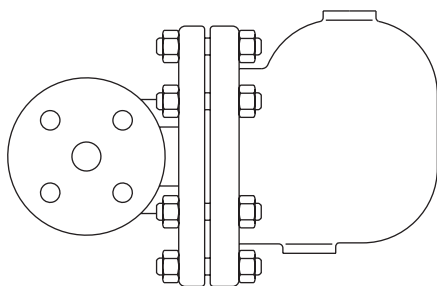


---

**FT43, FT44, FT46 and FT47**  
**Ball Float Steam Traps**  
Installation and Maintenance Instructions

---



1. Safety information
2. General product information
3. Installation
4. Commissioning
5. Operation
6. Maintenance and 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 European Pressure Equipment Directive and carry the  mark when so required. The products fall within the following Pressure Equipment Directive categories:

| Product                |                          | Group 2<br>Gases | Group 2<br>Liquids |
|------------------------|--------------------------|------------------|--------------------|
| FT43                   | DN15 - DN40              | SEP              | SEP                |
|                        | DN50                     | 1                | SEP                |
|                        | DN80 - DN100             | 2                | SEP                |
| FT44, FT46<br>and FT47 | DN15 - DN20              | SEP              | SEP                |
|                        | DN25 - DN50              | 1                | SEP                |
|                        | DN80 - DN100 (FT44 only) | 2                | SEP                |

- The products have been specifically designed for use on steam, air or water/ condensate which are 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.
- 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.
- Determine the correct installation situation and direction of fluid flow.
- 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.
- 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 in excess of 300 °C (572 °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

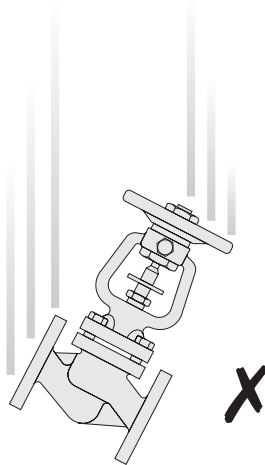
Customers and stockists are reminded that under EC Health, Safety and Environment Law, when returning products to Spirax Sarco they must provide information on any hazards and the precautions to be taken due to contamination residues or mechanical damage which may present a health, safety or environmental 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.

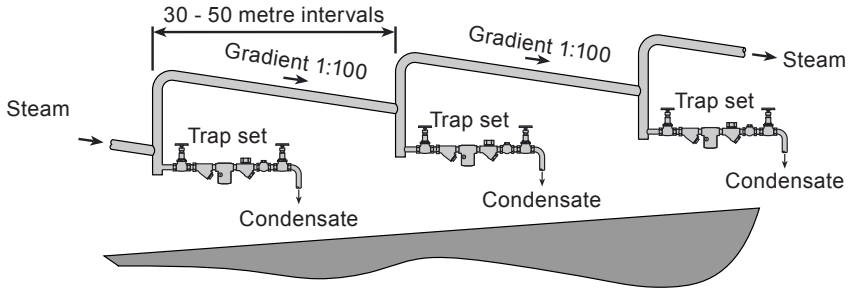
### Safe Handling

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.

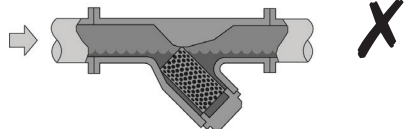
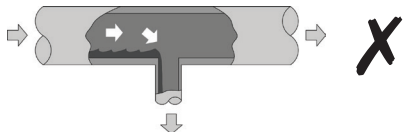
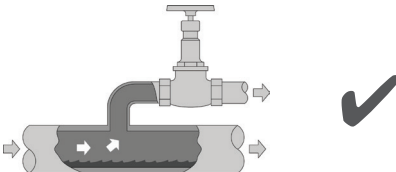
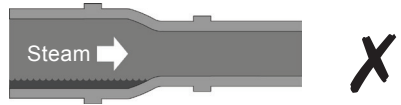
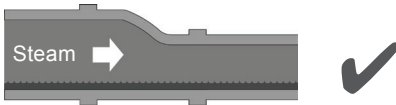
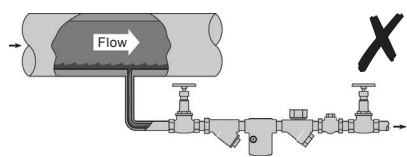
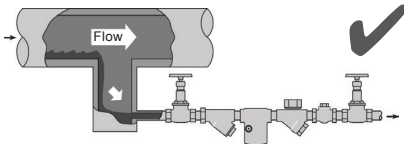


# Prevention of water hammer

Steam trapping on steam mains:

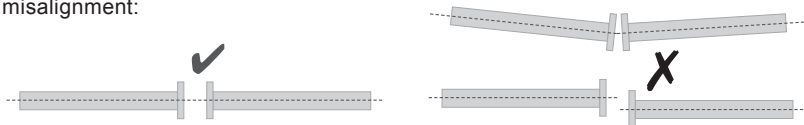


## Steam Mains - Do's and Don'ts:



## Prevention of tensile stressing

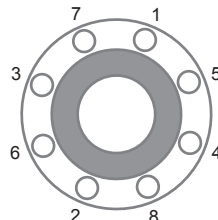
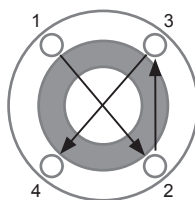
Pipe misalignment:



Installing products or re-assembling after maintenance:

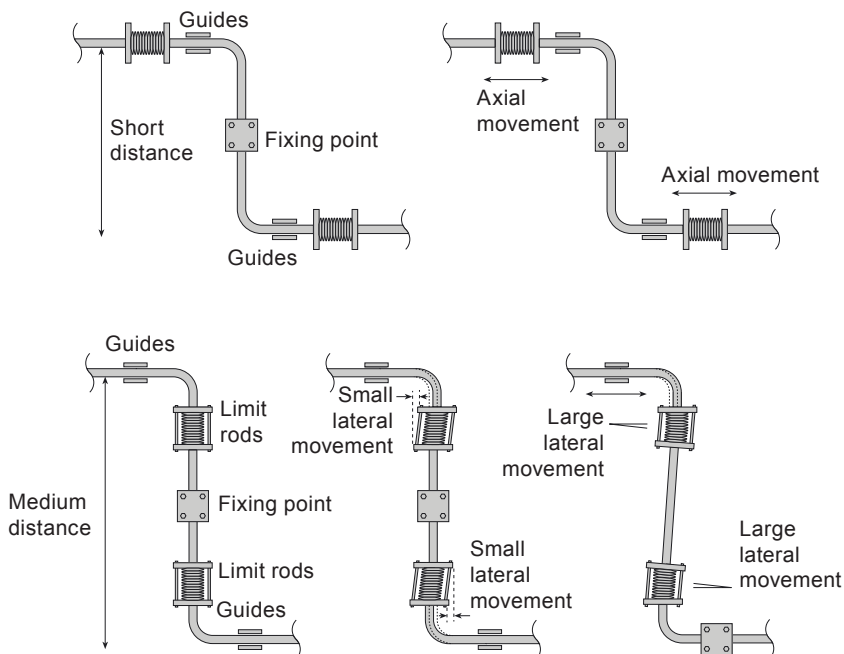


Do not over tighten.  
Use correct torque figures.



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 **FT43** - cast iron, **FT44** - carbon steel, **FT46** - austenitic stainless steel and **FT47** - SG iron ball float steam traps have stainless steel working internals and automatic built-in air venting facility. These traps are supplied with integrally flanged connections (for horizontal or vertical installations) and can be maintained without disturbing the pipework. Please be aware that the flow direction is not the same for all FT trap types or sizes but will be clearly marked on the trap body. For vertically orientated traps, identified by the added 'V' on the nomenclature i.e. FT44V, the flow is downwards only. The body and cover castings for the **FT44**, **FT46** and **FT47** are produced by a TÜV approved foundry.

#### Air vent

The BP99/32 capsule which is used in 4.5 bar - 21 bar ball float steam traps is suitable for use on 150 °C superheat @ 0 bar g. This value reduces with elevated pressure.

The bimetallic element is fitted as standard to the 32 bar variants to provide additional superheat resistance. It is also available on other variants on request. Please refer to the pressure/temperature graphs in the following pages.

#### Optional extras


A **manually adjustable needle valve** (designated 'C' on the nomenclature i.e. **FT46-C**) can be fitted to these traps. This option provides a **steam lock release (SLR)** feature in addition to the standard air vent.

