Thermo-Dynamic® Steam Traps

for efficient condensate drainage of steam mains, steam tracing systems and industrial process equipment

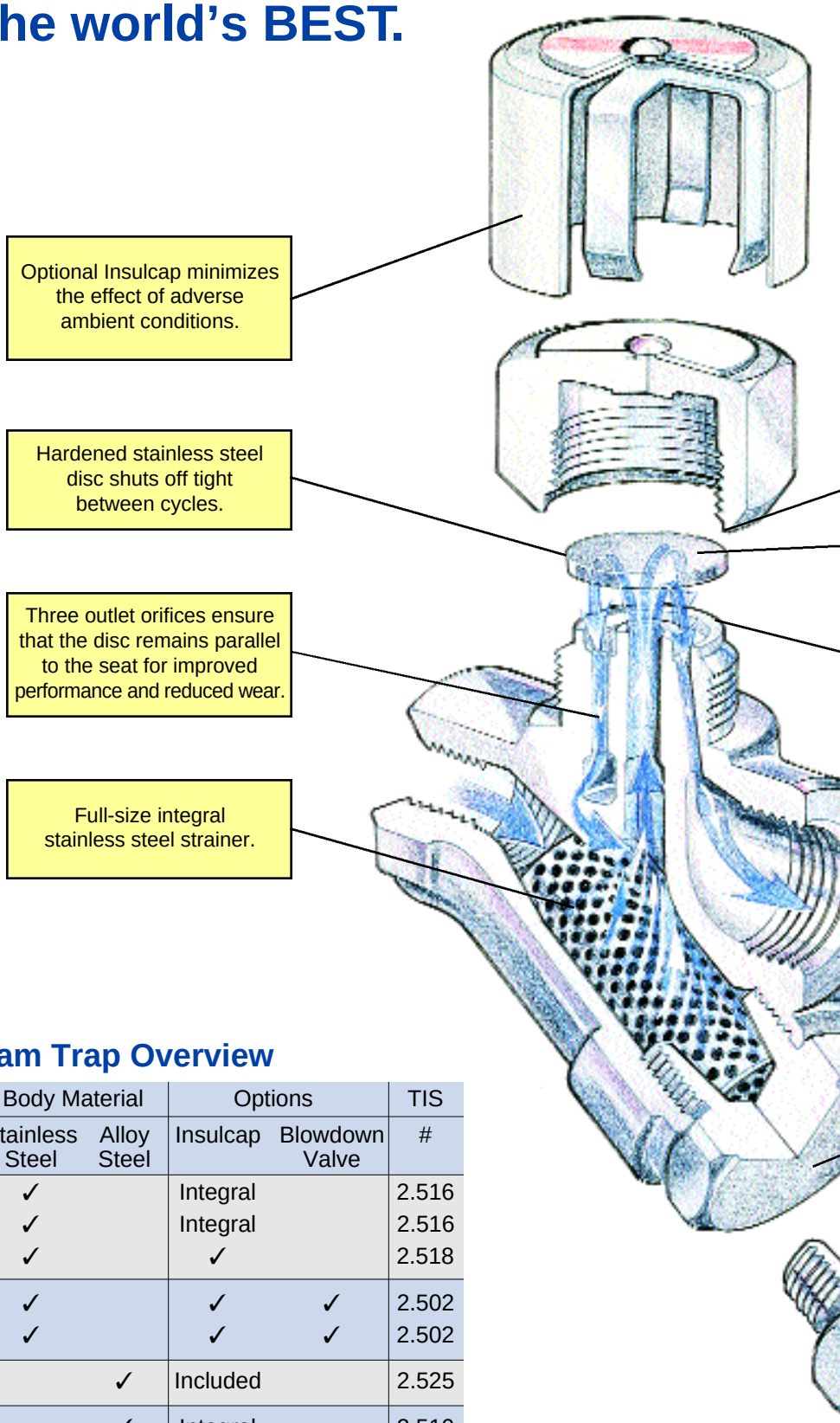
spirax sarco®

The world's FIRST Thermo-Dynamic® disc trap is still the world's BEST.

The Thermo-Dynamic® disc trap is one of the most popular steam traps on the market today. The cost effective, compact design makes the TD ideal for drainage of steam mains, steam tracing lines and small process equipment where size, as well as efficient operation are important.

Discharge from the TD is close to steam temperature; therefore, the steam space is kept free from condensate. The tight shut-off the TD provides prevents valuable steam from being wasted. These factors combine to optimize the steam system efficiency.

Spirax Sarco invented and patented the TD in 1953. Since then, the range has been refined to accommodate a variety of sizes and piping orientations and operating pressures up to 1740 psig.



