

SP Range

Installation, Operation & Maintenance Instructions



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EXPERIENCE THE EXCEPTIONAL



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. Use leak detection spray / fluid to check for leaks on all ports and connected equipment at top of vessel.
- Do not over-pressurise the system beyond the maximum allowable 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. 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.

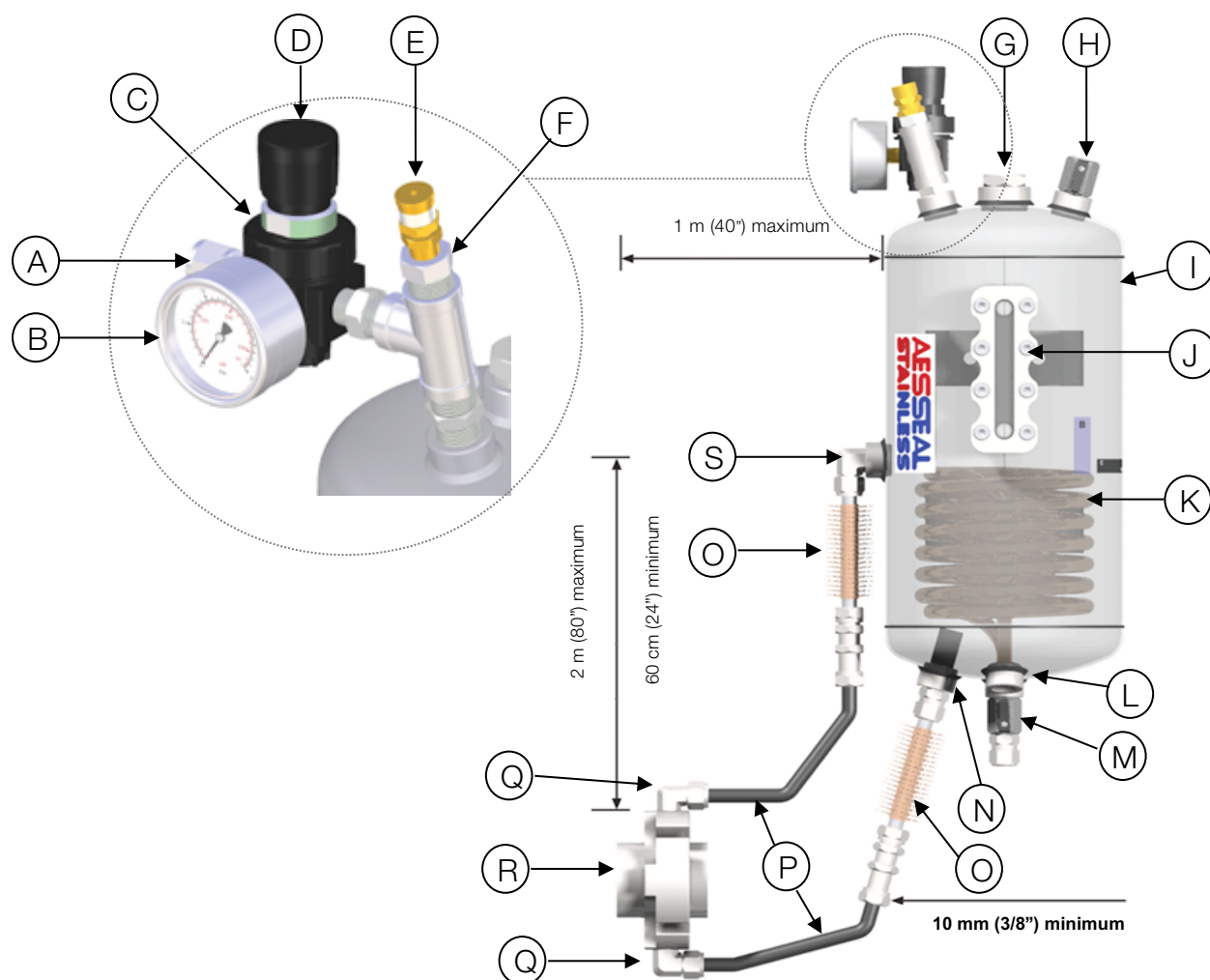


Environment

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

For further information please contact **AESSEAL®**

Fig. 1



Installing & Commissioning Components

- | | |
|---------------------------|---------------------------------|
| A Gas supply connection | K Cooling coil (optional extra) |
| B Pressure gauge | L Cooling coil inlet/outlet |
| C Pressure regulator | M Drain Valve |
| D Pressure regulator cap | N Seal supply connection |
| E Relief valve | O Finned tubing (SP3™ only) |
| F Relief valve lock nut | P Seal supply / return hose |
| G Level switch connection | Q Seal fittings |
| H Vessel fill | R Mechanical seal |
| I Pressure vessel | S Seal return connection |
| J Weld pad | |

1. Install the System in a suitable location which is free from vibration and within the following distances from the mechanical seal :
 - a. A minimum of 60cm (24") above the mechanical seal (R).
 - b. A maximum of 2 metres (80") above and 1 metre (40 inches) to the side of the mechanical seal (R).

2. Isolate the plant gas supply. Connect the vessel from the seal supply connection (N) to the mechanical seal (R), and from the mechanical seal (R) to the seal return connection (S), using the seal supply / return hose provided (P). To prevent the compression fitting crushing the Nylon hose (and possible leakage) push the metal tube insert (provided) fully into the end of the hose (right up to the shoulder on the insert). It is imperative that the return line from the seal (R) to the seal return connection (S) does not sag. If you are installing finned tubing please refer to Note 2.
3. Before filling the vessel, disconnect the return pipe (P) at the seal return connection on the vessel (S). This will allow trapped air to escape from the seal.
4. Open the fill valve (H) and fill the vessel using barrier fluid suitable for the application (oil based or water). Once the fluid is visible from the return pipe (P), re-connect it to the vessel.
