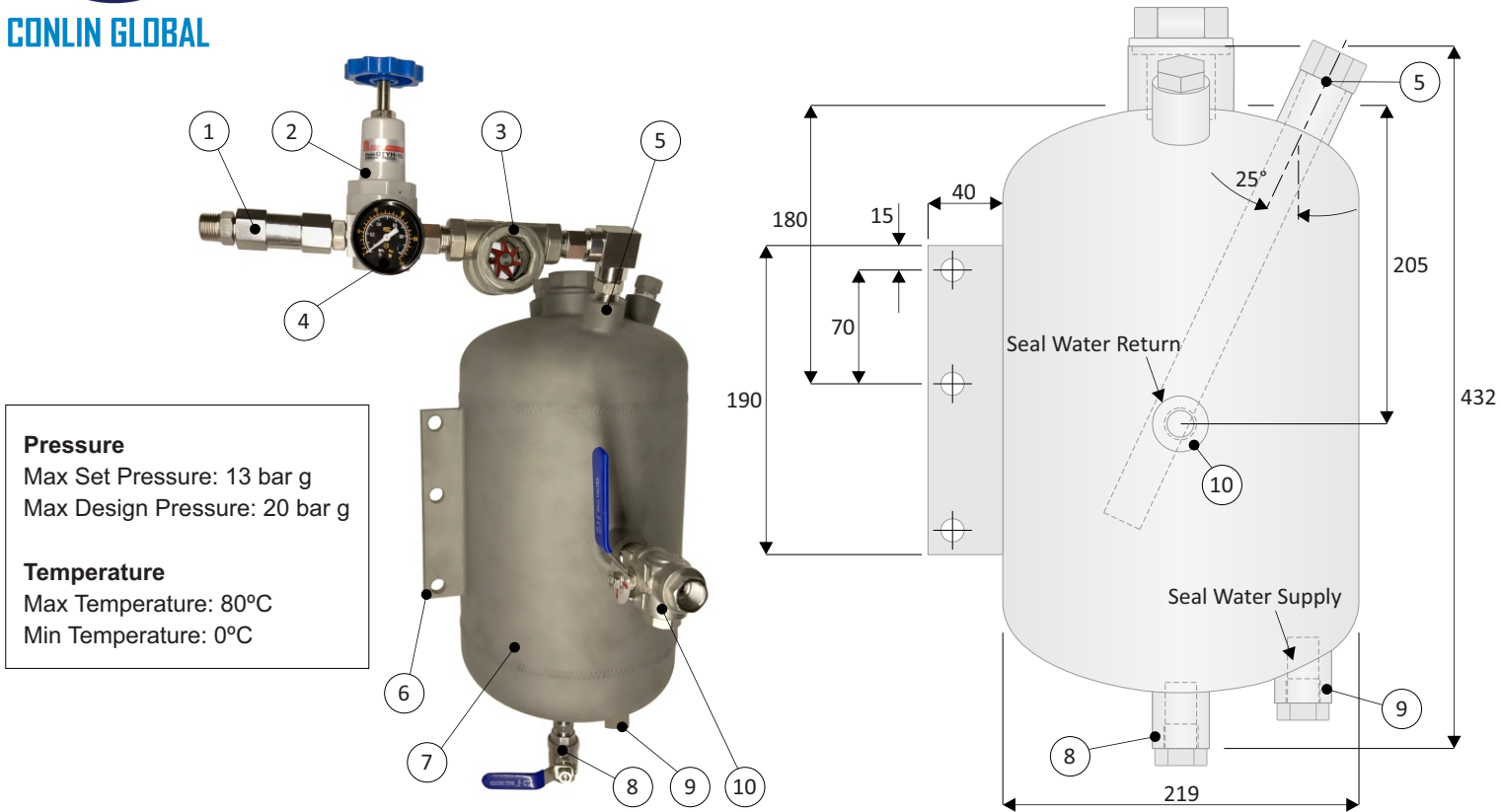


WATER MANAGEMENT SYSTEM



Double seals have often been avoided despite being the best solution for the application. The reason for this is that historically Barrier Fluid Systems have relied on a Nitrogen blanket with or without a “bladder” system. Maintenance engineers have opted to use double seals only when absolutely necessary, however, this has been detrimental to the integrity of the equipment.

The SWMS (Water Management System) barrier fluid system connects directly to the plant water line. Through the Pressure Regulator the plant water line pressure is set to achieve a 1.0 - 1.5 bar above stuffing box pressure. By viewing the flow indicator any mechanical seal failure can be detected, optionally an electronic flow switch can be provided to set off an alarm. The Barrier Fluid is circulated in the system through thermosiphon effect.

The pressure regulator will allow plant water to flow into the tank and re-establish the higher pressure Barrier Fluid automatically. The technician will notice the flow indicator turning and either notice water leakage to atmosphere to indicate outboard seal face leakage, or if no water is present, the cause of the water flow is due to inboard seal face leakage.