**Note:** The steam lock release and bimetallic air vent cannot be used in conjunction with each other. Alternative arrangements may be available. For further information please contact Spirax Sarco.

The **top of the cover can be drilled and tapped 3/8" BSP or NPT** for the purpose of fitting a balance line if requested at the point of order.

The **bottom of the cover can be drilled and tapped 3/8" BSP or NPT** for the purpose of fitting a drain cock if requested at the point of order.

#### Standards

This product fully complies with the requirements of the European Pressure Equipment Directive and carries the  mark when so required.

#### Certification

This product is available with a manufacturers' Typical Test Report. Certification to EN 10204 3.1 can be supplied at extra cost for the **FT44**, **FT46** and the **FT47**.

**Note:** All certification / inspection requirements must be stated at the time of order placement.

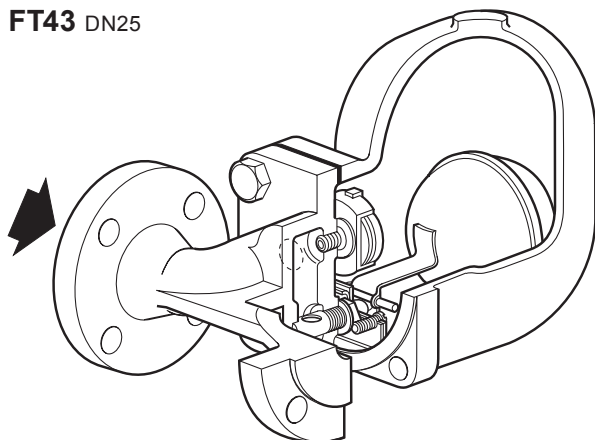
#### Note:

**For further product data see the following sections and Technical Information Sheets:**

| Product     |              | Material        | Section     | TI reference + Capacities       |
|-------------|--------------|-----------------|-------------|---------------------------------|
| <b>FT43</b> | DN25 - DN50  | Cast iron       | Section 2.2 | <b>TI-S02-21</b>                |
|             | DN80 - DN100 | Cast iron       | Section 2.2 | <b>TI-S02-22</b>                |
| <b>FT44</b> | DN15 - DN50  | Carbon steel    | Section 2.3 | <b>TI-S02-14</b>                |
|             | DN80 - DN100 | Carbon steel    | Section 2.3 | <b>TI-S02-23</b>                |
| <b>FT46</b> | DN15 - DN50  | Stainless steel | Section 2.4 | <b>TI-P143-01</b>               |
| <b>FT47</b> | DN15 - DN50  | SG iron         | Section 2.5 | <b>TI-P142-01 and TI-S02-36</b> |

## 2.2 FT43 - Cast iron

### FT43 DN25



### FT43-C

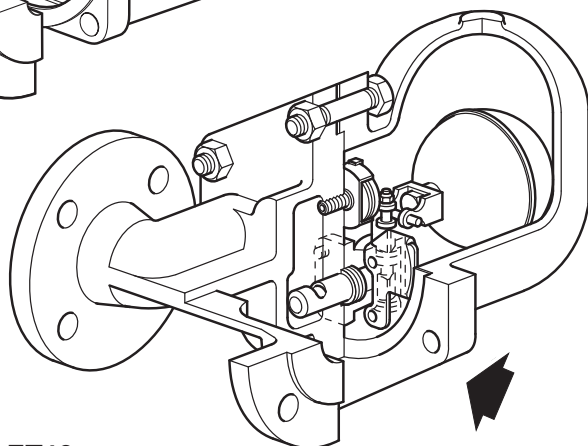
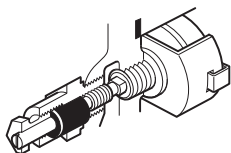


Fig. 1

FT43 DN40 and DN50

## Sizes and pipe connections

DN25, DN40 and DN50

**Note:** Flow direction, for FT43 horizontal orientated traps, when facing the body:

- DN25 is left to right. (R-L versions are available for DN25 FT43TV PN16 only)
- DN40 and DN50 is right to left.

Flow direction, for FT43V vertically orientated traps is downwards only.

**\*Note:** Only the one size, DN25, is available with JIS/KS flange connections with flow vertically downward FT43V.

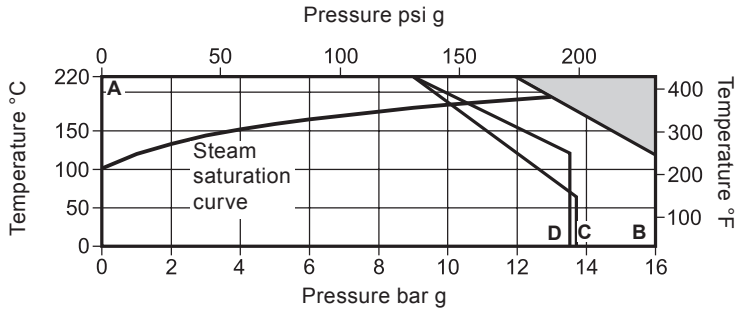
**Standard flanges** are EN 1092 PN16 with face-to-face dimensions in accordance with EN 26554 (Series 1).


**On request** - ASME B 16.5 Class 125 and JIS/KS 10 flanges are also available.

**Note:** ASME and JIS/KS flanges are supplied with tapped holes to receive flange bolts. ASME flanges have UNC threads and JIS/KS have metric threads.



# Pressure / temperature limits



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

**A - B** Flanged EN 1092 PN16.

**A - C** Flanged ASME 125.

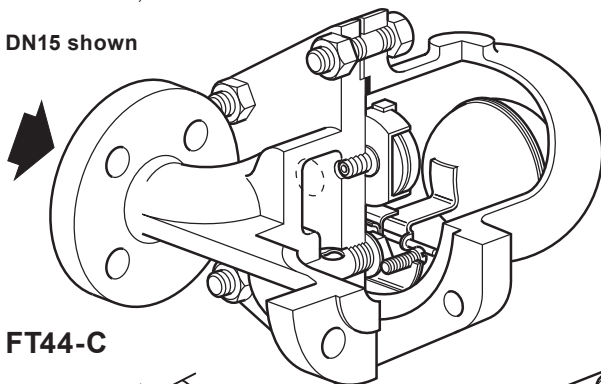
**A - D** Flanged JIS/KS 10 \*

|   |  |                     |                      |      |
|---|--|---------------------|----------------------|------|
| Body design conditions  |  |                     |                      | PN16 |
| PMA   | Maximum allowable pressure                             | 16 bar g @ 120 °C   | (232 psi g @ 248 °F) |      |
| TMA   | Maximum allowable temperature                          | 220 °C @ 12.1 bar g | (428 °F @ 175 psi g) |      |
| Minimum allowable temperature   |  |                     | 0 °C (32 °F)         |      |
| PMO   | Maximum operating pressure for saturated steam service | 13 bar g @ 195 °C   | (188 psi g @ 383 °F) |      |
| <b>Note:</b> The DN40 and DN50 traps are limited to a PMO equal to ΔPMX |  |                     |                      |      |
| TMO   | Maximum operating temperature                          | 220 °C @ 12.1 bar g | (428 °F @ 175 psi g) |      |
| Minimum operating temperature   |  |                     | 0 °C (32 °F)         |      |
| <b>Note:</b> For lower operating temperatures consult Spirax Sarco      |  |                     |                      |      |
| ΔPMX  | Maximum differential pressure                          | FT43-4.5            | 4.5 bar (65 psi)     |      |
|   |  | FT43-10             | 10 bar (145 psi)     |      |
|   |  | FT43-14             | 13 bar (188 psi)     |      |
| Designed for a maximum cold hydraulic test pressure of:                 |  | 24 bar g            | (348 psi g)          |      |
| <b>Note:</b> With internals fitted, test pressure must not exceed ΔPMX  |  |                     |                      |      |

## 2.3 FT44 - Carbon steel

### FT44 DN15, DN20 and DN25

DN15 shown



FT44 DN40 and DN50

DN50 shown

FT44-C

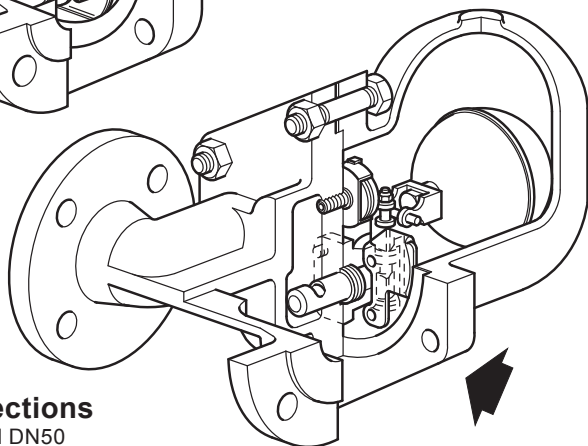
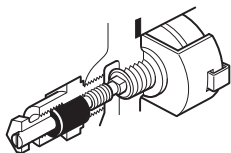


Fig. 2

### Sizes and pipe connections

DN15, DN20, DN25, DN40 and DN50

#### Horizontal traps:

Note the flow direction when facing the body is as follows:

- DN15 to DN25 is left to right.
- DN40 and DN50 is right to left.

