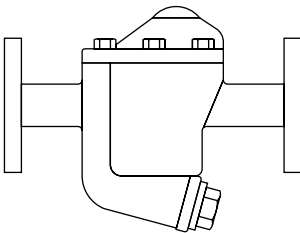
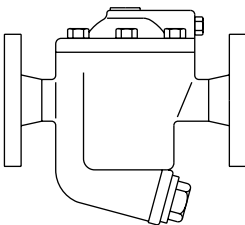


HM and HM34
Inverted Bucket Steam Traps
Installation and Maintenance Instructions



HM Series



HM34 Series

- 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 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 gasket 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 Spirax Sarco HM Series inverted bucket steam trap is manufactured in cast iron and has an integral strainer as standard. It is designed to be installed in horizontal pipework and will operate on steam pressures up to 14 bar g (203 psi g).

The Spirax Sarco HM34 series inverted bucket steam trap is similar to the HM Series but is manufactured in carbon steel and will operate on steam pressures up to 32 bar g (464 psi g).

Note: For further information see the following Technical Information Sheets, TI-S03-02 for the HM Series and TI-P072-01 for the HM34 Series, which gives full details of:- Materials, sizes and pipe connections, dimensions, weights, operating ranges and capacities.

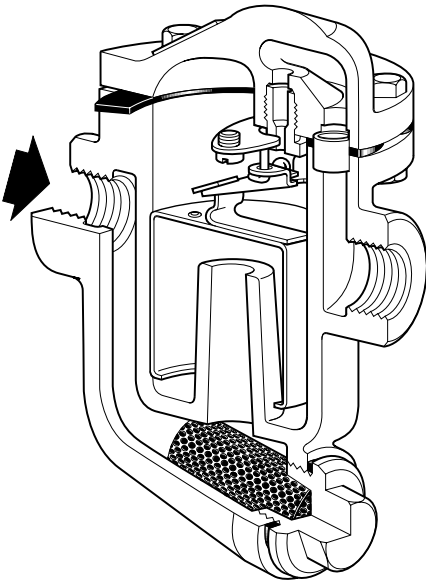


Fig. 1 HM00 (½") and HM10 (¾")

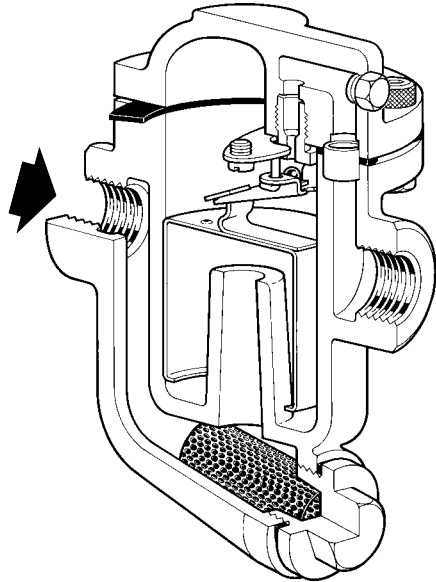


Fig. 3 HM34 (½" and ¾")

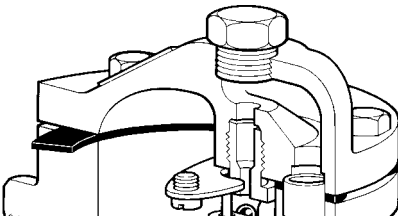


Fig. 2 HM12 (1")

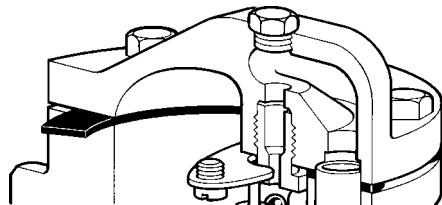


Fig. 4 HM34 (1")

2.2 Sizes and pipe connections

HM Series

½" (HM00), ¾" (HM10) and 1" (HM12) screwed BSP or NPT.

DN15 (HM003), DN20 (HM103) and DN25 (HM123) standard flange BS 4504 and DIN PN16.

