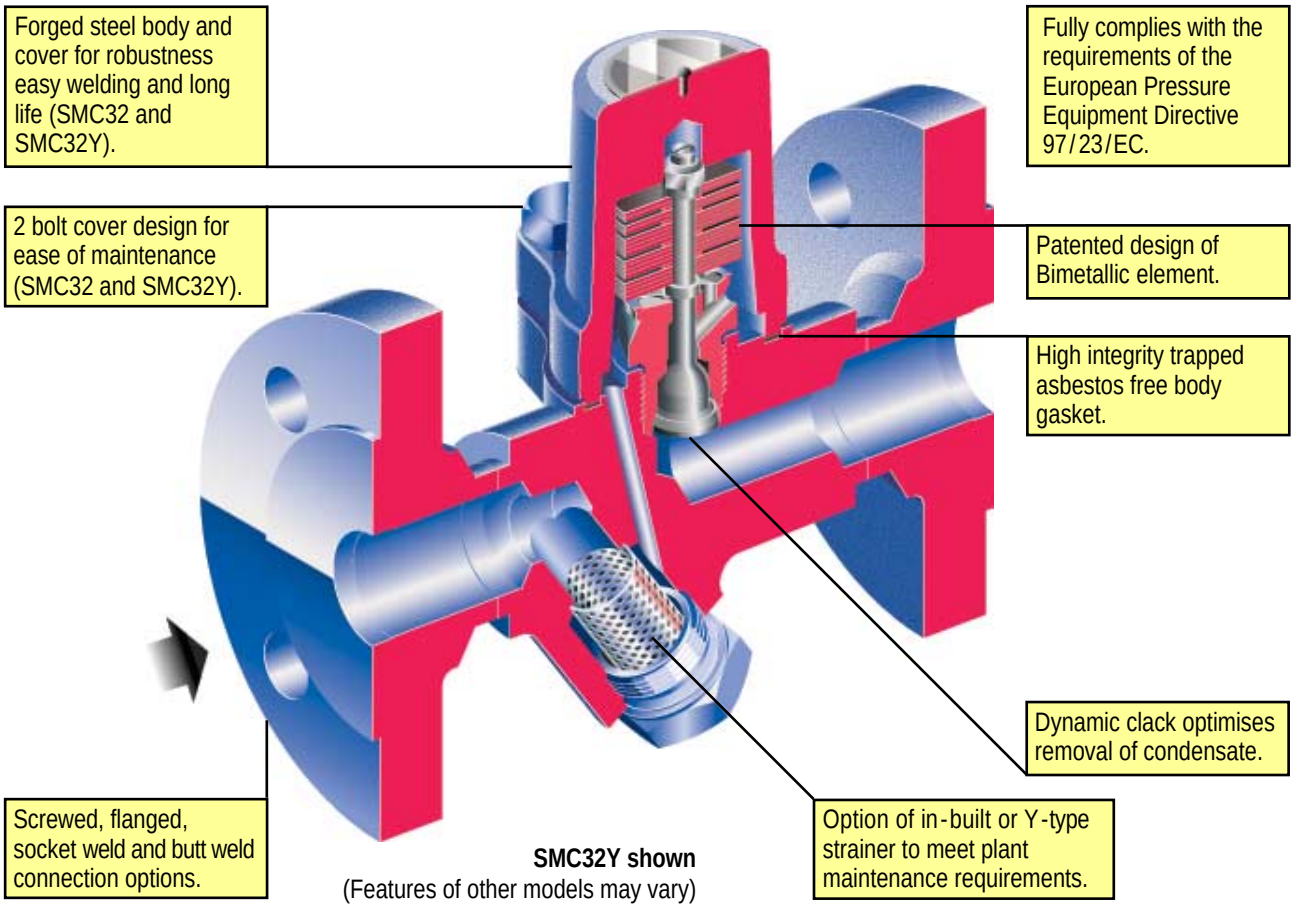
Bimetallic thermostatic steam traps

for pressures up to 40 bar g

spirax sarco

Bimetallic thermostatic steam traps

Spirax Sarco has been manufacturing bimetallic thermostatic steam traps for over 40 years. Continuous investment in product development has resulted in a design evolution which leads the world.