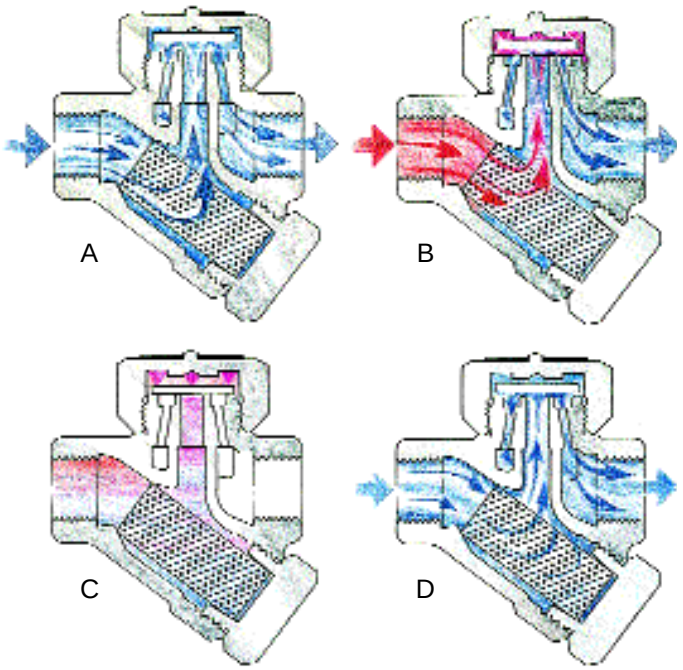
Thermo-Dynamic® Steam Trap Overview

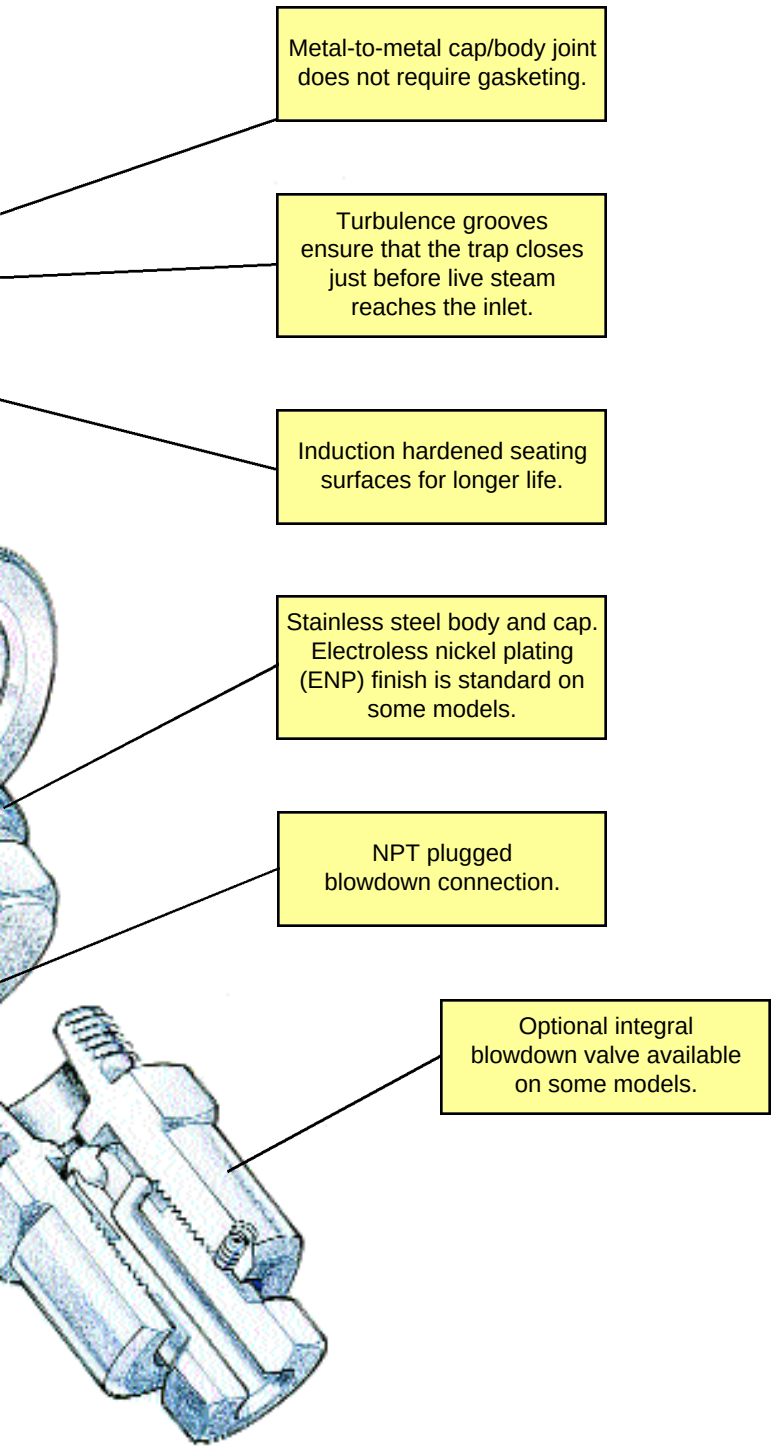
Model	Sizes (inches)				Connections			Body Material		Options		TIS
	3/8	1/2	3/4	1	NPT	SW	FLG	Stainless Steel	Alloy Steel	Insulcap	Blowdown Valve	#
TD52	✓	✓	✓	✓	✓			✓		Integral		2.516
TD52L		✓	✓		✓			✓		Integral		2.516
BTD52L	✓	✓			✓*			✓		✓		2.518
TD42L		✓	✓	✓	✓			✓		✓	✓	2.502
TD42H		✓	✓		✓			✓		✓	✓	2.502
TD62		✓	✓	✓	✓	✓	✓		✓	Included		2.525
TD120		✓	✓	✓		✓	✓		✓	Integral		2.510
UTD30L/H		✓	✓	✓	✓	✓		✓		✓	✓	2.517
UTD52L/H		✓	✓	✓	✓	✓		✓		Integral		2.5161
TDA52		✓			✓			✓				7.314

* BTD52L also available in 1/4" connection and with O.D. tube and tri-clamp connections.

How it works

On start-up, incoming pressure raises the disc and cool condensate, plus air, is immediately discharged (A). Hot condensate flowing through the trap releases flash steam. High velocity creates a low pressure area under the disc and draws it toward the seat (B). At the same time there is a pressure build up of flash steam in the chamber above the disc which forces it down against the seats on the inner ring and closes the inlet. The disc also seats on the outer ring and traps pressure in the chamber (C). Pressure in the chamber is decreased by condensation of the flash steam and the disc is raised. The cycle is then repeated (D).

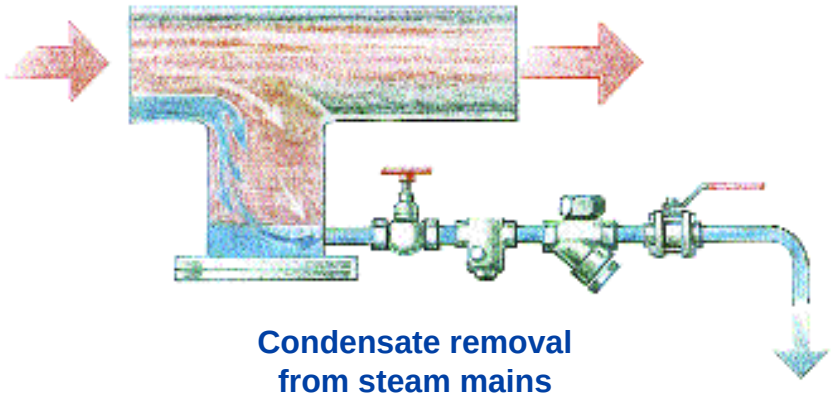




User benefits

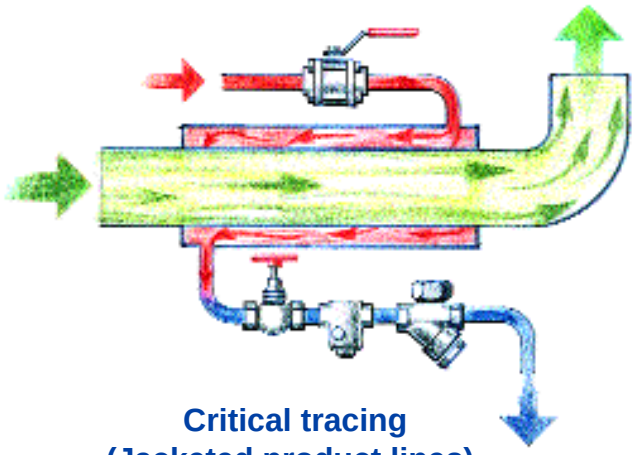
- Condensate is discharged close to steam temperature at all operating pressures.
- Withstands superheat, waterhammer, freezing, corrosive condensate and vibration.
- Only one moving part — a stainless steel disc hardened for long life.
- Blast discharge with clean, tight shutoff
- Audible “click” as the disc seats. Performance is easily checked.
- Monolithic stainless steel body eliminates internal gaskets and leak paths.
- Will work in any orientation.
- Available in swivel connector configuration for best orientation and simplified maintenance.

