

# Float & Thermostatic Steam Traps FT, FTB, FTI, OK, FTS-150, FTS-300

## 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.

- i) The products have been specifically designed for use on steam, air or water/condensate. 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.
- 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 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

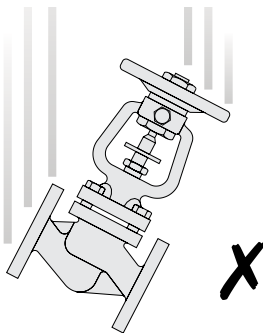
Customers and stockists are reminded that under EC Health, Safety and Environment Law, when returning products to Spirax Sarco they must provide information on any hazards and the precautions to be taken due to contamination residues or mechanical damage which may present a health, safety or environmental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

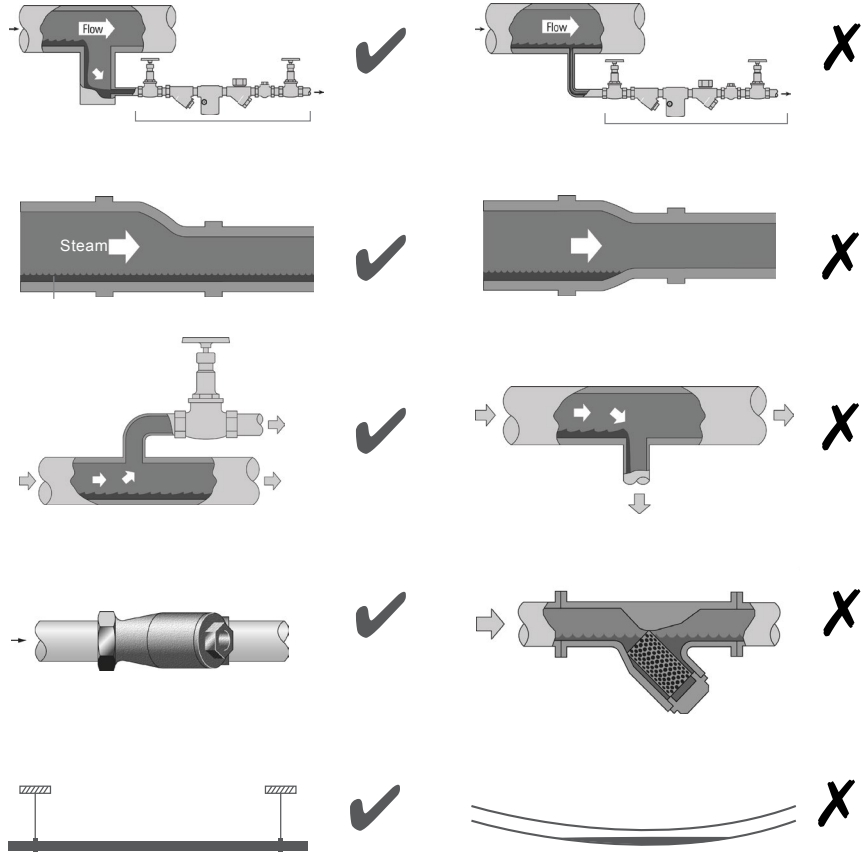
Cast iron products are commonly found on steam and condensate systems. If installed correctly using good steam engineering practices, it is perfectly safe. However, because of its mechanical properties, it is less forgiving compared to other materials such as SG iron or carbon steel. The following are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



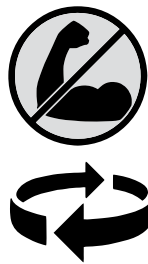
### Steam Mains - Do's and Dont's:



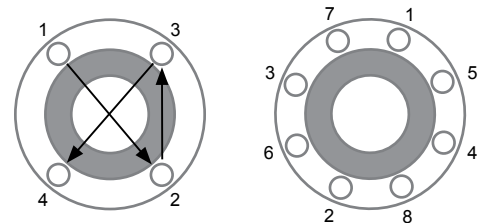
### Prevention of tensile stressing

Pipe misalignment:

Installing products or re-assembling after maintenance:



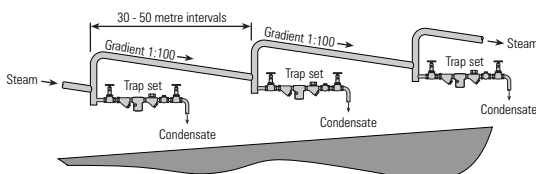
Do not over tighten.  
Use correct torque figures.



