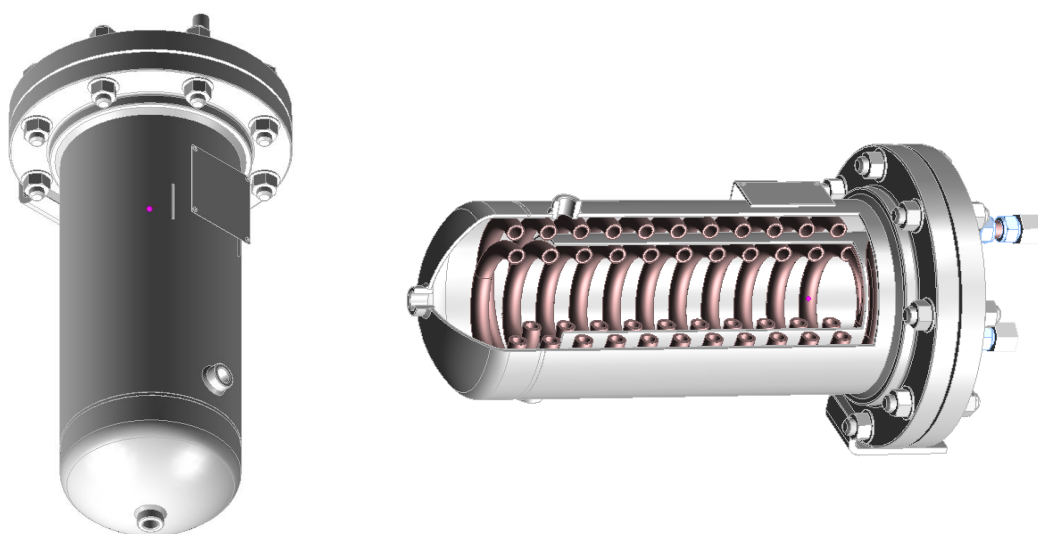


# AES682C Cooler

## Installation Operations & Maintenance Instructions



ENVIRONMENTAL TECHNOLOGY

### **AESSEAL plc**

Complex Systems Division, Mill Close  
Bradmarsh Business Park,  
Rotherham, S60 1BZ

**Tel:** +44 (0) 1709 369966

**E-mail:** [systems@aes seal.com](mailto:systems@aes seal.com)

**[www.aes seal.com](http://www.aes seal.com)**



## Health and Safety

- This system has been designed for use only as a barrier fluid system for mechanical seals using a suitable non-hazardous barrier fluid.
- Isolate the process and power on installation, maintenance and decommissioning (and ensure that the system pressure has been relieved before undertaking maintenance).
- The system should only be installed by competent engineering personnel.
- Electrical connections must be made in compliance with applicable legislation and / or local requirements by a competent / qualified electrician.
- If there is any risk of FIRE the system must be fitted with a suitable pressure relief device to prevent overpressurisation.
- Pipe relief valves discharge to safe area (when fitted).
- Pressure test the complete system assembly at 1.1x maximum working pressure (duration 5 minutes) and ensure the system is completely leak free before full operation.
- 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. Not designed for cyclic loading.
- The system may get hot in operation with risk of burn injury, and suitable engineering controls or guarding should be adopted where necessary. The risk from Legionella bacteria should be assessed with water barrier fluids at temperatures between 20°C to 45°C (68°F to 115°F).
- If the barrier fluid becomes contaminated it is recommended that the barrier fluid is replaced taking necessary precautions. If the contamination is potentially corrosive or damaging to the system remove from service and contact AESSEAL for technical advice.