Typical Applications for Thermo-Dynamic® Steam Traps



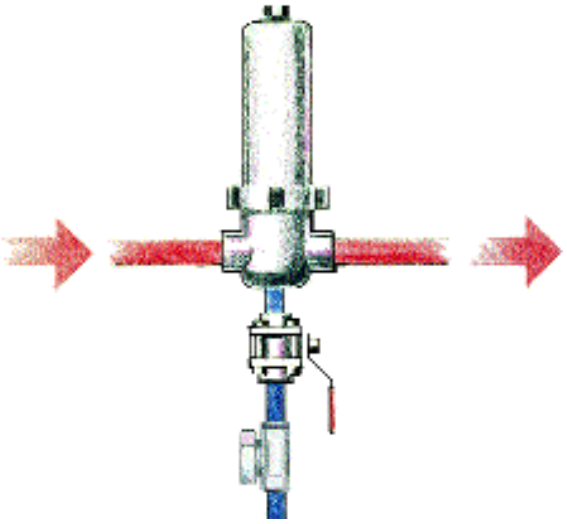
Condensate removal from steam mains

Instant removal of condensate prevents waterhammer and improves steam quality.



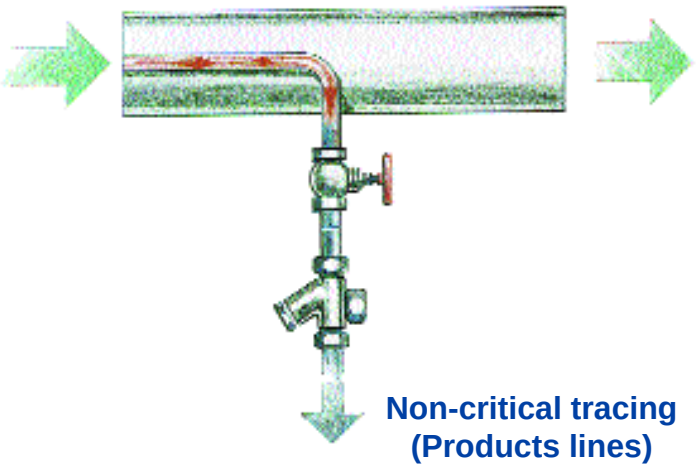
Critical tracing (Jacketed product lines)

Condensate is removed as it is formed, ensuring maximum heat transfer to the product eliminating the danger of solidification.



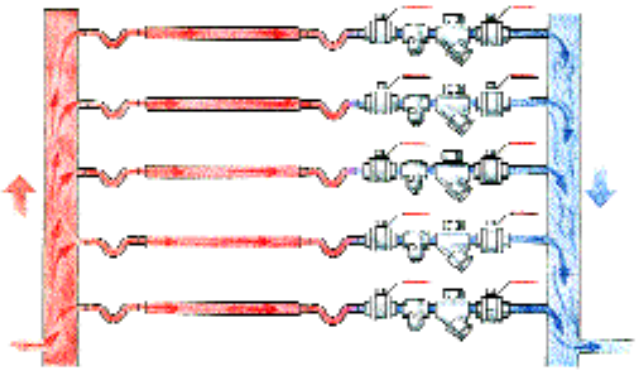
Draining high efficiency filters

Rapid removal of condensate ensures optimum filter efficiency.



Non-critical tracing (Products lines)

Simple and robust design, ideal for harsh outdoor conditions.



Condensate removal from platen presses

Fast efficient removal of condensate ensures even platen temperature with reduced risk of product wastage.

Steam Trap Selection and Sizing

Need to Know

1. The steam pressure at the trap after any pressure drop through the control valve or equipment.
2. The distance the condensate must be lifted after the trap. *Rule of thumb: 2 feet of lift equals 1 psi back pressure (approximately).*
3. Any other possible sources of back pressure in the condensate return system. For example:
   - Condensate taken to a pressurized deaerator tank or flash recovery vessel.
   - Local back pressure due to discharge of numerous traps close together into an undersized return.
4. Quantity of condensate handled. Obtained from:
   - Measurement
   - Calculation
   - Manufacturer's data
5. Safety Factor that is dependent upon particular application, typical examples as follows:

Steam Mains	2:1
Tracers	2:1
Non-Modulatng	2:1
Modulating over 30 psi*	3:1
Modulating under 30 psi*	Size trap at full load and 1/2 psi differential

* TD traps not recommended for modulating service. Refer to TI Sheet for minimum pressure.

How to Size

The difference between the steam pressure at the trap inlet and the total back pressure, including that due to lift after the trap, is the differential pressure. The quantity of condensate should be multiplied by the appropriate safety factor to produce the sizing load. The trap may now be selected using the differential pressure and the sizing load.

Note: The inlet pressure to the steam trap should never exceed the Maximum Operating Pressure (PMO) of the selected trap, regardless of differential pressure.

Example

A steam trap is required to drain 22 lb/h of condensate from a 4" insulated steam main, which is supplying steam at 100 psig. There will be a lift after the trap of 20 ft.

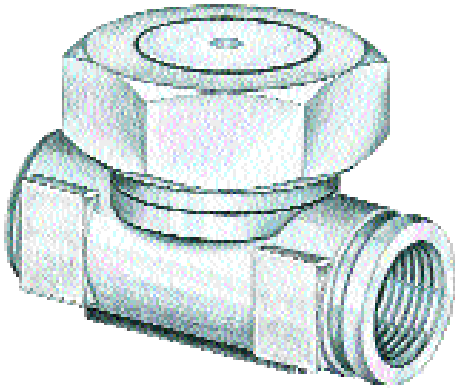
Inlet Pressure	100 psig
Lift	20 ft. = 10 psi (approximately)
Therefore, Differential Pressure	100 psi - 10 psi = 90 psi
Quantity	22 lb/h
Safety Factor	2:1
Sizing Load	44 lb/h

A 1/2" TD42L will handle the 44 lb/h sizing load at a differential pressure of 90 psi.

