EasyClean SW Range

Installation, Operation & Maintenance Instructions

AESSEAL®
ENVIRONMENTAL TECHNOLOGY

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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 over-pressurisation.
- 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.

General Information

- The maximum operation temperature of the SW Water Management system has been noted on the Vessel Label (N). Whilst pressurised the temperature should not exceed this temperature at any point
- Temperature indicating strips have been supplied with this vessel which show the maximum temperature that the vessel has reached and the current temperature of the vessel.
- If fitted, the pressure relief valve should be set to 1 bar (14 Psi) above the working pressure otherwise the system may be at risk of over pressurization.
- A warning label has been included with the assembly to inform the operator that the system must be fully depressurised prior to the removal of the clamp.
- All components included in the assembly provided by AESSEAL® have been designated as appropriate for the maximum temperatures and pressures that this system is rated to. No part of the system should be replaced without explicit agreement from AESSEAL®.

Environment

Once the barrier fluid and system have reached the end of its life, it should be disposed of in accordance with local regulations and with due regard to the environment.

For further information please contact AESSEAL®

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Installing & Commissioning

Option: Finned Tubing

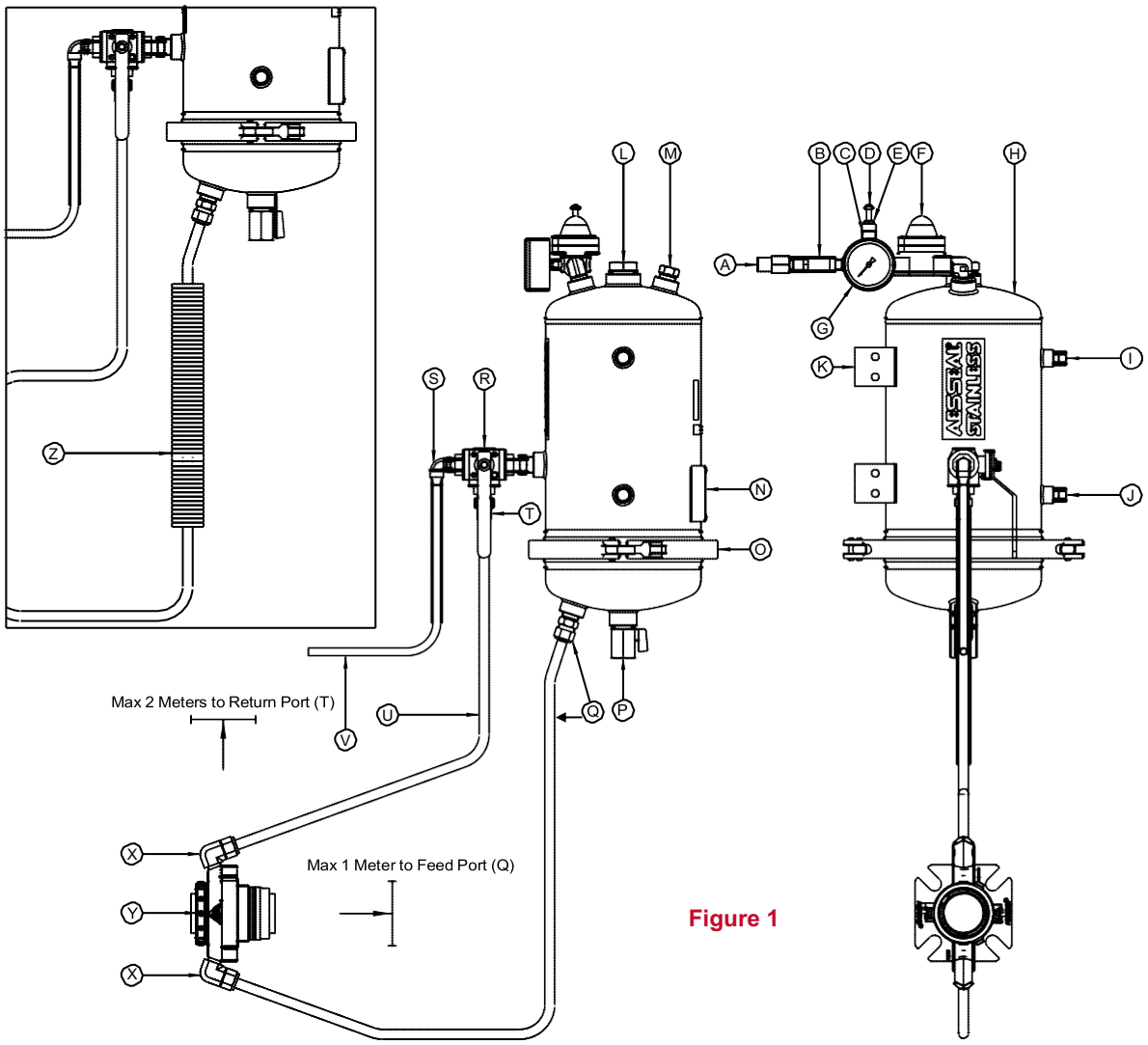
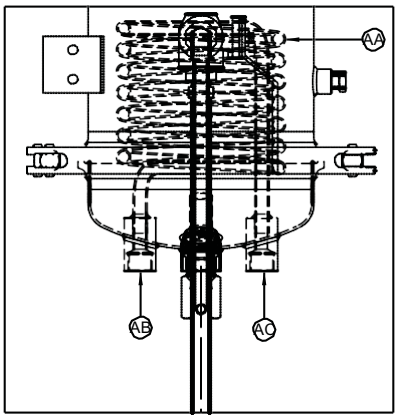


