

# Thermo-Dynamic® Steam Traps

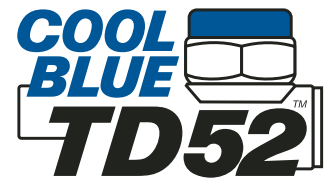
for efficient condensate drainage of  
steam mains, steam tracing systems  
and industrial process equipment

**COOL  
BLUE**  
**TD52™**



**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.

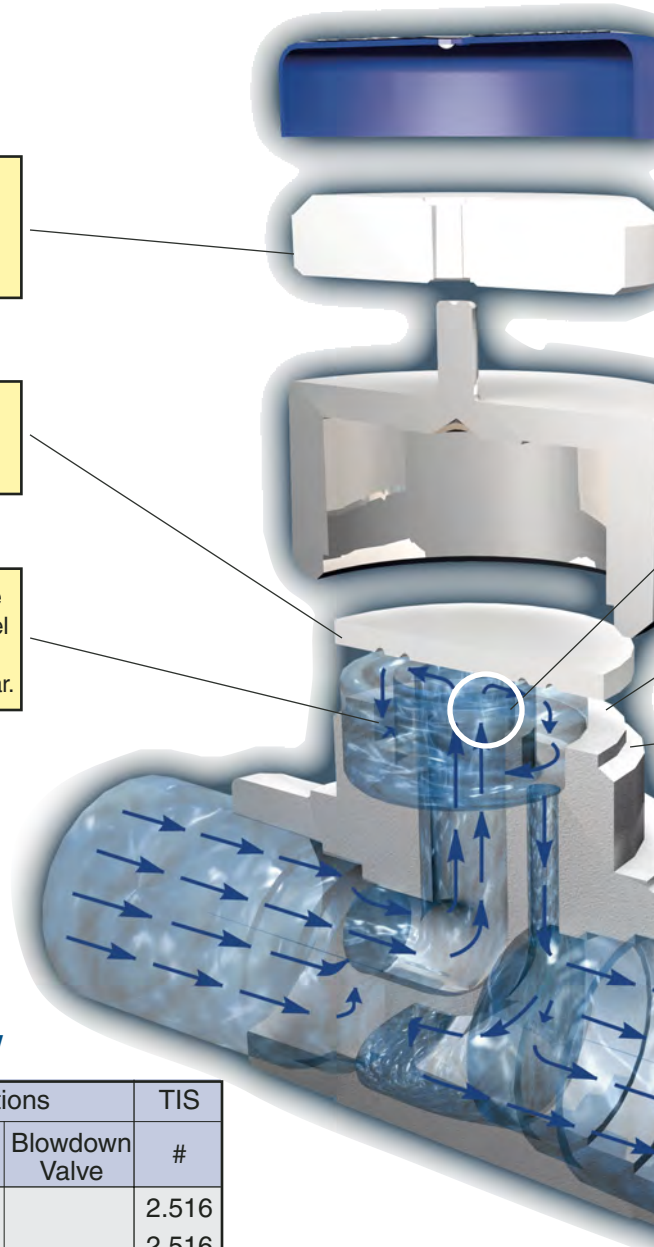
Discharge from the TD is close to steam temperature; therefore, the steam space is kept free from condensate. The tight shut-off the TD provides prevents valuable steam from being wasted. These factors combine to optimize the steam system efficiency.

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 3625 psig.

Ceramic insulation minimizes the effect of adverse ambient conditions.

Hardened stainless steel disc shuts off tight between cycles.

Three outlet orifices ensure that the disc remains parallel to the seat for improved performance and reduced wear.