SMC32Y shown
(Features of other models may vary)

Product range and options

Material		Stainless steel	Carbon steel			
Model		**T3**	**SMC32**	**SMC32Y**	**ABL**	**SP80 and SP100**
Size	DN8 - ¼"	●				
	DN10 - ⅜"	●				
	DN15 - ½"	●	●	●		
	DN20 - ¾"		●	●		
	DN25 - 1"		●	●		
	DN40 - 1½"				●	
	DN50 - 2"				●	
	DN80 - 3"					●
	DN100 - 4"					●
Connections	Flanged		●	●	●	●
	Screwed	●	●	●	●	
	Butt weld		●	●		●
	Socket weld		●	●	●	●
Strainer	Flat type		●			
	Cylindrical type			●	●	●
Discharge capacity		Low	Medium	Medium	High	High
Optional	Blowdown valve			●		

Why use bimetallic thermostatic steam traps?

The bimetallic steam traps are used primarily to control the release of condensate so that its sensible heat can be utilised and energy losses caused by flash steam on discharge reduced, all important in today's energy conscious world.

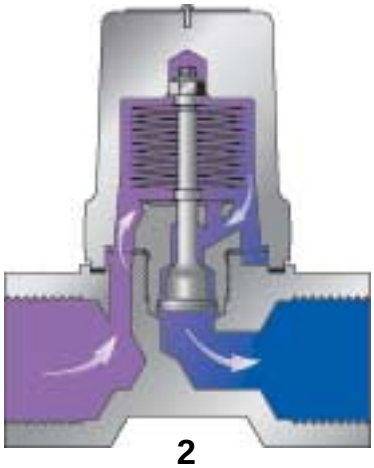
The unique patented bimetallic element used in the majority of our range of bimetal traps dictates that they follow the steam saturation curve over a wide pressure range.

The range is robust and has an in-built strainer (excluding T3) as standard and is resistant to waterhammer and freezing.

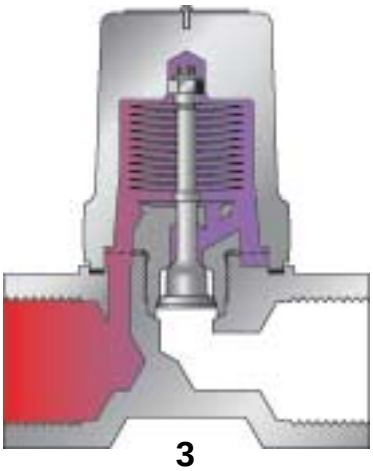
User benefits

- Strong, reliable and easy to install.
- Ease of maintenance with two bolt cover design.
- Automatically discharges air and incondensable gases to aid rapid warm-up of plant.
- Sensitive response avoiding the thermal inertia of heavier elements.
- Condensate released at below saturation temperature reducing the amount of flash steam.
- Resistant to waterhammer and freezing.
- Fully complies with the requirements of the European Pressure Equipment Directive 97/23/EC.
- Spirax Sarco's guarantee of worldwide knowledge, service and technical support.

1



2



3

How the bimetallic thermostatic steam trap works

On start-up, the bimetallic element is relaxed and the valve is open. Cooled condensate, plus air, is immediately discharged (**1**).

Hot condensate flowing through the trap heats the bimetallic element causing it to pull the valve towards the seat (**2**).

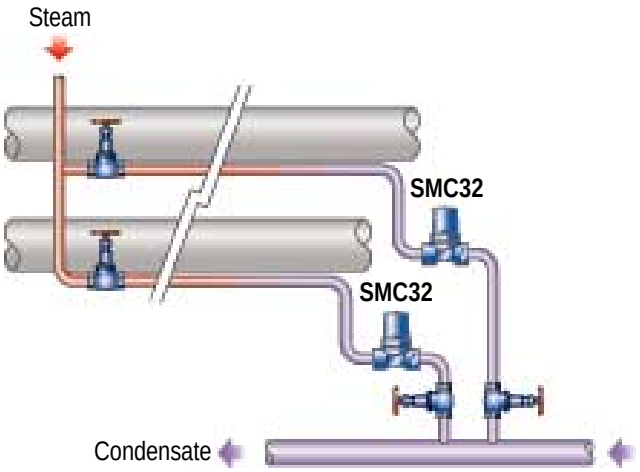
As the hot condensate is discharged and approaches steam saturation temperature the bimetallic element closes the valve (**3**). When there is no flow through the trap the condensate surrounding the element cools causing it to relax and the upstream pressure opens the valve. Condensate is discharged and the cycle repeats.

The ABL and SP ranges use a basic bimetal element in a slightly different way.