**Standard flanges** are EN 1092 PN40 with face-to-face dimensions in accordance with EN 26554 (Series 1).

**On request** - ASME B 16.5 Class 150 and 300 and JIS/KS 20 flanges are also available with extended face-to-face dimensions.

#### Vertical traps:

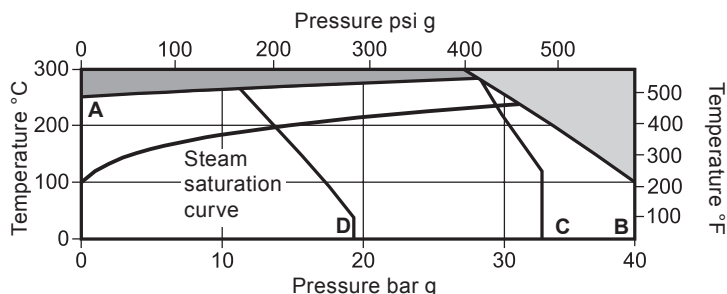
Note that the flow direction is vertically downwards only.

**Standard flanges** are EN 1092 PN40 with face-to-face dimensions in accordance with EN 26554 (Series 1).

**On request** - ASME B 16.5 Class 150 and 300 and JIS/KS 20 are also available with face-to-face dimensions in accordance with EN 26554 (Series 1).

**Note:** ASME and JIS/KS flanges are supplied with tapped holes to receive flange bolts. ASME flanges have UNC threads and JIS/KS have metric threads.

## Pressure / temperature limits



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

This product should not be used in this region as damage to the internals may occur.

**A - B** Flanged EN 1092 PN40 and ASME 300.

**A - C** Flanged JIS/KS 20.

**A - D** Flanged ASME 150.

| Body design conditions  |  | PN40                                     |
|---|--|--|
| PMA   | Maximum allowable pressure                             | 40 bar g @ 100 °C (580 psi g @ 212 °F)   |
| TMA   | Maximum allowable temperature                          | 300 °C @ 27.5 bar g (572 °F @ 399 psi g) |
| Minimum allowable temperature   |  | -10 °C (14 °F)                           |
| PMO   | Maximum operating pressure for saturated steam service | 32 bar g @ 239 °C (464 psi g @ 462 °F)   |
| <b>Note:</b> The DN40 and DN50 traps are limited to a PMO equal to ΔPMX |  |  |
| TMO   | Maximum operating temperature                          | 285 °C @ 28.5 bar g (545 °F @ 413 psi g) |
| Minimum operating temperature   |  | 0 °C (32 °F)                             |
| <b>Note:</b> For lower operating temperatures consult Spirax Sarco      |  |  |

|  |                               | Size     | DN15, DN20, DN25 | DN40, DN50 |             |
|--|-------------------------------|----------|------------------|------------|-------------|
| ΔPMX   | Maximum differential pressure | FT44-4.5 | 4.5 bar          | 4.5 bar    | (65 psi)    |
|  |                               | FT44-10  | 10 bar           | 10 bar     | (145 psi)   |
|  |                               | FT44-14  | 14 bar           | -          | (203 psi)   |
|  |                               | FT44-21  | 21 bar           | 21 bar     | (304 psi)   |
|  |                               | FT44-32  | 32 bar           | 32 bar     | (464 psi)   |
| Designed for a maximum cold hydraulic test pressure: |                               |          |                  | 60 bar g   | (870 psi g) |

**Note:** With internals fitted, test pressure must not exceed ΔPMX

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

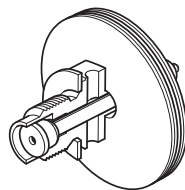
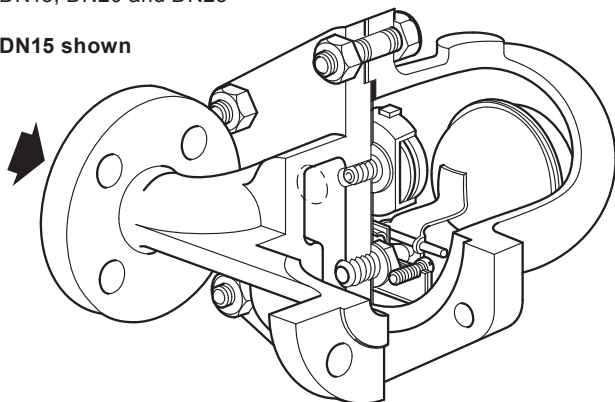
## 2.4 FT46 - Stainless steel

### FT46

4.5 bar - 21 bar

DN15, DN20 and DN25

DN15 shown



### FT46

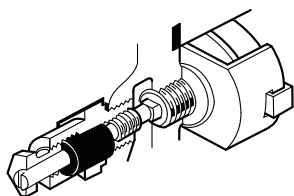
DN15 to DN50

32 bar

### FT46

4.5, 10 and 21 bar  
DN40 and DN50

DN50 shown



### FT46-C

4.5-21 bar

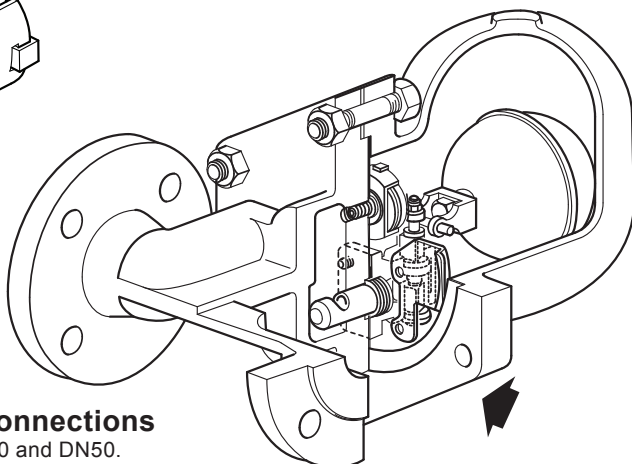


Fig. 3

## Sizing and pipe connections

DN15, DN20, DN25, DN40 and DN50.

**Note:** Flow direction when facing the body is as follows:

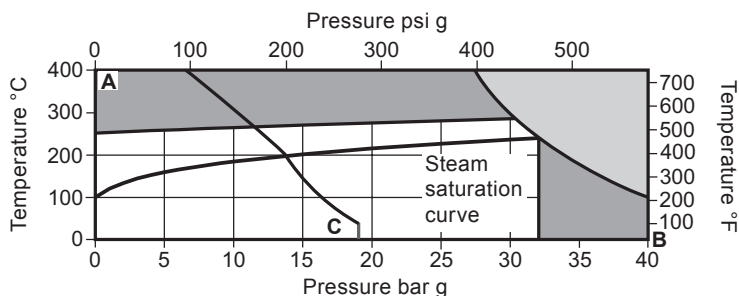
- DN15 to DN25 is left to right.
- DN40 and DN50 is right to left.

**Standard flanges** are EN 1092 PN40 with face-to-face dimensions in accordance with EN 26554 (Series 1).

**On request** - ASME B 16.5 Class 150 and 300 flanges are also available with face-to-face dimensions in accordance with EN 26554 (Series 1).

**Note:** ASME flanges are supplied with tapped (UNC) holes for flange bolts.

## Pressure / temperature limits



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

This product should not be used in this region as damage to the air vent may occur.

