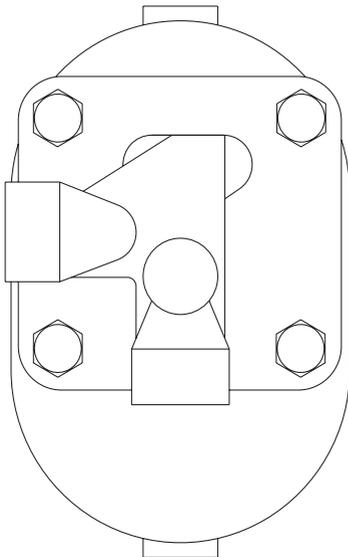


**AE10S High Capacity
Automatic Air and Gas Vent for Liquid Systems**
Installation and Maintenance Instructions



1. Safety information
2. General product information
3. Installation
4. Commissioning
5. Operation
6. Maintenance
7. Spare parts

1. Safety information

Safe operation of these products can only be guaranteed if they are properly installed, commissioned, used and maintained by qualified personnel (see Section 11 within this document) in compliance with the operating instructions. General installation and safety instructions for pipeline and plant construction, as well as the proper use of tools and safety equipment must also be complied with.

1.1 Intended use

Referring to the Installation and Maintenance Instructions, name-plate and Technical Information Sheet, check that the product is suitable for the intended use / application. The products listed below comply with the requirements of the European Pressure Equipment Directive 97 / 23 / EC and carry the CE mark when so required. The products fall within the following Pressure Equipment Directive categories:

| Product | Group 2 Gases | Group 2 Liquids |
|---------|---------------|-----------------|
| AE10S | SEP | SEP |

- i) The products have been specifically designed for use on steam, air or water / condensate which are in Group 2 of the above mentioned Pressure Equipment Directive. The products' use on other fluids may be possible but, if this is contemplated, Spirax Sarco should be contacted to confirm the suitability of the product for the application being considered.
- ii) Check material suitability, pressure and temperature and their maximum and minimum values. If the maximum operating limits of the product are lower than those of the system in which it is being fitted, or if malfunction of the product could result in a dangerous overpressure or overtemperature occurrence, ensure a safety device is included in the system to prevent such over-limit situations.
- iii) Determine the correct installation situation and direction of fluid flow.
- iv) Spirax Sarco products are not intended to withstand external stresses that may be induced by any system to which they are fitted. It is the responsibility of the installer to consider these stresses and take adequate precautions to minimise them.
- v) Remove protection covers from all connections before installation.

1.2 Access

Ensure safe access and if necessary a safe working platform (suitably guarded) before attempting to work on the product. Arrange suitable lifting gear if required.

1.3 Lighting

Ensure adequate lighting, particularly where detailed or intricate work is required.

1.4 Hazardous liquids or gases in the pipeline

Consider what is in the pipeline or what may have been in the pipeline at some previous time. Consider: flammable materials, substances hazardous to health, extremes of temperature.

1.5 Hazardous environment around the product

Consider: explosion risk areas, lack of oxygen (e.g. tanks, pits), dangerous gases, extremes of temperature, hot surfaces, fire hazard (e.g. during welding), excessive noise, moving machinery.

1.6 The system

Consider the effect on the complete system of the work proposed. Will any proposed action (e.g. closing isolation valves, electrical isolation) put any other part of the system or any personnel at risk?

Dangers might include isolation of vents or protective devices or the rendering ineffective of controls or alarms. Ensure isolation valves are turned on and off in a gradual way to avoid system shocks.

1.7 Pressure systems

Ensure that any pressure is isolated and safely vented to atmospheric pressure. Consider double isolation (double block and bleed) and the locking or labelling of closed valves. Do not assume that the system has depressurised even when the pressure gauge indicates zero.

1.8 Temperature

Allow time for temperature to normalise after isolation to avoid danger of burns.

1.9 Tools and consumables

Before starting work ensure that you have suitable tools and/or consumables available. Use only genuine Spirax Sarco replacement parts.

1.10 Protective clothing

Consider whether you and/or others in the vicinity require any protective clothing to protect against the hazards of, for example, chemicals, high/low temperature, radiation, noise, falling objects, and dangers to eyes and face.

1.11 Permits to work

All work must be carried out or be supervised by a suitably competent person. Installation and operating personnel should be trained in the correct use of the product according to the Installation and Maintenance Instructions.

