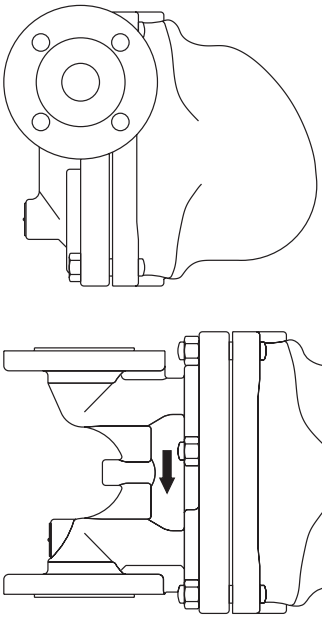
FT54, IFT54, FT57 and IFT57 Ball Float Steam Traps - DIN

Installation and Maintenance Instructions



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

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.
The products listed below comply with the requirements of the Pressure Equipment Directive (PED) and carry the CE mark when so required.

The products fall within the following Pressure Equipment Directive categories:

Product		Group 2 Gases	Group 2 Liquids
FT54, FT57, IFT54 and IFT57	DN15 - DN25	SEP	SEP
	DN40 - DN50	1	SEP

i) **These products have been specifically designed for use on steam, air or condensate/water, which is in Group 2 of the above mentioned Pressure Equipment Directive.**

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 nameplates, 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 400 °C (752 °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

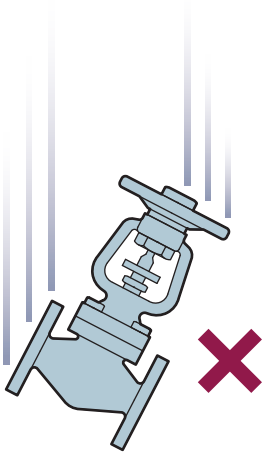
Customers and stockists are reminded that under EC Health, Safety and Environment Law, when returning products to Spirax Sarco they must provide information on any hazards and the precautions to be taken due to contamination residues or mechanical damage which may present a health, safety or environmental risk. This information must be provided in writing including Health and Safety data sheets relating to any substances identified as hazardous or potentially hazardous.

1.17 Working safely with cast iron products on steam

Cast iron products are commonly found on steam and condensate systems. If installed correctly using good steam engineering practices, it is perfectly safe.
However, because of its mechanical properties, it is less forgiving compared to other materials such as SG iron or carbon steel. The following are the good engineering practices required to prevent waterhammer and ensure safe working conditions on a steam system.

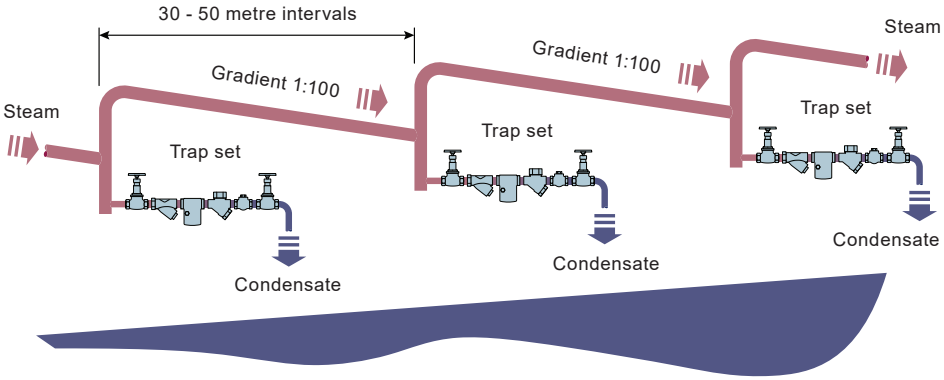
Safe Handling

Cast Iron is a brittle material. If the product is dropped during installation and there is any risk of damage the product should not be used unless it is fully inspected and pressure tested by the manufacturer.

