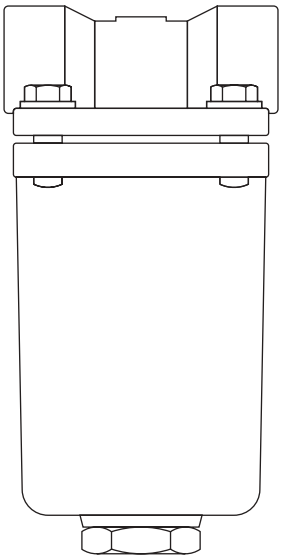
IM-P077-06
ST Issue 5

SCA Series
Inverted Bucket Steam Traps
Installation and Maintenance Instructions



1. General safety information

2. General product information

3. Installation

4. Commissioning

5. Operation

6. Maintenance

7. Spare parts

1. General 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 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 cover gasket contains 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

The product is recyclable. No ecological hazard is anticipated with the disposal of this product providing due care is taken.

2. General product information

2.1 General description

The Spirax Sarco SCA series are maintainable carbon steel inverted bucket steam traps with in-line connections. They are suitable for a wide range of pressures and incorporate an integral strainer.

Note: For additional information see the following Technical Information Sheet: TI-P077-05.

2.2 Sizes and pipe connections

½", ¾" and 1" screwed BSP or NPT and socket weld ends to ANSI B 16.11.
DN15, DN20 and DN25 flanged PN40, ANSI 150 and ANSI 300.

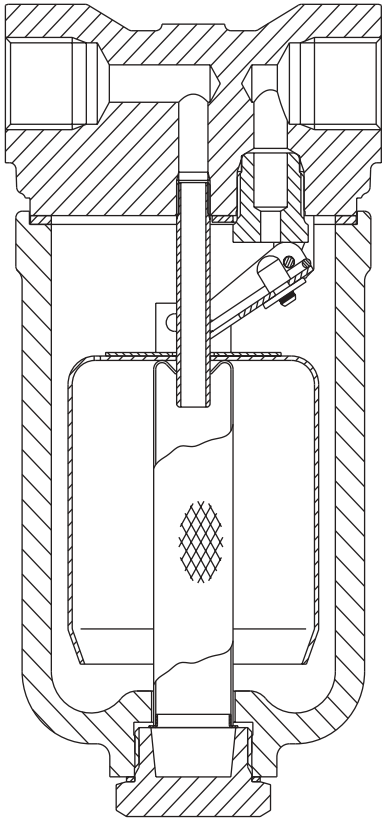


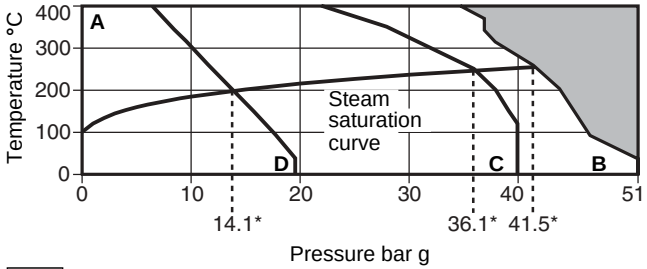
Fig. 1 SCA series inverted bucket steam trap

2.3 Limiting conditions (ISO 6552)

Maximum operating conditions depend on the orifice size.

Body design conditions	ANSI / ASME 300 (PN50)	
PMA - Maximum allowable pressure	51 bar g	(739 psi g)
TMA - Maximum allowable temperature	400°C	(752°F)
Designed for a maximum cold hydraulic test pressure of:	78 bar g	(1 131 psi g)

2.4 Operating range



The product must not be used in this region.

*PMO Maximum operating pressure recommended for saturated steam.
A - **B** Flanged ANSI 300, screwed and socket weld.
A - **C** Flanged BS 4504 PN40 (ISO 7005.1).
A - **D** Flanged ANSI 150.

ΔPMX - Maximum differential pressure

Size	ΔPMX - Maximum differential pressure bar					
	3	5	11	15	30	40
DN15 ½"	SCA3	SCA5	SCA11	SCA15	SCA30	SCA40
DN20 ¾"	SCA3	SCA5	SCA11	SCA15	SCA30	SCA40
DN25 1"	SCA3	SCA5	SCA11	SCA15	SCA30	SCA40

The SCA15, SCA30 and SCA40 are available as standard and the SCA3, SCA5 and SCA11 to special request.

Note: The pressure limit on the flange specified should be greater than the pressure limit of the internal mechanism. The table below offers guidance.

Flange	Pressure (at saturation)	Mechanism available
ANSI 150	14.1 bar g	SCA3, 5, 11 (15 limited to 14.1 bar g)
ANSI 300	41.6 bar g	all versions
PN40	36.1 bar g	SCA3, 5, 11, 15, 30 (40 limited to 36.1 bar g)

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. The inlet and outlet connections should be in a horizontal plane, with the trap installed below the drain point so that a water seal can be maintained around the open end of the bucket.
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 water seal could be blown away leading to steam wastage.

3.5 If the trap is 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.

3.6 Where inverted bucket steam traps are fitted in exposed conditions the possibility of freezing damage can be reduced by thermal insulation. Ensure you have the required tools available before undertaking the installation.