Where a formal 'permit to work' system is in force it must be complied with. Where there is no such system, it is recommended that a responsible person should know what work is going on and, where necessary, arrange to have an assistant whose primary responsibility is safety.

Post 'warning notices' if necessary.

1.12 Handling

Manual handling of large and/or heavy products may present a risk of injury. Lifting, pushing, pulling, carrying or supporting a load by bodily force can cause injury particularly to the back. You are advised to assess the risks taking into account the task, the individual, the load and the working environment and use the appropriate handling method depending on the circumstances of the work being done.

1.13 Residual hazards

In normal use the external surface of the product may be very hot. If used at the maximum permitted operating conditions the surface temperature of some products may reach temperatures in excess of 500°C (932°F).

Many products are not self-draining. Take due care when dismantling or removing the product from an installation (refer to 'Maintenance instructions').

1.14 Freezing

Provision must be made to protect products which are not self-draining against frost damage in environments where they may be exposed to temperatures below freezing point.

1.15 Safety information

See the relevant Sections of the attached Installation and Maintenance Instructions for specific details relating to these products.

1.16 Disposal

Unless otherwise stated in the Installation and Maintenance Instructions, this product is recyclable and no ecological hazard is anticipated with its disposal providing due care is taken.

1.17 Returning products

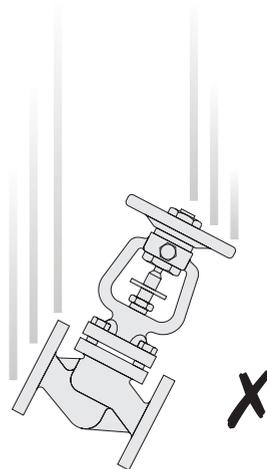
Customers and stockists are reminded that under EC Health, Safety and Environment Law, when returning products to Spirax Sarco they must provide information on any hazards and the precautions to be taken due to contamination residues or mechanical damage which may present a health, safety or environmental risk. This information must be provided in writing including Health and Safety data sheets relating to any substances identified as hazardous or potentially hazardous.

1.18 Working safely with cast iron products on steam

Cast iron products are commonly found on steam and condensate systems. If installed correctly using good steam engineering practices, it is perfectly safe. However, because of its mechanical properties, it is less forgiving compared to other materials such as SG iron or carbon steel. The following are the good engineering practices required to prevent waterhammer and ensure safe working conditions on a steam system.

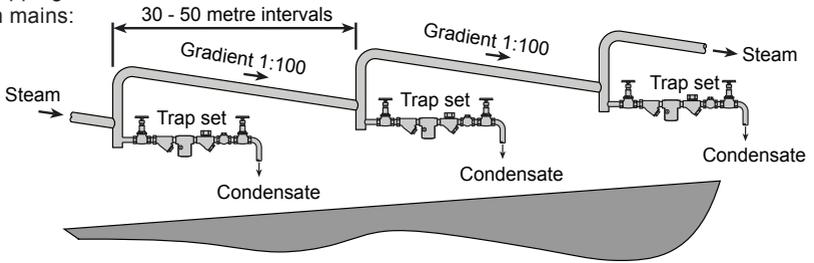
Safe Handling

Cast Iron is a brittle material. If the product is dropped during installation and there is any risk of damage the product should not be used unless it is fully inspected and pressure tested by the manufacturer.

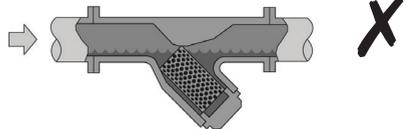
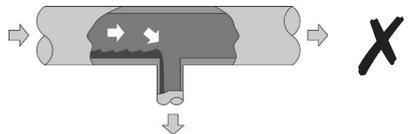
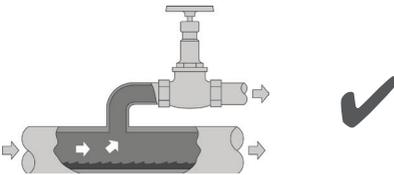
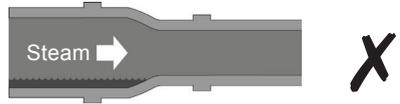
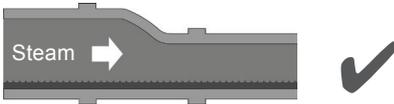
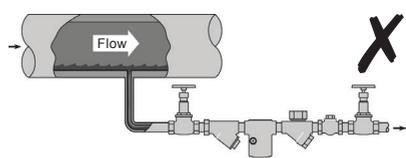
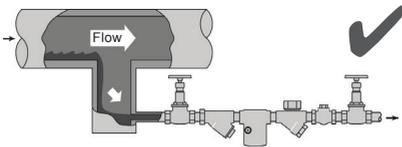