The ABL uses three elements to provide additional force to open the main valve.

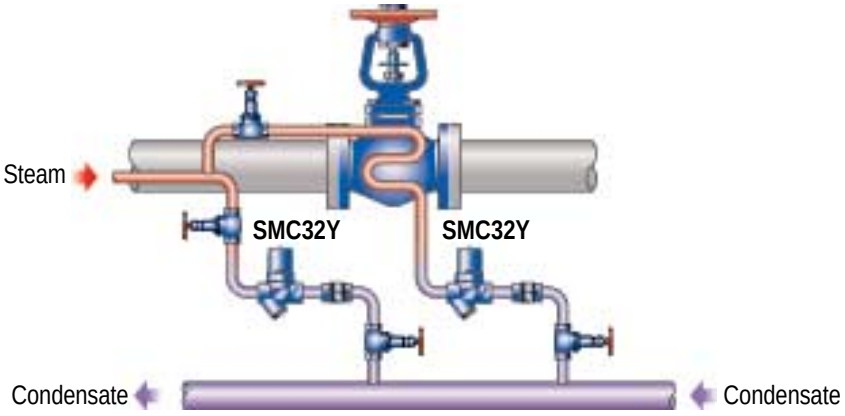
The SP uses the bimetal element as a pilot mechanism. When condensate cools, the element opens and allows pressure to build up on top of the main piston. This pressure is used to open the main valve. As condensate temperature increases, the bimetal element will close and the piston pressure will fall allowing the main valve to be closed by the spring.

Typical low capacity applications



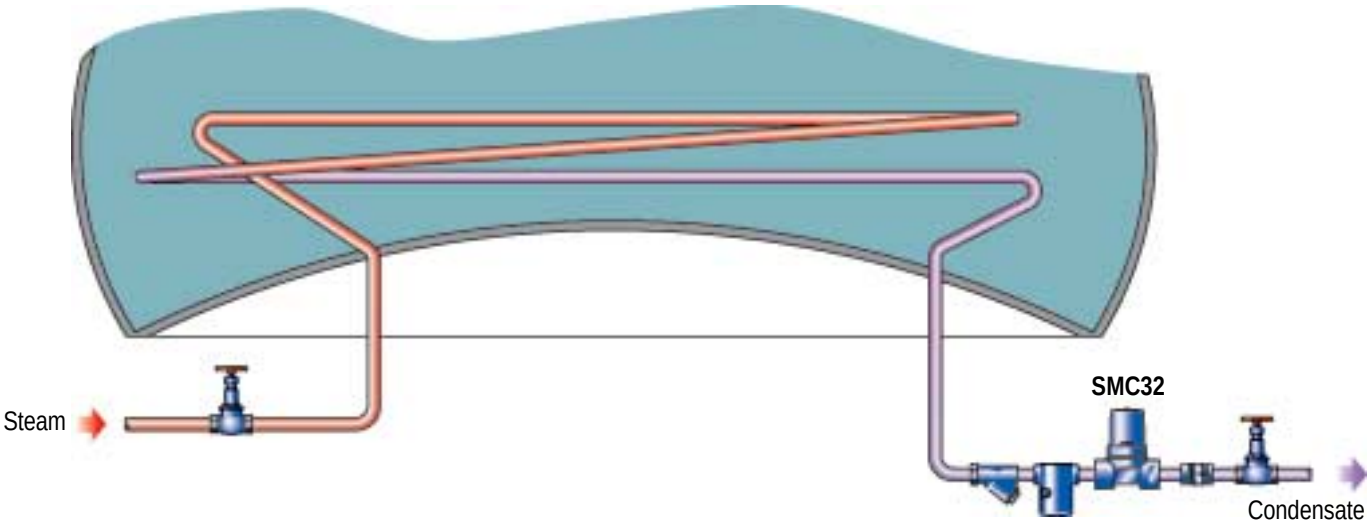
Non-critical tracing

Simple and robust design with depressed condensate discharge temperature using some of the sensible heat in hot condensate.



Instrument tracing

To ensure that process product is kept in fluid condition at all times for immediate use of instruments.



Crude temperature control of large oil storage tanks

For controlled waterlogging on large coils or internal heaters where product temperature can be satisfactorily held at temperatures below 100°C.

