

PLAN 53A CLOSED LOOP WATER SAVING SYSTEM

1.0 GENERAL

The function of the Chesterton Plan 53A Closed Loop Water Saving System is to provide barrier fluid to your Chesterton dual seal application. When choosing and installing a suitable barrier fluid system for your double seal application, consideration should be given to the following selection constraints. These constraints must also be considered in combination with your specific plant standards and requirements.

2.0 INSTALLATION PROCEDURE

(See Figure 1 for installation drawing)

2.1 Description:

When correctly installed, a convection barrier fluid system is simple, effective, and reliable. These guidelines will help ensure trouble free installation and operation.

2.1 Tubing:

Always use tubing that has an **inner diameter** of at least 3/8" (10 mm).

2.2 Fittings:

Do not use fittings with overly restricted bores. If finned tubing is being used, please note that this may be cut, bent and prepared just as ordinary tubing is. Use of 90-degree elbows should be avoided when using different piping than the tubing provided.

2.3 Vessel Mounting:

Please ensure that the system is mounted to a bracket/stand that is not subject to vibration. The system should be suitably mounted in a position where the pipe lengths fall in line with those recommended in Figure 1. This will ensure that natural convection will take place. On vertical pumps, there is a danger that when the system is filled, a pocket of air may be trapped in the seal. (Contact Chesterton Engineering or Chesterton Applications Engineering for questions)

2.4 Direction of Flow:

Determine direction of flow from Figure 1.

Pipe the barrier fluid outlet port to the return (side) connection on the barrier fluid tank. In practice, the ports may end up being horizontal, but this should not pose a problem if correctly installed.

2.5 Return Line:

The return (hot) line **SHOULD NOT SAG**. No point of this hose should sag below the input to of the gland. This cannot be overemphasized; the slightest sag can prevent flow. The return pipe must always go upwards. The seal return should not be higher than 3 feet (.9 meters) from the centerline of the seal.

2.6 Priming the Seal:

Before filling the vessel, disconnect the return tube at the vessel connection. Connect the water supply to the inlet port of the barrier fluid system (1/2" (12 mm) O.D).

1. Turn water supply on.
2. Allow water to flow through the outlet of seal and return line. This will allow trapped air to escape the seal.
3. Turn water off.
4. Connect seal return line back to vessel.
5. Follow section 2.7 for system start up.

CAUTIONS

These instructions are general in nature. It is assumed that the installer is familiar with seals, auxiliary equipments and the requirements of their plant. If in doubt, get assistance from someone in the plant that is familiar with seals or delay the installation until a seal representative is available.

All necessary auxiliary arrangements for successful operation (heating, cooling, flushing) as well as safety devices must be employed. These decisions are made by the user. The decision to use this system or any other Chesterton product in a particular service is the customer's responsibility.

INSTALLATION PROCEDURE (CONT'D)

2.7 System Start Up:

With water connected to the 1/2" O.D (12 mm) 1/2" NPT female fitting on the inlet of the barrier fluid system:

1. Rotate the regulator adjustment counter clockwise removing load from regulator spring.
2. Turn water supply on and allow vessel to fill.
3. Loosen the air vent valve cap to allow air to escape the tank.
4. Rotate the regulator adjustment clockwise allowing a larger flow rate to enter the tank. Be sure the adjustment is lower than that of your intended barrier fluid pressure.
5. Once the water has reached the air valve vent, the vessel will begin to pressurize and no further air will be ejected.
6. Adjust the regulator to the final pressure required of the system. If the return temperature exceeds 160°F (71.1 °C), it may become necessary to employ piping which can withstand higher temperatures. Also, site safety code may dictate some form of guarding around the system to prevent injury.

3.0 MATERIALS / SPECIFICATIONS

3.1 Materials of Construction:

Materials of construction, temperature and pressure limits as well as tank location relative to mechanical seal must be taken under consideration when selecting and installing a barrier fluid system.

3.2 System Limits:

Maximum Working Condition with Nylon Hose provided:

125 psig @ 94.8°F (8.6 bar(g) @ 34.8°C)

Maximum Working Temperature of System:

160 °F (71 °C) @ 73 psig

Maximum Working Condition of Tank without hose, instant tube fittings and flow indicator:

150 psig @ 212°F (10.3 bar(g) @ 100°C)

3.3 Barrier Fluid:

- a) When selecting and installing a barrier fluid, the plant must determine the compatibility with the process to which it is to be applied. Consideration must also be given to the personnel and environmental exposure when selecting and installing the barrier fluid with appropriate precautions including protective equipment and clothing.
- b) Vaporization must also be considered. Barrier fluids such as solvents should not be used due to their low vaporization temperatures.

4.0 GENERAL SPECIFICATION

4.1 Description:

The Chesterton Plan 53A Closed Loop Water Saving System should be connected directly to a suitable barrier fluid supply (subject to local regulations). This will form a low maintenance barrier fluid system. The supply will pressurize the vessel when it is full. The natural convection ensures the seal is kept cool. When the flow indicator shows water being drawn from the supply, this will indicate possible seal leakage.