Prevention of water hammer

Steam trapping
on steam mains:

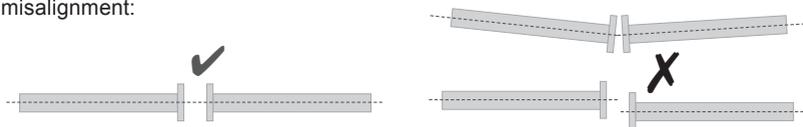


Steam Mains - Do's and Don'ts:



Prevention of tensile stressing

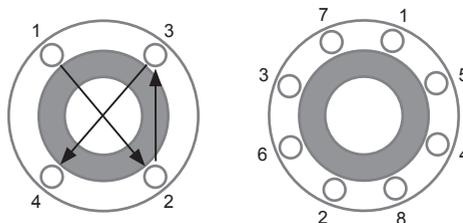
Pipe misalignment:



Installing products or re-assembling after maintenance:

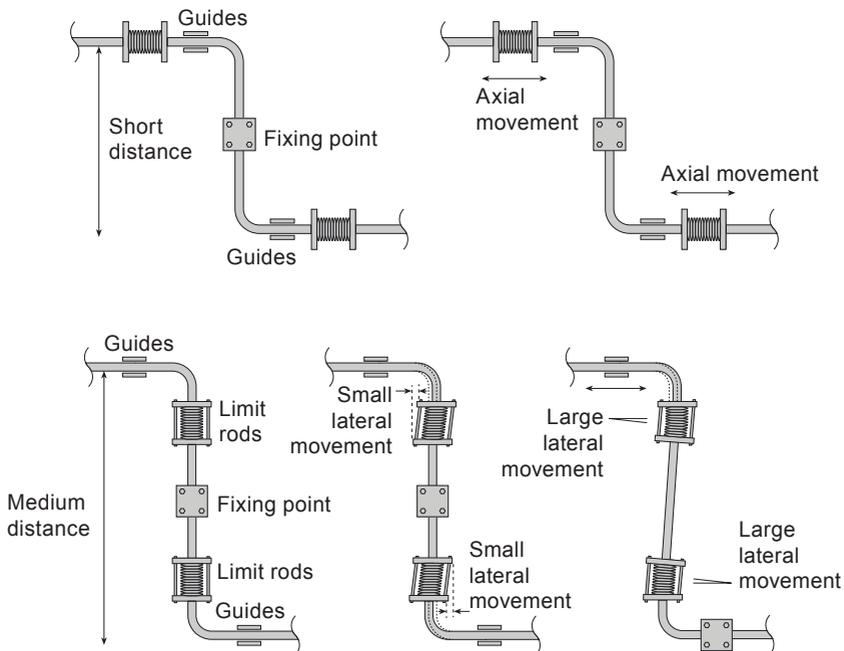


Do not over tighten.
Use correct torque figures.



Flange bolts should be gradually tightened across diameters to ensure even load and alignment.

Thermal expansion:



2. General product information

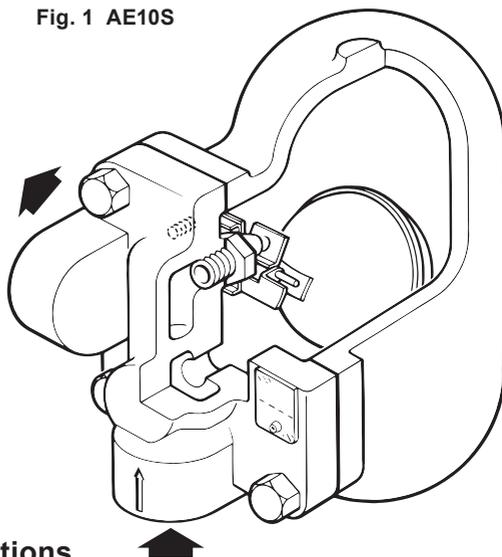
2.1 General description

The AE10S is a high capacity float type automatic air and gas vent for liquid systems and is readily maintainable. The body and cover are of cast iron and the valve and seat of stainless steel.

Certification

The product is available with certification to EN 10204 2.2 for body and cover as standard.