T3

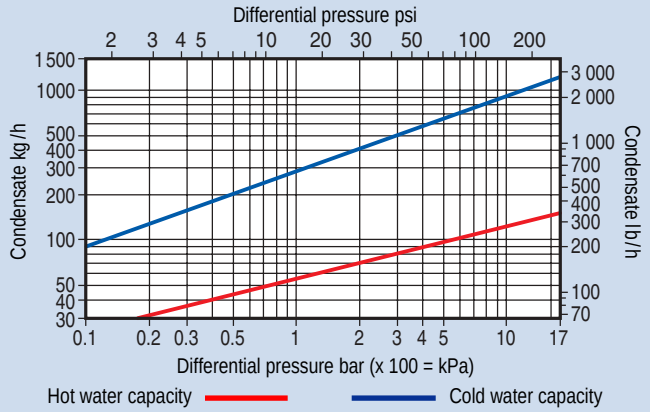
Sizes and pipe connections

⅜", ¼" and ½" screwed BSP or NPT.

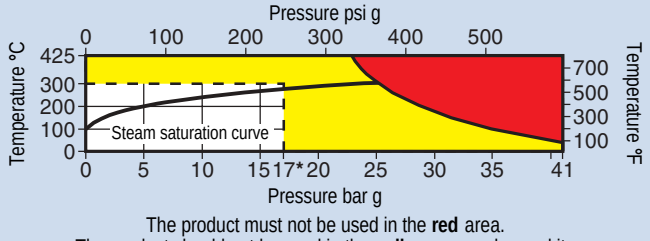
Materials

Body	Stainless steel (forged)	AISI 304L
Cover	Stainless steel (forged)	AISI 304L
Bimetallic element	Stainless steel	

Capacities



Operating range



The product must not be used in the **red** area.
The product should not be used in the **yellow** area or beyond its operating range as damage to the internals may occur.
***** PMO Maximum operating pressure for saturated steam service.
ΔPMX The backpressure for correct operation must not exceed 90% of the upstream pressure.
Note: Minimum operation for satisfactory operation is 0.15 bar g.

Limiting conditions (ISO 6552)

Body design conditions PN50, Class 300 to ANSI B 16.34
PMA - Maximum allowable pressure 41.4 bar g
TMA - Maximum allowable temperature 425°C
Designed for a maximum cold hydraulic test pressure of 62 bar g

SMC32
SMC32Y

SMC32Y shown

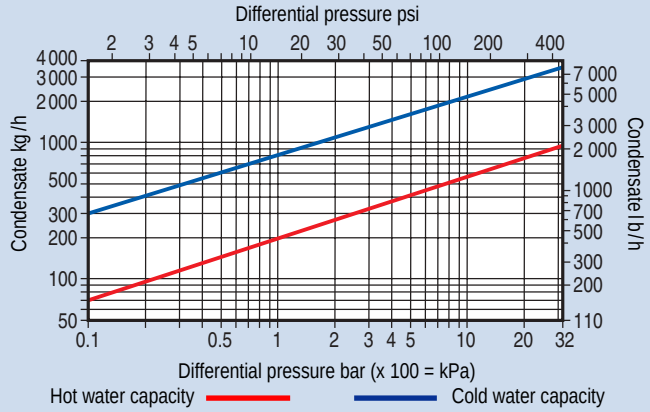
Sizes and pipe connections

½", ¾" and 1" screwed BSP/NPT, butt weld ends to EN 12 627 and socket weld ends to BS 3799 Class 300.
DN15, DN20 and DN25 standard flange to EN 1092-1 PN40, ANSI B 16.5 Class 150 and ANSI 300, JIS/KS 10K and JIS/KS 20K.

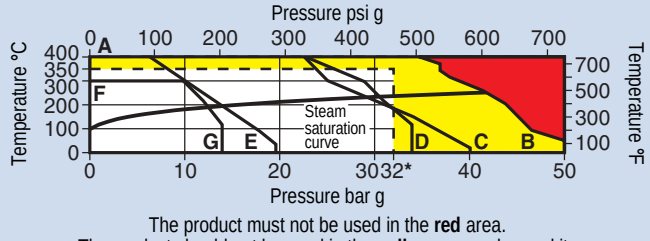
Materials

Body and cover	Carbon steel	DIN 17243 C22.8 (W/S 1.0460) ASTM A105N
Bimetallic element and seat	Corrosion resistant bimetal and stainless steel	Rau Type H46
Strainer screen	Stainless steel	AISI 304
Cover gasket	Stainless steel reinforced exfoliated graphite	
Cover bolts	Stainless steel (M10 x 30)	A2 - 70
Strainer cap (SMC32Y only)	Carbon steel	DIN 17243 C22.8 (W/S 1.0460) ASTM A105N
Strainer cap gasket (SMC32Y only)	Stainless steel	BS 1449 304 S16

