

Seal Support Systems

Reliability Enhancement

2012

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Reliability Enhancement

Research has **proven** that the biggest mechanical preventative of mechanical seal failure is the use of **effective Seal Support Systems**. This means that no matter how well designed your mechanical seal or bearing systems are, without a reliable Seal Support System there is still the possibility of your mechanical seal failing. The **innovative and reliable** Seal Support System Range at ASK, gives customers the **confidence** to remove this root cause of mechanical seal failure.

Warning !

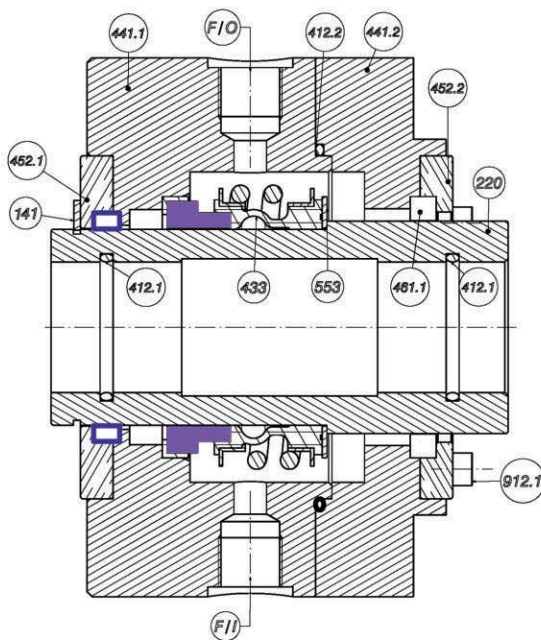
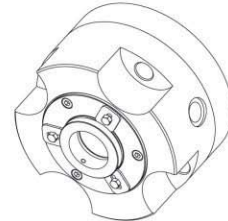
ALL Products are Suitable for ASK Pumps.

Gland Plate

ASK fully preassemble standard mechanical seals to meets requirements of API 682 3rd and dimensional requirements of API 610, 11th.

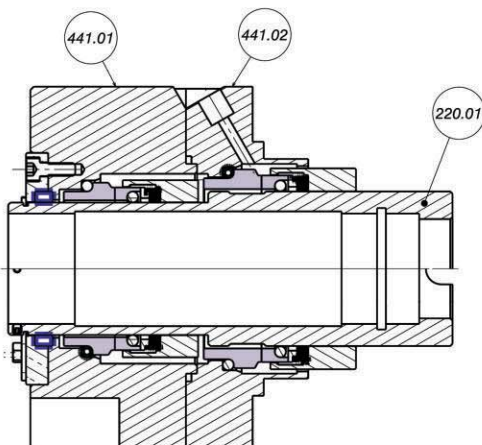
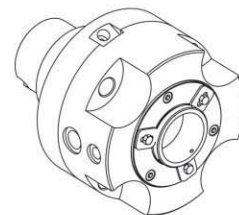
Cartridge Assembly Mechanical seal Configurations:

1CW-FX: One seal per cartridge assembly, contacting single wet seal with a fixed throttle bushing



Part No.	Part Name	Material
141	Spacer	SS 316
220	Shaft Sleeve	SS 316, Duplex
412.1	O - Ring	Viton
412.2	O - Ring	Viton
433	Mechanical Seal	By Seal Mfg
441.1	Seal Housing	CS, SS 304, SS
441.2	Adaptor	316, Duplex
452.1	Gland Plate	Bronze
452.2	gland Plate	Bronze
461.1	Packing	PTFE
553	Washer	SS 316
912.1	Hex. Bolt	A 193 B7

23CW-FB: Two seals per cartridge assembly that utilize an externally supplied liquid barrier or buffer fluids, contacting wet seals in a face-to-back configuration.



Part No.	Part Name	Material
220.01	Shaft Sleeve	SS 316, Duplex
441.01	Secondary seal Housing	CS, SS 304, SS 316 Duplex
441.02	Seal housing	

Technical table

	1CW-FX	23CW-FB
Seal type	Single	Dual
Connections	F/I: Flush In, 1/2" F/O: Flush Out, 1/2" D: Drain, 3/8" Q: Quench, 3/8"	F: Flush (Inner seal), 1/2" LBI: Liquid buffer / barrier fluid In, 1/2" LBO: Liquid buffer / barrier fluid out, 1/2" D: Drain, 3/8" Q: Quench, 3/8"
Seal Standard	API 682, 3 rd and EN 12756	
Seal Manufacturer	By Customer !	
Dimensions	Table 7, API 610, 11 th	
Materials	Carbon steel, SS 304, SS 316, Duplex SS	
Test pressure	40 barg @ 25C, 30 min	

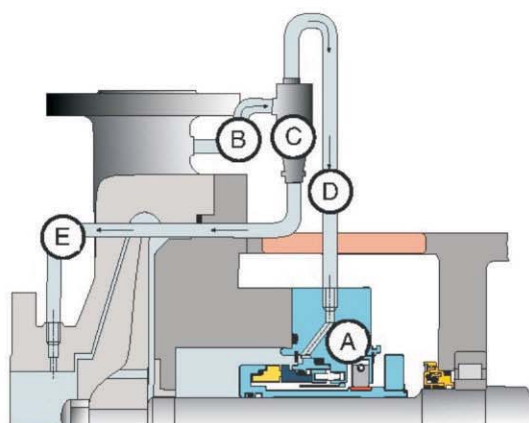
Seal Codes

ASK can fully preassembled below seal codes according to API 682, 3rd. Seal components supply from approved vendor lists.

