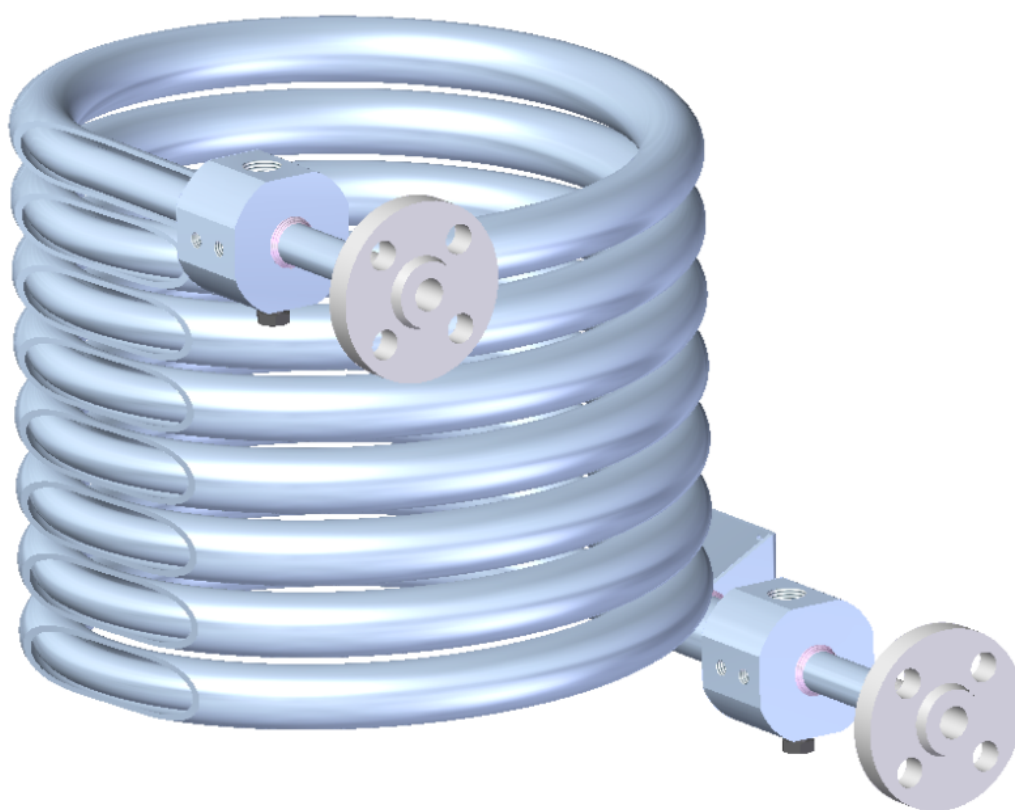


# AES-CIC Cooler

## Installation, Operation & 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

- Before attempting work on any process equipment, ensure that all permit requirements are satisfied and all necessary process, electrical and mechanical isolations are in place.
- Isolate the process and power on installation, maintenance and decommissioning (and ensure that the cooler / system pressure has been relieved before undertaking maintenance).
- The system should only be installed by competent engineering personnel.
- Do not over-pressurise the cooler beyond the maximum design pressure (process and cooling media sections). If there is any possibility of over pressurisation fit a suitable protection device – contact AESSEAL for advice.
- Do not exceed the operating limits of the cooler, please read the nameplate before operation.
- The cooler 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). 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).
- Ensure the cooler is fully vented to remove any trapped air, and is completely leak free before full operation.
- Ensure the cooler 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.