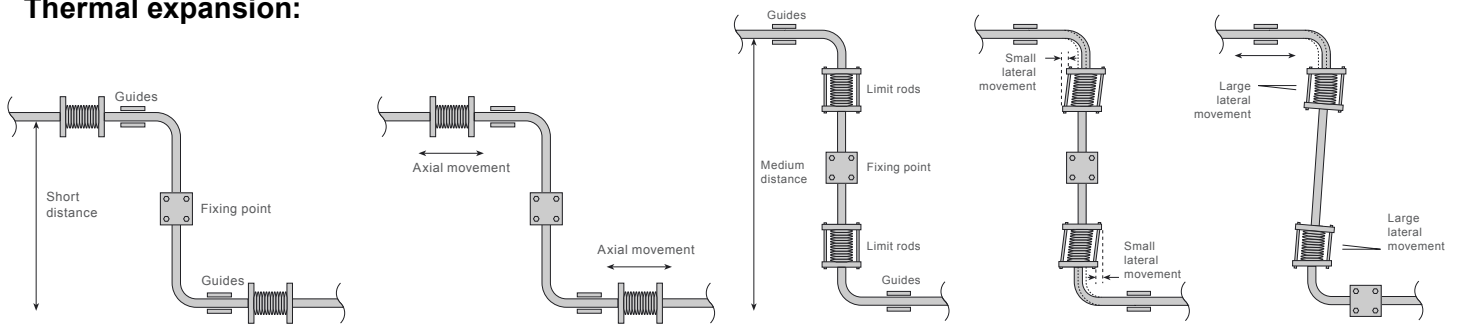
Flange bolts should be gradually tightened across diameters to ensure even load and alignment.

### Prevention of water hammer

Steam trapping on steam mains:



## Thermal expansion:



## Description and Operation

Spirax Sarco Float & Thermostatic Steam Traps are ideally suited for most HVAC and process applications. The spherical stainless steel float automatically adjusts the position of the main valve so that condensate is discharged continuously at the same rate as it enters the trap. Air and other non-condensable gases which are present at start up or which enter the trap during operation are discharged through the integral balanced pressure thermostatic air vent (some high pressure F & T traps have a bimetal air vent). The traps will operate against any back-pressure lower than the inlet pressure. (The differential pressure—inlet pressure minus outlet pressure—determines the trap's capacity).

All Spirax Sarco F & T traps will tolerate at least 450°F of temperature. The superheat tolerance of some models is higher; refer to the appropriate Technical Information Sheet or call Spirax Sarco for further information.