## 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
TDT		✓						✓		Integral		2.220
BTD52L	✓	✓			✓*			✓		✓		2.518
TD42L		✓	✓	✓	✓			✓		✓	✓	2.502
TD42H		✓	✓		✓			✓		✓	✓	2.502
TD62		✓	✓	✓	✓	✓	✓		✓	Included		2.525
TD120		✓	✓	✓		✓	✓		✓	Integral		2.510
UTDSL/H		✓	✓	✓	✓	✓		✓		Integral	Standard	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

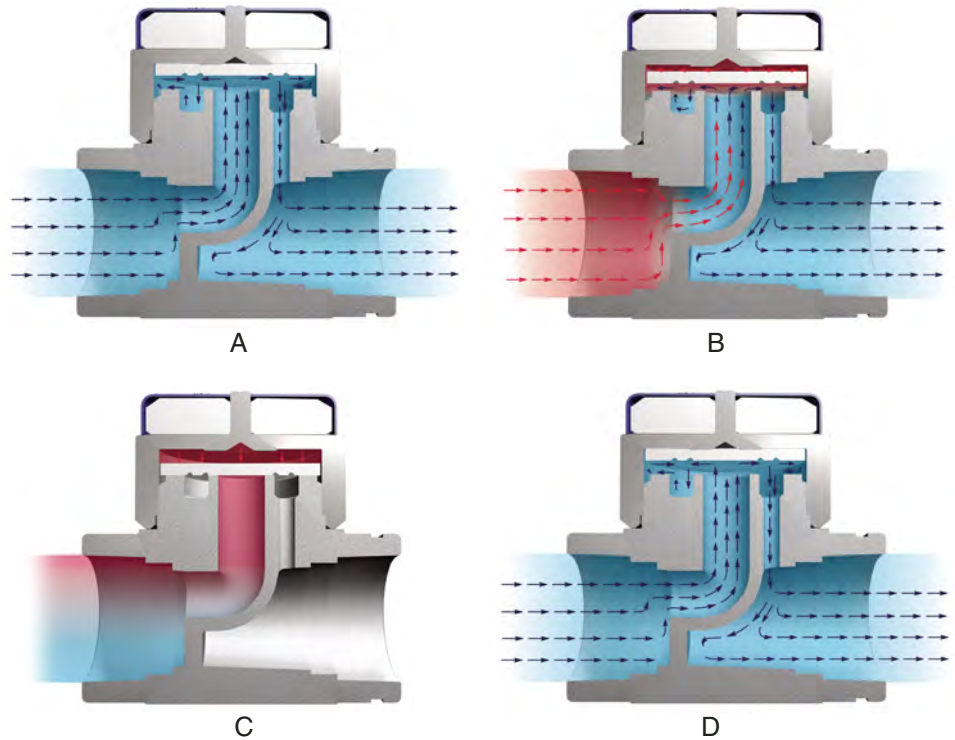
steam in the chamber above the disc which forces it down against the seats on the inner ring and closes the inlet. The disc also seats on the outer ring and traps pressure in the chamber (C). Pressure in the chamber is decreased by condensation of the flash steam and the disc is raised. The cycle is then repeated (D).

Turbulence grooves in disk ensure that the trap closes just before live steam reaches the inlet.

Induction hardened seating surfaces for longer life.

Metal-to-metal cap/body joint does not require gasketing.

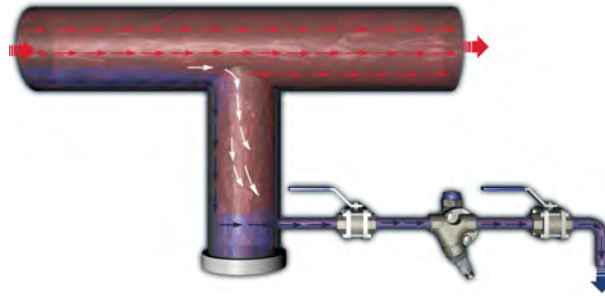
Stainless steel body and cap. Electroless nickel plating (ENP) finish is standard on some models.



## User benefits

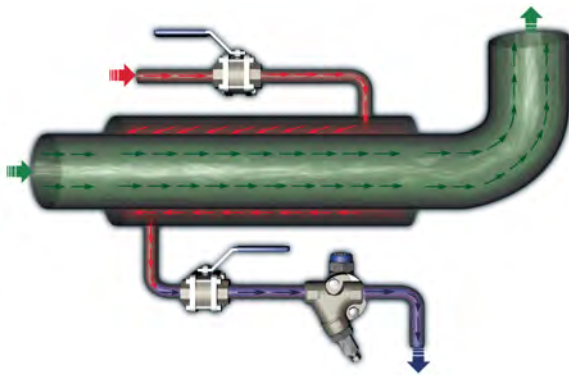
- Condensate is discharged close to steam temperature at all operating pressures.
- Withstands superheat, waterhammer, freezing, corrosive condensate and vibration.
- Only one moving part — a stainless steel disc hardened for long life.
- Blast discharge with clean, tight shutoff
- Audible “click” as the disc seats. Performance is easily checked.
- Single piece 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