Item	Description	Function
1	Non-return valve	Protects plant water supply from potential contamination from the seal and assists with protection against pressure fluctuation.
2	Pressure regulator	Enables the plant water pressure to be set at 1 - 1.5 bar above the stuffing box pressure and allows the automatic replenishing of water in the tank if required.
3	Flow indicator	Provides a visual indication of a mechanical seal upset by turning as the water flows through.
4	Pressure gauge	Barrier fluid pressure display in the tank.
5	Port	Filling water inlet.
6	Flange	Used to mount the pressure vessel onto a support structure.
7	Pressure Pot	304 Stainless Steel water storage tank.
8	2-Way Valve	Allows for the draining of the tank, or flushing of the tank.
9	Port	Outlet for water to the seal.
10	3-Way Valve	Allows the flushing of the seal if required.

Installation of SWMS Water Management System

Installation & Commissioning

1. Install the System in a suitable location, which is free from vibration and no more than 2 meters above and 1 meter from the side of the mechanical seal.
2. Isolate the plant water supply.
3. Connect the Seal Water Supply connection (9) at the bottom of the tank to the bottom barrier fluid port of the mechanical seal, using the tubing provided.
4. Connect the top barrier fluid port of the mechanical seal to the Seal Water Return connection (10) on the side of the tank (7) (at three-way valve). Use the tubing provided, however, it is of utmost importance that there is no sagging of the tube. If the tube sags, cut the tube a bit shorter. The idea is to have some slack in the tubing, but not any sagging.
5. Rotate the setting screw on top of the pressure regulator (2) counter clockwise to the zero position to prevent any liquid from flowing into the tank.
6. Connect the plant water supply to the non-return valve (1) on the “inlet arm” and open the water supply line. There should be no flow due to the fact that the regulator is set to zero.
7. Before filling the vessel, disconnect the seal water return tube at connection (10) on the three-way valve. “Crack” open the pressure regulator (2) to allow a slow stream of water to enter the tank and ultimately the seal.
8. Lower the end of the tube to just above the seal height and allow any trapped air to escape from the seal through the seal water return tube. Once the seal cavity is free from air entrapment, reconnect the tube again (10).
9. Adjust the pressure regulator (2) setting screw clockwise to allow the water supply to flow freely into the tank. At this point the Flow Indicator (3) will be turning to show flow of liquid.
10. Keep an eye on the pressure gauge (4) and adjust the setting screw to achieve the desired barrier fluid pressure on the pressure gauge. *Please note that the pressure of the barrier fluid must be between 1 bar and 1.5 bar above the stuffing box pressure.*
11. When the desired pressure has been reached make sure that the regulator lock nut is fastened to prevent tampering.
12. After commissioning, ensure that the plant water supply is maintained at all times.
13. During normal operation the flow indicator (3) will rotate if there is a problem with the seal. The flow indicator wheel should not be rotating during normal operation.
14. When the system is first run, check the direction of flow – i.e. which pipe gets hot. The warmer pipe should be the one coming from the top of the seal to the side of the tank. Call the technician if this is not so.

Note: Carefully follow the installation and commissioning instructions to ensure that there is a sufficient air pocket at the top of the tank which is required for the system to operate.

Minimum Specification for Hosing

- Pressure: 10 bar at 70°C
- Temperature: -20°C

HEALTH AND SAFETY WARNING

- This system has been designed for use only as a barrier fluid system for mechanical seals using a suitable non-hazardous barrier fluid, typically water.
- The SWMS does not have pressure relief valves supplied.
- Do not over-pressurise the system beyond the maximum design pressure. If there is any possibility of over-pressurisation the system must be fitted with a suitable protection device.
- Do not exceed the operating limits of the system. It is not designed for cyclic loading.
- The system may get hot in operation with risk of burn injury. Suitable engineering controls or guarding should be adopted where necessary.
- Ensure the system is completely leak free before full operation.
- If the barrier fluid becomes contaminated it is recommended that the barrier fluid is replaced taking necessary precautions.
- Isolate the process and power on installation, maintenance and decommissioning (and ensure that the system pressure has been relieved before undertaking maintenance)

Environment

- At end of life of the barrier fluid and system should be disposed of in accordance with local regulations and with due regard to the environment.

Maintenance

- The system should be maintained in accordance with site standards.

After 5 years

- We also recommend that after 5 years a complete internal and external inspection is conducted of the vessel, and all the systems component parts.

VESSEL DETAILS

Vessel Operating Limits:

- Maximum Pressure = 16 bar
- Maximum Temperature = 100°C
- Minimum Temperature = -20°C
- Volume = 10 liters

System Operating Limit:

- Maximum Operating Pressure = 10 bar