Category	Seal Arrangement	Seal Type	Flush Arrangement	Gland Plate Code
C2 Description: Seals are intended for use in seal chambers meeting the chamber envelope dimensional requirements of API 610. Their application is limited to seal chamber temperatures from -40 °C to 400 °C and absolute pressures up to 42 bar.	A1 Description: Seal configurations having one seal per cartridge assembly.	A Description: Seal is balanced, inside mounted, cartridge design, pusher seal with multiple or super sinus springs and in which the flexible element rotates. Secondary elements are elastomeric O - rings.	01, 02, 11, 12, 13, 14, 21, 23, 31, 32, 41, 61, 62	1CW-FX Description: One seal per cartridge assembly, contacting single wet seal with a fixed throttle bushing.
	A2 Description: Seal configuration having two seals per cartridge assembly, with the space between the seals at a pressure greater than the seal chamber pressure.		52, 61, 62	23CW-FB Description: Two seals per cartridge assembly that utilize an externally supplied liquid barrier or buffer fluids, contacting wet seals in a face-to-back configuration.
	A3 Description: Seal configurations having two seals per cartridge assembly, utilizing an externally supplied barrier fluid at a pressure greater than the seal chamber pressure.		53A, 53B, 61, 62	

Cyclone Separator

The cyclone separator is designed to separate heavy particles from the product liquid. The clean fluid is ideal for use as flush fluid, improving conditions at seal faces. The separated particles drain back into the sealed product. The benefit is a reliable and low-cost sealing system for heavy product particle applications, which does not require an independent flush supply.

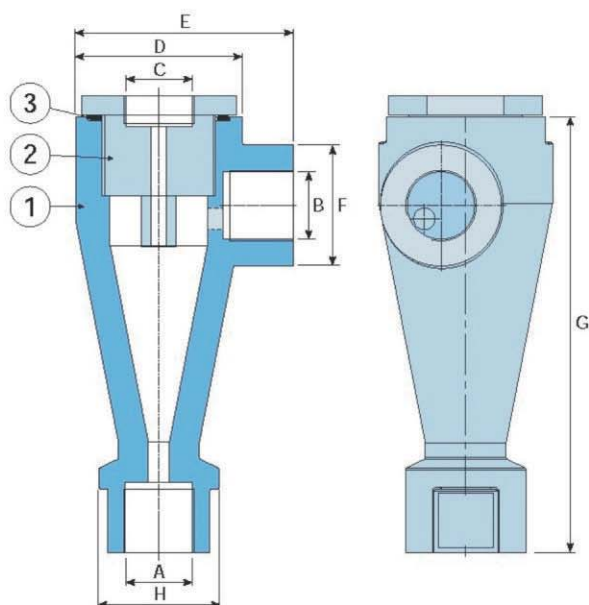


KEY – Piping diagram schematic

Item	Description
A	Mechanical Seal
B	Dirty Product Liquid Pressure Feed
C	Cyclone Separator
D	Clean Product Liquid (Mechanical Seal Flush Liquid)
E	Dirty Product Liquid Return to Pump Suction



General Dimensions and part list



Part List

Item	Description
1	Cyclone Separator Body
2	Hex. Reducing Bush
3	Washer

Key interface dimensions, mm (inches)

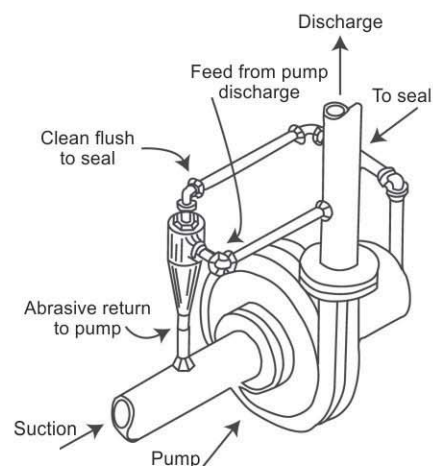
Style	Φ A,B,C	Φ D	E	F	G	H
316 SS Duplex	½" NPT	48 mm 1.89"	66 mm 2.60"	35 mm 1.38"	118 mm 4.65"	35 mm 1.38"
316 SS Duplex	1" NPT	82 mm 3.20"	106.5 mm 4.09"	57 mm 2.20"	220 mm 8.7"	57 mm 2.20"