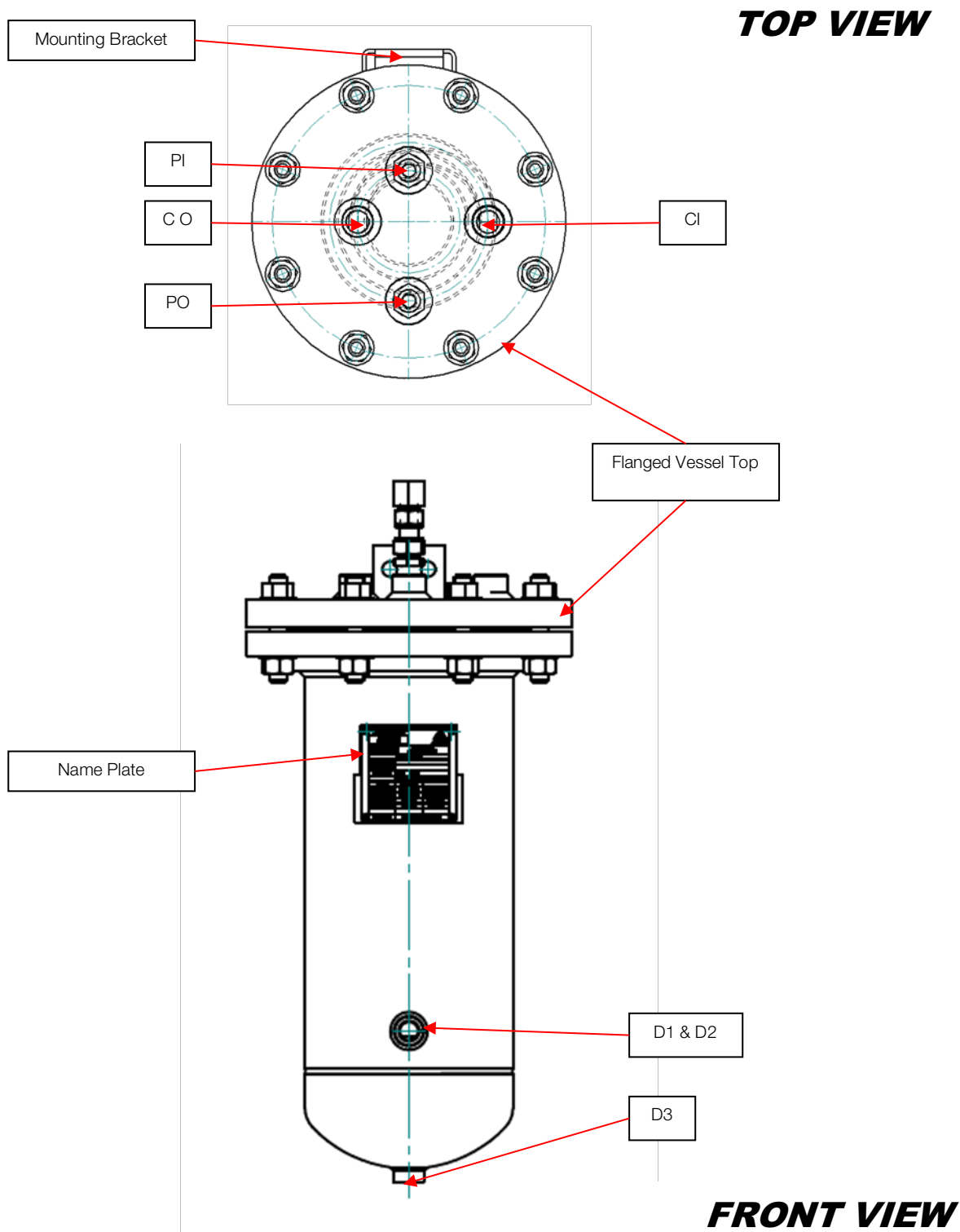
## Environment

Once the system has reached the end of its life, disposal should be in accordance with local regulations and with due regards to the environment.

**For further information please contact **AESSEAL®****

## Installing & Commissioning

### Typical AES682C Operational Arrangement



**Fig. 1 Typical Layout**

**Please also refer to the drawing contained in the document pack whilst reading these instructions!**

## Installing & Commissioning

### Pre-Installation Checks

- The shell-side and coil side should be drained of all fluid before installation or relocation.
- Isolate cooling water flow and fluid in seal loop (requiring cooling).
- If the AES682C cooler has been relocated and/or used on a different cooling application (e.g. change of process or barrier/buffer fluid) the shell-side should be flushed with water and the tube-side flushed with the barrier/buffer fluid to ensure flow passages are clear and free from debris.
- Prior to installation read all instructions for any other components to be used in conjunction with the AES682C as part of the associated API plan / sealing system.
- The AES682C cooler should not be used on barrier/buffer thermosyphon systems without forced circulation from an AESSEAL PUMPPAC/FDU or Pumping Scroll/Flow Inducer, due to risk of flow stalling, leading to seal failure.
- This system can be mounted vertically or horizontally. If mounted vertically; ensure the vessel is oriented so that the flanged end facing upwards.