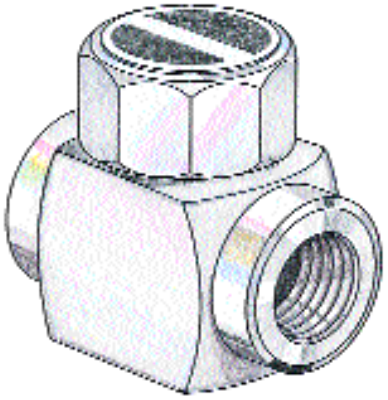
Thermo-Dynamic Steam Trap Quick Selection Chart

Steam Trap	Size	Trap Body Material	PMO (psi)	Capacity at PMO (lb/h)	Special Features
TD52	3/8" 1/2" 3/4" 1"	ASTM A743 GR.CA40F 420F	600 600 600 600	1250 2000 3050 4700	Integral Insulcap
TD52L	1/2" 3/4"	AISI 420F	600 600	1250 2000	Integral Insulcap
BTD52L	1/4" 3/8", 1/2"	AISI 316L	150	475 240	N/A
TD42L	1/2", 3/4", 1"	ASTM A743 Gr CA40F	600	700	Integral Strainer
TD42H	1/2" 3/4"	ASTM A743 Gr CA40F	600 600	1600 2000	Integral Strainer
TD62	1/2", 3/4", 1"	ASTM A217 Gr WC6	900	950	Integral Strainer
TD120	1/2", 3/4", 1"	ASTM A182 F22	1740	490	Integral Strainer
UTD30L/H	1/2", 3/4", 1"	ASTM A743 Gr CA40F	450	650	Integral Strainer Swivel Connector
UTD52L/H	1/2", 3/4", 1"	ASTM A743 GR.CA40F 420F	450	650	Swivel Connector Integral Strainer (with Strainer Connector) Integral Insulcap

TD52



BTD52L

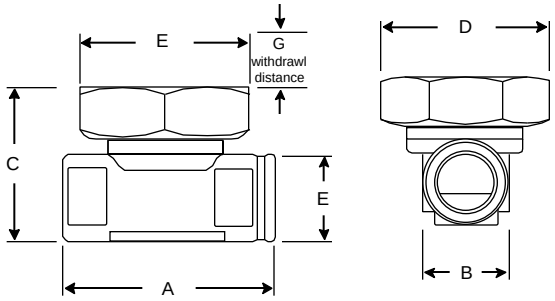


The TD52 is a rugged and compact Thermo-Dynamic® steam trap that is ideal for steam main drainage and steam tracing systems. It is constructed of hardened stainless steel and available in sizes up to 1". With a broad operating range of up to 600 psig, this trap can meet the wide array of applications found in HVAC and industrial systems.

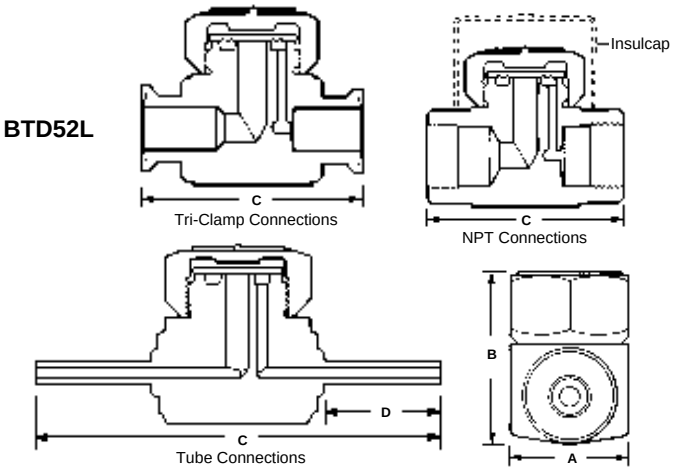
The BTD52L is a low capacity Thermo-Dynamic® steam trap suitable for corrosive atmopheres and clean steam drip application.

	TD52, TD52L	BTD52L
Sizes	3/8", 1/2", 3/4", 1" (TD52L in 1/2" & 3/4")	1'4",3/8", 1/2"
Body Material	Stainless Steel	316L Stainless Steel
Connections	NPT	NPT, 0.065" Tube,Tri-Clamp compatible (1/2" only)
Piping Configuration	In-Line	In-Line
TIS#	2.516	2.518
Maximum Operating Pressure (PMO)	600 psig	150

TD52



BTD52L



Dimensions (nominal) in inches

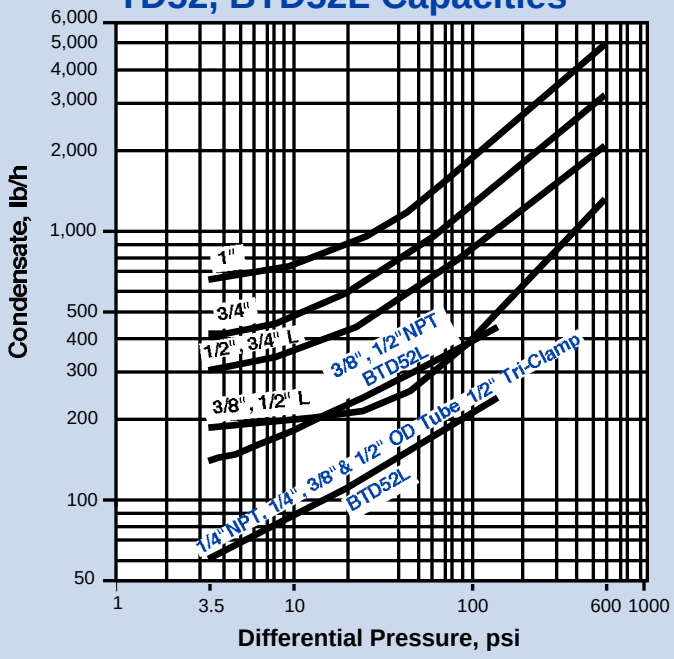
Type	A	B	C	D	E	F	G	Weight
3/8" TD52	2.0	1.03	1.8	2.3	2.0	1.0	0.4	.84 lbs
1/2" TD52L	2.7	1.24	2.1	2.3	2.0	1.2	0.4	1.2 lbs
1/2" TD52	2.7	1.24	2.1	2.3	2.0	1.2	0.4	0.2 lbs
3/4" TD52L	2.8	1.56	2.4	2.3	2.0	1.5	0.4	1.94 lbs
3/4" TD52	2.8	1.56	2.5	2.7	2.4	1.5	0.4	1.94 lbs
1" TD52	3.3	1.91	3.0	3.2	2.8	0.8	0.6	3.13 lbs