4.2 Standard Equipment:

- Standard Chesterton tank
- 2-way Ball Valve
- 3-way Ball Valve
- 11 feet of 1/2" O.D Nylon Polymer Hose
- Temperature Indicator Strips
- Instant tube fittings
- 1/8" Pressure Gauge Rear Entry
- Water Regulator
- Air Vent Valve
- Flow Indicator
- Check Valve
- Brass Fittings to connect to a Chesterton mechanical seal

TECHNICAL FEATURES

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a) VESSEL:

<i>Construction:</i>	All welded construction to ASME VII Div. 1 Non-Certified Tank.			
<i>Material:</i>	304 Stainless Steel			
<i>Finish:</i>	Sandblast exterior to 80-grit glass bead.			
<i>Capacity:</i>	3.5 US Gallons (13.2 Liters) nominal capacity.			
<i>Pressure Ratings:</i>	Maximum working pressure 250 psig @ 212 °F (17.2 bar(g) @ 100 °C) Vessel tested to 375 psig (25.9 bar(g))			
<i>Connections:</i>	Top port: 1/2" NPT	Vessel drain port:	1/2" NPT	Air vent valve port: 1/2" NPT
	Fill port: 1/2" NPT	Seal feed line port:	1/2" NPT	Seal return line port: 1/2" NPT
	Top port: 1/2" NPT	Sight glass mounting hole:	1/2" NPT	

TECHNICAL FEATURES (CONT'D)

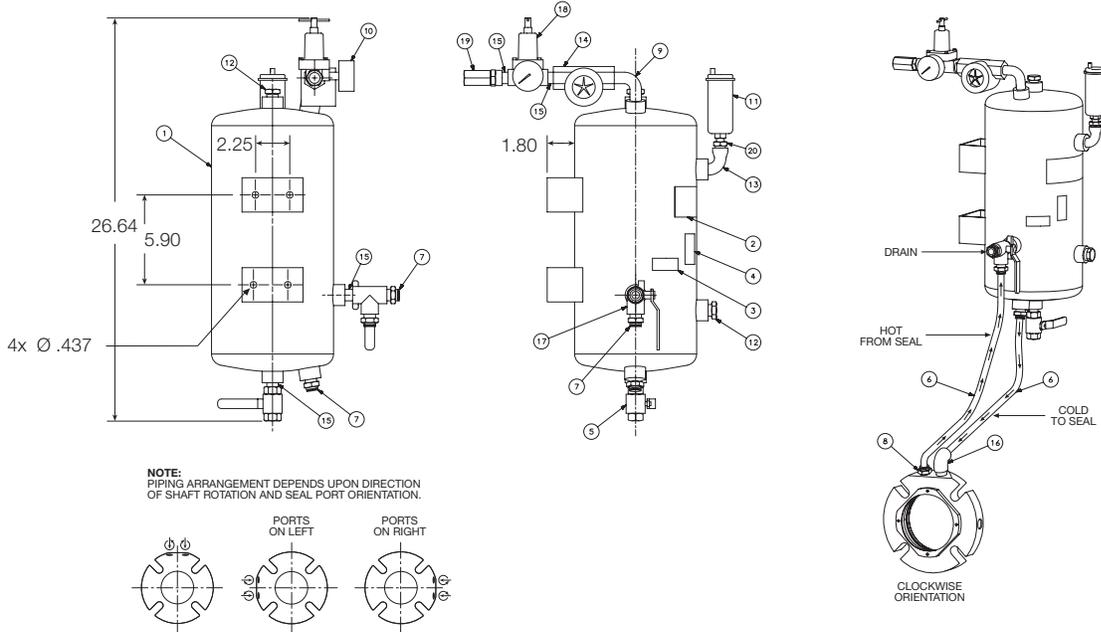
k) CHECK VALVE:

Description: This is placed at the inlet to the system to maintain set system pressure in the event of plant water failure. If any product enters the vessel, this valve will ensure that the product does not enter the plant water supply line.

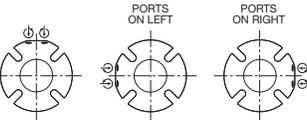
Construction: 1/2" female threads

Material: Brass

Pressure Rating: 1000 psig @ 250 °F (68.9 bar(g) @ 121 °C)

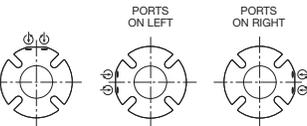


NOTE:
PIPING ARRANGEMENT DEPENDS UPON DIRECTION OF SHAFT ROTATION AND SEAL PORT ORIENTATION.



HIGH SEDIMENT CONFIGURATION

NOTE:
PIPING CONFIGURATION FOR HIGH SEDIMENT APPLICATION. PIPING ARRANGEMENT DEPENDS UPON DIRECTION OF SHAFT ROTATION AND SEAL PORT ORIENTATION.



20	157473	1	HEX BUSHING
19	157472	1	CHECK VALVE
18	157471	1	WATER PRESSURE REGULATOR
17	157470	1	BALL VALVE (3 WAY)
16	157469	2	INSTANT TUBE FITTING
15	157468	4	NIPPLE
14	157467	1	FLOW INDICATOR
13	157466	1	ELBOW
12	157465	2	PLUG
11	157464	1	AIR VENT
10	157463	1	PRESSURE GAUGE
9	157462	1	ELBOW
8	157461	2	INSTANT TUBE FITTING
7	157460	3	INSTANT TUBE FITTING
6	157459	1	HOSE (CUT TO SIZE)
5	157458	1	BALL VALVE (2 WAY)
4	157456	1	8 LEVEL TEMP. STRIP
3	157457	1	7 LEVEL TEMP. STRIP
2	157455	1	LABEL
1	157454	1	TANK



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