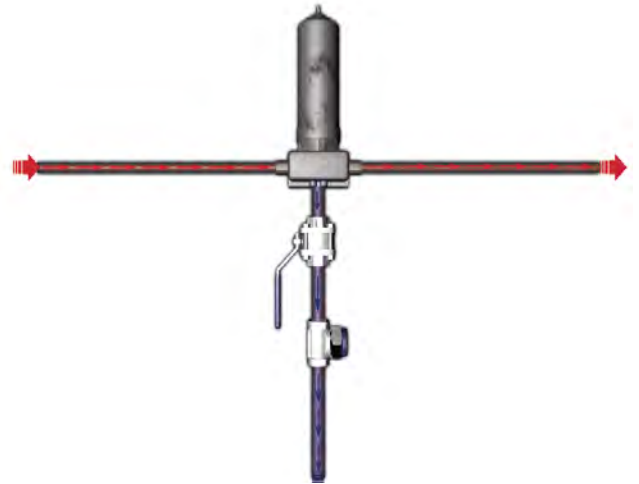
## Condensate removal from steam mains

Instant removal of condensate prevents waterhammer and improves steam quality.



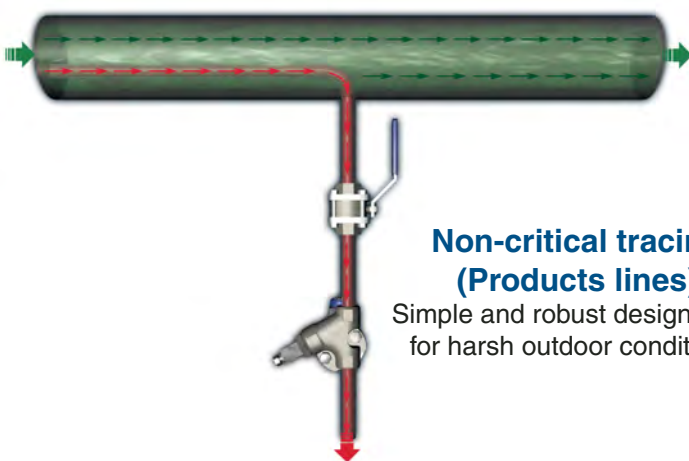
## Critical tracing (Jacketed product lines)

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



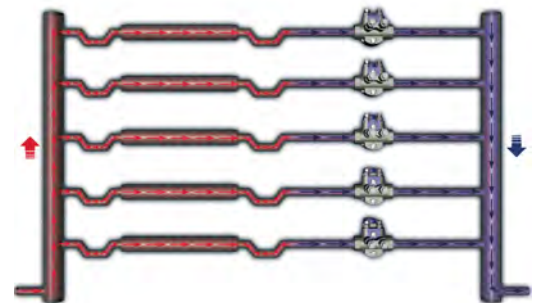
## Draining high efficiency filters

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

- The steam pressure at the trap after any pressure drop through the control valve or equipment.
- The distance the condensate must be lifted after the trap.  
*Rule of thumb: 2 feet of lift equals 1 psi back pressure (approximately).*
- 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.
- Quantity of condensate handled. Obtained from:
  - Measurement
  - Calculation
  - Manufacturer's data
- Safety Factor that is dependent upon particular application, typical examples as follows:
 

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

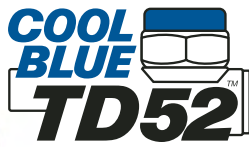
A steam trap is required to drain 22 lb/h of condensate from a 4" insulated steam main, which is supplying steam at 100 psig. There will be a lift after the trap of 20 ft.

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

A 1/2" TD52L will handle the 44 lb/h sizing load at a differential pressure of 90 psig.

