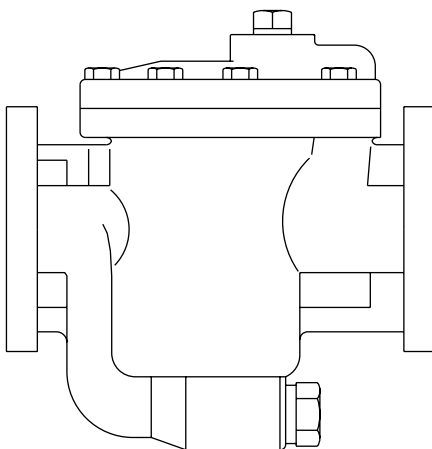


S and SF
Inverted Bucket Steam Traps
Installation and Maintenance Instructions



- 1. General
safety information*
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- 4. Commissioning*
- 5. Operation*
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1. General safety information

Safe operation of these units can only be guaranteed if they are properly installed, commissioned and maintained by a qualified person (see Section 11 of the attached Supplementary Safety Information) 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.

Warning

The body/cover gasket and strainer cap gaskets contain a thin stainless steel support ring which may cause physical injury if not handled and disposed of carefully.

Isolation

Consider whether closing isolating valves will put any other part of the system or personnel at risk. Dangers might include; isolation of vents and protective devices or alarms. Ensure isolation valves are turned off in a gradual way to avoid system shocks.

Pressure

Before attempting any maintenance consider what is or may have been in the pipeline. Ensure that any pressure is isolated and safely vented to atmospheric pressure before attempting to maintain the product, this is easily achieved by fitting Spirax Sarco depressurisation valves type DV (see separate literature for details). Do not assume that the system is depressurised even when a pressure gauge indicates zero.

Temperature

Allow time for temperature to normalise after isolation to avoid the danger of burns and consider whether protective clothing (including safety glasses) is required.

Disposal

These products are recyclable. No ecological hazard is anticipated with the disposal of these products providing due care is taken.

— 2. General product information —

2.1 General description

The S series is a maintainable cast iron inverted bucket steam trap with screwed in-line connections and integral strainer. The SF series has integral flanged connections and integral strainer.

Note: For additional information see the following Technical Information Sheet: TI-P077-01.

2.2 Sizes and pipe connections

½" - SA, ¾" - SB, 1" - SC, 1½" - SD Screwed BSP, ISO 7/1 Rp.

DN15 - SFA, DN20 - SFB, DN25 - SFC, DN40 - SFD.

Standard flange BS 4504 / DIN 2501 PN16 (UNI 2237 / 2229).

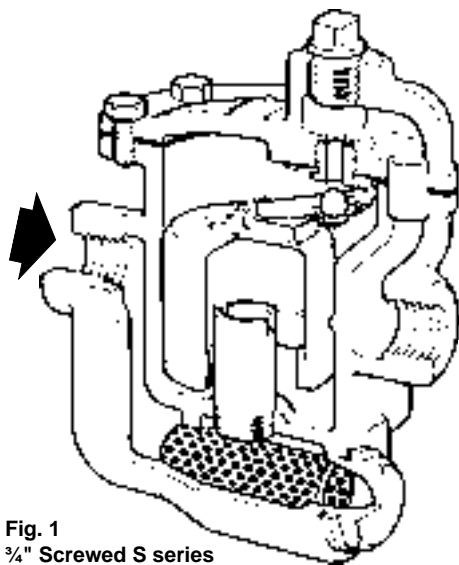


Fig. 1
¾" Screwed S series

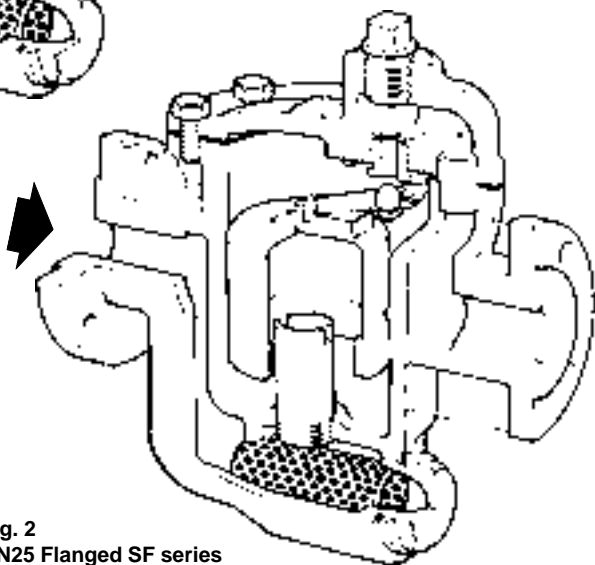


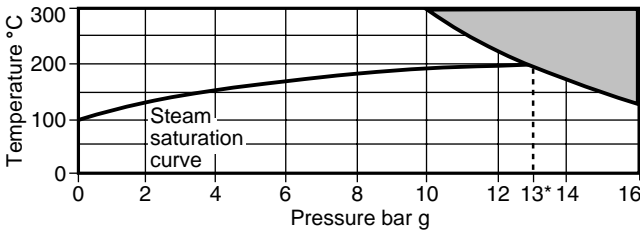
Fig. 2
DN25 Flanged SF series

2.3 Limiting conditions (ISO 6552)

Note: Maximum operating conditions depend on the selected orifice size.