### Connections

#### Ensure all connections are made:

- PI** Product/Barrier/Buffer In (Hot Fluid In) - ¾" NPTF
- PO** Product/Barrier/Buffer out (Hot Fluid Out) - ¾" NPTF
- CL** Coolant In - ¾" NPTF
- CO** Coolant Out - ¾" NPTF
- D1** Vent/Drain 1 – ½" NPTF
- D2** Vent/Drain 2 – ½" NPTF
- D3** Vent/Drain 3 – ½" NPTF

- Install the vessel in a suitable location, which is free from vibration, mounting it using the holes in the mounting bracket in a position so it is easy to monitor and maintain.
- Connect the '**PI**' port to the line from the outlet of the seal carrying the fluid heated by the seal (e.g. 'BARRIER OUT' on a dual seal system).
- Connect the '**PO**' port to the line supplying cooled fluid to the remainder of the seal cooling loop (e.g. return to seal chamber/pump discharge/circulation tank – dependent on API plan used for the application).
- Connect the '**CI**' port to the line supplying the cooling water.
- Connect the '**CO**' port to the cooling water return line.
- Ensure **D1** & **D2** on opposite sides of the vessel, and **D3** on the bottom of the vessel are plugged and/or closed off with valves (dependent on the API plan and application arrangement).
- Fill the shell side from the cooling water supply and connect the cooling water return line. The time taken for the vessel to fill will be dependent on the flow rate of cooling water supply.
- It is recommended to monitor the system pressure statically for several hours whilst carrying out visual checks at all connection points for signs of leakage, checking any remote instrumentation used in conjunction with this system is functioning correctly.
- In accordance with local/product safety requirements and practises, ensure all lines connecting the seal and system loop are primed and vented before start up of the pump and seal.
- Once satisfied that the system is pressure tight, the equipment can be run up in accordance with operating instructions.

## Operation

- Ensure the vessel is filled with cooling water before removing isolation from the hot fluid/coil side on the seal loop and running the pump and seal.
- Monitor the seal and system for several hours, paying close attention to seal inlet and outlet temperatures, vibration, noise, visible leakage and pressure loss as detailed in AESSEAL plc general commissioning instructions.
- When the system is first run, check the direction of flow – i.e. determine the hot and cool sides of the seal cooling loop connected to the AES682C cooler. The hot pipe should be connected to the 'PI' port on the vessel. If the flow is incorrect, reverse the connections.
- The system will need to be closely monitored for variations in pressure and temperature during the first 2 to 3 hours of operation until the equilibrium temperature is achieved.
- Ensure that the water supply to the vessel remains on after commissioning is complete and during operation.

## Caution

- Do not allow loose thread tape to enter the hot side flow passage.
- All connections should be checked for leakage.
- When the system is filled and operational any plugs should not be removed.

## Operating Limits

### Vessel

Maximum Design Pressure:	16 barg (232 psig)
Hydro Test Pressure:	24 barg (348 psig)
Design Temperature Range:	-50 to 80°C (-58 to 176°F)

### Coil

Maximum Design Pressure:	130 barg (1885 psig)
Hydro Test Pressure:	267 barg (3872.5 psig)
Design Temperature Range:	-50 to 350°C (-58 to 662°F)

**For system specifications and design limits, please see drawing.**

- *For 316 SS Systems, when used with a water based barrier/buffer the Chloride content should not exceed 250ppm.*

## Maintenance

This system should be maintained in accordance with site standards or local regulations.

### Daily

- Check and record system pressure reading. Any change may be a sign of a developing problem such as a blockage/advanced seal leakage.
- Check for signs of leakage from the seal, system support and pipe work.
- Ensure water supply to the cooling side (shell-side) is on and is continuous. Monitor the temperatures at the in and out legs to confirm direction of flow.

### Monthly

- Any filters (if fitted), should be inspected every month and changed if contaminated or blocked.
- If used as part of a barrier/buffer system cooling loop any discolouration of the barrier/buffer fluid or contamination of filters may be an indication of leakage of the inboard mechanical seal faces and should be investigated immediately.

### 5 Years

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

### 10 Years

- The system / vessel should be subjected to a complete and thorough examination, including the undertaking of a full system hydrostatic proof pressure integrity test by a suitably qualified and competent person\*. AESSEAL recommends this should form part of the written scheme of examination as per the PSSR 2000 regulations.

*\* AESSEAL offers a full examination, integrity testing and refurbishment service (or, where necessary, a replacement system / vessel), to ensure continued optimum and safe system performance.*

## Optional Extras

If you have purchased other optional extras, please refer to the installation instructions supplied by the manufacturer.