## Thermo-Dynamic Steam Trap Quick Selection Chart

Steam Trap	Size	Trap Body Material	PMO (psig)	Capacity at PMO (lb/h)	Special Features
TD52	3/8"	ASTM A743 GR.CA40F 420F	600	1250	Integral Insulcap
	1/2"		600	2000	
	3/4"		600	3050	
	1"		600	4700	
TD52L	1/2"	AISI 420F	600	1250	Integral Insulcap
	3/4"		600	2000	
BTD52L	1/4"	AISI 316L	150	475	Designed for clean steam applications
	3/8", 1/2"			240	
TD42L	1/2", 3/4", 1"	ASTM A743 Gr CA40F	600	700	Integral Strainer
TD42H	1/2"	ASTM A743 Gr CA40F	600	1600	Integral Strainer
	3/4"		600	2000	
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
UTD52L UTD52H	1/2", 3/4", 1"	ASTM A743 GR.Ca40F 420F	450	650	Swivel Connector Integral Strainer (with Strainer Connector) Integral Insulcap
				1700	
UTD52S L/H	1/2", 3/4", 1"	ASTM A743 GR.Ca40F 420F	450	650 L 1700 H	Integral Strainer in Trap
TDT	1/2"	ASTM A743 GR.Ca40F 420F	150	100	Subcooling Trap for Tracing

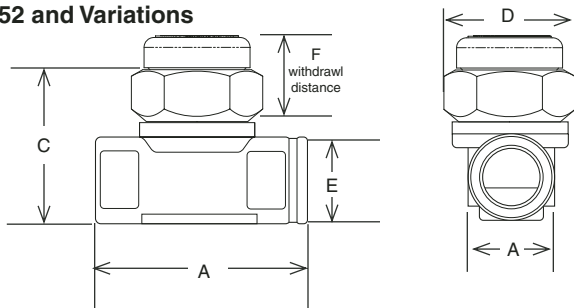


The TD52 is a rugged and compact Thermo-Dynamic<sup>®</sup> steam trap that is ideal for steam main drainage and steam tracing systems. It is constructed of hardened stainless steel and available in sizes up to 1". With a broad operating range of up to 600 psig, this trap can meet the wide array of applications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

**TD52, TD52L, TDT, 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-US	2-518-US
Maximum Operating Pressure (PMO)	600 psig	150

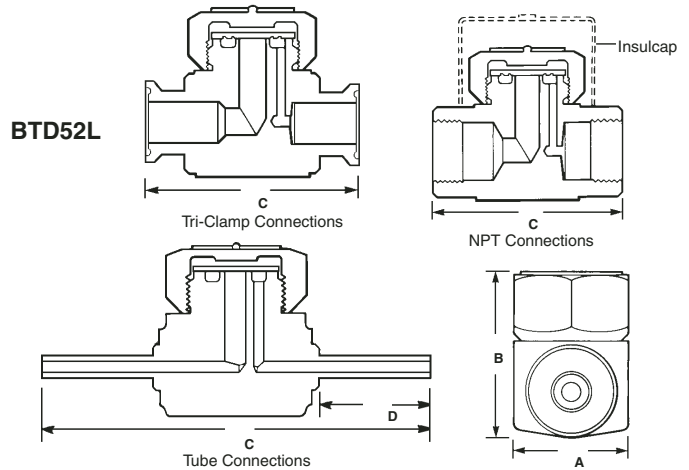
**TD52 and Variations**



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, TDT	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



The BTD52L is a low capacity Thermo-Dynamic<sup>®</sup> steam trap suitable for corrosive atmospheres and clean steam drip application.