Fig. 1 AE10S



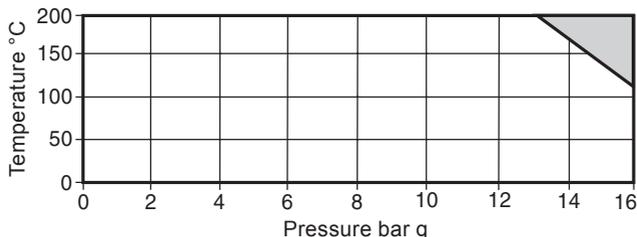
2.2 Sizes and pipe connections

3/4" screwed BSP or NPT.

2.3 Limiting conditions

| | | | |
|---|-------------------------------|----------|-------------|
| Maximum body design conditions | | | PN16 |
| PMA | Maximum allowable pressure | 16 bar g | (232 psi g) |
| TMA | Maximum allowable temperature | 200°C | (392°F) |
| PMO | Maximum operating pressure | 16 bar g | (232 psi g) |
| TMO | Maximum operating temperature | 200°C | (392°F) |
| ΔPMX | Maximum differential pressure | 6 bar | (87 psi g) |
| Designed for a maximum cold hydraulic test pressure of: | | 24 bar g | (348 psi g) |
| Minimum specific gravity of liquid | | | 0.6 |

2.4 Operating range



 The product must not be used in this region.

3. Installation

Note: Before actioning any installation observe the 'Safety information' in Section 1.

Referring to the Installation and Maintenance Instructions, name-plate and Technical Information Sheet, check that the product is suitable for the intended installation:

- 3.1** Check materials, pressure and temperature and their maximum values. If the maximum operating limit of the product is lower than that of the system in which it is being fitted, ensure that a safety device is included in the system to prevent overpressurisation.
- 3.2** Determine the correct installation situation and the direction of fluid flow.
- 3.3** Remove protective covers from all connections.
- 3.3** The ¾" AE10S high capacity automatic air vent must always be fitted with the inlet at the bottom so that the float mechanism is rising and falling in a vertical plane. From the tapping provided at the low point of the cover, a ½" balance pipe having continuous rise towards the automatic air vent must be fitted and connected into the inlet pipework (as shown in Figure 2) which is essential for satisfactory operation.

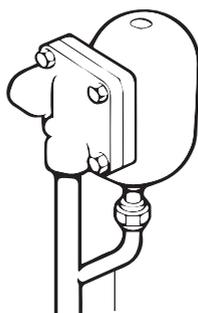


Fig. 2

½" Balance pipe

Because of the way automatic air and gas vents operate they all dribble water and liquid when discharging air and gas. This is perfectly normal. Spirax Sarco recommend piping the discharge to a safe visible point or drain via an air break.

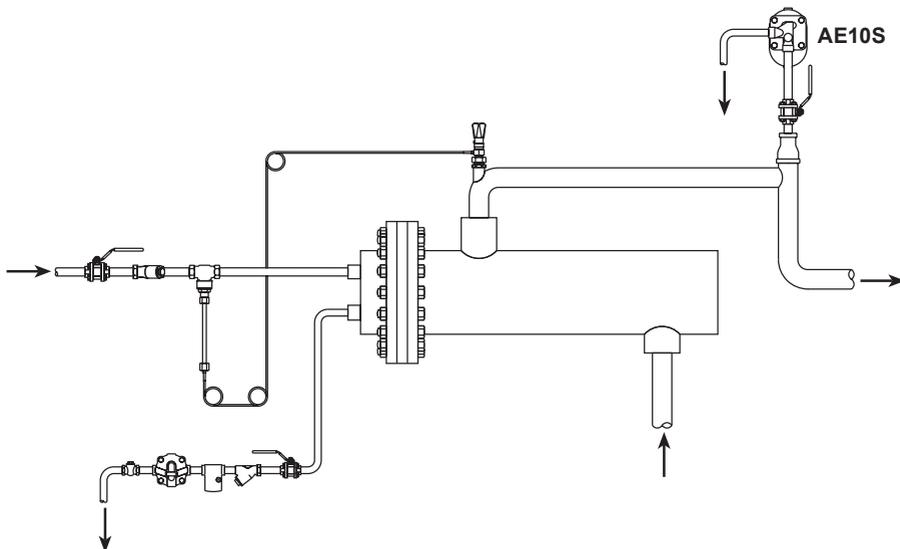


Fig. 3
 Typical installation using an AE10S on a fuel oil system where elimination of air is essential prior to a metering station.