Cyclone Separator Operating Limits

- Maximum Pressure: 40 bar g / 580 psi
- Maximum Temperature: 200 °C / 392 F
- Minimum Differential Pressure: 1.7 bar / 25 psi
- Maximum Differential Pressure: 12 bar / 174 psi

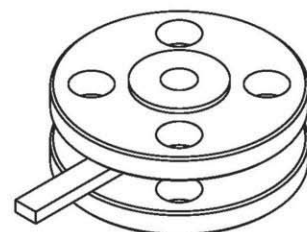
Operation Considerations

- **Solids contents** – Cyclone separators are designed for use on fluids with a maximum solids content of 6%, by volume.
- **Specific Gravity**-For an effective Cyclonic separation to exist, the solids must have a Specific Gravity (SG) at least twice that of the carrier fluid.
- **Particle Hardness**-Consideration must be given to the hardness and solubility of the solids. The solids must stay as solids and the hardness will affect the choice of the materials of construction.
- **Differential Pressure**-The higher the differential pressure the more efficient the separation will be. Higher pressure induces a higher velocity and a higher centrifugal force. A limit of 12 bar/174 psi is set as higher velocities give rise to increased erosion. If the differential pressure is to be greater than 12 bar / 174 psi then consideration should be given to provision of a pressure reducing device in the supply line which will not foul.
- **Viscosity**-The time in a Cyclone Separator is short. Viscous drag on a particle can prevent in centrifuging to the perimeter of the chamber in the time available. The Cyclone Separator must only be used with relatively low viscosity liquids.

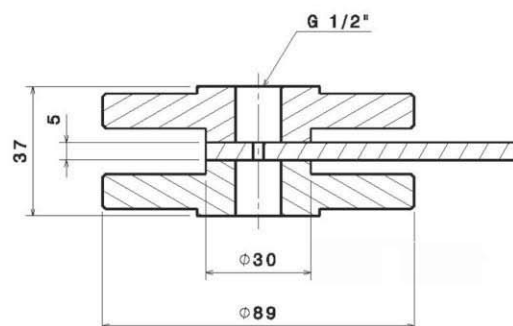
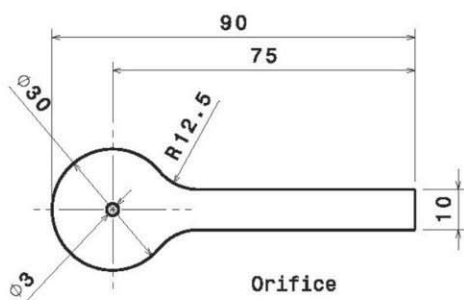


Flow Control Orifice Plate

An orifice may be required in the seal flush system solely, or in conjunction with a throat bushing and / or cyclone separator to: a) Limit the seal flush circulation rate to the seal, b) Control the seal chamber pressure.



Dimensions



Material: 316 Stainless Steel

Seal Flush Cooler

Liquid – Helicoil Cooler

The ASK Cooler is constructed from 316 stainless steel tube and cast iron casing (cast steel & cast 316 steel casting options available).

This robust product is a very efficient seal cooler used on API Piping Plan 21, 22 and 23 arrangements.

The product can also be used in conjunction with other products to provide additional cooling on high heat applications.

Technical Table

Part List

Item	Description
Flow rate	Min 8 lit/min (2GPM)
Tube size	½" with 0.065" wall thickness
Flush Conn.	½"
Vent size	3/8"
Drain size	3/8"
MAWP	40 bar g @ 25 °C

