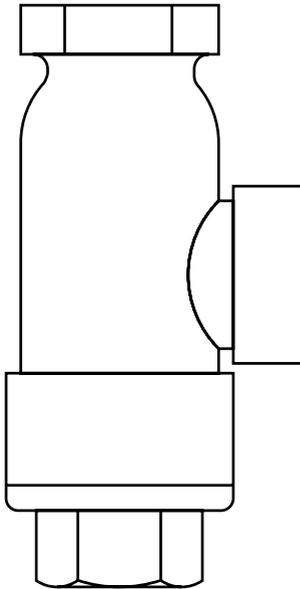


Fig 4
Screwed Strainer
Installation and Maintenance Instructions



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

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 1.11) 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. This product complies with the requirements of the European Pressure Equipment Directive 97/23/EC and falls within category 'SEP'. It should be noted that products within this category are required by the Directive not to carry the CE mark.

- i) This product has been specifically designed for use on steam, air or condensate / water, 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 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 and protective film from all name-plates, where appropriate, before installation on steam or other high temperature applications.

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 of 250°C (482°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 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.

1.16 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. General product information

2.1 Description

The Fig 4 is an angle type, brass bodied, screwed strainer. As standard it will be supplied with a stainless steel screen having 0.8 mm perforations. Optionally other perforations and mesh sizes are available as well as monel screens - See Section 2.4. The strainer cap can be drilled and tapped for blowdown and drain valves if required.

Standards

This product fully complies with the requirements of the European Pressure Equipment Directive 97/23/EC and carries the CE mark when so required.

Certification

This product is available with certification to EN 10204 2.2. **Note:** All certification/inspection requirements must be stated at the time of order placement.

Note: For additional information see Technical Information Sheet TI-P164-01.

2.2 Sizes and pipe connections

1/2" and 3/4" screwed BSP (BS 21 parallel) or NPT.

2.3 Materials

No.	Part	Material	
1	Body	Brass	BS 2872 CZ 122
2	Cap	Brass	BS 2872 CZ 122
3	Cap gasket	Reinforced exfoliated graphite	
4	Strainer screen	Stainless steel	316 L

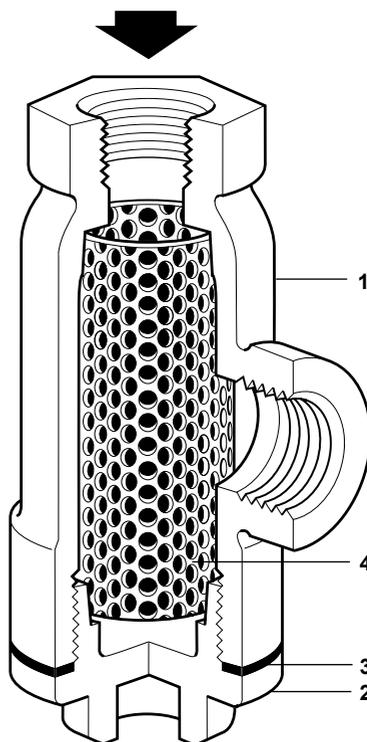
2.4 Optional extras

Strainer screens	Stainless steel screen	Perforations	1.6 and 3 mm
		Mesh	40, 100 and 200
Monel screen	Monel screen	Perforations	0.8 and 3 mm
		Mesh	100

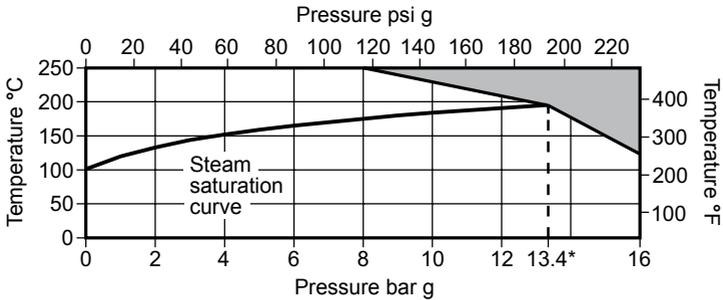
Blowdown or drain valve connections

The cap can be drilled and tapped to the following sizes to enable a blowdown or drain valve to be fitted.

Strainer size	Blowdown valve or drain valve
1/2" and 3/4"	1/2"



2.5 Pressure/temperature limits (ISO 6552)



 The product **must not** be used in this region.