For BTD52L dimensions, see TIS 2.518

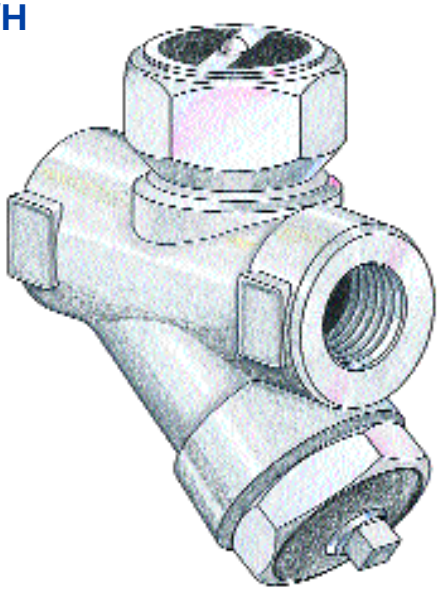
Dimensions (nominal) in inches

Size	A	B	C Tube	C Screwed	C Tri-Clamp	D Tube	Weight Tube	Weight Screwed	Weight Tri-Clamp
1/4"	1.4	2.1	–	2.6	–	–	–	1lb	–
3/8"	1.4	2.1	–	2.6	–	–	–	1lb	–
1/2"	1.4	2.1	4.4	2.6	2.6	1.5	1lb	1lb	1.2lb

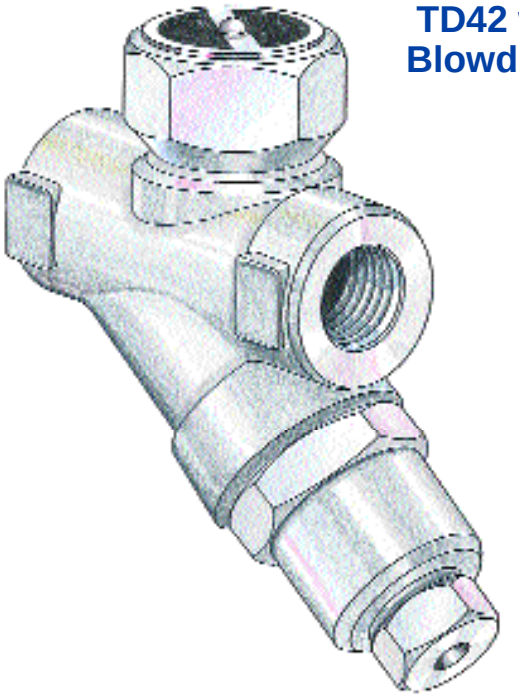
TD52, BTD52L Capacities



TD42L/H

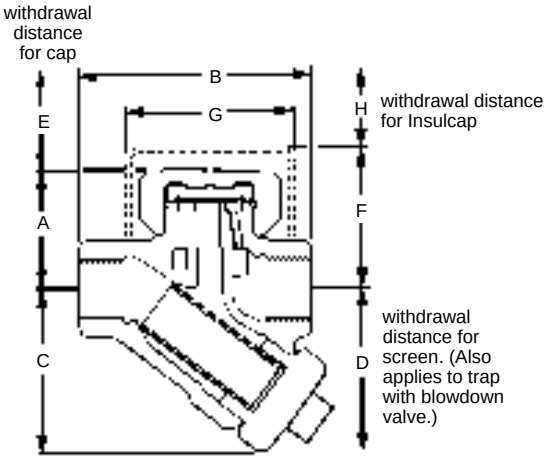


TD42 with Blowdown



The TD42, like the TD52, is a versatile and rugged steam trap suited for steam main drainage and steam tracing applications. The TD42 is built with an integral strainer to provide added protection from dirt and scale found in most steam systems. With a broad operating range of up to 600 psig, this trap can meet the wide array of applications found in HVAC and industrial systems.

TD42



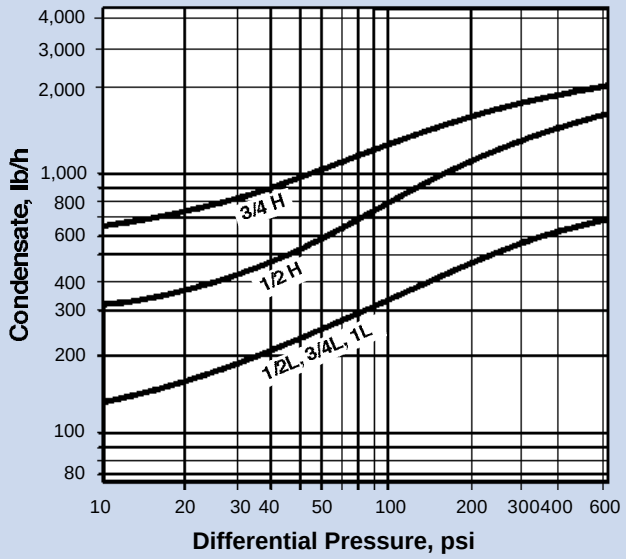
Dimensions (nominal) in inches

Size	A	B	C	D	E	F	G	H	Weight TD42L	Weight TD42H
1/2"	1.6	3.1	2.2	3.4	1.6	2.3	2.3	1.5	1.6 lb	1.7 lb
3/4"	1.7	3.5	2.4	3.9	0.8	2.4	2.3	1.5	1.9 lb	2.2 lb
1"	1.9	3.7	2.6	3.9	0.8	2.5	2.3	1.5	2.4 lb	—
With Blowdown Valve										
1/2"	1.6	3.1	2.8	4.0	1.6	2.3	2.3	1.5	2.2 lb	2.3 lb
3/4"	1.7	3.5	3.1	4.4	0.8	2.4	2.3	1.5	2.6 lb	2.8 lb
1"	1.9	3.7	3.3	4.5	0.8	2.5	2.3	1.5	3.9	—

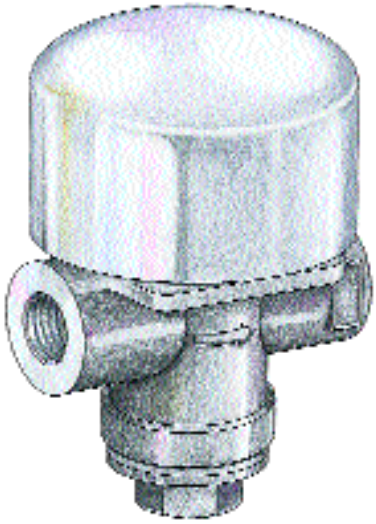
TD42L/H

Sizes	1/2", 3/4", 1" (1" not available in TD42H)
Body Material	Stainless Steel
Connections	NPT
Piping Configuration	In-Line
Options	Blowdown Valve, Insulcap
TIS#	2.502
Maximum Operating Pressure (PMO)	600 psig

TD42L/H Capacities

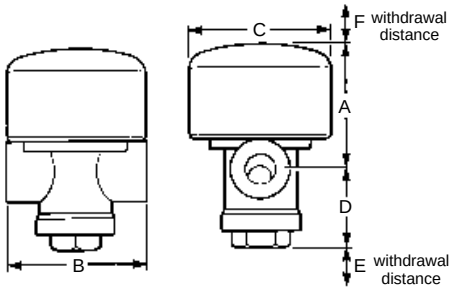


TD62



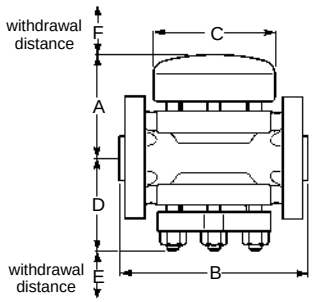
The TD62 is a medium to high pressure Thermo-Dynamic® steam trap suitable for steam main drainage and steam tracing systems. The operating range of up to 900 psig makes this trap ideal for many industrial systems where the medium to high pressure steam is utilized. The TD62 is also an ideal choice for superheat applications such as steam turbine drainage.

