

Steam Traps

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WT1000



WT2500



W2000



WT3000



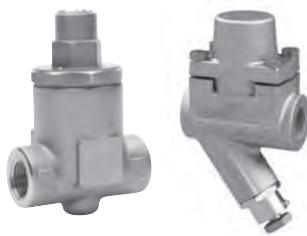
WT4000



TA/TS

Thermostatic

Model	Body Material	PMO (PSIG)	Sizes	Connections	Page No.
WT1000	Stainless Steel	300	1/2", 3/4"	NPT	54
WT1500	Stainless Steel	125	1/2"	NPT	55
WT2000	Stainless Steel	650	1/2", 3/4"	NPT	56-57
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Thermostatic Bi-Metallic

Model	Body Material	PMO (PSIG)	Sizes	Connections	Page No.
WT5000	Stainless Steel	650	3/8" - 1"	NPT, SW	66-67
BM300	Forged C.S.	320	1/2" - 1"	NPT, 150# / 300# FLG, SW, BW	68-69
WPN-Series	Alloy Steel	2230	1/2", 3/4", 1"	NPT, 300# FLG, SW, BW	70-71



Inverted Bucket

	Body Material	PMO (PSIG)	Sizes	Connections	Page No.
SIB/SIBH	Stainless Steel	450	1/2", 3/4"	NPT, SW,	96-97
IB Series	Cast Iron	150/250	1/2", 3/4"	NPT	98-103



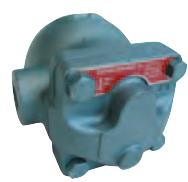
FT



FT600 & FT601



FTE & FTES



FTT



WFT

Float & Thermostatic

Model	Body Material	PMO (PSIG)	Sizes	Connections	Page No.
WFT	Cast Iron	250	3/4" - 2"	NPT	76-79
FTT/FTTS	Ductile Iron/Stainless Steel	300/225	1/2" - 2" / 1/2" - 1"	NPT, FLG	80-83
FTE/FTES	Ductile Iron/Cast Steel	200/300	1 1/2", 2", 2 1/2"	NPT, SW, FLG	84-85
FT600/FT601	Carbon Steel/Stainless Steel	450	3/4" - 4"	NPT, SW, FLG	86-91
FT	Cast Iron	75	3/4" - 2"	NPT	92-93



Quick-Change Universal Style

Model	Type	PMO (PSIG)	Sizes	Connection	Page No.
UC450	Connectors	600	1/2", 3/4", 1"	NPT, FLG, SW	108-111
USIB450	Inverted Bucket	450	1/2", 3/4", 1"	Mounts to Universal Connector	112-113
UFT450	Float & Thermostatic	225	1/2", 3/4", 1"	Mounts to Universal Connector	114-115
UTD450SM	Thermodynamic Side Mount	450	1/2", 3/4", 1"	Mounts to Universal Connector	116-117
UTD600SM	Thermodynamic Side Mount	600	1/2", 3/4", 1"	Mounts to Universal Connector	116-117
UTD450	Thermodynamic Top Mount	600	1/2", 3/4", 1"	Mounts to Universal Connector	118-119
UT450	Thermostatic	450	1/2", 3/4", 1"	Mounts to Universal Connector	120-121
UB450	Bi-Metallic	450	1/2", 3/4", 1"	Mounts to Universal Connector	122
UTD450H	Thermodynamic	450	1"	Special Universal Connector	123
UTS600	Trap Test Station	600	1/2", 3/4", 1"	NPT, FLG, SW	124-127



SDM, CCM & FM Manifolds

Pages 128-133

The **SDM Series** manifolds are used for steam distribution TO the tracing system and CCM Series for condensate collection FROM the tracing system. FM Series are Fabricated Carbon Steel or Stainless Steel.

Clean Steam



Model	Body Material	PMO (PSIG)	Sizes	Connections	Page No.
FDA300	Stainless Steel	90	1 1/2"	Tri-Clamp	137
FDA400	Stainless Steel	90	1/2", 3/4"	Tri-Clamp	138-139
FDA500	Stainless Steel	90	1/2", 3/4", 1"	Tri-Clamp, NPT, TW	140-141
FDA600	Stainless Steel	110	1/2", 3/4", 1"	Tri-Clamp, NPT, TW	142
FDA800	Stainless Steel	150	1/2"	Tri-Clamp, NPT, TW	143

Thermodynamic

Model	Body Material	PMO (PSIG)	Sizes	Connections	Page No.
TD600	Stainless Steel	600	3/8" – 1"	NPT	38-39
TD600S	Stainless Steel	600	1/2", 3/4", 1"	NPT	40-41
TD700S/TDF700S	Alloy Steel	650	1/2", 3/4", 1"	NPT, SW, FLG	42-45
TD900S	Alloy Steel	900	1/2", 3/4", 1"	NPT, SW, FLG	46-47
TD3600	Alloy Steel	3600	1/2", 3/4", 1"	SW, BW, FLG	48-49
WDF Diffuser	Stainless Steel	900/450	1/2", 3/4"	NPT/SW	50

	Characteristics	Material	Application
TD600 	No Strainer		
	The one piece body-seat design is extremely simple, rugged and economical, however, they are not fully in-line repairable.	420 Stainless Steel	Most widely used and economical thermodynamic trap for Drip & Tracing Applications 30 to 600 psig
TD600S 	Strainer		
	Trap body cannot be welded in-line.		
TD700S TDF700S 	Replacement Capsule Feature	TD700S: Cast Chrome-Moly Steel TDF700S: Forged Chrome-Moly Steel	Drip & Tracing Applications 30 to 650 psig
TD900S 		Alloy Steel	Drip Application High-Pressure to 900 psig
TD3600 		Alloy Steel	Drip Application Ultra High-Pressure to 3600 psig

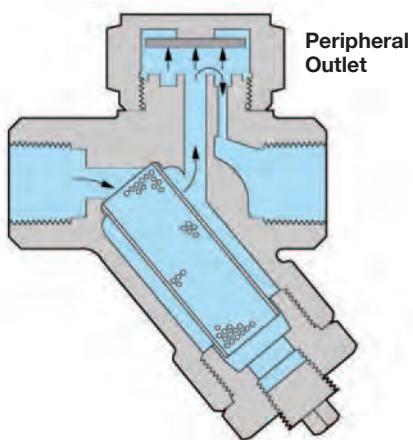
THERMODYNAMIC TRAPS

Thermodynamic traps use only one moving part, the valve disc, which allows condensate to be discharged when present and closes tightly upon the arrival of steam. These traps have an inherently rugged design and are commonly used as drip traps on steam mains and supply lines. Their solid construction and single moving part make them resistant to waterhammer and are freeze-proof when installed vertically. Thermodynamic traps will only discharge small amounts of air and therefore are typically not used in process applications. Since Thermodynamic traps rely on steam velocity to operate, they are not intended for low pressure service (below 30 PSI).

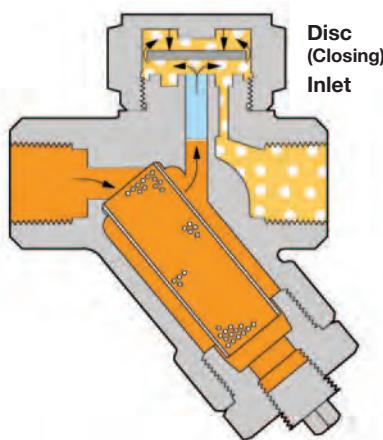
Operation:

The inlet pressure to the trap pushes the disc off the seat and allows unwanted condensate to be discharged through the peripheral outlet surrounding the inlet (**Figure A**). As hot condensate reaches the disc chamber, flash steam is created that travels at high velocity from the inlet to the outlet creating a low pressure area under the disc and higher pressure above the disc (**Figure B**). This differential pressure causes the disc to close against the seat and trap the steam in the system (**Figure C**). The steam pressure above the disc creates a force holding the disc closed. Heat transfer takes place through the cap and the steam pressure above the disc begins to reduce. When the downward force created by the steam pressure above the disc falls below the force created by the incoming condensate, the disc is pushed off its seat and the process repeats itself (**Figure A**). Cycle time is dependent on steam temperature, and more importantly, ambient temperature outside the trap. Since the amount of time the valve remains closed is primarily dependent on the heat transfer from the steam above the disc to the ambient environment, frequent cycling of the valve can occur in cold or wet environments. Applying an insulating cap over the cover of the trap will reduce the cycle rate.

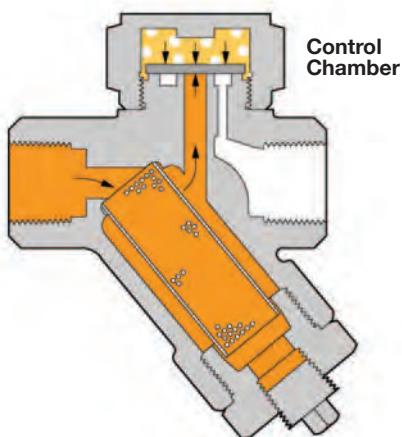
A) Valve Disc (Open)



B) Valve Disc (Starting to Close)



C) Valve Disc (Closed)



- A)** When condensate is present, trap remains in the open position allowing condensate to discharge.
- B)** When steam enters the trap, it creates an internal pressure above the disc that instantly forces the disc and seat to close tightly, preventing steam from escaping.
- C)** Trap will remain closed, trapping steam in the system until the steam above the disc condenses, due to heat loss through the cap.

Steam Traps

Thermodynamic Steam Trap

Model	TD600, TD600L
Sizes	3/8", 1/2", 3/4", 1"
Connections	NPT
Body Material	Stainless Steel 420F
Options	Insulation Cap
PMO Max. Operating Pressure	600 PSIG
TMO Max. Operating Temperature	800°F
PMA Max. Allowable Pressure	600 PSIG up to 800°F
TMA Max. Allowable Temperature	800°F @ 600 PSIG



Typical Applications

DRIP, TRACING: TD600 model steam traps are most commonly used in drip applications, such as draining condensate from steam mains and steam supply lines. They can also be used for steam tracing applications. These traps are suitable for outdoor applications that are subject to freezing as well as superheated steam conditions. They are compact and rugged with only a single moving part. If a trap with an integral strainer is desired, the TD600S is recommended. If a fully in-line repairable design is required, the TD700S or the UTD450 with Universal Quick-Change connector is recommended.

How It Works

The disc is the only moving part inside a thermodynamic trap. When steam enters the trap, it creates an internal pressure above the disc that instantly forces the disc to close tightly on the seat, preventing the steam from escaping. The internal steam pressure (holding the disc and seat shut) eventually drops, and the trap re-opens. When condensate enters the trap, it pushes the disc upwards, allowing the condensate to freely discharge. If steam is present, the trap instantly shuts.

Features

- High pressure applications up to 600 PSIG
- Hardened stainless steel seat and disc for extended service life even at high pressure
- Single trap will operate over the entire pressure range of 3.5-600 PSIG (recommended above 30 PSIG)
- Suitable for superheated steam
- Freeze-proof when trap is piped in a vertical orientation for complete drainage of condensate
- Three-hole balanced discharge extends life of the seat area
- Trap will function in any orientation (horizontal preferred)

Sample Specification

The steam trap shall be a thermodynamic disc type with all stainless steel construction. Integral seat design and disc to be hardened for long service life. Unit shall be capable of installation in any orientation and self-draining when mounted vertically.

Installation and Maintenance

The TD600 can be installed in any orientation; however, horizontal with cap facing upward is preferred for longest service life. The one piece body-seat design is extremely simple and economical; however, this configuration is generally considered not fully repairable since the seat cannot be repaired if damaged or worn. Welding of trap body directly into pipeline is not recommended since excessive heat may cause distortion of the seat area. The TD600 does not contain an integral strainer and separate strainer should therefore be installed to protect from dirt and pipe scale. If a fully in-line repairable design or a trap that can be welded into pipeline is desired, the TD700S, TD900S or the UTD450 with Universal Quick-Change connector is recommended.

Helpful Selection Information

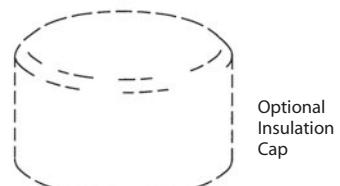
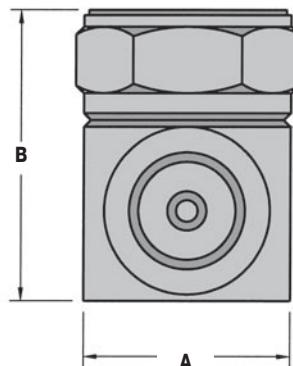
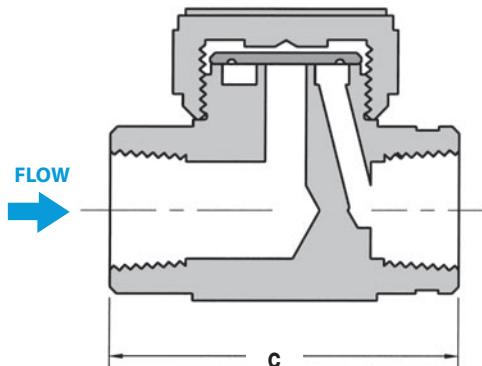
The TD600L has reduced size discharge orifice holes which are preferable in terms of performance, longevity, and efficiency; particularly on pressures over 150 psi. For most drip applications the 1/2" TD600L should have sufficient capacity. For higher load drip applications or if a 3/4" pipe connection is required, use 3/4" TD600L or best results. Choosing a model with a condensate handling capacity in the range of the specific application will prolong trap life.

L = Reduced Size Discharge Orifice holes which are preferable in terms of performance, longevity, and efficiency; particularly on pressures over 150 psi.

Options

An insulation cap is available to reduce cycle rates and steam loss in rain, snow, or cold environments.

ED = Etched disc for air service



DIMENSIONS & WEIGHTS – inches

Size	Model Code	Connection	A	B	C	Weight (lbs)
3/8"	TD600-11-N	NPT	1.37	1.69	2.00	0.75
1/2"	TD600-12-N	NPT	1.50	2.00	2.69	1.25
3/4"	TD600-13-N	NPT	1.75	2.38	2.81	2.00
1"	TD600-14-N	NPT	2.12	2.81	3.30	3.00
1/2"	TD600L-12-N	NPT	1.50	1.81	2.71	1.00
3/4"	TD600L-13-N	NPT	1.50	2.25	2.75	1.75

How to Size / Order

Select working pressure; follow column down to correct capacity (lbs/hr) block. Example:

Application: 500 lbs/hr at 100 PSIG working inlet pressure

Size/Model: 3/4" TD600L-13-N

MATERIALS

Body	Stainless Steel, AISI 420F
Disc	Stainless Steel, AISI 420
Cover	Stainless Steel, AISI 416
Insulation Cap	Stainless Steel, AISI 304

CAPACITIES – Condensate (lbs/hr)

Size	Model Code	Steam Inlet Pressure (PSIG)																				
		3.5	5	10	15	20	25	30	40	50	75	100	150	200	250	300	350	400	450	500	550	600
1/2"	TD600L-12-N	180	185	190	195	200	215	220	230	250	310	375	500	620	710	800	825	900	1070	1120	1185	1290
3/4"	TD600L-13-N	300	315	350	380	415	440	470	515	580	710	825	1020	1165	1300	1440	1565	1670	1775	1880	1960	2060
3/8"	TD600-11-N	180	185	190	195	200	215	220	230	250	310	375	500	620	710	800	825	900	1070	1120	1185	1290
1/2"	TD600-12-N	300	315	350	380	415	440	470	515	580	710	825	1020	1165	1300	1440	1565	1670	1775	1880	1960	2060
3/4"	TD600-13-N	415	430	475	520	565	610	650	720	825	1020	1185	1480	1710	1950	2110	2265	2490	2625	2780	2985	3140
1"	TD600-14-N	650	680	740	815	885	940	1000	1080	1225	1500	1800	2215	2625	2935	3300	3600	3875	4120	4350	4560	4840

Notes: 1) Maximum back pressure not to exceed 80% of inlet pressure (measured in absolute pressure) or trap may not close.

2) For optimum performance, recommended for operating pressure above 30 PSIG.

Steam Traps

Thermodynamic Steam Trap

TD600S
Thermodynamic

Model	TD600S, TD600LS
Sizes	1/2", 3/4", 1"
Connections	NPT
Body Material	Stainless Steel 420F
Options	Blowdown Valve, Insulation Cap
PMO Max. Operating Pressure	600 PSIG
TMO Max. Operating Temperature	750°F
PMA Max. Allowable Pressure	915 PSIG up to 250°F
TMA Max. Allowable Temperature	610°F @ 750 PSIG



TD600S
Strainer



TD600SB
Strainer &
Blowdown Valve

Typical Applications

DRIP, TRACING: TD600S model steam traps with integral strainer are most commonly used in drip applications, such as draining condensate from steam mains and steam supply lines. They can also be used for steam tracing applications. These traps are suitable for outdoor applications that are subject to freezing as well as superheated steam conditions. They are compact and rugged with only a single moving part. Integral strainer protects against dirt and scale. If a fully in-line repairable design is required, the TD700S or the UTD450 with Universal Quick-Change Connector is recommended.

How It Works

The disc is the only moving part inside a thermodynamic trap. When steam enters the trap, it creates an internal pressure above the disc that instantly forces the disc to close tightly on the seat, preventing the steam from escaping. The internal steam pressure (holding the disc and seat shut) eventually drops, and the trap re-opens. When condensate enters the trap, it pushes the disc upwards, allowing the condensate to freely discharge. If steam is present, the trap instantly shuts.

Features

- Integral strainer with optional blowdown valve to protect trap from contamination
- High pressure applications up to 600 PSIG
- Hardened stainless steel seat and disc for extended service life even at high pressure
- Single trap will operate over the entire pressure range of 3.5-600 PSIG (recommended above 30 PSIG)
- Suitable for superheated steam
- Freeze-proof when trap is piped in a vertical orientation for complete drainage of condensate
- Three-hole balanced discharge extends life of the seat area
- Trap will function in any orientation (horizontal preferred)

Sample Specification

The steam trap shall be all stainless steel thermodynamic type with hardened integral seat and disc with integral strainer and blowdown valve.

Installation and Maintenance

The TD600S can be installed in any orientation; however, horizontal with cap facing upward is preferred for longest service life. The one piece body-seat design is extremely simple and economical; however, this configuration is generally considered not fully repairable since the seat cannot be replaced if damaged or worn. Welding of trap body directly into pipeline is not recommended since excessive heat can cause distortion of the seat area. All models of the TD600S contain an integral strainer for protection against dirt and scale. If a fully in-line repairable design or a trap that can be welded into pipeline is desired, the TD700S, TD900S or the UTD450 with Universal Quick-Change connectors is recommended.

Helpful Selection Information

The TD600LS has reduced size discharge orifice holes which are preferable in terms of performance, longevity, and efficiency; particularly on pressures over 150 psi. For most drip applications the 1/2" TD600LS should have sufficient capacity. For higher load drip applications or if a 3/4" pipe connection is required, use 3/4" TD600LS for best results. Choosing a model with a condensate handling capacity in the range of the specific application will prolong trap life.

L = Reduced Size Discharge Orifice holes which are preferable in terms of performance, longevity, and efficiency; particularly on pressures over 150 psi.

Options

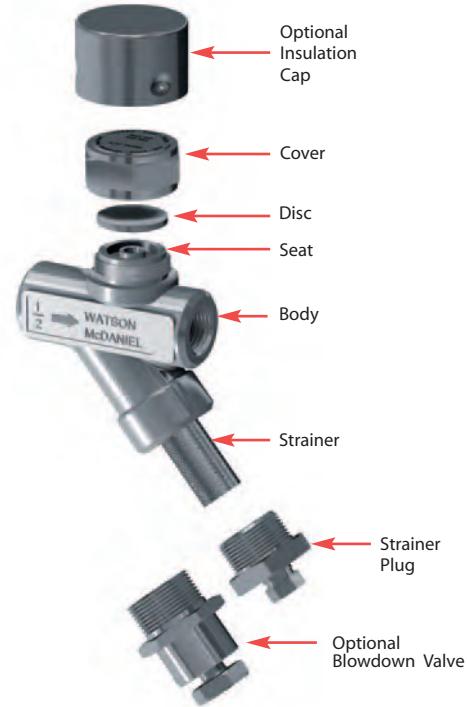
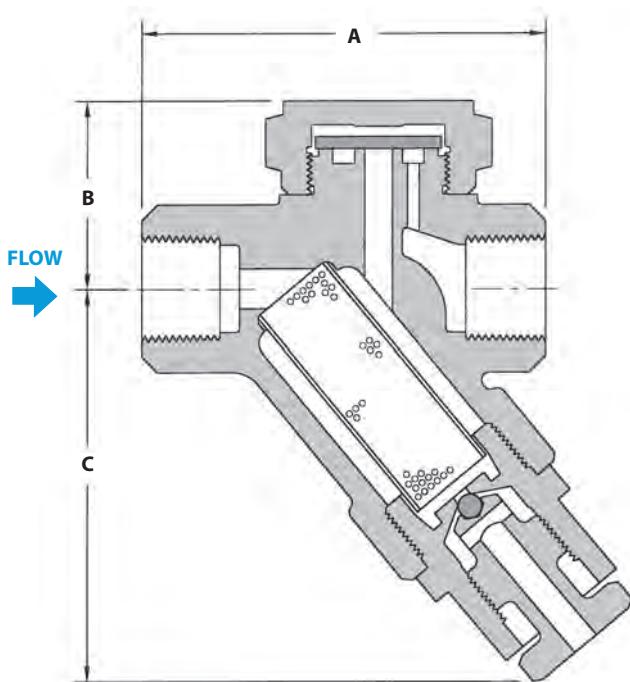
An insulation cap is available to reduce cycle rates and steam loss in rain, snow, or cold environments. Blowdown valve, used for flushing dirt and scale from strainer.

ED = Etched disc for air service

Steam Traps

Thermodynamic Steam Trap

TD600S
Thermodynamic



DIMENSIONS & WEIGHTS – inches

Size Model	Conn.	A	B	C	Weight (lbs)
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Series TD600S (Strainer)

1/2" TD600S-12-N	NPT	3.16	1.50	2.53	2
1/2" TD600LS-12-N	NPT	3.16	1.44	2.53	1.5
3/4" TD600S-13-N	NPT	3.56	1.62	2.53	2.5
3/4" TD600LS-13-N	NPT	3.56	1.56	2.53	2.4
1" TD600LS-14-N	NPT	3.75	1.44	2.53	2.5

Series TD600SB (Strainer & Blowdown Valve)

1/2" TD600SB-12-N	NPT	3.16	1.50	3.5	2.3
1/2" TD600LSB-12-N	NPT	3.16	1.44	3.5	2.0
3/4" TD600SB-13-N	NPT	3.56	1.62	3.5	2.8
3/4" TD600LSB-13-N	NPT	3.56	1.56	3.5	2.7
1" TD600LSB-14-N	NPT	3.72	1.44	3.5	2.7

MATERIALS

Body	Stainless Steel, AISI 420F
Disc	Stainless Steel, AISI 420
Cover	Stainless Steel, AISI 416
Insulation Cap	Stainless Steel, AISI 304
Strainer Screen	Stainless Steel, AISI 304
Blowdown Valve	Stainless Steel, AISI 303

How to Size / Order

Select working pressure; follow column down to correct capacity (lbs/hr) block. Example:

Application: 500 lbs/hr at 100 PSIG working inlet pressure

Size/Model: 3/4" TD600LS-13-N

CAPACITIES – Condensate (lbs/hr)

Size Model	Steam Inlet Pressure (PSIG)																			
	3.5	5	10	15	20	25	30	40	50	75	100	150	200	250	300	400	450	500	550	600
1/2" TD600LS-12-N	180	185	190	195	200	215	220	230	250	310	375	500	620	710	800	900	1070	1120	1185	1290
1" TD600LS-14-N																				
3/4" TD600LS-13-N	300	315	350	380	415	440	470	515	580	710	825	1020	1165	1300	1440	1670	1775	1880	1960	2060
1/2" TD600S-12-N	300	315	350	380	415	440	470	515	580	710	825	1020	1165	1300	1440	1670	1775	1880	1960	2060
3/4" TD600S-13-N	415	430	475	520	565	610	650	720	825	1020	1185	1480	1710	1950	2110	2265	2625	2780	2985	3140

Note: Maximum back pressure not to exceed 80% of inlet pressure (measured in absolute pressure) or trap may not close.

Note: For optimum performance, recommended for operating pressure above 30 PSIG.

Steam Traps

Thermodynamic Steam Trap (Repairable)

TD700S

Thermodynamic

Model	TD700S, TD700HS
Sizes	1/2", 3/4", 1"
Connections	NPT, SW, FLG
Body Material	Chrome-Moly Alloy Steel
Options	Blowdown Valve, Insulation Cap
PMO Max. Operating Pressure	650 PSIG
TMO Max. Operating Temperature	750°F
PMA Max. Allowable Pressure	650 PSIG up to 750°F
TMA Max. Allowable Temperature	750°F @ 650 PSIG

TD700S is a Direct Replacement for **Yarway Model 721**

TD700S Capsule is a Direct Replacement for **TLV Model P46Y**



Typical Applications

DRIP, TRACING: TD700S model steam traps are fully in-line repairable and most commonly used in drip applications, such as draining condensate from steam mains and steam supply lines. They can also be used for steam tracing applications. These traps are suitable for outdoor applications that are subject to freezing as well as superheated steam conditions. They feature a "Quick-Replace" capsule that contains the trap's complete internal working mechanism, which is easily replaced while the trap body remains in-line. All models contain an integral strainer for protection against dirt and scale.

How It Works

The disc is the only moving part inside a thermodynamic trap. When steam enters the trap, it creates an internal pressure above the disc that instantly forces the disc to close tightly on the seat, preventing the steam from escaping. The internal steam pressure (holding the disc and seat shut) eventually drops, and the trap re-opens. When condensate enters the trap, it pushes the disc upwards, allowing the condensate to freely discharge. If steam is present, the trap instantly shuts.

Features

- "Quick-Replace" capsule design for easy in-line repair
- Integral strainer with optional blowdown valve to protect trap from contamination
- High pressure applications up to 650 PSIG
- Hardened stainless steel seat and disc for extended service life even at high pressure
- Single trap will operate over the entire pressure range 4-650 PSIG (recommended above 30 PSI)
- Suitable for superheated steam
- Freeze-proof when trap is piped in a vertical orientation for complete drainage of condensate
- Non-integral seat and chrome-moly body allow for trap to be welded in-line
- Trap will function in any orientation (horizontal preferred)

Sample Specification

The steam trap shall be a thermodynamic style in a chrome-moly alloy steel body with an integral strainer and optional blowdown valve. Unit shall have an all stainless steel in-line removable seat and disc capsule assembly. Trap shall be capable of installation in any orientation and self-draining when mounted vertically.

Installation and Maintenance

The TD700S can be installed in any orientation; however, horizontal with cap facing upward is preferred for longest service life. For maintenance, ALL internal components are easily removed and completely changed using a replacement kit. All models of the TD700S contain an integral strainer for protection against dirt and scale. Available in NPT, Socket-Weld and Flange connections.

Helpful Selection Information

The TD700HS is a high pressure version of the standard TD700S model. While both the TD700S and TD700HS will operate with pressures up to 600 PSIG, the TD700HS has a slightly smaller discharge orifice and is recommended for system pressures over 300 PSIG because of increased efficiency and performance. The TD700S is available in NPT, socket weld, and flange connections from 1/2" through 1". Replacement capsules are available, see Parts & Kits Section.

Options

Blowdown valve, used for flushing dirt and scale from strainer.
Customized Flanged Connections.
Specify size and face-to-face dimensions.

TD700HS

The **TD700HS** is the high pressure version of the TD700S. The standard model **TD700S** will operate over the entire pressure range, however, the **TD700HS** will operate more efficiently and have a longer service life for pressures over 300 PSIG.

TD700S	Standard pressure capsule	4-300 PSIG
TD700HS	High pressure capsule	150-650 PSIG

Option: **TD700SB** = Blowdown Valve

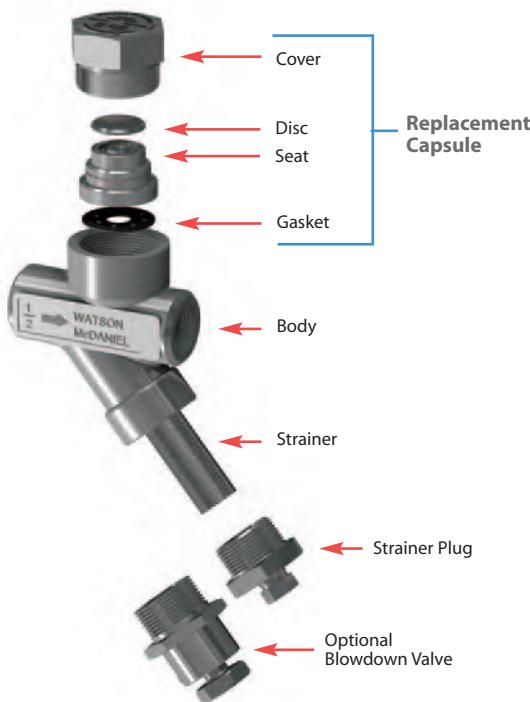
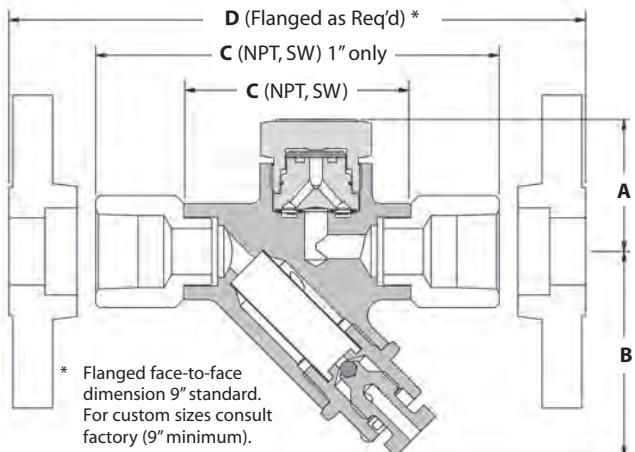
Steam Traps

Thermodynamic Steam Trap (Repairable)

TD700S

Thermodynamic

FLOW
→



DIMENSIONS & WEIGHTS – inches

Size/Model	Connection	A	B	C	Weight (lbs)
Series TD700S & TD700HS (Strainer)					
1/2"	NPT, SW	2.04	2.50	3.16	2.0
3/4"	NPT, SW	2.04	2.50	3.55	2.0
1"	NPT, SW	2.04	2.50	6.31	2.0
Series TD700SB & TD700HSB (Strainer & Blowdown Valve)					
1/2"	NPT, SW	2.04	3.06	3.16	2.25
3/4"	NPT, SW	2.04	3.06	3.55	2.25
1"	NPT, SW	2.04	3.06	6.31	2.25

* Note: 1" units include weld adapters, 300 Series SS.

MATERIALS

Body	Chrome Moly ASTM A-217, GR WC9
Seat	Stainless Steel, 420F
Seat Gasket	316SS/Grafoil
Cover	Stainless Steel, 416
Disc	Stainless Steel, 420
Retaining Ring	Stainless Steel Spring Wire
Strainer	Stainless Steel, 304
Strainer Plug, Pipe Plug	Stainless Steel, 303
Blowdown Valve	Stainless Steel
Flanges	Carbon Steel

How to Size / Order

Select working pressure; follow column down to correct capacity (lbs/hr) block. Example:

Application: 275 lbs/hr at 100 PSIG working inlet pressure

Size/Model: **TD700S**, specify pipe size and connections (NPT, SW, FLG)

CAPACITIES – Condensate (lbs/hr)

Size	Conn.	Model Code	Steam Inlet Pressure (PSIG)																		
			4	5	6	7	8	9	10	20	30	40	50	60	80	100	150	300	400	500	650
1/2"	NPT	TD700S-12-N	95	105	115	120	125	130	140	180	220	250	265	280	320	350	405	550	600	650	750
	SW	TD700S-12-SW																			
3/4"	NPT	TD700S-13-N	95	105	115	120	125	130	140	180	220	250	265	280	320	350	405	550	600	650	750
	SW	TD700S-13-SW																			
1"	NPT	TD700S-14-N	95	105	115	120	125	130	140	180	220	250	265	280	320	350	405	550	600	650	750
	SW	TD700S-14-SW																			
1/2"	NPT	TD700HS-12-N															250	330	380	410	500
	SW	TD700HS-12-SW																			
3/4"	NPT	TD700HS-13-N															250	330	380	410	500
	SW	TD700HS-13-SW																			
1"	NPT	TD700HS-14-N															250	330	380	410	500
	SW	TD700HS-14-SW																			

Notes: 1) Maximum back pressure not to exceed 80% of inlet pressure (measured in absolute pressure) or trap may not close.

2) For optimum performance, recommended for operating pressure above 30 PSIG.

Steam Traps

Thermodynamic Steam Trap (Repairable)

TDF700S

Thermodynamic

Model	TDF700S, TDF700FHS
Sizes	1/2", 3/4", 1"
Connections	NPT, SW, FLG
Body Material	ASME SA-182 F-11 Chrome-Moly
Options	Blowdown Valve, Insulation Cap
PMO Max. Operating Pressure	650 PSIG
TMO Max. Operating Temperature	800°F
PMA Max. Allowable Pressure	650 PSIG up to 800°F
TMA Max. Allowable Temperature	800°F @ 650 PSIG

TDF700S is a Direct Replacement for **Yarway Model 721**TDF700S Capsule is a Direct Replacement for **TLV Model P46Y**

Typical Applications

DRIP, TRACING: TDF700S model steam traps are fully in-line repairable and most commonly used in drip applications, such as draining condensate from steam mains and steam supply lines. They can also be used for steam tracing applications. These traps are suitable for outdoor applications that are subject to freezing as well as superheated steam conditions. They feature a "Quick-Replace" capsule that contains the trap's complete internal working mechanism, which is easily replaced while the trap body remains in-line. All models contain an integral strainer for protection against dirt and scale.

How It Works

The disc is the only moving part inside a thermodynamic trap. When steam enters the trap, it creates an internal pressure above the disc that instantly forces the disc to close tightly on the seat, preventing the steam from escaping. The internal steam pressure (holding the disc and seat shut) eventually drops, and the trap re-opens. When condensate enters the trap, it pushes the disc upwards, allowing the condensate to freely discharge. If steam is present, the trap instantly shuts.

Features

- "Quick-Replace" capsule design for easy in-line repair
- Integral strainer with optional blowdown valve to protect trap from contamination
- High pressure applications up to 650 PSIG
- Hardened stainless steel seat and disc for extended service life even at high pressure
- Single trap will operate over the entire pressure range 4-650 PSIG (recommended above 30 PSI)
- Suitable for superheated steam
- Freeze-proof when trap is piped in a vertical orientation for complete drainage of condensate
- Non-integral seat and chrome-moly body allow for trap to be welded in-line
- Trap will function in any orientation (horizontal preferred)

Sample Specification

The steam trap shall be a thermodynamic style in a chrome-moly alloy steel body with an integral strainer and optional blowdown valve. Unit shall have an all stainless steel in-line removable seat and disc capsule assembly. Trap shall be capable of installation in any orientation and self-draining when mounted vertically.

Installation and Maintenance

The TDF700S can be installed in any orientation; however, horizontal with cap facing upward is preferred for longest service life. For maintenance, ALL internal components are easily removed and completely changed using a replacement kit. All models of the TDF700S contain an integral strainer for protection against dirt and scale. Available in NPT, socket welded and flanged connections.

Helpful Selection Information

The TDF700HS is a high pressure version of the standard TDF700S model. While both the TDF700S and TDF700HS will operate with pressures up to 600 PSIG, the TDF700HS has a slightly smaller discharge orifice and is recommended for system pressures over 300 PSIG because of increased efficiency and performance. The TDF700S is available in NPT, socket weld, and flange connections from 1/2" through 1". Replacement capsules are available, see Parts & Kits Section.

Options

Blowdown valve, used for flushing dirt and scale from strainer.
Customized Flanged Connections.
Specify size and face-to-face dimensions.

TD700HS

The **TD700HS** is the high pressure version of the TDF700S.

The standard model **TDF700S** will operate over the entire pressure range, however, the **TD700HS** will operate more efficiently and have a longer service life for pressures over 300 PSIG.

TDF700S Standard pressure capsule

4-300 PSIG

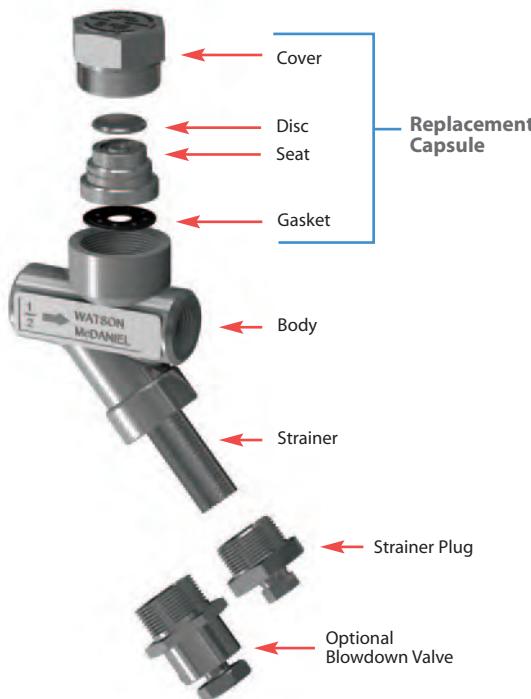
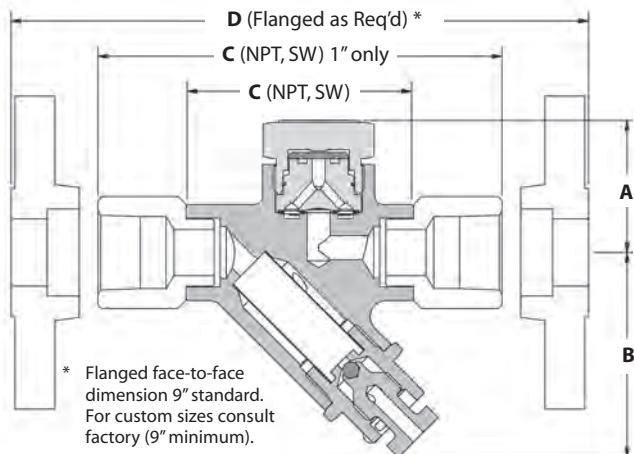
TDF700HS High pressure capsule

150-650 PSIG

Option: **TDF700SB** = Blowdown Valve

Steam Traps

Thermodynamic Steam Trap (Repairable)

FLOW
→

DIMENSIONS & WEIGHTS — inches

Size/Model	Connection	A	B	C	Weight (lbs)
Series TDF700S & TDF700HS (Strainer)					
1/2"	NPT, SW	2.04	2.50	3.16	2.0
3/4"	NPT, SW	2.04	2.50	3.55	2.0
1"	NPT, SW	2.04	2.50	6.31	2.0
Series TDF700SB & TDF700HSB (Strainer & Blowdown Valve)					
1/2"	NPT, SW	2.04	3.06	3.16	2.25
3/4"	NPT, SW	2.04	3.06	3.55	2.25
1"	NPT, SW	2.04	3.06	6.31	2.25

* Note: 1" units include weld adapters, SA-182 F-11.

MATERIALS

Body	Forged Chrome Moly ASME SA-182 F-11(0.15% Carbon max.)
Seat	Stainless Steel, 420F
Seat Gasket	316SS/Grafoil
Cover	Stainless Steel, 416
Disc	Stainless Steel, 420
Retaining Ring	Stainless Steel Spring Wire
Strainer	Stainless Steel, 304
Strainer Plug, Pipe Plug	Stainless Steel, 303
Blowdown Valve	Stainless Steel
Flanges	Carbon Steel

How to Size / Order

Select working pressure; follow column down to correct capacity (lbs/hr) block. Example:

Application: 275 lbs/hr at 100 PSIG working inlet pressure

Size/Model: **TDF700S**, specify pipe size and connections (NPT, SW, FLG)

CAPACITIES — Condensate (lbs/hr)

Size	Conn.	Model Code	Steam Inlet Pressure (PSIG)																		
			4	5	6	7	8	9	10	20	30	40	50	60	80	100	150	300	400	500	650
1/2"	NPT	TDF700S-12-N	95	105	115	120	125	130	140	180	220	250	265	280	320	350	405	550	600	650	750
	SW	TDF700S-12-SW																			
3/4"	NPT	TDF700S-13-N	95	105	115	120	125	130	140	180	220	250	265	280	320	350	405	550	600	650	750
	SW	TDF700S-13-SW																			
1"	NPT	TDF700S-14-N	95	105	115	120	125	130	140	180	220	250	265	280	320	350	405	550	600	650	750
	SW	TDF700S-14-SW																			
1/2"	NPT	TDF700HS-12-N															250	330	380	410	500
	SW	TDF700HS-12-SW																			
3/4"	NPT	TDF700HS-13-N															250	330	380	410	500
	SW	TDF700HS-13-SW																			
1"	NPT	TDF700HS-14-N															250	330	380	410	500
	SW	TDF700HS-14-SW																			

Notes: 1) Maximum back pressure not to exceed 80% of inlet pressure (measured in absolute pressure) or trap may not close.
2) For optimum performance, recommended for operating pressure above 30 PSIG.

Steam Traps

Thermodynamic Steam Trap (Repairable)

TD900S

Thermodynamic

Model	TD900S, TD900LS
Sizes	1/2", 3/4", 1"
Connections	NPT, SW, 600# FLG
Body Material	Low Carbon Chrome-Moly
Options	Insulation Cap
PMO Max. Operating Pressure	900 PSIG
TMO Max. Operating Temperature	842°F
PMA Max. Allowable Pressure	1500 PSIG @ 100°F
TMA Max. Allowable Temperature	842°F @ 981 PSIG



Typical Applications

DRIP: TD900S model steam traps, capable of handling pressures up to 900 PSIG, are used in drip applications such as draining condensate from steam mains and steam supply lines. The complete internal working mechanism can be replaced while the trap body remains connected in-line. All models contain an integral strainer for protection against dirt and scale. These traps are suitable for outdoor applications that are subject to freezing as well as superheated steam conditions.

How It Works

The disc is the only moving part inside a thermodynamic trap. When steam enters the trap, it creates an internal pressure above the disc that instantly forces the disc to close tightly on the seat, preventing the steam from escaping. The internal steam pressure (holding the disc and seat shut) eventually drops, and the trap re-opens. When condensate enters the trap, it pushes the disc upwards, allowing the condensate to freely discharge. If steam is present, the trap instantly shuts.

Features

- "Quick-Change" seat and disc for easy in-line repair
- High pressure applications up to 900 PSIG
- Integral strainer to protect trap from contamination
- Hardened stainless steel seat and disc for extended service life even at extremely high pressures
- Single trap model will operate over the entire pressure range (20-900 PSIG)
- Suitable for superheated steam
- Freeze-proof when trap is piped in a vertical orientation for complete drainage of condensate
- Trap will function in any orientation (horizontal preferred)

Sample Specification

The steam trap shall be a thermodynamic style with body material in chrome-moly alloy steel. Available in size 1/2", 3/4" and 1" Class 600 socket weld ends or flanges. Unit shall have hardened stainless steel seat and disc with a removable stainless steel strainer.

Installation and Maintenance

The TD900S can be installed in any orientation; however, horizontal with cap facing upward is preferred for longest service life. For maintenance, ALL internal components are easily removed and completely changed using a replacement kit. All models contain an integral strainer for protection against dirt and scale. Available in NPT, Socket-Weld and Flange connections.

Helpful Selection Information

The TD900LS is a reduced capacity version of the standard TD900S model. The TD900S is available in NPT, Socket Weld, and Flange connections from 1/2" thru 1".

Options

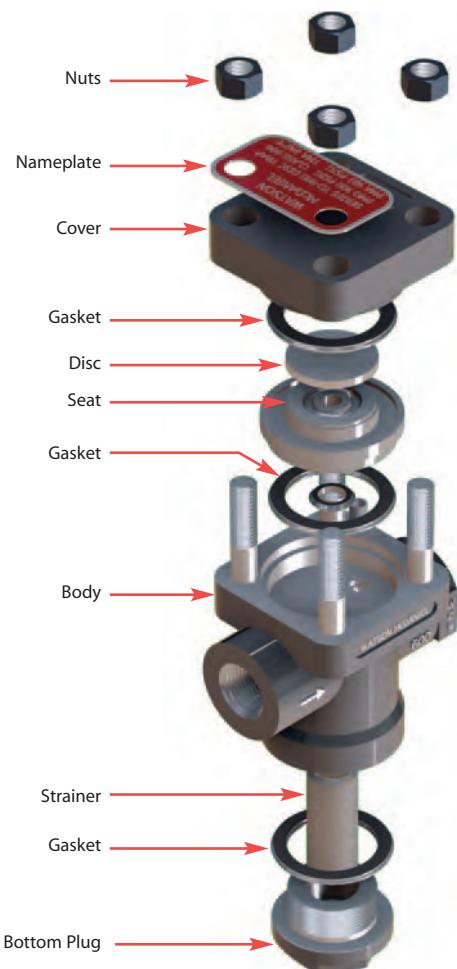
- Customized Flanged Connections: Specify size and face-to-face dimensions.
- Special 100 mesh strainer.

Steam Traps

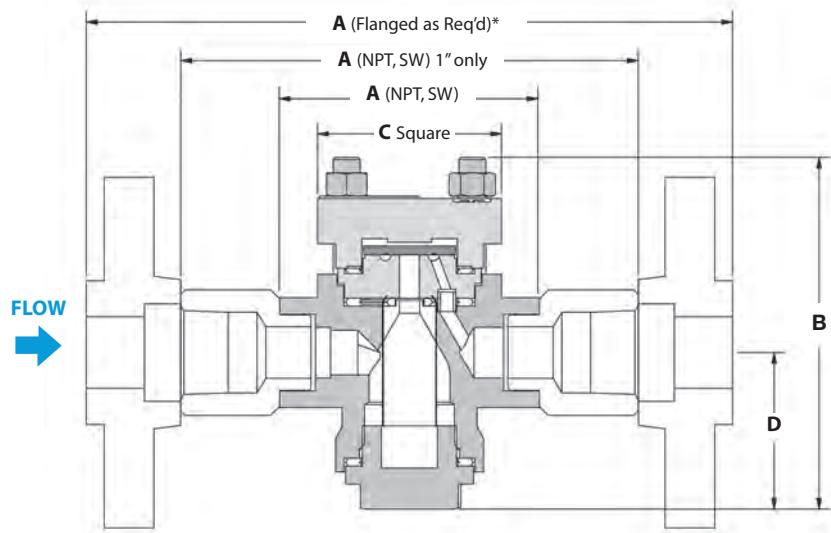
Thermodynamic Steam Trap (Repairable)

TD900S

Thermodynamic



Complete internal working mechanism can be replaced while trap body remains connected in-line



* Flanged face-to-face dimension 9" standard.
For custom sizes consult factory (9" minimum).

DIMENSIONS & WEIGHTS – inches

Size	Model	Connection	A	B	C	D	Weight (lbs)
1/2"	TD900S/TD900LS	NPT, SW	3.6	4.8	2.6	2.1	4.5
		*600# FLG	9.0	4.8	2.6	2.1	9.0
3/4"	TD900S/TD900LS	NPT, SW	3.6	4.8	2.6	2.1	4.5
		*600# FLG	9.0	4.8	2.6	2.1	11.0
1"	TD900S/TD900LS	NPT, SW	6.5	4.8	2.6	2.1	4.5
		*600# FLG	9.0	4.8	2.6	2.1	11.0

MATERIALS

Body	Alloy Steel, GR WC9
Seat	Stainless Steel, AISI 420
Cover	Alloy Steel, GR WC9
Adapter	316L Stainless Steel
Strainer Cap	Alloy Steel, GR WC9
Strainer	Stainless Steel, AISI 300
Disc	Stainless Steel, AISI 420
Gasket	Stainless Steel, AISI 304
Studs	SA-193, GR B7
Nuts	SA-194, GR 2H

CAPACITIES – Condensate (lbs/hr)

Size	Model Code (NPT)	Model Code (SW)	Steam Inlet Pressure (PSIG)										
			20	50	100	150	200	300	400	500	600	700	
1/2"	TD900S-12-N	TD900S-12-SW	243	411	555	641	700	781	835	874	905	930	951
3/4"	TD900S-13-N	TD900S-13-SW											968
1"	TD900S-14-N	TD900S-14-SW											
1/2"	TD900LS-12-N	TD900LS-12-SW											
3/4"	TD900LS-13-N	TD900LS-13-SW											
1"	TD900LS-14-N	TD900LS-14-SW											

Notes: TD900S: 1) Minimum recommended working pressure: 20 PSIG.

2) Maximum back pressure not to exceed 80% of inlet pressure (measured in absolute pressure) or trap may not close.

TD900LS: 1) Minimum recommended working pressure: 150 PSIG.

2) Maximum back pressure not to exceed 50% of inlet pressure (measured in absolute pressure) or trap may not close.

Steam Traps

High-Pressure Thermodynamic Steam Trap

TD3600

Thermodynamic

Model	TD3600
Sizes	1/2", 3/4", 1"
Connections	BW, SW, 900# FLG, 1500# FLG
Body Material	Forged Alloy Steel
PMO Max. Operating Pressure	3600 PSIG
TMO Max. Operating Temperature	975 °F @ 3600 psi 1025 °F @ 2220 psi
PMA Max. Allowable Pressure	2220 PSIG @ 1025 °F 3600 PSIG @ 975 °F
TMA Max. Allowable Temperature	1025 °F @ 2220 PSIG

Note: Connections may limit Pressure & Temperature ratings.



Typical Applications

DRIP: TD3600 model steam traps are designed to handle the drainage of condensate from extremely high pressure systems, and are commonly used as drip traps on high-pressure steam mains and steam supply lines. These traps are suitable for outdoor applications that are subject to freezing as well as superheated steam conditions. The complete internal working mechanism can be completely replaced while the trap body remains in line.

How it Works

The disc is the only moving part inside a thermodynamic trap. When steam enters the trap, it creates an internal pressure above the disc that instantly forces the disc to close tightly on the seat, preventing the steam from escaping. The internal steam pressure (holding the disc and seat shut) eventually drops, and the trap re-opens. When condensate enters the trap, it pushes the disc upwards, allowing the condensate to freely discharge. If steam is present, the trap instantly shuts.

Features

- "Quick-Change" seat and disc for easy in-line repair
- High pressure applications up to 3600 PSIG
- Integral strainer to protect trap from contamination
- Hardened stainless steel seat and disc for extended service life even at extremely high pressures
- Steam trap model will operate over the entire pressure range (100-3600 PSIG)
- Suitable for superheated steam
- Freeze-proof when trap is piped in a vertical orientation for complete drainage of condensate
- Trap will function in any orientation (horizontal preferred)

Sample Specification

The steam trap shall be a thermodynamic style with body material in forged alloy steel. Available in size 1/2", 3/4" and 1" Socket Weld, Butt Weld ends or ANSI 600# &1500# RF flanged connections. Unit shall have hardened repairable stainless steel seat and disc with a removable stainless steel sintered strainer.

Installation and Maintenance

The TD3600 can be installed in any orientation; however, with cap facing upward is preferred for longest service life. For maintenance, ALL internal components are easily removed and completely changed using a replacement kit. The TD3600 contains an integral high pressure sintered strainer for protection against dirt and scale.