## Limiting Operating Conditions

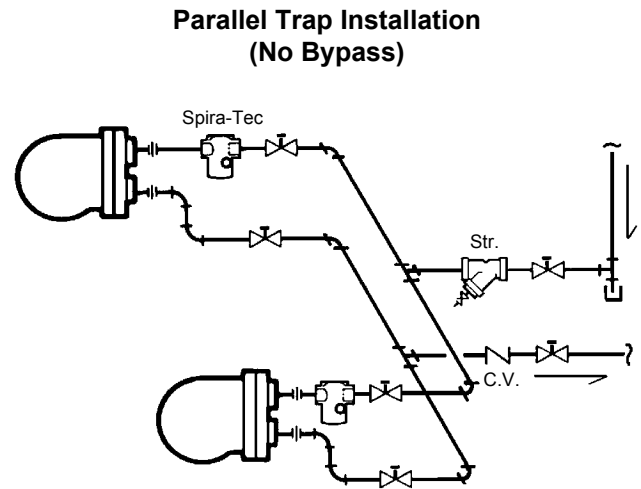
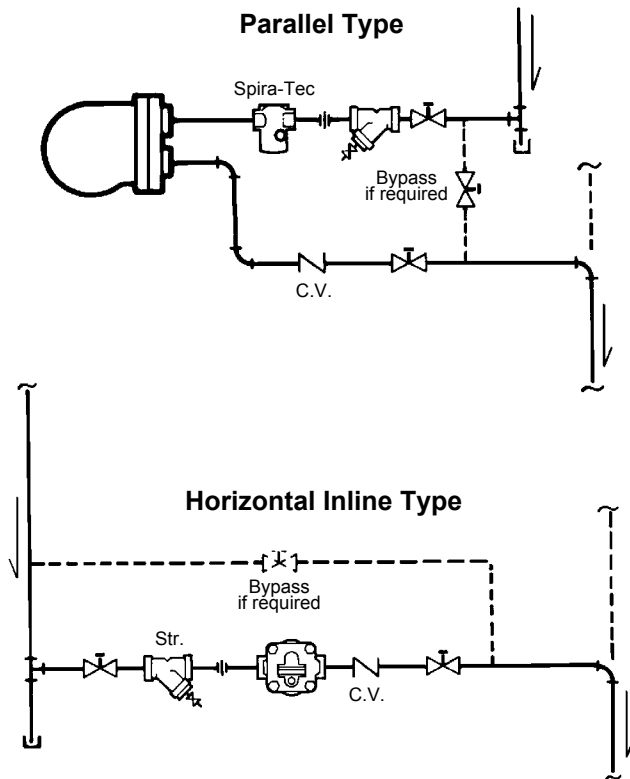
The maximum operating pressure (PMO) is shown on the nameplate. The PMO depends on the valve mechanism; if the pressure at the trap inlet is higher than the PMO, the excess pressure may lock the valve closed. In some cases (for example, if there is a permanent back-pressure in the return line) it may be permissible to exceed the PMO. Please consult Spirax Sarco for details.

The maximum operating temperature depends on the superheat tolerance of the air vent. This is always at least 450°F as the TMA (see below) is not exceeded.

The maximum allowable pressure and temperature (PMA and TMA) are determined by the pressure shell design conditions, and must not be permanently exceeded. The trap may be subjected to a temporary cold hydraulic test pressure of 1-1/2 times the cold PMA, provided that the air vent is first removed. If the test pressure will exceed 600 psi, the float must also be removed.

## Installation

1. Before installation, inspection or maintenance, the trap must be isolated from both supply and return line pressure.
2. The trap should be installed below the drainage point of the equipment or steam main so that condensate can flow by gravity into the trap. A vertical drop to the trap is advantageous, but long horizontal runs should be avoided because of the possibility of steam locking. If a long horizontal run to the trap is unavoidable, a trap with a steam lock release should be used.
3. If possible, a drop leg and dirt pocket should be installed ahead of the trap. The trap should be protected by a Spirax Sarco y-pattern stainer, preferably fitted with a blow down valve. Full-port isolating valves should be installed to permit servicing.
4. The trap must be installed in an upright position with the orientation arrow on the body or on the nameplate pointing straight down. The flow direction markings on the body or cover must be observed.
5. Before installing the trap, the inlet piping should be carefully blown down to remove any existing debris.
6. A Spira-tec® sensor chamber facilitates checking the trap's operation. A check valve downstream of the trap will prevent backflow from the return line.
7. If the condensate must be lifted to the return main, the trap, followed by a check valve, should be installed at the bottom of the lift. Sufficient pressure to lift the condensate (approximately 1 psi for each 2 ft. of lift) must be present at the trap inlet at all times.  
Note that a temperature control valve on the inlet steam may at times reduce the pressure below the amount required to lift the condensate. When the inlet steam is controlled and condensate must be lifted after the trap, a Spirax Sarco Pressure Powered Pump™ should be considered.
8. Bypass piping is not recommended because of the possibility of misuse. If continuous service is required, a second trap could be piped in parallel with suitable valving to allow one trap to be serviced while the other remains in operation. If a bypass line must be used, it should be at least one pipe size smaller than the trap.
9. Because condensate cannot drain completely from the body, an F & T trap installed outdoors can freeze up if it is not in continuous operation. If there is a possibility of an interruption in the steam supply, provisions should be made for draining or tracing the trap body.
10. The trap can be put into service by slowly opening the isolating valves. No priming is necessary.