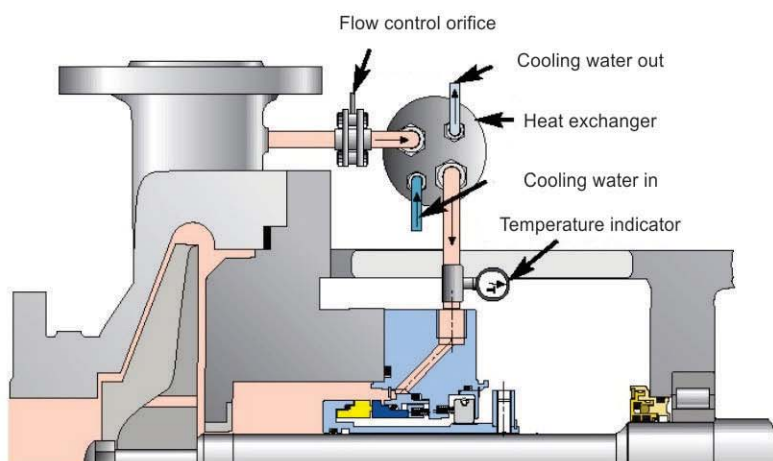


API PLAN
23

API PLAN
53B

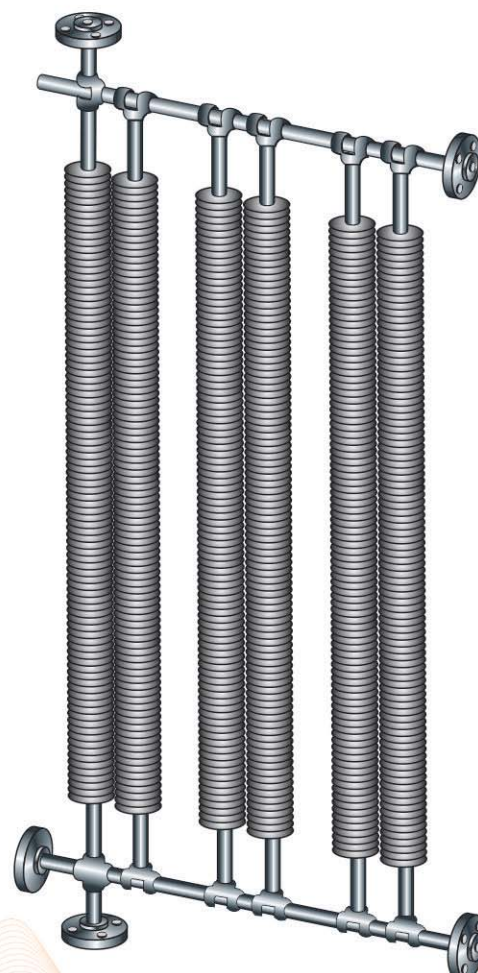
API PLAN
21

API PLAN
22



Convection – Finned Tubing

Finned tubing provides additional convection cooling on high heat applications. The tubing is constructed from 316 SS schedule 40 pipe with aluminum wound fin and 316 SS turbulator. It is available in banks of 2, 4 and 6, depending on the amount of heat needs to be removed. Butt and socket weld flanges are available for each bank option.