Helpful Selection Information

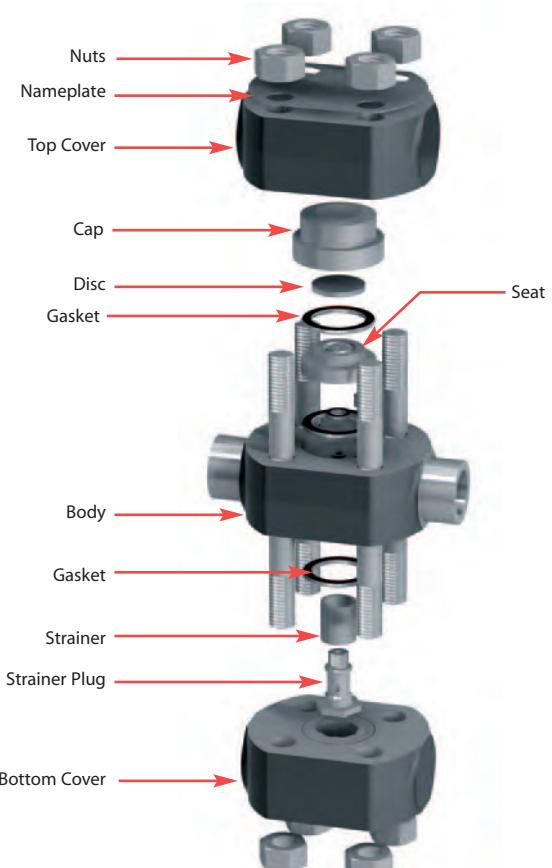
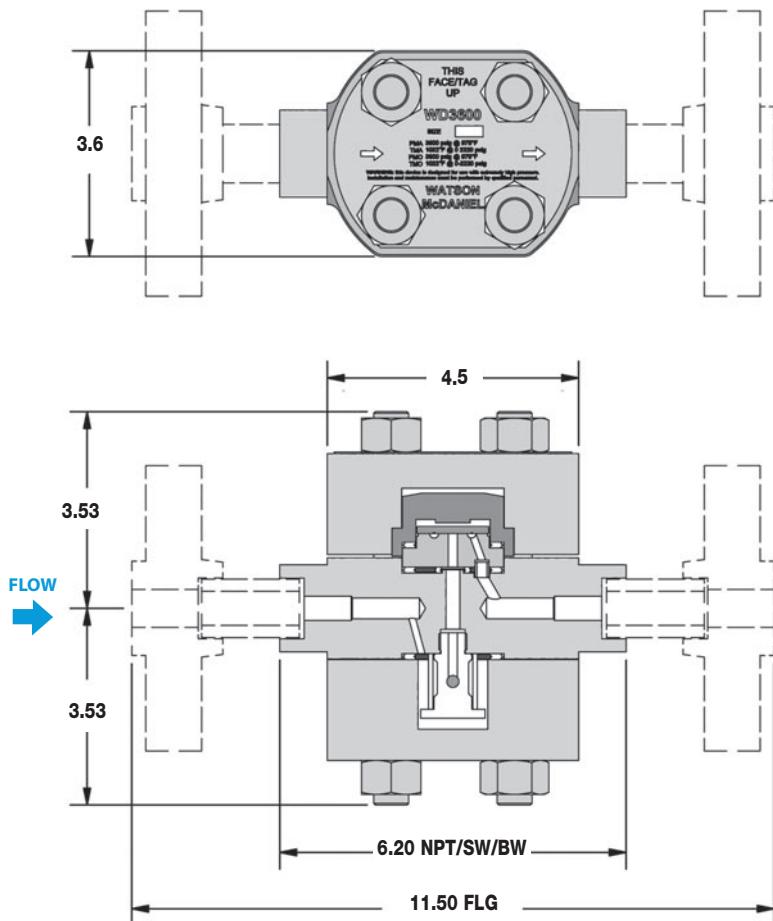
This trap was designed for handling the drainage of condensate from EXTREMELY HIGH PRESSURE systems, with a maximum operating pressure of 3600 PSIG. The TD3600 is available in Socket Weld, Butt Weld and Flange connections from 1/2" through 1".

Options

Customized Flanged Connections:
Specify size and face-to-face dimensions.

DIMENSIONS — inches

Weight: 25 lbs.



MATERIALS

Body	Forged Alloy Steel, ASTM 182 F22
Seat	Stainless Steel, AISI 420
Flanges	SA-105 Carbon Steel
Cover, top & bottom	Forged Alloy Steel, ASTM 182 F22
Strainer	Sintered Stainless Steel, AISI 300
Disc	Stainless Steel, AISI 420
Gasket	Stainless Steel, AISI 304
Studs	SA-193, GR B16
Nuts	SA-194, GR 4

How to Size / Order

Select working pressure; follow column down to correct capacity (lbs/hr) block. Example:

Application: 380 lbs/hr at 1000 PSIG working inlet pressure

Size/Model: **TD3600**, Specify pipe size and connections (BW, SW, 900# FLG, 1500# FLG)

CAPACITIES — Condensate (lbs/hr)

Size	Conn.	Model Code	Steam Inlet Pressure (PSIG)												
			100	500	1000	1250	1750	2000	2250	2500	2750	3000	3250	3500	3600
1/2"	SW	TD3600-12-SW													
3/4"	SW	TD3600-13-SW	165	290	380	400	435	470	500	525	550	575	595	610	625
1"	SW	TD3600-14-SW													

Note: Maximum back pressure not to exceed 50% of inlet pressure (measured in absolute pressure) or trap may not close.
Add note about other connections.

Steam Traps

Diffuser

Stainless Steel

Model	WDF1, WDF2
Size	1/2", 3/4"
Connections	NPT, SW
Body Material	Stainless Steel
Maximum Operating Pressure	WDF1 - 900 PSIG WDF2 - 450 PSIG



WDF1
with Inlet Connection only
When discharging to Atmosphere.



WDF2
with Inlet/Outlet Connections
When discharging to Condensate Return Line.

Typical Applications

The WDF Diffuser suppresses the high velocity discharge associated with blast-type steam traps in order to reduce noise, erosion and waterhammer. These compact units are made from Stainless Steel. Available in 1/2" and 3/4" NPT and SW connections.

The **WDF1** Diffuser can be fitted to the outlet of any steam or air trap discharging to the atmosphere. Maximum Operating Pressure is 900 PSIG.

The **WDF2** Diffuser can be fitted to the outlet of any steam or air trap discharging to a condensate return line. Maximum Operating Pressure is 450 PSIG.

How It Works

Diffusers use a specially-designed wire mesh absorption element to suppress the condensate discharge when mounted directly after the steam trap.

Features

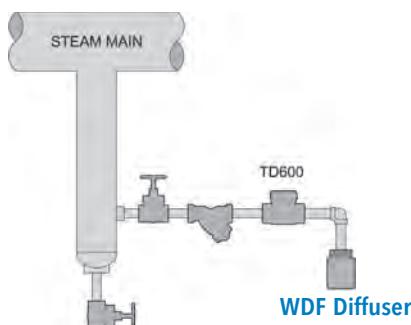
- Designed to cushion the discharge of steam traps by suppressing the high-velocity condensate often associated with blast-type steam trap discharge
- Helps to reduce noise, erosion, and flash steam
- Connection options for discharging directly to atmosphere or piping directly to condensate return system

Sample Specification

Diffuser shall be all stainless steel with a wire mesh absorption element.

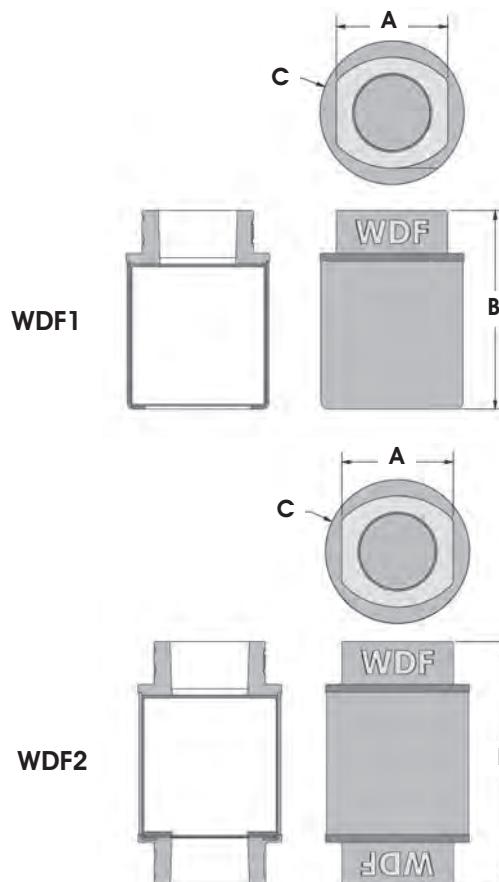
Installation

The diffuser should be installed directly after the steam trap and should be directed to a safe discharge area, away from personnel. Make certain that the diffuser size selected is the same as the discharge connection of the steam trap.



MATERIALS

Case	Stainless Steel
Mesh Muffler	Stainless Steel
Screen	Stainless Steel
End Connection	304L SS-CF3



Size/ Connection	Model Code	A	B	C
Diffuser with Inlet Connection Only (for discharging to atmosphere)				
1/2" NPT	WDF1-12-N	1 ⁵ / ₁₆	2 ⁵ / ₁₆	1 ¹¹ / ₁₆
3/4" NPT	WDF1-13-N	1 ⁵ / ₁₆	2 ⁵ / ₁₆	1 ¹¹ / ₁₆
1/2" SW	WDF1-12-SW	1 ⁵ / ₁₆	2 ⁵ / ₁₆	1 ¹¹ / ₁₆
3/4" SW	WDF1-13-SW	1 ⁵ / ₁₆	2 ⁵ / ₁₆	1 ¹¹ / ₁₆
Diffuser with Inlet/Outlet Connections (for discharging to condensate return line)				
1/2" NPT	WDF2-12-N	1 ⁵ / ₁₆	2 ⁷ / ₈	1 ¹¹ / ₁₆
3/4" NPT	WDF2-13-N	1 ⁵ / ₁₆	2 ⁷ / ₈	1 ¹¹ / ₁₆
1/2" SW	WDF2-12-SW	1 ⁵ / ₁₆	2 ⁷ / ₈	1 ¹¹ / ₁₆
3/4" SW	WDF2-13-SW	1 ⁵ / ₁₆	2 ⁷ / ₈	1 ¹¹ / ₁₆

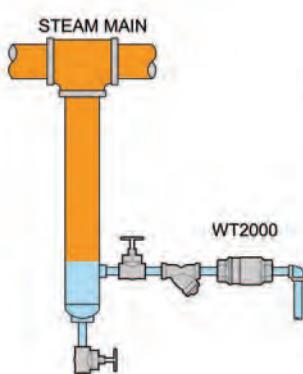
Thermostatic Traps Steam Traps

Industrial type Thermostatic traps are used on drip, process and tracing applications, and use an extremely rugged welded stainless steel bellows. They have excellent air venting capability with a capacity and pressure range for a wide variety of applications. Physical size of a thermostatic trap is considerably smaller than F&T or IB style traps of similar capacity making installation and repair considerably easier. For Example: A Thermostatic trap weighing only 4 pounds is able to replace an F&T trap or an IB trap weighing over 40 pounds. In contrast to an F&T or an IB trap, a single model of a thermostatic trap works over the entire pressure range (from 0-650 PSIG) simplifying model selection. In addition, Thermostatic traps are self-draining eliminating issues with freezing in cold climates. With several repairable and non-repairable models available, thermostatic traps offer many advantages and should be considered.

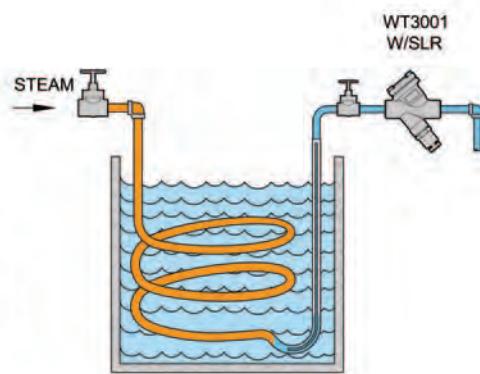


Thermostatic						Pages 51-64
Model	Body Material	PMO (PSIG)	Sizes	Connections	Page No.	
WT1000	Stainless Steel	300	1/2", 3/4"	NPT	54	
WT1500	Stainless Steel	125	1/2"	NPT	55	
WT2000	Stainless Steel	650	1/2", 3/4"	NPT	56-57	
WT3000	Stainless Steel	650	1/2", 3/4, 1"	NPT, SW, FLG	58-59	
WT4000	Stainless Steel	300	3/4", 1"	NPT, SW, FLG	60-61	
TA/TS	Brass	25/125	1/2", 3/4"	NPT	62-63	
WT2500	Cast Iron	250	1/2", 3/4"	NPT	64	

Typical Applications for Thermostatic Steam Traps

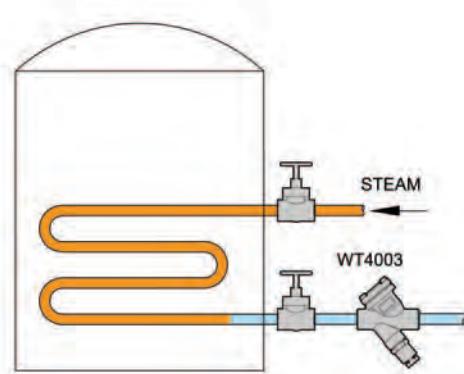


Steam Main Drip



Plating Tank (Batch Process)

With steam trap positioned above condensate collection point using the Steam Lock Release option (SLR)



Outdoor Storage Tank (Batch Process)

THERMOSTATIC STEAM TRAPS

Operation:

The bellows type thermostatic trap contains a fluid-filled thermal element (bellows). The operation of this thermal element is governed by the volumetric thermal expansion of the fluid inside the bellows as it changes states. There is no adjustment required for this trap as the fluid inside the bellows is chosen for its quick response to the change in temperature between steam and condensate at various pressures. The operation of the bellows follows the steam saturation curve, always discharging condensate a few degrees cooler than the steam temperature.

During start-up, when the system is cold, the bellows is retracted and the valve plug is lifted off the seat allowing air and condensate to be discharged from the system. As hot steam approaches the thermal element in the trap, the fluid inside the bellows vaporizes and expands, closing the valve tightly. As long as steam is present, the valve will remain closed. Only when subcooled condensate or air is present will the valve open.

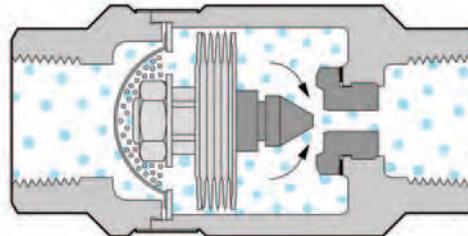
Watson McDaniel thermal element traps offer wide operating pressure ranges, rugged welded stainless steel bellows, and various orifice sizes, making them a great choice for a majority of applications.

Sub-cool:

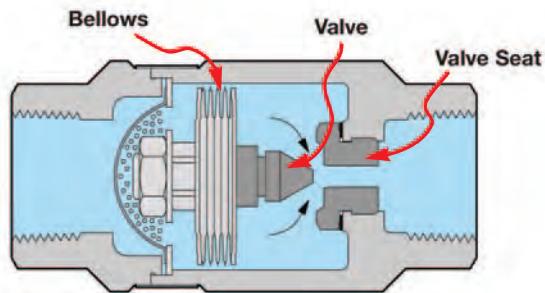
The sub-cooling of condensate prior to discharge can have certain beneficial effects. In the majority of tracing applications, the sub-cooling of condensate is highly desirable because of the additional energy that is extracted from the Hot condensate. If the trap did not sub-cool condensate, this energy would be wasted.

In Batch style process applications such as jacketed kettles, plating tanks and heating of outdoor storage tanks, the sub-cooling of condensate is generally not a factor to consider since the amount of condensate back-up requires less than 1% of the heat transfer surface area and is therefore considered negligible. So a heat exchanger with 50 square feet of surface area requires only $\frac{1}{2}$ a square foot of surface area to sub-cool the condensate. In a Continuous process application that exhibit rapid changes in steam pressures, steam traps requiring sub-cool could lead to additional condensate back up. This scenario is typical in instantaneous hot water heaters using a shell & tube heat exchanger with temperature control valves. The steam pressure in the heat exchanger can drop extremely fast when the water demand changes. In this case, additional sub-cooling of the condensate is required before it will discharge. In some cases, this may be acceptable, but in general, only F&T traps are recommended for process with rapid changes in steam pressures since they always discharge condensate immediately as it is formed. In addition, traps that sub-cool condensate have a softer discharge since less flash steam is generated in the return line.

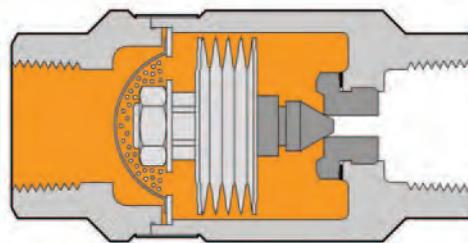
A) AIR When air, which is cooler than steam, is present, the bellows is retracted and the seat is open, allowing large quantities of air to be discharged.



B) CONDENSATE When condensate, which is cooler than steam, is present, the bellows retracts and the seat opens, allowing condensate to be discharged.



C) STEAM When steam reaches the trap, the bellows expands, closing off the seat and preventing the steam from escaping.



Non-Repairable (Seal-welded Stainless Steel Body)

The **WT1000** & **WT2000** Thermostatic Steam Traps have Stainless Steel, seal-welded bodies and are Non-repairable.

The **WT1000** is specifically intended for Drip and Tracing Applications.

The **WT2000** is substantially larger in capacity than the WT1000. It can be used for Batch Type Process Applications as well as for Drip and Tracing.

Also used as an Air Vent; Model AV2000.



Repairable (Replaceable Element and Seat)

The **WT3000** & **WT4000** Thermostatic Steam Traps have cast Stainless Steel bodies and are fully-repairable.

The **WT3000** has an identical capacity to the WT2000; commonly used for Process Applications but can also be used for drip and tracing if a repairable design is desired.

The **WT4000** has substantially higher capacity than the WT3000; used for larger Process Applications.



The **WT2500**, with a cast iron body, is an economical alternative to the WT3000 and is identical in capacity; however, its limited to 250 PSIG. It is likewise fully-repairable and can be used where cast iron is acceptable.

The **TA/TS Series** are referred to as Thermostatic Radiator Traps. They have brass bodies and are fully-repairable; predominantly used in the HVAC industry for steam traps and air vents.

The **WT1500** is ideal for sterilizers and is fully repairable.



Steam Traps

Thermostatic Steam Trap

(Non-Repairable)

Model	WT1000 (Non-Repairable)
Sizes	1/2", 3/4"
Connections	NPT
Body Material	Stainless Steel
PMO Max. Operating Pressure	300 PSIG
TMO Max. Operating Temperature	Saturated Steam Temperature
PMA Max. Allowable Pressure	1032 PSIG @ 100°F
TMA Max. Allowable Temperature	750°F @ 800 PSIG



Typical Applications

DRIP, TRACING: The **WT1000** is a low capacity thermostatic trap ideally sized for steam tracing. Thermostatic traps are small, light weight and have excellent air discharging capabilities. Discharging air at start-up allows steam to quickly enter the system. Trap body is permanently seal welded together and therefore non-repairable. Contains an extremely strong and rugged precision welded Stainless Steel thermal element. Its small discharge orifice, which makes it an optimal size trap for both drip and tracing applications, is susceptible to clogging depending on system conditions, therefore, a separate strainer should be installed.

How It Works

This thermostatic trap contains a welded stainless steel thermal element that expands when heated and contracts when cooled to 5°F below saturated steam temperature. When air or sub-cooled condensate are present, the trap is in the open discharge position. When steam reaches the trap, the element expands and closes off tightly.

Features

- Excellent at discharging air which allows steam to enter system quickly; extremely important during start-up
- Welded stainless steel thermal element resists shock from water hammer
- Freeze-proof when trap is installed in a vertical orientation allowing for complete condensate drainage
- Stainless steel Barstock body
- In the unlikely event of bellows failure; trap discharge remains open

Installation & Maintenance

Trap can be installed in any orientation. The WT1000 steam trap body is seal-welded and therefore non-repairable. If a new trap is required, remove from line and replace. This product cannot be welded in-line or failure of the thermal element due to excess heat may occur. Available in NPT threaded connections only.

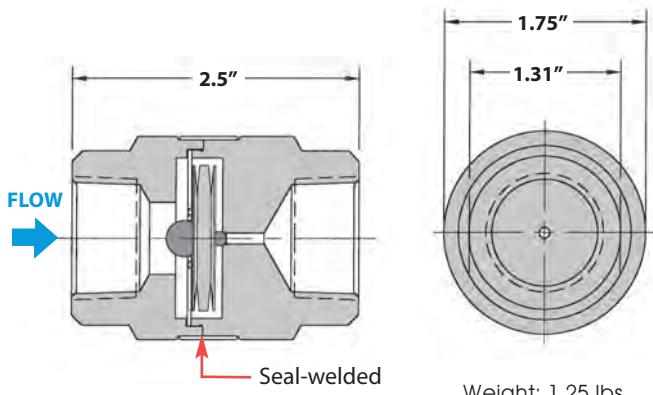
Sample Specification

The steam trap shall be of thermostatic type with stainless steel body and stainless steel thermal element.

MATERIALS

Trap Housing	Stainless Steel, AISI 304L
Thermal Element	Stainless Steel, 300 Series
Valve	Stainless Steel, AISI 440C

DIMENSIONS – inches



Weight: 1.25 lbs.

CAPACITIES – Condensate (lbs/hr)

Size	Model Code	Steam Inlet Pressure (PSIG)									
		5	10	20	50	100	125	150	200	250	300
1/2"	WT1000-12-N	95	140	195	305	435	485	530	610	685	750
3/4"	WT1000-13-N										

Steam Traps

Thermostatic Steam Trap for Sterilizers

(Repairable)

Model	WT1500 (Repairable)
Sizes	1/2"
Connections	NPT
Body Material	Stainless Steel
PMO Max. Operating Pressure	125 PSI
TMO Max. Operating Temperature	Saturated Steam Temperature
PMA Max. Allowable Pressure	362 PSIG @ 752 °F
TMA Max. Allowable Temperature	752°F @ 362 PSIG



Typical Applications

STERILIZERS, DRIP, TRACING: The WT1500 is a thermostatic trap ideally sized for sterilizers, steam tracing, and drip legs. Thermostatic traps are small, lightweight and have excellent air discharging capabilities allowing it to also be used as a low-capacity air vent. Discharging air at start-up allows steam to quickly enter the system. Contains an extremely strong and rugged precision welded Stainless Steel thermal element.

How It Works

This thermostatic trap contains a welded stainless steel thermal element that expands when heated and contracts when cooled to 15°F (average) below saturated steam temperature. When air or sub-cooled condensate are present, the trap is in the open discharge position. When steam reaches the trap, the element expands and closes off tightly.

Features

- Excellent at discharging air which allows steam to enter system quickly; extremely important during start-up
- Welded stainless steel thermal element resists shock from water hammer
- Freeze-proof when trap is installed in a vertical orientation allowing for complete condensate drainage
- In the unlikely event of bellows failure, trap remains open to remove condensate for system safety
- Repairable with assembly kit

Sample Specification

The steam trap shall be of thermostatic type with stainless steel body and stainless steel thermal element.

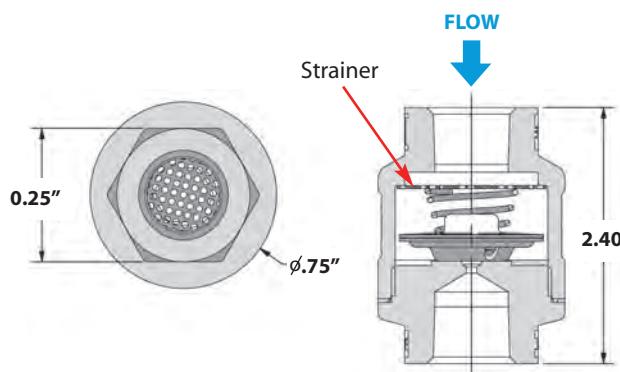
Installation and Maintenance

Trap can be installed in any orientation. This product cannot be welded in-line or failure of the thermal element due to excess heat may occur. Internal seating surfaces and bellows may be accessed for cleaning or repair, if needed. Available in NPT threaded connections only.

MATERIALS

Trap Housing	Stainless Steel, ASTM A351-CF8M
Thermal Element	Stainless Steel, 300 Series
Valve	Stainless Steel, AISI 440C

DIMENSIONS – inches



CAPACITIES – Condensate (lbs/hr)

Size	Model Code	Steam Inlet Pressure (PSIG)					
		5	10	20	50	100	125
1/2"	WT1500-12-N	130	185	250	400	560	640

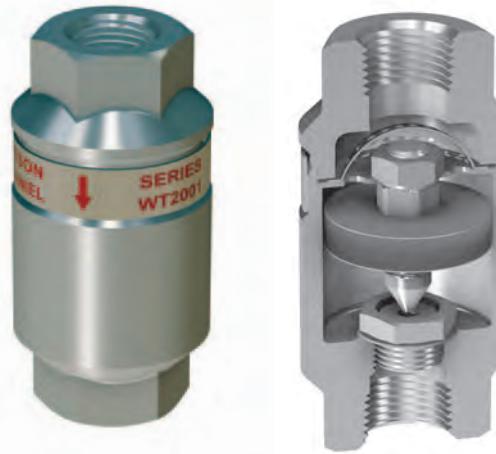
Steam Traps

Thermostatic Steam Trap (Non-Repairable)

WT2000

Thermostatic

Model	WT2000 (Non-Repairable)
Sizes	1/2", 3/4"
Connections	NPT
Body Material	Stainless Steel
PMO Max. Operating Pressure	650 PSIG
TMO Max. Operating Temperature	Saturated Steam Temp.
PMA Max. Allowable Pressure	1032 PSIG @ 100°F
TMA Max. Allowable Temperature	750°F @ 800 PSIG



Typical Applications

DRIP, TRACING, PROCESS: The **WT2000** is a general purpose medium-capacity thermostatic trap that can be used for steam tracing, as a drip trap on steam mains and steam supply lines, as well as for process applications. They are also commonly used as an Air Vent on heat exchangers or at the ends of steam mains. Thermostatic traps are small, light weight, operate over a wide pressure range, and have excellent air handling capabilities. Discharging air at start-up allows steam to quickly enter the system. All stainless steel construction and integral strainer, make the WT2000 an excellent choice for a variety of applications. Trap body is permanently seal welded together and therefore non-repairable. Contains an extremely strong and rugged precision welded Stainless Steel thermal element which is highly resistant to waterhammer.

How It Works

This thermostatic trap contains a welded stainless steel thermal element that expands when heated and contracts when cooled to 5°F below saturated steam temperature. When air or sub-cooled condensate are present, the trap is in the open discharge position. When steam reaches the trap, the element expands and closes off tightly.

Features

- Thermostatic traps are excellent at discharging air, which allows steam to enter quickly; extremely important during start-up
- Integral strainer to protect trap from contamination
- Welded stainless steel thermal element resists shock from waterhammer
- Freeze-proof when trap is installed in a vertical orientation allowing for complete condensate drainage
- Body is produced from stainless steel investment casting
- Hardened stainless steel seat for extended service life
- Will operate at steam pressures up to 650 PSIG

Sample Specification

Steam trap shall be of thermostatic type with stainless steel body, thermal element, internal screen, and hardened valve and seat.

Installation and Maintenance

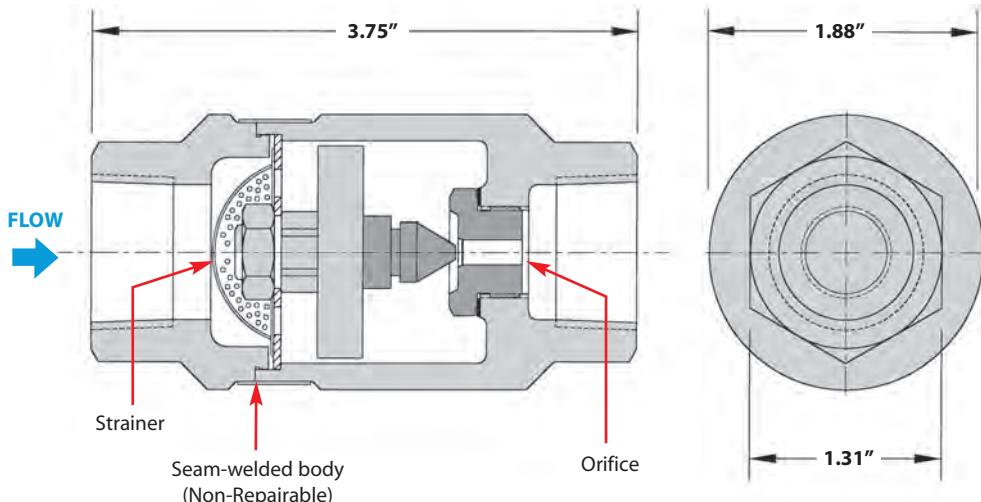
Trap can be installed in any position. The WT2000 steam trap body is seal-welded and therefore non-repairable. If a new trap is required, remove from line and replace. Cannot be welded in-line or failure of the thermal element may occur. Available in NPT threaded connections only.

Helpful Selection Information

Two orifice sizes are available: The 3/16" orifice should be used on all drip and tracing applications as well as small process applications with lower condensate loads. The 5/16" orifice is available to be used on process applications if additional capacity is required.

Options

- Special Bellows Option; available upon request:
 - Fail-closed Bellows (standard bellows fails in open position)
 - 43°F Sub-cool Bellows (Note: Standard bellows are designed for approximately 5°F sub-cool temperature)
- SLR** = Steam lock release
- Standard models contain a non-cleanable strainer screen. Also available without screen where it is desireable to flush dirt and scale thru the trap. Recommend WT2003 with larger orifice if used without strainer.



MATERIALS

Trap Housing	Stainless Steel, ASTM A351-CF3
Thermal Element	Stainless Steel
Valve & Seat	Stainless Steel, AISI 416
Strainer Screen	Stainless Steel

How to Size / Order

Select working pressure; follow column down to correct capacity (lbs/hr) block. Example:

Application: 1827 lbs/hr at 100 PSIG working inlet pressure

Size/Model: **WT2001-12-N**, 1/2" NPT, 3/16" orifice

CAPACITIES – Condensate (lbs/hr)

Size	Model Code	Orifice Size	Steam Inlet Pressure (PSIG)														
			5	10	20	50	100	125	150	200	250	300	350	400	500	600	650
1/2"	WT2001-12-N	3/16"	441	625	882	1391	1827	1969	2095	2305	2483	2636	2777	2903	3129	3323	3413
3/4"	WT2001-13-N																
1/2"	WT2003-12-N	5/16"	903	1271	1811	2861	3754	4043	4300	4730	5093	5413	5702	5959	6421	6820	7004
3/4"	WT2003-13-N																

Note: 3/16" orifice should be used on all drip and tracing applications.

Back Pressure as Percentage of Inlet Pressure	10	20	25	30	40	50	60	70	80	90
Percentage Decrease in Trap Capacity	0	0	0	2	5	12	20	30	40	55

Steam Traps

Thermostatic Steam Trap

(Repairable)

WT3000

Thermostatic



Model	WT3000 (Repairable)
Sizes	1/2", 3/4", 1"
Connections	NPT, SW, FLG
Body Material	Stainless Steel
Options	Strainer, Blowdown Valve
PMO Max. Operating Pressure	650 PSIG
TMO Max. Operating Temperature	Saturated Steam Temp.
PMA Max. Allowable Pressure	906 PSIG @ 100°F
TMA Max. Allowable Temperature	750°F @ 725 PSIG

Typical Applications

DRIP, TRACING, PROCESS: The **WT3000** is a general purpose medium capacity thermostatic trap that can be used for steam tracing; as a drip trap on steam mains and steam supply lines; as well as for process applications. All internal working components can be replaced while the trap body remains in-line. Thermostatic traps are small, light weight, operate over a wide pressure range, and have excellent air handling capabilities. Discharging air at start-up allows steam to quickly enter the system. All stainless steel construction and integral strainer option make the **WT3000** an excellent choice for a variety of applications. Contains an extremely strong and rugged precision welded Stainless Steel thermal element which is highly resistant to waterhammer.

How It Works

This thermostatic trap contains a welded stainless steel thermal element that expands when heated and contracts when cooled to 5°F below saturated steam temperature. When air or sub-cooled condensate are present, the trap is in the open discharge position. When steam reaches the trap, the element expands and closes off tightly.

Features

- The thermal element and seat can be easily removed and replaced in minutes with the trap body still in-line
- Operates at steam pressures up to 650 PSIG
- Thermostatic traps are excellent at discharging air, which allows steam to enter quickly; extremely important during start-up
- Welded stainless steel thermal element resists shock from waterhammer
- Freeze-proof when trap is installed in a vertical orientation allowing for complete condensate drainage
- Body is produced from stainless steel investment casting
- Hardened stainless steel seat for extended service life
- Available with integral strainer and blowdown valve

Sample Specification

The steam trap shall be of a thermostatic type with stainless steel body, thermal element and internal strainer. Trap must be in-line repairable with a bolt-on type cover that is sealed with a spiral wound Stainless Steel AISI 316 gasket. Seat and valve to be hardened stainless steel.

Installation and Maintenance

Trap can be installed in any orientation. All internal working components are extremely easy to replace and can be performed while the trap body remains connected in-line. Repair kit includes ALL parts to fully rebuild the steam trap including thermal element, seat and gasket. The **WT3000S** model comes with an optional strainer. **WT3000SB** comes with optional blowdown valve for flushing dirt and scale from strainer.

Helpful Selection Information

Two orifice sizes are available: The 3/16" orifice should be used on all drip and tracing applications as well as small process applications with lower condensate loads. The 5/16" orifice is available to be used on process applications if additional capacity is required.

Options

Strainer, blowdown valve, steam lock release and special bellows available.

S = Strainer (**WT3001S**)

SB = Strainer and blowdown valve (**WT3001SB**)

SLR = Steam lock release

Special Bellows Option; available upon request:

- Fail-closed Bellows (standard bellows fails in open position)
- 43°F Sub-cool Bellows (Note: Standard bellows are designed for approximately 5°F sub-cool temperature)

How to Size / Order

Refer to the Capacity Chart to determine which model, the **WT3001** or **WT3003** is required to satisfy the condensate load based on steam inlet pressure.

Example:

Application: 3754 lbs/hr at 100 PSIG steam inlet pressure
Size/Model: **WT3003S**, 5/16" orifice with strainer,
Specify size & connections (NPT, SW, FLG)

Example Model Codes:

WT3003S-13-N 3/4" NPT with strainer, and 5/16" orifice.

WT3001SB-12-N 1/2" NPT with strainer and blowdown valve,
3/16" orifice

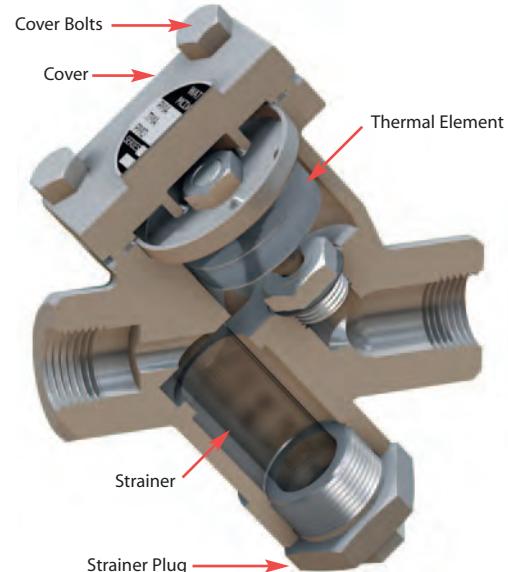
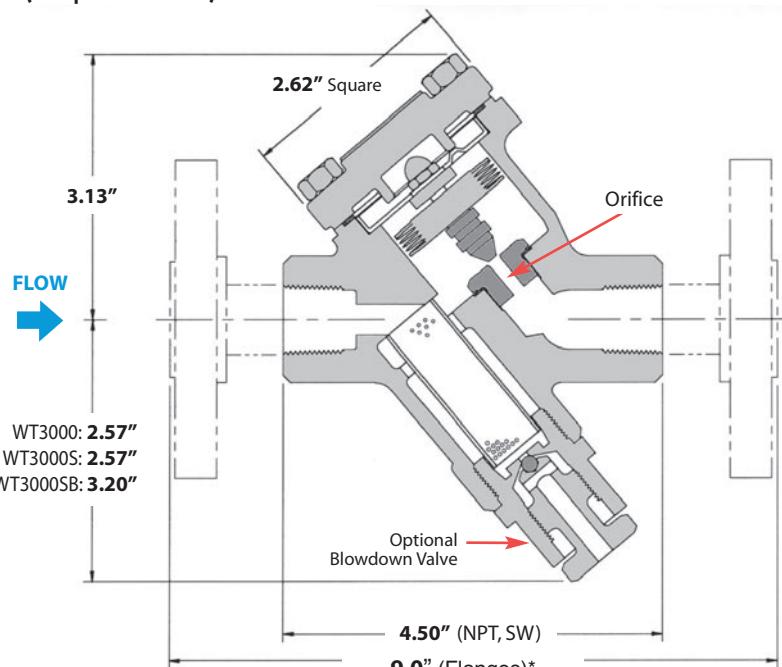
Steam Traps

Thermostatic Steam Trap (Repairable)

WT3000

Thermostatic

STEAM TRAPS



*For custom sizes consult factory (9" minimum).

NPT Weight: 5.0 lbs.

Size/Connection*	Model Code	Orifice Size Description
1/2" NPT	WT3001-12-N	3/16" No Strainer
3/4" NPT	WT3001-13-N	3/16" No Strainer
1/2" NPT	WT3001S-12-N	3/16" Strainer
3/4" NPT	WT3001S-13-N	3/16" Strainer
1" NPT	WT3001S-14-N	3/16" Strainer
1/2" NPT	WT3001SB-12-N	3/16" Strainer & Blowdown
3/4" NPT	WT3001SB-13-N	3/16" Strainer & Blowdown
1" NPT	WT3001SB-14-N	3/16" Strainer & Blowdown
1/2" NPT	WT3003-12-N	5/16" No Strainer
3/4" NPT	WT3003-13-N	5/16" No Strainer
1/2" NPT	WT3003S-12-N	5/16" Strainer
3/4" NPT	WT3003S-13-N	5/16" Strainer
1" NPT	WT3003S-14-N	5/16" Strainer
1/2" NPT	WT3003SB-12-N	5/16" Strainer & Blowdown
3/4" NPT	WT3003SB-13-N	5/16" Strainer & Blowdown
1" NPT	WT3003SB-14-N	5/16" Strainer & Blowdown

* For Socket Weld Connection change N to SW

Note: WT300R available; same options as above

MATERIALS

Cover & Body	Stainless Steel, AISI 316L
Thermal Element	Stainless Steel, AISI 300
Valve & Seat	Stainless Steel, AISI 416
Cover Gasket	Stainless Steel, AISI 316
Seat Gasket	Stainless Steel, AISI 316
Cover Bolts	Steel, ASTM A193 GR B7 Nickel Plated
Strainer*	0.046 Perforated Stainless Steel AISI 304
Blowdown Valve*	Stainless Steel, AISI 303
Flange	Stainless Steel, AISI 316

* Strainer and blowdown valve are optional

CAPACITIES – Condensate (lbs/hr)

Model	Orifice Size	Steam Inlet Pressure (PSIG)														
		5	10	20	50	100	125	150	200	250	300	350	400	500	600	650
WT3001	3/16"	441	625	882	1391	1827	1969	2095	2305	2483	2636	2777	2903	3129	3323	3413
WT3003	5/16"	903	1271	1811	2861	3754	4043	4300	4730	5093	5413	5702	5959	6421	6820	7004
WT300R	5/64"	85	120	170	265	350	375	400	440	475	500					
Back Pressure as Percentage of Inlet Pressure		10	20	25	30	40	50	60	70	80	90					
Percentage Decrease in Trap Capacity		0	0	0	2	5	12	20	30	40	55					

Steam Traps

Thermostatic Steam Trap

(Repairable)

WT4000

Thermostatic



Model	WT4000 (Repairable)
Sizes	3/4", 1"
Connections	NPT, SW, FLC
Body Material	Stainless Steel
Options	Strainer, Blowdown Valve
PMO Max. Operating Pressure	300 PSIG
TMO Max. Operating Temperature	Saturated Steam Temperature
PMA Max. Allowable Pressure	906 PSIG @ 100°F
TMA Max. Allowable Temperature	750°F @ 725 PSIG

Typical Applications

PROCESS: The **WT4000** is a high capacity version of the WT3000, for removing condensate and air from larger process applications. This steam trap is fully repairable while the body remains in-line. Like all thermostatic traps, they are small, light weight, operate over a wide pressure range, and have excellent air handling capabilities. Discharging air at start-up allows steam to quickly enter the system. All stainless steel construction and integral strainer option make the WT4000 an excellent choice for most process applications. Contains an extremely strong and rugged precision welded Stainless Steel thermal element which is highly resistant to waterhammer.

How It Works

This thermostatic trap contains a welded stainless steel thermal element that expands when heated and contracts when cooled to 5°F below saturated steam temperature. When air or sub-cooled condensate are present, the trap is in the open discharge position. When steam reaches the trap, the element expands and closes off tightly.

Features

- The thermal element and seat can be easily removed and replaced in minutes with the trap body still in-line
- Operates at steam pressures up to 300 PSIG
- Thermostatic traps are excellent at discharging air, which allows steam to enter quickly; extremely important during start-up
- Welded stainless steel thermal element resists shock from waterhammer
- Freeze-proof when the trap is installed in a vertical orientation allowing for complete condensate drainage
- Body is produced from stainless steel investment casting
- Hardened stainless steel seat for extended service life
- Available with integral strainer and blowdown valve

Sample Specification

The steam trap shall be of thermostatic type with stainless steel body, thermal element, and internal strainer. Trap must be in-line repairable with a bolt-on type cover that is sealed with a spiral wound Stainless Steel AISI 316 gasket. Seat and valve to be hardened stainless steel.

Installation and Maintenance

Trap can be installed in any orientation. All internal working components are extremely easy to replace and can be performed while the trap body remains connected in-line. Repair kit includes ALL parts to fully rebuild the steam trap including thermal element, seat and gasket. The WT4000 does not contain a strainer. The WT4000S contains a strainer. WT4000SB contains a blowdown valve for flushing dirt and scale from strainer.

Helpful Selection Information

Two orifice sizes are available: 7/16" standard capacity and 5/16" reduced capacity. Select these models for steam systems with maximum working pressure of 300 PSIG.

Options

Strainer, blowdown valve, and steam lock release.

S = Strainer (**WT4001S**)

SB = Strainer and blowdown valve (**WT4001SB**)

SLR = Steam lock release

Customized flanged connections: Specify size, face-to-face dimensions.

How to Size / Order

Refer to the Capacity Chart to determine which model, the WT4001 or WT4003 is required to satisfy the condensate load based on steam inlet pressure.

Example:

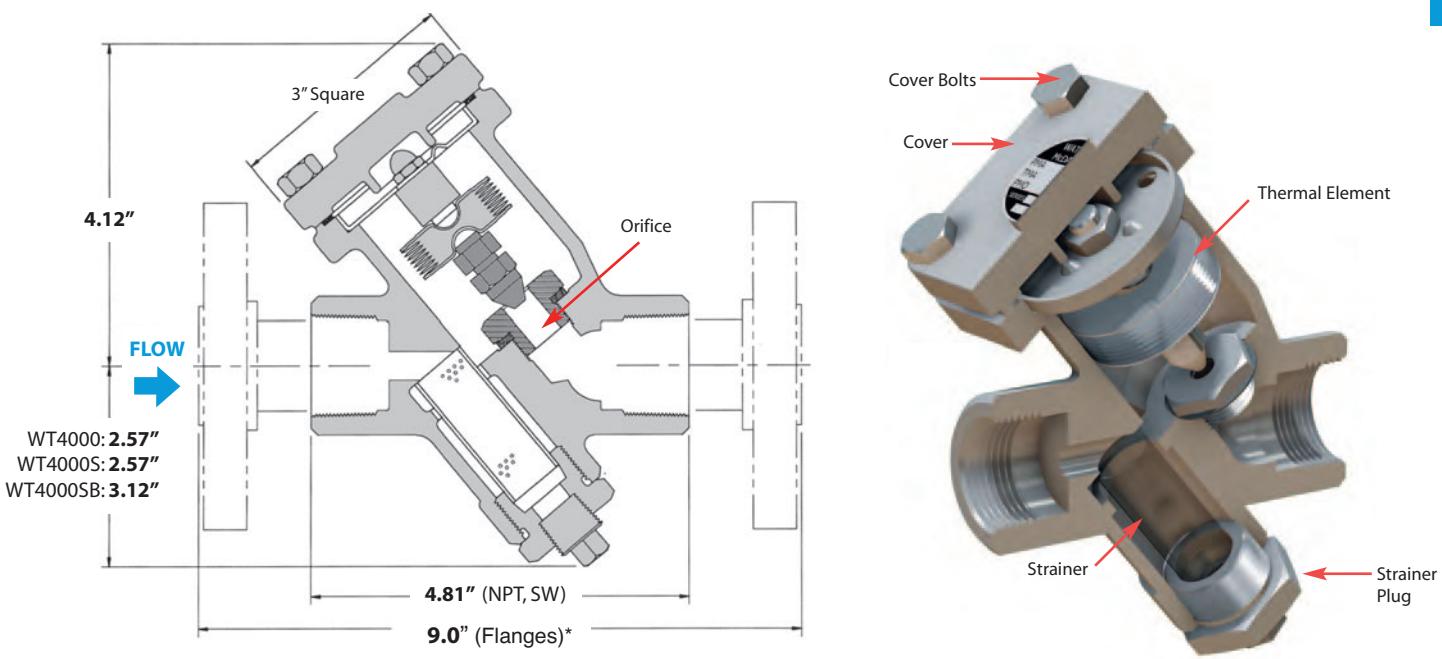
Application: 5610 lbs/hr at 100 PSIG steam inlet pressure

Size/Model: **WT4001S**, 5/16" orifice, and strainer
Specify size & connections (NPT, SW, FLC)

Example Model Codes:

WT4001S-13-N 3/4" NPT with strainer, and 5/16" orifice

WT4003SB-14-N 1" NPT with strainer and blowdown valve, 7/16" orifice



*For custom sizes consult factory (9" minimum).

NPT Weight: 4.5 lbs.

Size/Connection*	Model Code	Orifice Size	Description
3/4" NPT	WT4001-13-N	5/16"	No Strainer
1" NPT	WT4001-14-N	5/16"	No Strainer
3/4" NPT	WT4001S-13-N	5/16"	Strainer
1" NPT	WT4001S-14-N	5/16"	Strainer
3/4" NPT	WT4001SB-13-N	5/16"	Strainer & Blowdown
1" NPT	WT4001SB-14-N	5/16"	Strainer & Blowdown
3/4" NPT	WT4003-13-N	7/16"	Strainer
1" NPT	WT4003-14-N	7/16"	Strainer
3/4" NPT	WT4003S-13-N	7/16"	Strainer
1" NPT	WT4003S-14-N	7/16"	Strainer
3/4" NPT	WT4003SB-13-N	7/16"	Strainer & Blowdown
1" NPT	WT4003SB-14-N	7/16"	Strainer & Blowdown

* For Socket Weld Connection change N to SW

MATERIALS

Body	Stainless Steel, AISI 316L
Cover	Stainless Steel, AISI 316L
Cover Gasket	Spiral Wound Stainless Steel, AISI 316
Cover Bolts	Steel, ASTM A193 GR B7 Nickel Plated
Thermal Element	Stainless Steel, AISI 302
Valve & Seat	Hardened Stainless Steel, AISI 416
Seat Gasket	Stainless Steel, AISI 316
Strainer*	0.046 Perforated Stainless Steel AISI 304
Blowdown Valve*	Stainless Steel AISI 300

* Strainer and blowdown valve are optional

CAPACITIES — Condensate (lbs/hr)

Model	Orifice Size	Steam Inlet Pressure (PSIG)											
		1	2	5	10	20	50	100	125	150	200		
WT4001	5/16"	605	855	1350	1910	2705	4275	5610	6045	6425	7070	7615	8095
WT4003	7/16"	940	1325	2095	2960	4190	6620	8695	9365	9950	10955	11800	12540

Back Pressure as Percentage of Inlet Pressure	10	20	25	30	40	50	60	70	80	90
Percentage Decrease in Trap Capacity	0	0	0	2	5	12	20	30	40	55

Steam Traps

Thermostatic Steam Trap

(Repairable)

**TA25B, TA125, TAHC125
TS25B, TS125**

Model	TA25B, TA125, TAHC125 TS25B, TS125
Sizes	1/2", 3/4"
Connections	NPT
Body Material	Brass
PMO Max. Operating Pressure	TA25B, TS25B 25 PSIG TA125, TAHC125 125 PSIG TS125
TMO Max. Operating Temperature	Saturated Steam Temperature
PMA Max. Allowable Pressure	125 PSIG up to 450°F

TA Type • Right-Angle Connection



TS Type • Straight-thru Connection



Typical Applications

TA & TS type steam traps are predominantly used in the HVAC industry. They are referred to as radiator traps because the quick-disconnect right angle connection of the TA Type is found on most steam radiator installations. The TS Type offers a straight-through connection alternative. TA and TS Series radiator traps were designed specifically for removing condensate and air from 2-pipe steam heating systems. Their excellent air-handling capabilities, compact size, and economical cost make them a great choice for air vents on heat exchangers or for steam trap applications on OEM equipment. Contains an extremely strong and rugged precision-welded Stainless Steel thermal element which is highly resistant to waterhammer.

How It Works

This thermostatic trap contains a welded stainless steel thermal element that expands when heated and contracts when cooled. When air and condensate are present the trap is in the open discharge position. When steam reaches the trap the element expands and closes off tightly.

Features

- Excellent air handling capability
- In-line repairable
- Welded stainless steel thermal element
- Stainless seat on TA125, TAHC125 & TS125
- High thermal efficiency
- TAHC125 is a high-capacity version

Sample Specification

The steam trap shall be of thermostatic type with brass or bronze body and stainless steel thermal element. Trap must be in-line repairable.

Installation and Maintenance

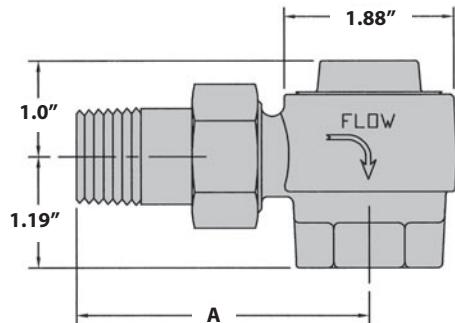
Trap can be installed in any orientation. The bodies are made from a high-quality brass forging and are easily repairable while the steam trap remains in-line by removing the cap and replacing the seat and thermal element. Repair kit includes thermal element, seat and gasket.

Steam Traps

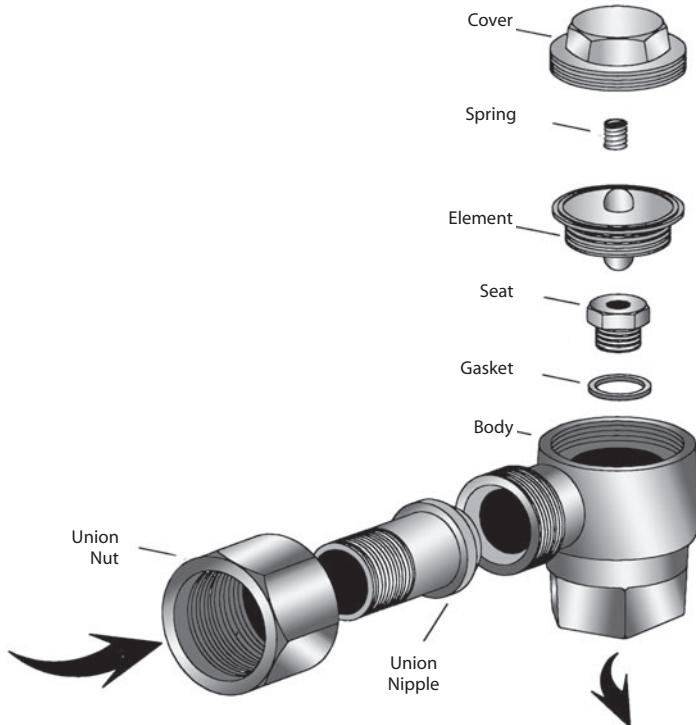
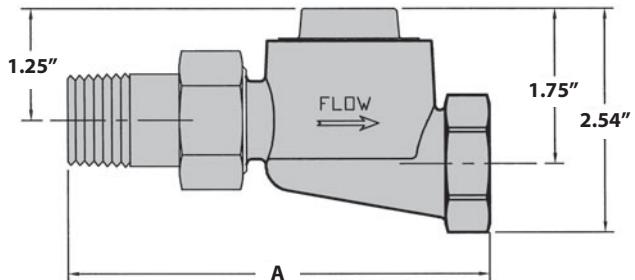
Thermostatic Steam Trap (Repairable)

TA25B, TA125, TAHC125 TS25B, TS125

TA Type • Right-Angle Connection



TS Type • Straight-thru Connection



DIMENSIONS & WEIGHTS — inches

Model	Pipe Size	A	Weight (lbs)
TA25B, TA125, TAHC125	1/2"	2.812	1.5
TA25B, TA125	3/4"	3.000	1.5
TS25B, TS125	1/2"	4.500	1.5
TS25B, TS125	3/4"	4.625	1.5

Note: Other Union Connections and Lengths are available; consult factory.

