LOCATED IN THIS AREA

Mount the Seal

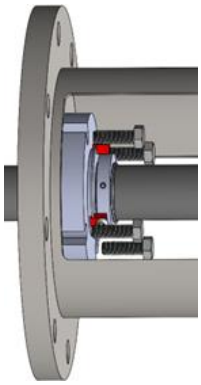
Slide the seal into the pedestal bore, aligning the slots in the seal to the holes in the pedestal. If your seal has a flush port, ensure the flush port is aligned with the hole in the top of the pedestal (12 o'clock position). A double seal with a Barrier/Buffer Outlet port should be installed with the outlet port at the 12 o'clock position & inlet port at 6 o'clock.

- ✓ Float the Seal *(Previously Completed)*
- ✓ Mount the Shaft *(Previously Completed)*
- ✓ Mount the Seal
- ☐ Tighten Set Screws onto Shaft
- ☐ Remove Set-up Clips



Insert and tighten the 4 provided bolts in an alternating pattern to the appropriate torque value for thread size called out in the table. The installation clips that hold the seal together and set the spring tension should remain in place until the end of the installation process.

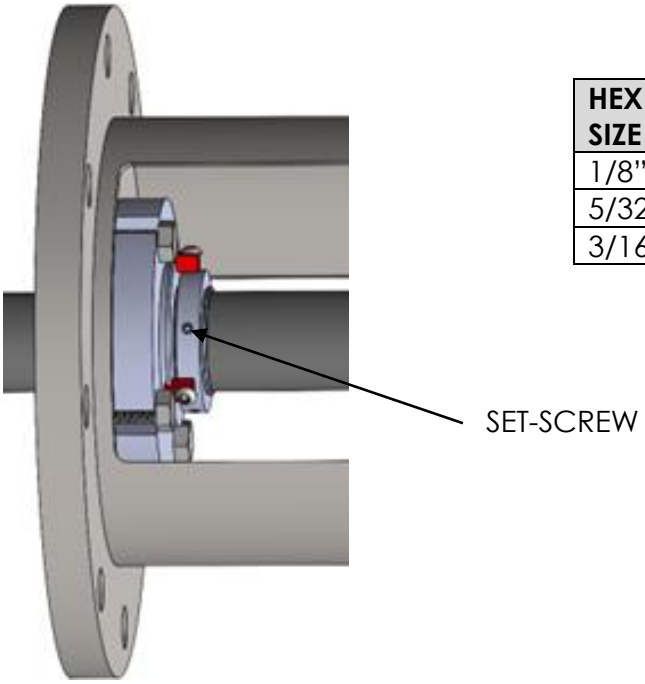
THREAD	18-8 STAINLESS
3/8"-16	16 ft-lb.
7/16"-14	26 ft-lb.
1/2"-13	36 ft-lb.
5/8"-11	81 ft-lb.



Tighten Set Screws onto Shaft

Use an alternating sequence to tighten and then torque the shaft set screws located on the rotating collar of the seal as required by the seal manufacturer. The goal is to keep the shaft centered within the seal bore, rather than pushed completely to one side. Start by loosely snugging the set screws in the prescribed pattern, then tighten the set screws a little more, and a little more, repeating the same pattern multiple times. Finally, torque the set screws to the appropriate value in table.

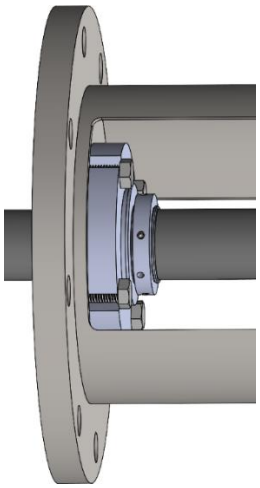
- ✓ Float the Seal *(Previously Completed)*
- ✓ Mount the Shaft *(Previously Completed)*
- ✓ Mount the Seal
- ✓ Tighten Set Screws onto Shaft
- ☐ Remove Set-up Clips



HEX SIZE	SET SCREW THREAD SIZE	18-8 STAINLESS
1/8"	¼"-28	72 in-lb
5/32"	5/16"-24	147 in-lb
3/16"	3/8"-24	**22 FT-LB**

Remove Set-up Clips

A common mistake is **failure to remove the set-up clips** at the end of the seal installation process.