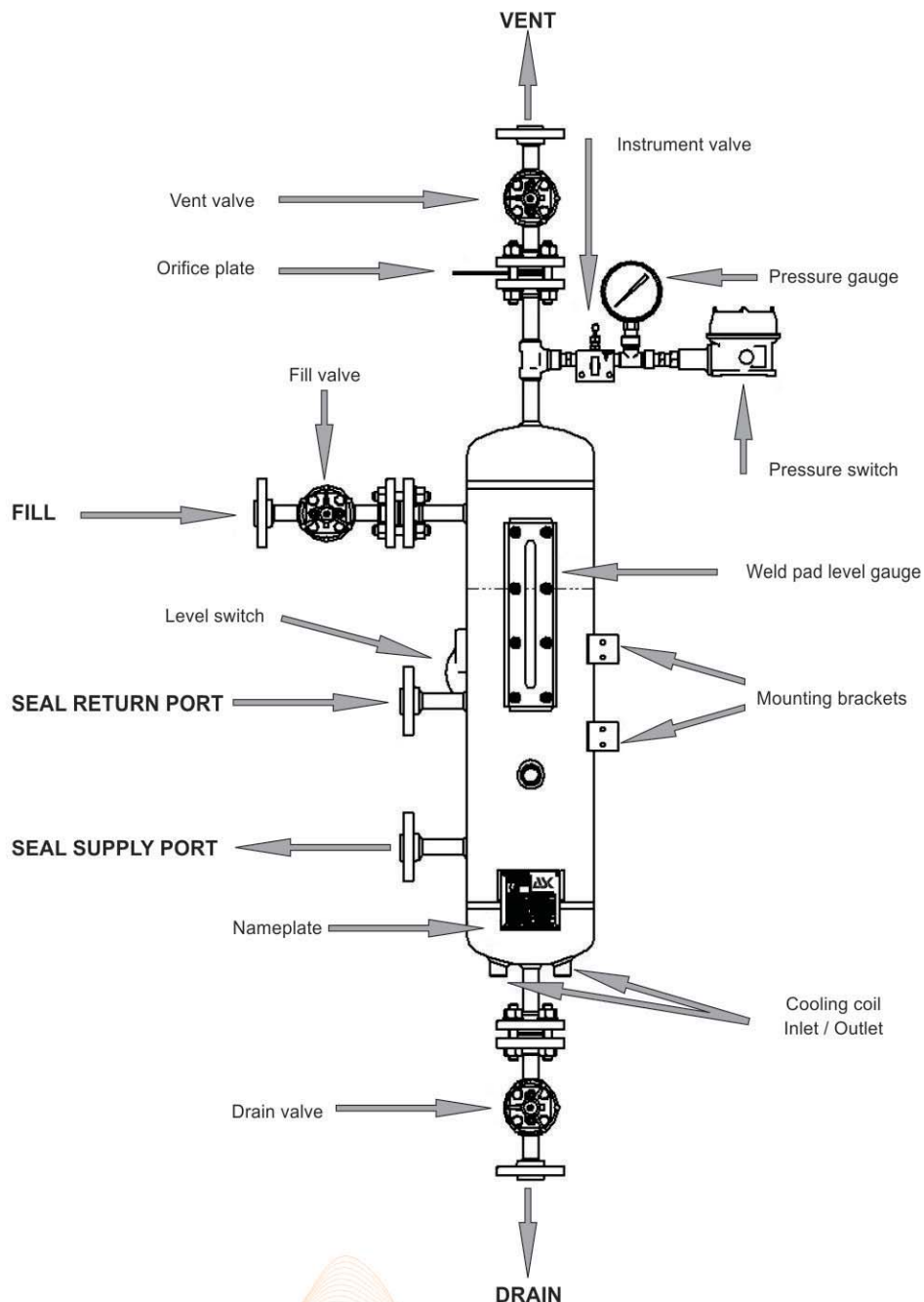
Barrier / Buffer Fluid Reservoir

API 682 Plans 52 and 53A Reservoirs

These reservoirs are designed to meet the requirements of API 682 for Plan 52 and 53A. The systems are supplied as complete assemblies ready to install. These 3 gallon capacity reservoirs are offered in two versions; welded ellipsoidal head, and flanged removable bottom head for ease of internal cleaning. Instruments available are Pressure Indicator, Pressure Switch and Level Switches.

The API 682 Reservoir Systems are designed for the Refinery, Petrochemical, and Chemical Industries.

Capacity	3 Gallon
Material	316 , 316 L Stainless Steel

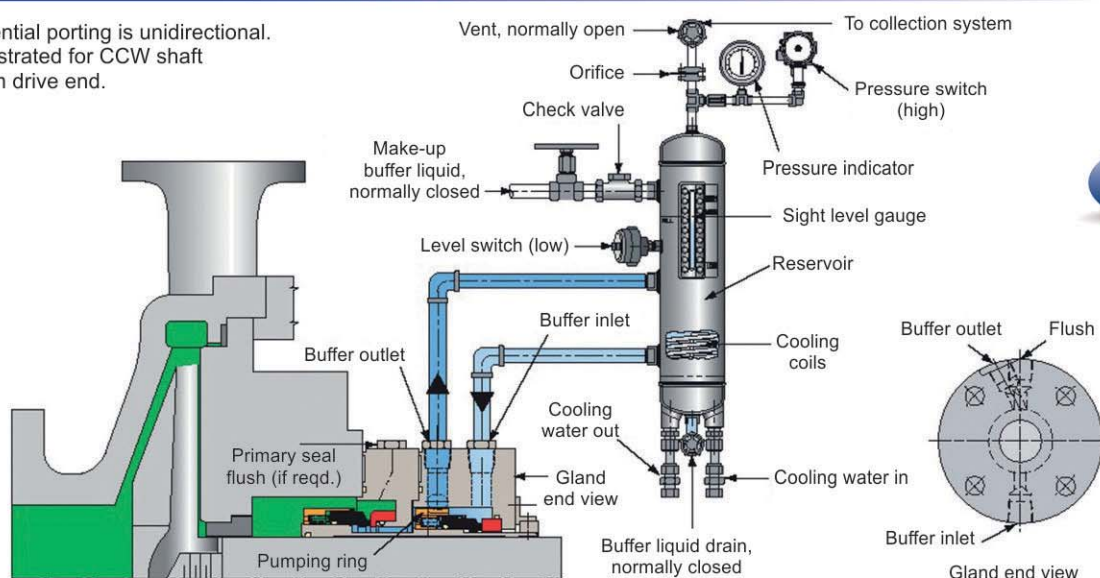


Technical Table

Part	Specification	Material	Manufacturer
Vessel	3 gallon, Schedule 40	316, 316 L Stainless Steel	ASK, IRAN
Cooling coil	½", 1.6 mm wall thickness	316, 316 L Stainless Steel	ASK, IRAN
Weld pad sight level gauge	borosilicate glass Up to 60 bar Visible length: 200 mm.	304, 316 Stainless Steel	ASK, IRAN
Level Switch	Vibration Limit Switch, EX (Optional)	316 Stainless Steel	West Europe
Check valve	Flanged, Class 600 #	CF3M	West Europe
Fill valve	Ball valve, Flanged 300#, RF	CF3M	West Europe
Vent valve	Ball valve, Flanged 300#, RF	CF3M	West Europe
Drain valve	Ball valve, Flanged 300#, RF	CF3M	West Europe
Pressure gauge	0 – 40 bar	316 Stainless Steel	West Europe
Pressure switch	Up to 60 bar, EX (Optional)	316 Stainless Steel	West Europe
Orifice plate	½", 3 mm hole	316 Stainless Steel	ASK, IRAN