How to Size / Order

Select differential pressure; follow column down to correct capacity (lbs/hr) block. Example:

Application: 2100 lbs/hr at 40 PSI differential pressure

Size/Model: 3/4" **TA125**

CAPACITIES — Condensate (lbs/hr)

Size	Model Code	PMO (PSIG)	Steam Inlet Pressure (PSIG)				
			15	25	40	65	125
1/2"	TA25B-12-N	25	825	1070			
	TS25B-12-N						
	TA125-12-N		825	1070	1323	1610	1950
3/4"	TS125-12-N	125	860	1220	1725	725	3575
	TAHC125-12-N						
	TA25B-13-N		1290	1700			
3/4"	TS25B-13-N	25					
	TA125-13-N		1290	1700	2100	2575	3300
3/4"	TS125-13-N	125					

MATERIALS

Body	Forged Brass, CA 377
Element	Welded Stainless Steel, AISI 302
Cover	Forged Brass, CA 377
Spring	Stainless Steel, AISI 304
Seat	TA25B/TS25B: Brass ASTM B-21 TA125/TAHC125/TS125: Stainless Steel, AISI 303
Gasket	Brass, ASTM B-21
Union Nipple	Brass, ASTM B-16
Union Nut	Brass, ASTM B-16

Steam Traps

Thermostatic Steam Trap

(Repairable)

WT2500

Thermostatic

Model	WT2500 (Repairable)
Sizes	1/2", 3/4"
Connections	NPT
Body Material	Cast Iron
PMO Max. Operating Pressure	250 PSIG
TMO Max. Operating Temperature	406°F
PMA Max. Allowable Pressure	250 PSIG up to 450°F
TMA Max. Allowable Temperature	450°F @ 250 PSIG



Typical Applications

DRIP, TRACING, PROCESS: The **WT2500** is a general purpose medium capacity thermostatic trap that can be used for steam tracing; as a drip trap on steam mains and steam supply lines; as well as for process applications. All internal working components can be replaced while the trap body remains in-line. Like all thermostatic traps, they are small, light weight, operate over a wide pressure range, and have excellent air handling capabilities. Discharging air at start-up allows steam to quickly enter the system. The **WT2500** is an excellent choice for a variety of applications. Contains an extremely strong and rugged precision welded Stainless Steel thermal element which is highly resistant to waterhammer.

How It Works

The thermostatic trap contains a welded stainless steel thermal element that expands when heated and contracts when cooled. When air and condensate are present, the trap is in the open discharge position. When steam reaches the trap, the element expands and closes off tightly.

Features

- The thermal element and seat can be easily removed and replaced in minutes with the trap body still in-line
- Operates at steam pressures up to 250 PSIG
- Thermostatic traps have excellent air handling capability
- Welded stainless steel thermal element resists shock from water hammer
- Freeze-proof when trap is installed in a vertical orientation allowing for complete condensate drainage
- Hardened stainless steel seat for extended service life

MATERIALS

Cover & Body	Cast Iron ASTM A-126 Class B
Thermal Element	Stainless Steel, AISI 302
Valve & Seat	Stainless Steel, AISI 416
Cover Gasket	Garlock

CAPACITIES – condensate (lbs/hr)

Size	Model Code	Orifice Size	Steam Inlet Pressure (PSIG)								
			5	10	20	50	100	125	150	200	250
1/2"	WT2501-12-N	3/16"	441	625	882	1391	1827	1969	2095	2305	2483
3/4"	WT2501-13-N										
1/2"	WT2503-12-N	5/16"	903	1271	1811	2861	3754	4043	4300	4730	5093
3/4"	WT2503-13-N										

Sample Specification

The steam trap shall be of a thermostatic type with cast iron body and stainless steel thermal element. Trap must be in-line repairable with a bolt-on type cover that is sealed with a spiral wound Stainless Steel AISI 316 gasket. Valve and seat to be hardened stainless steel.

Installation and Maintenance

Trap can be installed in any orientation. All internal working components are extremely easy to replace and can be performed while the trap body remains in line by removing the four-bolt cover. Repair kit includes ALL parts to fully rebuild the steam trap including thermal element, seat and gasket.

Helpful Selection Information

Two orifice sizes are available: The 3/16" orifice should be used on all drip and tracing applications as well as small process applications with lower condensate loads. The 5/16" orifice is available to be used on process applications if additional capacity is required.

Options

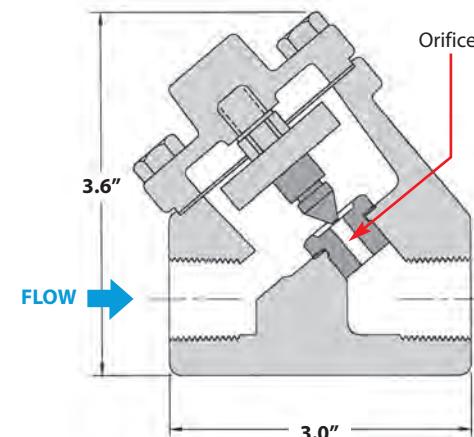
SLR = Steam lock release

How to Size / Order

Select working pressure; follow column down to correct capacity (lbs/hr). Example:

Application: 1827 lbs/hr at 100 PSIG working inlet pressure

Size/Model: **WT2501-12-N**, 1/2" NPT, 3/16" orifice.



Bi-Metallic

Model	Body Material	PMO (PSIG)	Sizes	Connections	Page No.
WT5000	Stainless Steel	650	3/8" – 1"	NPT, SW	66-67
BM300	Forged C.S.	320	1/2" – 1"	NPT, 150# / 300# FLG, SW, BW	68-69
WPN-Series	Alloy Steel	2230	1/2", 3/4", 1"	NPT, 300# FLG, SW, BW	70-71



Steam Traps

Bi-Metallic • Adjustable Discharge Temperature

WT5000
Bi-Metallic

Model	WT5000 (Bi-Metallic)
Sizes	3/8", 1/2", 3/4, 1"
Connections	NPT, SW
Body Material	Stainless Steel
PMO Max. Operating Pressure	650 PSIG
TMO Max. Operating Temperature	662°F
PMA Max. Allowable Pressure	900 PSIG
TMA Max. Allowable Temperature	800°F



Typical Applications

TRACING: The **WT5000** is specifically designed for steam tracing applications where accurate and adjustable control of condensate discharge temperature is desired. Can be used where a temperature sensitive medium is being transferred in piping system or held in a storage vessel and standard steam tracing methods may not be adequate to maintain specific product temperatures. Having the ability to adjust the condensate discharge temperature would allow for accurate temperature control of the product being traced. The significant feature of the **WT5000** is that the condensate discharge temperature is easily field-adjustable.

How It Works

Bi-metallic plates of dissimilar metals which are connected to the valve seat assembly respond to temperature variations. At relatively cool conditions, the trap is open for the discharge of condensate. When the temperature of the condensate is equal to or higher than the set temperature, the metals react and expand, closing the trap. External field-adjustability of the bi-metallic element allows control of the condensate discharge temperature.

The condensate temperature can be field adjusted as follows:

To **INCREASE** the temperature, turn the adjuster screw:
→ **COUNTERCLOCKWISE**

To **DECREASE** the temperature, turn the adjuster screw:
→ **CLOCKWISE**

Note: The lower the set temperature, the more condensate will back-up in front of the trap inlet connection. Therefore, consideration should be given to providing adequate piping to accommodate any such back-up.

Features

- Excellent for various steam tracing and small process applications using the additional energy (sensible heat) of the hot condensate
- Field-adjustable bi-metal element allows control of condensate discharge temperature
- Internal screen and seat/plug design help prevent pipe scale and debris from accumulating on seating surfaces to provide trouble-free operation
- In-line repairable

Sample Specification

The steam trap shall be a bi-metallic type with stainless steel body, seat, valve plug and bi-metallic element. Bi-metallic element shall be externally adjustable for control of condensate discharge temperature. Trap must be in-line repairable with a replaceable bimetal element, valve plug and seat.

Installation and Maintenance

Trap can be installed in any orientation. The body is made from stainless steel and is fully repairable while the steam trap remains in-line. If the trap fails, remove the cover and replace the internal working components. Repair kit includes bi-metallic element (including valve stem and plug), seat and gasket.

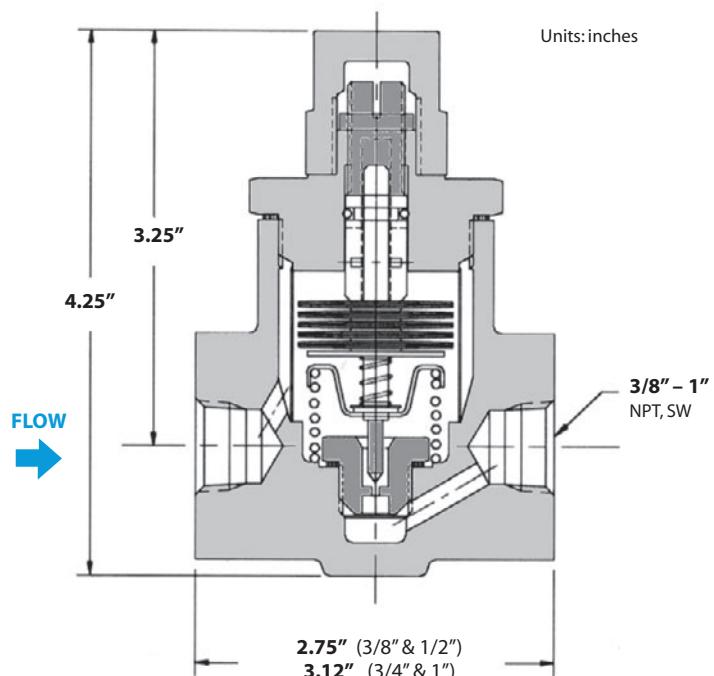
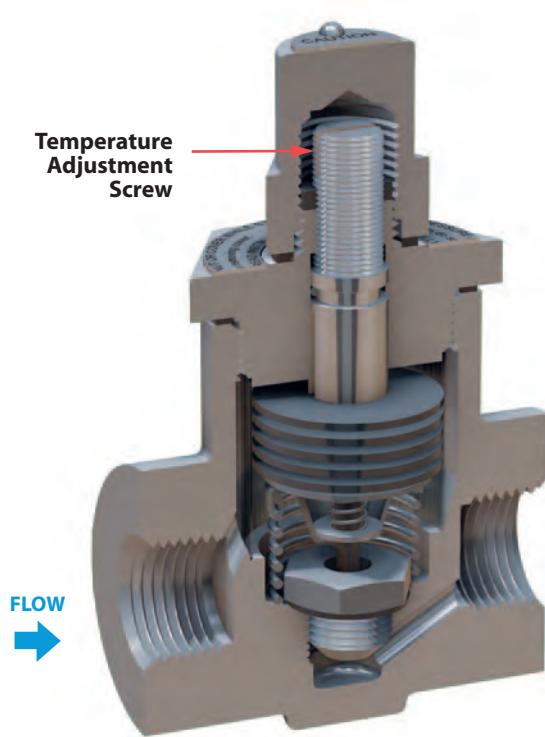
Helpful Selection Information

Available in 3/8" through 1" NPT and socket weld connections. Select this model for steam systems with maximum working pressure of 650 PSIG.

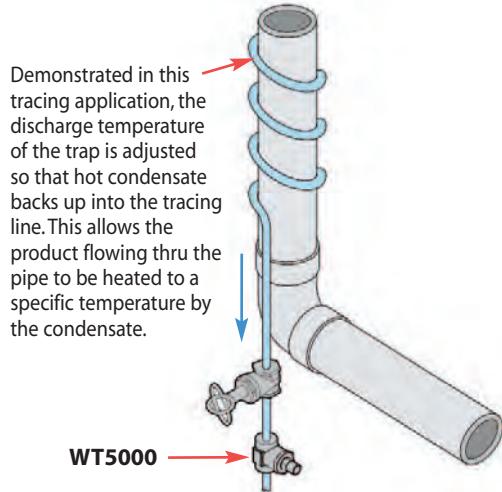
Size/Connection	Model Code	Weight lbs	Cross Reference TLV
3/8" NPT	WT5000-11-N	3.0	LEX3N-TZ
1/2" NPT	WT5000-12-N		
3/4" NPT	WT5000-13-N		
1" NPT	WT5000-14-N		
3/8" SW	WT5000-11-SW	3.0	LEX3N-TZ
1/2" SW	WT5000-12-SW		
3/4" SW	WT5000-13-SW		
1" SW	WT5000-14-SW		

MATERIALS

Body and Cover	304 Stainless Steel
Bimetal Element	GB14
Valve Seat	420 Stainless Steel
Valve Stem	420 Stainless Steel

**Notes:**

- 1) Capacities in chart are based on discharging condensate to atmospheric pressure (0 PSIG).
- 2) **Initial Opening Temperature = T** is the temperature at which the trap just begins to open. A negligible amount of condensate flow takes place at this temperature. It is adjustable between 120°F and 390°F.
- 3) **Initial Opening Temperature** must be at least 27 degrees below the saturated steam temperature to prevent possible steam loss.
- 4) When the condensate cools below the initial opening temperature, the Bi-metallic mechanism opens further, increasing trap capacity. Trap capacity can be adjusted up to the max value given in the chart.
- 5) For instructions on setting the trap discharge temperature and capacity, refer to the Watson McDaniel Installation and Maintenance Guide.
- 6) **Example:** A WT5000 trap with 125 PSIG Steam Inlet Pressure can be set to an Initial Opening Temperature between 120°F and 326°F. It can pass up to 413 lbs/hr when the temperature of the condensate is 80°F below the initial opening temperature (T-80°F).



T = Initial Opening Temperature of the Trap can be set from 120°F to 390°F

Trap Capacities at Various Inlet Pressures – Lbs/hr @ T, T-20°F, T-40°F, T-60°F, T-80°F

Condensate Discharge Temperature	Saturated Steam Temperature (°F) (based on given steam inlet pressure)													
	250	274	298	338	353	366	388	406	422	436	448	460	470	489
Maximum Initial Opening Temperature must be at least 27 degrees below saturated steam temperature. (390°F max)												390		
15	30	50	100	125	150	200	250	300	350	400	450	500	600	650
T = Initial Opening Temp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T-20°F 20° below Initial Opening Temperature	56	70	102	144	161	177	204	228	250	270	289	306	323	354
T-40°F 40° below Initial Opening Temperature	116	164	212	300	336	368	425	475	520	562	600	637	671	735
T-60°F 60° below Initial Opening Temperature	134	190	245	346	387	424	490	548	600	648	693	735	775	849
T-80°F 80° below Initial Opening Temperature	143	202	261	370	413	453	523	584	640	691	739	784	826	905

Steam Traps

Bi-Metallic Steam Trap

Model	BM300 (Repairable)
Sizes	1/2", 3/4, 1"
Connections	NPT, Socket Weld, Butt Weld, Flanged
Body Material	Forged Carbon Steel
PMO Max. Operating Pressure	320 PSIG
TMO Max. Operating Temperature	750°F
Max. Differential Pressure	320 PSI
PMA Max. Allowable Pressure	740 PSIG @ 100°F
TMA Max. Allowable Temperature	750°F @ 505 PSIG

BM300 Series

Bi-Metallic



Typical Applications

DRIP, TRACING: The **BM300** is a Medium Capacity Bi-metallic steam trap which is ideal as a drip trap on superheated steam mains and steam supply lines, as well as saturated steam lines and steam tracing applications. Bi-metallic traps subcool condensate before opening, making them extremely energy efficient and highly resistant to steam loss. The Body is made from Forged Carbon Steel and trap internals are fully repairable while the trap body remains in-line.

Thermostatic traps are small, lightweight and have excellent air discharging capabilities allowing it to also be used as a low-capacity air vent. Discharging air at start-up allows steam to quickly enter the system. Contains an extremely strong and robust bimetal element which is highly resistant to waterhammer. The hardened plug is back-seated to function as an internal check valve. Standard subcool is 25°F but is also field-adjustable.

How It Works

This thermostatically-actuated trap contains a bi-metallic thermal element that expands when heated and contracts when cooled to 25°F (average) below saturated steam temperature. When air or sub-cooled condensate are present, the trap is in the open discharge position. When steam reaches the trap, the element expands and closes off tightly.

Features

- The bi-metallic element and seat can be easily removed and replaced in minutes with the trap body still in-line
- Excellent at discharging air, which allows steam to enter quickly; extremely important during start-up
- Rugged stainless steel bi-metal element resists shock from waterhammer
- Freeze-proof when trap is installed in a vertical orientation allowing for complete condensate drainage
- Hardened stainless steel seat for extended service life
- Includes integral strainer with optional blowdown valve Standard factory-set subcool is 25°F but is also field-adjustable for optimum performance and energy savings

Sample Specification

The steam trap shall be of thermostatic bi-metal type with forged carbon steel body, stainless steel thermal element, and integral strainer. Trap must be in-line repairable with a bolt-on cover. Seat and valve to be hardened stainless steel.

Installation and Maintenance

Trap can be installed in any orientation. Internal seating surfaces and bi-metal may be accessed for cleaning or repair, if needed, while the product remains in-line. Repair is done by removing the cover and replacing the thermal controller assembly.

Size/Connection	Model Code	PMO PSIG	Weight lbs
Steam Trap with Internal Strainer			
1/2" NPT	BM300S-12-N	320	6
3/4" NPT	BM300S-13-N	320	6
1" NPT	BM300S-14-N	320	6
1/2" SW	BM300S-12-SW	320	6
3/4" SW	BM300S-13-SW	320	6
1" SW	BM300S-14-SW	320	6
1/2" BW	BM300S-12-BW	320	6
3/4" BW	BM300S-13-BW	320	6
1" BW	BM300S-14-BW	320	6
1/2" 150# FLG	BM300S-12-F150	320	8
3/4" 150# FLG	BM300S-13-F150	320	9
1" 150# FLG	BM300S-14-F150	320	10
1/2" 300# FLG	BM300S-12-F300	320	9
3/4" 300# FLG	BM300S-13-F300	320	11
1" 300# FLG	BM300S-14-F300	320	12
Steam Trap with Internal Strainer & Blowdown Valve			
1/2" NPT	BM300SB-12-N	320	6
3/4" NPT	BM300SB-13-N	320	6
1" NPT	BM300SB-14-N	320	6
1/2" SW	BM300SB-12-SW	320	6
3/4" SW	BM300SB-13-SW	320	6
1" SW	BM300SB-14-SW	320	6
1/2" BW	BM300SB-12-BW	320	6
3/4" BW	BM300SB-13-BW	320	6
1" BW	BM300SB-14-BW	320	6
1/2" 150# FLG	BM300SB-12-F150	320	8
3/4" 150# FLG	BM300SB-13-F150	320	9
1" 150# FLG	BM300SB-14-F150	320	10
1/2" 300# FLG	BM300SB-12-F300	320	9
3/4" 300# FLG	BM300SB-13-F300	320	11
1" 300# FLG	BM300SB-14-F300	320	12

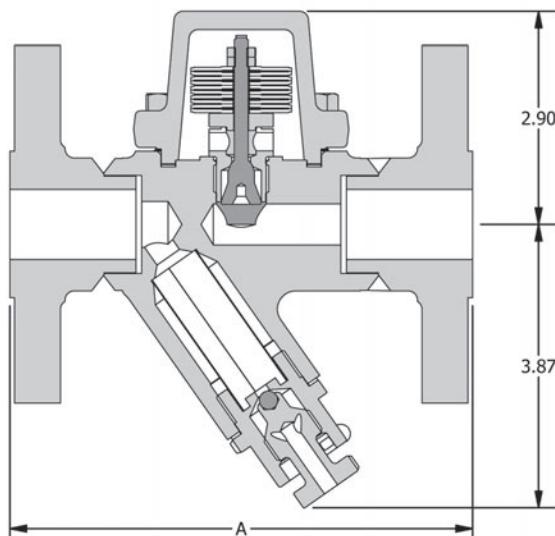
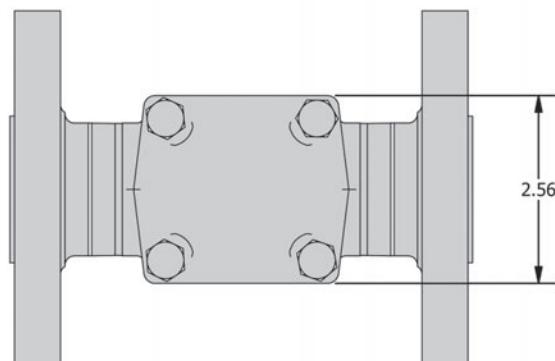
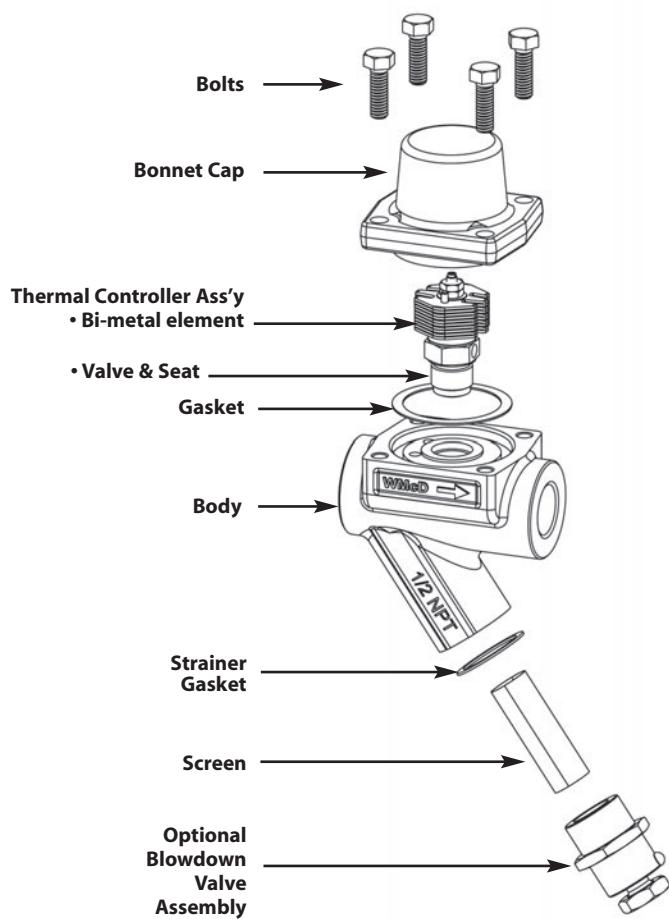
Steam Traps

Thermostatic Bi-Metallic Steam Trap

BM300 Series

Bi-Metallic

DIMENSIONS – inches



MATERIALS

Body	A105 Forged Carbon Steel
Thermal Controller Assembly	
• Bi-metal Element	Stainless Steel
• Valve	Hardened Stainless Steel
• Seat	Hardened Stainless Steel
Flange	A105 Forged Carbon Steel
Gasket	Grafoil with SS Liner
Bolts	Steel, A193, GR B7
Screen	Stainless Steel, 40 Mesh
Strainer Blowdown	Copper
Flange	Stainless Steel

"A" DIMENSIONS – inches

Size	NPT or SW	150# FLG	300# FLG
1/2"	3.74	5.9	5.9
3/4"	3.74	5.9	5.9
1"	3.74	6.3	6.3

HOT CAPACITIES – Condensate (lbs/hr)

Size	Model Code	Steam Inlet Pressure (PSIG)										
		15	20	30	40	50	75	100	150	200	250	320
1/2", 3/4", 1"	BM300	382	429	506	570	625	735	830	980	1100	1205	1330

COLD CAPACITIES – Condensate (lbs/hr)

Size	Model Code	Steam Inlet Pressure (PSIG)										
		15	20	30	40	50	75	100	150	200	250	320
1/2", 3/4", 1"	BM300	1532	1770	2165	2500	2795	3420	3935	4810	5560	6205	7055

Note: Hot Condensate Capacities are running loads at 25°F below saturation. Cold Water Capacities are start-up load capabilities.

Steam Traps

Bi-Metallic Steam Trap



WPN Series

Bi-Metallic

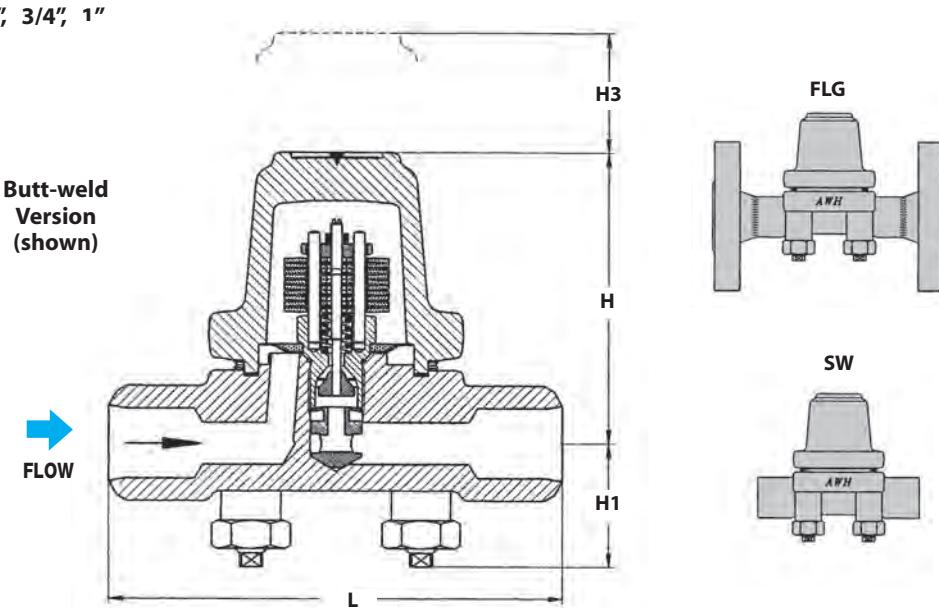
Typical Applications

DRIP, TRACING: **WPN Series** Bi-metallic steam traps are used in steam tracing, steam main drips and non-critical process equipment. They are extremely robust and reliable, making them a suitable choice for high pressure applications as well as outdoor applications that are subject to freezing. They are used in systems where a quick discharge of air, non-condensable gases and large quantities of cold water need to be drained at start-up.

Model	WPN-63	WPN-100	WPN-160	WPN-250
Sizes	1/2", 3/4", 1"	1/2", 3/4", 1"	1/2", 3/4", 1"	1/2", 3/4", 1"
Connections	300# FLG, SW, Butt-weld	600# FLG, SW, Butt-weld	900# FLG, SW, Butt-weld	1500# FLG, SW, Butt-weld
Body & Cover Material	Alloy Steel (A182-F12CL2)	Alloy Steel (A182-F12CL2)	Alloy Steel (A182-F12CL2)	Alloy Steel (A182-F22CL3)
Body Rating	ANSI 400	ANSI 600	ANSI 900	ANSI 1500
PMA Max. Allowable Pressure	810 PSIG up to 592°F	1200 PSIG up to 610°F	1600 PSIG up to 750°F	2180 PSIG up to 905°F
TMA Max. Allowable Temperature	1000°F @ 261 PSIG	1000°F @ 441 PSIG	1000°F @ 595 PSIG	1000°F @ 1305 PSIG
TMO Max. Operating Temperature	572°F	842°F	932°F	932°F
Pressure Controller	R56	R90	R130	R150
PMO Max. Operating Diff. Pressure of Pressure Controller	810 PSI	1200 PSI	1600 PSI	2230 PSI

WPN-63 / WPN-100 / WPN-160 / WPN-250

1/2", 3/4", 1"



How It Works

When the system is cold, the trap is wide open discharging air and cold condensate. When the bi-metallic plates inside the trap heat up, they pull the seat closed and the flow becomes restricted. Prior to steam temperature being reached, the trap shuts off tightly. Cooler temperatures cause the seat to open further. Therefore, trap capacity will increase when colder condensate is in contact with the Bi-metal element. Trap capacity is therefore given at different temperatures below saturated steam temperature.

DIMENSIONS & WEIGHTS – inches

Model	Size	Connection	L	H	H1	H3	Weight (lbs)
WPN-63, WPN-100, WPN-160, WPN-250	1/2", 3/4"	FLG*	8.26	4.16	1.68	2.8	17.6
	1"	FLG*	9.05	4.16	1.68	2.8	17.6
		SW	6.30	4.16	1.68	2.8	10.0
		Butt-weld	6.30	4.16	1.68	2.8	10.0

- * WPN-63: 300# FLG
- WPN-100: 600# FLG
- WPN-160: 900# FLG
- WPN-250: 1500# FLG

Steam Traps

Bi-Metallic Steam Trap

WPN Series

Bi-Metallic

How to select a A WPN Trap:

- 1) Select a Pressure Controller that has a max differential pressure within the range of your application.
- 2) Select a Trap Body depending on System Pressure; WPN63 thru WPN250.
- 3) Select Connection Type & Size
- 4) Configure Model Code (see Examples below)

Example Model Codes:

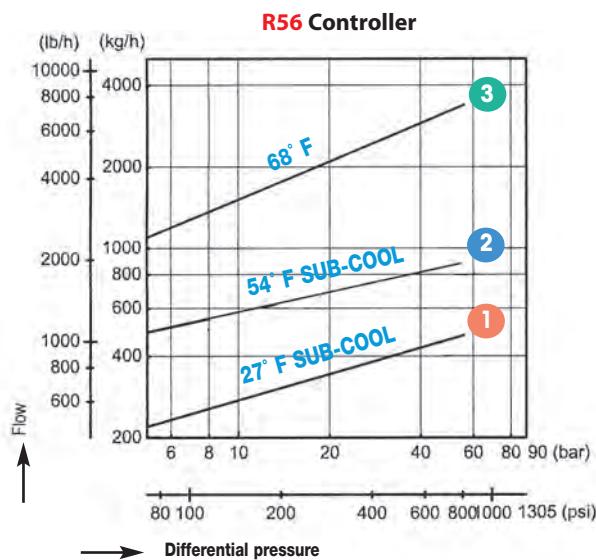
WPN63-C-R56-14-F600

(Model WPN63, 810 PSI Max Differential Pressure, 1" 600# Flanged with Standard Internal Strainer)

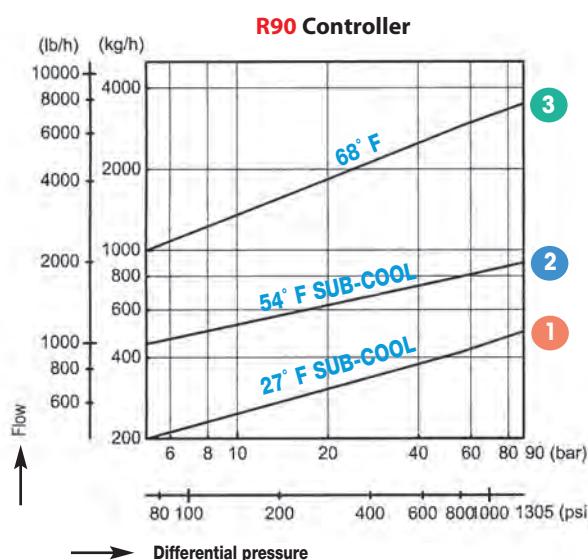
Model Configuration Chart

Position 1	Position 2	Position 3	Position 4	Position 5
Model	Body Material	Pressure Controller (Code -C)	Connection Code	Connection Type
WPN-63	Alloy Steel A182-F12CL2	R56	1/2" 12	F300, SW, BW
WPN-100	Alloy Steel A182-F12CL2	R90		F600, SW, BW
WPN-160	Alloy Steel A182-F12CL2	R130	1" 14	F900, SW, BW
WPN-250	Alloy Steel A182-F22CL3	R150		F1500, SW, BW

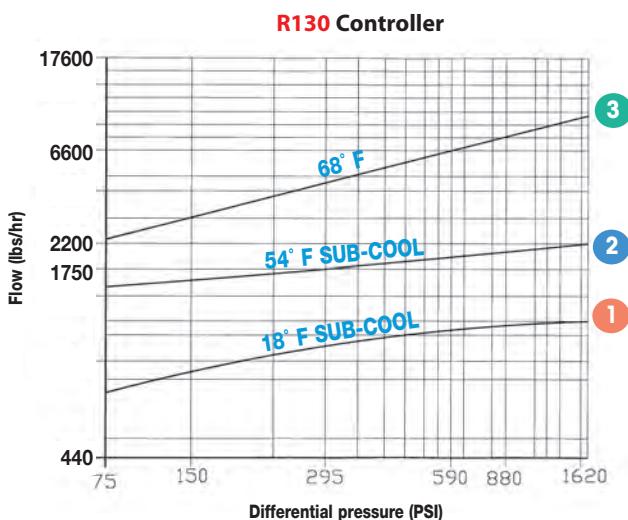
WPN-63 • 1/2", 3/4", 1"



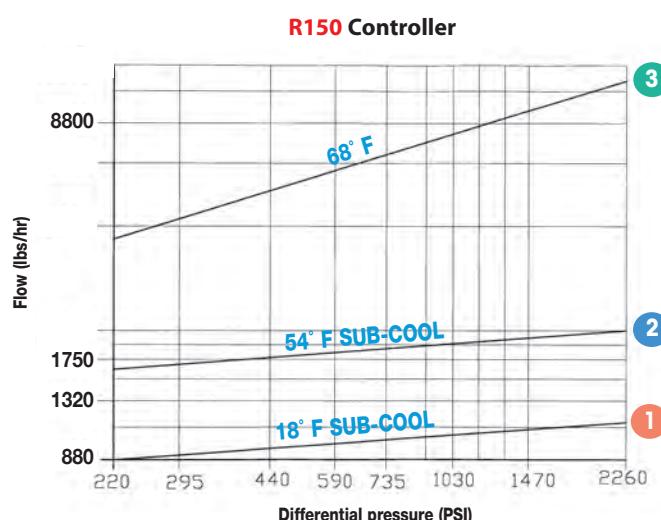
WPN-100 • 1/2", 3/4", 1"



WPN-160 • 1/2", 3/4", 1"



WPN-250 • 1/2", 3/4", 1"





Float & Thermostatic Steam Traps

Introduction

Float & Thermostatic						Pages 72-93
Model	Body Material	PMO (PSIG)	Sizes	Connections	Page No.	
WFT	Cast Iron	250	3/4" – 2"	NPT	76-79	
FTT/FTTS	Ductile Iron or Stainless Steel	300/225	1/2" – 2"/1/2" - 1"	NPT/NPT, SW	80-83	
FTE/FTES	Ductile Iron/Cast Steel	200/300	1 1/2", 2", 2 1/2"	NPT, SW, FLG	84-85	
FT600/FT601	Carbon Steel/Stainless Steel	450	3/4" – 4"	NPT, SW, FLG	86-91	
FT	Cast Iron	75	3/4" – 2"	NPT	92-93	

PMO = Maximum Operating Pressure

		Characteristics	Material	Application
WFT		Parallel Pipe Connection	WFT: Cast Iron	Primary Choice for Low to Medium Capacity General Purpose Process Applications. Smaller sizes can also be used for Drip Applications
		In-Line Pipe Connection	FTT: Ductile Iron FTTS: Stainless Steel	
FTE & FTES		Extremely High-Capacity	FTE: Ductile Iron FTES: Cast Steel	High Capacity Process Applications
FT600 & FT601		Cast Steel Body	FT600: Carbon Steel FT601: Stainless Steel	Where Carbon Steel or Stainless Steel bodies are required
FT		Parallel Pipe Connection (H-pattern)	FT: Cast Iron	General Purpose, Low to Medium Capacity Process Applications up to 75 PSIG. Smaller sizes can also be used for Drip Applications.

FLOAT & THERMOSTATIC TRAPS

F&T steam traps are the most common trap type used for process applications. They use a float-operated valve mechanism to discharge condensate as it is formed, and an air vent for discharging air at start-up; both very important requirements for process applications.

The **WFT** and **FTT-Series** with **Iron bodies**, are suitable for most general purpose process applications up to **250 PSIG**. The 3/4" WFT and FTT are often used for drip applications.

The **FTE-Series** has **extremely high capacity**.

The **FT600 Series** available with **Cast Steel** or **Stainless Steel bodies**; often required in Chemical and Petrochemical refineries and other industries.

Float & Thermostatic Steam Traps (F&Ts) are very versatile due to their ability to drain condensate from a wide variety of applications.

They can be installed in steam distribution piping to remove condensate and protect equipment leading up to any steam-using equipment such as heat exchangers, air coils, unit heaters, radiators, etc. When installed BEFORE steam-using equipment, this is referred to as a **DRIP** application. Typically a small (1/2" – 1") float and thermostatic steam trap can be installed in an appropriate drip leg to drain condensate to improve steam quality and reduce waterhammer before it enters the equipment. The thermostatic element will improve start-up times by discharging air that will initially be in cold steam piping. Steam pressure and condensate loads will be relatively constant in Drip applications meaning the trap will not have to cycle much. Additional consideration may be given to higher condensate loads at system start-up until the steam system reaches working pressure and temperature

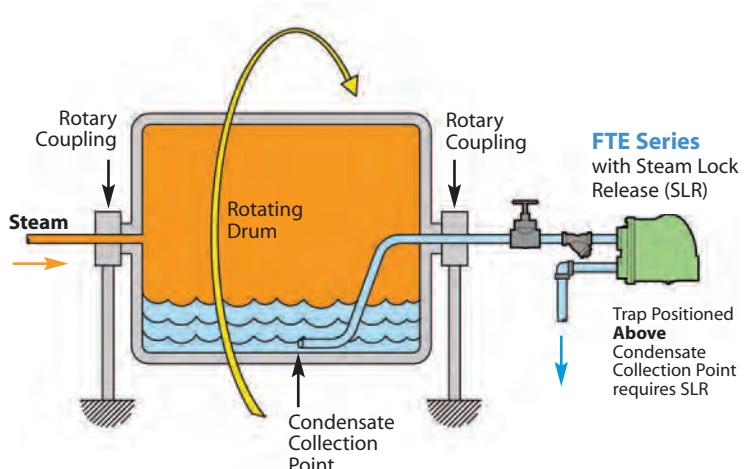
When an F&T trap is installed directly AFTER any steam-using equipment such as at the condensate outlet of a steam-to-water heat exchanger, this is referred to as a **PROCESS** application. Effectively, any equipment that is using steam for heating water or other liquid, air, or an industrial material is referred to as a process. Unlike the Drip application described above, pressure and condensate load in Process applications is typically not constant and may vary significantly. The Float & Thermostatic steam trap's ability to quickly adjust and modulate to varying conditions make it the primary choice for Process applications. The float-operated valve design allows the F&T to open immediately when condensate load or pressure increases and will close quickly when condensate load is reduced. The thermostatic element improves energy efficiency by discharging air immediately at start-up to significantly reduce heat-up times.

Steam Lock Release – All efforts should be made to drain condensate from piping and equipment by gravity whereby the steam trap is located below the equipment being drained. This is referred to as **Gravity Drainage**. However, certain applications require the steam trap to be installed above the point where condensate collects. This type of application is referred to as **Syphon Drainage** and requires the steam trap to be fitted with **Steam Lock Release (SLR)** to consistently drain condensate for optimum heating.

One such example of an application requiring Syphon Drainage and a steam trap fitted with SLR is a **Rotating Steam Dryer**

Rotating Steam Dryer

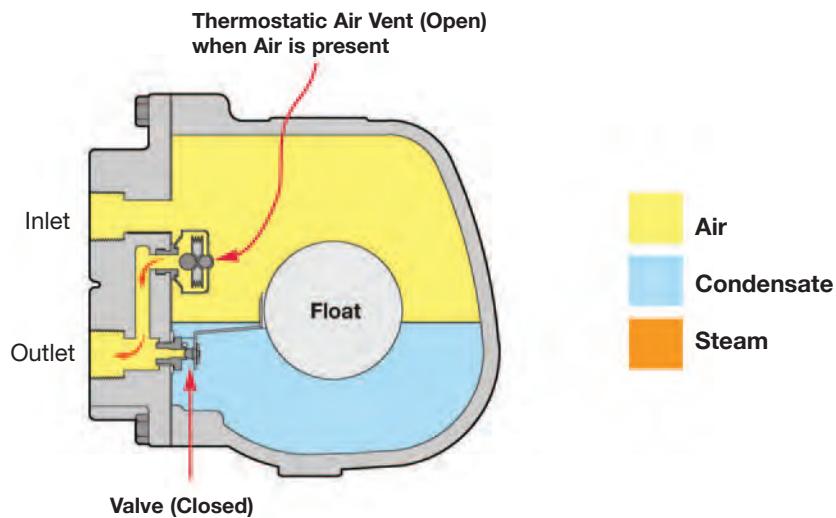
Commonly found in the Paper Making industry, a rotating piece of equipment offers a unique challenge of removing the condensate. Steam inside a rotating drum cylinder is used to heat product such as sheets of paper over the outside surface of the drum. Since the drum is rotating, the trap must be positioned **above** the condensate collection point. The steam pressure inside the drum pushes the condensate up through the pipe to the steam trap. If steam enters the tubing, it will "Steam Lock" the trap by causing it to close which in turn causes the condensate to build up inside the rotating drum. Since the pipe line is surrounded by steam, it may take an extended length of time for the steam in the pipe to dissipate. By using the Steam Lock Release feature, a small amount of steam is continually discharged thru the seat, allowing the condensate to continually reach the steam trap. This steam lock release feature is available on ALL F&T and Thermostatic traps and should be considered on this type of application.



Introduction

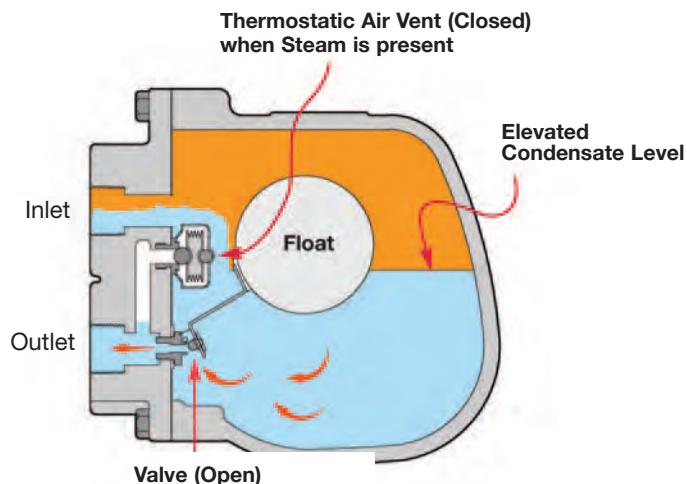
A) Venting Air

A) When cold air enters the trap during start-up, the thermostatic air vent is open, allowing the discharge of large quantities of air from the system.



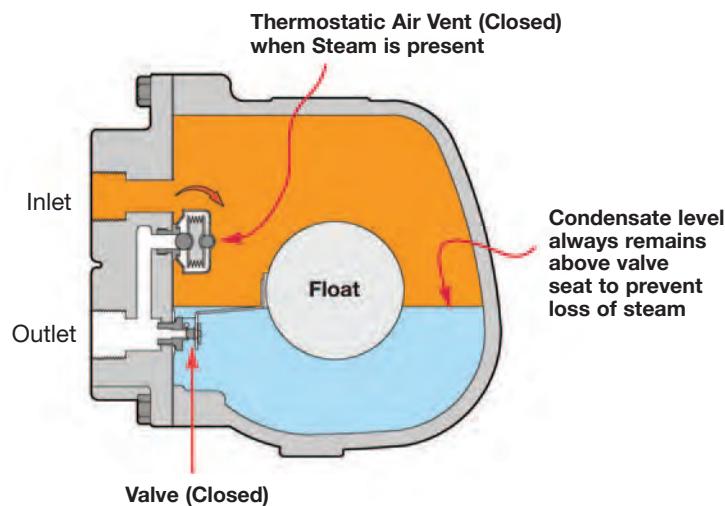
B) Discharging Condensate

B) When condensate enters the trap, the float lifts which opens the valve, allowing condensate to discharge. This image shows the valve/seat fully open and operating at full capacity.



C) Closed (Trapping Steam)

C) As the condensate discharges through the seat orifice, the float lowers, and shuts the valve. The float closes the valve with a level of condensate above the seating orifice to prevent loss of any steam. The float level rises and falls to modulate the seat opening in order to maintain a constant equilibrium between the incoming pressure and internal trap components, several orifice sizes are offered to accommodate various differential pressure ranges.



Steam Traps

Float & Thermostatic Steam Trap

WFT Series

Float & Thermostatic

Model	WFT
Sizes	3/4", 1", 1 1/4", 1 1/2", 2"
Connections	NPT
Body Material	Cast Iron
PMO Max. Operating Pressure	250 PSIG
TMO Max. Operating Temperature	Saturated Steam Temperature
PMA Max. Allowable Pressure	250 PSIG up to 450°F
TMA Max. Allowable Temperature	450°F @ 250 PSIG



Typical Applications

PROCESS, DRIP: **WFT Series** with parallel port connections were specifically designed for removing condensate and air from HVAC and industrial process applications such as unit heaters, pressing machines, heat exchangers and coils. They contain a high-quality welded stainless steel thermostatic air vent and stainless steel mechanism. The WFT Series are fully repairable while the trap remains in-line and are available in 3/4" thru 2" NPT connections. For drip applications, such as draining steam mains and steam supply lines, use model 3/4" WFT-125 (WFT-125-13-N).

How It Works

Float and thermostatic traps contain a float-operated valve and seat mechanism with a separate thermostatic element which work together to remove both condensate and air from the steam system. The float, which is attached to a valve, rises and opens the valve when condensate enters the trap, allowing the condensate to discharge. Air is discharged through the thermostatic air vent to the outlet side of the trap. Steam entering the trap causes the thermostatic element to expand, closing the air vent and trapping the steam.

Features

- All stainless steel internals with hardened seat and wear parts
- In-line repairability is simplified by having all internals attached to the cover
- Welded stainless steel thermostatic air vent resists shock from waterhammer. Live orifice air vent is available for superheated applications
- Excellent air handling capability allows air to be discharged rapidly so steam can enter the system quickly during start-up
- F&T traps discharge condensate immediately as it is formed (no condensate will back up into the system)

Sample Specification

The trap shall be of float and thermostatic design with cast iron body and parallel piping configuration. Thermostatic air vent to be welded stainless steel. All internals must be stainless steel with hardened seat area. Trap must be in-line repairable.

Installation and Maintenance

The trap must be installed upright and level for the float mechanism to operate properly. All internal components can be replaced with the trap connected in-line. Repair kits include thermostatic air vent, float, valve seat and disc, and gaskets. The standard thermostatic air vent can be damaged by superheat; therefore, in applications with superheated steam, the thermostatic air vent should be replaced with a special "live orifice" air vent.

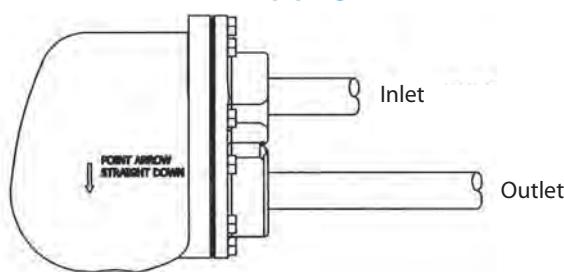
Options

- Live orifice air vent for superheated steam applications.
- NPT Connection for freeze protection
- **SLR** = Steam lock release
- **VB** = Vacuum Breaker
- **DP** = Drain Plug

MATERIALS

Body & Cover	Cast Iron
Gasket	Grafoil
Cover Screws	Steel, GR5
Float	Stainless Steel, AISI 304
Internals	Stainless Steel, 300 Series
Thermostat	Stainless Steel
Valve Seat	Stainless Steel, 17-4 PH
Valve Disc	Stainless Steel, AISI 420F

Demonstration of Parallel piping connections:



How to Size / Order

The **Maximum Operating Pressure** (PMO) rating of model selected must meet or exceed the maximum steam pressure or the trap may not open. For example; the WFT-125 has a PMO of 125 psi. Condensate capacity (lbs/hr) of the trap is based on the differential pressure across the trap.

For Drip Applications: a 3/4" WFT size is generally sufficient to exceed warm-up loads with a 2X safety factor.

For process applications: The condensate loads (lbs/hr) are normally calculated at the maximum steam pressure; then an appropriate safety margin is applied in order to select a trap with sufficient capacity when operating at lower steam pressures. Reference full explanation of Safety Load Factors in Steam Trap Introduction section.

When a temperature control valve regulates the flow of steam to the process equipment (Heat Exchanger) being drained of condensate, it is recommended to select a trap with a PMO that exceeds the inlet steam pressure to the temperature control valve. This assures that under all operating conditions, the steam pressure will not exceed the PMO of the trap.

For Example: Process application has a maximum steam inlet pressure of 100 psi, a maximum condensate load of 2,500 lbs/hr and is discharging to a condensate return line with a possible back pressure of 25 PSIG. $\Delta P = 100-25 = 75$ PSI

To select trap: If the Safety Load Factor is chosen to be 2X max capacity at max differential pressure, then Trap should be selected based on 5,000 lbs/hr (2,500 x 2 = 5,000) at 75 PSI differential pressure with a PMO in excess of 100 PSIG

Selection: WFT-125-17-N, PMO=125 PSIG, 2" NPT with a condensate capacity of 7,460 lbs/hr at **75 PSI** differential pressure.