**A - B** Flanged EN 1092 PN40 and ASME (ANSI) 300.

**A - C** Flanged ASME (ANSI) 150.

**Note:** The use of the bimetallic element extends the superheat resistance to in excess of 400 °C.

| Body design conditions        |  |  | PN40                                     |
|-------------------------------|--|--|--|
| PMA                           | Maximum allowable pressure                             | 40 bar g @ 100 °C                      | (580 psi g @ 212 °F)                     |
| TMA                           | Maximum allowable temperature                          | 400 °C @ 27.4 bar g                    | (752 °F @ 397 psi g)                     |
| Minimum allowable temperature |  |  | -10 °C (14 °F)                           |
| PMO                           | Maximum operating pressure for saturated steam service | 32 bar g @ 239 °C                      | (464 psi g @ 462 °F)                     |
| TMO                           | Maximum operating temperature                          | When fitted with a capsule             | 285 °C @ 30 bar g (545 °F @ 439 psi g)   |
|                               |  | When fitted with a bimetallic air vent | 400 °C @ 27.4 bar g (752 °F @ 397 psi g) |
| Minimum operating temperature |  |  | 0 °C (32 °F)                             |

**Note:** For lower operating temperatures consult Spirax Sarco

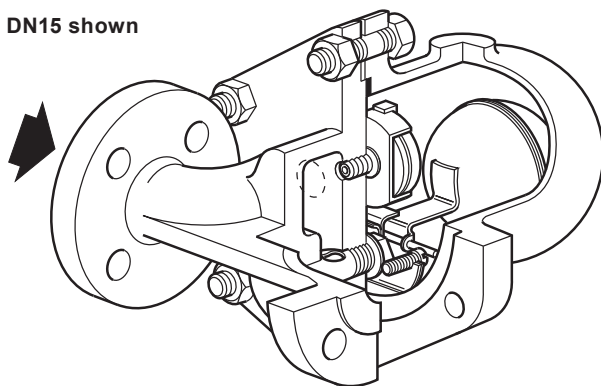
|  |                               | Size     | DN15<br>DN20<br>DN25 | DN40<br>DN50 |             |
|--|-------------------------------|----------|----------------------|--------------|-------------|
| Δ PMX  | Maximum differential pressure | FT46-4.5 | 4.5 bar              | 4.5 bar      | (65 psi)    |
|  |                               | FT46-10  | 10 bar               | 10 bar       | (145 psi)   |
|  |                               | FT46-14  | 14 bar               | -            | (203 psi)   |
|  |                               | FT46-21  | 21 bar               | 21 bar       | (304 psi)   |
|  |                               | FT46-32  | 32 bar               | 32 bar       | (464 psi)   |
| Designed for a maximum cold hydraulic test pressure:               |                               |          |                      | 60 bar g     | (870 psi g) |
| <b>Note:</b> With internals fitted, test pressure must not exceed: |                               |          |                      | 48 bar g     | (696 psi g) |

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

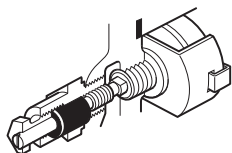
## 2.5 FT47 - SG iron

**FT47** DN15, DN20 and DN25

**DN15 shown**

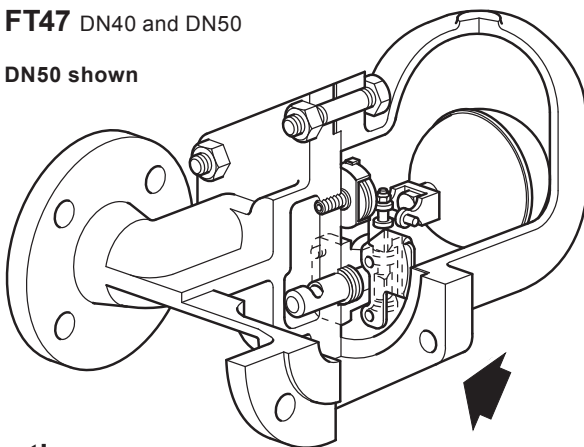


**FT47-C**



**FT47** DN40 and DN50

**DN50 shown**



**Fig. 4**

### Sizing and pipe connections

DN15, DN20, DN25, DN40 and DN50.

**Note:** Flow direction, for horizontal orientated traps, when facing the body is as follows:

- DN15 to DN25 is left to right.
- DN40 and DN50 is right to left.

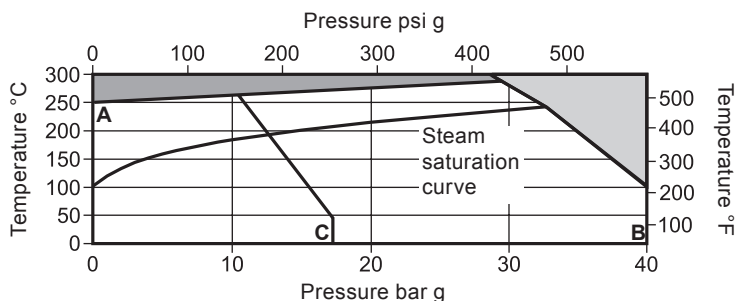
For vertically orientated traps the flow is downwards only.

**Standard flanges** are EN 1092 PN40 and PN25 with face-to-face dimensions in accordance with EN 26554 (Series 1).

**On request** - ASME B 16.5 Class 150 flanges are also available with face-to-face dimensions in accordance with EN 26554 (Series 1).

**Note:** ASME flanges are supplied with tapped (UNC) holes for flanged bolts.

## Pressure / temperature limits



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

This product should not be used in this region as damage to the internals may occur.

**A - B** Flanged EN 1092 PN25 / 40.

**A - C** Flanged ASME 150.

| Body design conditions  |  | PN40                                   |
|---|--|--|
| PMA   | Maximum allowable pressure                             | 40 bar g @ 100 °C (580 psi g @ 212 °F) |
| TMA   | Maximum allowable temperature                          | 300 °C @ 28 bar g (572 °F @ 406 psi g) |
| Minimum allowable temperature   |  | -10 °C (14 °F)                         |
| PMO   | Maximum operating pressure for saturated steam service | 32 bar g @ 239 °C (464 psi g @ 462 °F) |
| <b>Note:</b> The DN40 and DN50 traps are limited to a PMO equal to ΔPMX |  |  |
| TMO   | Maximum operating temperature                          | 285 °C @ 29 bar g (545 °F @ 420 psi g) |
| Minimum operating temperature   |  | 0 °C (32 °F)                           |

**Note:** For lower operating temperatures consult Spirax Sarco

|  |                               | Size     | DN15, DN20, DN25 | DN40, DN50 |             |
|--|-------------------------------|----------|------------------|------------|-------------|
| ΔPMX   | Maximum differential pressure | FT47-4.5 | 4.5 bar          | 4.5 bar    | (65 psi)    |
|  |                               | FT47-10  | 10 bar           | 10 bar     | (145 psi)   |
|  |                               | FT47-14  | 14 bar           | -          | (203 psi)   |
|  |                               | FT47-21  | 21 bar           | 21 bar     | (304 psi)   |
|  |                               | FT47-32  | 32 bar           | 25.5 bar   | (464 psi)   |
| Designed for a maximum cold hydraulic test pressure: |                               |          |                  | 60 bar g   | (870 psi g) |

**Note:** With internals fitted, test pressure must not exceed ΔPMX

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

# 3. Installation

**Note:** Before actioning any installation 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.

Referring to the Installation and Maintenance Instructions, name-plate, and Technical Information Sheet, check that the product is suitable for its intended use.

- 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 direction of fluid flow – please be aware that the flow direction is not the same for all FT trap types or sizes. However the flow direction will be clearly marked on the trap body.
- 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 trap must be fitted with the float arm in a horizontal plane so that it rises and falls vertically. Note: The trap can be visually checked for its correct orientation by reading the writing on the body, cover, and name-plate. If installed correctly the writing will be seen to be displayed the correct way up.
- 3.5** The trap should be fitted below the outlet of the steam system, with a small drop leg immediately proceeding the trap, typically 150 mm (6") see Figure 5. If no drop leg is allowed for then it may be possible (under low load conditions) for steam to flow over the condensate in the bottom of the pipe and reach the trap.