HM34 Series

½", ¾" and 1" screwed BSP or NPT and socket weld ends BS 3799 Class 3000

DN15, 20 and 25 standard flange BS 4504 PN40.

Flanges also available ANSI 150 and ANSI 300.

2.3 Materials

Trap	HM Series	HM34 Series
Cover	Cast iron	Cast steel
Body	½" and ¾"	Forged steel
	1"	Cast steel
Internals	Stainless steel	Stainless steel

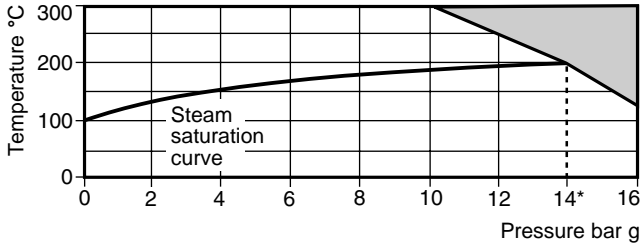
Note: For further information on materials see the following Technical Information Sheets: TI-S03-02 for the HM Series and TI-P072-01 for the HM34 Series.


2.4 Limiting conditions

	HM	HM34
Maximum body designed conditions	PN16	PN40
PMA - Maximum allowable pressure	16 bar g (232 psi g)	40 bar g (580 psi g)
TMA - Maximum allowable temperature	300°C (572°F)	300°C (572°F)
PMO - Maximum operating pressure	16 bar g (232 psi g)	40 bar g (580 psi g)
TMO - Maximum operating temperature	300°C (572°F)	300°C (572°F)
Designed for a maximum cold hydraulic test pressure of:	24 bar g (348 psi g)	60 bar g (870 psi g)

2.5 Operating range

HM Series



 The product must not be used in this region.

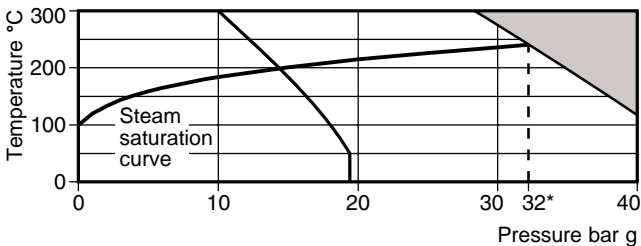
*PMO Maximum operating pressure recommended for saturated steam 14 bar g (203 bar g).


ΔPMX - Maximum differential pressure

Size	Maximum differential pressure bar					
	4	8.5	10	12.5	14	
Screwed	½"	HM00/8	HM00/7	HM00/6	—	—
	¾"	HM10/10	HM10/8	—	HM10/7	—
	1"	HM12/12	HM12/10	—	—	HM12/7
Flanged	DN15	HM003/8	HM003/7	HM003/6	—	—
	DN20	HM103/10	HM103/8	—	HM103/7	—
	DN25	HM123/12	HM123/10	—	—	HM123/7

Note: The pressure limit of the flange type should be greater than the pressure limit of the internal mechanism selected.

HM34 Series



 The product must not be used in this region.

*PMO Maximum operating pressure recommended for saturated steam 32 bar g (464 bar g).

ΔPMX - Maximum differential pressure

Size	Maximum differential pressure bar				
	4	8.5	12	20	32
DN15 - ½"	HM34/8	HM34/7	HM34/6	HM34/5	HM34/4
DN20 - ¾"	HM34/10	HM34/8	HM34/7	HM34/6	HM34/5
DN25 - 1"	HM34/12	HM34/10	HM34/8	HM34/6	HM34/5

Note: The pressure limit of the flange type should be greater than the pressure limit of the internal mechanism selected.

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 (see Fig. 5). 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 with the strainer pocket at the bottom. 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. See Fig. 6.

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.