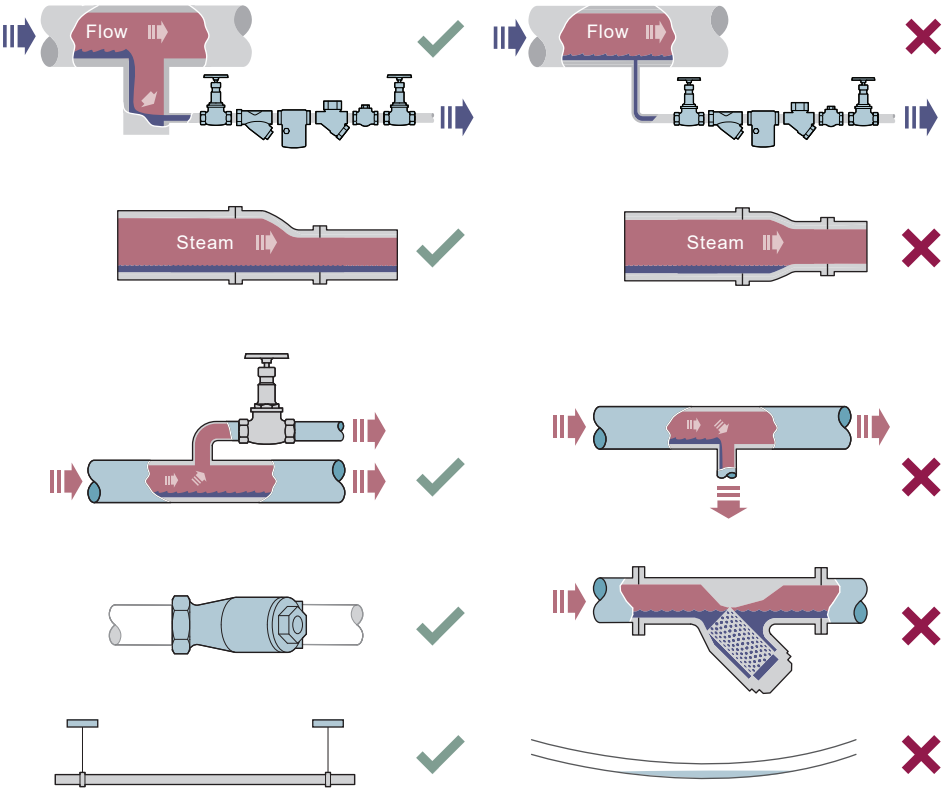


Prevention of waterhammer

Steam trapping on steam mains:

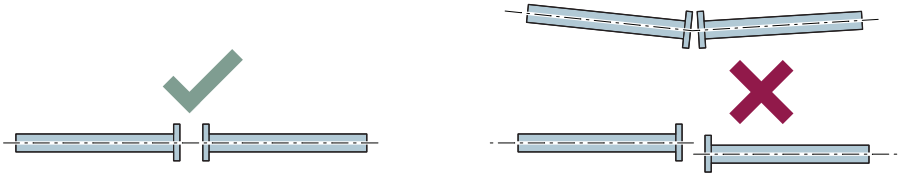


Steam Mains - Do's and Don'ts:

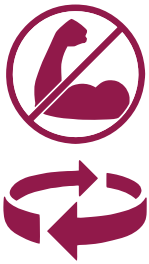


Prevention of tensile stressing

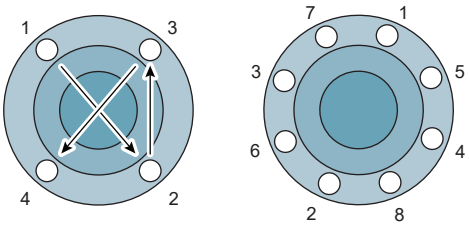
Pipe misalignment:



Installing products or re-assembling after maintenance:

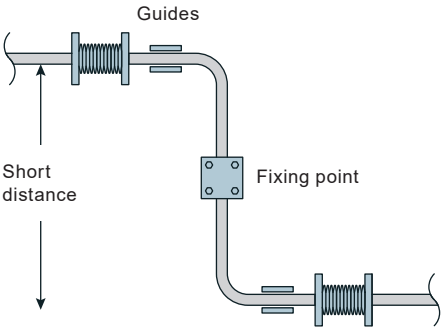


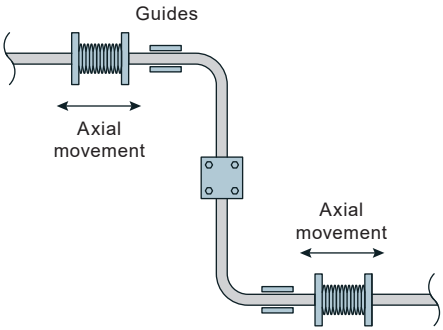
Do not over tighten.
Use correct torque figures.

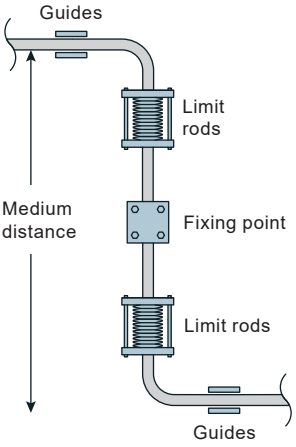


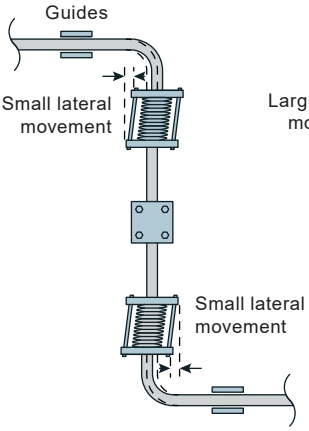
Flange bolts should be gradually tightened across diameters to ensure even load and alignment.

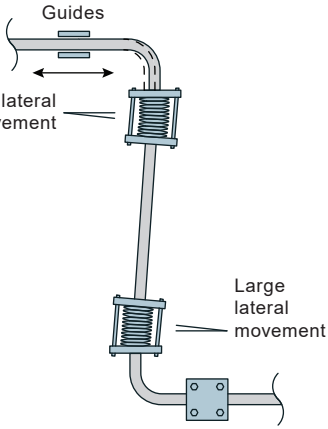
Thermal expansion:











2. General product information

2.1 General description

The FT54 and FT57 are ball float steam traps having an internal thermostatic air vent for the prompt removal of large condensate loads from steam systems.
The IFT54 and IFT57 are ball float steam traps fitted with an integral Spiratec sensor (SSI) for steam leakage detection.
All traps are supplied with integrally flanged connections (for horizontal and vertical installation) and can be maintained without disturbing the pipework.
Internals are manufactured in stainless steel for maximum resistance to wear and trouble free life.