Figure 1

Option: Cooling Coil



A	Water supply Connection	O	Pipe Clamp
B	Non Return Valve	P	Drain Port
C	Pressure Regulator	Q	Seal Supply Connection / Return Pipe
D	Pressure Regulator Screw	R	3-Way Valve (SW2 Only)
E	Pressure Regulator Lock Nut	S	Seal Flush Connection
F	Flow Indicator	T	Seal Return Connection
G	Pressure Gauge	U	Return Pipe
H	Pressure Vessel	V	Seal Flush Pipe
I	Spare Connection	X	Seal Fittings
J	Spare Connection	Y	Mechanical Seals
K	Mounting Brackets	Z	Finned Tubing
L	Instrumentation Port	AA	Cooling Coil
M	Spare Port	AB	Cooling Coil Inlet
N	Vessel Label	AC	Cooling Coil Outlet

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Section 1:

Installation & Commissioning

System configuration depending on set pressure :

	SYSTEM SET (WORKING) PRESSURE		
System Type	**1 to 4 Barg (15-58 psig)**	**4 to 6 Barg (58-87 psig)**	**6 to 8 Barg (87-116 psig)**
SSE10 L	As delivered	As delivered	Fit expansion vessel
SSE25 L	As delivered	remove air vent valve	

For set (working) pressures between 6 & 8 barg (58 & 87 psig) attach the expansion vessel (if not already fitted) to connection 'M' (refer to figure 1)*. Pre-charge expansion vessel with air to 90% of set (working) pressure (replace plastic cap).

25L systems only – for set (working) pressure between 4 & 6 barg (58 & 87 psig), remove the air vent valve (fitted to port I) and fit the plug supplied*.

Where the water supply regulator arm has been supplied seperate (items A to G) connect to the vessel*.

* *NPT threads - use thread sealant (eg Loctite 577), do not use PTFE tape. Tighten by hand first then tighten by 2 to 3 turns with a suitable tool (do not over tighten).*

When fitted ensure that the air vent valve cap is loosened adequately to allow the air to escape.

For cooling coil and finned tube refer to sections 2 and 3.