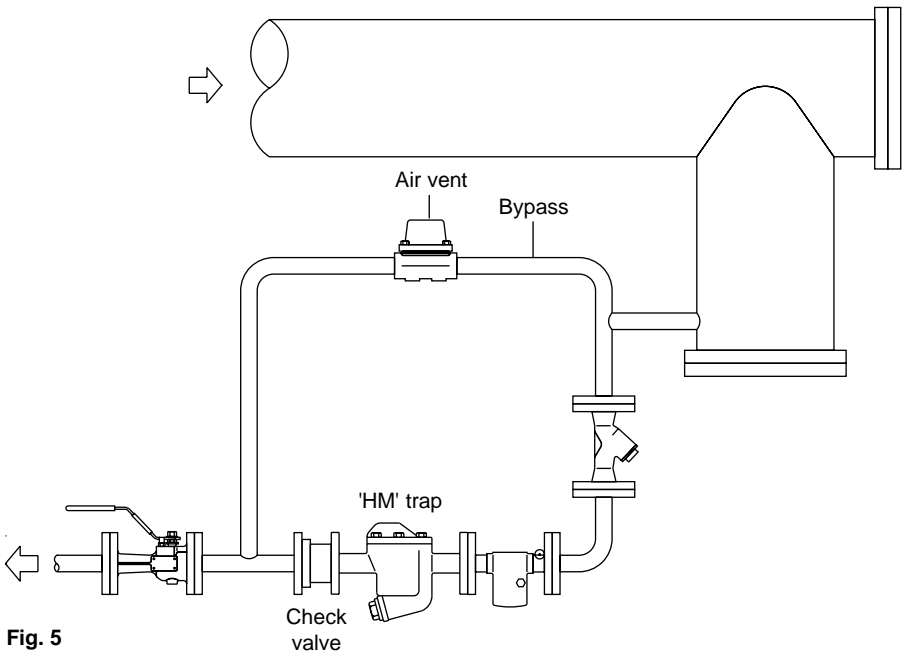


Fig. 5

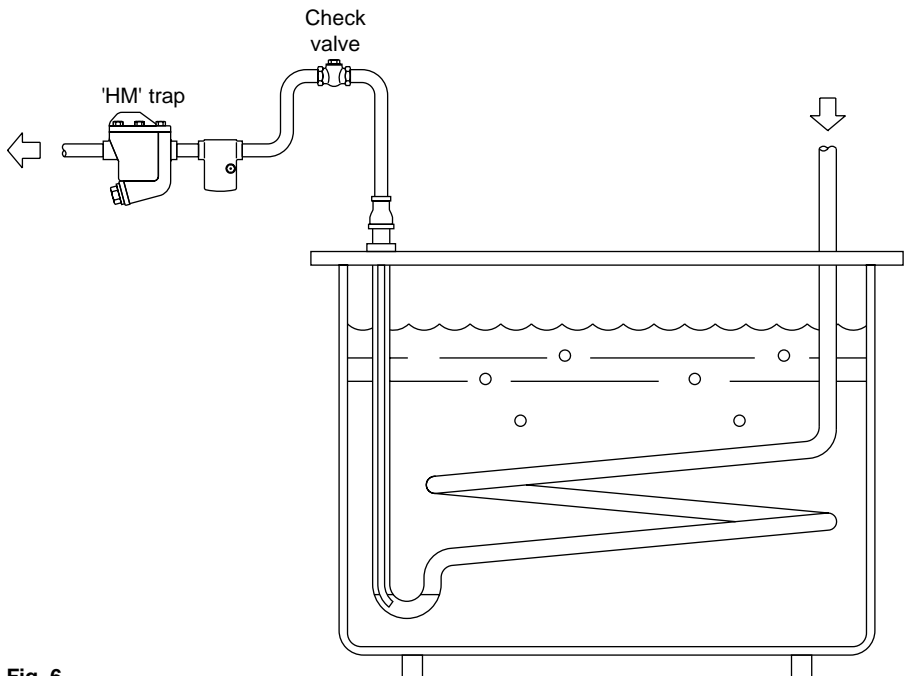


Fig. 6

6. Maintenance

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

Warning

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

6.1 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:

- Undo the cover bolts and nuts (2) and remove the cover from the body.
- Unhook the bucket (4) from the valve lever (10).
- Remove the valve guide plate by undoing the two screws (5).
- Remove the seat (8) from the cover.
- Ensure all joining faces are clean and then screw in the new seat to the recommended tightening torque. Use a small amount of joining paste on the threads.
- Fit new valve guide plate with the 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 (7) refit the cover to the body ensuring the small ferrule (11) is positioned correctly. Tighten cover bolts / nuts to the recommended tightening torque (see Table 1).