Body design conditions	PN16	
PMA - Maximum allowable pressure	16 bar g	(232 psi g)
TMA - Maximum allowable temperature	300°C	(572°F)
PMO - Maximum operating pressure	13 bar g	(188.5 psi g)
TMO - Maximum operating temperature	300°C	(572°F)
Designed for a maximum cold hydraulic test pressure of:	24 bar g	(348 psi g)

2.4 Operating range



The product must not be used in this region.

*PMO Maximum operating pressure 13 bar g (188.5 psi g).

△ PMX - Maximum differential pressure

Screwed	4 bar	8 bar	12 bar	Flanged	4 bar	8 bar	12 bar
½"	SA4	SA8	SA12	DN15	SFA4	SFA8	SFA12
¾"	SB4	SB8	SB12	DN20	SFB4	SFB8	SFB12
1"	SC4	SC8	SC12	DN25	SFC4	SFC8	SFC12
1½"	SD4	SD8	SD12	DN40	SFD4	SFD8	SFD12

2.5 Materials of construction

The S and SF series inverted bucket traps are manufactured in cast iron with stainless steel internals.

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.
- 3.4** The trap must be installed with the body upright so that the bucket is rising and falling vertically. When superheat conditions exist the trap body may need to be primed with water prior to steam being turned on to avoid steam blowing through the trap.
- 3.5** Inverted bucket steam traps do not permit rapid release of air. On process applications, in particular, this can lead to slow warm-up times and waterlogging of the steam space. A separate external air vent is therefore required in parallel to vent air efficiently. Any bypass should be positioned above the trap. If it is below, and is leaking or left open, the waterseal could be blown away leading to steam wastage. Where inverted bucket traps are fitted in exposed conditions the possibility of freezing damage can be reduced by thermal insulation.
- 3.6** Traps must be installed in a horizontal pipeline. The inlet of the trap should be below the drain point of the plant being drained, so that a waterseal can be maintained around the open end of the bucket. A small drop leg should precede the trap - typically 150 mm (6").
- 3.7** Where the trap discharges into a closed condensate return system or where there is a lift at the trap, a check valve should be fitted downstream of the trap.
- 3.8** If the trap has to be installed at a higher point than the drainage point then a small bore riser into a 'U' seal should be used. A check valve should be fitted before the trap to prevent the loss of the internal waterseal.
- 3.9** If the trap has to be installed on a superheated steam system application, then a non return valve should be fitted on the trap inlet, to prevent the trap from losing its waterseal. Priming of the trap with water may be required before commissioning.
- 3.10** When welding the trap into the pipeline, this should be carried out by the electric arc process. If it is installed in exposed positions, considerations should be given to insulating the trap.

Note: If the trap is to discharge to atmosphere ensure it is to a safe place, the discharging fluid may be at a temperature of 100°C (212°F).

4. Commissioning

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

5. Operation

Under most conditions the trap will discharge condensate with a blast type action. Under low load and/or low pressure applications the discharge may tend to 'dribble'. Condensate is discharged at steam temperature so due care must be given to the site of the discharge.

6. Maintenance

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

Warning

The body/cover gasket and strainer cap gaskets contain 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 trap it must be isolated from both the supply line and return line and any pressure allowed to safely normalise to atmosphere. The trap should then be allowed to cool. When reassembling, ensure that all joint faces are clean.



6.2 How to fit the valve and seat assembly (refer to Fig. 3):

- Undo the cover bolts and nuts and remove the cover from the body.
- Unhook the bucket from the valve lever.
- Remove the valve guide plate by undoing the two screws.
- Remove the seat from the cover.
- Ensure all jointing faces are clean and then screw in the new seat to the recommended torque (see Table 1). Use a small amount of jointing paste on the threads.
- Fit a new valve guide plate with two screws supplied and refit the new lever. Ensure that the valve and seat are aligned correctly before finally tightening the guide plate screws.
- Hook the bucket to the lever and ensure gasket faces on the body cover are clean.
- Using a new cover gasket refit the cover to the body ensuring the small ferrule is positioned correctly. Tighten the cover bolts/nuts to the recommended torque (see Table 1).

6.3 How to clean/replace the strainer screen (refer to Fig. 3):

- Undo the strainer cap and remove the screen and gasket.
- Clean or replace the strainer screen.
- Ensure threads are clean.
- Refit a new strainer cap gasket and locate the screen in the strainer cap.
- Screw into the body and tighten to the recommended torque (see Table 1).