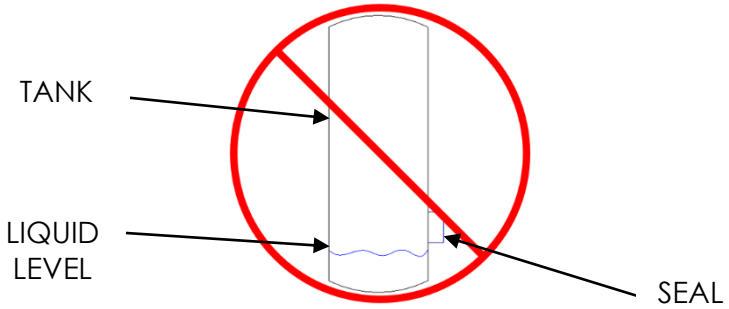
Failure to remove set-up clips before operating mixer can permanently damage seal and equipment.

Remove the set-up clips and be sure to save the seal's set-up clips. They will be essential for future disassembly, shipment, rebuild, and reassembly of the mechanical seal.

RT153 Seal with Optional Flush Port - Support System General Overview

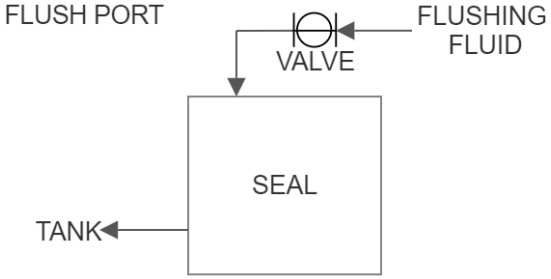
CAUTION:

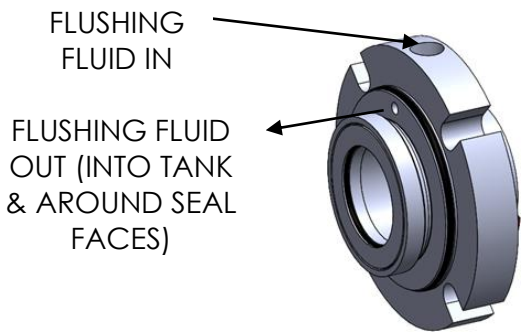
- **HANDLE SEAL WITH CARE, DO NOT SET SEAL DOWN ON THE SEAL'S NON-METALLIC SURFACE**
- **DO NOT RUN THE SEAL DRY**
  - **IF YOUR MIXER IS EQUIPPED WITH A SINGLE SEAL, THEN THE LIQUID LEVEL IN THE TANK MUST BE ABOVE SEAL BODY BEFORE RUNNING MIXER.**
  - **IF YOUR MIXER IS EQUIPPED WITH A DOUBLE SEAL, THEN THE BUFFER OR BARRIER SYSTEM MUST BE IN OPERATION BEFORE RUNNING MIXER.**
- **IF YOUR SEAL IS EQUIPPED WITH A FLUSH PORT, THE SEAL WILL LEAK IF NOT PLUGGED OR IF VALVE INSTALLED ON SEAL FLUSH SUPPORT SYSTEM IS NOT CLOSED.**