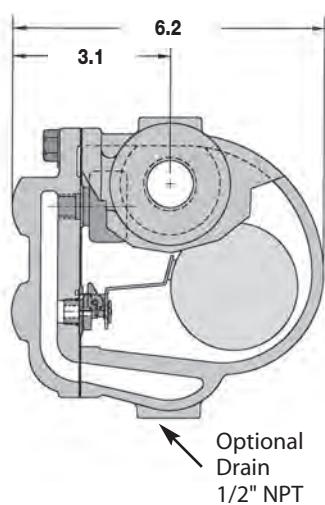
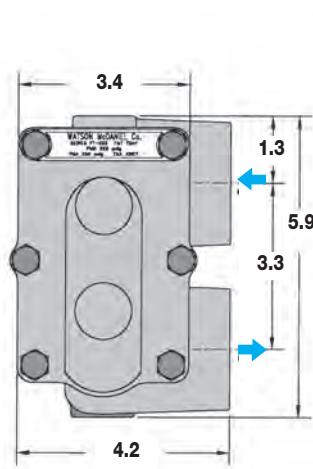
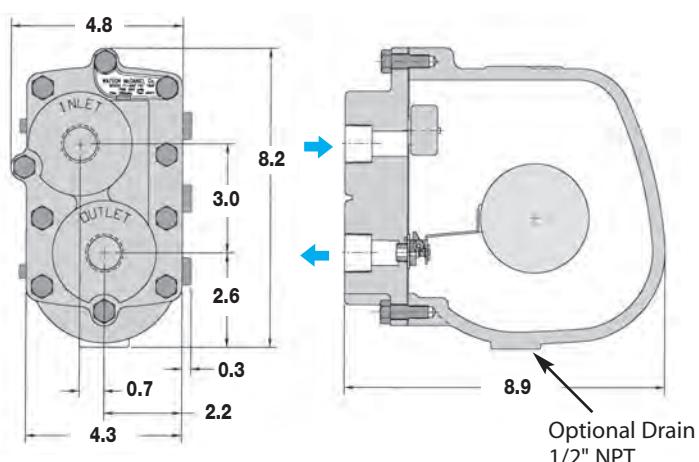
CAPACITIES – Condensate (lbs/hr)

Model Code	PMO (PSIG)	Pipe Size	Orifice Size	ΔP = Differential Pressure (PSI)																		
				1/4	1/2	1	2	5	10	15	20	30	40	50	100	125	150	175	200			
WFT-015-13-N	15	3/4"	0.250	390	490	620	780	1050	1320	1500												
WFT-015-14-N	15	1"	0.250	390	490	620	780	1050	1320	1500												
WFT-015-15-N	15	1 1/4"	0.312	610	770	960	1210	1630	2040	2330												
WFT-015-16-N	15	1 1/2"	0.500	1420	1910	2570	3460	5120	6890	8190												
WFT-015-17-N	15	2"	0.625	2260	2950	3860	5040	7170	9360	10930												
WFT-030-13-N	30	3/4"	0.228	330	420	530	670	930	1180	1350	1500	1720										
WFT-030-14-N	30	1"	0.228	330	420	530	670	930	1180	1350	1500	1720										
WFT-030-15-N	30	1 1/4"	0.228	330	420	530	670	930	1180	1350	1500	1720										
WFT-030-16-N	30	1 1/2"	0.390	930	1240	1650	2190	3210	4280	5060	5700	6750										
WFT-030-17-N	30	2"	0.500	1420	1910	2570	3460	5120	6890	8190	9260	11020										
WFT-075-13-N	75	3/4"	0.166	175	225	295	385	545	705	825	920	1075	1200	1305	1525							
WFT-075-14-N	75	1"	0.166	175	225	295	385	545	705	825	920	1075	1200	1305	1525							
WFT-075-15-N	75	1 1/4"	0.312	640	850	1130	1500	2180	2900	3420	3850	4540	5110	5600	6610							
WFT-075-16-N	75	1 1/2"	0.312	640	850	1130	1500	2180	2900	3420	3850	4540	5110	5600	6610							
WFT-075-17-N	75	2"	0.422	1020	1340	1760	2310	3330	4380	5140	5760	6770	7590	8290	9730							
WFT-125-13-N	125	3/4"	0.128	105	135	180	235	340	445	525	585	690	770	845	990	1110	1210					
WFT-125-14-N	125	1"	0.128	105	135	180	235	340	445	525	585	690	770	845	990	1110	1210					
WFT-125-15-N	125	1 1/4"	0.250	410	540	710	930	1340	1770	2070	2320	2730	3050	3340	3920	4390	4790					
WFT-125-16-N	125	1 1/2"	0.250	410	540	710	930	1340	1770	2070	2320	2730	3050	3340	3920	4390	4790					
WFT-125-17-N	125	2"	0.332	720	960	1270	1690	2460	3270	3860	4340	5130	5770	6320	7460	8390	9190					
WFT-175-13-N	175	3/4"	0.166	190	250	320	420	590	770	900	1010	1180	1310	1430	1670	1870	2030	2180	2310			
WFT-175-14-N	175	1"	0.166	190	250	320	420	590	770	900	1010	1180	1310	1430	1670	1870	2030	2180	2310			
WFT-175-15-N	175	1 1/4"	0.250	410	540	710	930	1340	1770	2070	2320	2730	3050	3340	3920	4390	4790	5150	5470			
WFT-175-16-N	175	1 1/2"	0.250	410	540	710	930	1340	1770	2070	2320	2730	3050	3340	3920	4390	4790	5150	5470			
WFT-175-17-N	175	2"	0.281	520	680	900	1180	1700	2230	2620	2930	3440	3860	4210	4950	5540	6050	6510	6920			
WFT-250-13-N	250	3/4"	0.128	115	145	190	245	345	450	520	580	675	755	820	955	1060	1155	1235	1310	1375	1440	1495
WFT-250-14-N	250	1"	0.128	115	145	190	245	345	450	520	580	675	755	820	955	1060	1155	1235	1310	1375	1440	1495
WFT-250-15-N	250	1 1/4"	0.203	270	350	450	590	820	1070	1240	1380	1600	1780	1940	2250	2500	2720	2910	3080	3240	3380	3520
WFT-250-16-N	250	1 1/2"	0.203	270	350	450	590	820	1070	1240	1380	1600	1780	1940	2250	2500	2720	2910	3080	3240	3380	3520
WFT-250-17-N	250	2"	0.250	410	540	710	930	1340	1760	2060	2310	2710	3040	3320	3890	4360	4760	5110	5430	5730	6000	6250

Steam Traps

Float & Thermostatic Steam Trap

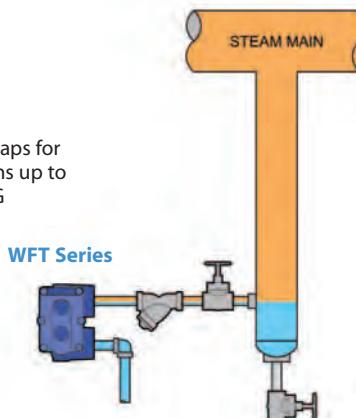
Dimensions: inches

WFT
3/4" • 1" • 1 1/4"WFT
3/4" & 1"

SPECIFICATIONS

Model	Sizes	Connection	PMO (PSIG)	PMA (PSIG)	Weight (lbs)
WFT-15	3/4", 1", 1 1/4"	NPT	15	125	9
WFT-30	3/4", 1", 1 1/4"	NPT	30	125	9
WFT-75	3/4", 1"	NPT	75	125	9
WFT-125	3/4", 1"	NPT	125	125	9

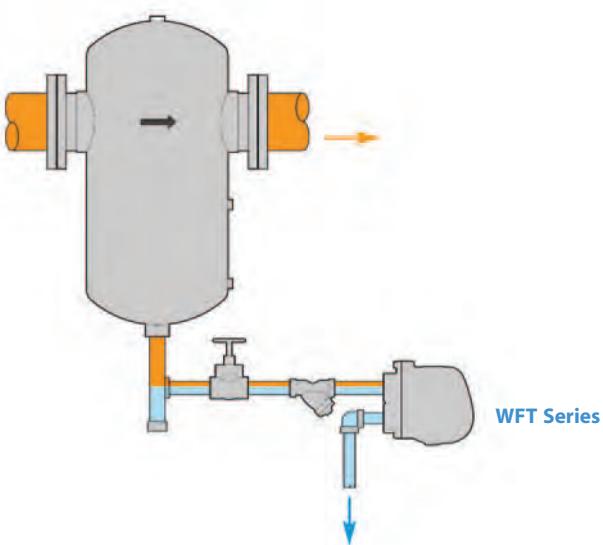
Use 3/4" F&T traps for drip applications up to 125 PSIG



Steam Main Drip Application

SPECIFICATIONS

Model	Sizes	Connection	PMO (PSIG)	PMA (PSIG)	Weight (lbs)
WFT-175	3/4", 1"	NPT	175	250	20
WFT-250	3/4", 1"	NPT	250	250	20



Separator Application

Steam Traps

Float & Thermostatic Steam Trap

WFT Series

Float & Thermostatic

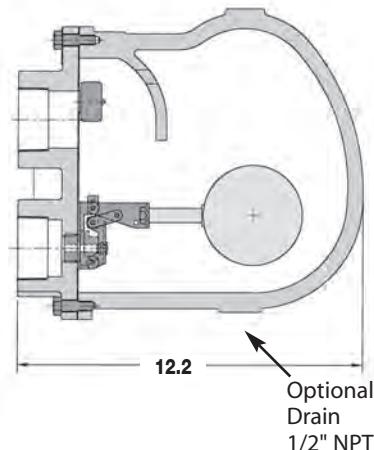
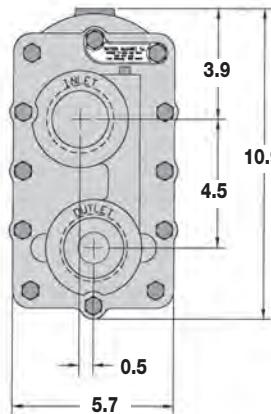
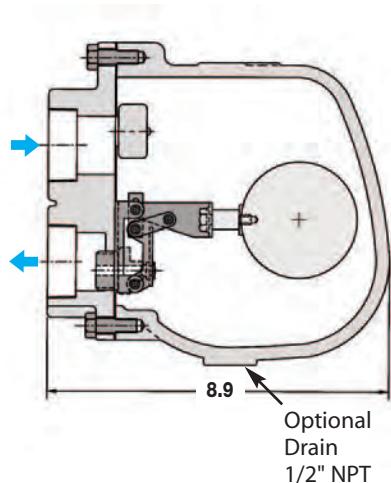
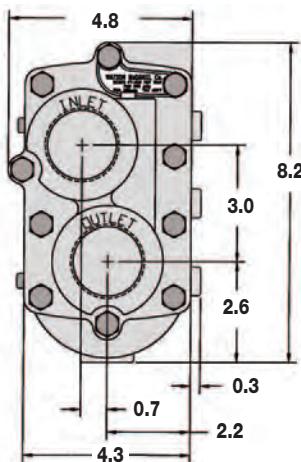
Dimensions: inches



WFT
1 1/4" & 1 1/2"



WFT
2"



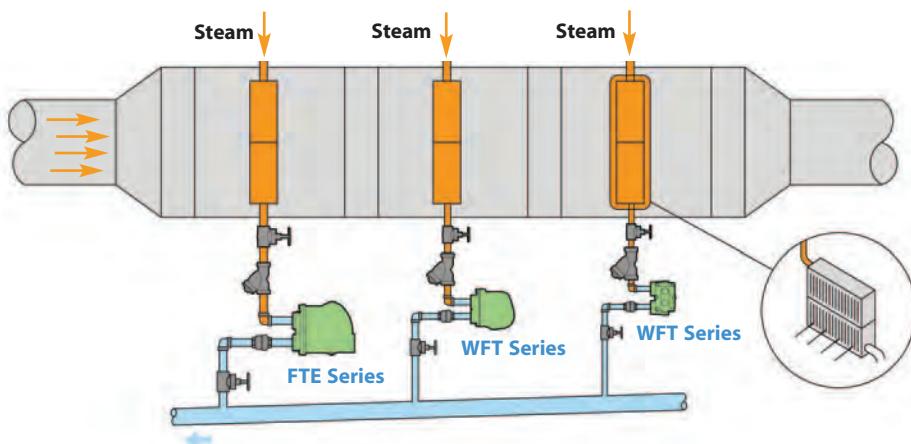
SPECIFICATIONS

Model	Sizes	Connection	PMO (PSIG)	PMA (PSIG)	Weight (lbs)
WFT-15	1 1/2"	NPT	15	250	21
WFT-30	1 1/2"	NPT	30	250	21
WFT-75	1 1/4", 1 1/2"	NPT	75	250	21
WFT-125	1 1/4", 1 1/2"	NPT	125	250	21
WFT-175	1 1/4", 1 1/2"	NPT	175	250	21
WFT-250	1 1/4", 1 1/2"	NPT	250	250	21

SPECIFICATIONS

Model	Sizes	Connection	PMO (PSIG)	PMA (PSIG)	Weight (lbs)
WFT-15	2"	NPT	15	250	53
WFT-30	2"	NPT	30	250	53
WFT-75	2"	NPT	75	250	53
WFT-125	2"	NPT	125	250	53
WFT-175	2"	NPT	175	250	53
WFT-250	2"	NPT	250	250	53

Multi-bank Air Heating Coils / Air Handler Unit



Steam Traps

Float & Thermostatic Steam Trap

Model	FTT - Ductile Iron	FTTS - Stainless Steel
Sizes	1/2" - 2"	1/2" - 1"
Connections	NPT, 150# FLG (1" - 2")	NPT, SW 150# FLG
Body Material	Ductile Iron	316 Stainless Steel
PMO Max. Operating Pressure	300 PSIG	225 PSIG
TMO Max. Operating Temperature	Saturated Steam Temperature	
PMA Max. Allowable Pressure	350 PSIG up to 450°F	
TMA Max. Allowable Temperature	450°F @ 300 PSIG	

FTT - 1/2" & 3/4" available in NPT only.

FTTS - available in 1/2"-1" only; capacities same as 1/2"-3/4" FTT.

Typical Applications

DRIP, PROCESS: FTT Series steam traps with in-line pipe connections are used for the removal of condensate and air in HVAC and industrial process applications such as unit heaters, water heaters, pressing machines, heat exchangers and coils. They contain a high-quality welded stainless steel thermostatic air vent and stainless seat and mechanism. F&T traps have excellent air handling capability, making them a better choice than Inverted Bucket traps for most process applications. For drip applications, such as draining steam mains and steam supply lines, use 1/2" or 3/4" sizes.

How It Works

Float and thermostatic traps contain a float and seat mechanism with a separate thermostatic element which work together to remove both condensate and air from the steam system. The float, which is attached to a valve, rises and opens the valve when condensate enters the trap. This allows the condensate to discharge. Air is discharged through the thermostatic air vent to the outlet side of the trap. Steam entering the trap causes the thermostatic element to expand, closing the air vent and trapping the steam.

Sample Specification

The trap shall be of float and thermostatic design with ductile iron body and in-line piping configuration. Thermostatic air vent to be welded stainless steel. All internals must be stainless steel with hardened seat area. Trap must be in-line repairable.

Options

Live orifice air vent for superheated steam applications.

Drain connection - FTT: 1"-2"; FTTS: all sizes

FTTS only - Left, Right, or Vertical (downward) flow direction

SLR = Steam lock release

How to Size / Order

The PMO (maximum operating pressure) rating of model selected must meet or exceed the maximum steam pressure or the trap may not open. For example; the FTT-145 has a PMO of 145 psi. Condensate capacity (lbs/hr) of the trap is based on the differential pressure across the trap. For drip applications, a 1/2" FTT size is generally sufficient to exceed warm-up loads with a 2X safety factor. The condensate loads (lbs/hr) for process applications are normally calculated at the maximum steam pressure; then an appropriate safety margin is applied in order to select the trap with sufficient capacity when operating at lower steam pressures. Reference full explanation of Safety Load Factors in Steam Traps Introduction section.

When a temperature control valve is regulating flow to the process equipment, it is recommended to select a trap with a PMO that will exceed the inlet steam pressure to the control valve.

For Example: Process application has a maximum steam inlet pressure of 100 psi, a maximum condensate load of 2,500 lbs/hr and is discharging to a condensate return line with a possible back pressure of 25 psig. $\Delta P = 100-25 = 75$ PSI

To select trap: If the Safety Load Factor is chosen to be 2X max capacity at max differential pressure, then Trap should be selected based on 5,000 lbs/hr (2,500 x 2 = 5,000) at 75 PSI differential pressure with a PMO in excess of 100 PSIG

Selection: FTT-145-16-N, PMO=145 PSIG, 11/2" NPT with a condensate capacity of 9,600 lbs/hr at 75 PSI differential pressure.

FTT & FTTS Series

Float & Thermostatic

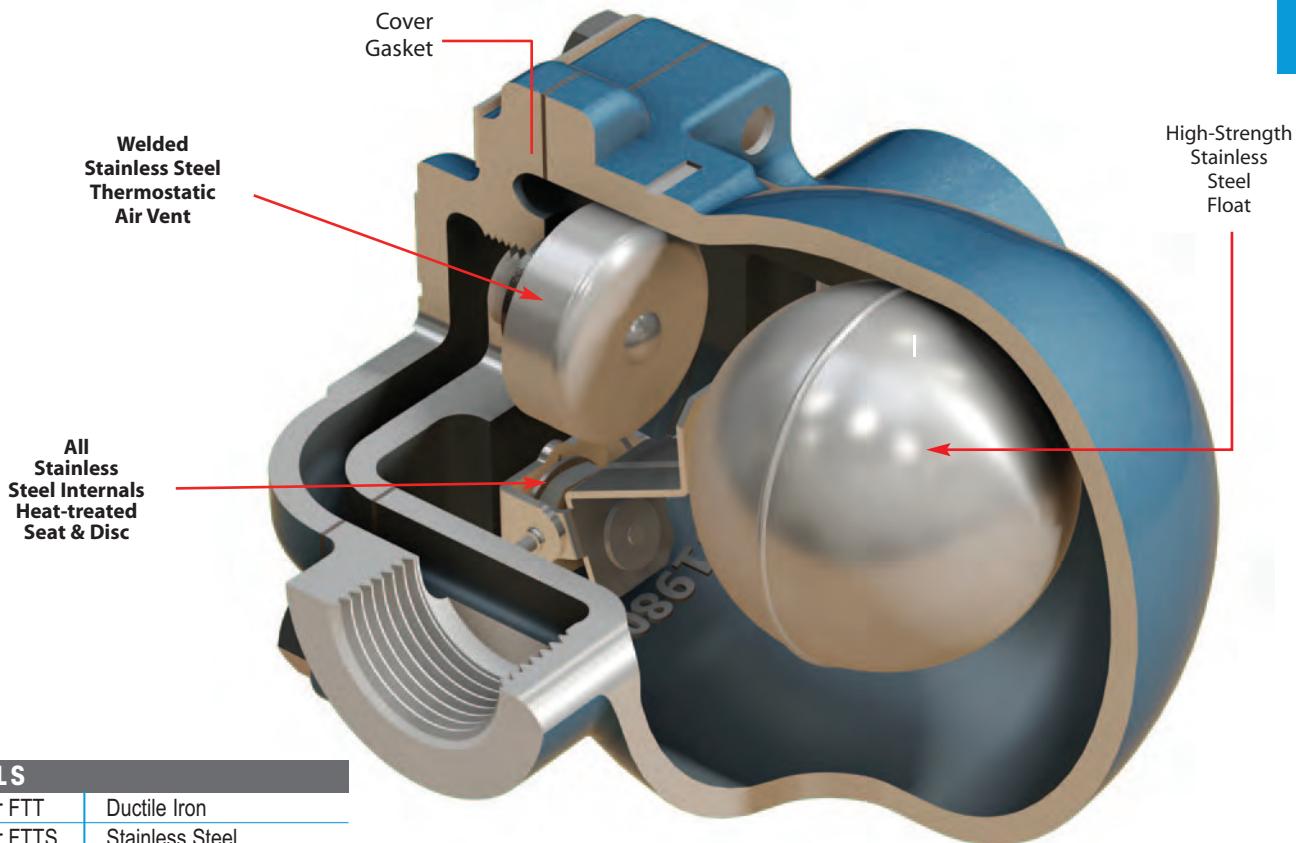


Installation and Maintenance

The trap must be installed upright and level for the float mechanism to operate properly. All internal components can be replaced with the trap body remaining in-line. Repair kits include thermostatic air vent, float, valve seat and disc, and gaskets. The standard thermostatic air vent can be damaged by superheat; therefore, in applications with superheated steam, the thermostatic air vent should be replaced with a special "live orifice" air vent.

Features

- Ductile Iron has a higher pressure and temperature rating and is more resistant to shock loads than cast Iron
- All stainless steel internals with hardened seat and wear parts
- In-line repairability is simplified by having all internals attached to the cover
- Welded stainless steel thermostatic air vent resists shock from waterhammer. Live orifice air vent is available for superheated applications
- Excellent air handling capability allows air to be discharged rapidly so steam can enter the system quickly during start-up
- F&T traps discharge condensate immediately as it is formed (no condensate will back up into the system)



MATERIALS

Body & Cover FTT	Ductile Iron
Body & Cover FTTS	Stainless Steel
Gasket	Grafoil
Cover Screws	Steel, GR5
Float	Stainless Steel, AISI 304
Internals	Stainless Steel
Thermostat	Stainless Steel
Valve Seat	Stainless Steel, 17-4 PH
Valve Disc	Stainless Steel, AISI 420F

Connection Code: **N**=NPT **F150** = 150# FLG
1/2" & 3/4" available in NPT only.

PMO = Max Operating Pressure

CAPACITIES — Condensate (lbs/hr)

Model Code	PMO (PSIG)	Pipe Size	ΔP = Differential Pressure (PSI)												75	100	125	145	200	225	250	300
			1/4	1/2	1	2	5	10	15	20	30	40	50									
FTT-065-12-N	65	1/2"	115	155	205	270	390	520	610	685	810	910	995	1110								
FTT-065-13-N	65	3/4"	115	155	205	270	390	520	610	685	810	910	995	1110								
FTT-065-14-N	65	1"	340	500	775	1100	1700	2400	2800	3250	3925	4200	5000	5825								
FTT-065-16-N	65	1 1/2"	1150	1650	2500	3450	5300	7500	8180	10600	13100	15000	16800	18900								
FTT-065-17-N	65	2"	3470	4820	8500	11950	18700	25200	26900	36000	43000	49600	55500	61300								
FTT-145-12-N	145	1/2"	55	75	100	135	200	270	320	365	435	490	540	600	640	725	795	850				
FTT-145-13-N	145	3/4"	55	75	100	135	200	270	320	365	435	490	540	600	640	725	795	850				
FTT-145-14-N	145	1"	190	275	405	550	840	1200	1380	1600	1850	2200	2450	2750	2920	3400	3700	3900				
FTT-145-16-N	145	1 1/2"	685	970	1275	1750	2740	3750	4490	5100	6250	7200	8000	8900	9600	11250	12000	13300				
FTT-145-17-N	145	2"	1860	2680	3125	4400	6900	9250	13790	14600	16900	19400	21900	25000	26800	31000	34000	37000				
FTT-225-12-N	225	1/2"	40	50	70	95	135	185	220	245	290	330	360	405	430	485	530	565	645	680		
FTT-225-13-N	225	3/4"	40	50	70	95	135	185	220	245	290	330	360	405	430	485	530	565	645	680		
FTT-225-14-N	225	1"	150	200	300	405	600	820	975	1130	1375	1510	1620	1875	2000	2350	2600	2750	3100	3250		
FTT-250-16-N	250	1 1/2"	530	710	825	1130	1760	2500	2950	3375	4125	4740	5250	6000	6400	7300	8000	8650	10200	10800	11300	
FTT-250-17-N	250	2"	695	985	1560	2185	3490	4800	5800	6750	8250	9500	10650	12400	13300	15000	16600	18120	21200	22300	23200	
FTT-300-14-N	300	1"	100	155	220	300	460	630	750	860	1060	1240	1360	1450	1600	1820	2000	2130	2500	2650	2800	3000

*Note: 1/2" - 1" FTTS capacities same as 1/2" - 3/4" FTT capacities.

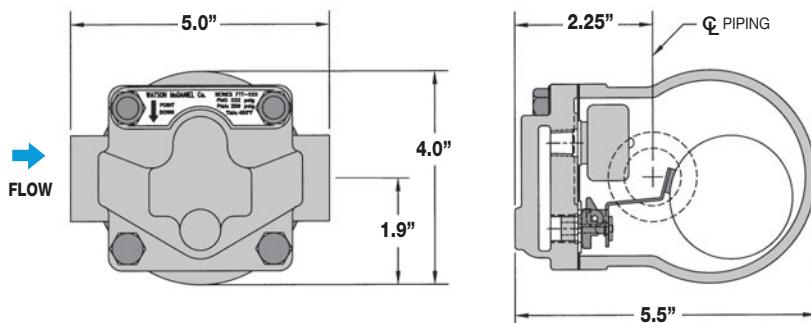
Steam Traps

Float & Thermostatic Steam Trap

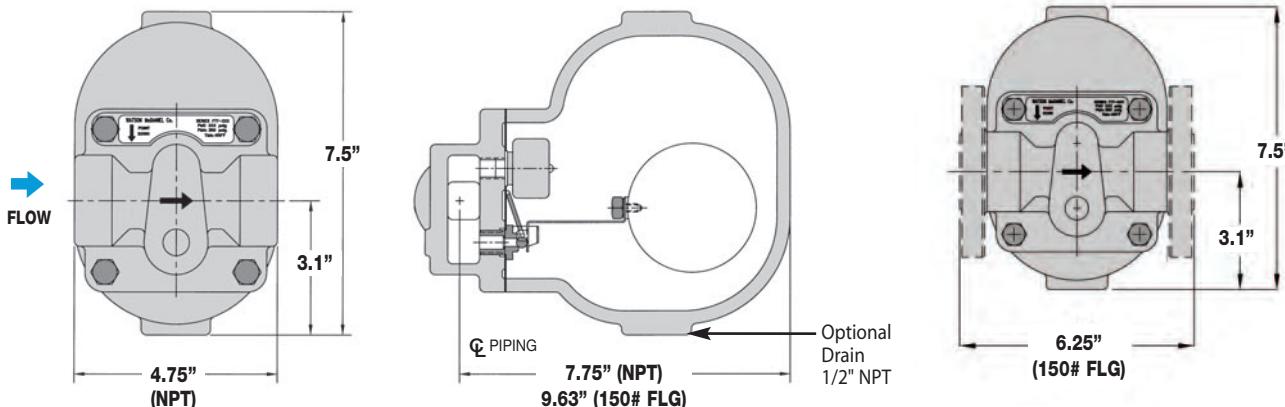
Dimensions: inches

FTT • 1/2" & 3/4"

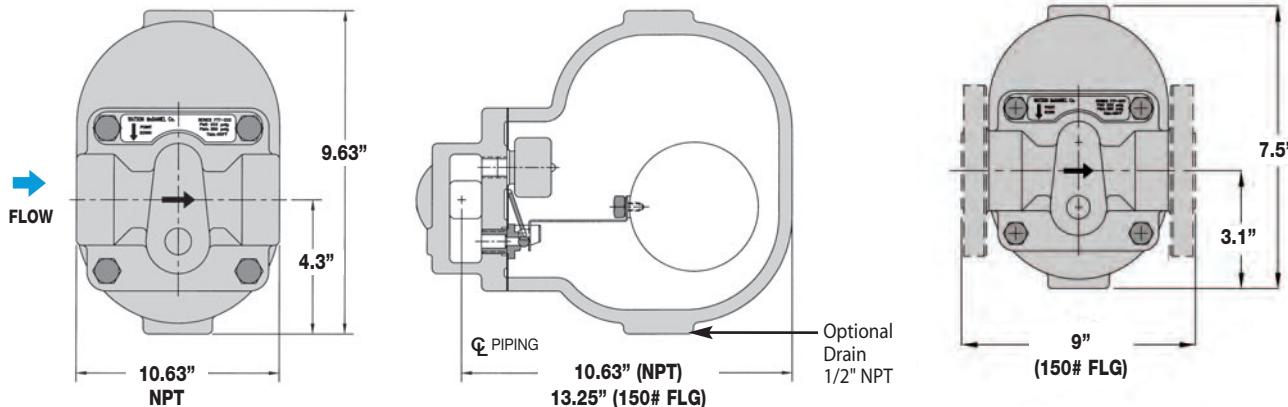
Weight 6 lbs.



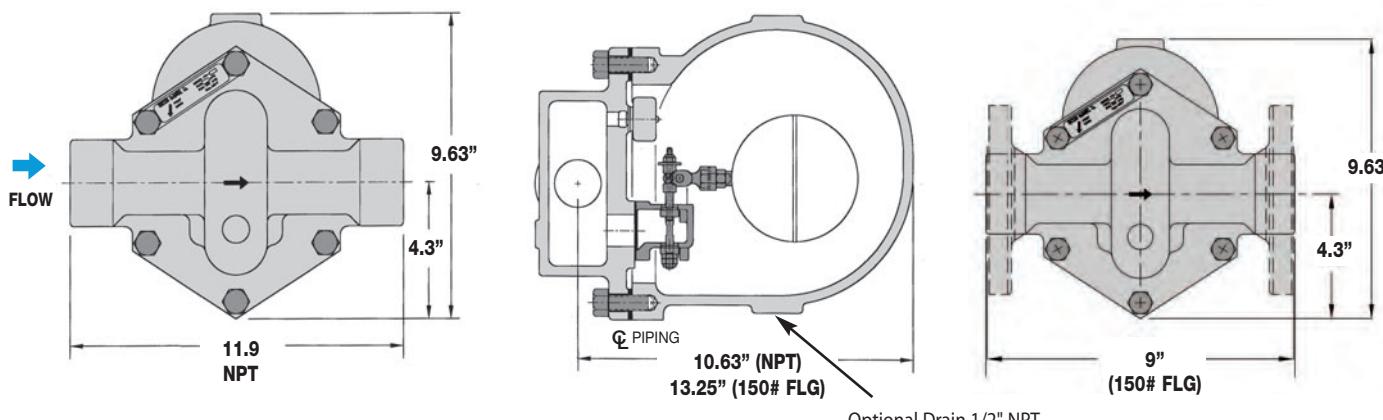
FTT • 1" • Weight NPT 16 lbs.



FTT • 1 1/2" • Weight NPT 38 lbs.



FTT • 2" • Weight NPT 42 lbs.



FTT & FTTS Series

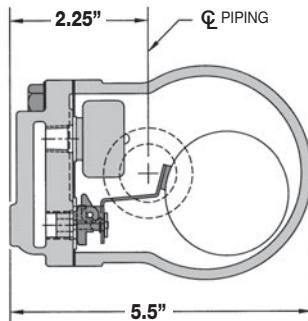
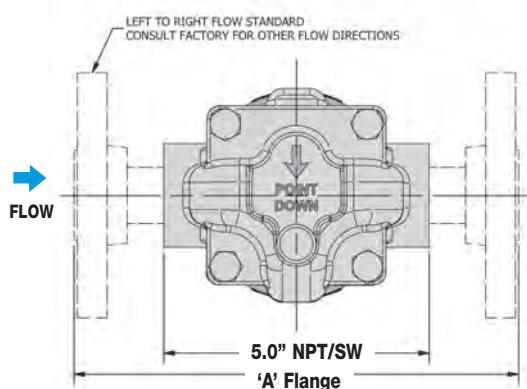
Float & Thermostatic

FTT Series Dimensions

Steam Traps**Float & Thermostatic Steam Trap****FTT & FTTS Series**

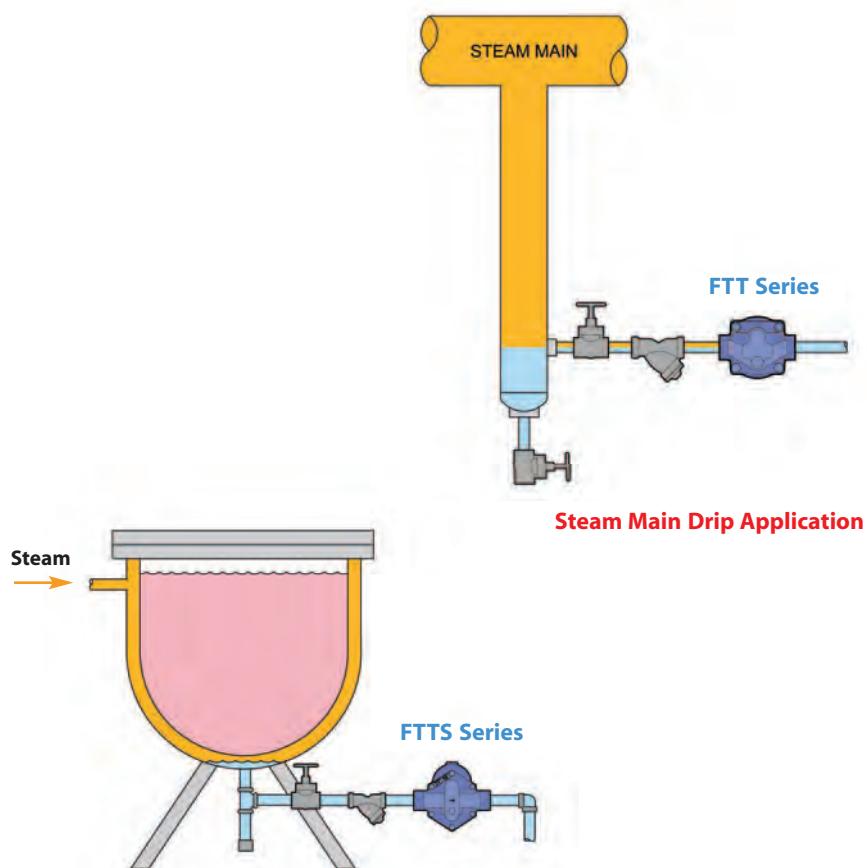
Float & Thermostatic

FTTS Series Dimensions

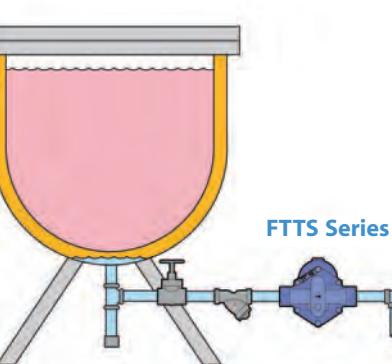
FTTS • 1/2", 3/4" & 1" • STAINLESS STEEL BODYWeight (NPT/SW): **6 lbs.**

Flanged FTTS Dimen. & Weights			
Model	Conn.	A' Dim. (in.)	Weight (lbs)
1/2"	150#	7.94	11.3
	300#	7.94	12.4
3/4"	150#	7.94	12.0
	300#	8.38	14.5
1"	150#	8.31	13.0
	300#	8.31	15.7

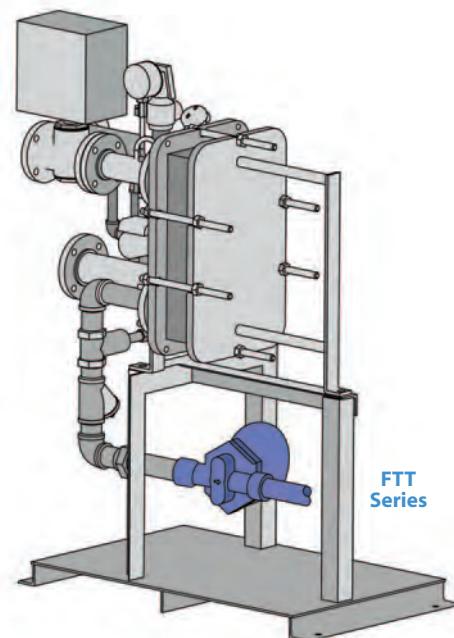
For vertical piping installation; consult factory.

Typical Applications for Float & Thermostatic Steam Traps

Steam Main Drip Application



Jacketed Kettle Application



Instantaneous Steam to Hot Water Heater (Heat Miser)

Steam Traps

Float & Thermostatic Steam Trap

The FTE & FTES are used for extremely high capacity condensate drainage applications.

Model	FTE	FTES
Sizes	1½", 2", 2½"	2½"
Connections	NPT	NPT, SW, FLG
Body Material	Ductile Iron	Cast Steel
PMO Max. Operating Pressure	200 PSIG	300 PSIG
TMO Max. Operating Temperature	450°F	450°F
PMA Max. Allowable Pressure	300 PSIG up to 450°F	300 PSIG up to 750°F
TMA Max. Allowable Temperature	450°F @ 300 PSIG	750°F @ 300 PSIG



FTE Model shown

Typical Applications

PROCESS: FTE & FTES Series are high capacity steam traps specifically designed to remove condensate and air from HVAC and industrial process applications with extremely high condensate load requirements. Examples include reboilers, absorption chillers, large air-handling coils, large heat exchangers and other large process equipment. They are available with a ductile iron (FTE) or steel body (FTES) and contain a high quality welded stainless steel thermostatic air vent and stainless mechanism. F&T traps have excellent air-handling capability, making them a better choice than Inverted Bucket traps for most process applications.

Features

- Ductile Iron has a higher pressure and temperature rating and is more resistant to shock loads than Cast Iron
- Cast Steel Body will allow operating pressures and temperatures up to 300 PSIG and 450°F
- High capacity steam trap for draining large process equipment (over 100,000 lbs/hr)
- All stainless steel internals with hardened seat and wear parts
- In-line repairability is simplified by having all internals attached to the cover
- Welded stainless steel thermostatic air vent resists shock from waterhammer. Live orifice air vent is available for superheated applications
- Excellent air handling capability allows air to be discharged rapidly so steam can enter the system quickly during start-up
- F&T traps discharge condensate immediately as it is formed (no condensate will back up into the system)

How It Works

Float and thermostatic traps contain a float and seat mechanism with a separate thermostatic element which work together to remove both condensate and air from the steam system. The float, which is attached to a valve, rises and opens the valve when condensate enters the trap. This allows the condensate to discharge. Air is discharged through the thermostatic air vent to the outlet side of the trap. Steam entering the trap causes the thermostatic element to expand, closing the air vent and trapping the steam.

Sample Specification

The trap shall be of float and thermostatic design with ductile iron or cast steel body. The trap must incorporate all stainless steel internals with hardened seat and welded stainless steel thermostatic air vent. Trap must be in-line repairable.

Installation and Maintenance

The trap must be installed upright and level for the float mechanism to operate properly. All internal components can be replaced with the trap body remaining in-line. Repair kits include thermostatic air vent, float, valve seat and disc, and gaskets. The **FTES** Series have cast steel bodies and are available in 2½" NPT, socket weld and flange connections. The standard thermostatic air vent can be damaged by superheat; therefore, in applications with superheated steam, the thermostatic air vent should be replaced with a special "live orifice" air vent.

Options

Live orifice air vent for superheated steam applications.

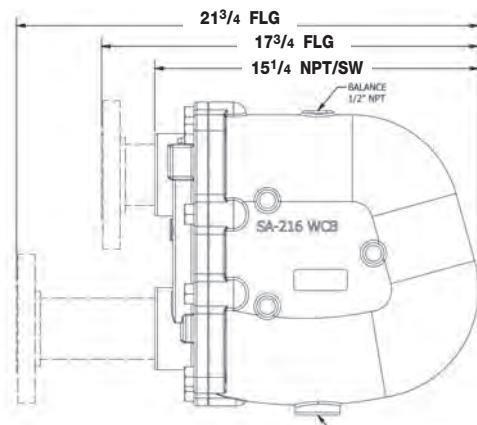
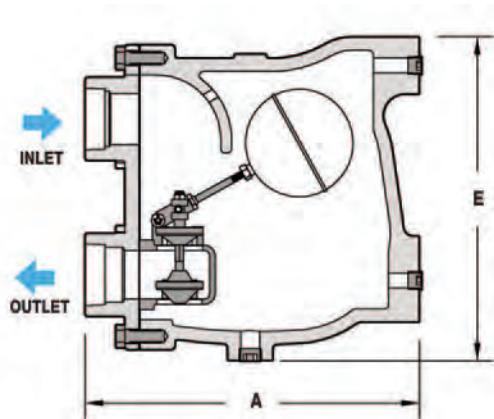
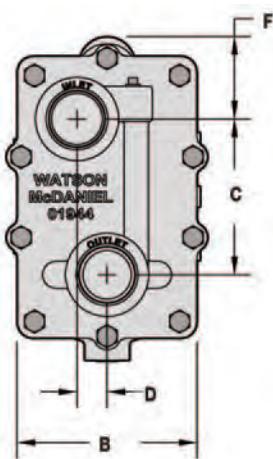
Parallel-pipe inlet/outlet connections are standard as shown. An optional In-line inlet/outlet connection is available; contact factory.

SLR = Steam lock release

VB = Vacuum breaker

FTE & FTES

Float & Thermostatic



FTES shown with Optional Flanges

DIMENSIONS & WEIGHTS — inches							
Size/Model	A	B	C	D	E	F	Weight
2" FTE-20	12.6	5.7	4.5	0.5	11.1	3.9	54
2" FTE-50	16.0	8.4	7.3	1.4	15.6	3.6	150
2 1/2" FTE-50	15.5	8.4	7.3	1.4	15.6	3.6	150
2 1/2" FTE-125	15.5	8.4	7.3	1.4	15.6	3.6	150
1 1/2" FTE-200	9.6	4.3	3.0	0.7	8.8	2.6	35
2" FTE-200	12.6	5.7	4.5	0.5	11.1	3.9	65
2 1/2" FTE-200	15.5	8.4	7.3	1.4	15.6	3.6	150
2 1/2" FTES-300	15.5	8.4	7.3	1.4	15.6	3.6	150

Note: 2 1/2" FTES-50, 125 & 300 have same dimensions and weights.

MATERIALS

Body & Cover (FTE)	Ductile Iron
Body & Cover (FTES)	Cast Steel, ASTM A-216
Cover Screw	Grade 5 Carbon Steel
Cover Gasket	Grafoil
Valve Discs	Stainless Steel, AISI 17-4PH
Main Valve Assembly Housing	Stainless Steel, AISI 17-4PH
Valve Assembly Gasket	Garlock
Ball Float	Stainless Steel, AISI 304
Thermostatic Vent	Stainless Steel, AISI 300
	Optional: Live orifice air vent

How to Size / Order

The PMO (maximum operating pressure) rating of model selected must meet or exceed the maximum steam pressure or the trap may not open. For example; the FTE-125 has a PMO of 125 psi. Condensate capacity (lbs/hr) of the trap is based on the differential pressure across the trap. The condensate loads (lbs/hr) for process applications are normally calculated at the maximum steam pressure; then an appropriate safety margin is applied in order to select a trap with sufficient capacity when operating at lower steam pressures. Reference full explanation of Safety Load Factors in Steam Traps Introduction section.

When a temperature control valve is regulating flow to the process equipment, it is recommended to select a trap with a PMO that will exceed the inlet steam pressure to the control valve.

For Example: Process application has a maximum steam inlet pressure of 100 psi, a maximum condensate load of 10,000 lbs/hr and is discharging to a condensate return line with a possible back pressure of 25 psig. $\Delta P = 100-25 = 75$ PSI

To select trap: If the Safety Load Factor is chosen to be 2X max capacity at max differential pressure, then Trap should be selected based on 20,000 lbs/hr (10,000 x 2 = 20,000) at 75 PSI differential pressure with a PMO in excess of 100 PSIG

Selection: FTE-200-17-N, PMO=200 PSIG, 2" NPT with a condensate capacity of 21,500 lbs/hr at 75 PSI differential pressure.

CAPACITIES — Condensate (lbs/hr)

Model Code	PMO (PSIG)	Pipe Size	Orifice Size	ΔP = Differential Pressure (PSI)														
				1/4	1/2	1	2	5	10	15	20	30	50	75	100	125	200	250
FTE-20-17-N*	20	2"	.937"	6100	7800	9300	11800	15900	19500	22500	26000							
FTE-50-17-N	50	2"	2.125"	12800	16900	20100	25300	33000	40200	43500	46000	47800	52500					
FTE-50-18-N	50	2 1/2"	2.125"	20400	25700	31000	37000	46300	55100	60300	65100	72000	82100					
FTE-125-18-N	125	2 1/2"	2.125"	20400	25700	31000	37000	46300	55100	60300	65100	72000	82100	90400	97700	105000		
FTE-200-16-N	200	1 1/2"	.375"	950	1350	1900	2200	2700	3300	3900	4400	5300	6400	7600	8500	9400	11900	
FTE-200-17-N	200	2"	.75"	2700	4100	5700	7400	9900	11800	13400	14400	16400	19000	21500	23000	24500	29200	
FTE-200-18-N	200	2 1/2"	1.5"	7200	12300	17400	21500	27600	32600	36000	39300	43100	49200	54700	58800	61900	74000	
FTES-50-18-N	50	2 1/2"	2.125"	20400	25700	31000	37000	46300	55100	60300	65100	72000	82100					
FTES-125-18-N	125	2 1/2"	2.125"	20400	25700	31000	37000	46300	55100	60300	65100	72000	82100	90400	97700	105000		
FTES-300-18-N	300	2 1/2"	1.5"	7200	12300	17400	21500	27600	32600	36000	39300	43100	49200	54700	58800	61900	74000	86000

* Single seat orifice. All others are double seated.

Steam Traps

Float & Thermostatic Steam Trap

Model	FT600 & FT601*
Sizes	3/4", 1", 1 1/2", 2"
Connections	NPT, SW, FLG
Body Material	Carbon Steel or 316SS
Options	Live Orifice Air Vent
PMO Max. Operating Pressure	450 PSIG
TMO Max. Operating Temperature	750°F
PMA Max. Allowable Pressure	990 PSIG @ 100°F
TMA Max. Allowable Temperature	750°F @ 670 PSIG

* **FT601 Body Material is 316 SS**
FT600 Body Material is Carbon Steel

FT600 & FT601

Float & Thermostatic



Typical Applications

PROCESS: FT600 Series steam traps with Cast Steel Body were specifically designed for removing condensate and air from higher pressure steam applications or where steel bodies are specified. They are typically used in chemical plants and petrochemical refineries on re-boilers, heat exchangers, and other critical process applications. The excellent air-handling capability of float and thermostatic traps make them a better choice than bucket traps for applications requiring quick system start-up. Maximum steam pressure is 450 PSIG. Note: Model FT601 is identical to FT600 except body material is 316 SS.

How It Works

Float and thermostatic traps contain a float and seat mechanism with a separate thermostatic element which work together to remove both condensate and air from the steam system. The float, which is attached to a valve, rises and opens the valve when condensate enters the trap. This allows the condensate to discharge. Air is discharged through the thermostatic air vent to the outlet side of the trap. Steam entering the trap causes the thermostatic element to expand, closing the air vent and trapping the steam.

Features

- Investment cast steel body and cover with class 400 shell rating (670 PSIG @ 750°F)
- Hardened stainless steel seat and disc for extended service life even at extreme temperatures and pressures
- Excellent air handling capability allows air to be discharged rapidly so steam can enter the system quickly during start-up
- In-line repairability is simplified by having all internals attached to the cover. Studded cover allows for easier removal of body.
- Welded stainless steel air vent resists shock from waterhammer. Live orifice air vent is available for superheated applications
- F&T traps discharge condensate immediately as it is formed (no condensate will back up into the system)

PRESSURE - TEMPERATURE RATINGS

Model	FT600	FT601
NPT, SW, 600# FLG	670 PSIG @ 750° F	565 PSIG @ 750° F
300# FLG	505 PSIG @ 750° F	425 PSIG @ 750° F
150# FLG	150 PSIG @ 567° F	150 PSIG @ 567° F

Options

Live orifice air vent for superheated applications.

SLR = Steam lock release

VB = Vacuum breaker

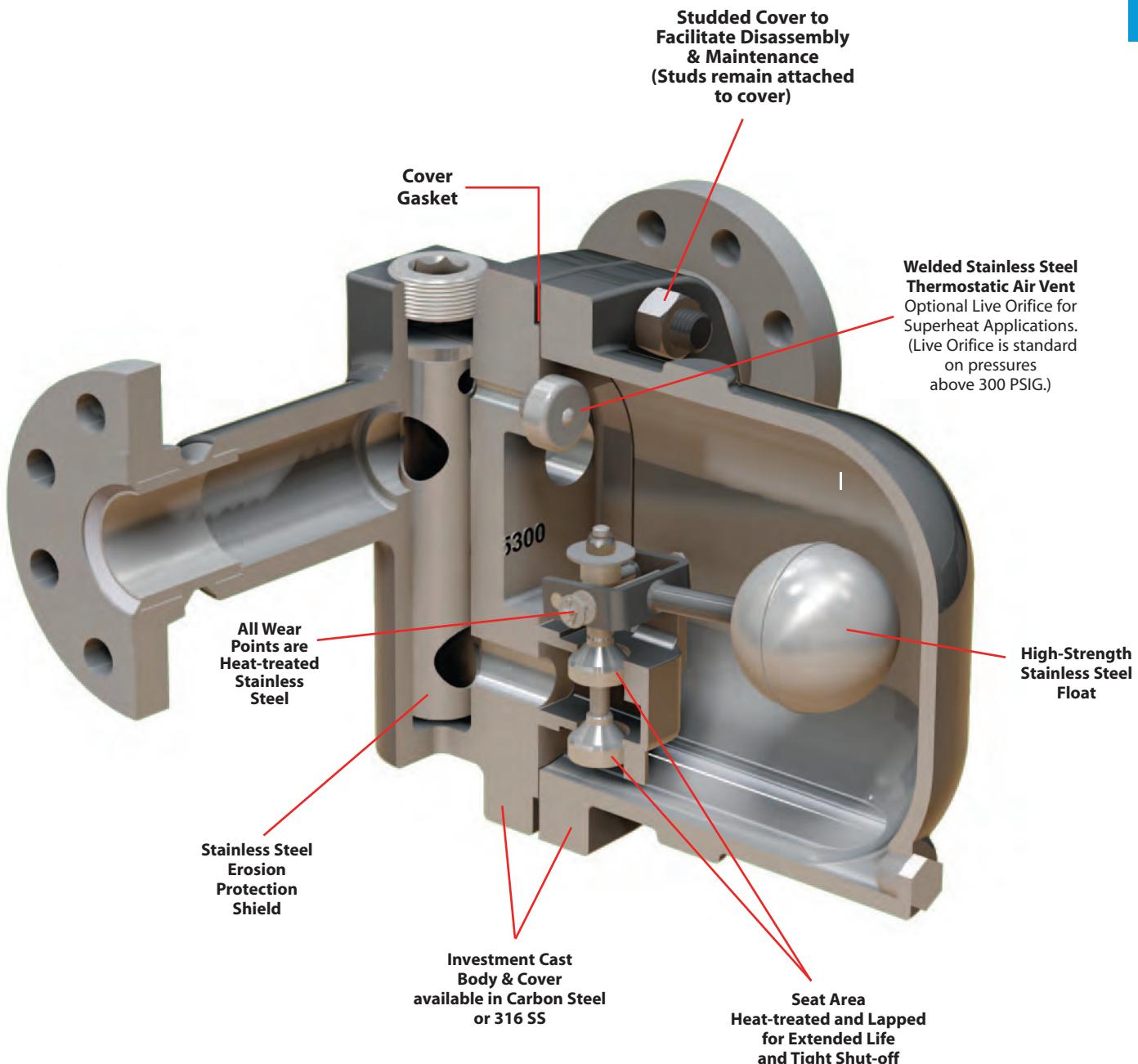
RL = Right to Left flow path. Consult factory.
 (Left to Right flow is standard)

Sample Specification

The steam trap shall be of the mechanical float type having cast steel bodies, horizontal in-line connections in NPT, SW, or flanged, and all stainless steel internals. Incorporated into the trap body shall be an all stainless steel welded thermal element air vent which is water hammer resistant. The air vent is to be located at the high point of trap body to assure proper venting of non-condensables. The trap body will be in-line renewable. All bodies and covers shall be class 400 shell design, suitable for 670 PSIG @ 750°F.

Installation and Maintenance

The trap must be installed upright and level for the float mechanism to operate properly. All internal components can be replaced while the steam trap remains connected to the piping (in-line repairable). Threaded studs are permanently installed into the cover assembly which greatly simplifies the removal and replacement of the body when servicing. Internal components include a high quality welded stainless steel thermostatic air vent and stainless steel seat and mechanism. The standard thermostatic air vent can be damaged by superheat; therefore, in applications with superheated steam, the thermostatic air vent should be replaced with a special "live orifice" air vent.



MATERIALS

FT 600: Body & Cover	Cast Steel, ASTM A-216
FT 601: Body & Cover	316 SS
Cover Studs	Steel, SA 193, GR B7
Cover Nuts	Steel, SA 194, GR 2H
Cover Gasket	Stainless Steel Reinforced Grafoil
Valve Assembly	Stainless Steel, AISI 431
Gasket, Valve Assembly	Stainless Steel Reinforced Grafoil
Pivot Assembly	Stainless Steel, 17-4 PH
Mounting Screws	Stainless Steel Hex Head, 18-8
Float	Stainless Steel, ASTM -240, 304
Air Vent Assembly	Thermostatic element 304 SS Optional: Live orifice

How to Size / Order

The **Maximum Operating Pressure** (PMO) rating of model selected must meet or exceed the maximum steam pressure or the trap may not open. For example, the **FT600-145** has a PMO of 145 psi. Condensate capacity (lbs/hr) of the trap is based on the differential pressure across the trap.

For Drip Applications: A (3/4)" FT600 size is sufficient to exceed warm-up loads with a 2X safety factor.

For process applications: The condensate loads (lbs/hr) are normally calculated at the maximum steam pressure; then an appropriate safety margin is applied in order to select a trap with sufficient capacity when operating at lower steam pressures. Reference full explanation of Safety Load Factors in Steam Traps Introduction section.