The FT54 and IFT54 have a body and cover manufactured in carbon steel.
The FT57 and IFT57 have a body and cover manufactured in SG iron.

Standards
These products fully compy with the requirements of the Pressure Equipment Directive (PED) and carry the CE mark when so required.

The body and cover casting for the FT54, IFT54, FT57, and IFT57 are produced by TÜV approved foundries and are as available as follows:

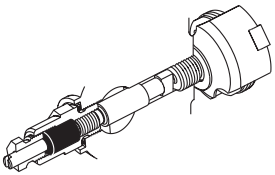
Options:	**Carbon steel**	**FT54H,**	**FT54H-C,**	**IFT54H**	- Horizontal flow
		FT54V,	**FT54V-C,**	**IFT54V**	- Vertical flow
	SG iron	**FT57H,**	**FT57H-C,**	**IFT57H**	- Horizontal flow

Note: For additional information see the following technical information sheets:-
FT54 TI-P603-01, **IFT54** TI-P615-06, **FT57** TI-P603-02, **IFT57** TI-P615-03.

2.2 Sizes and pipe connections

FT54, **IFT54**	DN15, 20, 25, 40 and 50 Standard flange DIN 2501 PN40 and EN 1092.
FT57, **IFT57**	DN15, 20, 25, 40 and 50 Standard flange DIN 2501 PN40 and EN 1092.

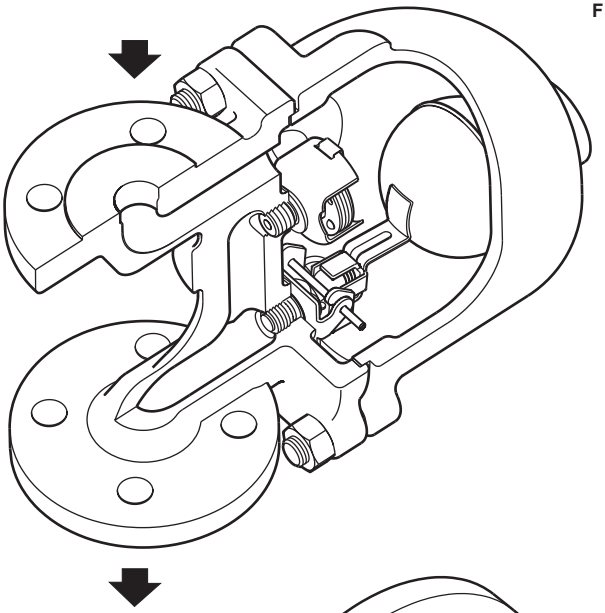
Face-to-face dimensions to DIN 2545 (BS EN 26554) Series 1.



Traps having the optional steam lock release will have the nomenclature:-
FT54V-C, FT54H-C or FT57H-C

Fig. 1 Optional steam lock release (FT54 and FT57 only)

Fig. 2 DN15 FT54V (vertical) shown



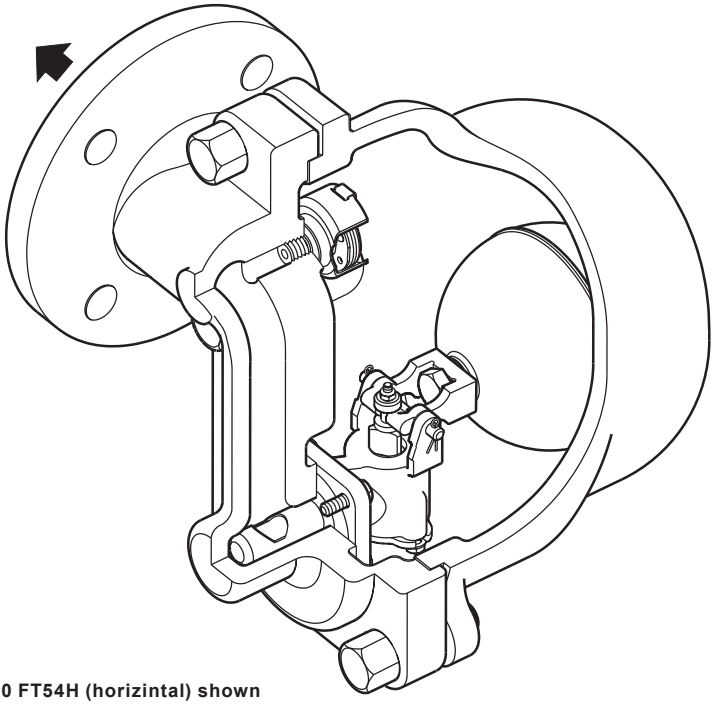
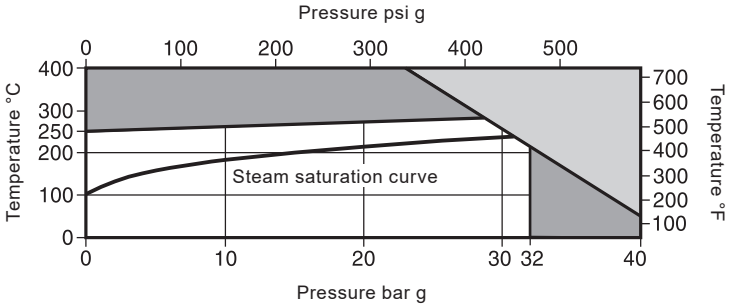