API Plan 52 Illustration

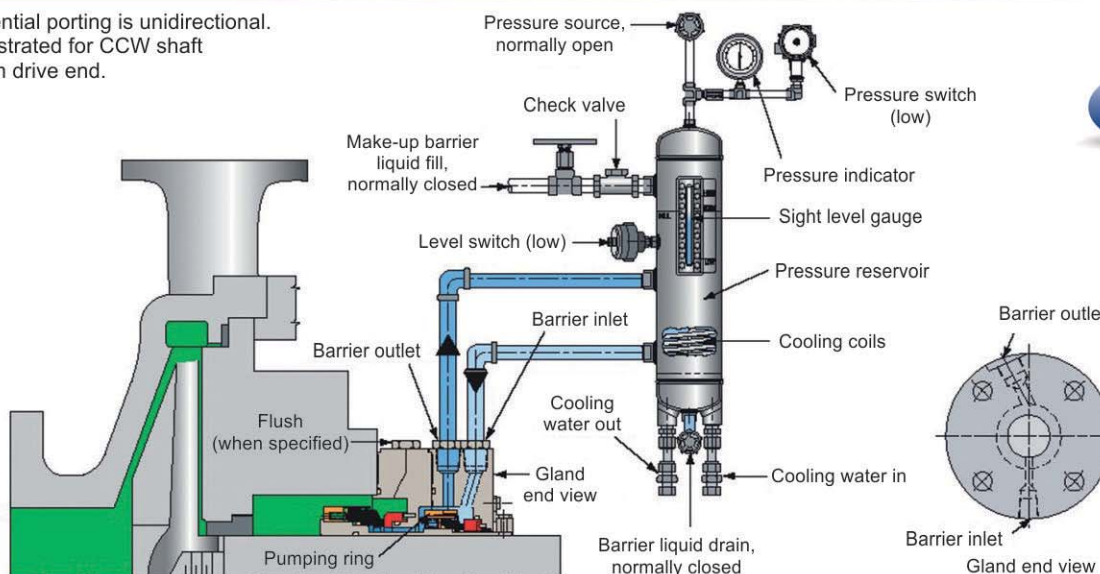
Note: Tangential porting is unidirectional.
Gland is illustrated for CCW shaft rotation from drive end.



API PLAN
52

API Plan 53A Illustration

Note: Tangential porting is unidirectional.
Gland is illustrated for CCW shaft rotation from drive end.



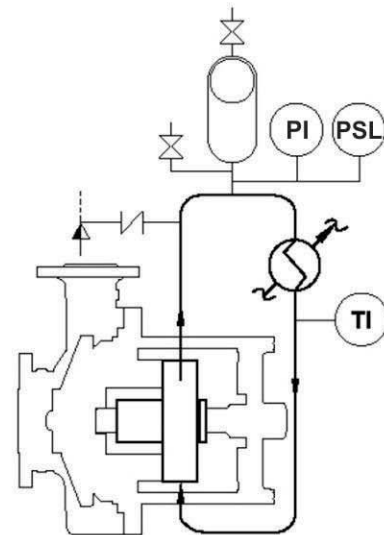
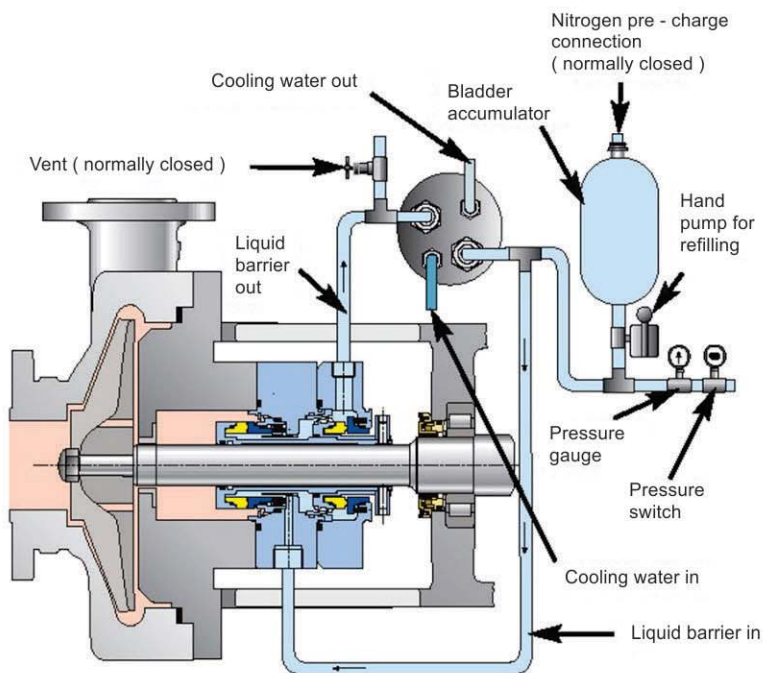
API PLAN
53A