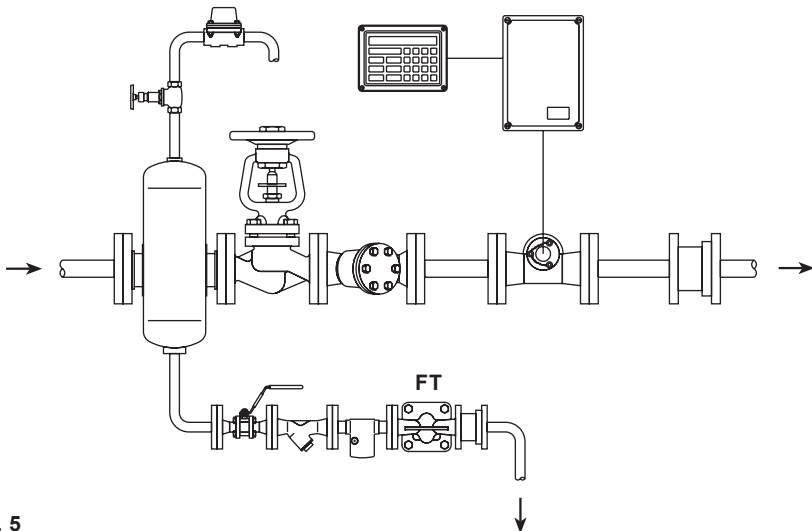


Fig. 5



**3.6** Float traps should be fitted as close to the outlet of the plant to be drained as possible otherwise the trap can steam lock. Steam locking occurs when the pipe between the condensate outlet and the steam trap fills with steam and prevents condensate from reaching the trap. This can lead to the system waterlogging which will affect plant efficiency. It is very similar to the air locking experienced in water systems.

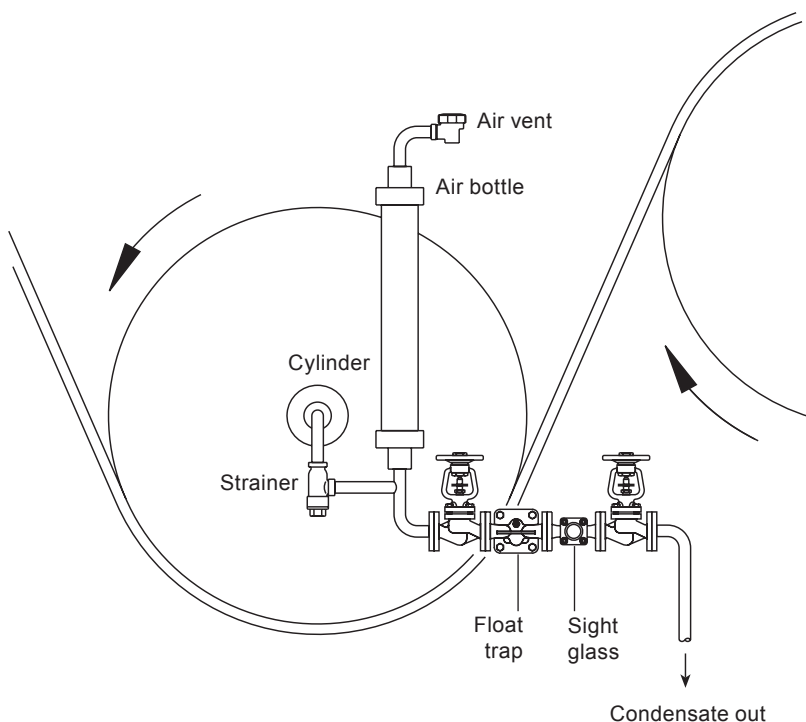
The most common application where steam locking is a risk is on rotating cylinders and other applications where condensate is removed via a dip tube or siphon pipe. Steam locking can easily be prevented by fitting the trap with a combined thermostatic air vent and an adjustable needle valve (SLR), Figure 6 shows an FT-C trap fitted on a slow speed cylinder.

The adjustable needle valve (SLR) is opened by turning the spindle anticlockwise. The standard factory setting is  $\frac{1}{2}$  turn which equates to an approximate steam 'bypass' of 22 kg/h @ 10 bar.

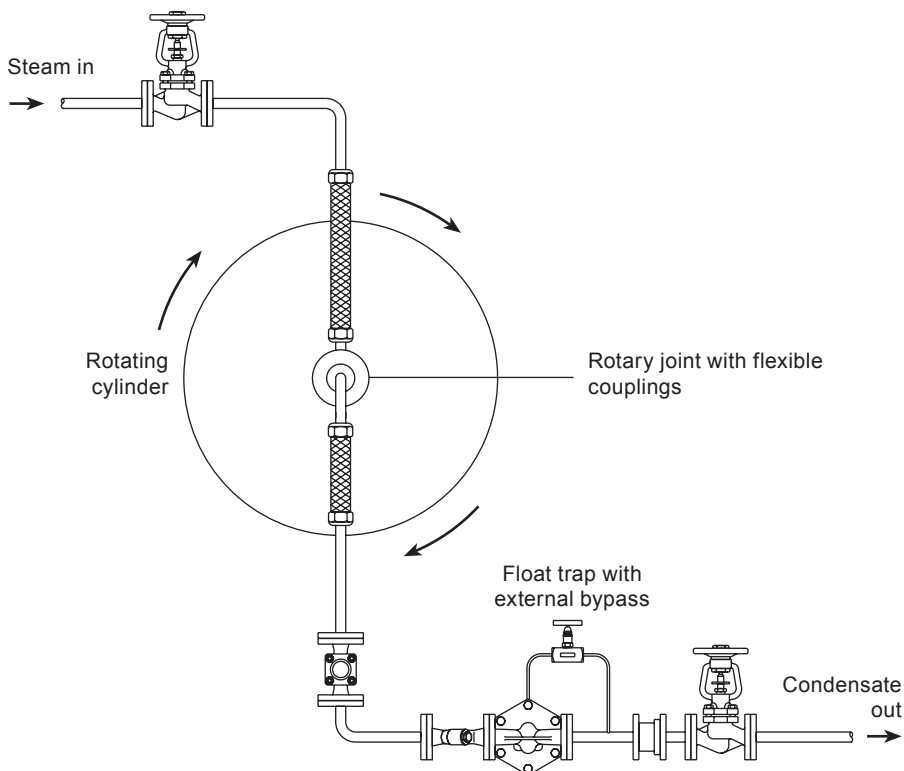
Site adjustment of the adjustable needle valve can be achieved by turning anticlockwise to increase the bypass flow, and clockwise to reduce the flow.

When draining from a high speed cylinder application, there is need for large amounts of blow-through steam to assist the flow of condensate out of the cylinder via the siphon tube.

In such cases the adjustable needle valve cannot handle such large amounts and an external bypass with an adjustable needle valve is required. See Figure 7 (page 18).



**Fig. 6 Slow speed cylinder drainage with system unit**



**Fig. 7 High speed cylinder with float trap and parallel blow-through valve**

- 3.7** If the trap is to be situated in an exposed position, it should be either lagged or drained by a separate small thermostatic trap such as the Spirax Sarco No.8, or Bydrain.
- 3.8** Always fit a non-return (check) valve downstream of any steam trap which discharges into condensate return lines where back pressure is experienced. This is not commonly caused by a rising condensate line. The check valve will prevent the steam space flooding when the inlet pressure is reduced or the steam is shut off.
- 3.9** Ensure adequate space is left to remove the cover from the body for maintenance – the maximum withdrawal to remove the cover is 200 mm (8").

**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

The float trap is a continuous 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 the steam arrives, the float drops and closes the main valve. Float traps are renowned for their high start-up load handling capability, clean tight shut-off and resistance to waterhammer and vibration.

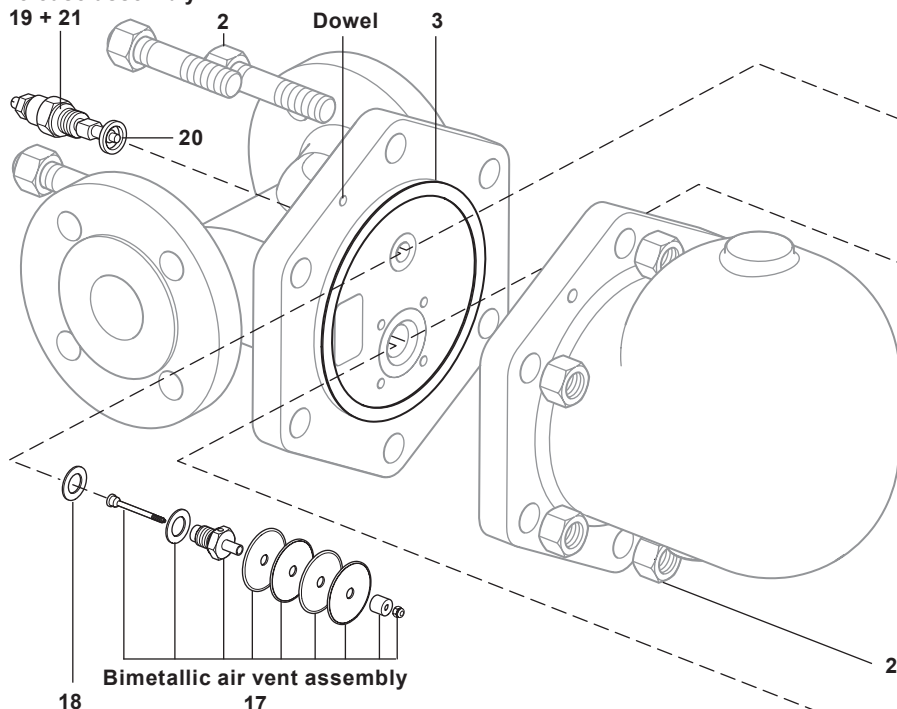
# 6. Maintenance and Spare parts

## 6.1 FT43, FT44, FT46 and FT47 (DN15 to DN50)

### Notes:

- Before actioning any maintenance programme observe the 'Safety information' in Section 1.
- The FT43 is not normally provided with a bimetallic air vent due to its PN16 rating. This arrangement can be made available on request.