Fig. 3 DN40 FT54H (horizintal) shown

2.3 FT54 pressure / temperature limits (ISO 6552)



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

The product should not be used in this region or beyond its operating range as damage to the internals may occur.

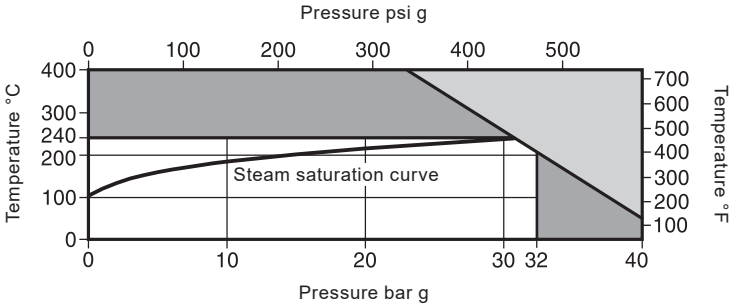
Body design conditions			PN40
PMA	Maximum allowable pressure	40 bar g @ 50 °C	(580 psi g @ 122 °F)
TMA	Maximum allowable temperature	400 °C @ 24 bar g	(752 °F @ 348 psi g)
Minimum allowable temperature		-10 °C	(14 °F)
PMO	Maximum operating pressure for saturated steam service	31 bar g	(449.5 psi g)
TMO	Maximum operating temperature	284 °C @ 28.5 bar g	(543 °F @ 413 psi g)
Minimum operating temperature		0 °C	(32 °F)

Note: For lower operating temperatures consult Spirax Sarco.

ΔPMX	Maximum differential pressure	**FT54H-4** **FT54V-4**	4 bar	(58 psi)
		FT54H-4.5 **FT54V-4.5**	4.5 bar	(65 psi)
		FT54H-8 **FT54V-8**	8 bar	(126 psi)
		FT54H-10 **FT54V-10**	10 bar	(145 psi)
		FT54H-12 **FT54V-12**	12 bar	(174 psi)
		FT54H-20 **FT54V-20**	20 bar	(290 psi)
		FT54H-28 **FT54V-28**	28 bar	(406 psi)
		FT54H-32 **FT54V-32**	32 bar	(464 psi)
Designed for a maximum cold hydraulic test pressure of:			60 bar g	(870 psi g)

Caution: The trap in its complete operational form must not be subjected to a pressure greater than 48 bar (696 psi g) otherwise damage to the internal mechanism may result.

2.4 IFT54 pressure / temperature limits (ISO 6552)



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

The product should not be used in this region or beyond its operating range as damage to the internals may occur.

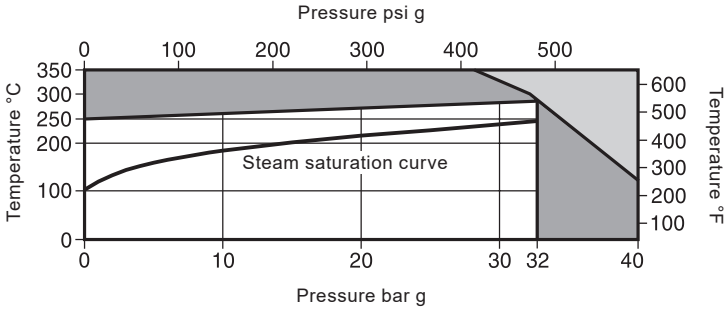
Body design conditions			PN40
PMA	Maximum allowable pressure	40 bar g @ 50 °C	(580 psi g @ 122 °F)
TMA	Maximum allowable temperature	400 °C @ 24 bar g	(752 °F @ 348 psi g)
Minimum allowable temperature		-10 °C	(14 °F)
PMO	Maximum operating pressure for saturated steam service	31 bar g	(449.5 psi g)
TMO	Maximum operating temperature	240 °C @ 31 bar g	(464 °F @ 449.5 psi g)
Minimum operating temperature		0 °C	(32 °F)

Note: For lower operating temperatures consult Spirax Sarco.

ΔPMX	Maximum differential pressure	**IFT54H-4** **IFT54V-4**	4 bar	(58 psi)
		IFT54H-4.5 **IFT54V-4.5**	4.5 bar	(65 psi)
		IFT54H-8 **IFT54V-8**	8 bar	(126 psi)
		IFT54H-10 **IFT54V-10**	10 bar	(145 psi)
		IFT54H-12 **IFT54V-12**	12 bar	(174 psi)
		IFT54H-20 **IFT54V-20**	20 bar	(290 psi)
		IFT54H-28 **IFT54V-28**	28 bar	(406 psi)
		IFT54H-32 **IFT54V-32**	32 bar	(464 psi)
Designed for a maximum cold hydraulic test pressure of:			60 bar g	(870 psi g)

Caution: The trap in its complete operational form must not be subjected to a pressure greater than 48 bar (696 psi g) otherwise damage to the internal mechanism may result.