API 682 Plan 53B

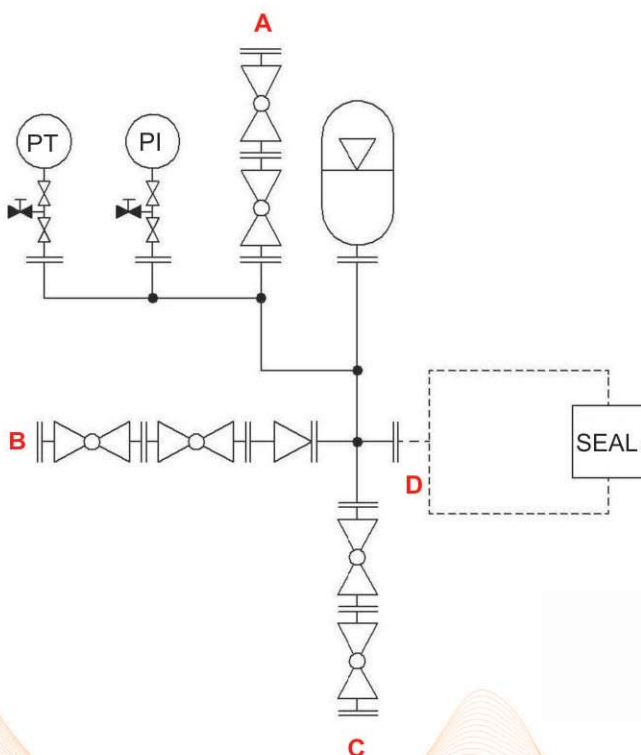
Plan 53B is a dual pressurized system that eliminates direct gas contact with the barrier liquid. The Plan 53B uses a bladder accumulator as a physical barrier between the gas and the barrier fluid. The bladder is pressurized with gas prior to filling the system with barrier liquid. As the system is filled, the bladder is compressed thus providing a positive pressure on the barrier liquid.

Circulation is via a pumping ring, and a heat exchanger (air or water-cooled) is added to the sealing loop to provide cooling.

Capacity	2.5 Gallon Accumulator Size
Materials	Carbon Steel
Max. Pressure	103 bar / 1500 psi



API PLAN 53B



Typical P&ID Configuration PLAN 53B

A: Vent Connection

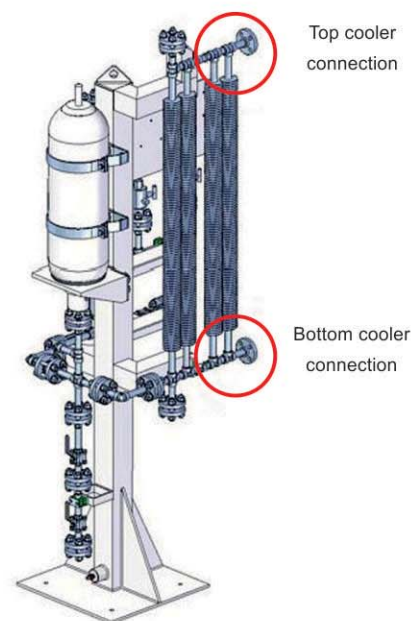
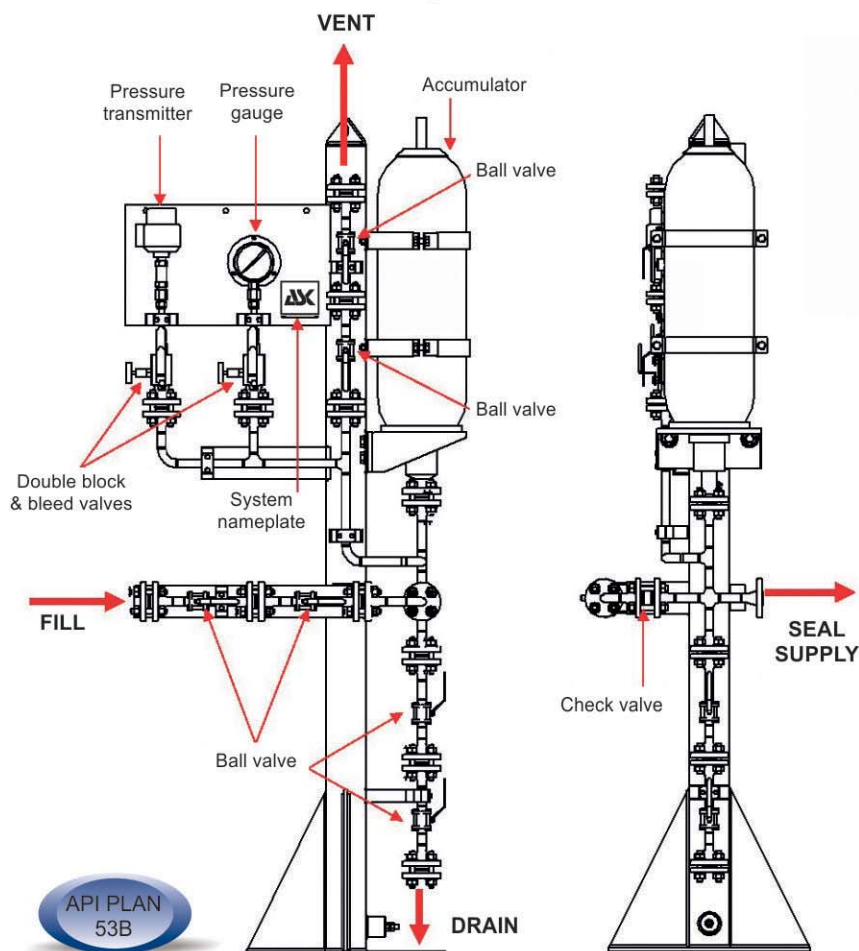
B: Fill Connection

C: Drain Connection

D: Supply to Seal

● Cooling system is not shown.