Body design conditions		PN16
PMA	Maximum allowable pressure	16 bar g @ 120°C (232 psi g @ 248°F)
TMA	Maximum allowable temperature	250°C @ 8 bar g (482°F @ 116 psi g)
Minimum allowable temperature		0°C (32°F)
* PMO	Maximum operating pressure for saturated steam service	13.4 bar g @ 196°C (194 psi g @ 385°F)
TMO	Maximum operating temperature	250°C @ 8 bar g (482°F @ 116 psi g)
Minimum operating temperature		0°C (32°F)
Note: For lower operating temperatures consult Spirax Sarco		
Designed for a maximum cold hydraulic test pressure of:		24 bar g (348 psi g)

2.6 K_v values

Size	½" and ¾"
Perforations 0.8, 1.6 and 3 mm	4
Mesh 40 and 100	4
Mesh 200	4

For conversion C_v (UK) = $K_v \times 0.97$ C_v (US) = $K_v \times 1.17$

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 protection covers from all connections and protective film from all name-plates, where appropriate, before installation on steam or other high temperature applications.
- 3.4** The strainer should be installed with the strainer cap at the bottom with the inlet at the top.

4. Commissioning

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

5. Operation

Strainers are passive items and will prevent the onward movement of dirt and debris, which is larger than the holes in the screen. The pressure drop across the strainer will increase as the screen becomes blocked. Regular cleaning / blowdown is recommended to keep the screen clean.

6. Maintenance

Note: Before actioning any maintenance programme 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

Before undertaking any maintenance on the strainer, it must be isolated from both the supply line and return line and any pressure allowed to safely normalise to atmosphere. The strainer should then be allowed to cool. When reassembling, ensure that all joint faces are clean.

6.2 How to clean or replace the strainer screen:

- Remove the strainer cap (2).
- When the strainer cap (2) has been removed the strainer screen (4) can be taken out from the recess in the strainer body (1).
- Clean the strainer screen (4) or replace it with a new one - See Section 7 for spares.
- Reassemble the strainer screen (4) by firstly pushing it into the recess of the strainer cap (2).
- Always fit a new strainer cap gasket (3 - See Section 7 for spares) ensuring the jointing faces are clean.
- Refit the strainer cap, new strainer cap gasket and either cleaned or new strainer screen (2, 3 and 4) into the recess of the strainer body (1) and tighten the strainer cap (2) to the recommended torque - See Table 1.
- Check for leaks.

----- = Not an available spare

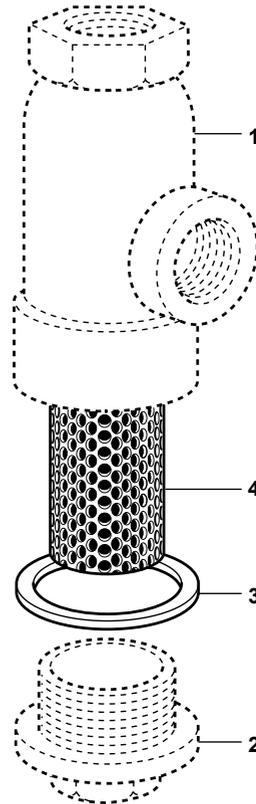


Table 1 Recommended tightening torques

Item	Product size	 or mm		N m	(lbf ft)
2	1/2" and 3/4"	26 A/ F	1" BSP	42 - 48	(30 - 35)

7. Spare parts

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

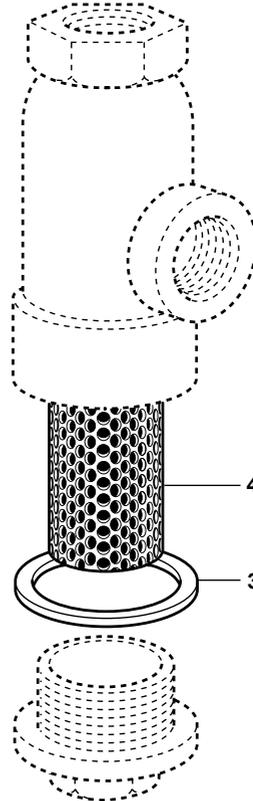
Available spares

Strainer screen (state material, mesh, perforation and size of strainer)	4
Cap gasket (packet of three)	3

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size, model no. and pressure rating of the trap.

Example: 1 off 0.8 mm perforated stainless steel screen for a 1/2" Spirax Sarco Fig 4 strainer.



8. Fault finding

Symptom	Possible cause	Remedy
No flow through strainer	Blocked screen	Clean or replace screen
	System is isolated	Check isolation valves
Increased pressure drop across strainer	Screen is blocked up	Clean or replace screen