## Maintenance

1. After isolation from supply and return line pressure, all Spirax Sarco F & T traps can be serviced without disturbing the piping connections. On some models the cover with mechanism attached can be removed for servicing while the body remains in the pipeline.
2. On most models, dirt and sludge which may accumulate in the trap can be removed by "blowing down" through the drain plug in the bottom of the body.
3. The trap should be disassembled periodically for inspection and replacement if necessary of the valve mechanism and air vent.
4. Ensure that the trap is properly isolated, and that any pressure which may remain in the trap is relieved before the trap is opened. This can be accomplished by opening the blowdown valve on the upstream strainer and waiting until the trap has cooled. Some condensate will remain in the trap body. This can be drained by removing the drain plug or by cracking the body-cover joint.
5. Remove and save the cover bolts, and remove the body or cover. Using a suitable solvent, clean all dirt and incrustation from the body, cover and mechanism. Inspect the body and cover for condensate corrosion.
6. Inspect the valve head and seat for damage, wear

or wiredrawing. Replace the mechanism if necessary, using a complete valve mechanism kit and following the instructions included with the kit.

7. Inspect the float for leakage or damage, and replace if necessary. A distorted or collapsed float is evidence of a severe and dangerous overpressure or waterhammer condition which must be corrected before the trap is returned to service.
8. The air vent should be removed, tested for proper operation, and replaced if necessary. Instructions are included with the air vent kit.
9. Remove all traces of the old gasket from the body and cover, and ensure that the gasket surfaces are clean and undamaged. Using a new cover gasket, reassemble the trap. Tighten the cover bolts to the torque shown on page 3.
10. The trap can be returned to service by slowly opening the isolating valves. Priming is not required.

**Note:** Flash steam is formed when a portion of the hot condensate re-evaporates as it passes from a higher to a lower pressure (for example, as it flows through a steam trap). This flash steam is normal, and it should not be mistaken for live steam leakage when the operation of the trap is being observed.

## Spare Parts

The following spare parts are available for Spirax Sarco Float & Thermostatic Steam traps:

**Valve Mechanism Kit** - Complete valve mechanism with mechanism gasket and mounting screws as required. A separate cover gasket kit should be ordered when replacing mechanism parts.

**Gasket Kit** - Three each of cover and mechanism gaskets.

**Air Vent Kit** - Air vent assembly.

**Replacement Kit** - Valve mechanism with gasket, float with screw and washer, air vent assembly, cover gasket.

**Float Kit** - Float with screw and lockwasher as required.

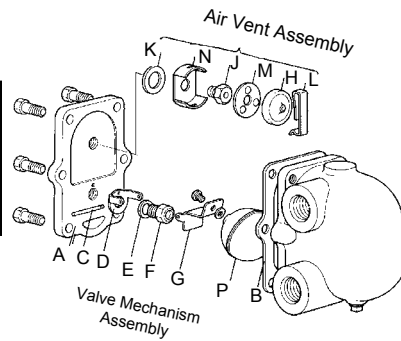
**Note:** In some models, the float is welded to the mechanism arm, and is included in the valve mechanism kit. A separate float kit is not available.