When a temperature control valve regulates the flow of steam to the process equipment (Heat Exchanger) being drained of condensate, it is recommended to select a trap with a PMO that exceeds the inlet steam pressure to the temperature control valve. This assures that under all operating conditions, the steam pressure will not exceed the PMO of the trap.

For Example: Process application has a maximum steam inlet pressure of 100 psi, a maximum condensate load of 2,500 lbs/hr and is discharging to a condensate return line with a possible back pressure of 20 psig. $\Delta P = 100-20 = 80$ PSI

To select trap: If the Safety Load Factor is chosen to be 2X max capacity at max differential pressure, then Trap should be selected based on 5,000 lbs/hr (2,500 x 2 = 5,000) at 80 PSI differential pressure with a PMO in excess of 100 PSIG

Selection: **FT600-145-16-N**, PMO=145 PSIG, 1½" NPT with a condensate capacity of 9,900 lbs/hr at **80 PSI** differential pressure.

Connection Codes:

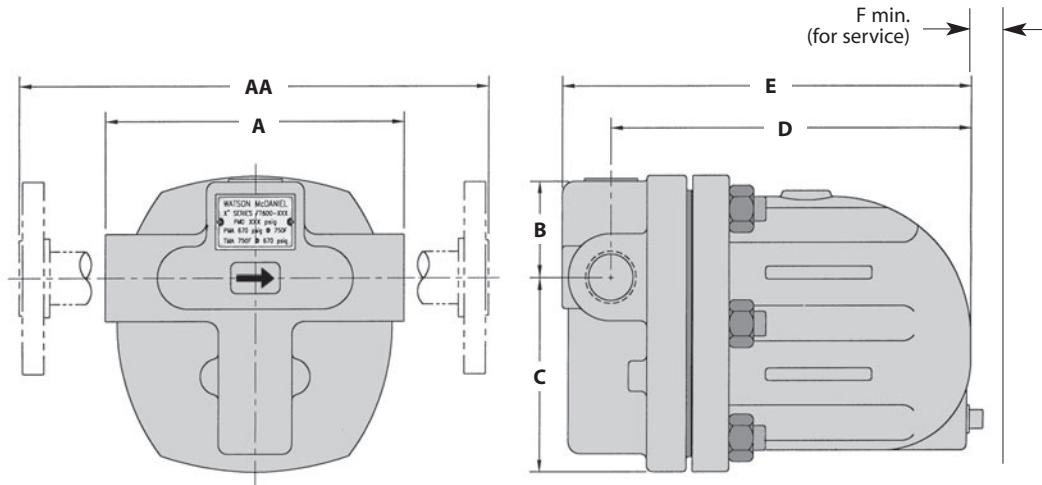
(N=NPT, SW=Socket Weld, F150=150# FLG, F300=300# FLG, F600=600# FLG)

CAPACITIES – Condensate (lbs/hr)																				
Model Code*	PMO (PSIG)	Sizes	ΔP = Differential Pressure (PSI)												100	145	200	300	400	450
			1/2	1	2	3	5	10	20	30	40	50	65							
FT600-65-13-N	65	3/4"	155	225	300	363	463	635	960	1060	1180	1320	1460							
FT600-65-14-N	65	1"	500	775	1094	1340	1690	2370	3260	3990	4500	5000	5500							
FT600-65-16-N	65	1½"	1650	2500	3450	4130	5300	7500	10625	13125	15000	16800	18850							
FT600-65-17-N	65	2"	4820	8500	11950	14670	18700	25250	35900	43000	49600	55500	61250							
FT600-145-13-N	145	3/4"	104	137	180	218	275	380	520	625	725	863	895	995	1120	1315				
FT600-145-14-N	145	1"	275	400	555	660	850	1237	1593	1925	2240	2490	2750	3000	3430	3935				
FT600-145-16-N	145	1½"	970	1275	1750	2125	2740	3750	5100	6250	7200	7995	8875	9900	11250	13300				
FT600-145-17-N	145	2"	2680	3125	4400	5375	6900	9250	14625	16875	19375	21875	25000	27500	31000	37000				
FT600-200-13-N	200	3/4"	70	93	137	160	205	287	400	487	560	610	710	775	875	1060	1250			
FT600-200-14-N	200	1"	212	300	410	487	610	925	1140	1375	1520	1687	1875	2060	2312	2750	3100			
FT600-200-16-N	200	1½"	710	825	1130	1400	1760	2500	3375	4125	4740	5250	6000	6600	7300	8650	10200			
FT600-200-17-N	200	2"	1100	1560	2187	2800	3490	4800	6750	8250	9500	10625	12400	13700	15000	18120	21200			
FT600-300-13-N	300	3/4"	35	50	68	83	106	155	197	240	275	300	340	375	413	490	570	710		
FT600-300-14-N	300	1"	155	225	300	363	463	635	960	1060	1180	1320	1468	1640	1815	2130	2550	3000		
FT600-300-16-N	300	1½"	710	825	1130	1400	1760	2500	3375	4125	4740	5250	6000	6600	7300	8650	10200	12600		
FT600-300-17-N	300	2"	1100	1560	2187	2800	3490	4800	6750	8250	9500	10625	12400	13700	15000	18120	21200	26250		
FT600-450-13-N	450	3/4"	22	32	42	49	62	84	119	145	163	175	192	210	186	275	312	375	425	450
FT600-450-14-N	450	1"	91	137	180	218	275	380	520	625	725	863	895	995	1120	1315	1500	1870	2125	2250
FT600-450-16-N	450	1½"	710	825	1130	1400	1760	2500	3375	4125	4740	5250	6000	6600	7300	8650	10200	12600	14375	15200
FT600-450-17-N	450	2"	1100	1560	2187	2800	3490	4800	6750	8250	9500	10625	12400	13700	15000	18120	21200	26250	28700	31250

Note: For 450 Model, the Thermostatic Air Vent is replaced with a live Orifice.

* Chart is applicable for both Models FT600 & FT601

FT600 & FT601:
 3/4", 1", 1 1/2", 2"



DIMENSIONS & WEIGHTS — inches

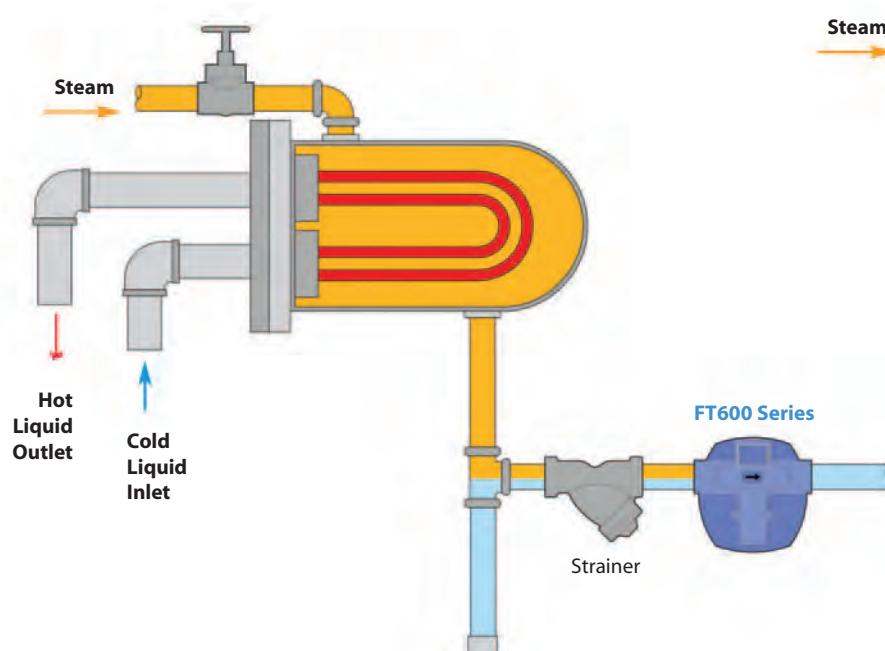
Model*	Size	A	AA	B	C	D	E	F	Weight (lbs)	
									NPT/SW	FLG
FT600	3/4"	6.10	10.10	2.07	3.93	7.38	8.41	5.75	25	31
FT600	1"	6.50	10.40**	2.50	5.50	8.44	9.50	6.25	31	36
FT600	1 1/2"	9.80	14.00	3.26	6.85	10.40	11.94	7.75	82	91
FT600	2"	11.80	16.00	3.60	7.40	11.59	13.27	8.00	93	107

* Chart is applicable for FT600 & FT601

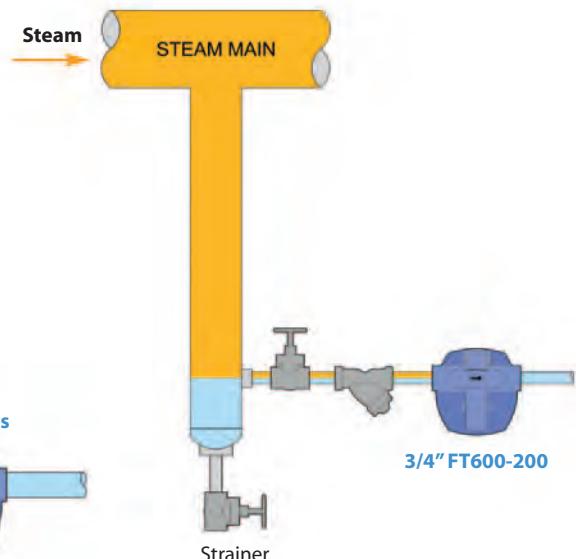
** Face-to-Face for 1" FT600/601 with 600# flanges is 12".

Typical Applications for Float & Thermostatic Steam Traps

Shell & Tube Heat Exchanger Application:



Steam Main Drip Application



Steam Traps

Float & Thermostatic Steam Trap

FT600 & FT601

Float & Thermostatic

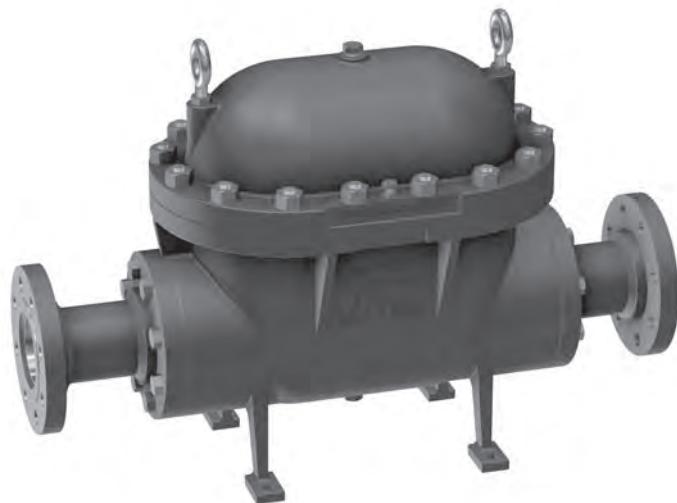
Model	FT600 & FT601*
Sizes	3", 4"
Connections	NPT, SW, FLG
Body Material	Carbon Steel or 316SS
PMO Max. Operating Pressure	450 PSIG
TMO Max. Operating Temperature	750°F

* FT601 Body Material is 316 SS

FT600 Body Material is Carbon Steel

3" & 4" FT600 & FT601 contain an open orifice air vent.

If a thermostatic air vent is required, contact factory.



PRESSURE - TEMPERATURE RATINGS

Model	FT600	FT601
NPT, SW, 300# FLG 600# FLG	505 PSIG @ 750° F	505 PSIG @ 750° F
150# FLG	150 PSIG @ 567° F	150 PSIG @ 567° F

Size	Conn	PMO (PSIG)	Model Code
3"	NPT	450	FT600-450-19-N
3"	SW	450	FT600-450-19-SW
3"	150 # Flg	285	FT600-285-19-F150
3"	300 # Flg	450	FT600-450-19-F300
3"	600 # Flg	450	FT600-450-19-F600
4"	150 # Flg	285	FT600-285-20-F150
4"	300 # Flg	450	FT600-450-20-F300
4"	600 # Flg	450	FT600-450-20-F600

CAPACITIES – Condensate (1000 lbs/hr)

Temp	Differential Pressure (PSI)																				
	1/2	1	2	5	10	15	20	30	40	50	75	100	125	150	175	200	250	300	350	400	450
COLD*	44	59	81	122	170	205	230	280	317	350	425	480	540	580	625	670	740	800	860	910	960
HOT	44	53	64	83	100	112	121	138	149	159	177	190	201	212	222	230	247	260	270	280	290

* Cold Water capacities are to be used when the trap is used as a liquid drain trap.

Note: For liquid drain trap applications, please specify "liquid drain trap" when ordering.

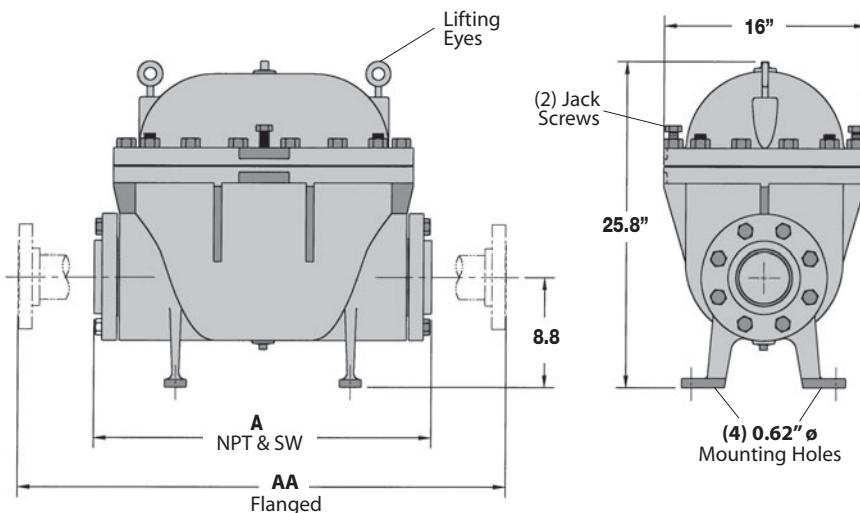
CAPACITY CORRECTION FACTORS

To obtain capacity with a liquid other than water, multiply water capacity by correction factor.

Spec. Gravity	1	.98	.96	.94	.92	.90	.88	.86	.84	.82	.80	.75	.70	.65	.60	.55	.50
Corr. Factor	1	.990	.980	.970	.959	.949	.938	.927	.917	.906	.894	.866	.837	.806	.775	.742	.707

FT600 & FT601:

3" & 4"



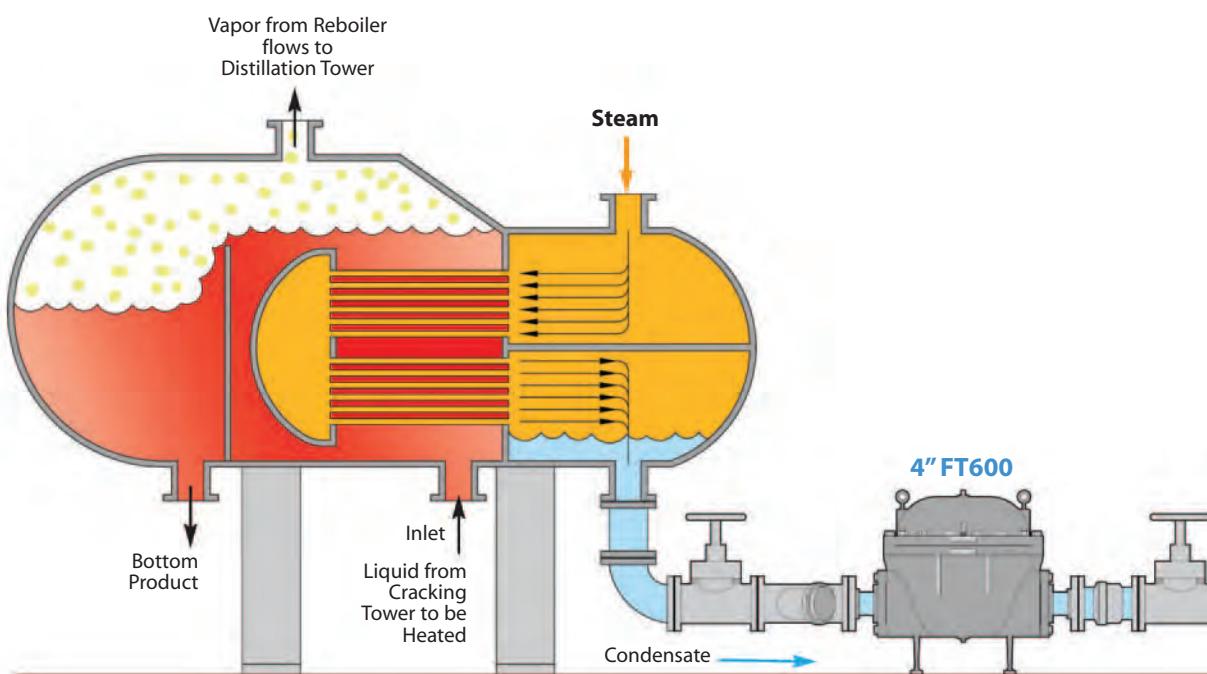
DIMENSIONS & WEIGHTS – inches

Model*	Size			Weight (lbs)	
		A	AA	Connection	FLG
FT600	3"	27	39	587 (NPT, SW)	626
FT600	4"	27	39	587 (SW)	654

* Chart is applicable for both Models FT600 & FT601

FT600: 3" - 4":

Process: Refinery Reboiler Application



Steam Traps

Float & Thermostatic Steam Trap

FT Series

Float & Thermostatic

Model	FT
Sizes	3/4", 1", 1 1/4", 1 1/2", 2"
Connections	NPT
Body Material	Cast Iron
PMO Max. Operating Pressure	75 PSIG / 125* PSIG
TMO Max. Operating Temperature	Saturated Steam Temperature
PMA Max. Allowable Pressure	75 PSIG up to 450°F
TMA Max. Allowable Temperature	450°F @ 75 PSIG

* FT123 & FT124 only to 125 PSIG (PMA/TMA 125 PSIG @ 400 F)



Typical Applications

DRIP, PROCESS: FT Series steam traps are designed for operating pressures up to 75 PSIG. These float and thermostatic traps are used for lower pressure HVAC and light industrial process applications. They are used on unit heaters, water heaters, pressing machines, heat exchangers and coils. For drip applications, such as draining steam mains and steam supply lines, use 3/4" FT-075 (FT73-075-13-N). F&T traps have excellent air-handling capability, which make them a better choice than Inverted Bucket traps for most process applications. FT Series traps have a dual inlet-outlet H-Pattern connection allowing for additional flexibility in installation.

How It Works

Float and thermostatic traps contain a float and seat mechanism with a separate thermostatic element which work together to remove both condensate and air from the steam system. The float, which is attached to a valve, rises and opens the valve when condensate enters the trap. This allows the condensate to discharge. Air is discharged through the thermostatic air vent to the outlet side of the trap. Steam entering the trap causes the thermostatic element to expand, closing the air vent and trapping the steam.

Sample Specification

The trap shall be of float and thermostatic design with cast iron body. Thermostatic element to be welded stainless steel. Float and seating material to be stainless steel. Trap must be in-line repairable.

Features

- H-pattern design allows piping from either side of the steam trap (there are two inlet ports at top and two outlet ports at bottom)
- F&T traps have excellent air handling capability allows air to be discharged rapidly and steam to enter the system quickly during start-up
- Welded stainless steel thermostatic air vent resists shock from waterhammer
- In-line repairable (all internals are attached to cover)

Installation and Maintenance

The trap must be installed upright and level for the float mechanism to operate properly. All internal components can be replaced with the trap body piped in-line. Repair kit includes thermostatic element, valve seat and disc, float and sealing gasket.

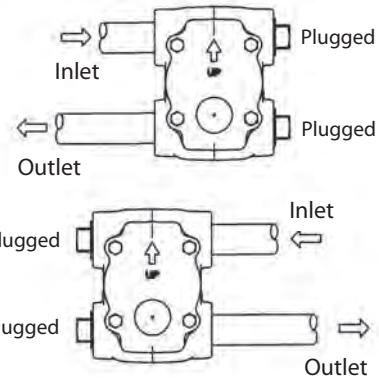
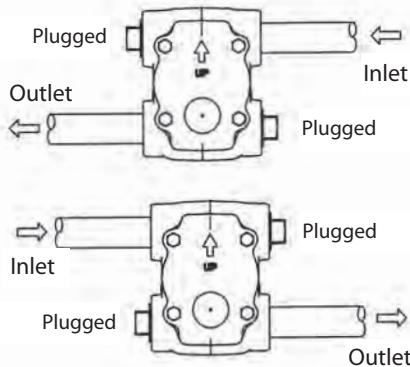
Helpful Selection Information

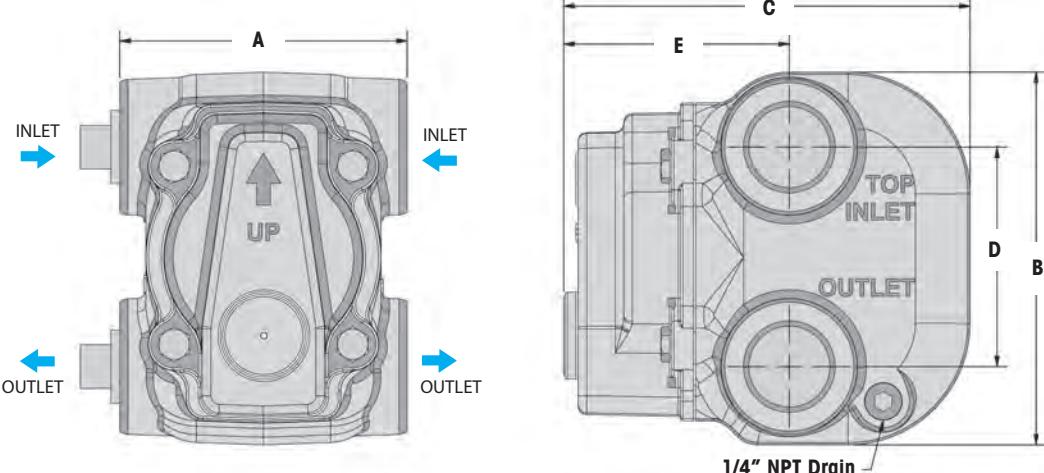
Select a model that can handle the maximum working pressure of the steam system. For example, the FT3-015 has a maximum working pressure of 15 PSI. Consult capacity tables to properly size unit. Available in 3/4" through 2" NPT connections. Select these models for steam systems with maximum working pressure of 75 PSIG.

Options

SLR = Steam lock release

Demonstration of H-Style piping connections:





DIMENSIONS & WEIGHTS — inches/pounds

Model	A	B	C	D	E	Weight
FT-3, FT-4, FT-33, FT-34, FT-73, FT-74, FT123, FT-124	.125	5.00	5.125	3.125	2.75	7.50
FT-6, FT-35, FT-36 FT-75, FT-76	5.00	6.81	6.47	4.125	3.43	13.0
FT-7, FT-37L, FT-77L	6.375	7.68	8.218	5.25	4.41	21.0
FT-8, FT-38, FT-78 FT-S8-15, FT-S8-75	6.50	11.0	8.968	7.468	4.531	40.0

MATERIALS

Body & Cover	Cast Iron, ASTM A-126 Class B
Nuts & Bolts	High-Tensile Steel
Gasket	Grafoil/Garlock
Float	Stainless Steel
Valve & Seat	Stainless Steel
Thermostatic Assembly	Stainless Steel Bellows & Valve

How to Size / Order

The maximum operating pressure (PMO) rating of model selected must meet or exceed the maximum steam pressure or the trap may not open. Reference full explanation of Safety Load Factors in Steam Traps Introduction section.

For Example: Process application has a maximum steam inlet pressure of 50 psi, a maximum condensate load of 1,700 lbs/hr and is discharging to a condensate return line with a possible back pressure of 10 psig. $\Delta P = 50-10 = 40$ PSI

To select trap: If the Safety Load Factor is chosen to be 2X max capacity at max differential pressure, then Trap should be selected based on 3,400 lbs/hr (1,700 x 2 = 3,400) at 40 PSI differential pressure with a PMO in excess of 50 PSIG

Selection: FT77L-075-16-N, PMO=75 PSIG, 1 1/2" NPT with a condensate capacity of 3,750 lbs/hr at 40 PSI differential pressure.

CAPACITIES — Condensate (lbs/hr)

Model Code	PMO (PSIG)	Pipe Size	Orifice Size	ΔP = Differential Pressure (PSI)										25	30	40	50	75	125
				1/4	1/2	1	2	3	5	10	15	20							
FT3-015-13-N	15	3/4"	9/32"	340	440	600	830	990	1280	1790	2150								
FT4-015-14-N	15	1"	9/32"	340	440	600	830	990	1280	1790	2150								
FT6-015-15-N	15	1 1/4"	25/64"	850	1100	1460	2000	2350	2950	4000	4800								
FT7-015-16-N	15	1 1/2"	1/2"	1300	1700	2050	2550	2900	3500	4400	5300								
FT8-015-17-N	15	2"	21/32"	2500	3150	4000	5700	6100	6800	8300	9800								
FTS8-015-17-N	15	2"	15/16"	4400	5850	7400	9200	10300	12600	15300	18100								
FT33-030-13-N	30	3/4"	11/64"	220	300	405	530	650	890	1210	1485	1705	1865	2010					
FT34-030-14-N	30	1"	11/64"	220	300	405	530	650	890	1210	1485	1705	1865	2010					
FT35-030-14-N	30	1"	1/4"	450	600	880	1205	1420	1845	2560	3230	3715	4100	4405					
FT36-030-15-N	30	1 1/4"	1/4"	450	600	880	1205	1420	1845	2560	3230	3715	4100	4405					
FT37L-030-16-N	30	1 1/2"	7/16"	600	800	1200	1680	2210	2600	3500	4500	5200	5700	6100					
FT38-030-17-N	30	2"	13/32"	1550	2045	2625	3560	4260	5660	7890	9440	10500	11360	12095					
FT73-075-13-N	75	3/4"	9/64"	140	195	265	360	430	580	770	990	1110	1210	1290	1430	1560	1830		
FT74-075-14-N	75	1"	9/64"	140	195	265	360	430	580	710	990	1110	1210	1290	1430	1560	1830		
FT75-075-14-N	75	1"	#16	270	360	485	660	780	1020	1430	1740	1980	2200	2420	2670	2910	3370		
FT76-075-15-N	75	1 1/4"	#16	270	360	485	660	780	1020	1430	1740	1980	2200	2420	2670	2910	3370		
FT77L-075-16-N	75	1 1/2"	5/16"	340	460	690	900	1200	1400	1900	2350	2700	3000	3250	3750	4150	4700		
FT78-075-17-N	75	2"	5/16"	800	1075	1300	1700	2000	2600	3750	4350	4700	5050	5400	5960	6500	7550		
FTS8-075-17-N	75	2"	13/32"	1360	1800	2100	2800	3300	4300	6300	7300	8000	8500	9000	10000	11000	12500		
FT123-125-13-N	125	3/4"	#39	74	105	145	190	235	320	430	520	605	640	680	755	820	910	1190	
FT124-125-14-N	125	1"	#39	74	105	145	190	235	320	430	520	605	640	680	755	820	910	1190	

Inverted Bucket

Model	Body Material	PMO (PSIG)	Sizes	Connections	Page No.
SIB/SIBH	Stainless Steel	450	1/2", 3/4"	NPT, SW	96-97
IB Series 103X/104X	Cast Iron	250	1/2" – 1½"	NPT	98-103

PMO = Maximum Operating Pressure

Inverted Bucket Traps

The Inverted Bucket Trap, with its rugged design, offers features that are advantageous in certain conditions. The discharge orifice of the IB is mounted at the top of the trap, making them less susceptible to failure from dirt and pipe scale when compared to other trap types. Although they are typically not the primary choice for process applications due to their lack of air venting capability, they are often used in drip applications. They can be used on less critical process applications which do not require venting of air during system start-up or when a secondary air vent is added to the system.

SIB Series Stainless Steel Body



SIB/SIBH

IB Series Cast Iron Body (No Strainer)



1031

1032

1033

1034

IB Series Cast Iron Body (with Strainer)



1041

1042

1044 & 1038S

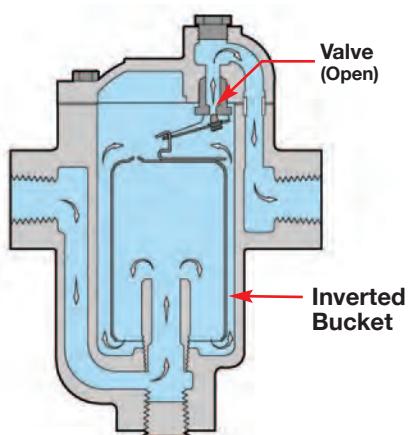
Introduction

INVERTED BUCKET TRAPS.

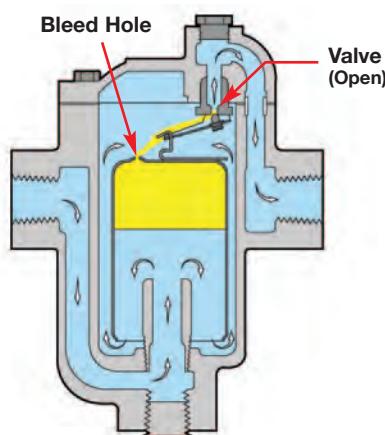
Operation:

Due to its weight, the inverted bucket within the trap will rest on the bottom of the trap body keeping the valve open and allowing condensate to be discharged (Figure A). In the top of the bucket there is a small bleed hole which allows air to escape from inside the bucket and exit through the outlet port (Figure B). When steam arrives through the inlet of the trap, it fills the inverted bucket which makes it buoyant and rise to the top of the trap, closing the valve (Figure C). As steam condenses and/or is bled through the small bleed hole in the top of the bucket, the bucket loses buoyancy which causes it to sink to the bottom of the trap. The valve then opens allowing condensate to be discharged from the system (Figure A). The bucket trap must maintain a certain amount of water (prime) in order to operate. If the trap loses its prime, the bucket will not be able to float when steam enters; keeping the valve in the open position which allows steam to escape (Figure D). Due to the balance of forces required between the incoming pressure and internal trap components, several orifice sizes are required to accommodate various differential pressure ranges. For this reason care must be used to select a trap model with an equal or higher PMO rating than the steam pressure.

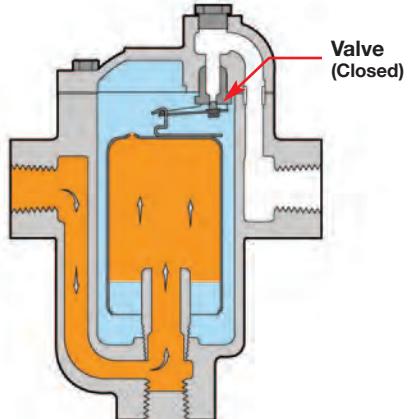
A) Discharging Condensate



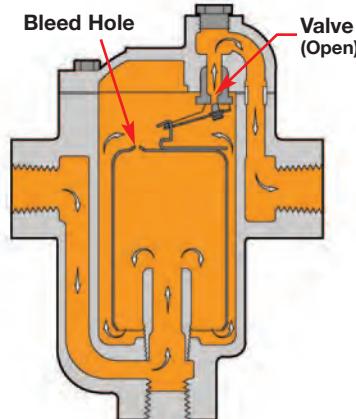
B) Discharging Air



C) Closed (Trapping Steam)



**D) Potential Failure Mode
Loss of Prime**



A) With condensate completely filling the trap, the bucket is in the down position with the valve open, allowing condensate to be discharged.

B) Small amounts of air will pass thru the bleed hole on top of the bucket and be discharged. (Note: Large amounts of air will lift the bucket and close off the trap, temporarily air locking the system.)

C) When steam enters the trap, the inverted bucket fills with steam and floats to the surface, closing off the valve, preventing steam from escaping.

D) **Potential Failure Mode:** Bucket traps must maintain a water prime to function properly. If the prime is lost, the bucket will remain in the down position with the valve open, and live steam will be discharged from the system.



Steam Traps

Inverted Bucket Steam Trap

SIB/SIBH

Inverted Bucket

Model	SIB, SIBH
Size	1/2", 3/4"
Connections	NPT, SW
Body Material	Stainless Steel
PMO Max. Operating Pressure	450 PSIG*
TMO Max. Operating Temperature	750°F
PMA Max. Allowable Pressure	720 PSIG @ 100°F
TMA Max. Allowable Temperature	750°F @ 400 PSIG

Typical Applications

DRIP, TRACING: The SIB & SIBH Inverted Bucket Steam traps are suitable for removing condensate from steam mains and steam supply lines. They are also used on unit heaters, laundry equipment, and other smaller, low capacity and less critical process applications where slow start-up can be tolerated. The discharge orifice of the inverted bucket trap is mounted at the top of the trap body, which makes them less susceptible to failure from dirt and debris when compared to other trap types. The SIBH is physically larger and has a higher pressure capability for a particular orifice size than the SIB.

How It Works

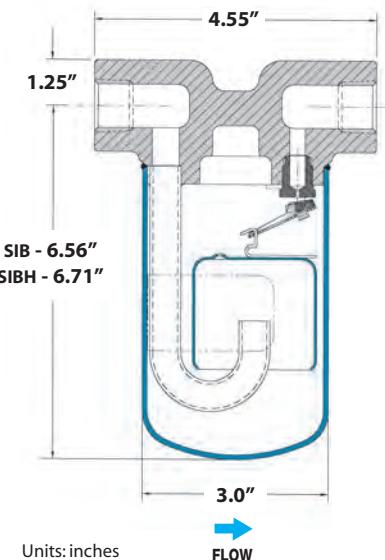
When the trap is filled with condensate, the inverted bucket inside the steam trap loses its buoyancy and rests on the bottom of the trap. This pulls the disc off the seat allowing condensate to be discharged through the seat orifice located at the top of the trap. When steam enters, it fills the inverted bucket causing the bucket to float to the surface which closes the discharge valve, containing the steam in the system. Eventually, the steam is bled off through a small hole in the top of the bucket causing it to sink, which repeats the cycle.

Features

- All stainless steel body
- Acceptable for superheated steam (with check valve installed at inlet)
- Waterhammer resistant
- Valve & seat are located at the top of the trap body making them less prone to clogging from debris and pipe scale
- All stainless steel internals with hardened valve & seat



SIB
Inverted Bucket
Steam Trap



Sample Specification

Steam trap shall be an all stainless steel module design inverted bucket type with a frictionless valve lever assembly.

Option

CV = built-in Inlet Check Valve recommended for Superheated Steam

Installation and Maintenance

Trap must be installed in upright position to function properly. The stainless steel body is seal welded and therefore non-repairable. If a new trap is required, remove and replace. Bucket traps require an internal water seal to operate. Applications with superheated steam can cause the water seal to flash into steam and trap to fail in open position. A check valve installed at trap inlet will help prevent the loss of prime.

MATERIALS

Body	Stainless Steel GR CF3
Cover	304L Stainless Steel
Internals	300 Series Stainless Steel
Valve Plug & Seat	420F Stainless Steel

CAPACITIES – Condensate (lbs/hr)

Model	Orifice Size	PMO (PSIG)	Differential Pressure (PSI)																		
			5	10	15	20	25	30	40	50	60	70	80	100	125	150	180	200	250	350	450
SIB-20	3/16"	20	450	560	640	690															
SIB-80	1/8"	80	300	350	400	440	460	500	550	580	635	660	690								
SIB-150	#38	150	210	250	280	300	320	350	380	400	420	450	470	500	550	570					
SIBH-15	1/4"	15	830	950	1060																
SIBH-30	3/16"	30	530	700	820	880	950	1000													
SIBH-70	5/32"	70	380	500	560	620	680	710	770	840	90	950									
SIBH-125	1/8"	125	285	375	440	485	530	560	620	670	720	780	800	860	950						
SIBH-200	7/64"	200	205	265	315	350	385	410	465	500	580	590	620	650	700	810	840	860			
SIBH-250	#38	250	155	205	240	270	295	320	360	400	500	530	550	580	630	660	690	710	760		
SIBH-450	.057	450	31	50	70	84	95	105	120	133	145	152	160	174	187	198	208	215	228	248	263

Helpful Selection Information

The PMO (maximum operating pressure) rating of model selected must meet or exceed the maximum steam pressure or the trap may not open. For example; the **SIB-12-N-150** has a PMO of 150 PSI. Condensate capacity (lbs/hr) of the trap is based on the differential pressure across the trap.



SIB
Inverted Bucket
Steam Trap



SIBH
Inverted Bucket
Steam Trap

Size/ Connection	Model Code	PMO PSI	Weight lbs	Cross Reference	
				Spirax Sarco	Armstrong
1/2" NPT	SIB-12-N-20				
3/4" NPT	SIB-13-N-20	20	5.0	SIB30	1810
1/2" SW	SIB-12-SW-20				
3/4" SW	SIB-13-SW-20				
1/2" NPT	SIB-12-N-80				
3/4" NPT	SIB-13-N-80	80	5.0	SIB30	1810
1/2" SW	SIB-12-SW-80				
3/4" SW	SIB-13-SW-80				
1/2" NPT	SIB-12-N-150				
3/4" NPT	SIB-13-N-150	150	5.0	SIB30	1810
1/2" SW	SIB-12-SW-150				
3/4" SW	SIB-13-SW-150				
1/2" NPT	SIB-12-N-450				
3/4" NPT	SIB-13-N-450	450	5.0	SIB30	1810
1/2" SW	SIB-12-SW-450				
3/4" SW	SIB-13-SW-450				
1/2" NPT	SIBH-12-N-15				
3/4" NPT	SIBH-13-N-15	15	5.5	SIB30H	1811
1/2" SW	SIBH-12-SW-15				
3/4" SW	SIBH-13-SW-15				
1/2" NPT	SIBH-12-N-30				
3/4" NPT	SIBH-13-N-30	30	5.5	SIB30H	1811
1/2" SW	SIBH-12-SW-30				
3/4" SW	SIBH-13-SW-30				
1/2" NPT	SIBH-12-N-70				
3/4" NPT	SIBH-13-N-70	70	5.5	SIB30H	1811
1/2" SW	SIBH-12-SW-70				
3/4" SW	SIBH-13-SW-70				
1/2" NPT	SIBH-12-N-125				
3/4" NPT	SIBH-13-N-125	125	5.5	SIB30H	1811
1/2" SW	SIBH-12-SW-125				
3/4" SW	SIBH-13-SW-125				
1/2" NPT	SIBH-12-N-200				
3/4" NPT	SIBH-13-N-200	200	5.5	SIB30H	1811
1/2" SW	SIBH-12-SW-200				
3/4" SW	SIBH-13-SW-200				
1/2" NPT	SIBH-12-N-250				
3/4" NPT	SIBH-13-N-250	250	5.5	SIB30H	1811
1/2" SW	SIBH-12-SW-250				
3/4" SW	SIBH-13-SW-250				
1/2" NPT	SIBH-12-N-450				
3/4" NPT	SIBH-13-N-450	450	5.5	SIB30H	1811
1/2" SW	SIBH-12-SW-450				
3/4" SW	SIBH-13-SW-450				

Steam Traps

Inverted Bucket Steam Trap

IB Series

Inverted Bucket

Model	1031, 1032, 1033, 1034, 1041, 1042, 1044, 1038S
Sizes	1/2", 3/4", 1", 1 1/4", 1 1/2"
Connections	NPT
Body Material	Cast Iron
Options	Internal check valve, Thermic vent
PMO Max. Operating Pressure	250 PSIG
TMO Max. Operating Temperature	450°F
PMA Max. Allowable Pressure	250 PSIG up to 450°F
TMA Max. Allowable Temperature	450°F @ 250 PSIG



Typical Applications

DRIP, TRACING PROCESS: **IB Series** inverted bucket steam traps are primarily intended for drip applications; to remove condensate from steam mains and steam supply lines. The smaller sized units have adequate capacity for the majority of drip applications. The discharge orifice of the inverted bucket trap is mounted at the top of the trap body, which makes them less susceptible to failure from dirt and debris when compared to other trap types. Since Inverted Bucket traps have poor air-handling capability, they are normally not recommended for most process applications. However, they can be used on certain process applications such as unit heaters and laundry equipment, where discharging air during system start-up is not a critical factor. F&T traps are the preferred choice for systems where air *must* be quickly discharged.

How It Works

When the trap is filled with condensate, the inverted bucket inside the steam trap loses its buoyancy and rests on the bottom of the trap. This pulls the disc off the seat allowing condensate to be discharged through the seat orifice located at the top of the trap. When steam enters, it fills the inverted bucket causing the bucket to float to the surface which closes the discharge valve, containing the steam in the system. Eventually, the steam is bled off through a small hole in the top of the bucket causing it to sink, which repeats the cycle.

Features

- Waterhammer resistant
- Suitable for superheated steam
(use internal check valve option to eliminate loss of prime)
- In-line repairability is simplified by having all internals attached to the cover
- Valve & seat are located at the top of the trap body making them less prone to clogging from debris and pipe scale
- All stainless steel internals with hardened valve & seat

Sample Specification

The steam trap shall be of an inverted bucket trap design. Trap body and cover shall be of cast iron construction with all stainless steel internals and hardened seat and disc.

Installation and Maintenance

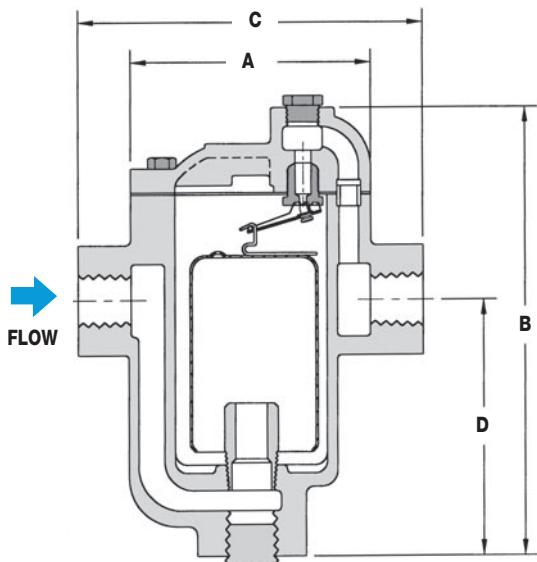
Trap must be installed in upright position to function properly. All working components can be replaced with the trap body remaining in-line. With superheated steam, a check valve should be installed at inlet or trap may lose prime. A replacement kit containing the lever and seat assembly is a more economical option than replacing the entire steam trap. Also available are replacement screens, gaskets and buckets. When ordering replacement lever and seat assemblies, specify model and operating pressure. See Replacement Parts and Kits Section for exact cross-reference to Armstrong PCA (Pressure Change Assembly) kits.

Helpful Selection Information

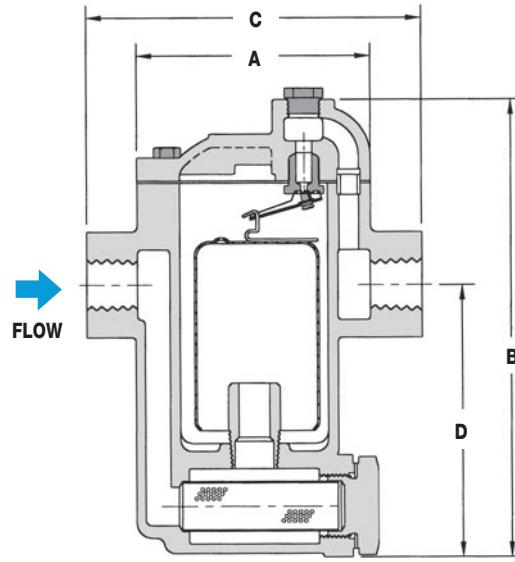
Select a model with a higher maximum operating pressure (PMO) that meet or exceed the maximum steam pressure or the trap may not open. For example, the **IB-1032-14-N-250** has a PMO of 250 PSI. Choose a model that will handle the capacity requirement based on the differential pressure across the trap. Reference capacity charts.

Options

Strainer and Blowdown valve connection available on 1041, 1042, 1044 & 1038S. Thermic vent to improve air handling capability. Internal check valve for superheated or condensate backflow applications.



1031/1031S/1032/1033/1034
without Strainer (except 1031S)



1041/1042/1044/1038S
with Strainer

DIMENSIONS & WEIGHTS – inches

Model	A	B	C	D	Weight (lbs)
1031	3.8125	5.875	5.00	2.75	5
1031S*	3.8125	5.875	5.125	2.75	5
1032	3.8125	6.875	5.375	4.25	6
1033	5.625	9.06	6.625	5.375	15
1034	7.00	11.75	7.75	7.03	27
1041*	3.8125	6.06	5.00	3.43	5
1042*	3.8125	7.06	5.00	4.43	6
1044*	7.00	12.375	7.75	7.375	30
1038S*	7.03125	12.375	7.75	7.375	30

* With Integral Strainer

How to Order Options: (reference model code chart)

Check Valve (suffix CV)

Built-in Inlet Check Valve is recommended when used on Superheated Steam

Example: **IB1032-12-N-125-CV**

Thermic Vent (suffix TV)

A Thermic Vent is recommended when using a Bucket Trap on any type of process application or where the removal of air from the system is critical.

Example: **IB1032-12-N-125-TV**

Thermic Vent & Check Valve (suffix TCV)

For both Check Valve & Thermic Vent Options use Suffix Code

Example: **IB1032-12-N-125-TCV**

Blowdown Valve (add B to Model Code)

Blowdown connection is available on Models 1038S, 1041, 1042 and 1044

Example: **IB1041B-13-N-150**

(Model IB1041, 3/4" NPT, 150 PSI max operating pressure with Blowdown & Strainer)

MATERIALS

Body & Cover	Cast Iron, ASTM A-278 Class 30
Nuts & Bolts	High-Tensile Steel
Gasket	Garlock
Bucket	Stainless Steel
Lever & Seat Assembly	Stainless Steel
Valve & Seat	Hardened Stainless Steel
Integral Strainer*	Stainless Steel

* 1031S, 1038S, 1041, 1042, 1044 models only.

How to Size / Order

From the capacity chart, select the model that can handle the working pressure of the system (PMO). Select the appropriate trap that will meet the capacity requirements at the differential pressure. Example:

Application: 1000 lbs/hr at 75 PSIG working pressure and 2 PSI differential pressure

Note: Specify Model, PMO and Connection Size

Size/Model: **IB-1034, 80 PSIG**, Specify pipe size (3/4", 1"), or **IB-1044, 80 PSIG**, Specify pipe size (3/4", 1")

Cross Reference Chart

NO STRAINER		STRAINER	
Watson McDaniel	Armstrong	Watson McDaniel	Armstrong
1031	800	1041	880
1032	811	1042	881
1033	812	1044	883
1034	813		

Steam Traps

Inverted Bucket Steam Trap

IB Series

Inverted Bucket

NO STRAINER				
Conn. NPT	Model Code	PMO PSI	Weight lbs	Cross Ref. Armstrong
1/2"	IB1031-12-N-20	20	7	800
3/4"	IB1031-13-N-20			
1/2"	IB1031-12-N-80	80	7	800
3/4"	IB1031-13-N-80			
1/2"	IB1031-12-N-125	125	7	800
3/4"	IB1031-13-N-125			
1/2"	IB1031-12-N-150	150	7	800
3/4"	IB1031-13-N-150			
1/2"	IB1032-12-N-15			
3/4"	IB1032-13-N-15	15	8	811
1"	IB1032-14-N-15			
1/2"	IB1032-12-N-30			
3/4"	IB1032-13-N-30	30	8	811
1"	IB1032-14-N-30			
1/2"	IB1032-12-N-70			
3/4"	IB1032-13-N-70	70	8	811
1"	IB1032-14-N-70			
1/2"	IB1032-12-N-125			
3/4"	IB1032-13-N-125	125	8	811
1"	IB1032-14-N-125			
1/2"	IB1032-12-N-200			
3/4"	IB1032-13-N-200	200	8	811
1"	IB1032-14-N-200			
1/2"	IB1032-12-N-250			
3/4"	IB1032-13-N-250	250	8	811
1"	IB1032-14-N-250			
1/2"	IB1033-12-N-15			
3/4"	IB1033-13-N-15	15	17	812
1/2"	IB1033-12-N-30			
3/4"	IB1033-13-N-30	30	17	812
1/2"	IB1033-12-N-70			
3/4"	IB1033-13-N-70	70	17	812
1/2"	IB1033-12-N-125			
3/4"	IB1033-13-N-125	125	17	812
1/2"	IB1033-12-N-200			
3/4"	IB1033-13-N-200	200	17	812
1/2"	IB1033-12-N-250			
3/4"	IB1033-13-N-250	250	17	812
3/4"	IB1034-13-N-15			
1"	IB1034-14-N-15	15	30	813
3/4"	IB1034-13-N-30			
1"	IB1034-14-N-30	30	30	813
3/4"	IB1034-13-N-60			
1"	IB1034-14-N-60	60	30	813
3/4"	IB1034-13-N-80			
1"	IB1034-14-N-80	80	30	813
3/4"	IB1034-13-N-125			
1"	IB1034-14-N-125	125	30	813
3/4"	IB1034-13-N-180			
1"	IB1034-14-N-180	180	30	813
3/4"	IB1034-13-N-250			
1"	IB1034-14-N-250	250	30	813

WITH STRAINER				
Conn. NPT	Model Code	PMO PSI	Weight lbs	Cross Ref. Armstrong
1/2"	IB1041-12-N-20	20	7	880
3/4"	IB1041-13-N-20			
1/2"	IB1041-12-N-80	80	7	880
3/4"	IB1041-13-N-80			
1/2"	IB1041-12-N-125	125	7	880
3/4"	IB1041-13-N-125			
1/2"	IB1041-12-N-150	150	7	880
3/4"	IB1041-13-N-150			
1/2"	IB1042-12-N-15			
3/4"	IB1042-13-N-15	15	8	881
1/2"	IB1042-12-N-30			
3/4"	IB1042-13-N-30	30	8	881
1/2"	IB1042-12-N-70			
3/4"	IB1042-13-N-70	70	8	881
1/2"	IB1042-12-N-125			
3/4"	IB1042-13-N-125	125	8	881
1/2"	IB1042-12-N-200			
3/4"	IB1042-13-N-200	200	8	881
1/2"	IB1042-12-N-250			
3/4"	IB1042-13-N-250	250	8	881
3/4"	IB1044-13-N-15			
1"	IB1044-14-N-15	15	37	883
3/4"	IB1044-13-N-30			
1"	IB1044-14-N-30	30	37	883
3/4"	IB1044-13-N-60			
1"	IB1044-14-N-60	60	37	883
3/4"	IB1044-13-N-80			
1"	IB1044-14-N-80	80	37	883
3/4"	IB1044-13-N-125			
1"	IB1044-14-N-125	125	37	883
3/4"	IB1044-13-N-180			
1"	IB1044-14-N-180	180	37	883
3/4"	IB1044-13-N-250			
1"	IB1044-14-N-250	250	37	883
11/4"	IB1038S-15-N-15			
11/2"	IB1038S-16-N-15	15	37	883
11/4"	IB1038S-15-N-30			
11/2"	IB1038S-16-N-30	30	37	883
11/4"	IB1038S-15-N-60			
11/2"	IB1038S-16-N-60	60	37	883
11/4"	IB1038S-15-N-80			
11/2"	IB1038S-16-N-80	80	37	883
11/4"	IB1038S-15-N-125			
11/2"	IB1038S-16-N-125	125	37	883
11/4"	IB1038S-15-N-180			
11/2"	IB1038S-16-N-180	180	37	883
11/4"	IB1038S-15-N-250			
11/2"	IB1038S-16-N-250	250	37	883



1034



1031



1032



1033

1044
&
1038S

1034



1041



1042

Helpful Selection Information

Select a model with a higher maximum operating pressure (PMO) that meet or exceed the maximum steam pressure or the trap may not open. For example, the **IB-1032-14-N-250** has a PMO of 250 PSI. Choose a model that will handle the capacity requirement based on the differential pressure across the trap. Reference capacity charts.