2.5 FT57 pressure / temperature limits (ISO 6552)



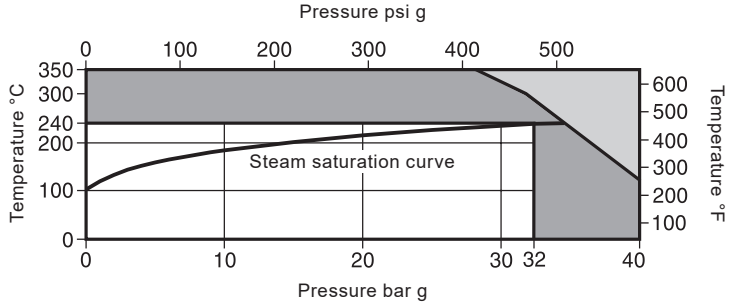
The product **must not** be used in this region.

The product should not be used in this region or beyond its operating range as damage to the internals may occur.

Body design conditions				PN40
PMA	Maximum allowable pressure		40 bar g @ 120 °C	(580 psi g @ 248 °F)
TMA	Maximum allowable temperature		350 °C @ 28 bar g	(662 °F @ 348 psi g)
Minimum allowable temperature			-10 °C	(14 °F)
PMO	Maximum operating pressure for saturated steam service		32 bar g	(464 psi g)
TMO	Maximum operating temperature		287 °C @ 32 bar g	(548 °F @ 464 psi g)
Minimum operating temperature			0 °C	(32 °F)
Note: For lower operating temperatures consult Spirax Sarco.				
ΔPMX	Maximum differential pressure	**FT57H-4**	4 bar	(58 psi)
		FT57H-4.5	4.5 bar	(65 psi)
		FT57H-8	8 bar	(126 psi)
		FT57H-10	10 bar	(145 psi)
		FT57H-12	12 bar	(174 psi)
		FT57H-20	20 bar	(290 psi)
		FT57H-28	28 bar	(406 psi)
		FT57H-32	32 bar	(464 psi)
Designed for a maximum cold hydraulic test pressure of:			60 bar g	(870 psi g)

Caution: The trap in its complete operational form must not be subjected to a pressure greater than 48 bar (696 psi g) otherwise damage to the internal mechanism may result.

2.6 IFT57 pressure / temperature limits (ISO 6552)



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

The product should not be used in this region or beyond its operating range as damage to the internals may occur.

Body design conditions				PN40
PMA	Maximum allowable pressure		40 bar g @ 120 °C	(580 psi g @ 248 °F)
TMA	Maximum allowable temperature		350 °C @ 28 bar g	(662 °F @ 348 psi g)
Minimum allowable temperature			-10 °C	(14 °F)
PMO	Maximum operating pressure for saturated steam service		32 bar g	(464 psi g)
TMO	Maximum operating temperature		240 °C @ 32 bar g	(464 °F @ 464 psi g)
Minimum operating temperature			0 °C	(32 °F)
Note: For lower operating temperatures consult Spirax Sarco.				
ΔPMX	Maximum differential pressure	**IFT57H-4**	4 bar	(58 psi)
		IFT57H-4.5	4.5 bar	(65 psi)
		IFT57H-8	8 bar	(126 psi)
		IFT57H-10	10 bar	(145 psi)
		IFT57H-12	12 bar	(174 psi)
		IFT57H-20	20 bar	(290 psi)
		IFT57H-28	28 bar	(406 psi)
		IFT57H-32	32 bar	(464 psi)
Designed for a maximum cold hydraulic test pressure of:			60 bar g	(870 psi g)

Caution: The trap in its complete operational form must not be subjected to a pressure greater than 48 bar (696 psi g) otherwise damage to the internal mechanism may result.

3. Installation

Note: Before actioning any installation observe the 'Safety information' in Section1.

The trap is designed for installation in horizontal (H) (FT54 or FT57) or vertical (V) pipework (FT54 only), with the float arm in a horizontal plane so that the float rises and falls vertically, ideally with a drop leg immediately preceding the trap. A direction of flow arrow is clearly marked on the body.

Note: When installed, ensure the cover markings 'TOP' and the arrow is in the upright position.

Suitable isolation valves must be installed to allow for safe maintenance/replacement. Remove all protective caps prior to installation. Open isolation valves slowly and check for leaks. Where steam traps are fitted in exposed conditions, the possibility of freezing damage may be reduced by thermal insulation/draining/isolation.