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

**Capacities**

Pounds of condensate per hour continuous discharge at saturated steam temperature to atmosphere

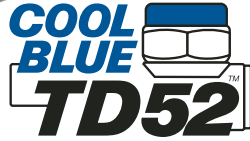
Inlet Pressure psig	barg	3/8" TD52 1/2" TD52L	1/2" TD52 3/4" TD52L	TD52 3/4"	TD52 1"	BTD52	
						1/4" npt, 1/2" OD Tube	1/2, 3/8 npt
3.5	.24	180	300	405	640	62	169
5	.34	185	310	420	670	70	173
10	.69	190	345	470	725	88	184
20	1.4	200	410	560	865	110	206
30	2.1	215	465	640	980	126	229
50	3.5	245	575	810	1200	150	273
75	5.2	305	700	1000	1470	172	329
100	6.9	370	810	1160	1750	189	385
150	10.3	500	1000	1450	2200	216	497
200	13.8	610	1140	1670	2600		
250	17.2	700	1270	1900	2900		
300	20.7	790	1410	2100	3250		
350	24.1	880	1530	2250	3500		
400	27.6	960	1630	2430	3780		
450	31.0	1050	1730	2600	4020		
500	34.5	1100	1830	2750	4250		
550	37.9	1160	1910	2900	4450		
600	41.4	1250	2000	3050	4700		

Note: TDT Capacity 100 lb/hr 10 to 150 psig

# UTD52SL/H



# UTD52L/H

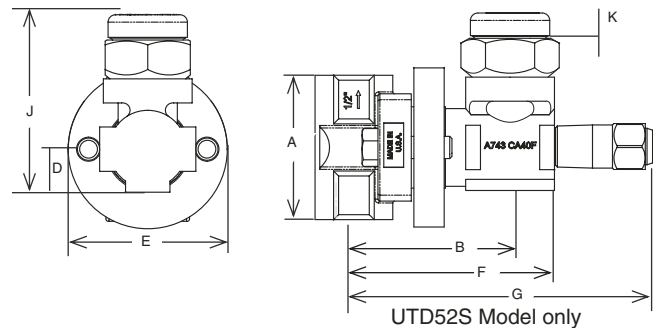


The UTD52L/H combines the rugged TD52 with Spirax Sarco's swivel connector. The result is a Thermo-Dynamic<sup>®</sup> steam trap that can be installed in vertical or horizontal piping. This is ideal for steam main drainage and steam tracing applications where space may be limited. The use of Spirax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