CAPACITIES – Condensate (lbs/hr)

Model	Pipe Size	Orifice Size	PMO (PSIG)	Differential Pressure (PSI)																			
				1/4	1/2	1	2	5	10	15	20	30	50	60	70	80	100	125	150	180	200	250	
1031	1/2", 3/4"	3/16"	20	139	200	270	340	450	560	640	690												
	1/2", 3/4"	1/8"	80	75	115	150	190	300	350	400	440	500	580	635	660	690							
	1/2", 3/4"	7/64"	125	50	80	100	145	240	280	320	350	410	490	520	560	580	640	680					
	1/2", 3/4"	#38	150	35	50	75	105	150	250	280	300	350	400	420	450	470	500	550	570				
1032	1/2", 3/4", 1"	1/4"	15	191	300	450	590	830	950	1060													
	1/2", 3/4", 1"	3/16"	30	150	235	325	410	530	700	820	880	1000											
	1/2", 3/4", 1"	5/32"	70	85	145	220	275	380	500	560	620	710	840	900	950								
	1/2", 3/4", 1"	1/8"	125	70	110	160	210	285	375	440	485	560	670	720	780	800	860	950					
	1/2", 3/4", 1"	7/64"	200	45	75	110	145	205	265	315	350	410	500	550	580	620	650	700	810	840	860		
	1/2", 3/4", 1"	#38	250	15	40	80	105	155	205	240	270	320	400	500	530	550	580	630	660	690	710	760	
1042	1/2", 3/4"	1/4"	15	191	300	450	590	830	950	1060													
	1/2", 3/4"	3/16"	30	150	235	325	410	530	700	820	880	1000											
	1/2", 3/4"	5/32"	70	85	145	220	275	380	500	560	620	710	840	900	950								
	1/2", 3/4"	1/8"	125	70	110	160	210	285	375	440	485	560	670	720	780	800	860	950					
	1/2", 3/4"	7/64"	200	45	75	110	145	205	265	315	350	410	500	550	580	620	650	700	810	840	860		
	1/2", 3/4"	#38	250	15	40	80	105	155	205	240	270	320	400	500	530	550	580	630	660	690	710	760	
1033	1/2", 3/4"	5/16"	15	350	570	850	1140	1600	1900	2100													
	1/2", 3/4"	1/4"	30	270	400	640	810	1000	1300	1600	1800	2050											
	1/2", 3/4"	3/16"	70	195	300	480	610	750	950	1200	1375	1600	1900	2000	2200								
	1/2", 3/4"	5/32"	125	130	205	320	415	595	775	910	900	1100	1380	1480	1600	1650	1800	2000					
	1/2", 3/4"	1/8"	200	75	120	200	255	365	490	585	630	700	900	980	1080	1120	1220	1400	1500	1560	1600		
	1/2", 3/4"	7/64"	250	30	80	130	170	250	335	400	470	525	665	600	700	800	900	1000	1100	1180	1220	1300	
1034	3/4", 1"	1/2"	15	950	1410	1880	2300	2900	3500	3900													
	3/4", 1"	3/8"	30	600	960	1300	1640	2200	2800	3300	3500	4000											
	3/4", 1"	5/16"	60	490	800	1090	1400	1750	2200	2600	2900	3500	4100	4400									
	3/4", 1"	9/32"	80	330	580	720	1070	1450	1800	2100	2400	2800	3300	3600	3800	4000							
	3/4", 1"	1/4"	125	260	430	620	810	1150	1650	1800	1900	2200	2600	2800	3000	3200	3600	3900					
	3/4", 1"	7/32"	180	200	310	470	610	880	1170	1380	1510	1800	2100	2300	2500	2700	2900	3200	3500	3700			
1044	3/4", 1"	3/16"	250	170	250	380	490	700	940	1100	1250	1450	1700	1800	2000	2100	2300	2700	2800	3100	3200	3500	
	11/4", 11/2"	1/2"	15	1188	1763	2350	2875	3625	4375	4875													
	11/4", 11/2"	3/8"	30	760	1190	1625	2050	2750	3500	4125	4375	5125											
	11/4", 11/2"	5/16"	60	615	1000	1375	1750	2188	2750	3250	3625	4375	5125	5500									
	11/4", 11/2"	9/32"	80	420	720	900	1340	1810	2250	2625	3000	3500	4125	4500	4750	5000							
	11/4", 11/2"	1/4"	125	330	540	775	1010	1440	2063	2250	2375	2750	3250	3500	3750	4000	4500	4875					
1038S	11/4", 11/2"	7/32"	180	250	390	590	760	1100	1470	1725	1890	2063	2375	2875	3125	3375	3625	4000	4375	4625			
	11/4", 11/2"	3/16"	250	210	320	470	610	875	1170	1380	1560	1800	2125	2250	2500	2625	2875	3375	3500	3875	4000	4375	

* 1031S only available @ PMO = 125 PSIG.

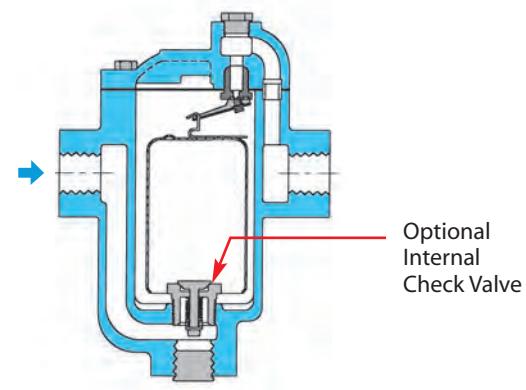
Steam Traps**Inverted Bucket** Steam Trap**Replacement Kits**

A replacement kit containing the lever and seat assembly is a more economical option than replacing the entire steam trap. Also available are replacement screens, gaskets and buckets.

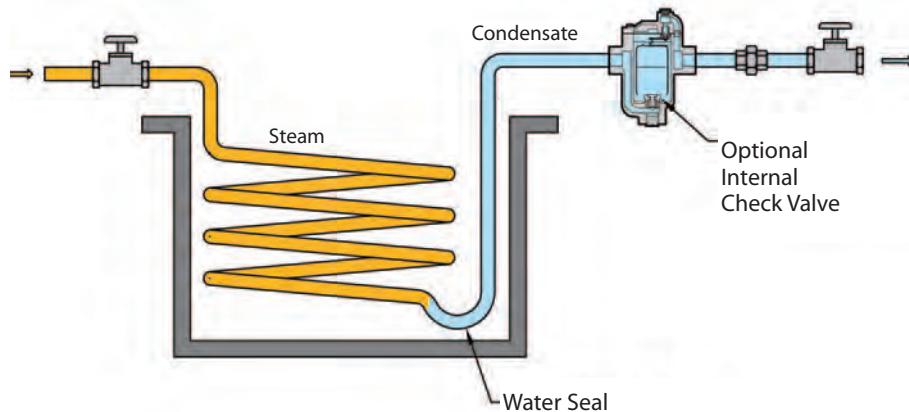
When ordering replacement lever and seat assemblies specify model and operating pressure. See Replacement Parts and Kits Section for exact cross-reference to Armstrong PCA (Pressure Change Assembly) Kits.

Why use a Check Valve Option ?

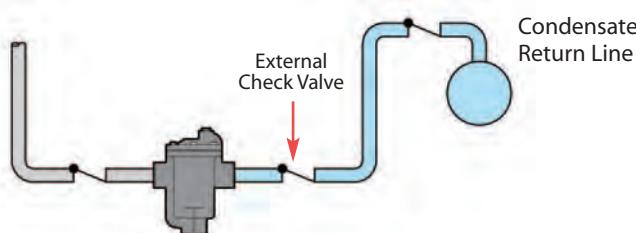
The optional internal check valve allows the bucket trap to retain its prime even when exposed to superheated steam. The IB Trap must retain hot condensate inside the trap body to operate. Superheated steam or a sudden drop in inlet pressure can flash off the hot condensate inside the trap body causing the trap to lose its prime. If the steam pressure falls below the discharge pressure on the outlet side of the steam trap, the internal check valve will stop the back flow of condensate into the steam system. When discharging to a condensate return line, a check valve is always recommended.

**Steam Trap Installed Above Condensate Collection Point**

In this example, condensate must travel upwards to reach the trap. Under this condition, it is possible for condensate to flow from the condensate return line into the steam coils, thereby flooding the system. The internal check valve, inside the IB trap, prevents the back flow of condensate.

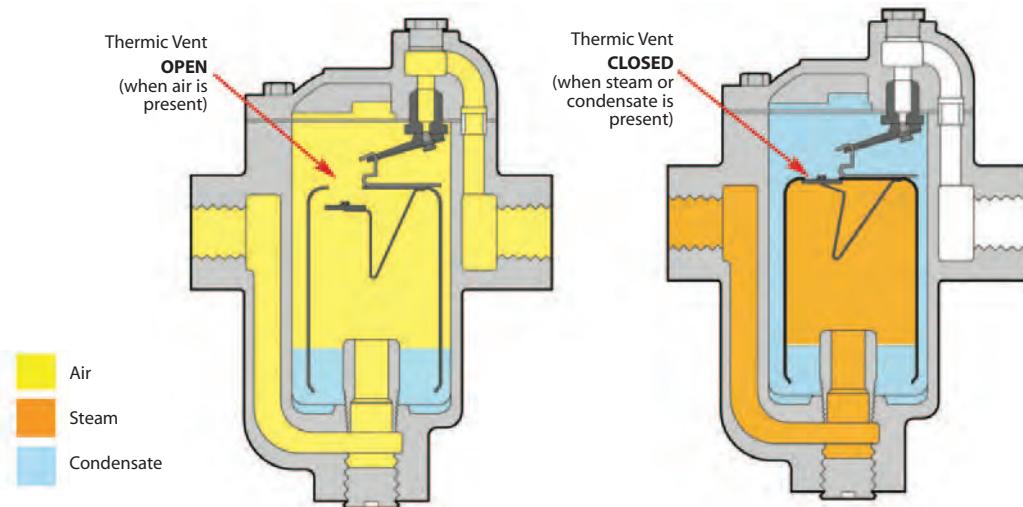
**Steam Trap Discharging into Elevated Condensate Return Line**

When a steam trap discharges condensate to an elevated location, a check valve should be used to stop condensate from flowing backwards into the steam system.

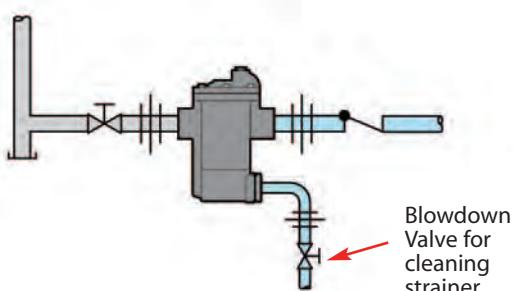
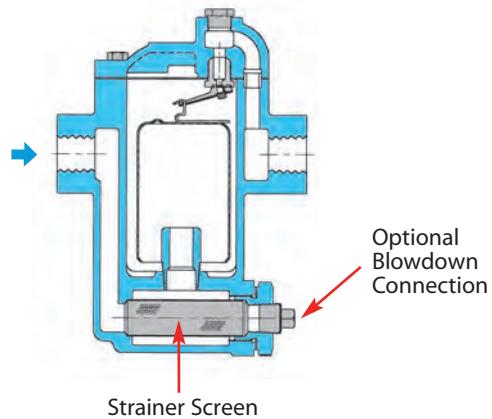


Why use a Thermic Vent ?

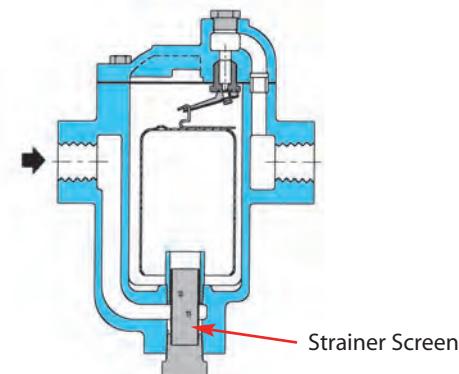
The Thermic Vent is used for discharging air from the steam system during start-up.

**Blowdown Valve Connection**

A Blowdown Valve connection is available as an option on the **1041**, **1042**, **1044**, and **1038S** models. This simplifies maintenance by allowing the strainer to be cleaned without removal. User to supply blowdown valve.

**1031S**

The **1031S** is equipped with a small protection screen to guard against dirt in the steam system. It is a more economical alternative than the 1041 which has a full-port strainer. Specifically designed for use in laundries. Available in 125 PSIG model only.

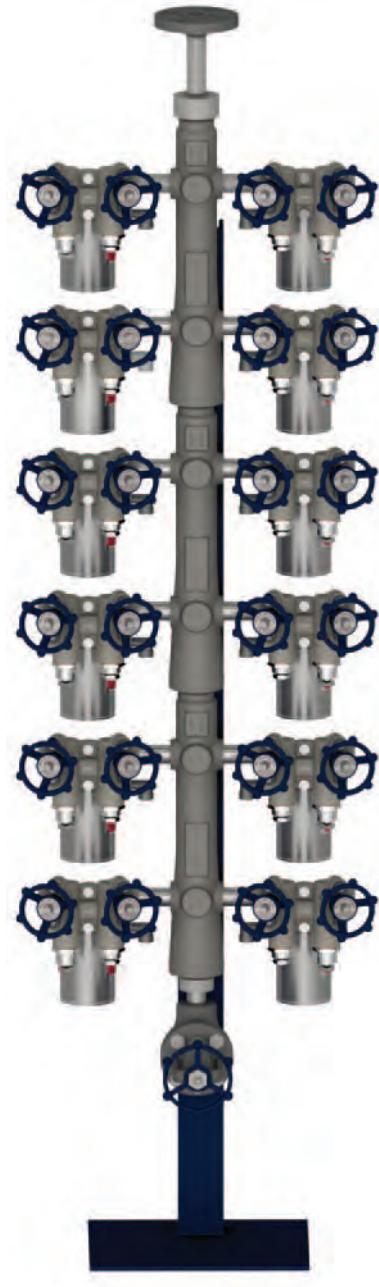


Quick-Change Universal Style Trap Connectors Trap Modules & Manifolds



Quick-Change Universal Style Trap Connectors

Trap Modules & Manifolds



UC450 Series

Quick-Change Universal Style Trap-Connector System

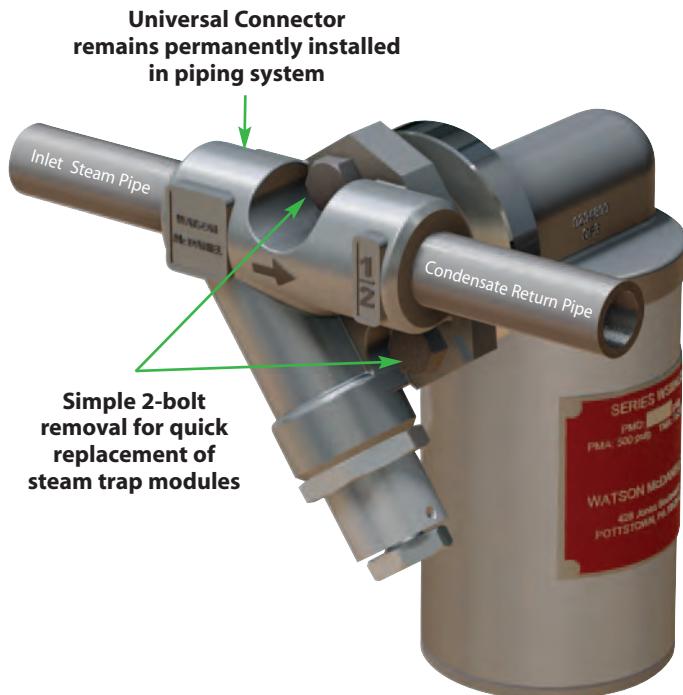
The **UC450 Series QUICK-CHANGE Universal Trap-Connector System** with multiple choices for trap modules and multiple choices for connectors are used in steam systems where a simplified and economical maintenance program of steam traps is desired. These Universal Style quick replacement steam traps can be used on steam supply lines as well as for tracing and small process applications. They are commonly used in chemical plants, petrochemical refineries, paper mills and other industrial facilities.

The All Stainless Steel Universal Style Steam Traps feature a permanent installation of the Universal Connector with a 2-bolt mounting arrangement for the Universal Steam Trap Module, allowing the Steam Trap to be removed and replaced in minutes:

- Steam trap is replaced without having to unthread piping
- By removing only 2 bolts with a socket or open-end wrench
- Trap module can swivel 360° on the universal connector allowing proper orientation



Replaceable
Steam Trap
Module

**“QUICK-CHANGE” Universal Trap Modules**

STEP 1:
Select an appropriate
Universal
**STEAM TRAP
MODULE**



UTD450
Thermodynamic
“Top Mount”



UTD450SM
Thermodynamic
“Side Mount”



UT450
Thermostatic
Bellows



UB450
Thermostatic
Adjustable Bi-Metal



USIB450
Inverted Bucket



UFT450
Float &
Thermostatic

“QUICK-CHANGE” Universal Connectors

STEP 2:
Select appropriate Universal **CONNECTOR**.
Any Universal Connector (shown right) will
work with any Universal Steam Trap Module.
(Including those of other manufacturers. See
product catalog for full offering of Connectors.)
Trap orientation must be considered.



UC450



UC450S



UC450SR



UTS600
Connector
Trap Test Station

UC450 Series Quick-Change Universal Style Trap-Connector System

Why Use the UC450 Series "QUICK-CHANGE" Universal Style Trap-Connector System ?

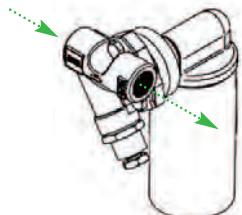
Quick-Change Steam Traps

are recommended in any application – particularly those which require simple and frequent replacement of steam traps

Universal Connectors

These Connectors remain permanently installed in the piping system. The convenient 2-bolt mounting system allows the Trap Module to be replaced quickly and easily using a socket or open-end wrench without having to unthread piping.

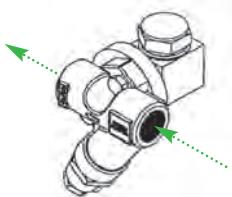
Quick-Change Steam Trap Modules with Universal Connectors



Inverted Bucket Trap

USIB450 Steam Trap
(shown with)

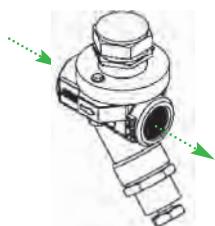
UC450SR Connector



Thermodynamic "side-mount" Trap

UTD450SM Steam Trap
(shown with)

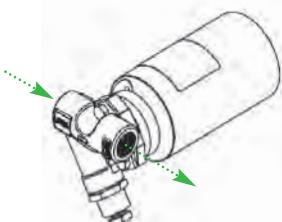
UC450SBL Connector



Thermodynamic "top-mount" Trap

UTD450 Steam Trap
(shown with)

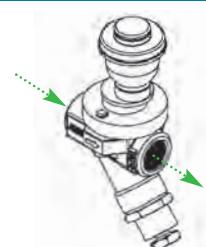
UC450SB Connector



Float & Thermostatic Trap

UFT450 Steam Trap
(shown with)

UC450SBR Connector



Thermostatic Trap

UT450 Steam Trap
(shown with)

UC450SB Connector

4 basic configurations of connectors are available:

UC450, **UC450S** & **UC450R**/
UC450L.

Choice is based on strainer orientation or if a piping interference exists.

The **UC450SR** is the standard connector choice.

The R & L versions are a mirror image of each other and are strictly a user's preference based on piping orientation.



UC450



UC450S



UC450SR

UC450 Series

(For use with **Universal Quick-Change Trap Modules**)

Model	UC450, UC450S, UC450SB UC450SR, UC450SBR, UC450SL, UC450SBL
Sizes	1/2", 3/4", 1"
Connections	NPT, SW, FLG*, Tube Weld*
Body Material	Stainless Steel
PMO Max. Operating Pressure	(trap module dependent)
TMO Max. Operating Temperature	(trap module dependent)
PMA Max. Allowable Pressure	750 PSIG @ 100°F
TMA Max. Allowable Temperature	800°F @ 400 PSIG

Steam Trap Modules that mount to Universal Connectors are shown on the following pages. Trap modules available in: Inverted Bucket, Float & Thermostatic, Thermodynamic, Thermostatic and Bi-metallic type.

Typical Applications

DRIP, TRACER: UC450 Series Universal Trap Connectors reduce the time and manpower to replace steam traps. The stainless steel Connector remains permanently in-line allowing steam trap module to be replaced in minutes. These universal connectors can be used for drip service on steam mains and steam supply lines, tracing, or for small process equipment. Industrial standard 2-bolt universal connectors are commonly used in chemical plants, petrochemical refineries, paper mills, and other industrial facilities. The UC450 connectors conform to industrial standards, making them compatible with other manufacturers' universal steam trap modules.

Used with the following Watson McDaniel Steam Trap Modules:

USIB450	- Inverted Bucket
UTD450	- Thermodynamic
UTD450SM	- Thermodynamic
UTD600LSM	- Thermodynamic
UT450	- Thermostatic
UFT450	- Float & Thermostatic
UB450	- Bi-Metallic

How It Works

Universal connectors remain permanently installed in the piping system. The convenient 2-bolt mounting system allows the trap module to be removed and replaced quickly and easily using a socket or open-end wrench without disturbing the existing piping.

Features

- Universal connector with 2-bolt mounting allows for fast, easy replacement of trap module making it more cost-effective than replacing conventional type steam traps
- All stainless steel construction
- Trap module can rotate 360° on the universal connector allowing any orientation during installation
- Compatible with other manufacturers' trap modules
- Available with integral strainer and blowdown valve

Sample Specification

The Universal Connector shall be all stainless steel construction with a two-bolt 360 degree swivel mount flange design and available with integral strainer and blowdown valve.

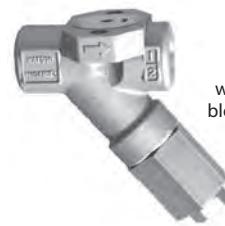
Universal Style Quick-Change Connectors



UC450
no strainer



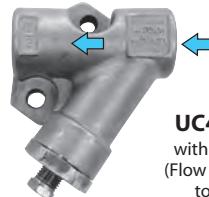
UC450S
with strainer



UC450SB
with strainer & blowdown valve



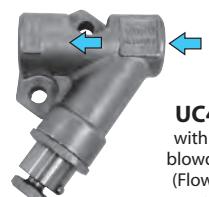
UC450SR
with strainer
(Flow direction
to Right)



UC450SL
with strainer
(Flow direction
to Left)



UC450SBR
with strainer &
blowdown valve
(Flow direction
to Right)



UC450SBL
with strainer &
blowdown valve
(Flow direction
to Left)

*Customized Flanged and Tube Fitting connections available; consult factory.

Installation and Maintenance

The universal connector can be installed in vertical or horizontal piping and available in 1/2", 3/4" and 1" threaded NPT and socket weld (SW). In horizontal installations, orientation of connector body may be dependent on the specific type of trap module used. These connectors remain permanently installed in the piping system. The convenient 2-bolt mounting system allows the trap module to be easily replaced.

MATERIALS

Body	Stainless Steel, AISI 316
Strainer	40 Mesh Stainless Steel, AISI 304
Blowdown Valve	Stainless Steel, AISI 303

How to Size / Order

Connectors and Trap Modules are ordered separately. See following pages for the Trap Modules.

UC450 Series

Universal Style Quick-Change Connectors

(For use with **Universal Quick-Change Trap Modules**)

Helpful Selection Information

Choose the desired style connector:

UC450, UC450S

UC450SR (flow to right)

UC450SL (flow to left)

Four basic configurations of connectors are available: UC450, UC450S, and UC450SR/UC450SL.

The UC450SR (with strainer, flow to right) is the most common connector choice. Choice is based upon strainer orientation or if a piping interference exists. All connector styles operate with any trap module. The **R** and **L** versions are mirror images of each other and are selected based on which side the user prefers the trap mounted on.

UC450 Type

UC450
No Strainer



UC450S Type

UC450S
Strainer



UC450SB
Strainer &
Blowdown Valve

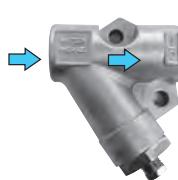


Size	Model Code Threaded - NPT	Model Code Socket Weld	Weight lbs
Connector			
1/2"	UC450-12-N	UC450-12-SW	1.5
3/4"	UC450-13-N	UC450-13-SW	1.5
1"	UC450-14-N	UC450-14-SW	3.0
Connector (with Strainer)			
1/2"	UC450S-12-N	UC450S-12-SW	2.5
3/4"	UC450S-13-N	UC450S-13-SW	2.5
1"	UC450S-14-N	UC450S-14-SW	3.5
Connector (with Strainer & Blowdown Valve)			
1/2"	UC450SB-12-N	UC450SB-12-SW	2.5
3/4"	UC450SB-13-N	UC450SB-13-SW	2.5
1"	UC450SB-14-N	UC450SB-14-SW	4.5

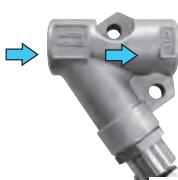
UC450SR Type

Flow to Right (as viewed)

UC450SR
Strainer



UC450SBR
Strainer &
Blowdown Valve

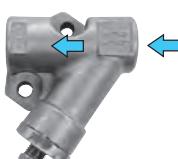


Size	Model Code Threaded - NPT	Model Code Socket Weld	Weight lbs
Connector (with Strainer) FLOW TO RIGHT			
1/2"	UC450SR-12-N	UC450SR-12-SW	2.5
3/4"	UC450SR-13-N	UC450SR-13-SW	2.5
1"	UC450SR-14-N	UC450SR-14-SW	2.5
Connector (with Strainer & Blowdown Valve) FLOW TO RIGHT			
1/2"	UC450SBR-12-N	UC450SBR-12-SW	2.5
3/4"	UC450SBR-13-N	UC450SBR-13-SW	2.5
1"	UC450SBR-14-N	UC450SBR-14-SW	2.5

UC450SL Type

Flow to Left (as viewed)

UC450SL
Strainer



UC450SBL
Strainer &
Blowdown Valve



Size	Model Code Threaded - NPT	Model Code Socket Weld	Weight lbs
Connector (with Strainer) FLOW TO LEFT			
1/2"	UC450SL-12-N	UC450SL-12-SW	2.5
3/4"	UC450SL-13-N	UC450SL-13-SW	2.5
1"	UC450SL-14-N	UC450SL-14-SW	2.5
Connector (with Strainer & Blowdown Valve) FLOW TO LEFT			
1/2"	UC450SBL-12-N	UC450SBL-12-SW	2.5
3/4"	UC450SBL-13-N	UC450SBL-13-SW	2.5
1"	UC450SBL-14-N	UC450SBL-14-SW	2.5

UC450 Series

NPT or SW

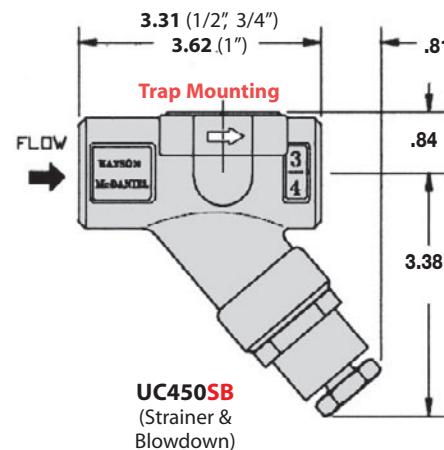
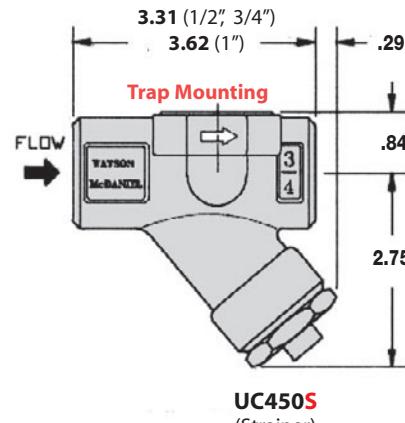
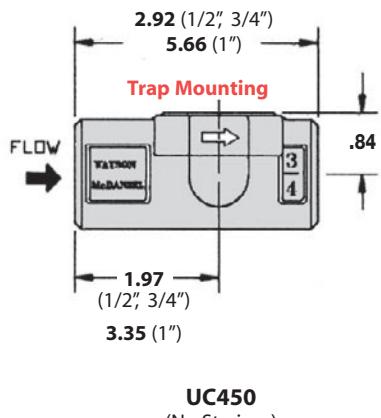
Universal Style Quick-Change Connectors

Dimensions

UC450, UC450S, UC450SB Universal Connectors

Connectors available in 1/2", 3/4" and 1" sizes in NPT or Socket-Weld Connections

Note: Optional Flange or Tube Weld units available.

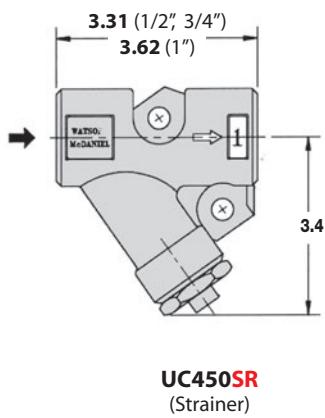
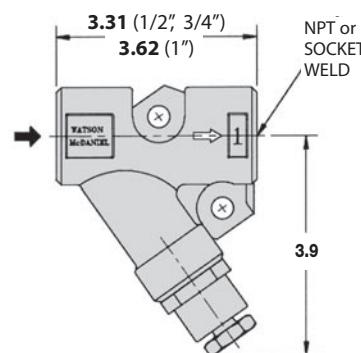
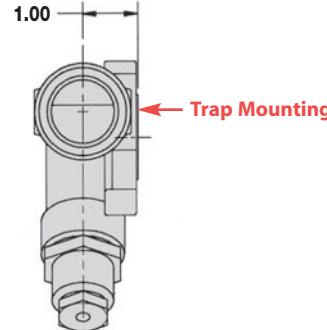
UC450
(No Strainer)UC450S
(Strainer)UC450SB
(Strainer &
Blowdown)

UC450SR & UC450SBR Universal Connectors

Connectors available in 1/2", 3/4" and 1" sizes in NPT or Socket-Weld Connections

Flow Direction - To RIGHT

Note: Optional Flange or Tube Weld units available.

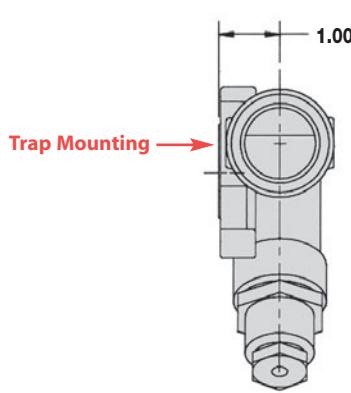
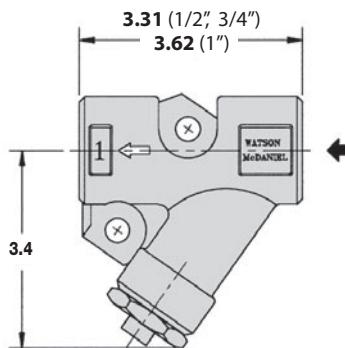
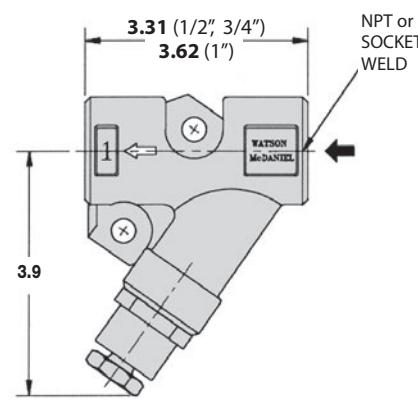
UC450SR
(Strainer)UC450SBR
(Strainer & Blowdown)

UC450SL & UC450SBL Universal Connectors

Connectors available in 1/2", 3/4" and 1" sizes in NPT or Socket-Weld Connections

Flow Direction - To LEFT

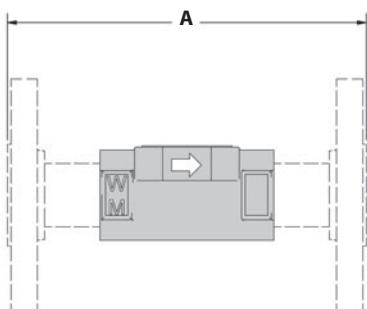
Note: Optional Flange or Tube Weld units available.

UC450SBL
(Strainer & Blowdown)UC450SL
(Strainer)

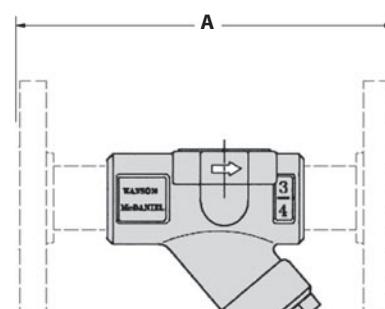
Flanged

FLANGED Dimensions

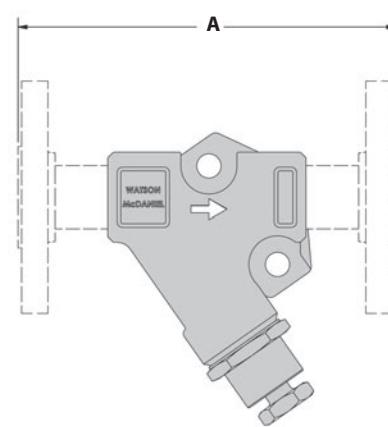
UC450



UC450S
UC450SB



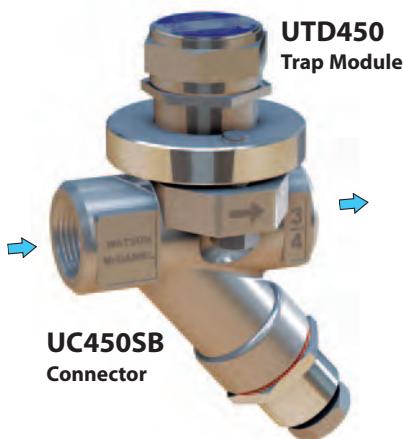
UC450SR, UC450SBR,
UC450SL, UC450SBL
(SBR shown)



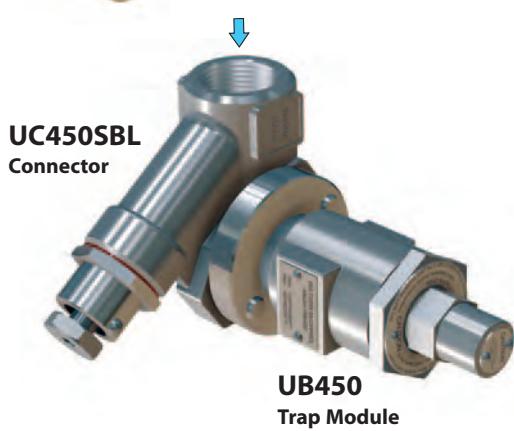
"A' DIMENSIONS FLANGED – inches

Conn.	Size	UC450	UC450S UC450SR UC450SL	UC450SB UC450SBR UC450SBL
		No Strainer	Strainer	Strainer & Blowdown
150# or 300#	1/2"	5.88	6	6
	3/4"	6	6	6.31
	1"	7	7	7

Typical Examples of Trap Modules & Connectors



UTD450
Trap Module



UC450SBL
Connector



UC450SBR
Connector



UC450SL
Connector



UT450
Trap Module

USIB450

Inverted Bucket Steam Trap Module

Universal Style Quick-Change Trap Module

Model	USIB450, USIB450H
Connections	Fits UC450 Series Universal Connectors
Body Material	Stainless Steel
PMO Max. Operating Pressure	450 PSIG*
TMO Max. Operating Temperature	800°F
PMA Max. Allowable Pressure	720 PSIG @ 100°F
TMA Max. Allowable Temperature	800°F @ 400 PSIG

*750°F @ operating pressures below 400 PSIG. See installation note regarding using trap in superheated applications.

Steam trap modules can be used with other manufacturers' Universal Connectors.

Typical Applications

DRIP, TRACER: The **USIB450** inverted bucket steam trap modules must be mounted to a universal connector. They are typically used for drip applications such as draining condensate from steam mains or steam supply lines as well as for steam tracing applications. **USIB450H** is the higher capacity model.

How It Works

The UC450 universal connector is permanently installed into the pipeline where the steam trap would normally be placed. The trap module, which functions like any standard inverted bucket steam trap, is fastened to the universal connector with two bolts. When a new trap module is needed, it can be easily removed and replaced with a standard open-end or socket wrench without disturbing the existing piping.

Sample Specification

The steam trap shall be an all stainless steel modular design, inverted bucket type with a frictionless valve lever assembly. The trap shall have a 360 degree swivel mount on a stainless steel Universal Connector that is available with integral strainer and blowdown valve options.

Options

Universal Connectors are available with an integral strainer and blowdown valve. Connector is purchased separately.

See the UC450 Universal Connectors section for more information.

- CV = built-in Inlet Check Valve recommended for Superheated Steam

When using Flanged UC450 Connectors in vertical piping, special Module options are available ; Contact factory.



Installation and Maintenance

Universal connector is first permanently threaded or welded into piping system. The USIB trap module is attached to the universal connector with two bolts. When a new trap is needed, it can be easily removed and replaced with a standard open-end or socket wrench without disturbing the existing piping. Trap must be installed in upright position as shown to function properly. With superheated steam, a check valve must be installed at inlet of trap to prevent the loss of prime. In vertical piping installations with upward flow, use of a blowdown valve is not recommended because discharge would be in upward and possibly unsafe direction.

Features

- Trap module can be easily removed and replaced in minutes without having to disconnect any piping
- Hardened stainless steel valves and seat
- Freeze resistant
- Connectors available with integral strainers and blowdown valves
- 360° swivel design for convenient installation

MATERIALS

Body	Stainless Steel GR CF3
Cover	304L Stainless Steel
Internals	300 Series Stainless Steel
Valve Plug & Seat	420F Stainless Steel
Bolts	ASTM A193 GR B7
Gasket	Spiral-Wound 304 Stainless Steel with Grafoil Filler
Swivel Flange	303 Stainless Steel

CAPACITIES – Condensate (lbs/hr)

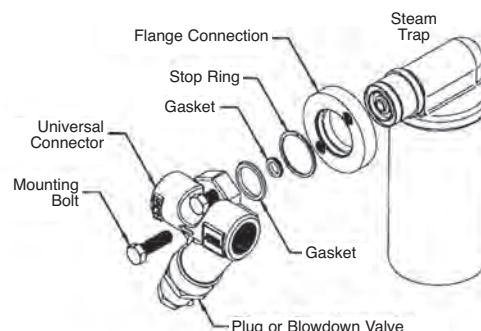
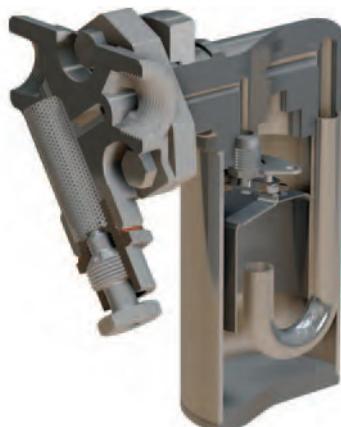
Model	Orifice Size (PSIG)	Differential Pressure (PSI)															
		5	10	15	20	25	30	40	50	60	70	80	100	125	150	180	200
USIB450-20	3/16" 20	450	560	640	690												
USIB450-80	1/8" 80	300	350	400	440	460	500	550	580	635	660	690					
USIB450-150	#38 150	210	250	280	300	320	350	380	400	420	450	470	500	550	570		
USIB450H-15	1/4" 15	830	950	1060													
USIB450H-30	3/16" 30	530	700	820	880	950	1000										
USIB450H-70	5/32" 70	380	500	560	620	680	710	770	840	900	950						
USIB450H-125	1/8" 125	285	375	440	485	530	560	620	670	720	780	800	860	950			
USIB450H-200	7/64" 200	205	265	315	350	385	410	465	500	580	590	620	650	700	810	840	860
USIB450H-250	#38 250	155	205	240	270	295	320	360	400	500	530	550	580	630	660	690	710
USIB450H-450	.057 450	31	50	70	84	95	105	120	133	145	152	160	174	187	198	208	215
																	228
																	248
																	263

USIB450

Inverted Bucket Steam Trap Module

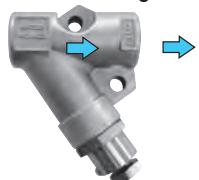
Universal Style Quick-Change Trap Module

(mounts to **UC450** Universal Connectors)



Horizontal Piping (Connector with Strainer)

Steam Flow to the Right (Standard)



Trap shown with **UC450SR** Connector
(Use **L** Style if a Piping Constraint exists)

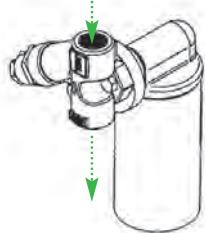


Vertical Piping (Connector with Strainer)

Steam Flow Downward



Trap shown with **UC450SR** Connector

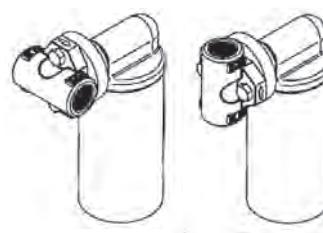


Vertical or Horizontal Piping (No Strainer)

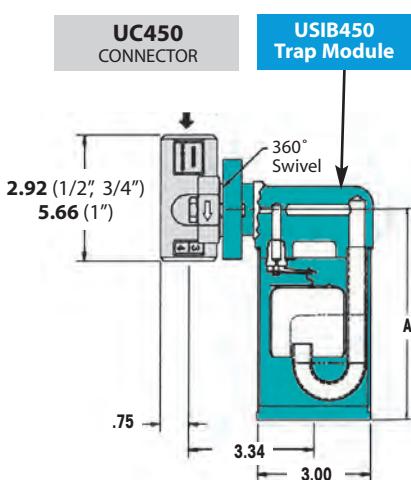
Steam Flow Any Direction



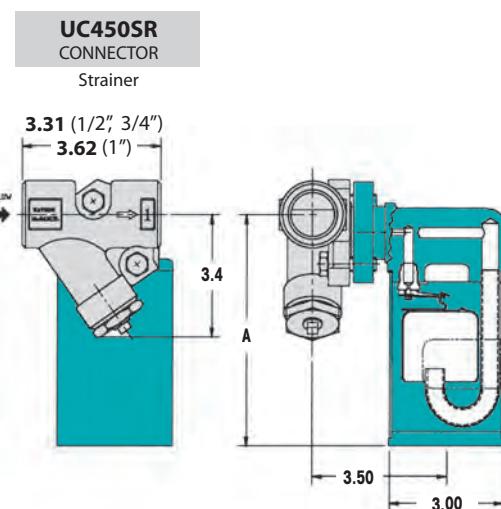
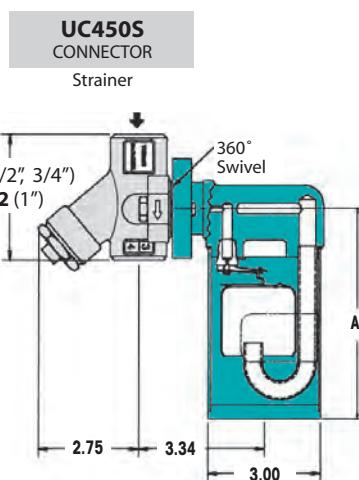
Trap shown with **UC450** Connector



Connectors available in 1/2", 3/4" and 1" sizes in NPT or Socket-Weld Connections



USIB450 A-Dimension = 6.12"
USIB450H A-Dimension = 7.12"



UFT450

Universal Style

Quick-Change Trap Module

Float & Thermostatic Steam Trap Module (mounts to **UC450** Universal Connectors)

Model	UFT450
Connections	Fits UC450 Series Universal Connectors
Body Material	Stainless Steel
PMO Max. Operating Pressure	450 PSIG
TMO Max. Operating Temperature	397°F
PMA Max. Allowable Pressure	720 PSIG @ 100°F
TMA Max. Allowable Temperature	800°F @ 400 PSIG



UFT450
Float & Thermostatic
Steam Trap Module

Steam trap modules can be used with other manufacturers' Universal Connectors.

Typical Applications

PROCESS, DRIP: The **UFT450** Float & Thermostatic steam trap module can be used on small process equipment that generates light condensate loads and requires excellent air handling capability. These low capacity F&T trap modules can also be used in drip service on steam mains and steam supply lines. Mounts to any universal connector.

How It Works

The UC450 universal connector is permanently installed into the pipeline where the steam trap would normally be placed. The trap module, which functions like any F&T steam trap, is fastened to the universal connector with two bolts. When a new trap module is needed, it can be easily removed and replaced with a standard open-end or socket wrench without disturbing the existing piping.

Sample Specification

The steam trap shall be an all stainless steel modular design, float & thermostatic unit. The thermostatic air vent to be pressure balanced welded bellows. The trap shall have a 360 degree swivel mount on a stainless steel Universal Connector that is available with integral strainer and blowdown valve options.

Installation and Maintenance

Universal connector is first permanently threaded or welded into piping system. The UFT450 mounts to any 2-Bolt Quick-Change Universal Connector. Trap module must be installed in orientation shown. The trap module is bolted to the universal connector with two bolts. When a new trap module is needed, it can be easily removed and replaced with a standard open-end or socket wrench without disturbing the existing piping.

Features

- Trap module can be easily removed and replaced in minutes without having to disconnect any piping
- Hardened stainless steel valves and seat
- Freeze resistant
- Connectors available with integral strainers and blowdown valves
- 360° swivel design for convenient installation

Options

Universal Connectors are available with an integral strainer and blowdown valve. Connector is purchased separately. See the Universal Connectors section for more information.

SLR = Steam Lock Release

Helpful Selection Information

Select a model that can handle the maximum working pressure of the steam system. For example, the UFT450-65 has a maximum working pressure of 65 PSI.

MATERIALS

Body	Stainless Steel GR CF3
Cover	304L Stainless Steel
Internals	300 Series Stainless Steel
Valve Disc	420F Stainless Steel
Valve Seat	17-4 PH Stainless Steel
Bolts	ASTM A193 GR B7
Gasket	Spiral-Wound 304 Stainless Steel with Grafoil Filler
Swivel Flange	303 Stainless Steel

CAPACITIES — Condensate (lbs/hr)

Model	PMO (PSIG)	Differential Pressure (PSI)																			
		1/4	1/2	1	2	5	10	15	20	30	40	50	65	75	100	125	145	200	225	350	450
UFT450-15	15	390	490	620	780	1050	1320	1500													
UFT450-65	65	115	155	205	270	390	520	610	685	810	910	995	1110								
UFT450-145	145	55	75	100	135	200	270	320	365	435	490	540	600	640	725	795	850				
UFT450-225	225	40	50	70	95	135	185	220	245	290	330	360	405	430	485	530	565	645	680		
UFT450-450	450	16	23	32	44	70	98	119	137	167	192	214	243	261	300	335	360	421	446	553	626

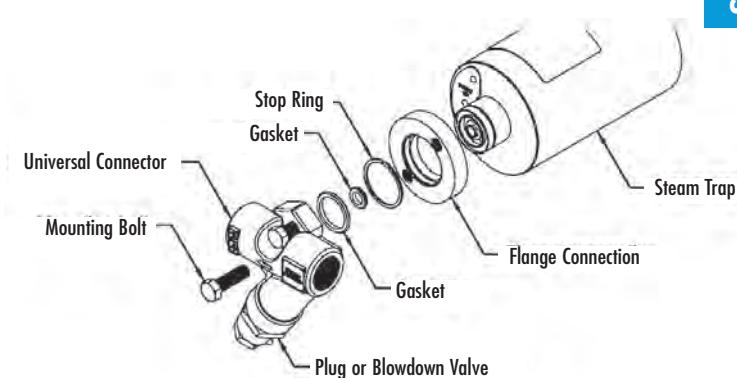
UFT450

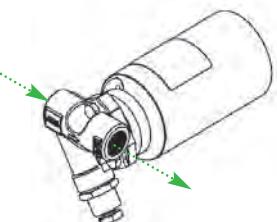
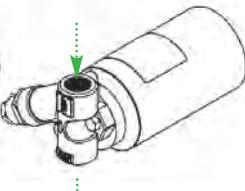
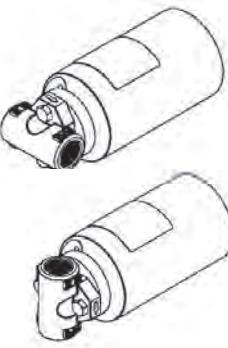
Universal Style Quick-Change Trap Module

Float & Thermostatic Steam Trap Module (mounts to **UC450** Universal Connectors)

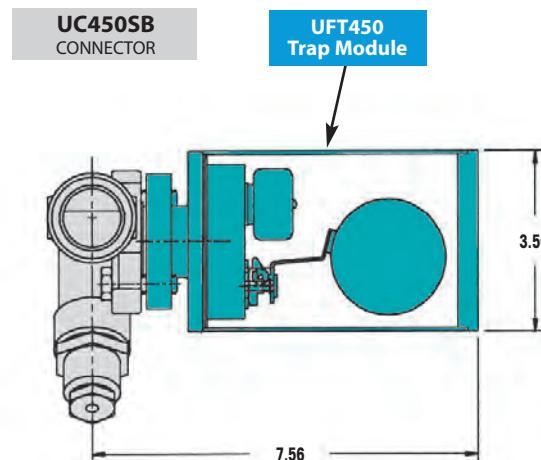
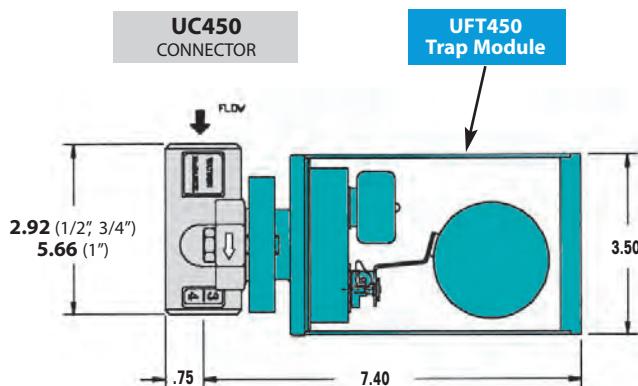


UFT450 Trap Module must be oriented Horizontally, as shown.



Horizontal Piping (Connector with Strainer)	Vertical Piping (Connector with Strainer)	Vertical or Horizontal Piping (No Strainer)
<p>Steam Flow to the Right UC450SBR Connector (with Blowdown Valve) shown below</p>  <p>Trap shown with UC450SBR Connector (Use L Style Connector to reverse orientation as an alternative if a Piping Constraint exists)</p> 	<p>Steam Flow Downward UC450SBR Connector (with Blowdown Valve) shown below</p>  <p>Trap shown with UC450SBR Connector</p> 	<p>Steam Flow Any Direction UC450 Connector shown below</p>  <p>Trap shown with UC450 Connector</p> 

Connectors available in 1/2", 3/4" and 1" sizes in NPT or Socket-Weld Connections



UTD450SM UTD600SM

Universal Style

Quick-Change Trap Module

Thermodynamic Steam Trap Module

(mounts to UC450 Universal Connectors)

Model (Side Mount Style)	UTD450LSM UTD450SM	UTD600LSM
Connections	Fits UC450 Series Universal Connectors	
Body Material	Stainless Steel	Stainless Steel
PMO Max. Operating Pressure	450 PSIG	600 PSIG
TMO Max. Operating Temperature	750°F	750°F
PMA Max. Allowable Pressure	720 PSIG @ 100°F	720 PSIG @ 100°F
TMA Max. Allowable Temperature	800°F @ 400 PSIG	800°F @ 600 PSIG



UTD450SM & UTD600SM

**Thermodynamic
Steam Trap Module**
(Side Mount Style)
For vertical or horizontal
piping installations.

Steam trap modules can be used with other manufacturers' Universal Connectors.

Typical Applications

DRIP, TRACER: Designed for drip applications for the draining of condensate from steam mains and other steam supply lines as well as for tracing applications. The **UTD450SM & UTD600SM** Steam Trap Modules can be used anywhere conventional thermodynamic steam traps are used. This trap module can be used on either vertical or horizontal piping installations and can mount to any 2-bolt Quick-Change Universal Connector.