4. Commissioning

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

5. Operation

5.1 Steam trap

The float trap is a continuous discharge trap, removing condensate the instant it forms. On start-up, the thermostatic air vent allows air to bypass the main valve preventing the system air binding. Hot condensate will close the air vent tightly, but as soon as it enters the main chamber of the trap, the float rises and the lever mechanism attached to it opens the main valve, keeping the system drained of condensate at all times. When steam arrives, the float drops and closes the main valve. Float traps are renown for their high start-up load handling capability, clean tight shut-off and resistance to waterhammer and vibration.

5.2 Steam trap with integral sensor

As condensate flows through the trap the sensor will always be submerged in condensate. When the trap is connected to a hand held indicator or an automatic trap monitor the circuit is complete and displays a **green light**.

If the trap fails open, the condensate level drops within the trap exposing the sensor tip. This breaks the circuit and a **red light** is displayed on the monitoring equipment indicating a leaking trap.

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

Maintenance can be completed with the trap in the pipeline, once the safety procedures have been observed. It is recommended that new gaskets and spares are used whenever maintenance is undertaken. Ensure that the correct tools and necessary protective equipment are used at all times. When maintenance is complete open isolation valves slowly and check for leaks.

6.2 How to fit a new valve and seat assembly

DN15, DN20 and DN25:

- Remove pin (**15**) and detach the float mechanism (**8**) ensuring the valve ball (**6**) and spring (**13**) do not fall out.
- Unscrew the main valve seat (**29**) and the support bolt (**14**), remove the support frame (**12**).
- Ensure the gasket faces are clean and dry.
- Fit a new support frame, main valve seat and gasket assembly, and support bolt (**14**).
- Ensure the main valve seat is centralised on the support frame before tightening the support bolt (**14**) and seat to the recommended torques (see Table 1).
- Fit the float assembly (**8**) with the valve ball and spring ensuring the conical spring is installed with the largest diameter facing the float. **Fit a new pin. Ensure the float assembly moves freely in a vertical plane.**

DN40 and DN50:

- Unscrew the 4 bolts (**16**) and remove the main valve assembly (**5**, **10** and **8**).
- Ensure the gasket faces are clean and dry.
- Fit a new gasket (**7**) and main valve assembly.
- Tighten bolts (**16**) evenly to the recommended tightening torque (see Table 1).

6.3 How to replace or clean the sensor:

- Remove the sensor (**28**) from the trap. Clean the sensor insulation. If pitting of the insulation occurs, a new sensor should be fitted. Replace new sensor, ensuring the gasket (**27**) is centralised. Tighten to the recommended tightening torques (see Table 1).

Note: The sensor should be removed periodically to inspect and clean the insulation as a build-up of pipeline residue may affect the function of the sensor. Frequency of inspection will be dictated by condensate quality. If pitting of the insulation occurs, a new sensor should be fitted.

6.4 How to replace the air vent assembly:

- Remove the spring clip, capsule, spacer plate and unscrew the seat (**26**, **25**, **24** and **17**).
- Fit a new gasket (**18**), seat and frame and tighten to the recommended tightening torque (see Table 1).
- Assemble new spacer plate, capsule and clip.