TD62
Socket Weld/
NPT



Dimensions (nominal) in inches							
TD62 SW/NPT							
Size	**A**	**B**	**C**	**D**	**E**	**F**	**Weight**
1/2" & 3/4"	3.1	3.6	3.6	2.0	0.8	2.0	4.6 lb
1"	3.3	3.9	3.6	1.8	0.8	2.0	5.3 lb

TD62
Flanged

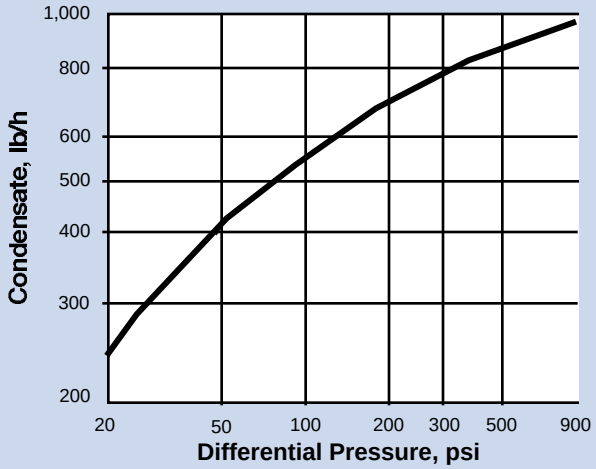


Dimensions (nominal) in inches							
TD62 Flanged							
Size	**A**	**B**	**C**	**D**	**E**	**F**	**Weight**
1/2"	3.2	5.9	5.7	3.6	1.6	1.2	18.7 lb
3/4"	3.2	5.9	5.7	3.6	1.6	1.2	18.7 lb
1"	3.2	5.9	6.1	3.6	1.6	1.2	20.0 lb

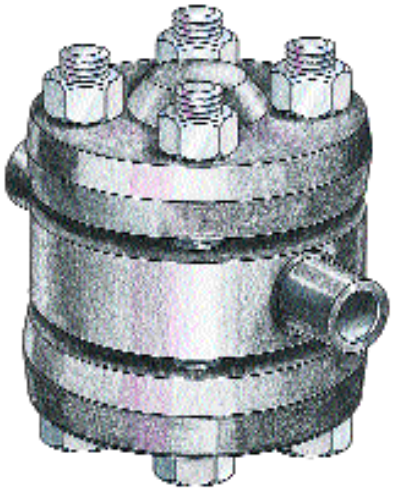
TD62

Sizes	1/2", 3/4", 1"
Body Material	Alloy Steel
Connections	SW to ANSI B16, 11 Class 6000
Piping Configuration	In-Line
Options	NPT Connections, ANSI 300/600 Flanged
TIS#	2.525
Maximum Operating Pressure (PMO)	900 psig

TD62 Capacities



TD120

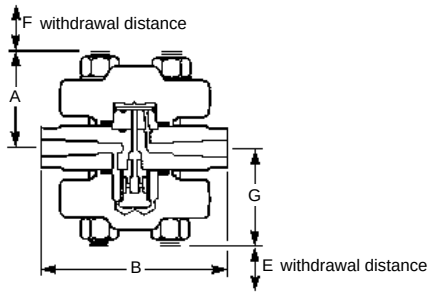


The TD120 is a high pressure Thermo-Dynamic® steam trap suited for steam main drainage and steam tracing systems in excess of 900 psig. The TD120 is also an ideal choice for superheat applications such as steam turbine drainage.

TD120

Sizes	1/2", 3/4", 1"
Body Material	Forged Alloy Steel
Connections	SW to ANSI B 16.11 Class 6000
Piping Configuration	In-Line
Options	Buttweld & ANSI 1500 RF connections
TIS#	2.510
Maximum Operating Pressure (PMO)	3,625 psig

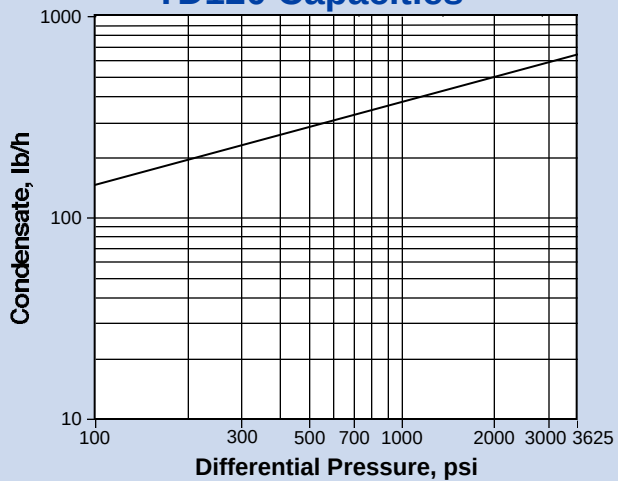
TD120



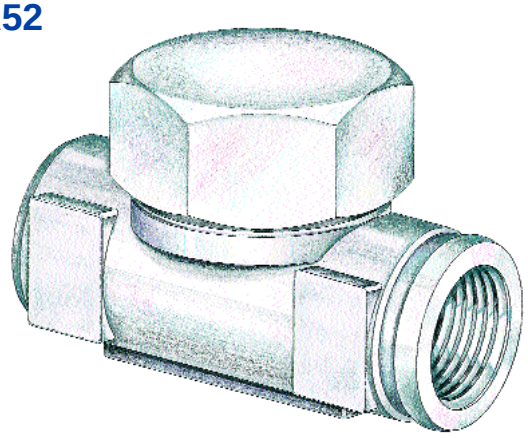
Dimensions (nominal) in inches

Size	A	B	E	F	G	Weight
1/2"	3.1	6.2	2.2	2.0	3.1	23.1 lb
3/4", 1"	3.2	6.2	2.2	2.0	3.2	23.1 lb

TD120 Capacities



TDA52

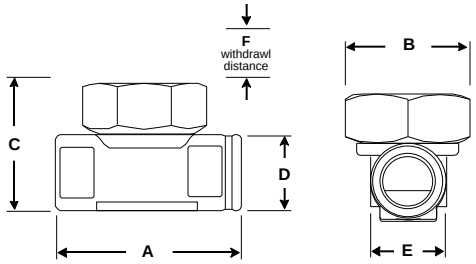


The only Thermo-Dynamic® Drain Trap currenlty offered, the TDA52 is a compact product that is very popular for drainage of compressed air lines. This 1/2" unit can accomodate pressures of 50 psig up to 250 psig and is constructed of stainless steel to resist corrosion.