How It Works

The UC450 universal connector is permanently installed into the pipeline where the steam trap would normally be placed. The trap module, which functions like any thermodynamic steam trap, is fastened to the universal connector with two bolts. When a new trap module is needed, it can be easily removed and replaced with a standard open-end or socket wrench without disturbing the existing piping.

Features

- Trap module can be easily removed and replaced in minutes without having to disconnect any piping
- Trap modules can be used with most manufacturers' 2-bolt universal connector
- All stainless steel construction with hardened seat

Sample Specification

The steam trap module shall be designed to attach to the industry standard two-bolt universal connector. Trap module shall be of a thermodynamic design. Universal connector shall conform to the two bolt industry standard with integral strainer and blowdown options.

Installation and Maintenance

Universal connector is first permanently installed (threaded, welded, flanged) into piping system. Trap module should be installed in orientation shown with cap facing upwards. The trap module is fastened to the universal connector using two bolts. If the trap fails for any reason, replace only the trap module. In vertical piping installations with upward flow, use of a blowdown valve is not recommended. Discharge would be in upward and unsafe direction.

Options

Universal Connectors are available with an integral strainer and blowdown valve. Connector is purchased separately. See the Universal Connectors section for more information.

Helpful Selection Information

Connector selection to use with the UTD450SM and UTD600LSM: UC450 (no strainer), UC450SR (strainer), UC450SBR (strainer and blowdown).

MATERIALS

Body	Stainless Steel, AISI 420
Disc	Stainless Steel, AISI 420
Cap	Stainless Steel, AISI 416
Insulation Cover	Stainless Steel, AISI 304
Bolts	Steel, ASTM A193 GR B7
Gaskets (2)	Spiral Wound 304 Stainless Steel with Grafoil Filler

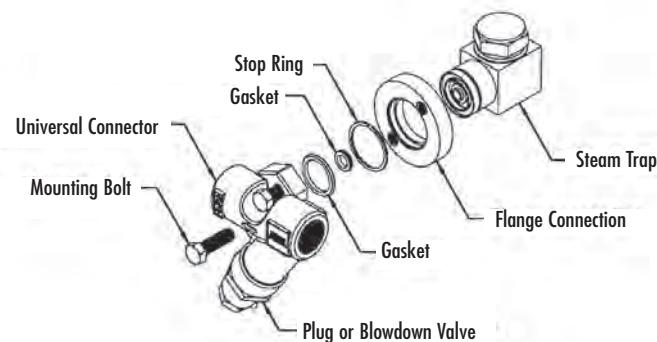
CAPACITIES – Condensate (lbs/hr)

Model	Differential Pressure (PSI)																
	4	10	15	20	25	30	40	50	75	100	150	200	250	300	400	450	600
UTD450LSM	140	215	242	270	295	320	355	390	455	510	600	670	730	790	880	925	
UTD450SM	247	370	420	475	520	560	625	685	800	900	1060	1185	1300	1400	1560	1630	
UTD600LSM											465	500	550	600	632	675	730

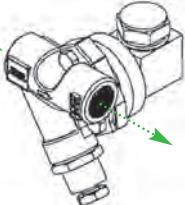
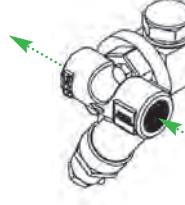
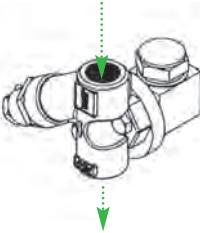
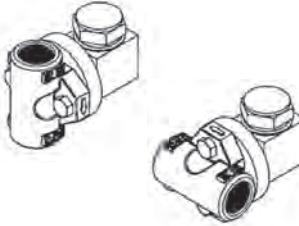
UTD450SM UTD600SM

Universal Style Quick-Change Trap Module

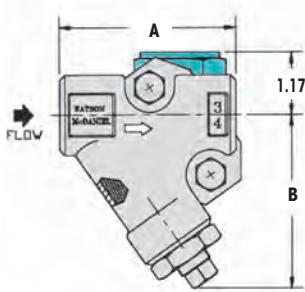
Thermodynamic Steam Trap Module (mounts to UC450 Universal Connectors)



UTD450/UTD600 Trap Module should be oriented with cap facing Upwards, As shown.

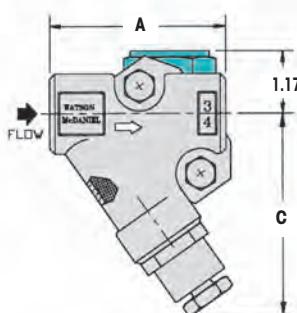
Horizontal Piping (Connector with Strainer)	Vertical Piping (Connector with Strainer)	Vertical or Horizontal Piping (No Strainer)
Steam Flow to the Right or to the Left	Steam Flow Downward	Steam Flow Vertically or Horizontally
  Trap shown with UC450SBL Connector	 Trap shown with UC450SBR Connector	  Trap shown with UC450 Connector
 		

Connectors available in 1/2", 3/4" and 1" sizes in NPT and Socket-Weld Connections



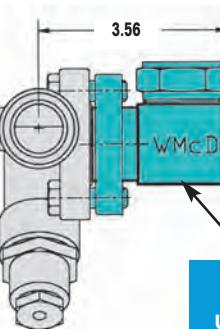
UC450SR
CONNECTOR

Strainer

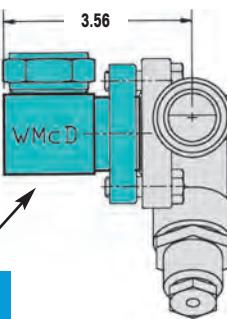


UC450SBR
CONNECTOR

Strainer & Blowdown



UTD450SM
or
UTD600LSM
Steam Trap



UC450SBL
CONNECTOR

Strainer & Blowdown

DIMENSIONS – inches

Size	A	B	C
1/2"	3.31	3.25	3.78
3/4"	3.31	3.25	3.78
1"	3.62	3.44	3.95

UTD450**Thermodynamic Steam Trap Module** (mounts to **UC450** Universal Connectors)

Model (Top Mount Style)	UTD450 UTD450L
Connections	Fits UC450 Series Universal Connectors
Body Material	Stainless Steel
PMO Max. Operating Pressure	450 PSIG
TMO Max. Operating Temperature	750°F
PMA Max. Allowable Pressure	720 PSIG @ 100°F
TMA Max. Allowable Temperature	800°F @ 400 PSIG

Steam trap modules can be used with other manufacturers' Universal Connectors.

Typical Applications

DRIP, TRACER: Designed to work as a drip trap for the draining of condensate from steam mains and other steam supply lines, the **UTD450** Thermodynamic Steam Trap Module can be used anywhere conventional thermodynamic steam traps are used. Can also be used on tracing applications. This model is only recommended for horizontal piping installations to allow the cap to be oriented upwards. The UTD450 mounts to any 2-bolt Quick-Change Universal Connector.

The UTD450 is recommended for horizontal piping only so that cap can be oriented upwards, as shown.

How It Works

The UC450 universal connector is permanently installed into the pipeline where the steam trap would normally be placed. The trap module, which functions like any thermodynamic steam trap, is fastened to the universal connector with two bolts. When a new trap module is needed, it can be easily removed and replaced with a standard open-end or socket wrench without disturbing the existing piping.

Features

- Trap module can be easily removed and replaced in minutes without having to disconnect any piping
- Trap modules can be used with most manufacturers' 2-bolt universal connector
- All stainless steel construction with hardened seat

Sample Specification

The steam trap module shall be designed to attach to the industry standard two-bolt universal connector. Trap module shall be of a thermodynamic design. Universal connector shall conform to the two bolt industry standard with integral strainer and blowdown options.

**UTD450****Thermodynamic Steam Trap Module**

(Top Mount Style)

Recommended for horizontal piping installations only so that cap can be oriented upwards as shown.

Installation and Maintenance

The UTD450 Trap module was intended for horizontal piping installations so the trap can be installed with cap facing upwards. Trap module is attached to the connector using two bolts. If the trap fails for any reason, replace only the trap module. When a new trap module is needed, it can be easily removed and replaced with a standard open-end or socket wrench without disturbing the existing piping.

Options

Universal Connectors are available with an integral strainer and blowdown valve. Connector is purchased separately. See the Universal Connectors section for more information.

Helpful Selection Information

Connector selection to use with the UTD450: UC450 (no strainer), UC450S (strainer), UC450SB (strainer and blowdown). Select this model for steam systems with maximum working pressure of 450 PSIG.

MATERIALS

Body	Stainless Steel, AISI 420
Disc	Stainless Steel, AISI 420
Cap	Stainless Steel, AISI 416
Insulation Cover	Stainless Steel, AISI 304
Bolts	Steel, ASTM A193 GR B7
Gaskets (2)	Spiral Wound 304 Stainless Steel with Grafoil Filler

CAPACITIES – Condensate (lbs/hr)

Model	Differential Pressure (PSI)																
	4	10	15	20	25	30	40	50	75	100	150	200	250	300	350	400	450
UTD450L	140	215	242	270	295	320	355	390	455	510	600	670	730	790	840	880	925
UTD450	247	370	420	475	520	560	625	685	800	900	1060	1185	1300	1400	1485	1560	1630

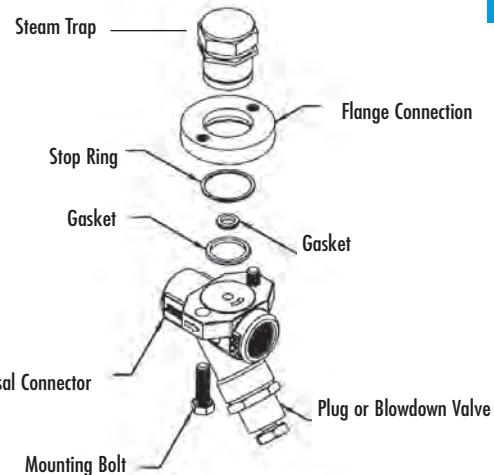
UTD450

Thermodynamic Steam Trap Module

Universal Style Quick-Change Trap Module



UTD450 Trap Module should be oriented with cap facing Upwards. Therefore it should only be used with Horizontal Piping, as shown.



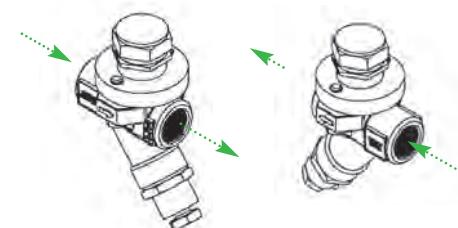
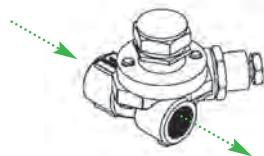
Horizontal Piping (Connector with Strainer)

Steam Flow to the Right / Steam Flow to the Left
UC450SBR & UC450SB Connector (with Blowdown Valve) shown below

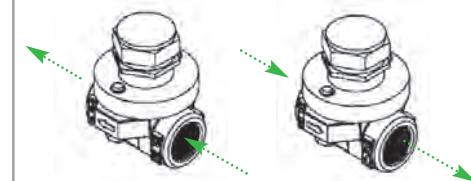


Trap shown with **UC450SBR** Connector
Strainer & Blowdown Valve is directed to the side

Trap shown with **UC450SB** Connector
Strainer & Blowdown Valve is directed downwards



Trap shown with **UC450** Connector

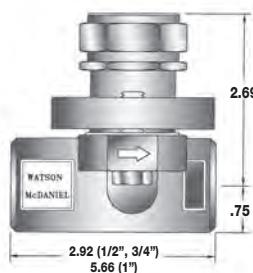


Horizontal Piping (No Strainer)

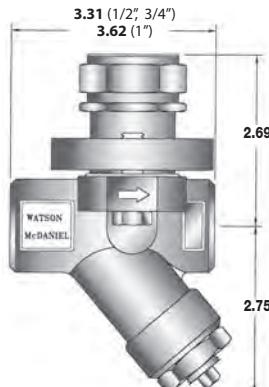
Steam Flow Horizontally
UC450 Connector shown below



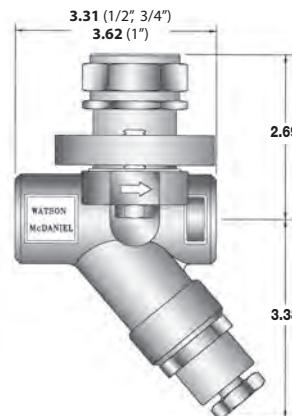
Connectors available in 1/2", 3/4" and 1" sizes in NPT and Socket-Weld Connections



UTD450 Trap Module
with UC450 Connector



UTD450 Trap Module
with UC450S Connector
(Strainer)



UTD450 Trap Module with
UC450SB Connector
(Strainer & Blowdown)

UT450

Thermostatic Steam Trap Module

Universal Style Quick-Change Trap Module

Model	UT450
Connections	Fits UC450 Series Universal Connectors
Body Material	Stainless Steel
PMO Max. Operating Pressure	450 PSIG
TMO Max. Operating Temperature	Saturated Steam Temp.
PMA Max. Allowable Pressure	720 PSIG @ 100°F
TMA Max. Allowable Temperature	800°F @ 400 PSIG

Steam trap modules can be used with other manufacturers' Universal Connectors.



UT450
Thermostatic
Steam Trap
Module

Typical Applications

DRIP, TRACER, PROCESS: The **UT450** Thermostatic Steam Trap Module can be used anywhere conventional thermostatic steam traps are used. Used for drip, tracing and light process applications. Trap module mounts to any 2-bolt Quick-Change Universal Connector.

How It Works

The UC450 universal connector is permanently installed into the pipeline where the steam trap would normally be placed. The trap module is fastened to the universal connector with two bolts. When a new trap module is needed, it can be easily removed and replaced with a standard open-end or socket wrench without disturbing the existing piping.

Features

- Trap module can be easily removed and replaced in minutes without having to disconnect any piping
- Trap modules can be used with most manufacturers' 2-bolt universal connector
- All stainless steel construction with hardened seat

Sample Specification

The steam trap module shall be designed to attach to the industry standard two-bolt universal connector. Trap module shall be of a thermostatic design. The universal connector shall conform to the two-bolt industry standard with integral strainer and blowdown options.

Installation and Maintenance

Mounts to any two-bolt quick change universal connector. Trap module is attached to the connector using two bolts and two sealing gaskets. When a new trap module is needed, it can be easily removed and replaced with a standard open-end or socket wrench without unthreading the existing piping. In vertical piping installations with upward flow, use of a blowdown valve is not recommended. Discharge would be in upward and unsafe direction.

Options

Universal Connectors are available with an integral strainer and blowdown valve. Connector is purchased separately. See the Universal Connectors section for more information.

Special 43°F Sub-cool Bellows available.

(Note: Standard bellows are designed for approximately 5°F sub-cool temperature)

Helpful Selection Information

Connector selection to use with the UT450: UC450 (no strainer), UC450SR (strainer), UC450SBR (strainer and blowdown). Select this model for steam systems with maximum working pressure of 450 PSIG.

MATERIALS

Body	Stainless Steel, AISI 420
Thermal Element	Stainless Steel, AISI 302
Disc & Seat	Stainless Steel, AISI 420
Insulation Cover	Stainless Steel, AISI 304
Bolts	Steel, ASTM A193 GR B7
Gaskets (2)	Spiral Wound 304 Stainless Steel with Grafoil Filler

CAPACITIES — Condensate (lbs/hr)

Model	Orifice Size	Steam Inlet Pressure (PSIG)												
		5	10	20	50	100	125	150	200	250	300	350	400	450
UT450	3/16"	441	625	882	1391	1827	1969	2095	2305	2483	2636	2777	2903	3019

Note: 5/64" low capacity orifice is available upon request.

Back Pressure as Percentage of Inlet Pressure	10	20	25	30	40	50	60	70	80	90
Percent Decrease in Trap Capacity	0	0	0	2	5	12	20	30	40	55

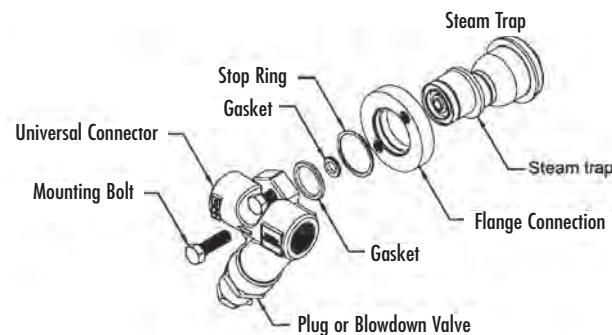
UT450

Thermostatic Steam Trap Module (mounts to UC450 Universal Connectors)



UT450
Thermostatic
Steam Trap
Module
shown with
UC450SL
Connectors

UT450 Trap Module may be
mounted in any orientation

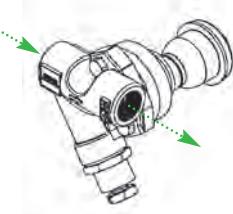


Horizontal Piping (Connector with Strainer)

Steam Flow to the Right or to the Left
UC450SBR & UC450SB Connector shown below



Trap shown with
UC450SBR Connector



Trap shown with
UC450SB Connector

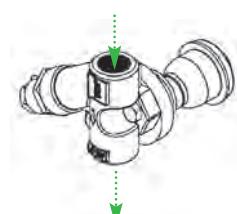


Vertical Piping (Connector with Strainer)

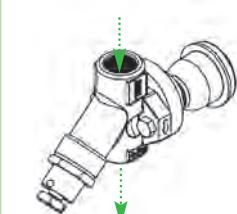
Steam Flow Downward
UC450SBR & UC450SB Connector shown below



Trap shown with
UC450SBR Connector



Trap shown with
UC450SB Connector

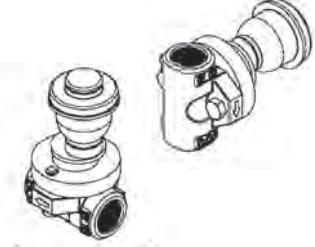


Vertical or Horizontal Piping (No Strainer)

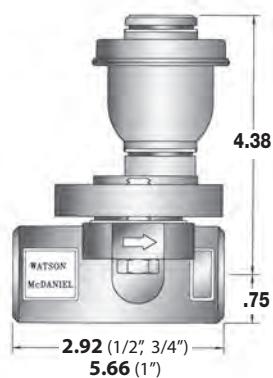
**Steam Flow Vertically
or Horizontally**
UC450 Connector shown below



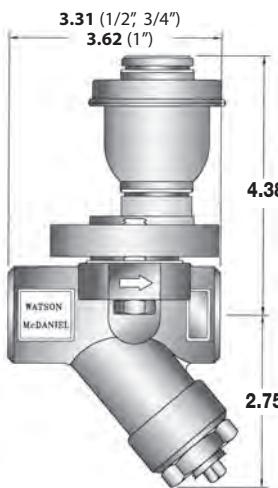
Trap shown with **UC450**
Connector



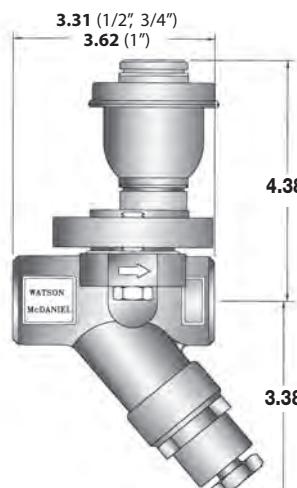
Connectors available in 1/2", 3/4" and 1" sizes in NPT and Socket-Weld Connections



UT450 Trap Module
with **UC450** Connector



UT450 Trap Module with **UC450S** Connector
(Strainer)



UT450 Trap Module
with **UC450SB** Connector
(Strainer & Blowdown)

UB450

Bi-Metallic Steam Trap Module

Universal Style Quick-Change Trap Module

Model	UB450
Connections	Fits UC450 Series Universal Connectors
Body Material	Stainless Steel
PMO Max. Operating Pressure	450 PSIG
TMO Max. Operating Temperature	662°F
PMA Max. Allowable Pressure	720 PSIG @ 100°F
TMA Max. Allowable Temperature	800°F @ 400 PSIG

Steam trap modules can be used with other manufacturers' Universal Connectors.

Typical Applications

The UB450 Series Bi-Metallic Steam Trap Modules are used in steam tracing applications (for process line heating, instrumentation and winterization, general steam jacketing). In tracing applications, the externally-adjustable (temperature adjustment) bi-metal element provides accurate control of condensate discharge temperature as required to maintain a specific product temperature as well provide maximum usage of energy.

How It Works

The UB450 contains bi-metallic plates of dissimilar metals that respond to steam temperature variations by expanding or contracting, depending upon the temperature, allowing condensate and air to discharge when cool, and trapping steam when hot. Condensate discharge temperature is field-adjustable. The trap module is fastened to the universal connector using 2-bolts.

Features

- Excellent for various steam tracing and small process applications where maximum energy usage is desired
- Field-adjustable bimetal element allows precise control of condensate discharge temperature, providing maximum use of additional energy in the condensate
- Internal screen and seat/plug design help prevent pipe scale and debris from accumulating on seating surfaces to provide trouble-free operation

Installation and Maintenance

Universal connector is first permanently threaded or welded into piping system. Trap module is attached to the universal connector using two bolts. If the trap fails for any reason, replace only the trap module. In vertical piping installations with upward flow, use of a blowdown valve is not recommended. Discharge would be in upward and unsafe direction.



UB450
Bi-Metallic
Steam Trap
Module

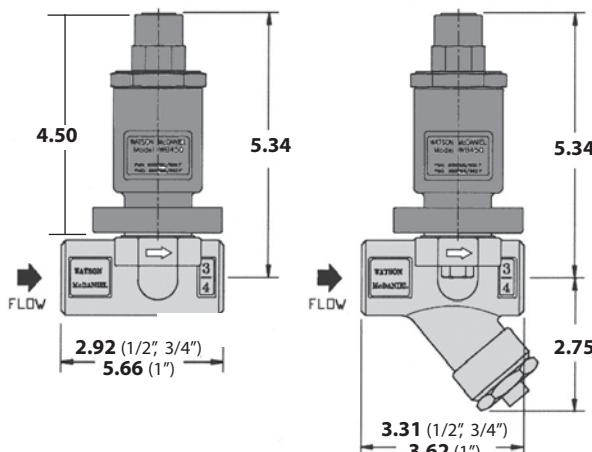
Field-adjustable
discharge
temperature



UB450
Bi-Metallic
Steam Trap
Module
shown with
UC450SBL
connector

MATERIALS

Body and Cover	Stainless Steel, A-351, Gr. CF8
Bimetal Element	GB14
Valve Seat	17-4 Ph Stainless Steel
Gaskets (2)	Spiral Wound 304 Stainless Steel with Grafoil Filler



Shown with
UC450 & UC450S Connectors

Maximum Trap Capacities at Various Inlet Pressures and Set Temperatures – Condensate (lbs/hr)

Set Temperature	Steam Inlet Pressure (PSIG)											
	15	30	50	100	125	150	200	250	300	350	400	450
220°F	56	70	102	144	161	177	204	228	250	270	289	306
240°F	116	164	212	300	336	368	425	475	520	562	600	637
260°F	134	190	245	346	387	424	490	548	600	648	693	735
280°F	143	202	261	370	413	453	523	584	640	691	739	784

Notes: 1) Capacities in chart are based on discharging condensate to atmosphere with a condensate temperature of 200°F.

2) Contact factory for additional information including other condensate set and discharge temperatures.

3) To ensure proper operation and eliminate possible steam loss, the Set Temperature should be lower than 27°F subcool (degrees below inlet steam saturation temperature).

UTD450H & UTD450HSP

Universal Style Quick-Change Trap Module

Thermodynamic Compact Steam Trap Module

(mounts to UC450H-Series Universal Connectors)

Model	UTD450H & UTD450HSP
Connections	Fits UC450H Special Universal Connectors
Body Material	Stainless Steel
PMO Max. Operating Pressure	450 PSIG
TMO Max. Operating Temperature	750°F
PMA Max. Allowable Pressure	450 PSIG @ 750°F
TMA Max. Allowable Temperature	750°F @ 450 PSIG

UTD450H/HSP
Steam Trap ModuleUC450H
Connector

Typical Applications

The **UTD450H** Series is a highly specialized Thermodynamic Steam Trap Module. Designed to mount on 1" UC450H Universal Quick-Change connectors, it offers **extremely high capacity** capability for special drip applications such as steam tunnels and manholes where long distances between steam traps and deteriorating pipe insulation are common. Combined with potential groundwater accumulations, capacity requirements in these applications far exceed normal drip applications. With only 2-bolts the non-swivel steam trap module can be quickly replaced making this design ideally suited for hazardous locations. Two bottom port options are included for possible monitoring.

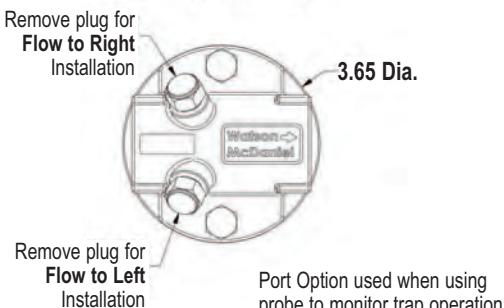
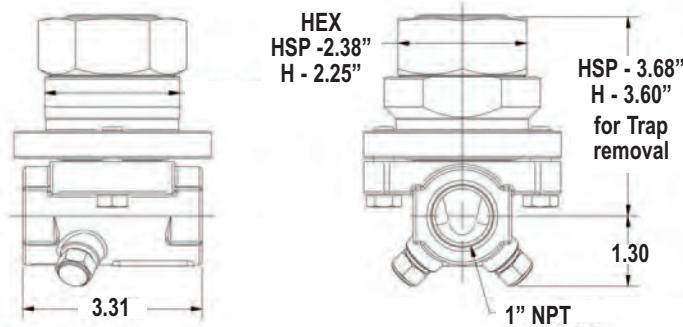
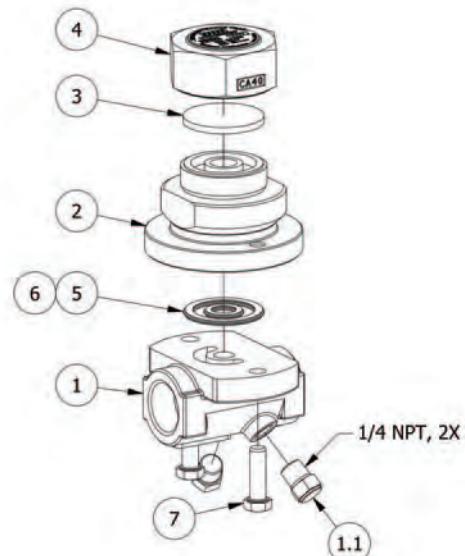
The UTD450HSP is a higher capacity version.
Module and connector comply with ASME B31.1
Power Piping.

Typical Applications

The UTD450H steam trap module can be installed in any orientation for normal operation.

Helpful Selection Information

The UTD450H is a special high capacity steam trap module and should only be used in applications where their capacity capabilities are appropriate. Consult factory for sizing and application assistance. Steam Trap Module and Connector are purchased separately.



Port Option used when using probe to monitor trap operation

MATERIALS

1) Connector	A-743 CA40 Stainless Steel, Nickel Plated
1.1) Pipe Plug	416 Stainless Steel
2) Trap Body	A-743 CA40 Stainless Steel, Nickel Plated
3) Disc	420 Stainless Steel
4) Cap	416 Stainless Steel
5) Outer Gasket	Spiral Wound Inconel 625 w/ Grafoil Fill
6) Inner Gasket	Spiral Wound Inconel 625 w/ Grafoil Fill
7) Bolt, 3/8-16	A-193 Grade B7, Nickel Plated

Note: Connector Part #'s: UC450HR-14-N (Flow to Right) & UC450HL-14-N (Flow to Left)

CAPACITIES – condensate (lbs/hr)

Size	Model Code	Steam Inlet Pressure (PSIG)									
		100	125	150	175	200	250	300	350	400	450
1"	UTD450H	1879	2070	2269	2491	2690	2985	3256	3510	3750	3979
	UTD450HSP	2930	3230	3540	3880	4200	4660	5084	5480	5855	6212

Universal Style Quick-Change Trap Test Station

(For use with **Universal Quick-Change Trap Modules**)

Connector Design: Class 600 per ANSI/ASME B 16.34

Model	UTS600
Sizes	1/2", 3/4", 1"
Connections	NPT, SW, FLG
Body Material	Stainless Steel
PMO Max. Operating Pressure	(trap module dependent)
TMO Max. Operating Temperature	(trap module dependent)
PMA Max. Allowable Pressure	1440 PSIG @ 100°F
TMA Max. Allowable Temperature	800°F @ 845 PSIG

The UTS600 Steam Trap Test Station contains Inlet & Outlet Isolation Valves, Blowdown Valve & Steam Trap Test Valve.

Typical Applications

DRIP, TRACER: UTS600 Series Universal Connector Steam Trap Test Station reduce the time and manpower to test and replace steam traps. The Trap Test Station remains permanently in-line allowing steam trap module to be replaced in minutes. Integral isolation valves and trap test valve allow for simple trap testing by visually inspecting trap discharge. These Trap Test Stations can be used for drip service on steam mains and steam supply lines, tracing, or for small process equipment. The 2-bolt Universal Connectors are commonly used in chemical plants, petrochemical refineries, paper mills, and other industrial facilities. The 2-bolt Universal Connectors are considered an industrial standard, making them compatible with other manufacturers' universal steam trap modules.

How It Works

The Test Trap Station permanently installed in the piping system. The convenient 2-bolt mounting system allows the trap module to be removed and replaced quickly and easily using a socket or open-end wrench without disturbing the existing piping. The handwheels control the integral piston-style inlet and outlet isolation valves while the test valve opens a port to visually inspect trap discharge and function. A strainer and blowdown valve are included to protect the trap module from fouling due to pipe scale and debris. Blowdown can also be used to reduce start-up times.

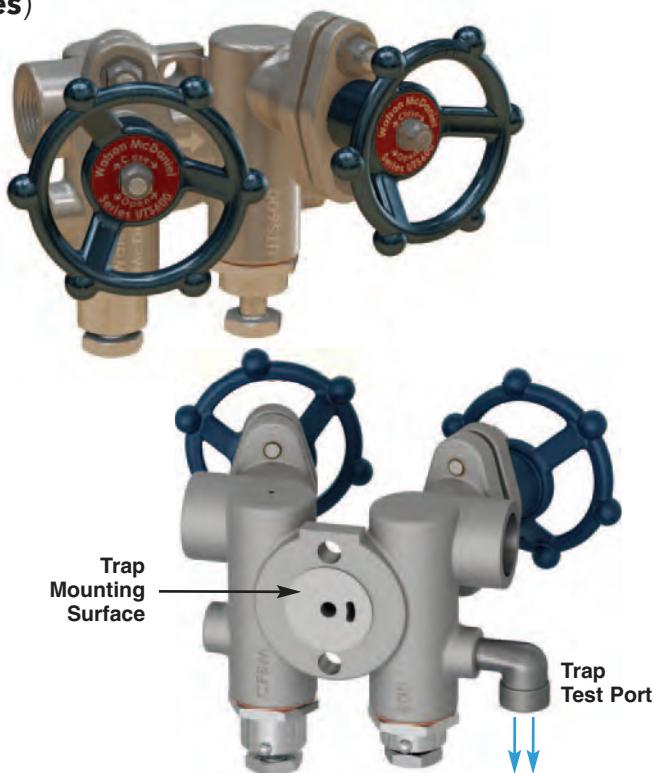
Features

- Universal connector with 2-bolt mounting allows for fast, easy replacement of trap module making it more cost-effective than replacing conventional type steam traps
- Integral piston-style valves allow for reliable isolation of trap module for testing and replacement of trap
- All stainless steel construction
- Trap module can rotate 360° on the universal connector allowing any orientation during installation
- Compatible with other manufacturers' trap modules
- Available with integral strainer and blowdown valve

Sample Specification

The Universal Connector Steam Trap Test Station shall be all stainless steel construction designed to ANSI/ASME B16.34 Class 600. The unit shall include a two-bolt 360 degree swivel mount flange design, piston-style isolation valves, test valve, and integral strainer and blowdown valve.

UTS600 Series



Installation and Maintenance

The universal connector can be installed in vertical or horizontal piping and available in 1/2", 3/4" and 1" threaded NPT, socket weld (SW), and flanged (FLG). In horizontal installations, orientation of connector body may be dependent on the specific type of trap module used. These connectors remain permanently installed in the piping system. The convenient 2-bolt mounting system allows the trap module to be easily replaced using a socket or open-end wrench without having to unthread piping. Pipe test port to safe location.

MATERIALS

Connector Body	Stainless Steel, ASTM A351 CF8M
Bonnet	Stainless Steel, ASTM A351 CF8M
Bonnet Studs	A193 Grade B7
Bonnet Nuts	A194 Grade 2H
Valve Stem & Piston	Stainless Steel, 416
Valve Rings	Graphite & Stainless Steel
Handwheel	Ductile Iron
Washers	Stainless Steel
Gasket	Copper
Strainer Screen	Stainless Steel, 304
Blowdown Body & Stem	Stainless Steel
Test Valve Body & Stem	Stainless Steel

Option

Internal Check Valve available; Consult factory..

How to Size / Order

Connectors and Trap Modules are ordered separately. See following pages for the Trap Modules.

UTS600 Series

Universal Style Quick-Change Trap Test Station

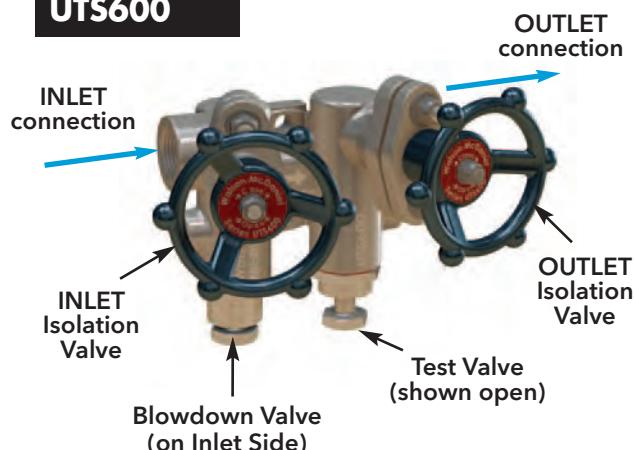
(For use with **Universal Quick-Change Trap Modules**)

Helpful Selection Information

Choose the desired style connector:
UTS600R (Flow to Right)
UTS600L (Flow to Left)

All connector styles will operate with any trap module. UTS600 Series Connectors include integral inlet and outlet isolation valves, strainer and blowdown valve on inlet side and test valve on outlet side.

UTS600



Size	Model Code Threaded - NPT	Model Code Socket Weld	Weight lbs
Connector (with Isolation Valves, Test Valve, Strainer and Blowdown Valve) FLOW TO RIGHT "R"			
1/2"	UTS600R-12-N	UTS600R-12-SW	7
3/4"	UTS600R-13-N	UTS600R-13-SW	7
1"	UTS600R-14-N	UTS600R-14-SW	9
Connector (with Isolation Valves, Test Valve, Strainer and Blowdown Valve) FLOW TO LEFT "L"			
1/2"	UTS600L-12-N	UTS600L-12-SW	7
3/4"	UTS600L-13-N	UTS600L-13-SW	7
1"	UTS600L-14-N	UTS600L-14-SW	9

Note: 1" units include weld adapters.

UTS600F



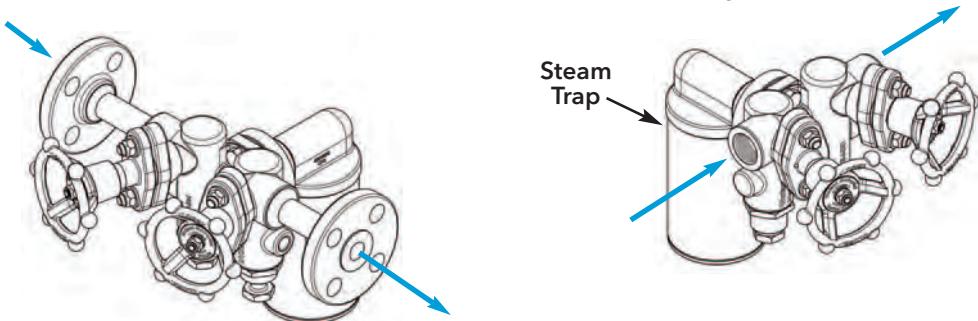
Size	Model Code Flanged - 150#	Model Code Flanged - 300#	Weight lbs
Connector (with Isolation Valves, Test Valve, Strainer and Blowdown Valve) FLOW TO RIGHT "R"			
1/2"	UTS600R-12-F150	UTS600R-12-F300	14
3/4"	UTS600R-13-F150	UTS600R-13-F300	14
1"	UTS600R-14-F150	UTS600R-14-F300	15
Connector (with Isolation Valves, Test Valve, Strainer and Blowdown Valve) FLOW TO LEFT "L"			
1/2"	UTS600L-12-F150	UTS600L-12-F300	14
3/4"	UTS600L-13-F150	UTS600L-13-F300	14
1"	UTS600L-14-F150	UTS600L-14-F300	15

Note: 600# FLG connections are available; consult factory.

Horizontal Piping

Steam Flow to the Right; Specify UTS600R
Steam Flow to the Left; Specify UTS600L

UTS600R Connector (shown below) with USIB450 Inverted Bucket Trap Module



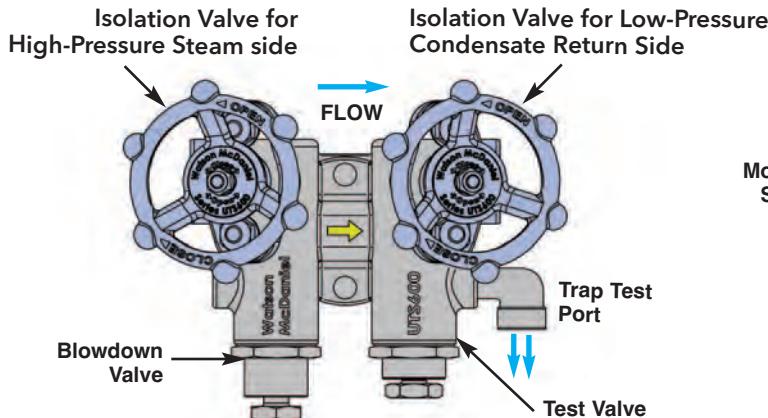
Universal Style

Quick-Change Trap Test Station(For use with **Universal Quick-Change Trap Modules**)**UTS600 Series**

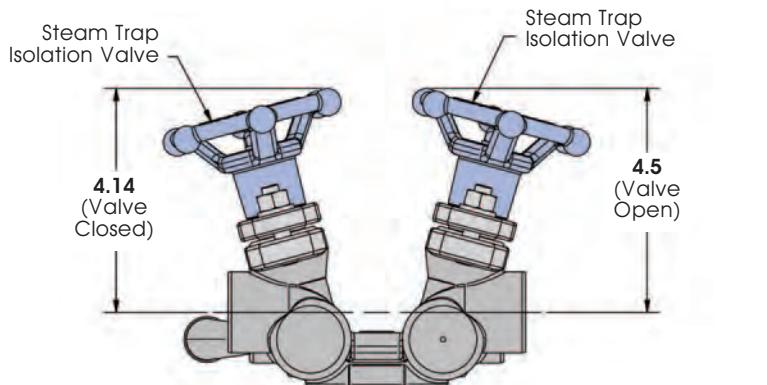
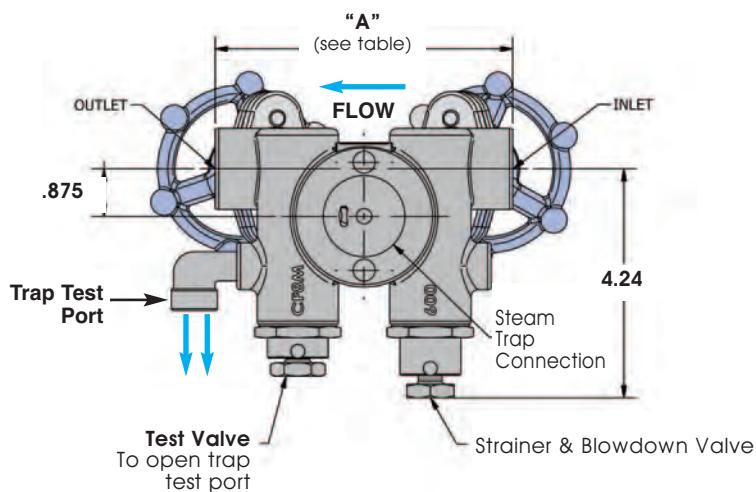
Dimensions & Model Codes

UTS600R Steam Trap Test Station

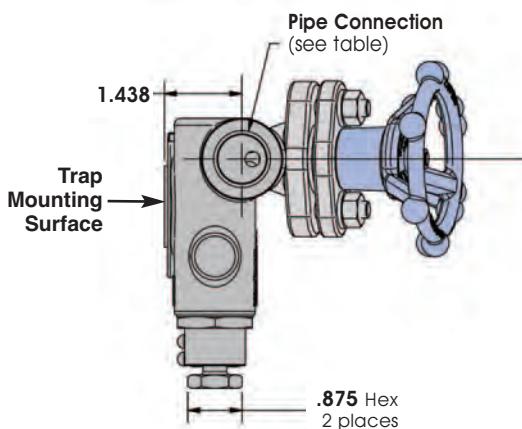
*Customized Flanged and Tube Fitting connections available; consult factory.



('R' Configuration Shown)
for Opposite Flow Order 'L' Configuration



Note: Do not exceed 8 full handle rotations when opening Isolation Valves.



Pipe Connection Inlet x Outlet	Model Code	A (in.)
1/2" NPT	UTS600R-12-N	5.50
1/2" SW	UTS600R-12-SW	5.50
1/2" 150# FLG	UTS600R-12-150	12.00
1/2" 300# FLG	UTS600R-12-300	12.00
1/2" 600# FLG	UTS600R-12-600	12.00
3/4" NPT	UTS600R-13-N	5.50
3/4" SW	UTS600R-13-SW	5.50
3/4" 150# FLG	UTS600R-13-150	12.00
3/4" 300# FLG	UTS600R-13-300	12.00
3/4" 600# FLG	UTS600R-13-600	12.00
1" NPT	UTS600R-14-N	8.25
1" SW	UTS600R-14-SW	8.25
1" 150# FLG	UTS600R-14-150	12.00
1" 300# FLG	UTS600R-14-300	12.00
1" 600# FLG	UTS600R-14-600	12.00

Used with the following Watson McDaniel Steam Trap Modules:

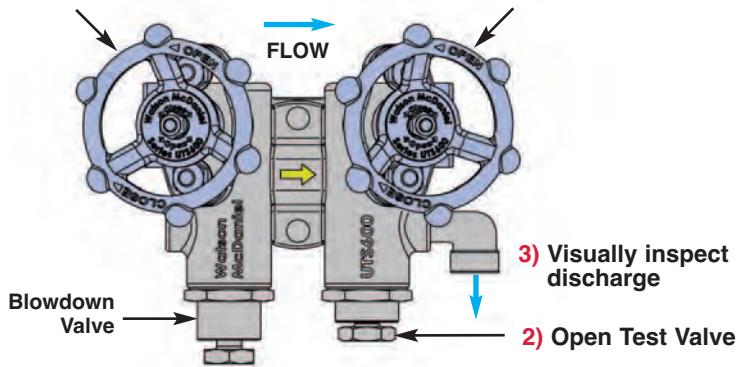
USIB450	- Inverted Bucket
UTD450	- Thermodynamic
UTD450SM	- Thermodynamic
UTD600LSM	- Thermodynamic
UT450	- Thermostatic
UFT450	- Float & Thermostatic
UB450	- Bi-Metallic

Features of the Watson McDaniel Steam Test Trap Station

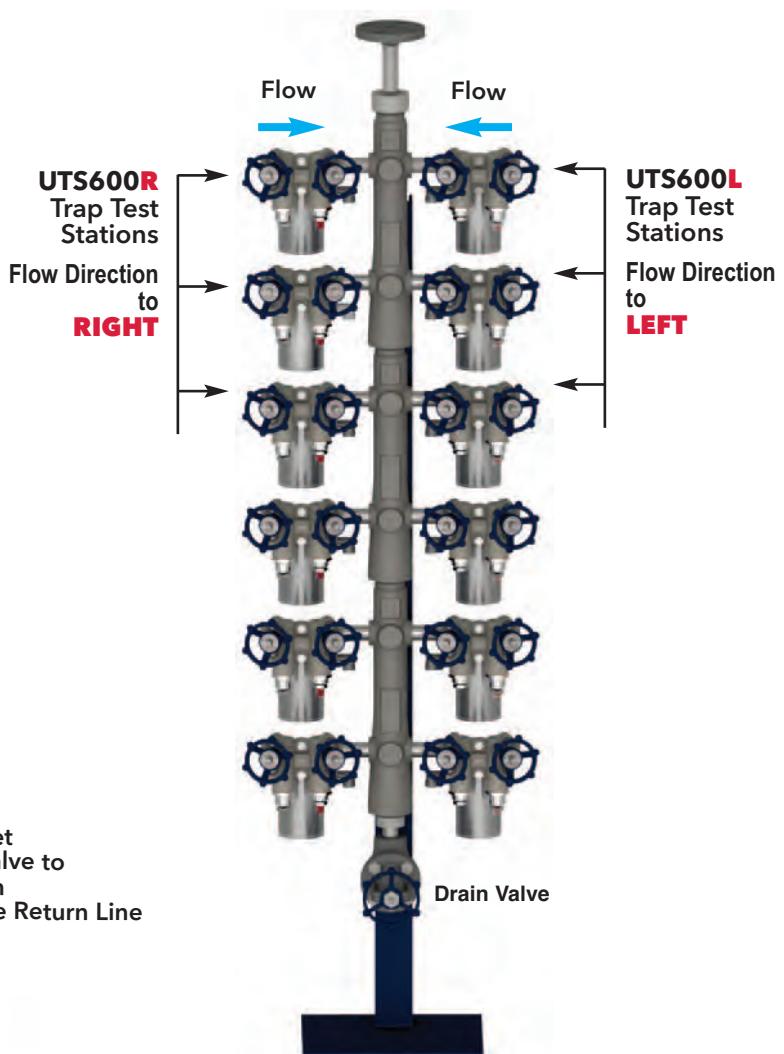
Testing steam traps is critical to prevent energy loss and maintain steam system safety. However, testing steam traps is often overlooked due to the tedious and sometimes difficult procedure to accurately assess a steam trap's operation.

The UTS600 Trap Test Station greatly simplifies the process of testing and maintaining a facility's steam trap population. By simply closing the Outlet Isolation Valve and opening the Test Valve, the condensate discharge is isolated from the Condensate Return Line and then routed through the Trap Test Port elbow to visually observe trap discharge. Visual inspection of a steam trap's discharge is the most accurate method of determining if a trap is functioning properly.

Isolation Valve
for
High-Pressure
Steam side



(‘R’ Configuration Shown)
for Opposite Flow Order ‘L’ Configuration



UTS600
Trap Test Stations
fitted with Inverted Bucket
Trap Modules
shown on a
CCM-12
(Condensate Collection
Manifold)

Steam Traps

Steam Distribution Manifolds

Forged Carbon Steel with Integral Isolation Valves

Model	SDM Series
Sizes	1/2", 3/4"
Connections	NPT, SW, Tube Fitting
Body Material	Forged Carbon Steel
PMO Max. Operating Pressure	825 PSIG
Pressure/Temperature Rating	825 PSIG @ 800°F

Typical Applications

SDM Series manifolds are used for **STEAM DISTRIBUTION TO** the tracing system. Commonly used in chemical and petrochemical facilities as well as in other industrial plants that have multiple tracing applications. Manifolding the steam distribution system not only reduces installation and maintenance costs, but also streamlines and organizes piping. The SDM Series has integral isolation valves (option available without isolation valves).

Description

The SDM Series manifold is forged carbon steel with 4, 8, or 12 branch steam outlet connections with integral isolation valves. Available with a variety of end connections, including NPT or Socket-weld. The top steam inlet connection is either Butt-weld or Flanged. The bottom condensate outlet connection is available with optional gate valve. The manifold assembly is offered separately or with optional frame stand.

Installation & Maintenance

Securely install the manifold in a vertical orientation with steam inlet connection at the top. A drip station with appropriately sized steam trap mounted at the bottom condensate outlet connection is recommended. If optional frame is selected, make certain it rests on a stable base and secure as needed.

Sample Specification

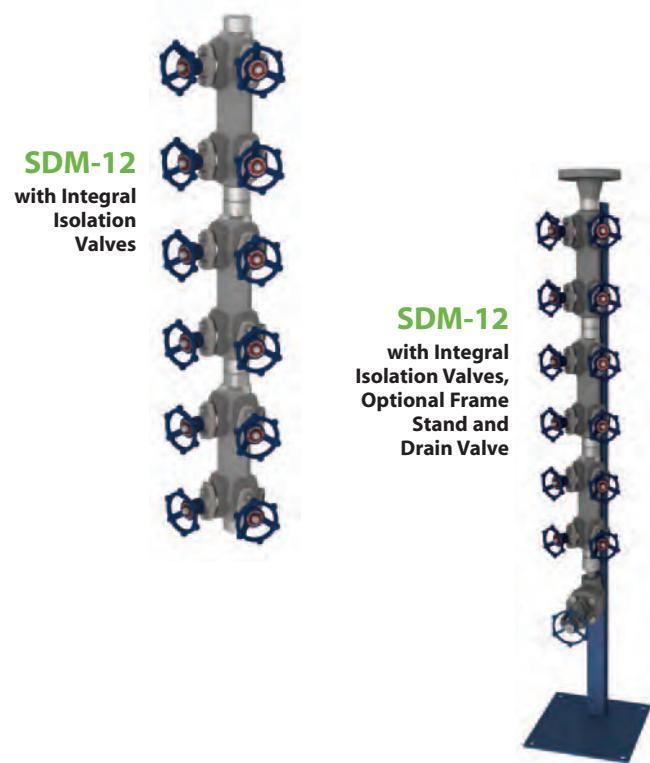
The steam distribution manifold shall be forged carbon steel with branch options to accommodate up to 12 steam supply connections.

Features

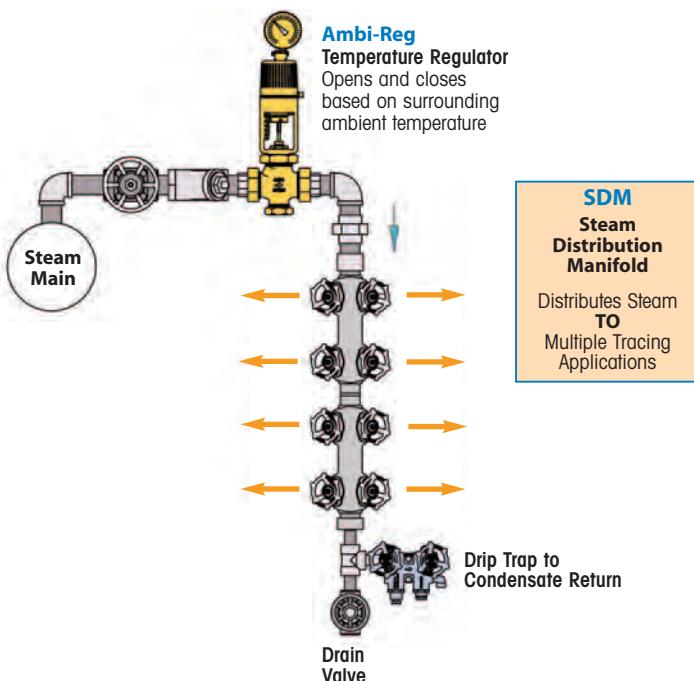
- Compact design saves valuable plant space
- Complete with Material Traceability Reports (CMTRs)
- Available in 4, 8, & 12 branch designs
- Integral piston-style valves allow for tight shut-off and long service life
- All welding in accordance with Section IX of the ASME Boiler and Pressure Vessel Code
- Provides freeze protection
- Reduces installation and maintenance time
- Options include frame stands, drip steam traps, drain valves, insulation jackets, etc.