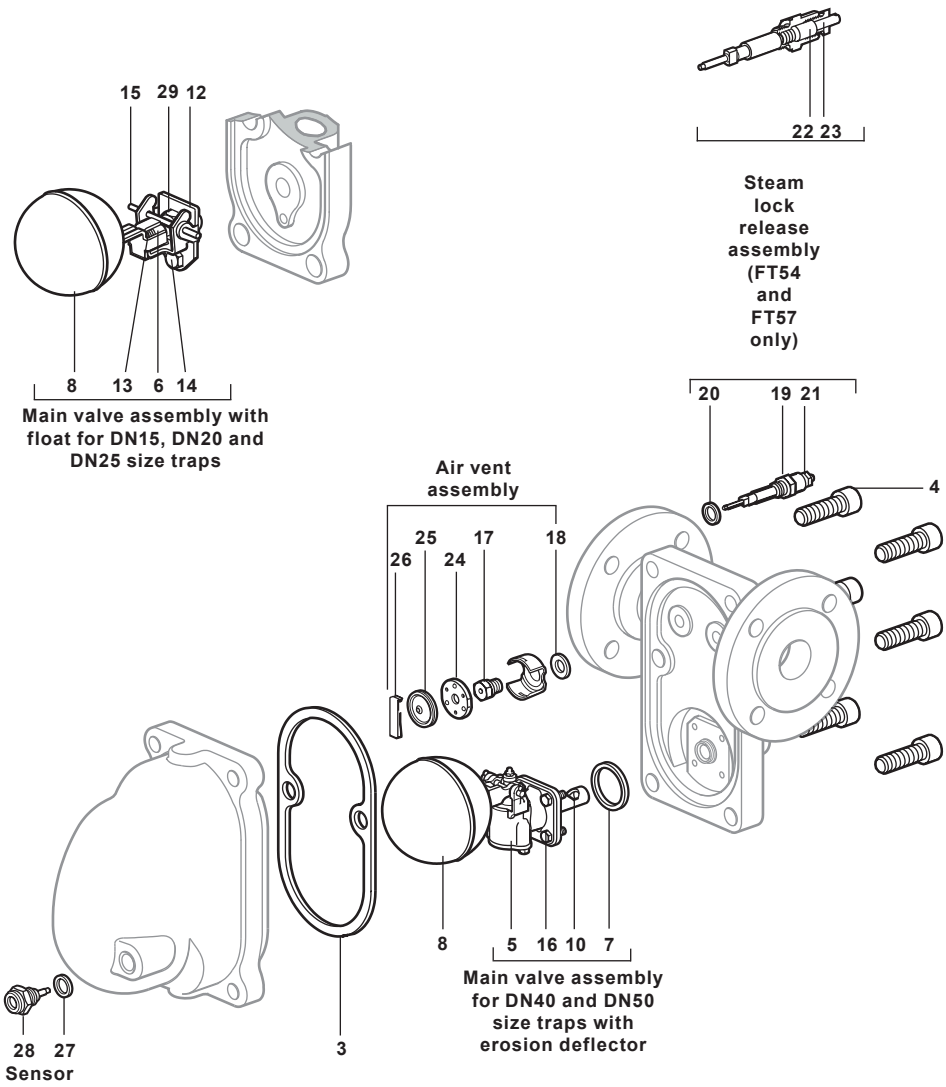


Fig. 4 IFT54H and IFT57H shown

Table 1 Recommended tightening torques

Item				 or mm		Nm	(lbf ft)
4	DN15 DN20 DN25	**FT54H, IFT54H, FT57H, IFT57H**	Bolt	10 (socket)	M12 x 35	70 - 75	(51 - 55)
		FT54V IFT54V	Stud		M12	35 - 40	(26 - 29)
			Nut	19 A/F	M12	70 - 75	(51 - 29)
	DN40 DN50	**FT54H, IFT54H FT57H, IFT57H**	Bolt	24 A/F	M16 x 55	150 - 165	(110 - 121)
			Stud		M16	70 - 80	(51 - 59)
		FT54V IFT54V	Nut	24 A/F	M16	150 - 165	(110 - 121)
14				10 A/F	M6 x 10	10 - 12	(7 - 9)
16				10 A/F	M6 x 10	10 - 12	(7 - 9)
17				17 A/F		50 - 55	(37 - 40)
19	SLR sub-assembly FT54 and FT57 only			19 A/F		40 - 45	(29 - 33)
21	SLR retaining nut FT54 and FT57 only			13 A/F		4 - 5	(3.0 - 3.7)
28				24 A/F	M12	50 - 55	(37 - 40)
29				17 A/F	M12	50 - 55	(37 - 40)