TDA52

Sizes	1/2",
Body Material	Stainless Steel
Connections	NPT
Piping Configuration	In-Line
Options	BSP Connections
TIS#	7.314
Maximum Operating Pressure (PMO)	250 psig

TDA52



Dimensions (nominal) in inches

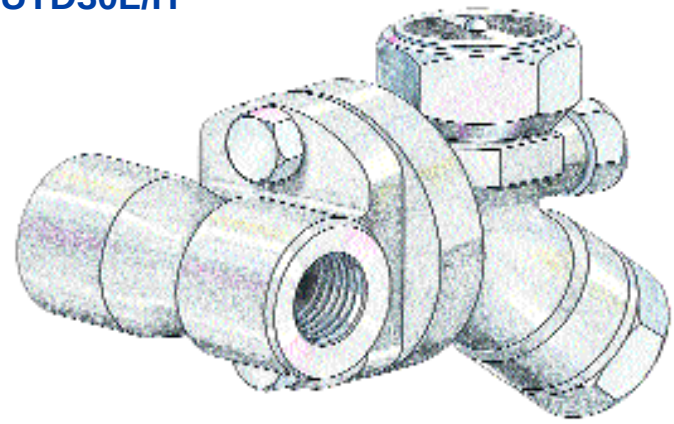
Size	A	B	C	Weight
1/2"	2.5	1.4	1.9	1 lb

TDA52 Capacities

pounds of water per hour continuous discharge to atmosphere

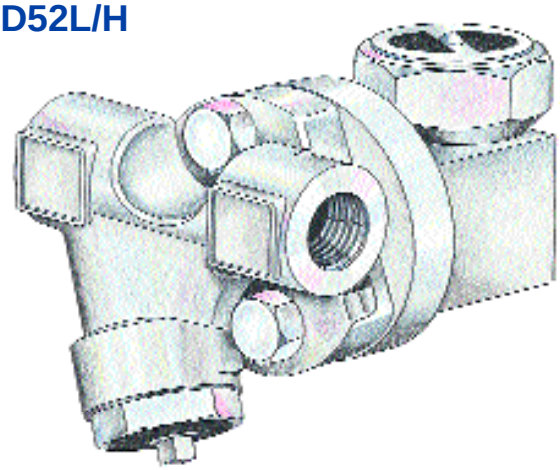
Inlet Pressure psig	bar	1/2" TDA52
50	3.5	1140
75	5.2	1400
100	6.9	1650
150	10.3	2050
200	13.8	2400
250	17.2	2800

UTD30L/H



The UTD30L/H combines a Thermo-Dynamic® steam trap with Spirax Sarco's swivel connector to provide a compact and versatile trap that can be installed in either vertical or horizontal piping. The UTD30's built in strainer provides added protection against dirt and pipe scale, plus the strainer can be renewed as quickly as the trap resulting in less downtime.

UTD52L/H

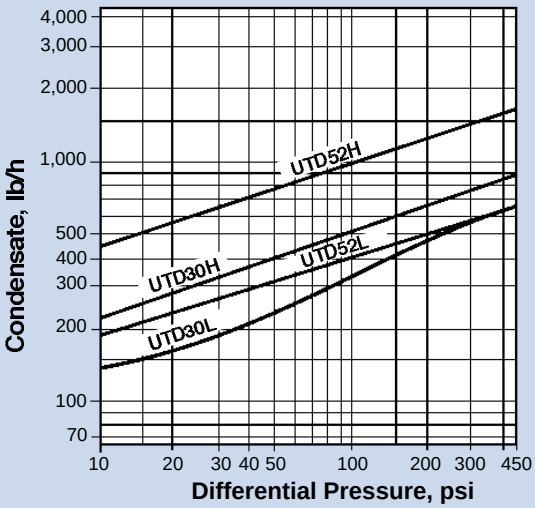


The UTD52L/H combines the rugged TD52 with Spirax Sarco's swivel connector. The result is a Thermo-Dynamic® steam trap that can be installed in vertical or horizontal piping. This is ideal for steam main drainage and steam tracing applications where space may be limited. The use of Spirax Sarco's Strainer Connector provides the UTD52 with a permanent, in-line strainer for added protection against dirt and pipe scale.

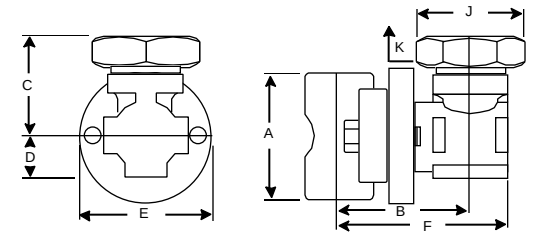
UTD30L/H and UTD52L/H

Sizes	1/2", 3/4", 1"
Body Material	Stainless Steel
Connections	NPT
Piping Configuration	In-Line/Swivel
Options	Carbon Steel Connector SW Connections Insulcap(30L/H), Blowdown Valve
TIS#	2.517 & 2.5161
Maximum Operating Pressure (PMO)	450 psig