### Steam lock release assembly

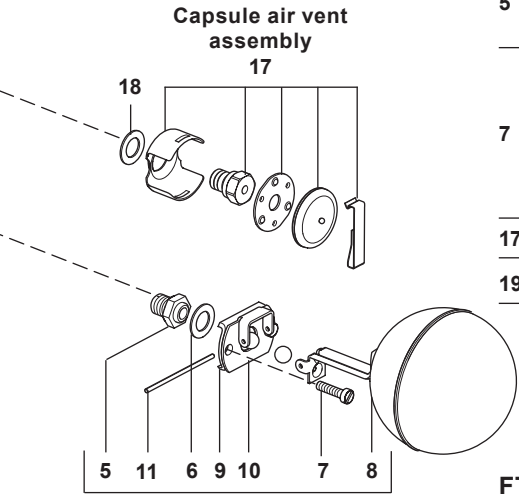


### Warning

The cover gasket contains a thin stainless steel support ring which may cause physical injury if not handled and disposed of carefully.

Table 1 Recommended tightening torques

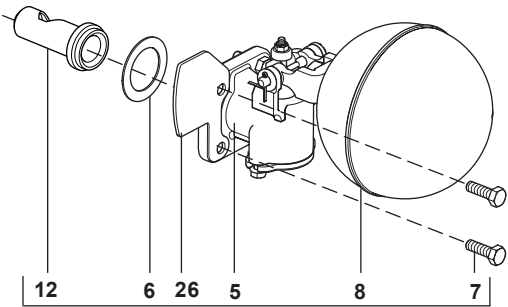
| Item No. | Size                   |  or  | mm       | N m       | (lbf ft)    |
|----------|------------------------|--|----------|-----------|-------------|
| 2*       | DN15,<br>DN20,<br>DN25 | 17 A/F   | M10 x 30 | 29 - 33   | (19 - 24)   |
|          | DN40                   | 24 A/F   | M12 x 60 | 60 - 66   | (44 - 48)   |
|          | DN50                   | 24 A/F   | M16 x 70 | 80 - 88   | (58 - 65)   |
| 5        | DN15,<br>DN20,<br>DN25 |  |          | 50 - 55   | (37 - 40)   |
| 7        | DN15,<br>DN20,<br>DN25 |  | M5 x 20  | 2.5 - 2.8 | (1.8 - 2.1) |
|          | DN40                   | 10 A/F   | M6 x 20  | 10 - 12   | (7.0 - 9.0) |
|          | DN50                   | 13 A/F   | M8 x 20  | 20 - 24   | (15 - 17)   |
| 17       |                        | 17 A/F   |          | 50 - 55   | (37 - 40)   |
| 19*      |                        | 22 A/F   |          | 40 - 45   | (29 - 33)   |



Main valve assembly with float  
(DN15, DN20 and DN25)

FT44 only\*

|    |                        |        |          |         |           |
|----|------------------------|--------|----------|---------|-----------|
| 2  | DN15,<br>DN20,<br>DN25 | 17 A/F | M10 x 30 | 19 - 22 | (14 - 16) |
| 19 |                        | 22 A/F |          | 50 - 55 | (37 - 40) |

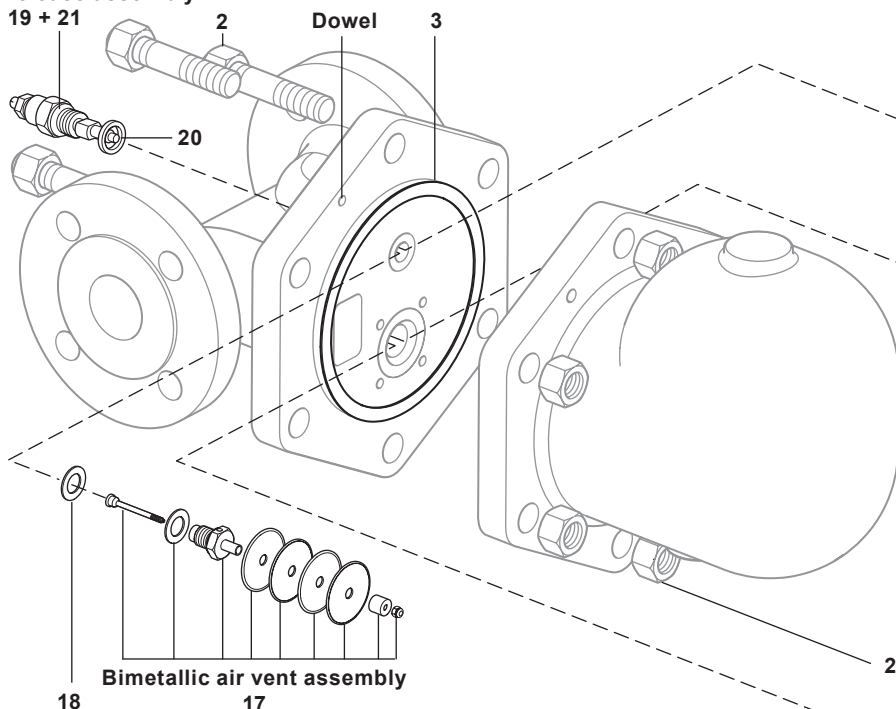


Main valve assembly  
(DN40 and DN50)

## Servicing:

- With suitable isolation, repairs can be carried out with the trap in the pipeline.
- When reassembling, make sure that all joint faces are clean and the dowel locates in the cover.

### Steam lock release assembly



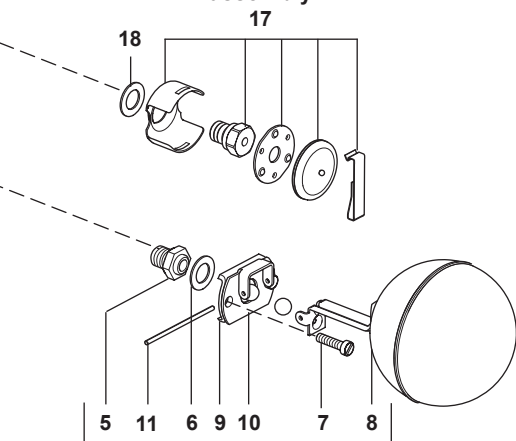
## How to fit the main valve assembly for DN15, DN20 and DN25:

- Unscrew the support frame (9), pivot frame (10) and the valve seat (5).
- Ensure the seat/gasket faces are clean and dry.
- Fit the new gasket (6) and the valve seat (5) to the body (**Do not use gasket paste**).
- Attach the support frame (9) and pivot frame (10) to the body with the assembly set screws (7) but do not tighten.
- Fit the float arm (8) to the pivot frame (10) using the pin (11) and by moving the complete assembly centre the valve head onto the seat orifice.
- Tighten the assembly set screws (see Table 1 for the recommended tightening torques).

## How to fit the main valve assembly for DN40 and DN50:

- Unscrew the 4 bolts or nuts (7).
- Remove the main valve assembly (5) and gasket (6).
- Ensure the gasket faces are clean and dry.
- Fit the new gasket (6) and the main valve assembly (5), including the baffle plate (see Figures 10 and 11).
- Tighten the bolts or nuts (7) evenly (see Table 1 for recommended tightening torques).