1. Install the system in a suitable location, which is free from vibration
2. Ensure the vessel is within the following distances from the mechanical seal :
   a. A minimum of 60cm (24") above the mechanical seal.
   b. A maximum of 2 metres (80") above and 1 metre (40 inches) to the side of the mechanical seal (Y).
3. Isolate the water supply.
4. Connect the vessel from the supply connection (Q) to the mechanical seal (S) and from the mechanical seal to the seal return connection (T) using the two lengths of tubing provided.
5. It is imperative to ensure that the seal supply (Q) and return (U) pipelines do not sag and have no sharp bends. It is imperative that the return line (U) from the seal (Y) to the seal return connection (T) does not sag. If installing finned tubing please refer to section 3.
6. Rotate the pressure regulator screw (D) fully counter clockwise.
7. Connect the plant water supply to the non return valve (A).
8. Before filling the vessel, disconnect the return pipe (U) at the seal return connection (T). This will allow trapped air to escape from the seal (Y0.
9. Turn on the plant water supply and fill the vessel until fluid is visible at the end of the seal return pipe (U).
10. Re-connect the seal return pipe and continue to fill the pressure vessel. *Note when the water level in the vessel reaches the air vent valve (when fitted) the noise of air escaping will stop.*

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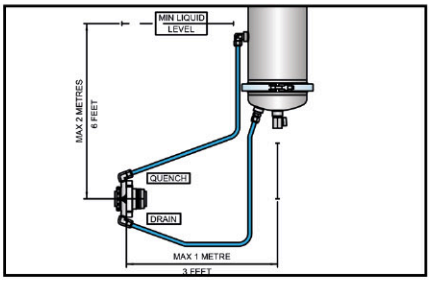

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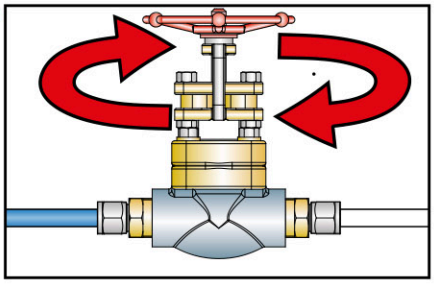

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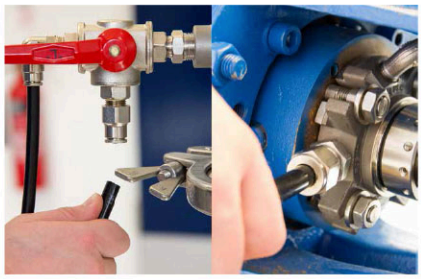

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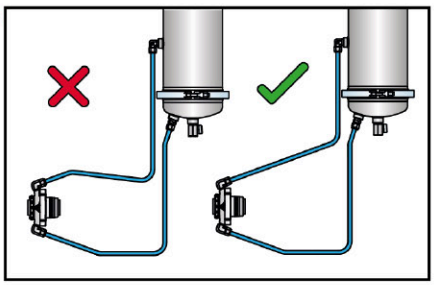

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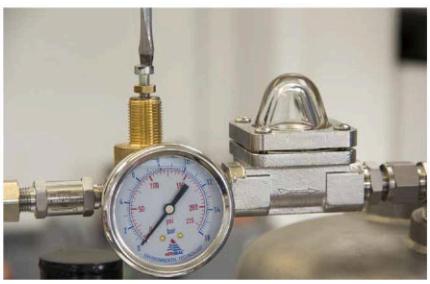

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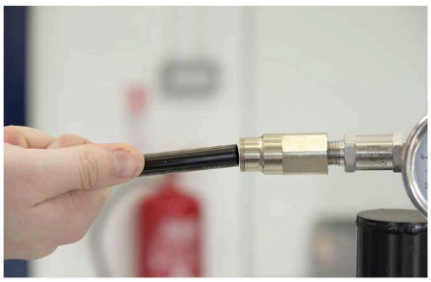