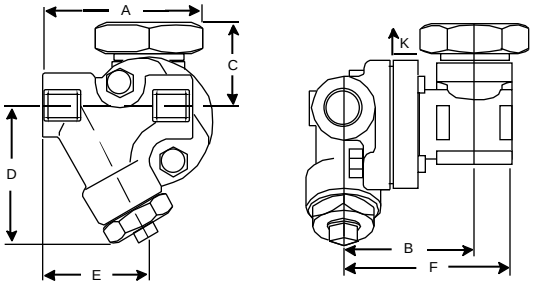
UTD30L/H, UTD52L/H Capacities



UTD52L/H with Standard Swivel Connector



UTD52L/H with Strainer Swivel Connector



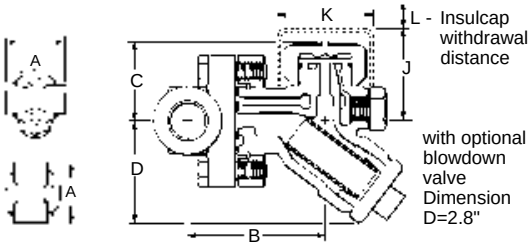
Dimensions (nominal) in inches

Size	A	B(L)	B(H)	C(L)	C(H)	D	E	F(L)	F(H)	J(L)	J(H)	K(L)	K(H)	Weight
UTD52L/H with Standard Swivel Connector														
1/2"	2.4	2.7	3.0	2.0	2.1	0.7	2.6	3.3	3.8	2.3	2.7	0.4	0.5	3.3 lb
3/4"	2.9	2.7	3.0	2.0	2.1	0.7	2.6	3.3	3.8	2.3	2.7	0.4	0.5	3.3 lb
1"	3.6	2.7	3.0	2.0	2.1	0.7	2.6	3.4	3.8	2.3	2.7	0.4	0.5	3.7 lb
UTD52L/H with Strainer Swivel Connector														
1/2"	3.2	2.7	3.0	1.6	1.7	2.9	2.3	3.3	3.8	2.3	2.7	0.4	0.5	3.8 lb
3/4"	3.5	2.7	3.0	1.4	1.5	3.0	2.5	3.3	3.8	2.3	2.7	0.4	0.5	4.2 lb
1"	3.9	2.7	3.0	1.2	1.3	3.1	2.7	3.4	3.8	2.3	2.7	0.4	0.5	4.5 lb

Dimensions (nominal) in inches

Size	A	B	C	D	J	K	L	Weight
UTD30L/H								
1/2"	2.4	2.7	1.6	2.1	2.3	2.3	1.5	3.7 lb
3/4"	2.8	2.6	1.6	2.1	2.3	2.3	1.5	3.9 lb
1"	3.5	2.8	1.6	2.1	2.3	2.3	1.5	4.0 lb

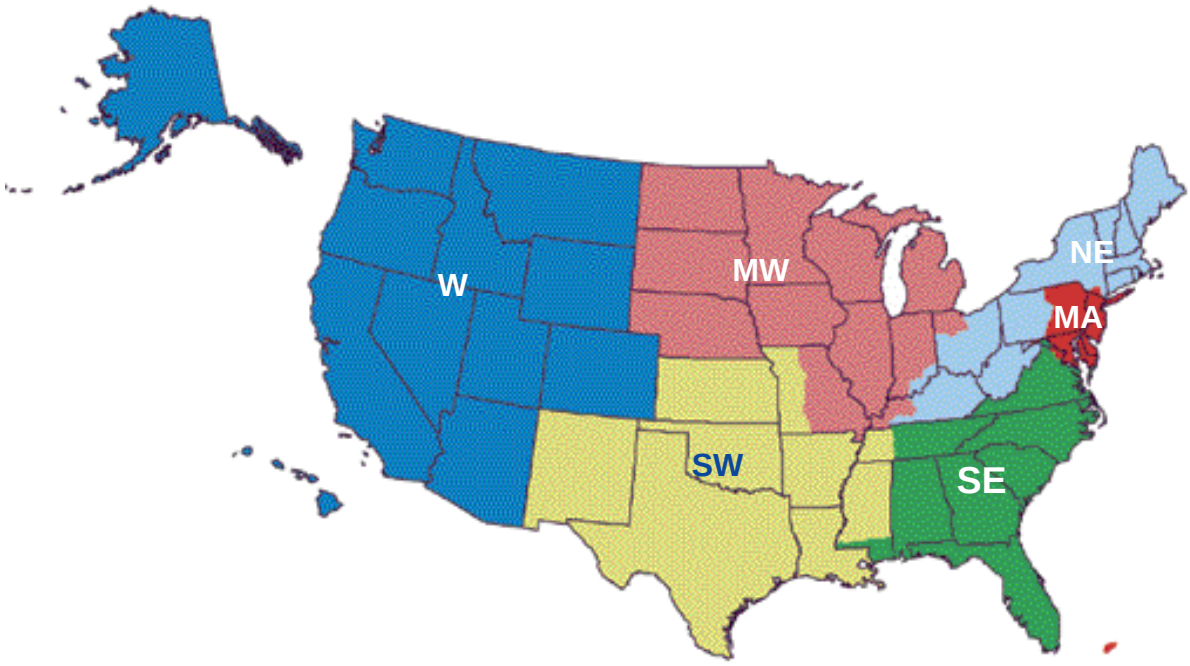
UTD30L/H



Steam Trap Selection Guide

As the USA's leading provider of steam system solutions, Spirax Sarco recognizes that no two steam trapping systems are identical. Because of the wide array of steam trap applications with inherently different characteristics, choosing the correct steam trap for optimum performance is difficult. Waterhammer, superheat, corrosive condensate, or other damaging operating characteristics dramatically affect performance of a steam trap. With over 85 years of experience in steam technology, Spirax Sarco is committed to helping its customers design, operate and maintain an efficient steam system. You have our word on it!

Application		1st Choice						2nd Choice					
		Float & Thermostatic	Thermo-Dynamic®	Balanced Pressure	Bimetallic	Liquid Expansion	Inverted Bucket	Float & Thermostatic	Thermo-Dynamic®	Balanced Pressure	Bimetallic	Liquid Expansion	Inverted Bucket
Steam Mains	to 30 psig	✓											✓
	30-400 psig		✓										✓
	to 600 psig		✓										✓
	to 900 psig		✓										✓
	to 2000 psig		✓										✓
	with Superheat		✓								✓		
Separators		✓											✓
Steam Tracers	Critical		✓							✓			
	Non-Critical			✓					✓				
Heating Equipment													
	Shell & Tube Heat Exchangers	✓											✓
	Heating Coils	✓											✓
	Unit Heaters	✓											✓
	Plate & Frame Heat Exchangers	✓											✓
	Radiators			✓									
General Process Equipment	to 30 psig	✓											✓
	to 200 psig	✓											✓
	to 465 psig	✓											✓
	to 600 psig					✓							
	to 900 psig					✓							
	to 2000 psig					✓							
Hospital Equipment	Autoclaves	✓								✓			
	Sterilizers	✓								✓			
Fuel Oil Heating	Bulk Storage Tanks			✓				✓					
	Line Heaters	✓											
Tanks & Vats	Bulk Storage Tanks			✓				✓					
	Process Vats	✓							✓				
Vulcanizers			✓					✓					
Evaporators		✓											✓
Reboilers		✓											✓
Rotating Cylinders		✓											
Freeze Protection						✓							



For more information on Spirax Sarco, contact your Regional Hub Office below, or call 1-800-883-4411 and you will be connected to the location nearest you.

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