Model	Size(s)	Spare Parts Kits*			Torque Values ft·lb		TIS Number
		Valve Mechanism Kit	Gasket Kit	Float Kit	Cover Bolts	Valve Seat or mounting screws	
FT-15	3/4", 1"	54749	55475	55448	11-16	27-31	2.313
	1-1/4"	Replacement Module: 67908					
		54752	55475	55447	11-16	34-37	
FT-30	3/4", 1"	Replacement Module: 67909			11-16	27-31	
		58131	58127	58129			
	58135	58128	58130	11-16	34-37		
FT-75	3/4", 1"	Replacement Module: 68592				11-16	
		58139	55475	55447	17-26		
	58132	58127	58129	11-16		27-31	
FT-125	3/4", 1"	Replacement Module: 68593			11-16		27-31
		58133	58127	58129		17-26	
	58137	58128	58130	17-26	90-95 118-122		
FTI	3/4", 1"	Replacement Module: 68594				11-16	27-31
		54751	55475	55447	17-26		
	54749		55448	17-26		27-31	
FTI	1-1/4", 1-1/2"	Replacement Module: 68594			17-26		90-95 118-122
		58134	58127	58129		80-85	
	58138	58128	58130	80-85	90-95		
FTI	1-1/2"	Replacement Module: 68594				80-85	90-95
		74323			80-85		
	74324			80-85		90-95	
FT-150	3/4", 1"	Replacement Module: 68594			17-21		8-10
		74325	74327	74328		17-21	
	74326			17-21	8-10		
FT-200	1-1/4", 1-1/2"	Replacement Module: 68594				17-21	8-10
		80087	55481	55447	17-21		
	80090	55482	58130	17-21		8-10	
FTB-20	3/4", 1"	Replacement Module: 68594			17-21		8-10
		81850	55481	55447		17-21	
	80091	55482	58130	17-21	8-10		
FTB-30	1-1/4", 1-1/2"	Replacement Module: 68594				17-26	150-155
		58152	55479	58159	17-26		
	58177	58173	58160	93-97		53-55	
FTB-125	2"	Replacement Module: 68594			93-97		53-55
		58177	CI 58173/CS 68806	58160		93-97	
	58158	68806	58160	85-90	16-19		
FTB-200	2-1/2"	Replacement Module: 68594				85-90	16-19
		58179	58180	58129	23-27		
	61044	55479	58159	23-27		8-11	
FTB-175	2"	Replacement Module: 68594			93-97		16-19
		58158	58173	58160		93-97	
	58179	74122	74123	27-31	8-11		
FTB-200	1-1/2"	Replacement Module: 68594				27-31	8-11
		58179	74122	74123	27-31		
	66379			15-17		17-19	
OK 150, FTS150 OK 300, FTS300	1/2"	Replacement Module: 68594			15-17		17-19
		63353	66576	55447		15-17	
	63354			15-17	17-19		
FT450-	4.5 10 14	Replacement Module: 68594				27-31	27-31
		66379			27-31		
	66380			27-31		27-31	
FT450-	1"	Replacement Module: 68594			27-31		27-31
		66381	66392	N/A		27-31	
	66382			27-31	27-31		
FT450-	4.5 10 14	Replacement Module: 68594				27-31	27-31
		66384			27-31		
	66385			27-31		27-31	
FT450-	1-1/2"	Replacement Module: 68594			80-85		7-9
		66386	66392	N/A		80-85	
	66387			80-85	7-9		
FT450-	4.5 10 32	Replacement Module: 68594				80-85	7-9
		66388			80-85		
	66395			80-85		7-9	
FT450-	2"	Replacement Module: 68594			93-97		15-18
		66396	66393	62541		93-97	
	66397			93-97	15-18		
FT450-	4.5 10 32	Replacement Module: 68594				93-97	15-18
		66389			93-97		
	66390	66394	62541	93-97		15-18	
66391			93-97		15-18		

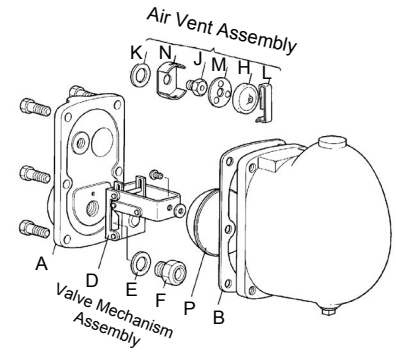
\* Air Vent Kits - see next page

## Air Vent Kits

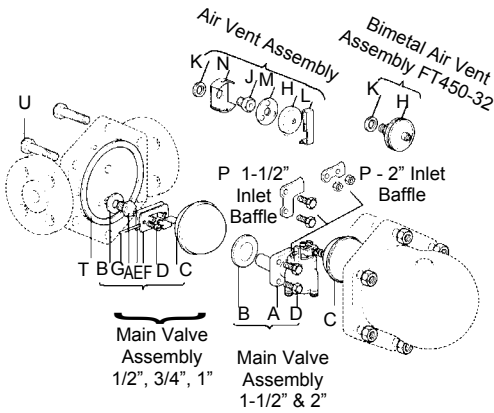
Model	Air Vent Kit No.	Air Vent Seat Torque ft•lb
FT-450 4.5 to 32	71512	26-30
FT-450 with bimetal option	66642	37-40
All Others	62652	26-30