Schematic diagram



Finned tubing cooler

It may be used when there is no cooling water near the pump.

Where a cooler or bank of finned tubing is used, barrier fluid inlet line should be connected to the bottom cooler tube bank connection, and the barrier fluid outlet should be connected to the top.

Technical Table

Part	Specification	Material	Manufacturer
Bladder Accumulator	2.5 gallons, 160 bar	CS, SS 316	West Europe
Pressure Gauge	0 – 40 bar	316 Stainless Steel	West Europe
Pressure Transmitter	0 – 40 bar EX (Optional)	316 Stainless Steel	West Europe
Ball valve	Ball valve, Flanged 300#, RF	CF3M	West Europe
Check Valve	Flanged, Class 600 #	CF3M	West Europe
On – Off Valve	Connection: ½"	316 Stainless Steel	West Europe
Liquid – Helicoil Cooler	Connection: ½" Cooling capacity depends to application	CF3M	ASK - IRAN
Temperature Gauge (Optional)	0 – 150 °C	316 Stainless Steel	West Europe
Finned Tubing Cooler (Optional)	Schedule 40 pipe, Cooling capacity depends to application	SS 316, Al Alloys, Cooper	ASK - IRAN

Accessories

Mobile Refill Cart

Available in 10 gallon capacity, these portable units provide a means to refill a seal reservoir while still in operation. Each unit is complete with an atmospheric reservoir, hand pump, and hose assembly with quick connect end.

Capacity	10 gallon
Max. Pressure	60 bar
Reservoir Material	316 Stainless Steel

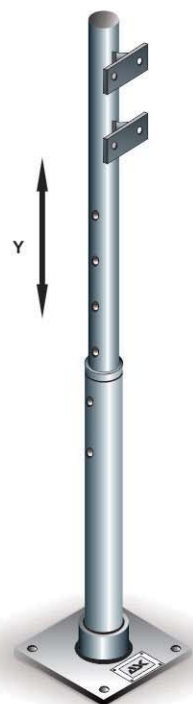
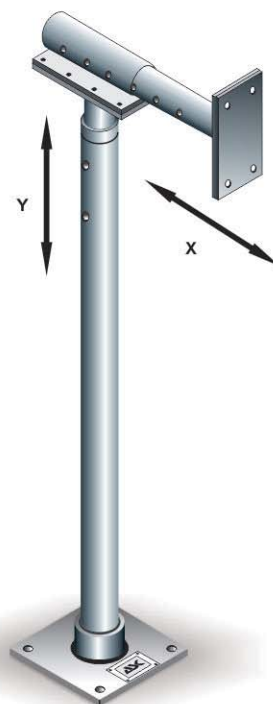
API PLAN
53A

API PLAN
53B



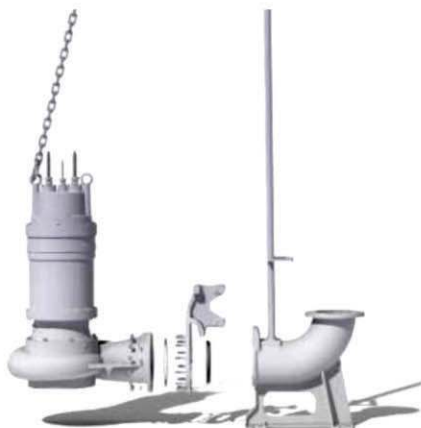
Mounting Stand

- Standard and Telescopic options
- XY and Y Telescopic System Stands
- Robust design
- Heavy duty construction
- Adjustable levers to meet dimensional requirements
- Stainless steel Materials (Optional)



A Leader in Engineered Pump Package Solutions

ASK Family of Pumps



Submersible Sewage Pump
SEW Series



Single Stage Vertical In-Line
Centrifugal Pump
OH3 Series



Vertically Suspended, Single Stage
Centrifugal Pump
VS4 Series



End Suction Horizontal Centrifugal Pump
Centerline Mounted
OH2 Series



Rubber Lined Horizontal
Centrifugal Pump
OH1/SL series



End Suction Horizontal
Centrifugal Pump
Foot Mounted
OH1 Series

ASK Series	Market Sector	Capacity m3/hr	TDH m	Temperature °C	Pressure barg
OH1	General Industries	1100	95	120	16
OH2	Oil	550	260	400	40
OH3	Gas	550	175	350	40
VS4	Petrochemical	1100	95	150	20
OH1/SL	Mining	800	130	85	20
SEW	Water and Waste water	1800	95	70	16

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