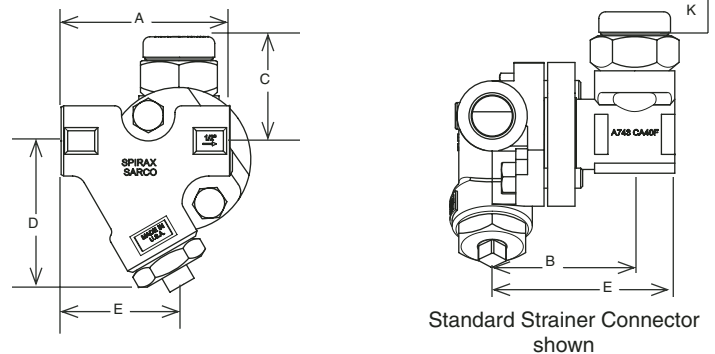
## UTD52L/H UTD52SL/H

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

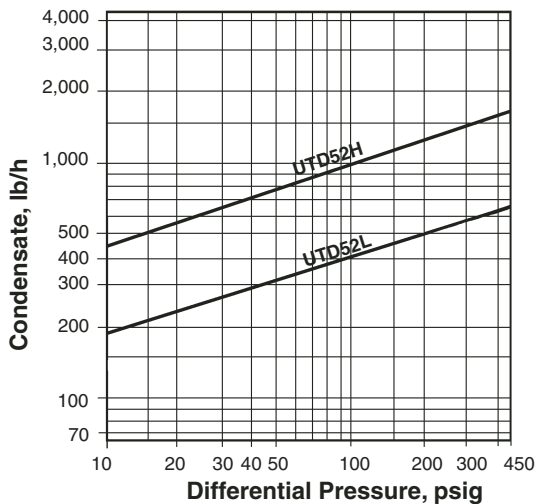
UTD52L/H with Standard Swivel Connector



UTD52L/H with Strainer Swivel Connector



## UTD52L/H Capacities



Dimensions (nominal) in inches														
Size	A	B(L)	B(H)	C(L)	C(H)	D	E	F(L)	F(H)	G(L)	G(H)	K(L)*	K(H)*	Weight
<b>UTD52L/H with Standard Swivel Connector</b>														
1/2"	2.4	2.7	3.0	2.4	2.5	0.7	2.6	3.3	3.8	5.1	5.4	0.4	0.4	3.3 lb
3/4"	2.9	2.7	3.0	2.4	2.5	0.7	2.6	3.3	3.8	5.1	5.4	0.4	0.5	3.3 lb
1"	3.6	2.7	3.0	2.4	2.5	0.7	2.6	3.4	3.8	5.1	5.4	0.4	0.5	3.7 lb
<b>UTD52L/H with Strainer Swivel Connector</b>														
1/2"	3.2	2.7	3.0	1.6	1.7	2.9	2.3	3.3	3.8			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			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			0.4	0.5	4.5 lb

## TD42L/H



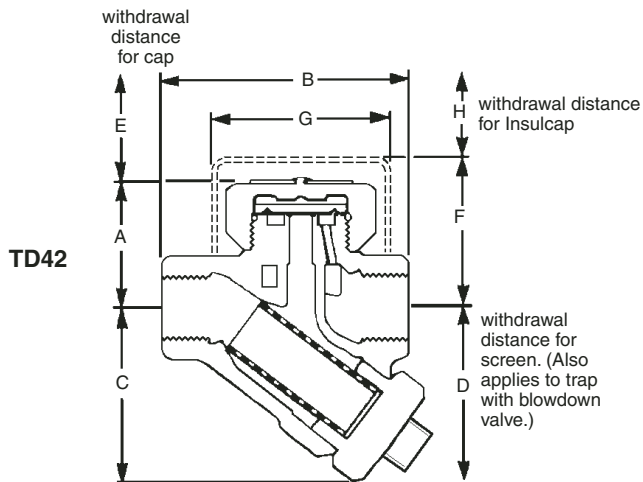
## TD42 with Blowdown



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.

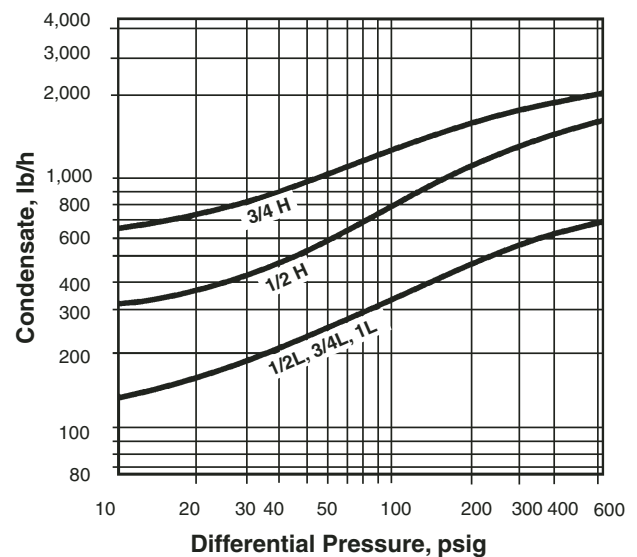
### TD42L/H

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



Dimensions (nominal) in inches										
Size	A	B	C	D	E	F	G	H	Weight TD42L 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 Capacities



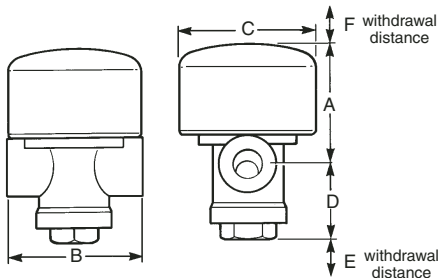


The TD62M is a medium to high pressure Thermo-Dynamic<sup>®</sup> steam trap suitable for steam main drainage and steam tracing systems. The operating range of up to 900 psig makes this trap ideal for many industrial systems where the medium to high pressure steam is utilized. The TD62M is also an ideal choice for superheat applications such as steam turbine drainage. Trap has replaceable seat assembly which allows it to be repaired inline without disturbing piping.