Capacities



Operating range



The product must not be used in the **red** area.
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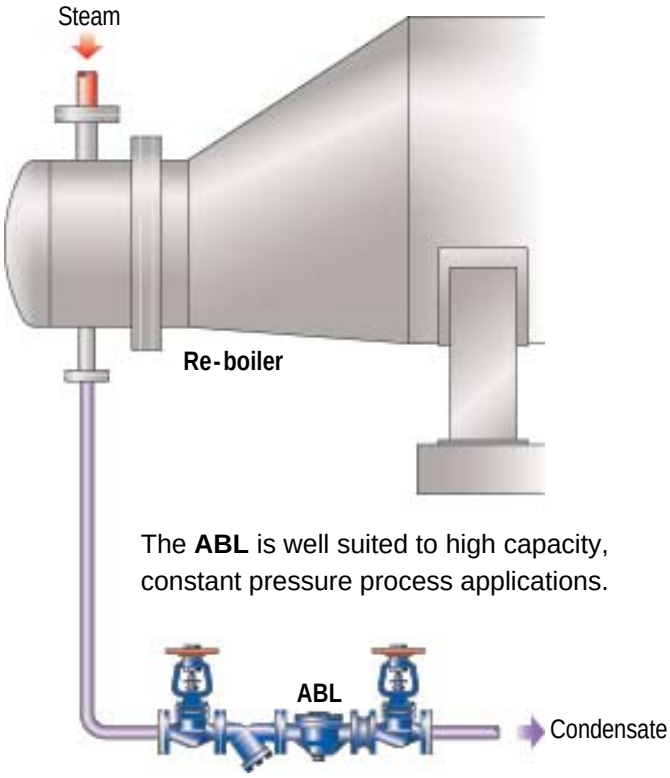
***** PMO Maximum operating pressure for saturated steam service.
A - B Screwed, socket weld, butt weld and flanged ANSI 300
A - C Flanged EN 1092-1 PN40 **A - D** Flanged JIS/KS 20K
A - E Flanged ANSI 150 **F - G** Flanged JIS/KS 10K

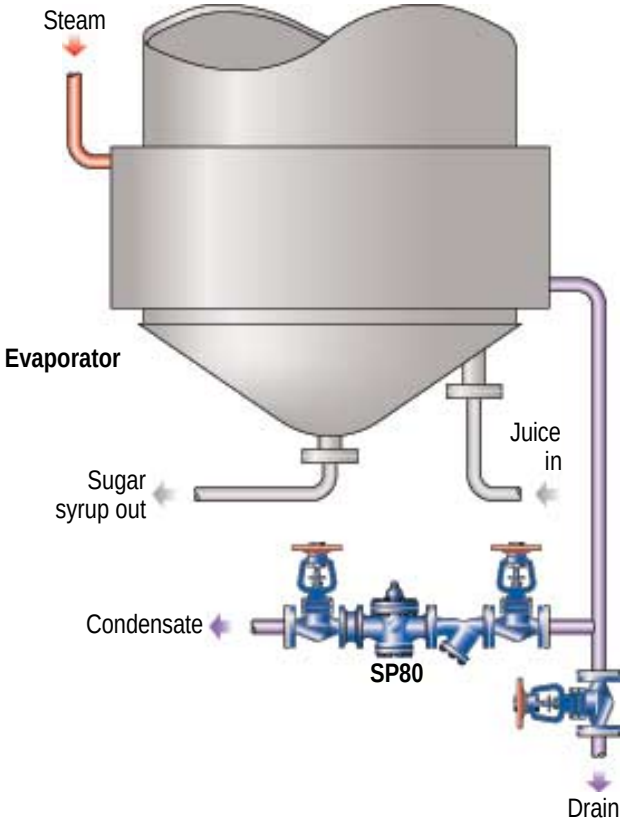
Limiting conditions (ISO 6552)

Body design conditions PN40
PMA - Maximum allowable pressure 50 bar g
TMA - Maximum allowable temperature 400°C
Designed for a maximum cold hydraulic test pressure of 75 bar g

Typical high capacity applications



The **ABL** is well suited to high capacity, constant pressure process applications.