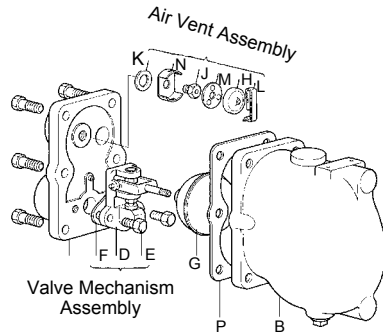
**3/4", 1" FT-15/30/75/125**  
**1-1/4" FT-15/30**



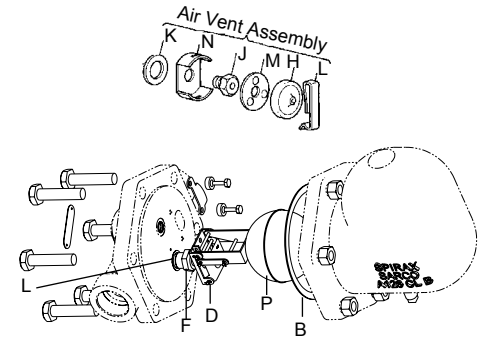
**1-1/4" FT-75/125**  
**1-1/2" FT-15/30/75/125**  
**2" FTB-20**



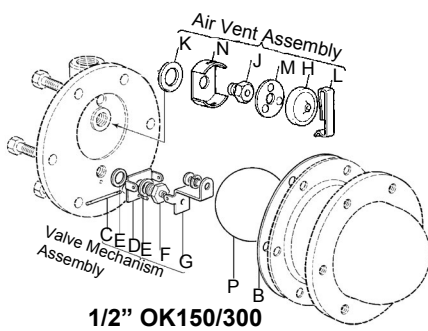
**3/4", 1", 1-1/2", 2" FT450**



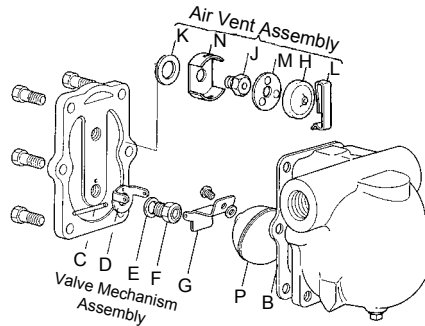
**3/4", 1", 1-1/4", 1-1/2" FT-150/200**



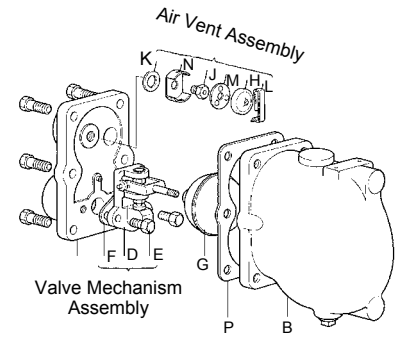
**1-1/2" FTI 15 to 200**



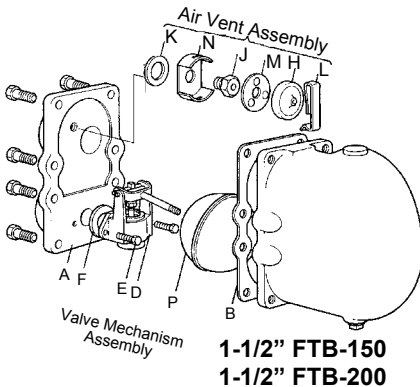
**1/2" OK150/300**  
**1/2" FTS150/300**



**1/2", 3/4", 1" FTI-15/30/75/125/200**



**2" FTB-30**  
**2-1/2" FTB-125**  
**2-1/2" FTB-175**  
**2" FTB-175**



**1-1/2" FTB-150**  
**1-1/2" FTB-200**

For any additional information you may require, contact: Spirax Sarco Applications Engineering Department  
**Toll Free 1-800-883-4411**

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