## Environment

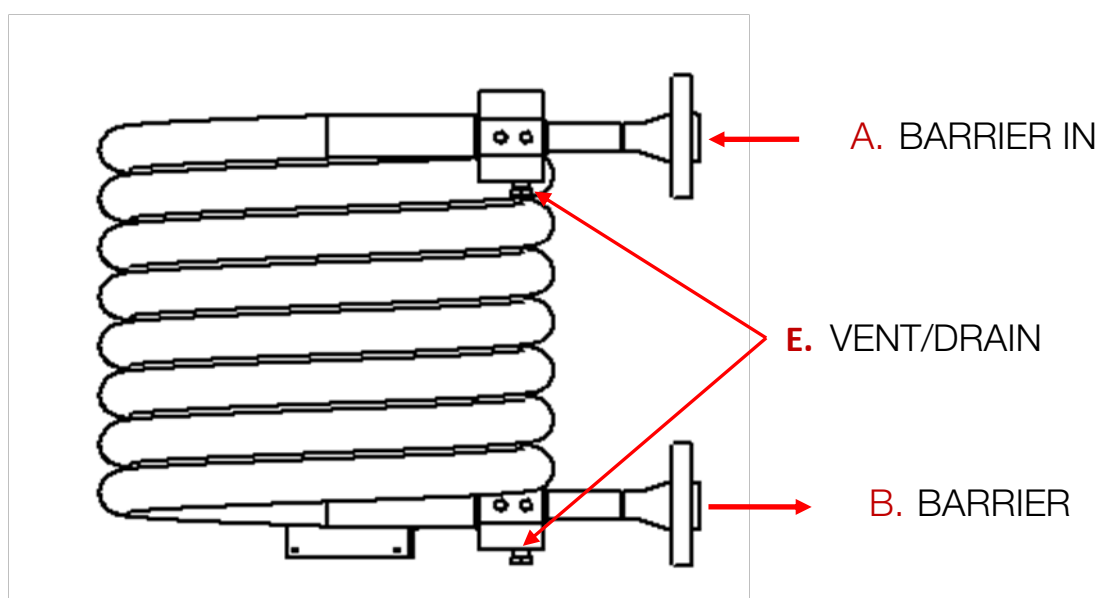
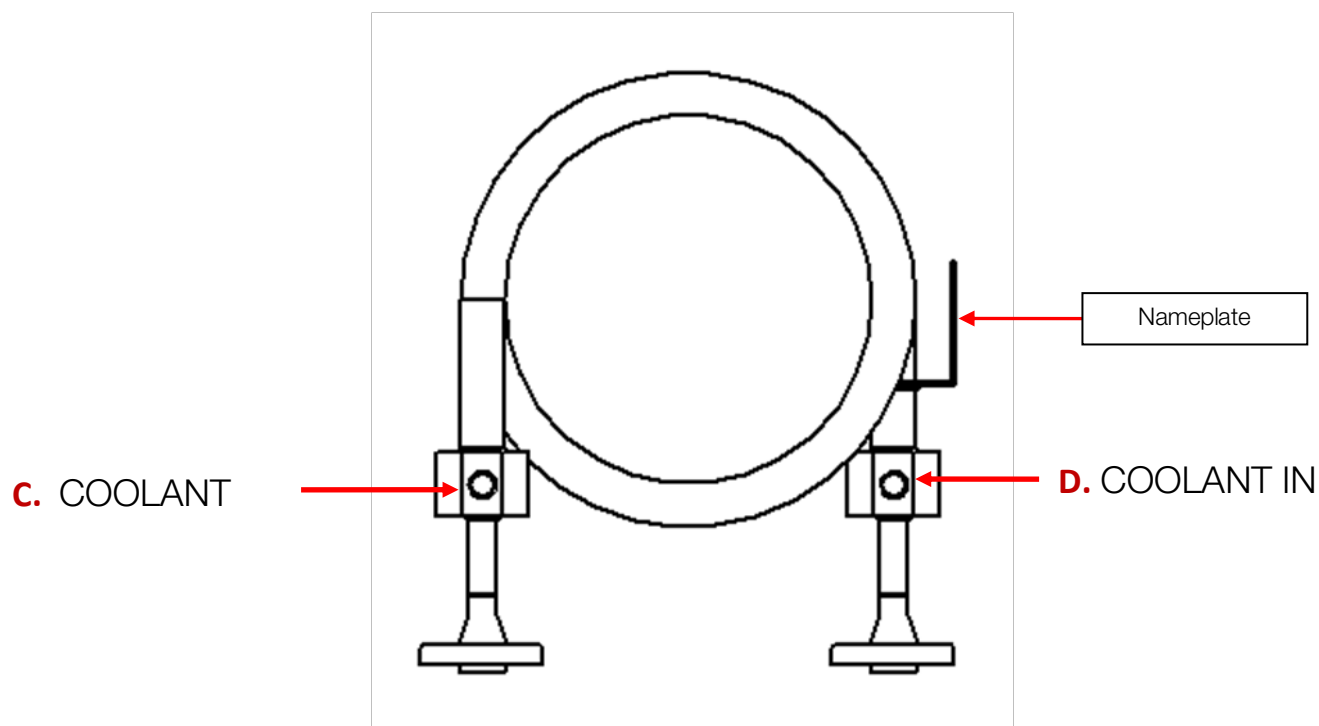
Once the cooler has reached the end of its life, disposal should be in accordance with local regulations and with due regards to the environment.