The **SP80** and **SP100** are used for drainage of evaporators in the sugar industry where large volumes of condensate have to be removed.

ABL

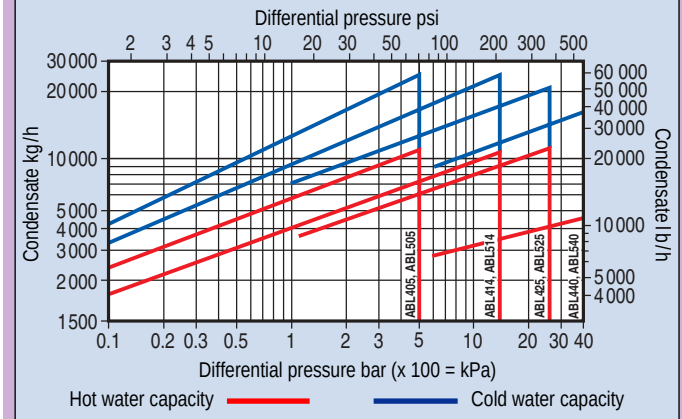
Sizes and pipe connections

1½" and 2" screwed BSP / NPT and socket weld ends to ANSI B 16.11.
DN40 and DN50 flanged to EN 1092-1 PN40, PN64, ANSI B 16.5 Class 150, 300 and 600.

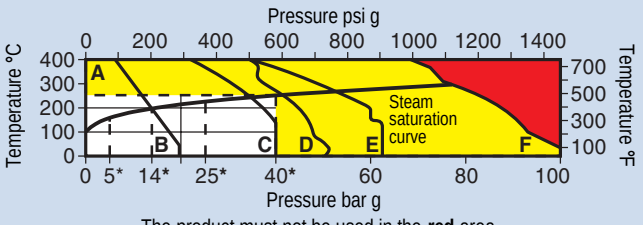
Materials

Body and cover	Steel	ASTM A105N
Bimetallic element and seat	Stainless steel	
Strainer screen	Stainless steel	AISI 304L
Cover gasket	ABL: 405, 505, 414 ABL: 514, 425, 525	Copper / graphite
	ABL: 440, 540	Stainless steel / graphite
Cover bolts	Steel	ASTM A193 B7
Cap	Steel	ASTM A105

Capacities



Operating range



The product must not be used in the **red** area.
The product should not be used in the **yellow** area or beyond its operating range as damage to the internals may occur.
***** PMO Maximum operating pressure for saturated steam service.
A - B Flanged ANSI 150
A - C Flanged EN 1092-1 PN40 **A - D** Flanged ANSI 300
A - E Flanged PN64 **A - F** Flanged ANSI 600, screwed and socket weld

Limiting conditions (ISO 6552)

Body design conditions Class 600 to ANSI B 16.34
PMA - Maximum allowable pressure: ABL405 / ABL505 5 bar g, ABL414 / ABL514 14 bar g, ABL425 / ABL525 25 bar g, ABL440 / ABL540 40 bar g
TMA - Maximum allowable temperature 400°C
Designed for a maximum cold hydraulic test pressure of 150 bar g

SP80N
SP100N

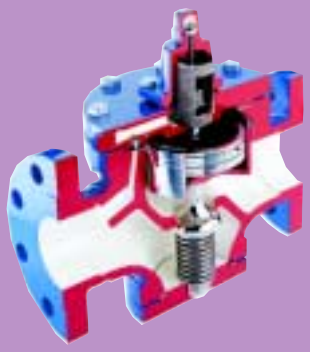
Sizes and pipe connections

3" and 4" socket weld ends to ANSI B 16.11 or
butt weld ends to ANSI B 16.25.
DN80 and DN100 flanges to EN 1092-1 PN40,
ANSI B 16.5 Class 150 and 300

Materials

Body and cover	Steel	ASTM A216 WCB4 and A105
Bimetallic element	Stainless steel	
Strainer screen	Stainless steel	AISI 304L
Cover gasket	Graphite (Asbestos-free)	
Cover bolts and nuts	Steel	ASTM A193 B7 and A194 2H

SP80E
SP100E



Sizes and pipe connections

3" and 4" socket weld ends to ANSI B 16.11 or
butt weld ends to ANSI B 16.25.
DN80 and DN100 flanges to EN 1092-1 PN40,
ANSI B 16.5 Class 150 and 300