**Capsule air vent assembly**



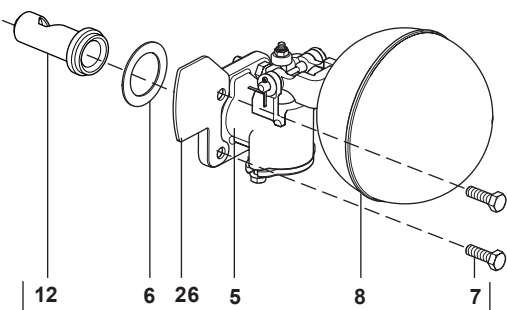
**Main valve assembly with float  
(DN15, DN20 and DN25)**

## How to fit the capsule air vent assembly for DN15 to DN100:

- Remove the spring clip, capsule, spacer plate, unscrew the seat and remove the frame (17) and gasket (18).
- Ensure the gasket faces are clean and dry.
- Fit the new gasket (18), the frame and seat (17) and tighten to the recommended torque (see Table 1).
- Assemble the new spacer plate, capsule and clip.

## How to fit the bimetallic air vent assembly for DN15 to DN100:

- Unscrew and remove the element assembly (17) and gasket (18).
- Ensure the gasket faces are clean and dry.
- Fit the new gasket (18) and element assembly (17) and tighten to the recommended torque (see Table 1).

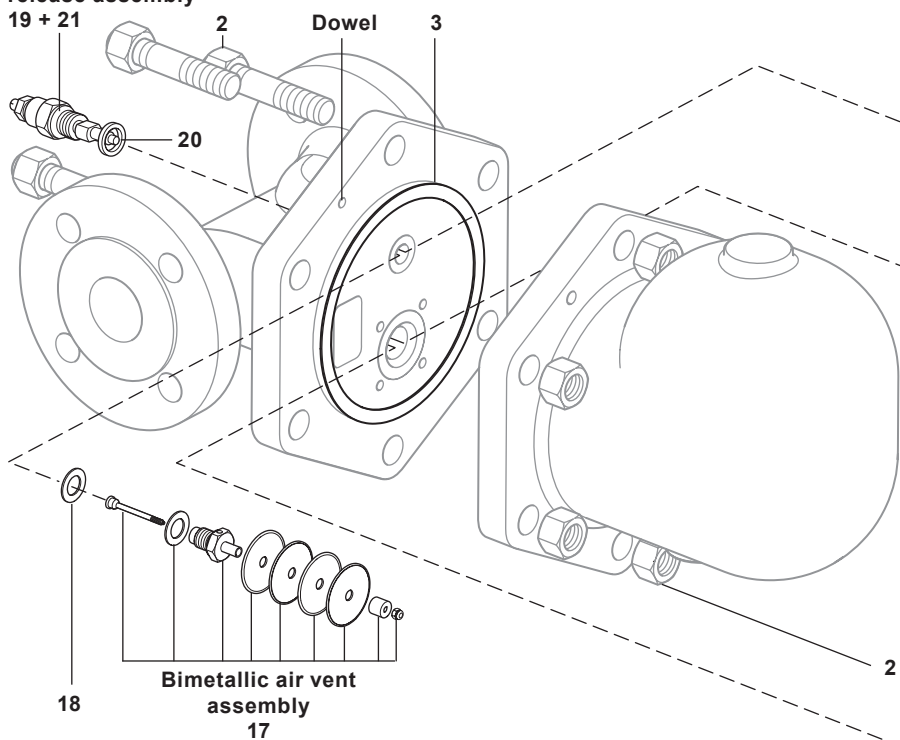


**Main valve assembly  
(DN40 and DN50)**

## Spare parts

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

### Steam lock release assembly

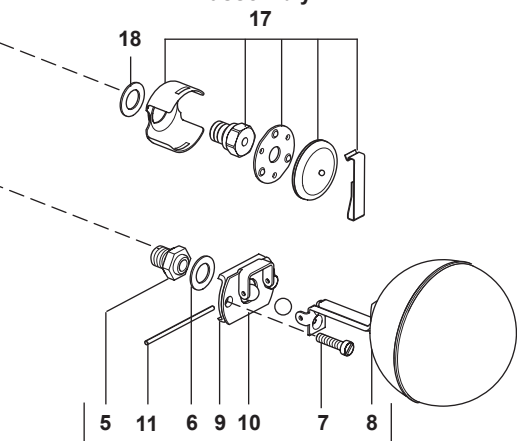




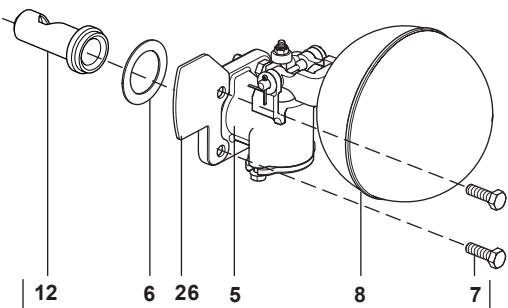
## Available spares

|   |  |
|---|--|
| Main valve assembly with float (DN15, DN20 and DN25)<br>(specify horizontal or vertical traps)    | 5, 6, 7, 8, 9, 10, 11  |
| Main valve assembly with erosion deflector (DN40 and 50)<br>(specify horizontal or vertical trap) | 5, 6, 7, 12, 26  |
| Ball float and lever (DN40 and DN50)  | 8  |
| Air vent assembly   | <div>Bimetallic air vent assembly</div> <div>Capsule air vent assembly</div> <div>17, 18</div> |
| Steam lock release and capsule air vent assembly  | 17, 18, 19, 20, 21   |
| Complete set of gaskets (packet of 3 sets)  | 3, 6, 18, 20   |

**Capsule air vent  
assembly**



**Main valve assembly with float  
(DN15, DN20 and DN25)**



**Main valve assembly  
(DN40 and DN50)**

## How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size, type of trap, connection: horizontal or vertical and pressure range.

**Note:** When ordering a spare air vent Assembly, please specify whether you require a bimetallic or capsule air vent assembly.

**Example:** 1 - Capsule air vent assembly for a Spirax Sarco DN20 FT46-4.5 ball float steam trap, with horizontal connectors.

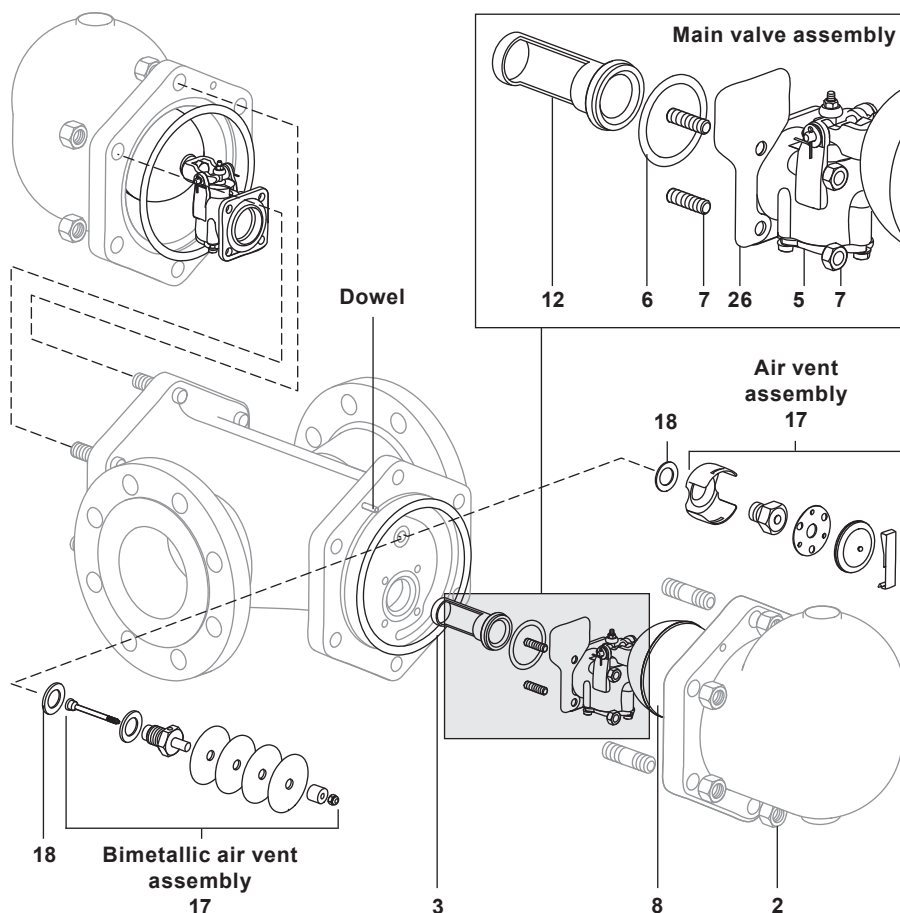
## 6.2 FT43 and FT44 (DN80 and DN100)

### Notes:



- Before actioning any maintenance programme observe the 'Safety information' in Section 1.
- The FT43 is not normally provided with a bimetallic air vent due to its PN16 rating. This arrangement can be made available on request.