**TD62M**

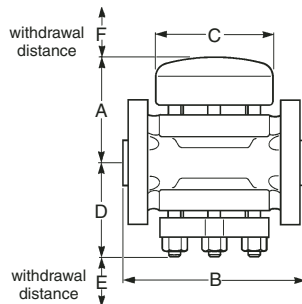
Sizes	1/2", 3/4", 1"
Body Material	Alloy Steel
Connections	SW to ANSI B16, 11 Class 6000
Piping Configuration	In-Line
Options	NPT Connections, ANSI 300/600 Flanged
TIS#	2.525
Maximum Operating Pressure (PMO)	900 psig

**TD62M  
Socket Weld/  
NPT**



Dimensions (nominal) in inches							
TD62M 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

**TD62M  
Flanged**



Dimensions (nominal) in inches							
TD62M 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

Pounds of condensate per hour continuous discharge at saturated steam temperature to atmosphere			
Capacities		TD62M	TD62LM
Inlet Pressure psig	barg		
50	3.4	97.0	424
100	6.9	140.3	556
200	13.8	202.9	688
300	20.7	251.8	766
400	27.6	293.5	821
500	34.5	330.5	863
600	41.4	364.2	898
700	48.3	395.3	928
800	55.2	424.4	953
900	62.1	451.9	976

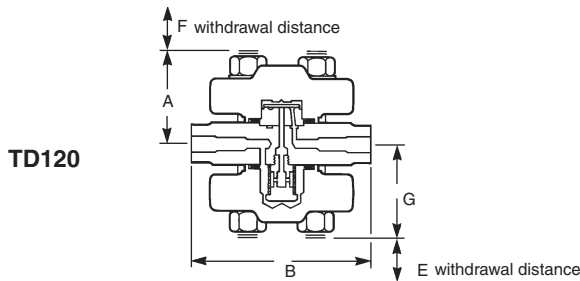
## TD120



The TD120 is a high pressure Thermo-Dynamic<sup>®</sup> 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

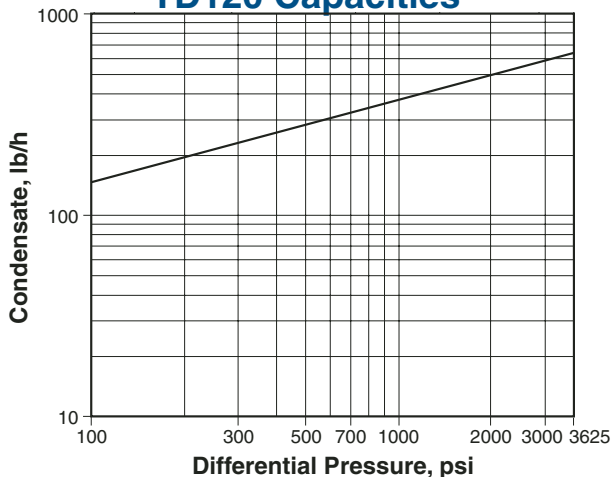
Sizes	1/2", 3/4", 1"
Body Material	Forged Alloy Steel
Connections	SW to ANSI B 16.11 Class 6000
Piping Configuration	In-Line
Options	Buttweld & ANSI 1500 RF connections
TIS#	2.510
Maximum Operating Pressure (PMO)	3,625 psig



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



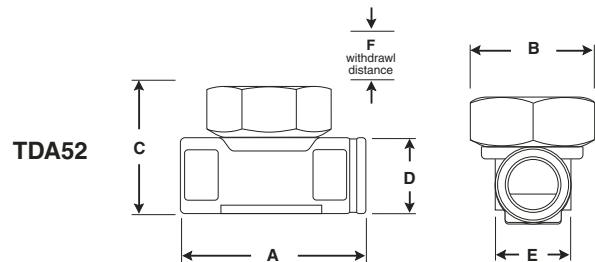
## TDA52



The only Thermo-Dynamic<sup>®</sup> Drain Trap currently offered, the TDA52 is a compact product that is very popular for drainage of compressed air lines. This 1/2" unit can accommodate 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	barg	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