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Section 1 (continued):

Installation & Commissioning

11. At this point the pressure regulator screw (D) can be adjusted clockwise to achieve the desired barrier fluid pressure on the pressure gauge (G). Please note that the pressure of the barrier fluid must be 1 bar/14 psi above the stuffing box pressure.
12. When the desired pressure has been reached close the regulator lock nut (E).
13. During normal operation the flow indicator (F) will indicate if there is a problem with the seal (Y). This ball should not be seen during normal operation.
14. If there is a problem arises the ball inside the indicator (F) will become visible.

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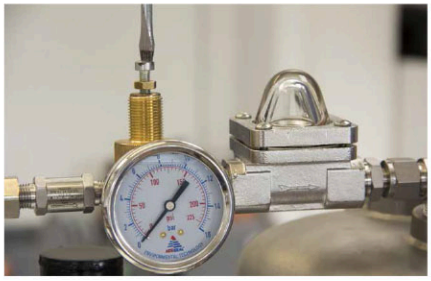

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Section 2:

Cooling Coil

1. Isolate the water supply that you intend to use to the cooling coil.
2. Connect the water supply to the cooling coil inlet port (AB) on the vessel and from the cooling coil outlet port (AC) to an appropriate drain.

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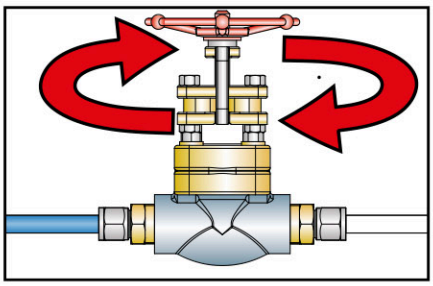

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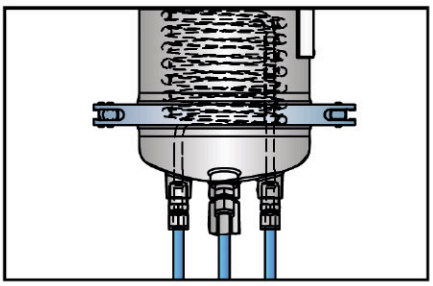

Section 3:

Finned Tubing

1. Install the supplied lengths of finned tubing by connecting one length to the seal supply connection (Q) and the other to the seal return connection (T) on the vessel.
2. The end user supplies and connects the hard pipe from the seal to the finned tubing.

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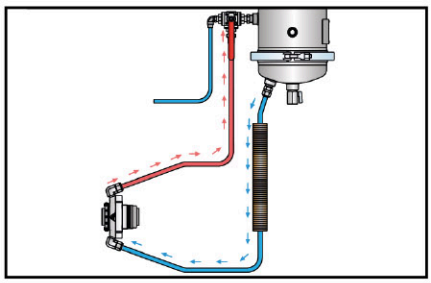

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Installation Notes

- Failure to complete/check the following may result in a malfunction and could cause serious injury.
- When assembling the vessel the alignment of the gasket should be checked to make sure that the ridge of the gasket slots in to the groove of the ferrule.
- When tightening the clamp it is important that each end of the clamp is tightened evenly and that the bolts aretightened to a torque reading of 20Nm. The use of anti-seizing compound on threaded surfaces is strongly advised.
- When assembling the vessel it is important to make sure that the sealing surfaces of the ferrule on the lower and upper parts of the vessel are clean and free from surface defects.
- When assembling the vessel it is important that the gasket is in a pristine condition and has no abrasions or surface defects in any way.
- If in doubt please contact AESSEAL® for further advice

Assembly and Disassembly of Lower Section

1. Carefully align the gasket with the ferrule on the lower section of the vessel.
2. Hold the lower section and offer it up to the upper section of the vessel, ensuring that the gasket lines up with the corresponding groove in both ferrules.
3. Make sure that the clamp is a loose fit on one half of the vessel assembly so that is form encompasses the two ferrules and the gasket.
4. Bring the second arm of the clamp up and so that it fits around the ferrules and gasket. Apply a suitable anti-seizing compound to all threaded components, then align and tighten the bolts to 20Nm. The system should then be pressurised to 1.1 times the operating pressure for a minimum of 5 minutes.