SDM Series

Manifolds



Tracing Applications



MATERIALS

Manifold Body	Forged Carbon Steel SA-105N
Frame	Carbon Steel
Drain Valve (optional)	Carbon Steel

Steam Traps

Steam Distribution Manifolds

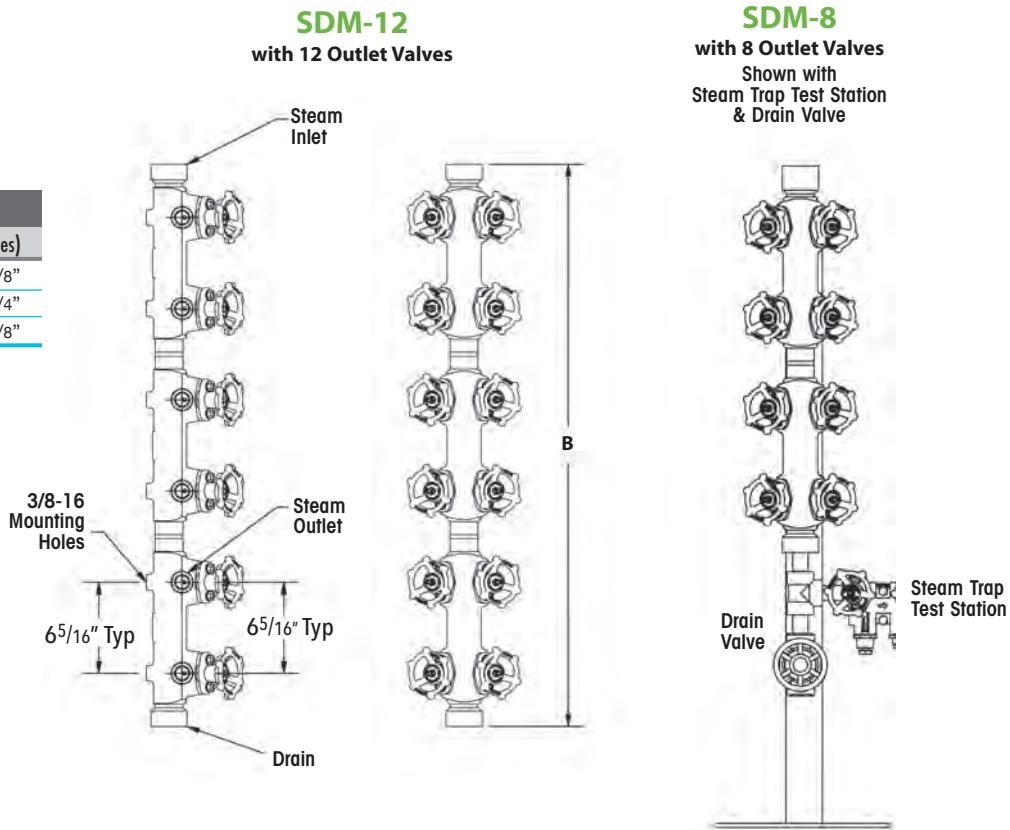
SDM Series

Manifolds

Forged Carbon Steel **with Integral Isolation Valves**

DIMENSIONS

Model	# of Outlet Valves	B (inches)
SDM	4	135/8"
SDM	8	261/4"
SDM	12	387/8"



Model Code Configuration Chart

Models	Type	Branch Count	Branch Outlet Connections		Top (Steam Inlet) Connection		Bottom (Condensate Outlet) Connection		Options	
			Size	Type	Size	Type	Size	Type		
SDM	Steam Distribution Manifold	4	12	1/2"	N	(F)NPT	13	3/4"	N (F)NPT	
			13	3/4"	SW	Socket Weld	14	1"	BW Butt Weld	
			10	1/4"	WN	Welded Nipples	16	1 1/2"	F1 150# RF Flange	
			11	3/8"	BP	BSPP - British Straight Thread	17	2"	F3 300# RF Flange	
		8	TW Tube Weld 1/4" or 3/8"		D1 DIN Flg. PN 100		D2 DIN Flg. PN 20		3/4" Drain Valve Frame Stand Insulation Jacket Drip Leg Station	
			D5 DIN Flg. PN 50		D6 DIN Flg. PN 100		F1 150# RF Flange			
			D4 DIN Flg. PN 40		F2 300# RF Flange		F3 300# RF Flange			
			D3 DIN Flg. PN 65		F4 600# RF Flange		F6 600# RF Flange			

Note: Additional configurations available: Consult factory.

Steam Distribution Manifold are available without integral isolation valves; See Model CCM or FM on following pages.

Example Model Code: **SDM-813SW16F113SW**, Insulation Jacket

Steam Distribution Manifold with (8) 3/4" SW Branch Connections, 1 1/2" 150# RF Flange Top Connection, 3/4" SW Bottom Connection with Optional Insulation Jacket

Steam Traps

Condensate Collection Manifolds

Forged Carbon Steel

Models	CCM	Plain Manifold
Model	CCMS	w/ Internal Siphon Tube
Model	CCMV	w/ Isolation Valve
Model	CCMVS	w/ Isolation Valves & Siphon Tube
Sizes	1/2", 3/4"	
Connections	NPT, SW, Tube Fitting	
Body Material	Forged Carbon Steel	
PMO Max. Operating Pressure	825 PSIG	
Pressure/Temperature Rating	825 PSIG @ 800°F	

Typical Applications

CCM Series manifolds are used for **CONDENSATE COLLECTION** FROM the tracing system. Commonly used in chemical and petrochemical facilities as well as in other industrial plants that have multiple tracing applications. Manifolding the condensate collection system not only reduces installation and maintenance costs, but also streamlines and organizes piping.

Description

The CCM Series manifold is forged carbon steel with 4, 6, 8, 10, or 12 branch condensate inlet connections available with a variety of end connections, including NPT or Socket-weld. The top condensate outlet connection is either NPT, Butt-weld or Flanged. The bottom drain connection is available with optional gate valve. The manifold assembly is offered separately or with optional frame stand. **Model CCMS** condensate collection manifold is provided with a built-in siphon tube to minimize bi-phase flow, which reduces water hammer and helps control flash steam.

Installation & Maintenance

Securely install the manifold in a vertical orientation with condensate outlet connection at the top. Steam trap stations and a bottom drain valve are required, and available as options. If optional frame is selected, make certain it rests on a stable base and secure as needed.

Sample Specification

The condensate collection manifold shall be forged carbon steel with branch options to accommodate up to 12 connections. Model CCMS manifold shall include integral siphon tube for promoting single phase condensate discharge.

Features

- Compact design saves valuable plant space
- Complete with Material Traceability Reports (CMTRs)
- Available in 4, 6, 8, 10, & 12 branch designs
- Available with pre-assembled steam trap stations including isolation and test valves
- All welding in accordance with Section IX of the ASME Boiler and Pressure Vessel Code

MATERIALS

Manifold Body	Forged Carbon Steel SA-105N
Frame	Carbon Steel
Universal Trap Station (optional)	Carbon Steel
Universal Steam Trap Module (optional)	Stainless Steel
Drain Valve (optional)	Carbon Steel

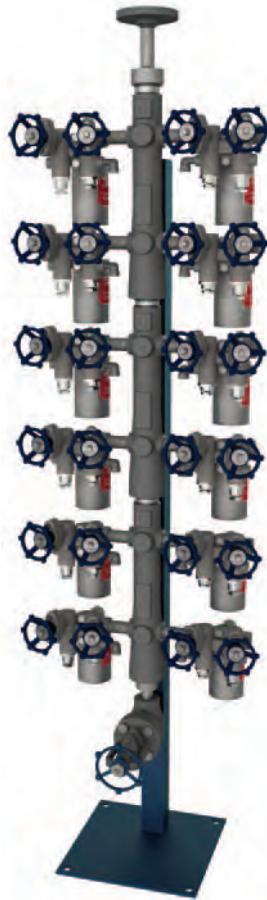


CCMS-12 Manifold

with Internal Siphon Tube

Shown with the following Options:

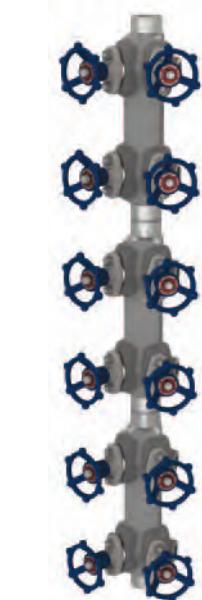
- Frame & Stand
- Drain Valve



CCMS-12 Manifold

Shown with the following:

- 12 UTS600 Trap Test Stations fitted with Inverted Bucket Trap Modules (See UTS600 section)
- Frame & Stand
- Drain Valve



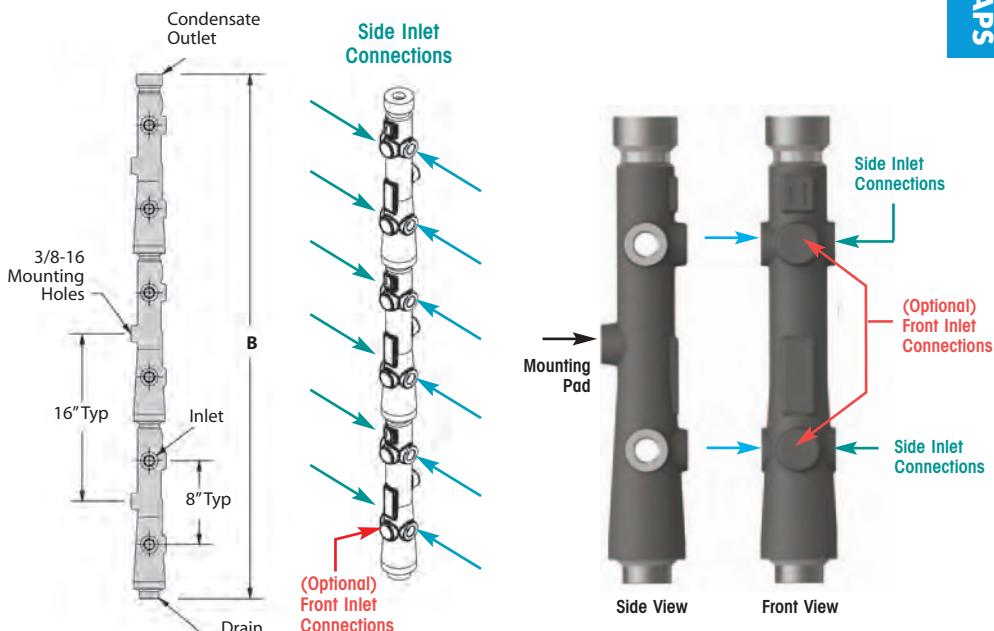
CCMVS-12 Manifolds

contain
Integral
Isolation Valves

Steam Traps
Condensate Collection Manifolds

Forged Carbon Steel

DIMENSIONS - inches		
Model	# of connections	B (inches)
CCM-4	4 sides	181/16"
CCM-6	4 sides/2 front	181/16"
CCM-8	8 sides	341/16"
CCM-10	8 sides/2 front	341/16"
CCM-12	12 sides	501/16"
CCMS-4	4 sides	199/16"
CCMS-6	4 sides/2 front	199/16"
CCMS-8	8 sides	359/16"
CCMS-10	8 sides/2 front	359/16"
CCMS-12	12 sides	519/16"
CCMV-4	4	135/8"
CCMV-8	8	261/4"
CCMV-12	12	387/8"
CCMVS-4	4	151/8"
CCMVS-6	8	273/4"
CCMVS-12	12	403/8"



Model Code Configuration Chart

Models	Type	Branch Count	Branch Inlet Connections		Top (Condensate Outlet) Connection		Bottom (Drain Outlet) Connection		Options
			Size	Type	Size	Type	Size	Type	
CCM	Plain	4	12 1/2"	N (F)NPT	13 3/4"	N (F)NPT	13 3/4"	N (F)NPT	3/4" Drain Valve, Frame Stand, Insulation Jacket, Universal Trap Test Stations
CCMS	w/Siphon Tube	6	13 3/4"	SW Socket Weld	14 1"	BW Butt Weld	14 1"	MN (M)NPT	
		8		WN Welded Nipples	16 1 1/2"	F1 150# RF Flange	16 1 1/2"	SW Socket Weld	
		10		BP BSPP - British Straight Thread		F3 300# RF Flange		BW Butt Weld	
		12				F6 600# RF Flange		F1 150# RF Flange	
CCMV	w/ Valves	4				WD Welded Male NPT (with siphon)		F3 300# RF Flange	
CCMVS	w/Siphon Tubes & Valves	8				D2 DIN Flg. PN 20		F6 600# RF Flange	
		12	10 1/4"	TW 1/4" Tube Weld	17 2"	D5 DIN Flg. PN 50			
			11 3/8"	3/8" Tube Weld		D1 DIN Flg. PN 100			

S = Siphon Tube

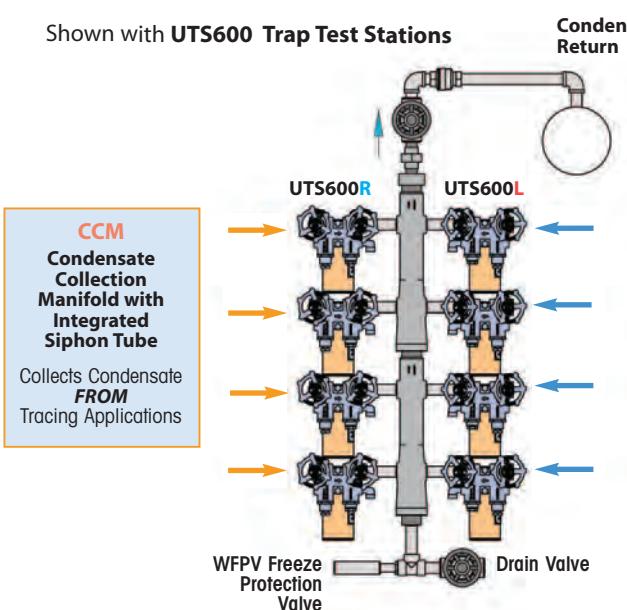
V = Integral Valves

Note: Standard connecting nipples will be Schedule 80. Schedule 160 available; Consult Factory.

Example Model Code: **CCM-413N13N13N** - 3/4" Drain Valve

Condensate Collection Manifold with (4) 3/4" NPT Branch Connections, 3/4" NPT Top Outlet Connection, 3/4" NPT Drain Connection, 3/4" Drain Valve

Shown with **UTS600 Trap Test Stations**



CCM-4
Condensate Collection Manifold
(shown with 4 UTS600 Trap Test Stations
fitted with
Inverted Bucket Steam Traps
and Drain Valve)

Steam Traps

Steel Manifolds

Fabricated Carbon Steel or Stainless Steel

Model	FM
Sizes	1/2", 3/4"
Connections	NPT, SW
Body Material	Carbon Steel or Stainless Steel
PMO Max. Operating Pressure	720 PSIG
Pressure/Temperature Rating	720 PSIG @ 508°F

Typical Applications

FM Series manifolds are used for either **STEAM DISTRIBUTION** or **CONDENSATE COLLECTION**.

Commonly used in chemical and petrochemical facilities as well as in other industrial plants that have multiple tracing applications. Manifolds are fabricated from carbon steel or stainless steel and available with either NPT or Socket-Weld connections.

Steam Distribution

Manifolding the steam distribution system not only reduces installation and maintenance costs but also streamlines and organizes piping.

Condensate Collection

Condensate collection type are available with a built-in siphon tube to minimize bi-phase flow and reduce water hammer, as well for freeze protection.

Features

- Compact design saves valuable plant space
- Fabricated Carbon Steel or Stainless Steel construction
- Available in 4, 6, 8, & 12 branch designs
- Standard designs or custom built manifolds available
- Reduces installation and maintenance time

MATERIALS

Manifold Body	Fabricated Carbon Steel or Stainless Steel
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FM Series

Manifolds

COLLECTION

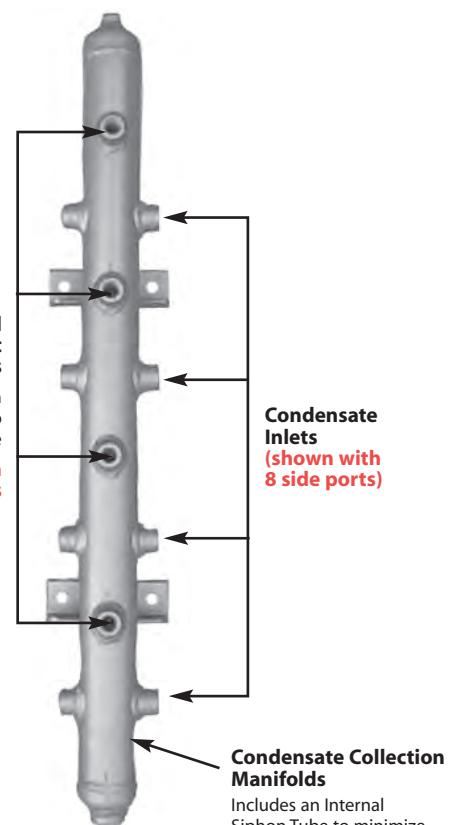
FM Manifold

Carbon Steel
(FM12 shown)

Optional Front Port Connections
for added installation flexibility to minimize space
(shown with 4 front ports)

Condensate Inlets
(shown with 8 side ports)

Condensate Collection Manifolds
Includes an Internal Siphon Tube to minimize Bi-phase Flow



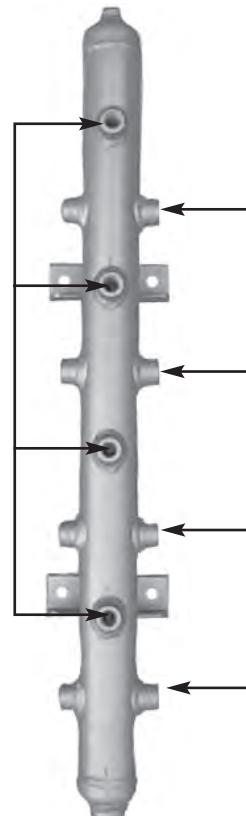
DISTRIBUTION

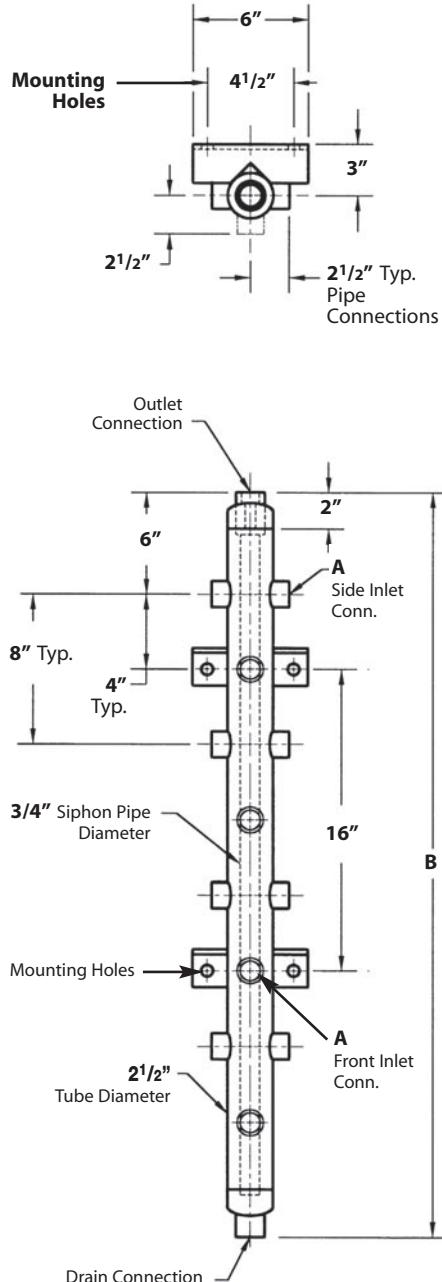
FM Manifold

(Carbon Steel)

Optional Front Port Connections
for added installation flexibility to minimize space
(shown with 4 front ports)

Steam Outlet Ports
(shown with 8 side ports)





Description Vertical Mount	Model Code	Inlet (A)		# Side Conn.	# Front Conn.	Conn. Total	B Length (in)	Wt. (lbs)
		Size	Type					
Condensate Collection (C) Manifolds with Internal Siphon Tube								
4 side conn.	FM4-12-N-C	1/2"	NPT	4	0	4	24	25
4 side conn.	FM4-13-N-C	3/4"	NPT	4	0	4	24	27
4 side/2 front conn.	FM6-12-N-C	1/2"	NPT	4	2	6	24	27
4 side/2 front conn.	FM6-13-N-C	3/4"	NPT	4	2	6	24	29
8 side conn.	FM8-12-N-C	1/2"	NPT	8	0	8	40	40
8 side conn.	FM8-13-N-C	3/4"	NPT	8	0	8	40	42
8 side/4 front conn.	FM12-12-N-C	1/2"	NPT	8	4	12	40	46
8 side/4 front conn.	FM12-13-N-C	3/4"	NPT	8	4	12	40	48
12 side conn.	FM12A-12-N-C	1/2"	NPT	12	0	12	56	56
12 side conn.	FM12A-13-N-C	3/4"	NPT	12	0	12	56	58
Steam Distribution (D) Manifolds								
4 side conn.	FM4-12-N-D	1/2"	NPT	4	0	4	24	25
4 side conn.	FM4-13-N-D	3/4"	NPT	4	0	4	24	27
4 side/2 front conn.	FM6-12-N-D	1/2"	NPT	4	2	6	24	27
4 side/2 front conn.	FM6-13-N-D	3/4"	NPT	4	2	6	24	29
8 side conn.	FM8-12-N-D	1/2"	NPT	8	0	8	40	40
8 side conn.	FM8-13-N-D	3/4"	NPT	8	0	8	40	42
8 side/4 front conn.	FM12-12-N-D	1/2"	NPT	8	4	12	40	46
8 side/4 front conn.	FM12-13-N-D	3/4"	NPT	8	4	12	40	48
12 side conn.	FM12A-12-N-D	1/2"	NPT	12	0	12	56	56
12 side conn.	FM12A-13-N-D	3/4"	NPT	12	0	12	56	58

Connection Codes: N = NPT, SW = Socket Weld

For Socket Weld Connections: change N in Model code to SW. Example: **FM4-12-SW-C**

Note: Custom designs available;
Consult factory.

Clean Steam Traps

 **Watson
McDaniel**



Clean Steam Traps

Introduction



What is Clean Steam or Pure Steam?

Clean Steam is steam that is made from deionized or distilled water in specialty boilers or steam generators. It is typically used in pharmaceutical applications such as sterilizers, fermenters and bioreactors as well as in the food production industries, distilleries and hospitals. Clean Steam should be used on any process that utilizes steam in such a way that it may come into direct contact with the end product and cause contamination. Industrial grade steam (most common grade of steam) is unsuitable for direct product contact because it contains contaminants from boiler additives, rust, and other heat transfer equipment. Pure Steam is clean steam that is produced to be virtually free of pyrogens and endotoxins, and is defined as "Water For Injection" or WFI.

Materials of construction

The Ultra-Pure water that is used to make clean steam has been depleted of all of its ions during the purification process, making it very chemically aggressive to metals, or "ion hungry." Therefore, only corrosion resistant metals such as 316 Stainless Steel can be used in products that handle clean steam. It's often required that the Stainless Steel in contact with Clean Steam must be passivated, a chemical process that removes any residual surface iron and promotes Chrome Oxide formation, further improving corrosion resistance.



Surface Finish

Smoothing the surfaces by means of polishing reduces the ridges and crevices where micro-organisms (bacteria) may grow. While mechanical polishing will reduce the surface ridges significantly, electro-polishing is required to meet the standards of sanitary systems. Electro-polishing is an electro-chemical process that smoothes the surface of a metal object by removing surface metal ion by ion. Ra is measured in microinches and refers to the smoothness of a surface. The lower the Ra number, the smoother the surface and the less chance for surface contamination and microorganism growth.


FDA300

FDA400

FDA500

FDA600

FDA800

Clean Steam

134-143

Model	Body Material	PMO (PSIG)	Sizes	Connections	Page No.
FDA300	Stainless Steel	90	1 1/2"	Tri-Clamp	137
FDA400	Stainless Steel	90	1/2", 3/4"	Tri-Clamp	138-139
FDA500	Stainless Steel	90	1/2", 3/4", 1"	Tri-Clamp, NPT, TW	140-141
FDA600	Stainless Steel	110	1/2", 3/4", 1"	Tri-Clamp, NPT, TW	142
FDA800	Stainless Steel	150	1/2"	Tri-Clamp, NPT, TW	143

Sanitary Steam Traps Vs. Clean Steam Traps

Steam traps to be installed in sanitary piping systems must adhere to stringent design standards beyond traps merely suitable for clean steam applications.

Sanitary Steam Traps are designed to offer free flow through internal passages by incorporating very smooth internal finishes. The internal electro-polish finish on a sanitary steam trap must be between 20-25 Ra while the external finish is usually between 25-32 Ra. Because the system must be periodically passivated to provide sterilization, these traps offer a sanitary tri-clamp connection on the body to allow for removal of the thermal element. Removal of the element allows unobstructed flow through the trap during passivation. The FDA300, FDA400 & FDA500 are Sanitary Steam Traps.

Clean Steam Traps are steam traps designed for the same functionality as the sanitary traps, but do not offer the same level of surface finish, RA. Therefore clean steam traps cannot be used when a sanitary specified application is required.

Clean-in-place (CIP) & Sterilization-in-place (SIP)

CIP is a system which allows the automatic cleaning and disinfecting of plant equipment without dismantling, using cleaning fluids such as detergents, acids, alkalies, and water. CIP uses a high flow, highly turbulent solution to remove soil in the system. Chemicals are used to break up and remove the remaining soil. Sanitizer is then used to kill remaining microorganisms.

SIP is the process of sterilizing plant equipment without dismantling, usually following CIP procedures. SIP uses low pressure steam for sterilization purposes – typically 30 – 35 psig. The steam trap bodies must be passivated to remove any residual iron deposits as well as to promote a chrome oxide layer to enhance corrosion resistance of the stainless steel.

Connections

Because different facilities may identify different areas of potential contamination in a piping system, various end connections are available to satisfy customer needs.

Sanitary Tri-Clamp - A quick disconnect type fitting that meets sanitary piping standards allowing piping systems or products to be easily dismantled.

Tube Weld (TW) - a connection offered where welding of the steam trap is preferred for sanitary applications

NPT – a standard national pipe thread taper connection offered for applications with less stringent requirements, often considered on main line drip applications

Manufacturing and Design Standards

ASME BPE – Provides requirements of equipment used in bioprocessing, pharmaceutical and other applications that require high hygienic levels.

USP 24 – Standard for Pharmaceutical Grade Water which specifies the chemical composition of the allowable number of contaminants.

FDA CFR Title 21-177.1550 – Standard for perfluoro-carbon resins that may be safely used as components intended to contact food.

3A Sanitary Standards – Standards provide material specifications, design criteria and other necessary information for equipment types to satisfy public health concerns where a high degree of sanitation is required.

High-Capacity Sanitary

Model	FDA300
Sizes	1 1/2"
Connections	Tri-Clamp
Body Material	Stainless Steel
PMO Max. Operating Pressure	90 PSIG
TMO Max. Operating Temperature	Saturated Steam Temperature
PMA Max. Allowable Pressure	145 PSIG up to 338°F
TMA Max. Allowable Temperature	350°F @ 132 PSIG



Typical Applications

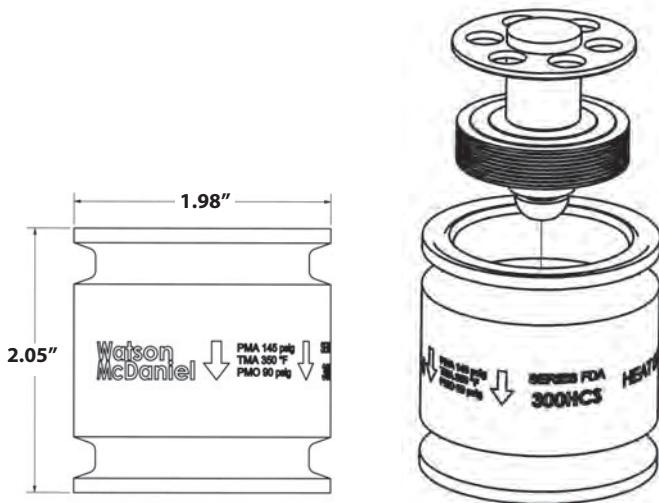
PROCESS: FDA300 Series high-capacity thermostatic clean steam traps are used on clean steam applications, and for condensate drainage on CIP/SIP systems and various process vessels.

How It Works

This trap contains a welded 316L stainless steel thermal element that expands when heated and contracts when cooled. When air and subcooled condensate are present, the trap is in an open discharge position. When steam reaches the trap, the element expands, closing the trap tightly.

Features

- All wetted parts are 316L stainless steel
- Electro-polish finish of 20-25 microinches RA on internal surfaces of body
- Electro-polish finish of 25-32 microinches RA on external surfaces of body
- Operates close to saturation curve to minimize condensate back-up
- Completely self-draining in the vertical downward flow orientation



Size/Connection Inlet x Outlet	Model Code	Orifice Size	Weight lbs
1 1/2" TC x TC	FDA300-16-TCTC	0.394	2.25

Sample Specification

The steam Trap shall be all 316L stainless steel thermostatic type with a balanced pressure bellows that operates close to saturated steam temperatures. Internal body parts shall have an electro-polish finish of 20-25 microinches RA internally and a 25-32 finish externally. The unit shall have a split-body sanitary clamp design for easy maintenance. Trap shall be completely self-draining when mounted vertically.

Installation and Maintenance

This trap is designed for installation in a vertical, downward flow orientation to ensure that the self-draining clean steam requirement is satisfied.

Options

Electropolish to 15 Ra internal or lower is available;
Consult factory.

MATERIALS

Body	Stainless Steel, AISI 316L	
Element Plate	Stainless Steel, AISI 316L	
Thermal Element	Stainless Steel, AISI 316L	
Clamp	Stainless Steel, AISI 304	

Model	Orifice (Inches)	Differential Pressure (PSI)					
		5	10	20	50	75	90
FDA300	0.394	216	368	702	2214	4300	5904

Note: Capacities at 9°F below saturated steam temperature

Steam Traps

Clean Steam Thermostatic Steam Trap

(Repairable)

FDA400

Thermostatic Clean Steam

Model	FDA401, FDA402, FDA403
Sizes	1/2", 3/4"
Connections	Tri-clamp
Body Material	Stainless Steel
PMO Max. Operating Pressure	90 PSIG
TMO Max. Operating Temperature	Saturated Steam Temperature
PMA Max. Allowable Pressure	145 PSIG up to 338°F
TMA Max. Allowable Temperature	350°F @ 132 PSIG

Material Traceability Reports (MTR) provided with all FDA400 Series Steam Traps.



Typical Applications

DRIP, PROCESS: **FDA400 Series** thermostatic clean steam traps are used in clean steam applications such as drainage for CIP/SIP systems and various process vessels. The universal horizontal connection allows the trap body to swivel to any angle. The FDA400 Series allows for a 90 degree connection either the inlet or outlet capable of 360 degree orientation.

How It Works

This trap contains a welded 316L stainless steel thermal element that expands when heated and contracts when cooled. When air and subcooled condensate are present, the trap is in an open discharge position. When steam reaches the trap, the element expands, closing the trap tightly.

Features

- Universal horizontal connection swivels to any angle
- All wetted parts are 316L stainless steel
- Electro-polish finish of 20-25 microinches RA on internal surfaces of body
- Electro-polish finish of 25-32 microinches RA on external surfaces of body
- Operates close to saturation curve to minimize condensate back-up
- Completely self-draining in the vertical downward flow orientation

Sample Specification

The Steam Trap shall be all 316L stainless steel thermostatic type with a balanced pressure bellows that operates close to saturated steam temperatures. Inlet, outlet or both connections must contain a 90° swivel arrangement capable of 360° orientation. Internal body parts shall have an electro-polish finish of 20-25 microinches RA internally and a 25-32 finish externally. The unit shall have a split-body sanitary clamp design for easy maintenance. Trap shall be completely self-draining when mounted vertically.

Installation and Maintenance

Trap is designed for installation in a vertical, downward flow orientation to ensure that the self-draining clean steam requirement is satisfied.

Options

Electropolish to 15 Ra internal or lower is available; Consult factory.

Special Bellows available that sub-cools 2°F

Size/Connection Inlet x Outlet	Model Code	Port Configuration		Weight lbs
9/64" Orifice (0.141)				
1/2" TC x TC	FDA401-12-TCTC	90°	90°	3
1/2" TC x TC	FDA402-12-TCTC	90°	Straight	3
1/2" TC x TC	FDA403-12-TCTC	Straight	90°	3
5/16" Orifice (0.312)				
3/4" TC x TC	FDA411-13-TCTC	90°	90°	3
3/4" TC x TC	FDA412-13-TCTC	90°	Straight	3
3/4" TC x TC	FDA413-13-TCTC	Straight	90°	3

MATERIALS

Body	Stainless Steel, AISI 316L				
Gasket	Teflon/Encapsulated Viton				
Element Plate	Stainless Steel, AISI 316L				
Thermal Element	Stainless Steel, AISI 316L				
Clamp	Stainless Steel, AISI 304				

CAPACITIES – Condensate (lbs/hr)

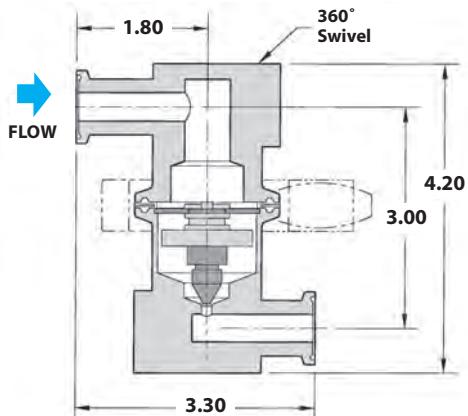
Model	Orifice (inches)	Differential Pressure (PSI)					
		5	10	20	50	75	90
FDA400	9/64	140	240	400	690	850	950
FDA410	5/16	850	1200	1695	2690	3165	3400

Note: Capacities at 10°F below saturation.

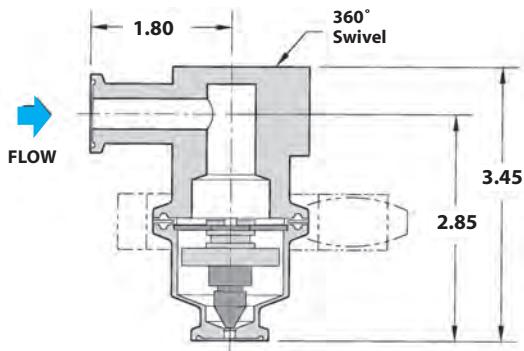
FDA400 Series Connections: 1/2" & 3/4"

Units: inches

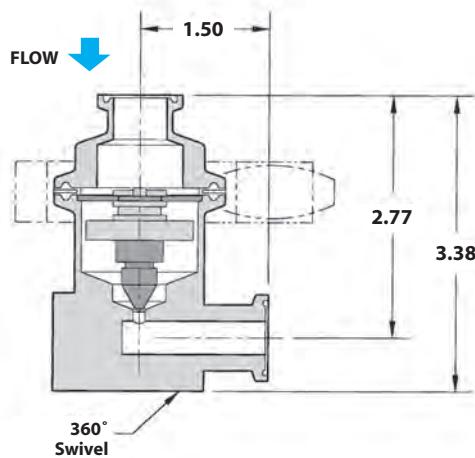
FDA401 9/64" Orifice (0.141) **Inlet: 90° Angle**
FDA411 5/16" Orifice (0.312) **Outlet: 90° Angle**



FDA402 9/64" Orifice (0.141) **Inlet: 90° Angle**
FDA412 5/16" Orifice (0.312) **Outlet: Straight**



FDA403 9/64" Orifice (0.141) **Inlet: Straight**
FDA413 5/16" Orifice (0.312) **Outlet: 90° Angle**



Steam Traps

Clean Steam Thermostatic Steam Trap (Repairable)

Model	FDA500, FDA510
Sizes	1/2", 3/4", 1", 1 1/2"
Connections	Tri-clamp, NPT, Tube Weld
Body Material	Stainless Steel
PMO Max. Operating Pressure	90 PSIG
TMO Max. Operating Temperature	Saturated Steam Temperature
PMA Max. Allowable Pressure	145 PSIG up to 338°F
TMA Max. Allowable Temperature	350°F @ 132 PSIG

Material Traceability Reports (MTR) provided with all FDA500 Series Steam Traps.

Typical Applications

DRIP, PROCESS: FDA500 Series thermostatic clean steam traps are used in clean steam applications as drip traps on piping runs as well as for drainage for CIP/SIP systems and various process vessels.

How It Works

This trap contains a welded 316L stainless steel thermal element that expands when heated and contracts when cooled. When air and subcooled condensate are present, the trap is in an open discharge position. When steam reaches the trap, the element expands, closing the trap tightly.

Features

- All wetted parts are 316L stainless steel
- Electro-polish finish of 20-25 microinches RA on **internal** surfaces of body. Consult factory for 15RA max surface finish option.
- Electro-polish finish of 25-32 microinches RA on **external** surfaces of body
- Operates close to saturation curve to minimize condensate back-up
- Completely self-draining in the vertical downward flow orientation

Sample Specification

The steam Trap shall be all 316L stainless steel thermostatic type with a balanced pressure bellows that operates close to saturated steam temperatures. Internal body parts shall have an electro-polish finish of 20-25 microinches RA internally and a 25-32 finish externally. The unit shall have a split-body sanitary clamp design for easy maintenance. Trap shall be completely self-draining when mounted vertically.

Installation and Maintenance

This trap is designed for installation in a vertical, downward flow orientation to ensure that the self-draining clean steam requirement is satisfied. If purchased with tube weld connections with the intention of welding in-line, the thermal element and gasket must be removed during the welding process or heat damage may occur.

Options

Electropolish to 15 Ra internal or lower is available; Consult factory.

Special Bellows available that sub-cools 2°F

FDA500

Thermostatic Clean Steam



Size/Connection Inlet x Outlet	Model Code	Orifice Size	Weight lbs
1/2" TC x TC	FDA500-12-TCTC	9/64"	2.00
3/4" TC x TC	FDA500-13-TCTC	9/64"	2.00
1" TC x TC	FDA500-14-TCTC	9/64"	2.25
1 1/2" TC x TC	FDA500-16-TCTC	9/64"	2.25
1/2" TC x TC	FDA510-12-TCTC	5/16"	2.00
3/4" TC x TC	FDA510-13-TCTC	5/16"	2.00
1" TC x TC	FDA510-14-TCTC	5/16"	2.25
1 1/2" TC x TC	FDA510-16-TCTC	5/16"	2.25
1/2" TC x NPT	FDA500-12-TCNP	9/64"	2.00
3/4" TC x NPT	FDA500-13-TCNP	9/64"	2.00
1" TC x NPT	FDA500-14-TCNP	9/64"	3.00
1 1/2" TC x NPT	FDA500-16-TCNP	9/64"	2.25
1/2" TC x NPT	FDA510-12-TCNP	5/16"	2.25
3/4" TC x NPT	FDA510-13-TCNP	5/16"	2.25
1" TC x NPT	FDA510-14-TCNP	5/16"	2.25
1 1/2" TC x NPT	FDA510-16-TCNP	5/16"	2.25
1/2" TW x TW	FDA500-12-TWTW	9/64"	2.25
1/2" TW x TW	FDA510-12-TWTW	5/16"	2.25

MATERIALS

Body	Stainless Steel, AISI 316L	
Gasket	Teflon/Encapsulated Viton	
Element Plate	Stainless Steel, AISI 316L	
Thermal Element	Stainless Steel, AISI 316L	
Clamp	Stainless Steel, AISI 304	

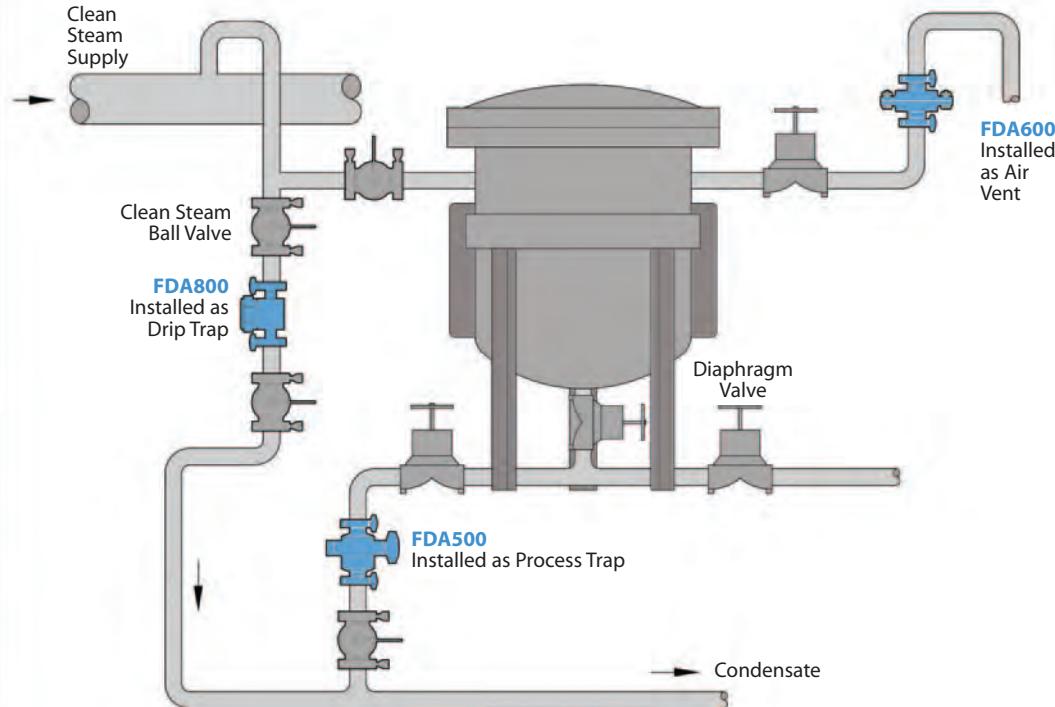
CAPACITIES – Condensate (lbs/hr)

Model	Orifice (inches)	Differential Pressure (PSI)					
		5	10	20	50	75	90
FDA500	9/64	140	240	400	690	850	950
FDA510	5/16	850	1200	1695	2690	3165	3400

Note: Capacities at 10°F below saturation.

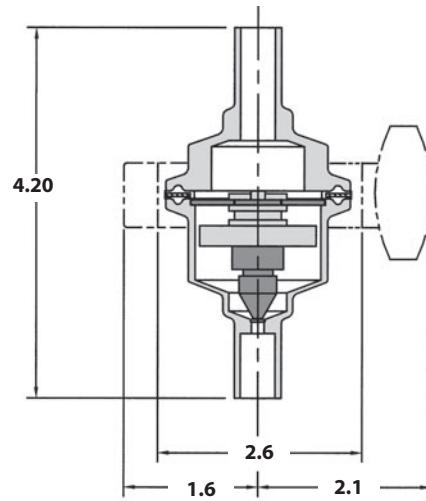
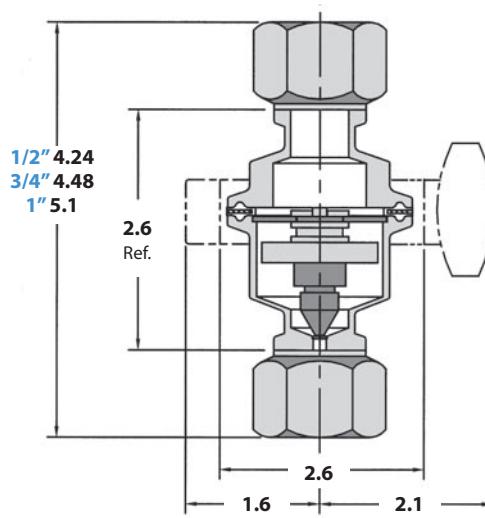
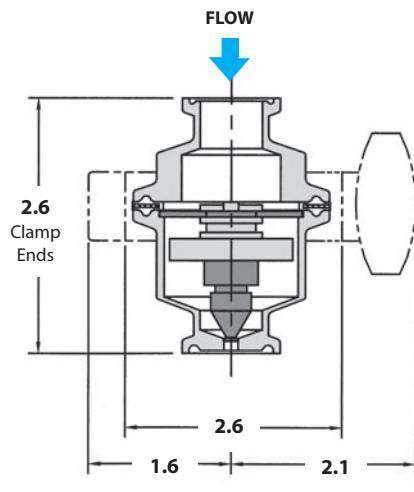


Typical Clean Steam Application



FDA500 Series Connections: 1/2", 3/4" & 1"

Units: inches

Tri-Clamp Connection: **TC x TC**Connection: **NP x NP** or **TC x NP**Tube-weld Connection: **TW x TW**

Steam Traps

Clean Steam Thermostatic Steam Trap

(Repairable)

FDA600

Thermostatic Clean Steam

Model	FDA600
Sizes	1/2", 3/4", 1"
Connections	Tri-clamp, NPT, Tube Weld
Body Material	Stainless Steel
PMO Max. Operating Pressure	110 PSIG
TMO Max. Operating Temperature	Saturated Steam Temperature
PMA Max. Allowable Pressure	145 PSIG up to 338°F
TMA Max. Allowable Temperature	350°F @ 132 PSIG



Typical Applications

DRIP, PROCESS: FDA600 Series thermostatic clean steam traps are used as drip traps on piping runs on clean steam applications and for drainage for CIP/SIP systems and various process vessels.

How It Works

This trap contains a welded 316L stainless steel thermal element that expands when heated and contracts when cooled. When air and subcooled condensate are present, the trap is in an open discharge position. When steam reaches the trap, the element expands, closing the trap tightly.

Features

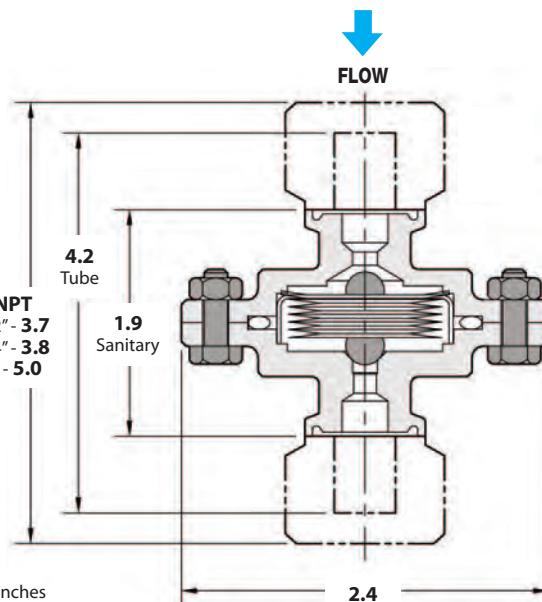
- All wetted parts are 316L stainless steel
- Operates close to saturation curve to minimize condensate back-up
- Completely self-draining in the vertical downward flow orientation

Sample Specification

The Steam Trap shall be all 316L stainless steel thermostatic type with a balanced pressure bellows that operates close to saturated steam temperatures. The unit shall have a split-body design for easy maintenance. Trap shall be completely self-draining when mounted vertically.

Installation and Maintenance

Trap is designed to be installed in a vertical, downward flow orientation to ensure that the self-draining clean steam requirement is satisfied. If purchased with tube weld connections with the intention of welding in-line, the thermal element and gasket must be removed during the welding process or heat damage may occur.



Size/Connection Inlet x Outlet	Model Code	PMO PSI	Weight lbs
1/2" TC x TC	FDA600-12-TCTC	110	1.25
3/4" TC x TC	FDA600-13-TCTC	110	1.25
1" TC x TC	FDA600-14-TCTC	110	1.25
1/2" TC x NPT	FDA600-12-TCNP	110	1.25
3/4" TC x NPT	FDA600-13-TCNP	110	1.25
1" TC x NPT	FDA600-14-TCNP	110	1.25
1/2" NPT x NPT	FDA600-12-NPNP	110	1.25
3/4" NPT x NPT	FDA600-13-NPNP	110	1.25
1" NPT x NPT	FDA600-14-NPNP	110	1.25
1/2" TW X TW	FDA600-12-TWTW	110	1.25

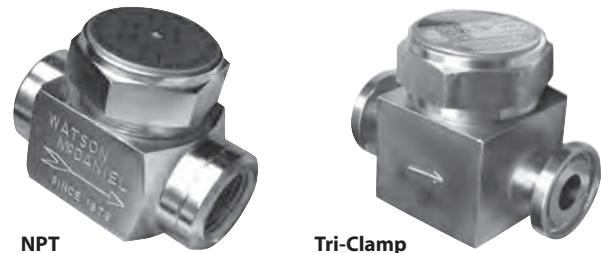
MATERIALS

Body	Stainless Steel, AISI 316L
Thermal Element	Stainless Steel, AISI 316L
O-Ring, FDA Grade	Teflon Coated Silicone/FEP
Nuts & Bolts	Stainless Steel, AISI 316L

CAPACITIES – Condensate (lbs/hr)

Condensate Temp Below Saturation	Differential Pressure (PSI)						
	1	5	10	20	50	75	110
10 °F	32	105	175	290	615	805	1160
20 °F	42	115	225	440	1060	1500	1850
Cold Water	735	1070	1375	1900	3100	3500	4600

Model	FDA800
Sizes	1/2"
Connections	Tri-Clamp, NPT, Tube Weld
Body Material	Stainless Steel
PMO Max. Operating Pressure	150 PSIG
TMO Max. Operating Temperature	500°F
PMA Max. Allowable Pressure	230 PSIG @ 850°F
TMA Max. Allowable Temperature	850°F @ 230 PSIG



Typical Applications

DRIP: The **FDA800 Series** thermodynamic clean steam traps are used as drip traps on steam mains in CIP/SIP systems and drainage for separators and filters.

How It Works

Using the thermodynamic properties of flash steam, this trap features a disc that is pushed open by incoming condensate, then closes tightly when steam enters the trap. Because it normally operates in an open position, condensate is continuously discharged from the line. Steam entering the trap creates an internal pressure that forces the valve to close tightly, preventing the steam from escaping.

Features

- Small and compact
- All 316L stainless steel components
- Works in any position (horizontal preferred)

Sample Specification

The steam trap shall be a thermodynamic disc type with an all 316L stainless steel construction and integral seat design. Unit shall be capable of installation in any orientation and self-draining when mounted vertically.

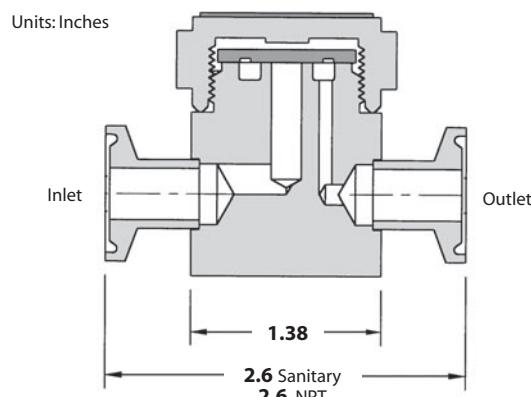
Installation and Maintenance

Can be installed in any position; however, horizontal is preferred. For self-draining requirements, the trap should be installed vertically. Installation should include a strainer before the trap inlet since dirt is a common cause of premature failure.

MATERIALS

Body	Stainless Steel, AISI 316L
Disc	Stainless Steel, AISI 316L
Cap	Stainless Steel, AISI 316L

Size/Connection Inlet x Outlet	Model Code	PMO PSI	Weight lbs
1/2" TC x TC	FDA800-12-TCTC	150	1.5
1/2" TW x TW	FDA800-12-TWTW	150	1.5
1/2" NPT x NPT	FDA800-12-NPBP	150	1.5



CAPACITIES – Condensate (lbs/hr)

Size	Differential Pressure (PSI)											
	3.5	5	10	15	20	25	30	40	50	75	100	150
1/2"	180	185	190	195	200	215	220	230	250	310	375	500

Note: Maximum back pressure not to exceed 80% of inlet pressure.