6.3 How to clean / replace the strainer screen:

- Undo the strainer cap (13) and remove the screen (12) and gasket (14).
- Clean or replace the strainer screen (12).
- Ensure threads are clean.
- Refit 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 no.	 or  mm		Nm	(lbf ft)
	HM	HM34		
2	HM	1/2" and 3/4"	M6 x 25	15 - 16 (11 - 12)
		1"	M12 x 45	85 - 95 (61 - 68)
	HM34	1/2" and 3/4"	M8 x 30	25 - 28 (18 - 20)
		1"	M12 x 45	25 - 28 (18 - 20)
8	HM	1/2" and 3/4"	13	50 - 55 (36 - 40)
		1"	13	80 - 88 (57 - 63)
	HM34	1/2" and 3/4"	13	50 - 55 (36 - 40)
		1"	13	80 - 88 (57 - 63)
13	HM	1/2" and 3/4"	M28	90 - 100 (64 - 72)
		1"	M32	125 - 145 (89 - 104)
	HM34	1/2" and 3/4"	M28	90 - 100 (64 - 72)
		1"	M32	125 - 145 (89 - 104)

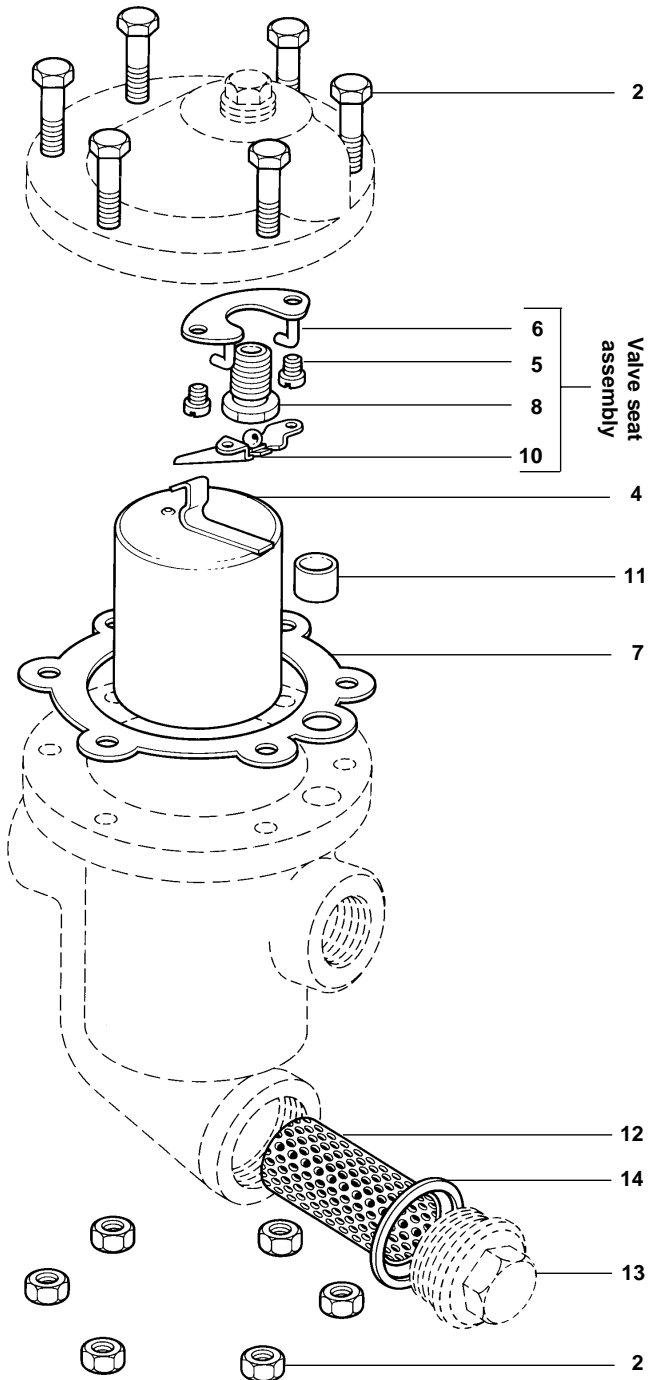


Fig. 7 HM Series shown

7. Spare parts

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

Available spares

Valve and seat assembly	5, 6 (2 off), 8, 10
Bucket	4
Cover gasket and ferrule (packet of 3 each)	7, 11
Strainer screen	12
Strainer screen gasket (packet of 3)	14
Set of cover bolts and nuts (set of 6)	2

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and series of the trap.

Example: 1 - Valve and seat assembly for DN15 HM34/7 Spirax Sarco inverted bucket steam trap.

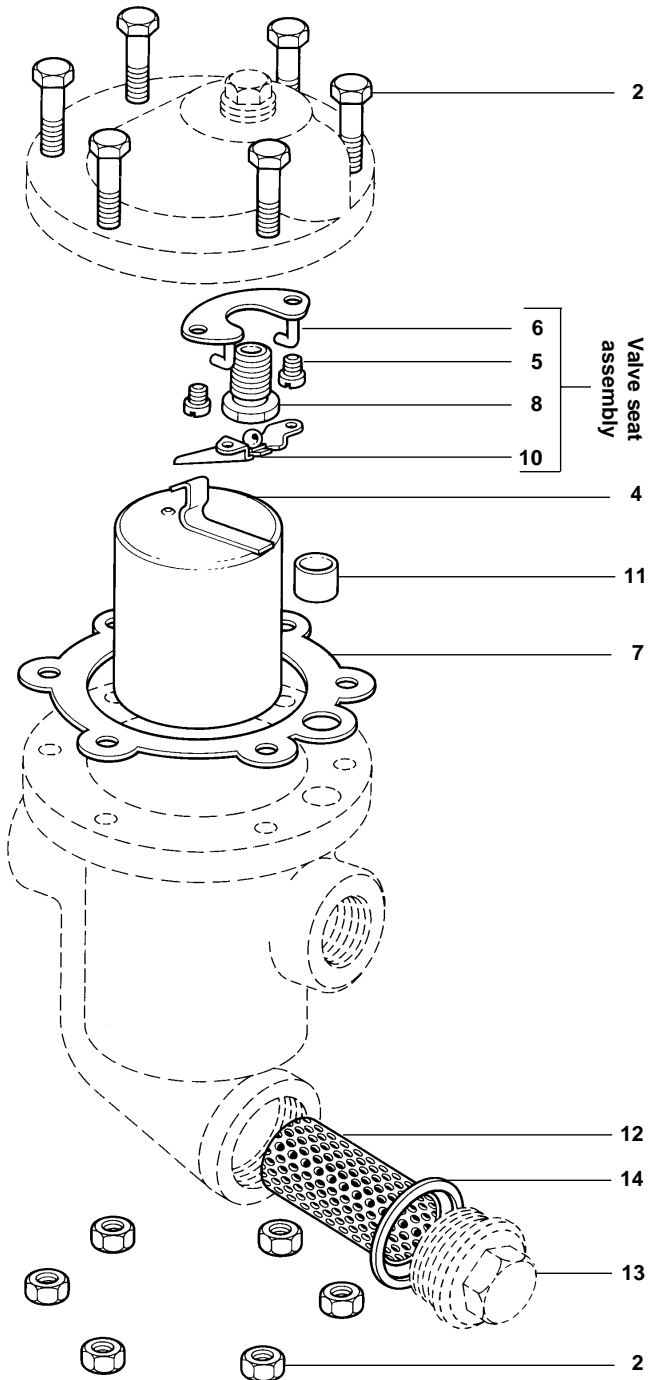


Fig. 8 HM Series shown