### Warning

The cover gasket contains a thin stainless steel support ring which may cause physical injury if not handled and disposed of carefully.



**Table 2 Recommended tightening torques**

| Item No. |  | or<br>mm |  | N m     | (lbf ft)  |
|----------|---|----------|---|---------|-----------|
| 2        | 24 A/F  |          | M16 x 45  | 80 - 88 | (58 - 65) |
| 7        | 13 A/F  |          | M8 x 20   | 20 - 24 | (15 - 17) |
| 17       | 17 A/F  |          |   | 50 - 55 | (37 - 40) |

### Unscrew element assembly

- Remove the cover nuts (2) and cover.
- Undo the 4 main valve assembly nuts (7).
- Remove the main valve assembly (5) and gasket (6).
- Ensure gasket faces are clean and dry.
- Fit new gasket (6) and main valve assembly (5).
- Tighten nuts (7) evenly (see Table 2 for the recommended tightening torques).
- Re-use or replace the ball float (8) as required.
- Replace cover gasket (3) ensuring the gasket face has been cleaned.
- Replace the cover, ensuring the dowel is located correctly.
- Retighten the cover nuts (2) evenly (see Table 2 for the recommended tightening torques).

### How to fit the capsule air vent assembly:

- Remove the spring clip, capsule, spacer plate, unscrew the seat and remove the frame (17) and gasket (18).
- Ensure the gasket faces are clean and dry.
- Fit the new gasket (18), frame and seat (17) and tighten evenly (see Table 2 for the recommended tightening torques).
- Assemble new spacer plate, capsule and clip.

### How to fit the bimetallic air vent assembly for DN15 to DN100:

- Unscrew and remove the element assembly (17) and gasket (18).
- Ensure the gasket faces are clean and dry.
- Fit the new gasket (18) and element assembly (17) and tighten evenly to the recommended torque (see Table 2).

## Spare parts

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

### Available spares

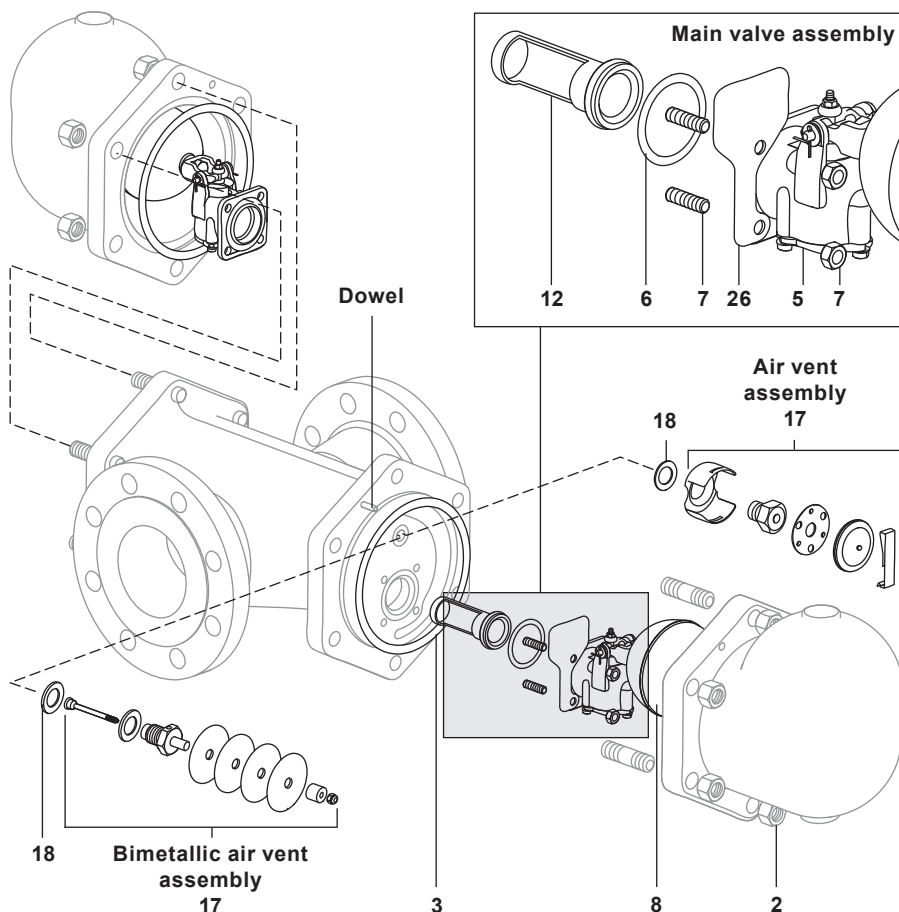
|                                       |                        |
|---------------------------------------|------------------------|
| Main valve assembly                   | <b>5, 6, 7, 12, 26</b> |
| Ball float and lever                  | <b>8</b>               |
| Air vent assembly                     | <b>17, 18</b>          |
| Bimetallic air vent assembly          |                        |
| Capsule air vent assembly             |                        |
| Set of all gaskets (packet of 3 sets) | <b>3, 6, 18</b>        |

**Note:** For a complete overhaul 2 off of each spare are required.

### 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. and pressure rating of the trap.

**Example:** 1 - Main valve assembly for a DN80 Spirax Sarco FT43-10TV ball float steam trap.



### 6.3 FT mechanisms (DN40 only)

#### Baffle arrangement used on FT43, FT44, FT46 and FT47 (horizontal only)

In line with our policy of continuous product improvement, we have found it beneficial to add a baffle plate over the inlet port.

This eliminates any risk of flow from the inlet port affecting the correct operation of the float. When fitting the mechanism, assemble the baffle plate supplied under the mechanism retaining bolts.

The correct positioning is shown below.

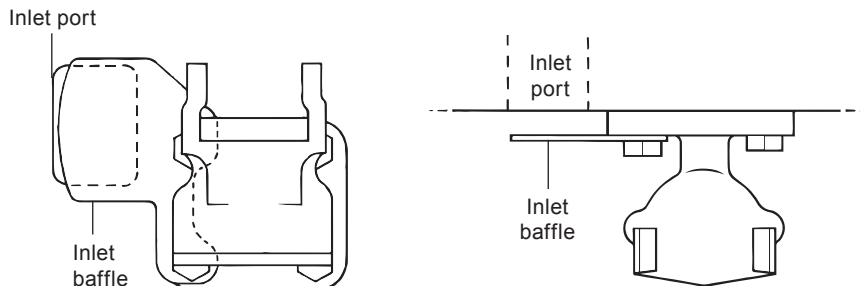


Fig. 8

### 6.4 FT mechanisms (DN50 only)

#### Baffle arrangement used on FT43, FT44, FT46 and FT47 (horizontal only)

When fitting the mechanism, assemble as follows:

1. Remove two uppermost studs and replace with the longer studs provided.
2. Assemble the mechanism over the four studs.
3. Place the spacer collars then baffle plate over the longer studs so that the collars rest on the back of the square flange.
4. Replace the nuts and tighten as normal.

The correct assembly and positioning is shown below.

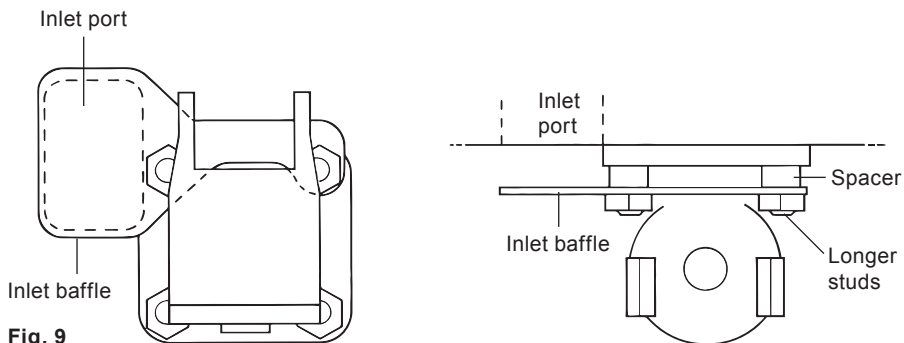


Fig. 9