3.7 Open isolation valves slowly, until normal operating conditions are achieved.

3.8 Check for leaks and correct operation.

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 functional. 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 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 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

- Isolate the inverted bucket steam trap and remove the cover by undoing the cover bolts (**3**).
- Remove the complete bucket assembly by undoing the two screws (**11**).
- Remove the valve seat (**9**).
- Screw in a new valve seat to the recommended torque (see Table 1), using a little jointing paste on the threads and making sure that joint faces are clean.
- Fix a new bucket assembly in position by using new screws (**11**) (supplied with the spares kit), centralise the valve to the orifice and tighten screws to the recommended torque (see Table 1).
- Using new gaskets, refit the body to the recommended torque (see Table 1) and reconnect outlet pipework.
- Isolation valves should be opened slowly to allow the pressure and temperature to build up in a controlled manner.
- Check for leaks.

6.3 How to clean / replace strainer screen

- Unscrew the strainer cap (**6**).
- Remove the strainer screen (**5**).
- Clean or replace the strainer screen and reassemble using a new strainer cap gasket (**18**).
- Tighten the strainer cap (**6**) to the recommended tightening torques (see Table 1).
- Isolation valves should be opened slowly to allow the pressure and temperature to build up in a controlled manner.
- Check for leaks.

Table 1 Recommended tightening torques

Item No	Part	mm  or 		N m	lb / ft
* 3	Cover bolts	14 A/F	M10	40 - 45	30 - 33
6	Strainer cap	32 A/F	M28	170 - 190	125 - 140
9	Valve seat	17 A/F	M16	35 - 40	26 - 30
* 11	Valve guide plate screws	Posidrive	M4 x 6	2.5 - 3.0	2.0 - 2.5

*Items 3 and 11 are not illustrated

7. Spare parts

Spare parts are available as indicated. No other parts are supplied as spares.

Available spares

Internal set (state pressure range)	**4, 8, 9, 10, 11** (2 off)***, 12, 13, 14, 15, 16** (2 off)**, 17**
Strainer set	**5, 18**
Cover and strainer gasket (packet of three)	**8, 18**

*****Item 11 (valve guide plate screws) are not shown.

How to order spares

Always order spare parts by using the description given in the column headed 'Available spares' and state the size, model number and pressure rating of the trap.

Example: 1 - Internal set for a Spirax Sarco DN20, SCA15 inverted bucket steam trap having a pressure rating of 15 bar.

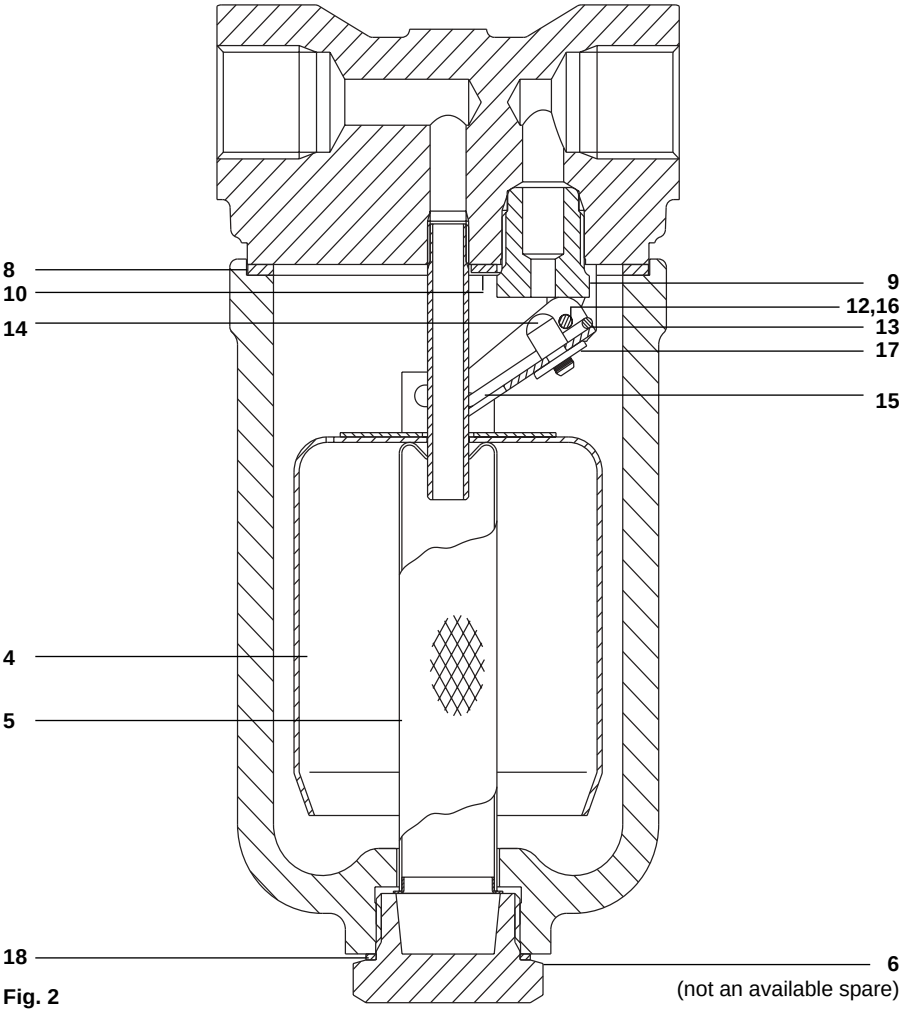


Fig. 2