4. Commissioning

After installation or maintenance ensure that the system is fully functioning. Carry out tests on any alarms or protective devices.

5. Operation

Spirax Sarco automatic air eliminators utilise a simple, but well proven, float and lever valve assembly which opens to air and gases and closes tightly against water. Once fitted they require no adjustment, either on start-up or during subsequent running. Operation is totally automatic over a variety of light or heavy duty applications.

6. Maintenance

Note: Before actioning any maintenance program observe the 'Safety information' in Section 1.

Warning

The cover gasket contains a thin stainless steel support ring which may cause physical injury if not handled and disposed of carefully.

6.1 General information

With suitable isolation, repairs can be carried out with the automatic air vent in the pipeline.

6.2 How to fit the main valve assembly:

- Once the trap has been isolated, undo the cover bolts (2) and lift off the cover.
- Remove the existing mechanism (5, 6, 7, 8, 9, 15, 16 and 17). Using a little jointing paste on the thread and gasket (6), fit the new valve seat (5) to the body.
- Attach the support frame (15) and pivot frame (16) to the body using the assembly set screws (7) but do not tighten.
- Fit the float arm (8 and 9) to the pivot frame (16) using the pin (17) and by moving the complete assembly, centre the valve cone onto the seat orifice. Tighten the assembly set screws (7) to the recommended torque (see Table 1).
- Check the operation by raising and lowering the float several times, making sure that the valve cone is centering properly on the seat.
- When reassembling make sure that all joint faces are clean. Always use a new gasket (3). Tighten cover bolts uniformly and to the recommended torque.
- Open up the isolating valve, allowing system pressure to build up slowly.
- Check for leaks.

7. Spare parts

The spare parts available are shown in heavy outline. Parts drawn in broken line are not supplied as spares.

Available spares

Main valve assembly with float

5, 6, 7, 8, 9, 15, 16, 17

Three complete sets of gaskets (packet of 3 sets)

3, 6

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of automatic air vent.

Example: 1 - Main valve assembly with float for a 3/4" Spirax Sarco AE10S high capacity automatic air and gas vent.

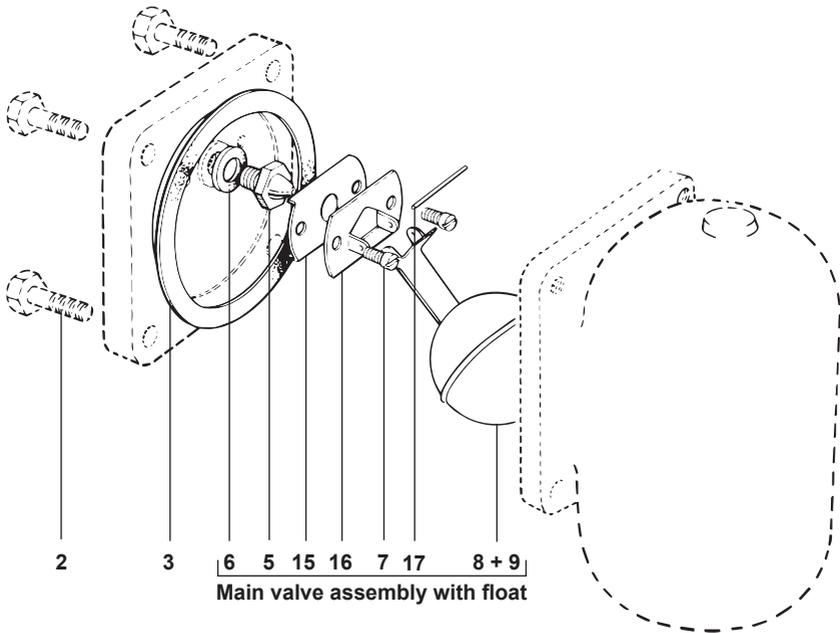


Fig. 4

Table 1 Recommended tightening torques

| Item No. |  | or mm |  | N m | (lbf ft) |
|----------|---|----------|---|-----------|-------------|
| 2 | 17 A/F | | M10 x 30 | 29 - 32 | (20 - 23) |
| 7 | | | M5 x 20 | 2.5 - 2.8 | (1.8 - 2.0) |
| 5 | 17 A/F | | M12 x 8 | 50 - 55 | (36 - 39) |