# Steam Trap Selection Guide

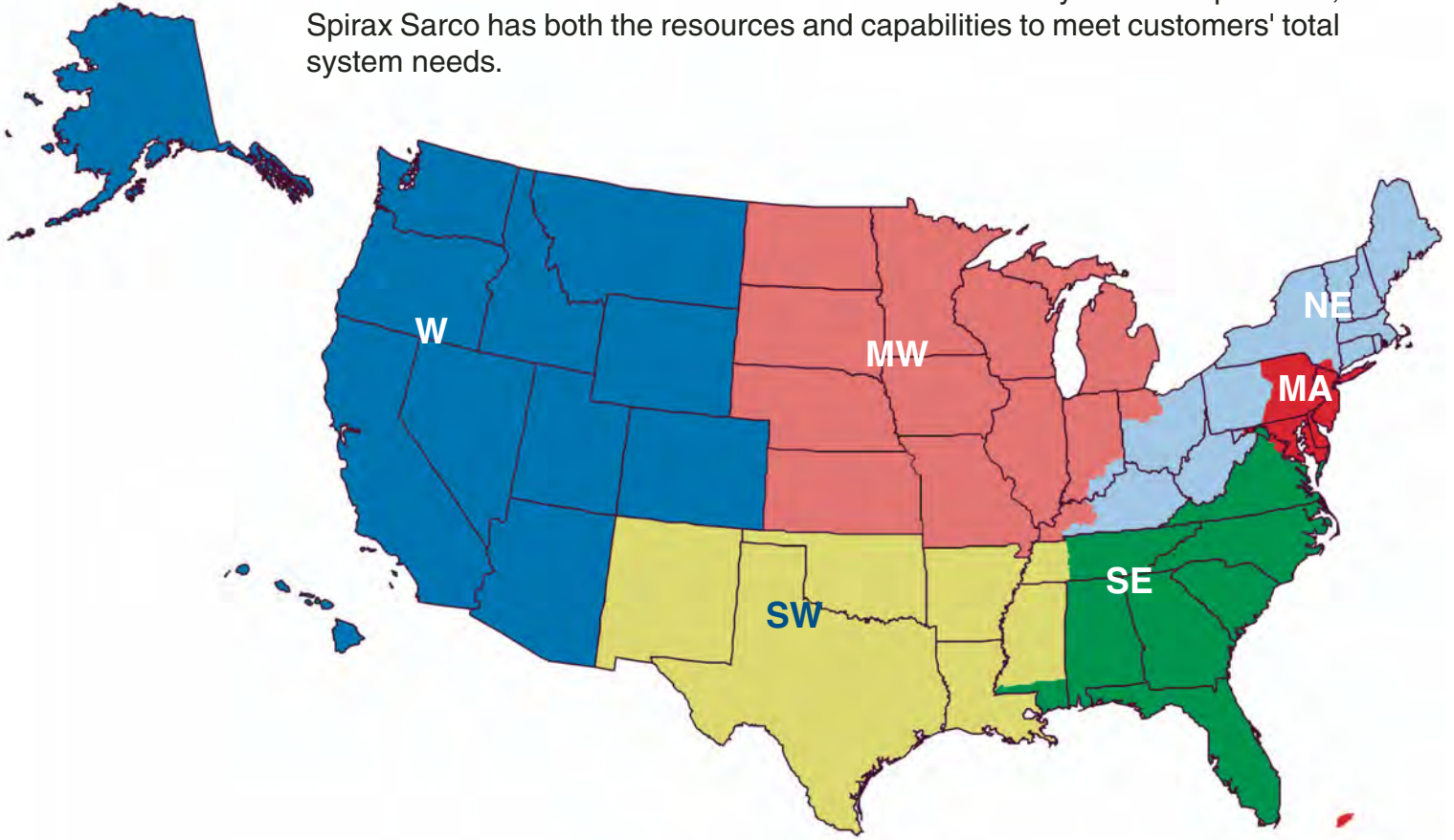
As the USA's leading provider of steam system solutions, Spirax Sarco recognizes that no two steam trapping systems are identical. Because of the wide array of steam trap applications with inherently different characteristics, choosing the correct steam trap for optimum performance is difficult. Waterhammer,

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						✓							



is the world's leading provider of steam system solutions dedicated to providing knowledge, service and products for the control and efficient use of steam and other industrial fluids. With over 90 years of experience, Spirax Sarco has both the resources and capabilities to meet customers' total system needs.



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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