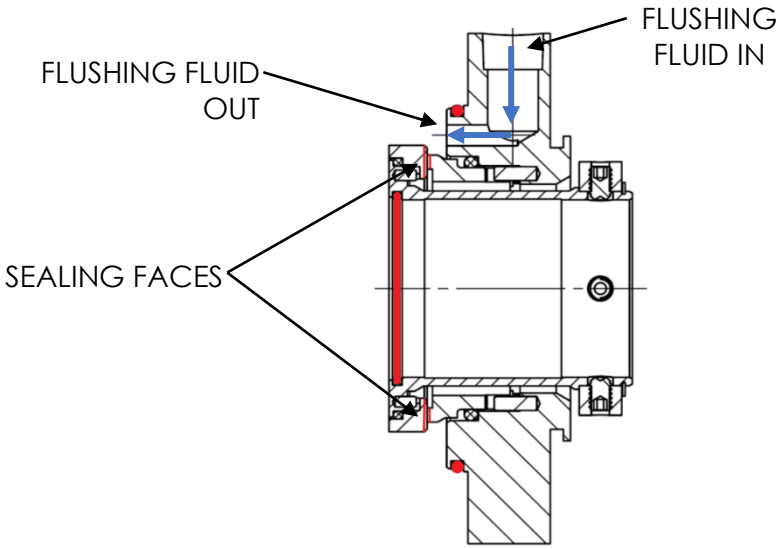
DO NOT RUN MIXER IF LIQUID IN THE TANK IS BELOW THE SEAL

The flush port in the seal is for clean in place to flood fluid around the process side of the seal in order to flush seal faces. The flush port in the single seal should be in the 12 o'clock position when installed.

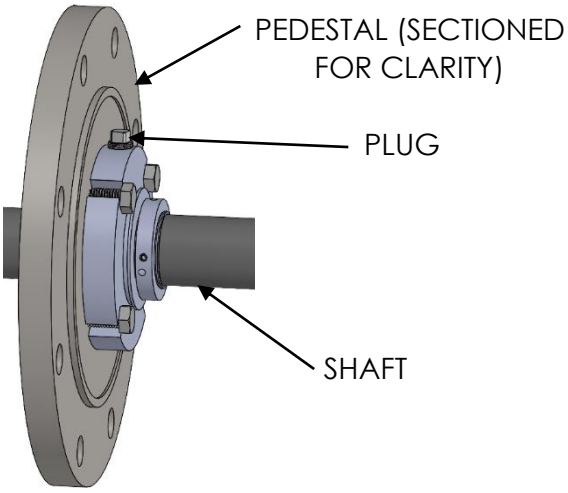




Low pressure fluid should be used when flushing the seal faces. Otherwise, flushing fluid will shoot past the sealing faces, not cleaning faces as intended.



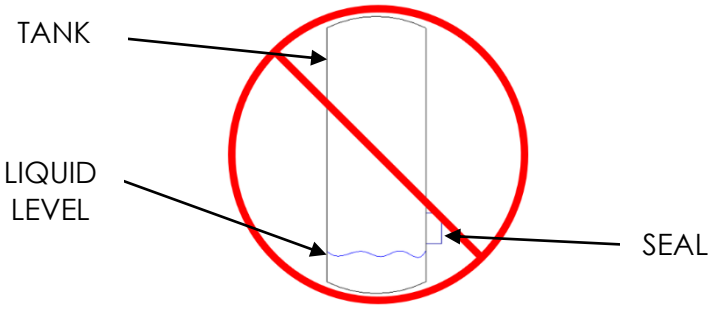
If flush port isn't being used in operation or being used for cleaning, then a plug should be installed. **LEAVING THE FLUSH PORT OPEN WILL RESULT IN LEAKING.**



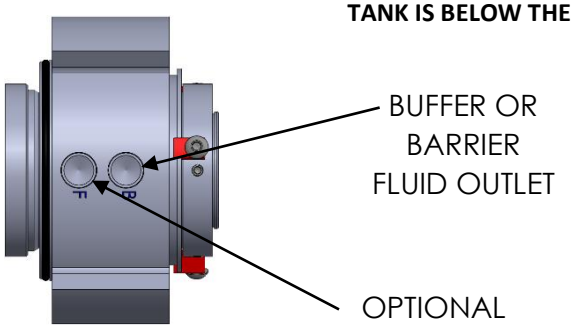
RT153 Double Seal Buffer & Barrier Ports - Support System General Overview

CAUTION:

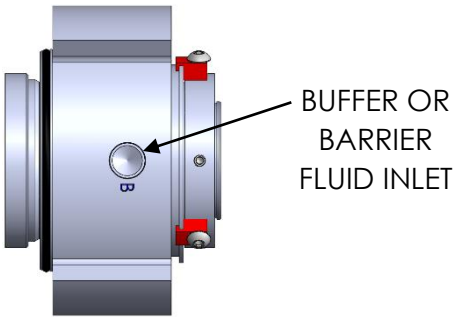
- **HANDLE SEAL WITH CARE, DO NOT SET SEAL DOWN ON THE SEAL'S NON-METALLIC SURFACES**
- **DO NOT RUN SEAL WITHOUT A LIQUID SUPPORT SYSTEM**
- **DO NOT RUN SEAL DRY**
- **REFER TO THE APPROVAL (OR AS MANUFACTURED) DRAWING FOR REQUIRED SPECIFICATIONS (TEMP., BARRIER PRESSURE, BARRIER/BUFFER FLUID, ETC.) TO RUN YOUR SEAL**



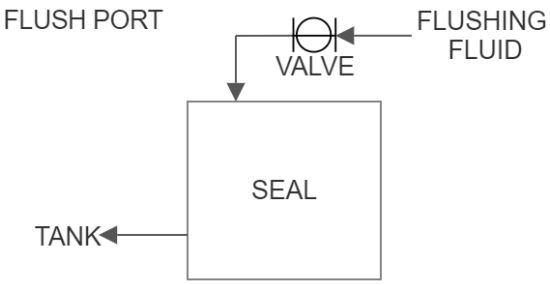
DO NOT RUN MIXER IF LIQUID IN THE TANK IS BELOW THE SEAL

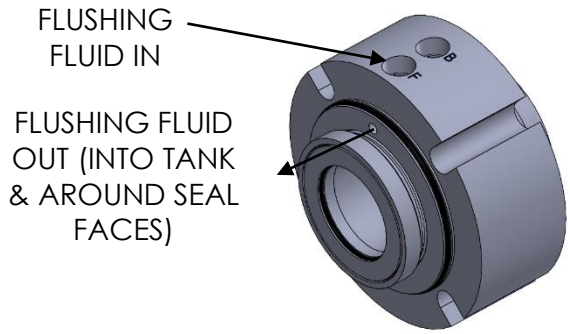


VIEW OF SEAL 2-PORT SIDE

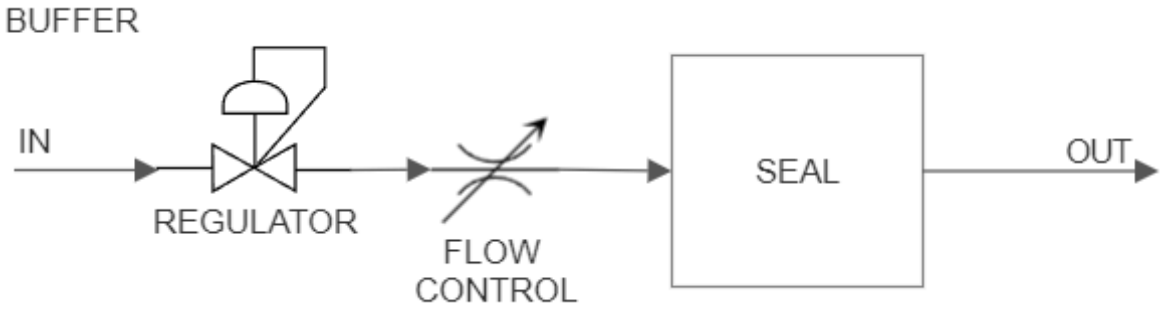


VIEW OF SEAL SINGLE PORT – OPPOSITE 2-PORT SIDE



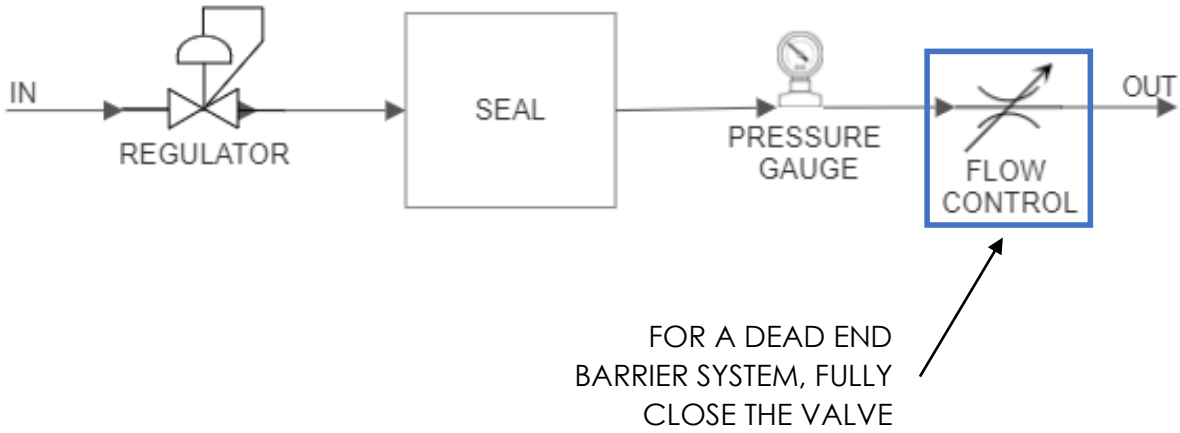


A **buffer fluid** is a double mechanical seal fluid system where the pressure in the seal system is **less than** the