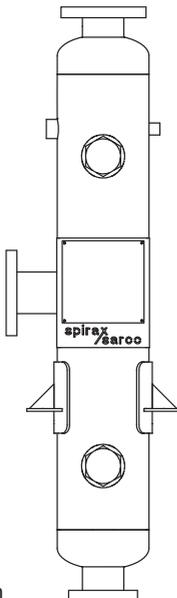


FV
Flash Vessel
Installation and Maintenance Instructions



FV6 shown

1. Safety information
2. Specific product safety information
3. Product information
4. Installation
5. Commissioning
6. Operation
7. Maintenance
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1. Safety information

Safe operation of the unit can only be guaranteed if it is properly installed, commissioned and maintained by a qualified person (see Section 1.10) 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 these 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 Pressure Equipment Directive (PED) and carry the  mark. The products fall within the following Pressure Equipment Directive categories:

Product	Group 2 Gases
Flash vessel, FV6 and FV8	Category 2
Flash vessel, FV12, FV15 and FV18	Category 3

- i) The products have been specifically designed for use with steam which is 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 products 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 over temperature 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 transit 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.

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.

1.7 Temperature

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

1.8 Tools and consumables

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

1.9 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.

1.10 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 these 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.

1.11 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.

1.12 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 flash vessels may reach a temperature approaching 198 °C (390 °F).

Many products are not self-draining. Take due care when dismantling or removing the product from an installation (refer to Section 7 - 'Maintenance instructions').

1.13 Freezing

Provision must be made to protect products which are not self-draining against frost damage if they are inoperative in environments where they may be exposed to temperatures below freezing point during shutdown. The vessel should be thoroughly defrosted prior to use. Trace heating should be considered under severe environmental conditions, in order to prevent the operating temperature of the vessel dropping below -10 °C (14 °F) during service.

1.14 Disposal

This product is recyclable and no ecological hazard is anticipated with its disposal providing due care is taken.

1.15 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.

2. Specific product safety information

The following information is specific to FV type flash vessels and should be read in conjunction with the 'Safety information', Section 1

2.1 Overpressure protection

Flash vessels must be protected against overpressure situations and provision is made for fitting a safety valve. However, it should not be assumed that the safety valve will be the same size as the connection. Safety valve sizing must be in accordance with National Standards. A connection is also provided for a pressure gauge. Safety valves and pressure gauges are both available from Spirax Sarco.

Warning

If this product is not used in the manner specified by this IMI, then the protection provided may be impaired.

3. Product information

3.1 General information

Spirax Sarco products are designed, manufactured and tested to exacting standards to meet modern system requirements. Where applicable, they satisfy current safety and design codes and users can expect long service life when products are selected, installed and maintained in accordance with Spirax Sarco recommendations.

The FV type flash vessels are designed and constructed to comply with the Pressure Equipment Directive (PED), these vessels are particularly suited to boiler heat recovery systems where efficient separation of flash steam from blowdown is essential to prevent contamination of the boiler feedtank and/or heat transfer surfaces. Spirax Sarco flash vessels are equally suited to condensate steam flash applications.

This Installation and Maintenance Instruction document provides comprehensive information on operation, installation and maintenance and should be read prior to commencing work on the product.