5. Continue to fill the vessel until the liquid level reaches a few millimetres below the top of the weld pad level gauge (J). Close the fill valve (H).
6. With the gas supply isolated (inert gas only), connect the supply to the pressure regulator (C) (the pressure regulator has max inlet pressure of 17 bar / 250 psi and max outlet pressure of 13 bar / 200 psi).
7. Screw the cap on the relief valve (E) fully clockwise.
8. Pull up the cap (D) on the pressure regulator (C) and turn it fully anti-clockwise.

Set Relief Valve Pressure

9. The working pressure of the relief valve must be set before the working pressure of the system, (the working pressure of the relief valve should be 1 bar / 14.5 psi above the System working pressure).
10. To set the relieving pressure of the relief valve, turn on the gas supply and turn the pressure regulator cap (D) clockwise until your desired pressure for the relief valve (E) is reached on the pressure gauge (B).
11. Turn the cap on the relief valve (E) slowly clockwise until a small volume of gas begins to dispel from the relief valve, (a slight sound will be heard).
12. At this point stop turning the relief valve cap (E) clockwise, and lock it using the lock nut (F). This is now set as the relieving pressure for the System.
13. The customer should set the relief valve to their requirements, and record the set pressure on the nameplate. NB. If the relief valve has been pre-set as a customer requirement, then this section of the nameplate will be completed on receipt.

Set Working Pressure of the System

14. To set the working pressure of the System (System working pressure must be 1 Bar or 14.5 psi above stuffing box pressure), isolate the gas supply and turn the pressure regulator cap (D) fully anti clockwise until all the gas in the vessel has escaped (gas present from setting the relieving pressure for the relief valve).
15. Turn on the gas supply & turn the pressure regulator cap (D) clockwise until the desired pressure is shown on the pressure gauge (B). This is now set as the System working pressure. Press the cap (D) down to lock it so that the pressure can not be altered.
16. Ensure that the gas supply to the vessel remains on after commissioning is complete.
17. If your vessel has a cooling coil (K) refer to Note 1 for commissioning details.

Note 1: Cooling Coil

1. Isolate the site water supply and connect to the cooling coil inlet port on the vessel, and from the cooling coil outlet port to an appropriate drain.