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

## Installing & Commissioning

### Typical Coil in coil cooler Operational Arrangement

TOP VIEW



SIDE VIEW

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

## Installing & Commissioning

### Pre-Installation Checks

- For optimum performance the CIC cooler has been specifically designed for water, or water based-coolants. If any other coolant is to be used contact AESSEAL for advice.
- It is recommended that the CIC 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.
- The CIC Cooler heat exchanger units are not intended to serve as anchor points for interconnecting pipework. All pipework must be adequately supported and expansion devices fitted as necessary so that loadings are not transmitted to the inlet and outlet nozzles.
- The shell-side and coil side should be drained of any residual fluid before installation or relocation.
- Isolate barrier fluid in seal loop (requiring cooling).
- If the CIC Cooler is to be moved and/or used on a different cooling application (e.g. change of process or barrier/buffer fluid) we recommend that it is flushed and cleaned.
- Prior to installation read all instructions for any other components to be used in conjunction with the cooler as part of the associated API plan / sealing system.

### Connections

#### Ensure all connections are made:

- A** Barrier Fluid **SUPPLY IN** (Hot Fluid In) - ½" (DN15) ASME B16.5 600lb raised face flange
- B** Barrier Fluid **RETURN OUT** (Cooled Fluid Out) - ½" (DN15) ASME B16.5 600lb raised face flange
- C** Coolant **OUT** - ½" NPTF
- D** Coolant **IN** - ½" NPTF
- E(x2)** Vent/Drain - ¼" NPTF (Plugged)

- Mount the CIC Cooler onto the equipment it is intended for by using appropriate supports to hold the cooler in position, and in close proximity to the fluid inlet **A** and outlet **B** connection points to enable coupling-up to the process media and cooling water. **Nb.** No strain should be on the connection points.
- The process fluid is passed through the coolers internal coil by connecting the cooler flanges to the corresponding flanges on the equipments supply and return feeds.  
**Nb.** We recommend that the top connection on the cooler is always used as the inlet for the process fluid.
- Connect the coolant supply **D**, and the coolant out **C** to drain using the appropriate fittings.  
**Nb.** We recommend that the bottom connection on the cooler is always used as the inlet for the coolant. The cooler has been designed to work correctly when the barrier fluid and coolant flows are in opposite directions to each other.
- To vent the coolant supply, undo the vent/drain blanking plugs **Ex2** and turn on the coolant supply until fluid is flowing from both outlets, then retighten the blanking plugs. Check to see that the coolant is flowing to the appropriate drain from outlet **C**.
- Connect and ensure that the process media supply in, and return out connections are connected to the correct inlet **A**, and outlet **B** flanges using the appropriate spiral wound gaskets, stud bolts, nuts and washers, and tightened to the correct torque.
- 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

- 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 Cooler. The hot pipe should be connected to the supply in on the Cooler. 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 coolant supply to the cooler remains on after commissioning is complete and during operation.
- Refer to CIC Cooler nameplate for any operational parameters.

## 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

### Tube/Barrier Fluid side

Maximum Design Pressure:	60 barg (870 psig)
Hydro Test Pressure:	90 barg (1305 psig)
Design Temperature Range:	-50 to 250°C (-58 to 482°F)

### Shell/Coolant side

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)

**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

The cooler 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 cooler, seal, system support and pipe work.
- Ensure coolant supply to the cooling side (shell-side) is on and is continuous. Monitor the temperatures at the in and out connections 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.

### After 5 Years

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

## Optional Extras

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