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Section 4:

Direction of Flow

1. When the system is first run, check the direction of flow – i.e. which pipe gets hot. The hot pipe must flow to the return port on the vessel or flow may cease. If the flow is incorrect, reverse the connections at the seal or vessel.

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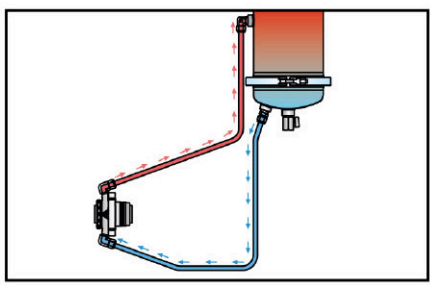

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System Details

System Design Limits

Min Operating Pressure: 1 barg / 15 psig

Max Operating Pressure: 8 barg / 116 psig (with expansion vessel)

Max Design Pressure: 10 barg / 145 psig

Max Temperature: 80ºC / 176ºF (with suitably rated piping/hosing) *

Min Temperature: 0ºC / 32ºF

- *For W2 and P2 Systems, when used with a water based barrier/buffer the Chloride content shall not exceed 100ppm*

* Maximum piping / hosing pressure 10 bar / 145 psi at 80ºC / 176ºF (mimimum temperature 0ºC / 32ºF)

Vessel Maximum Volume:

SSE10: 10 litres / 2.64 gal (US)

SSE25: 25 litres / 6.60 gal (US)

Design Code: ASME VIII Div.1

Complies with Pressure Equipment Directive.

Operation

- If required the system should be flushed and cleaned / sterilised in accordance with site standards prior to commissioning.
- Prior to operation the system should be pressurised with the barrier fluid or another compatible fluid to 1.1 times the working pressure. This pressure should be held for 5 minutes wherein there should be no leakage or drop in pressure. After the completion of the test, the vessel should be filled as per the instructions in Section 1: Installation & Commissioning.
- Use leak detection spray / fluid to check for leaks on all ports and connected equipment at top of vessel.
- Barrier fluid is cooled through a thermosyphon effect. Higher temperature barrier fluid rises into the seal pot allowing cooler fluid to flow out of the seal pot and into the seal. This thermosyphon effect ensures that the seal is kept cool.
- It is important to check the direction of flow by checking the relative temperatures of the inlet and outlet pipes on the vessel to the seal. In normal operation the outlet pipe should be warmer then the inlet pipe.
- Please contact AESSEAL® for further advice.

Maintenance

- The gasket should be inspected for wear prior to each use. There should be no visible damage to the gasket and all the surfaces should be free from dirt or grease. In the event that the gasket is deemed unsuitable it should be destroyed and replaced immediately.
- When re-installing the clamp make sure that the threads on the bolts and hex nuts is clean and free from any build up of dirt or grease and that there is no cross threading. Reapply anti-seizing compound between installations.
- The system and all its components should be maintained in accordance with site standards and as detailed below.

- **Annually**
    - Check and examine the system for leaks and deterioration. Check expansion vessel Ípre-charge pressure (when fitted).
    - As a minimum the gasket should be replaced after 1 year in operation or as site conditions dictate

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- **After 5 Years**
    - It is recommended that after 5 years in operation a complete internal and external inspection be conducted on the vessel and all system components by an AESSEAL® recommended engineer.
    - It is recommended that the clamp be replaced after a period of 5 years in operation.

- **After 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 UK 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.*

- If in doubt please contact AESSEAL® for further advice

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