Note 2: Finned Tubing

2. Install the supplied lengths of finned tubing by connecting one length to the seal supply connection (N), and the other to the seal return connection on the vessel (S)*.
3. The end user supplies and connects the hard pipe from the seal to the finned tubing (O).

**Finned tubing can be bent to suit the application.*

Note 3: Direction of Flow

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

System Refilling

The system can be refilled in 3 main ways:

1. Depressurising the system

- a. The system can be depressurised by isolating the nitrogen pressure to the system and turning the regulator cap (D) counter-clockwise. The regulator is self-venting so as the set pressure is reduced, nitrogen will be released from the system lowering the system pressure.
- b. Open the fill valve (H) and carefully pour clean barrier fluid into the vessel through the open valve using a funnel or other. Care should be taken to avoid spillages.
- c. Once the desired barrier fluid level is achieved, close the fill valve (H) and repressurise the system following the 'Set Working Pressure of the System' section above.

2. System Hand Pump (If Supplied)

- a. Make sure that the hand pump reservoir is full of the correct barrier fluid before using to refill the system, this can be done without having to depressurise the vessel.
- b. If an isolation valve has been positioned between the hand pump and the vessel ensure that this valve is open.
- c. Operate the hand pump handle; with each stroke a volume of barrier fluid is transferred into the vessel. This will displace the nitrogen in the vessel which will vent through the self venting regulator to maintain the barrier fluid set pressure.
- d. Continue to pump until the desired barrier fluid level is achieved whilst replenishing the hand pump reservoir as appropriate.

3. Customer Hand Pump

- a. If depressurising the system can not be tolerated and the system has not been fitted with a hand pump, then an alternative appropriate hand pump should be used. Ensure the barrier fluid used is the same as the barrier fluid already in the vessel.
- b. A suitably pressure rated non return valve should be fitted to fill valve (H), then the hand pump outlet can be connected to the non return valve using a suitably rated hose. N.B. If assistance is required in determining the suitability of the non return valve, hand pump or hose please contact AESSEAL for advice.
- c. Open fill valve (H) and operate the hand pump handle. With each stroke a volume of barrier fluid is transferred into the vessel. This will displace the nitrogen in the vessel which will vent through the self venting regulator to maintain the barrier fluid set pressure. Continue to pump until the desired barrier fluid level is achieved.
- d. Continue to pump until the desired barrier fluid level is achieved whilst refilling the barrier fluid level in the hand pump reservoir as appropriate.
- e. Ensure the fill valve (H) is closed before removing the hand pump, hosing and non return valve from the system. Care must be taken to avoid loosening the connection between the fill valve (H) and the vessel (I). It is recommended that this connection is checked for leaks after filling is complete.

Optional Extra's Installation/ Commissioning

If you have purchased an optional extra please refer to the installation instructions supplied with it.

Maintenance

The system should be maintained in accordance with site standards.

- **Daily** - Check for leaks and barrier fluid pressure & temperature.
- **Annually** - Check and examine the system for leaks and deterioration. Check expansion vessel pre-charge pressure (when fitted).
- **5 years** - Complete a full internal and external inspection of the vessel and all system 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*

System Design Limits :

- Maximum Pressure (SSE10 / SSE25) : 10 barg / 145 psig (minimum 1 barg / 15 psig)
- Maximum Pressure (AES15 / SSE25 HP) : 30 barg / 435 psig (minimum 1 barg / 15 psig)
- Maximum Temperature : 100°C / 212°F (with suitably rated piping), or
80°C / 176°F (with suitably rated Nylon hosing*)
- Minimum Temperature = -20°C / -4°F (water applications 0°C / 32°F)

* Minimum hosing specification 10 Bar / 145 psi at 80°C/176°F (min temperature -20°C / -4°F)

Vessel Maximum Volume :

- SSE10 = 10 litres / 2.64 gal (US)
- SSE12 = 12 litres / 3.00 gal (US)
- AES15 = 15 litres / 3.96 gal (US)
- SSE25 = 25 litres / 6.60 gal (US)

Vessel Design Code :

ASME VIII Div.1

Complies with Pressure Equipment Directive (2014/68/EU) & Pressure Equipment (Safety) Regulations 2016