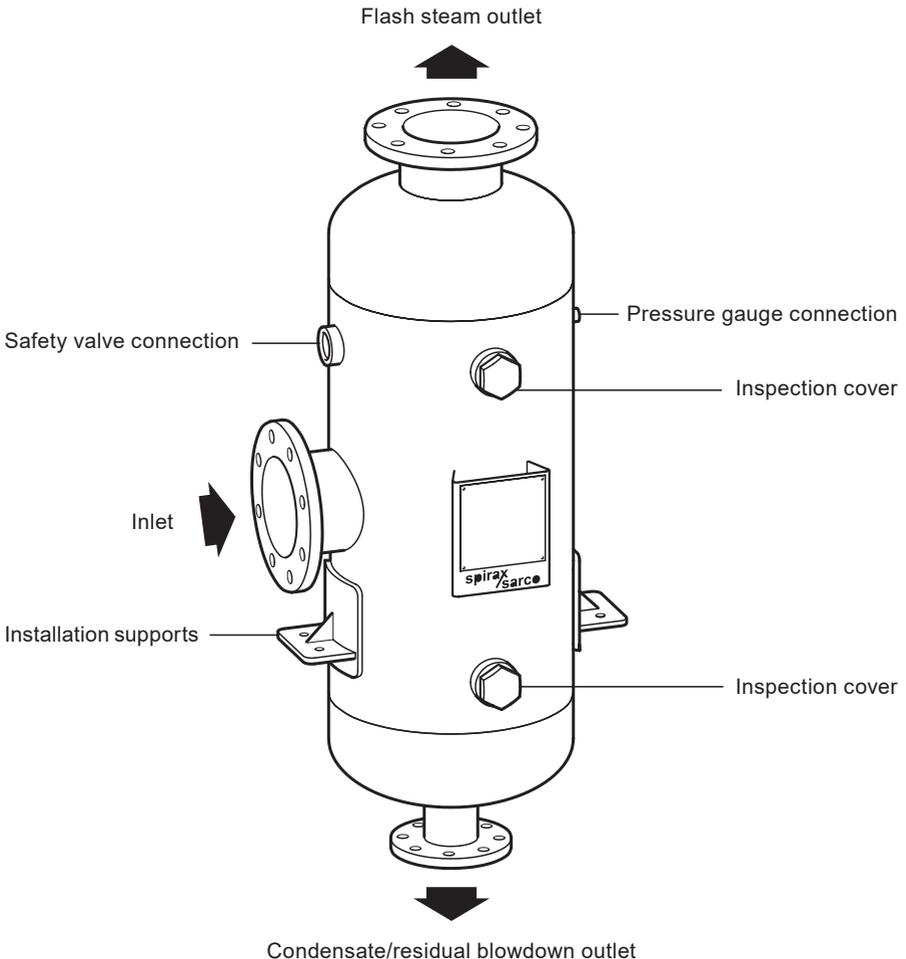


Fig. 1 Typical features of the FV type flash vessel (model FV15/FV18 shown)

3.2 Technical data

Designed for use with saturated steam.

Material of construction:	Carbon steel	
Paint finish	Temperature resistant silver paint	
Maximum design pressure	14 bar g	(203 psi g)
Maximum design temperature	198 °C	(390 °F)
Minimum design (operating) temperature	-10 °C	(14 °F)
Designed for a maximum cold hydraulic test pressure	In accordance with the Pressure Equipment Directive (PED).	
Note : Maximum design Pressure and temperature can be further limited, lower than that stated on the nameplate depending on the chosen flange rating of the system.		
PN16	13.3 bar g @ 198 °C (192.9 psi g @ 390 °F)	
Class A150	13.8 bar g @ 198 °C (200.1 psi g @ 390 °F)	

Note: These vessels will withstand full vacuum conditions.



spirax / sarco

Vessel

Made in the U.K. by	<input type="text"/>
Vessel Designation	<input type="text"/>
Spiax Sarco Part Number	<input type="text"/>
Conforms to Ped 2014/68/EU Category	<input type="text"/>
Design Code	<input type="text"/>
Date of Manufacture	<input type="text"/>
Serial Number	<input type="text"/>
Maximum Design Pressure	<input type="text"/>
Maximum Design Temperature	<input type="text"/>
Minimum Design Temperature	<input type="text"/>
Volume	<input type="text"/>
Hydraulic Test Pressure	<input type="text"/>
Date of Test	<input type="text"/>
Weight (Dry)	<input type="text"/>
Weight (Dry)	<input type="text"/>

Fig. 2 Typical FV type flash vessel name-plate details

4. Installation

Note:

Before actioning any installation observe the 'Safety information' in Sections 1 and 2.

FV type flash vessels are supplied with integral support brackets.

Brackets should be fastened firmly to secure mounting points. **It is important that external stresses are not introduced into the vessel** and shims should be used beneath the support brackets if necessary to obtain accurate pipeline alignment during installation.

Ensure that the blanking plugs supplied with the vessel are fitted securely, both at ambient and operating temperatures.

The vessel must be mounted with the flash steam outlet uppermost, (see Figure 1). Each vessel incorporates a 3/8" BSP screwed boss for a pressure gauge, U-syphon gauge and cock. A separate connection is provided to accommodate a safety valve* and it is recommended that a float trap is fitted beneath the condensate/residual blowdown outlet. Fitment of a vacuum breaker may be required to counteract the creation of vacuum conditions by steam condensation.

* It must not be assumed that the safety valve will be the same size as the connection - refer to 'Overpressure protection', Section 2.1.

5. Commissioning

Before putting the unit into service, ensure that:

- Blanking plugs are tight; check for tightness also when vessel has reached operating temperature. **Caution:-** Maximum operating temperature is 198 °C (390 °F).
- All connections to adjoining pipework/plant are sound and secured so that no external stresses are introduced into the unit
- No extraneous objects/material are present within the vessel.
- Any associated safety accessory (e.g. safety valve) has been correctly sized, adequately tested and is in working order.
- Check allowable pressure/temperature rating of flanges used and ensure operation and safety accessories are set within this limit.

6. Operation

Operation of flash vessels is inherently simple and no special operating instructions are required. The vessel allows for the safe expansion of saturated water from high to lower pressures with the accompanying production of flash steam.

On a precautionary note, vessels are designed to operate at high temperatures and care should be taken to avoid personal injury if vessels are unlagged.

Operating conditions

Spirax Sarco flash vessels are designed to operate under saturated steam conditions up to 14 bar g @ 198 °C (203 psi g @ 390 °F). They have a minimum design operating temperature of -10 °C (14 °F).

Note : Maximum design Pressure & Temperature can be further limited, lower than that stated on the nameplate depending on the chosen flange rating of the system.

PN16	13.3 bar g @ 198 °C (192.9 psi g @ 390 °F)
Class A150	13.8 bar g @ 198 °C (200.1 psi g @ 390 °F)

7. Maintenance

Flash vessels require no routine maintenance; however, blanking plugs should be checked periodically for tightness and, where used, insulation for security.

Vessels should be included in a written scheme of examination including regular internal visual inspection for signs of excessive corrosion, by a suitably qualified competent person who is responsible for determining the frequency of examination.

8. Spare parts

No spare parts are required or available for flash vessels. Repairs to pressure vessels are not recommended as specialist design procedures and welding operations are required, together with reinspection by a qualified competent person.