pressure in the tank. The differential between these pressures is dependent on the application. Any seal leakage may allow the process fluid to leak into the seal buffer fluid.

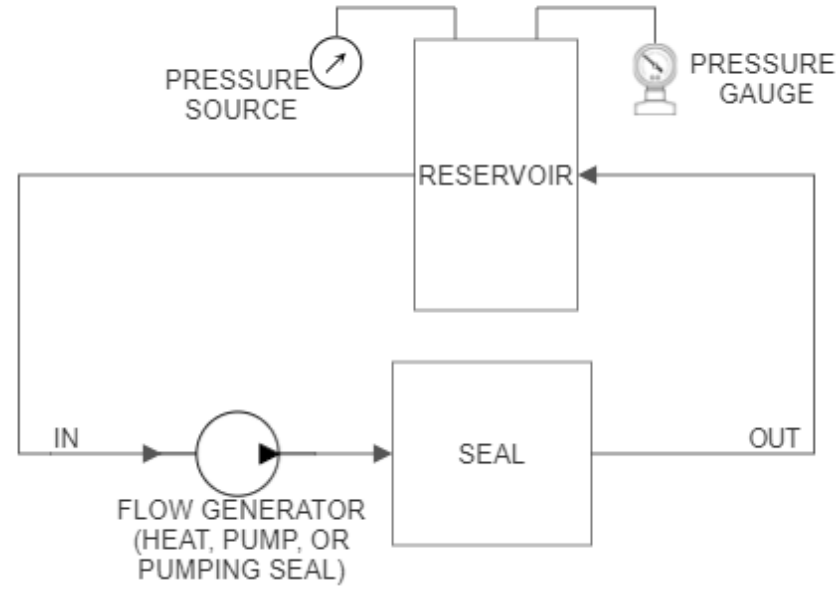


A **barrier fluid** is a double mechanical seal fluid system with the pressure in the seal system **greater than** the tank pressure. The differential between these pressures is dependent on the application. Any seal leakage may allow the barrier fluid to leak into the tank. Below are images showing the barrier - open loop and barrier - closed loop systems.

BARRIER (OPEN LOOP)



BARRIER (CLOSED LOOP)



THE PIPING PLANS SHOWN IN THIS MANUAL ARE INTENDED TO PROVIDE A GENERAL OVERVIEW. PLEASE REFER TO **API** PIPING PLANS THAT ARE SPECIFIC TO YOUR MIXING APPLICATION.