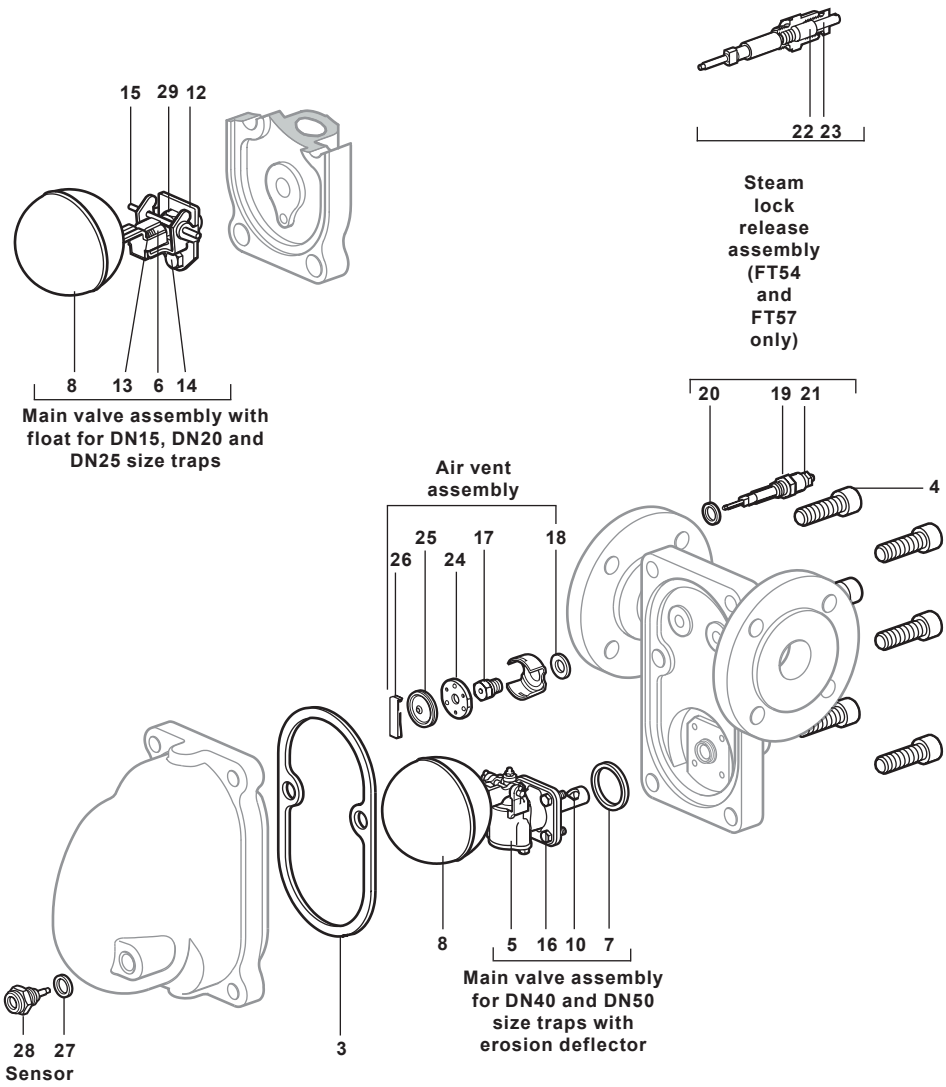


Fig. 5 Recommended tightening torques

7. Spare parts

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

Available spares

Main valve assembly with float	(DN15, 20 and 25)	**6**, **8**, **12**, **13**, **14**, **15**, **29**
Main valve assembly with erosion deflector	(DN40 and 50)	**5**, **7**, **10**, **16**
Ball float	(DN40 and 50 only)	**8**
Air vent assembly		**17**, **18**, **24**, **25**, **26**
Complete set of gaskets	(packet of 3)	**3**, **7**, **18**
Steam lock release and air vent assembly (FT54 and FT57 only)		**17**, **18**, **19**, **20**, **21**, **22**, **23**
Sensor and gasket (IFT54 and IFT57 only)		**27**, **28**

How to order spares

Always order spare parts by using the description given in the column headed 'Available Spares' and state the size, model No., orientation i.e. horizontal (H) or vertical (V) and pressure rating of the trap.

Example: 1- Main valve assembly for a DN40 FT54H-4.5 ball float steam trap. For operating pressures up to 4.5 bar.

Note: If the product has the optional steam lock release fitted the nomenclature would be FT54H-4.5-C.

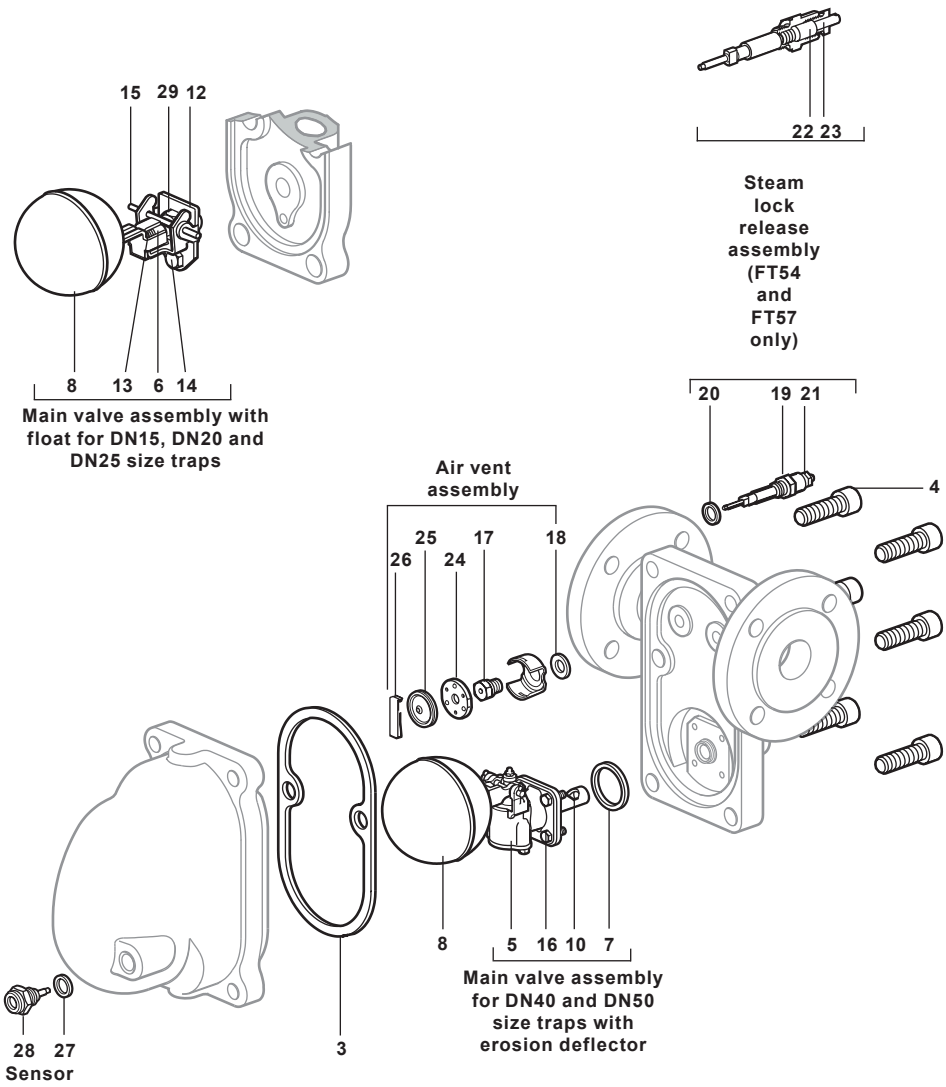


Fig. 6 IFT54H and IFT57H shown - Available spares