Table 1 Recommended tightening torques

Item	Size	or		N m	(lbf ft)
			 mm		
3	½" - DN15	15	-	25 - 30	(19 - 22)
	¾" - DN20	17	-	35 - 40	(26 - 30)
	1" - DN25	22	-	50 - 60	(37 - 45)
	1½" - DN40	30	-	80 - 90	(59 - 67)
10	½" - DN15	30	-	50 - 60	(37 - 45)
	¾" - DN20	36	-	50 - 60	(37 - 45)
	1" - DN25	46	-	70 - 80	(52 - 59)
	1½" - DN40	50	-	90 - 110	(67 - 81)
16	½" - DN15	-	M4 x 8	2.5 - 3	(2.0 - 2.2)
	¾" - DN20	-	M5 x 10	3 - 4	(2.2 - 3.0)
	1" - DN25	-	M5 x 10	3 - 4	(2.2 - 3.0)
	1½" - DN40	-	M6 x 10	5 - 6	(3.7 - 4.4)
17	½" - DN15	-	M8 x 20	20 - 25	(15 - 19)
	¾" - DN20	-	M12 x 25	60 - 70	(45 - 52)
	1" - DN25	-	M10 x 30	40 - 45	(30 - 34)
	1½" - DN40	-	M12 x 35	60 - 70	(45 - 52)

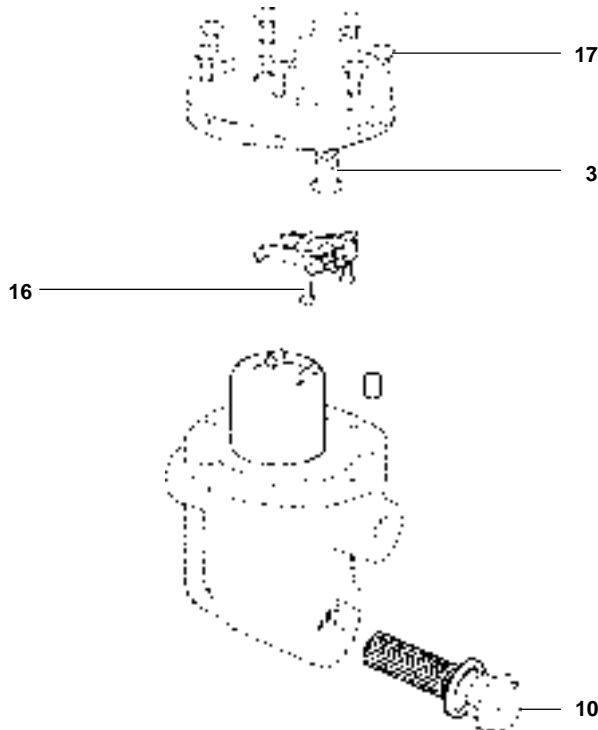


Fig. 3

7. Spare parts

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

Available spares

*(2 off)

Valve and seat assembly	3, 4, 5, 6, 7, 12, 13, 14*, 16*, 19, 20*
Bucket assembly	8
Strainer screen	9, 11
Packet of gaskets	7, 11, 12, 13

How to order spares

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

Example: 1 - Valve and seat assembly for Spirax Sarco DN20 SFB8 inverted bucket steam trap for differential pressures up to 8 bar.

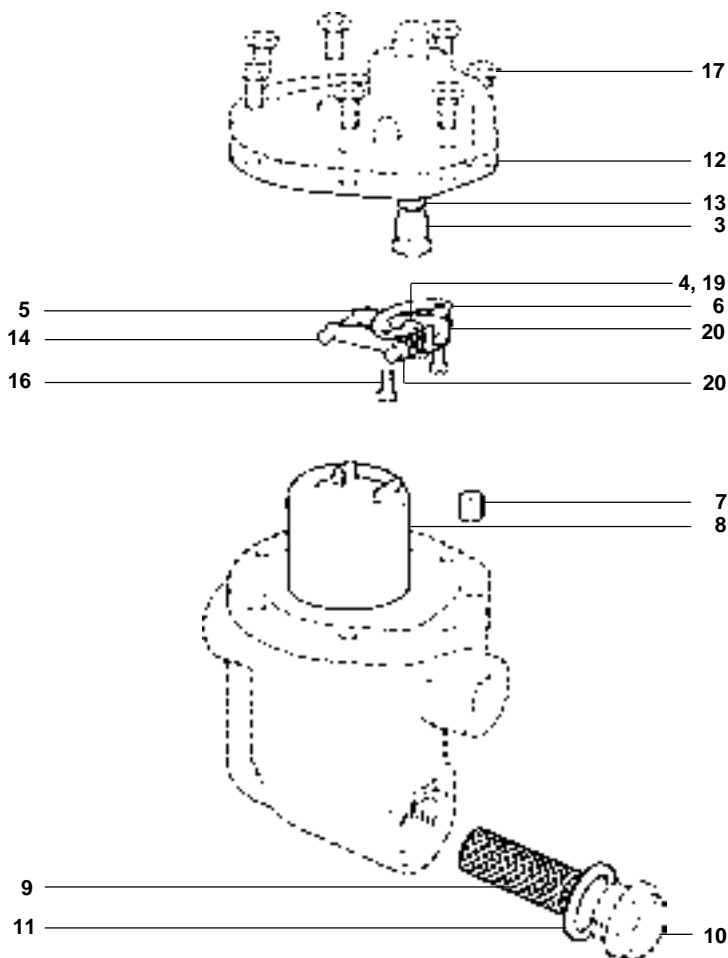


Fig. 4