Materials

Body and cover	Steel	ASTM A216 WCB4 and A105
Bimetallic element	Stainless steel	
Strainer screen	Stainless steel	AISI 304L
Cover gasket	Graphite (Asbestos free)	
Cover bolts and nuts	Steel	ASTM A193 B7 and A194 2H

Capacities

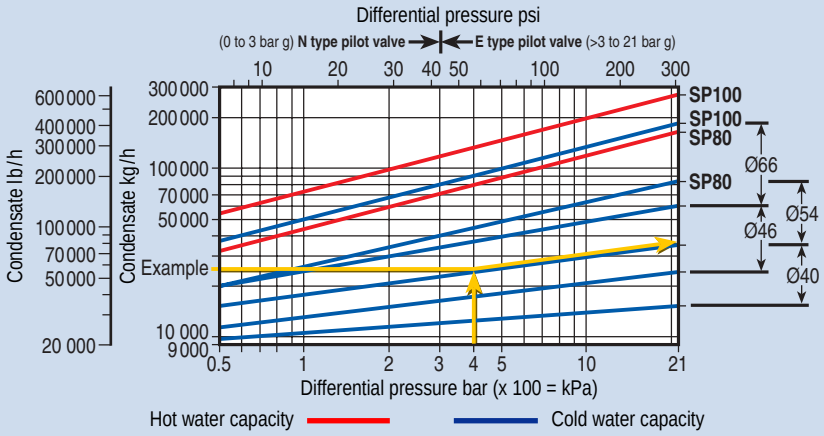
How to size the SP80 and SP100:
Both the SP80 and SP100 bimetallic steam traps are available with 2 different pilot valve assemblies (**N type**) or (**E type**) and 4 different seat types to achieve the rated capacities.

To work out the appropriate bimetallic pilot valve and seat size for your application, follow the sizing procedure listed below:

1. The trap inlet pressure must be known: If the inlet pressure is below 3 bar g then select an **N type** pilot valve. If the inlet pressure is above 3 bar g then select an **E type** pilot valve.

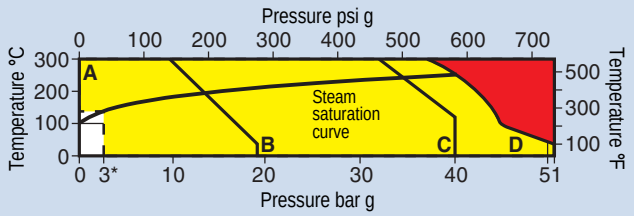
2. The outlet pressure must be known to determine the differential pressure across the trap.

3. Depending on the desired capacity and differential pressure required, use the capacity chart to choose the seat diameter which is closest to the seat's mid range capacity.



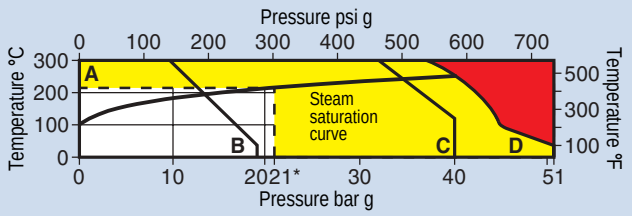
Sizing example:
1. If the trap inlet pressure is 10 bar g - select E type pilot valve.
2. If the outlet pressure is 6 bar g then: 10 bar g (inlet pressure) - 6 bar g (outlet pressure) means 4 bar g differential pressure exists.
3. If the trap is required to drain 25 000 kg/h then select either an SP80E or SP100E with a 46 mm seat, as this is closest to the mid-range capacity for a 46 mm seat. Although the capacity is also within the lower range of a 54 mm seat, trap performance would not be optimised.

Operating range (N type)



The product must not be used in the **red** area.
The product should not be used in the **yellow** area or beyond its operating range as damage to the internals may occur.
***** PMO Maximum operating pressure for saturated steam service.
A - B Flanged ANSI 150
A - C Flanged EN 1092-1 PN40
A - D Flanged ANSI 300, Socket weld and butt weld

Operating range (E type)



The product must not be used in the **red** area.
The product should not be used in the **yellow** area or beyond its operating range as damage to the internals may occur.
***** PMO Maximum operating pressure for saturated steam service.
A - B Flanged ANSI 150
A - C Flanged EN 1092-1 PN40
A - D Flanged ANSI 300, socket weld and butt weld

Limiting conditions (ISO 6552)

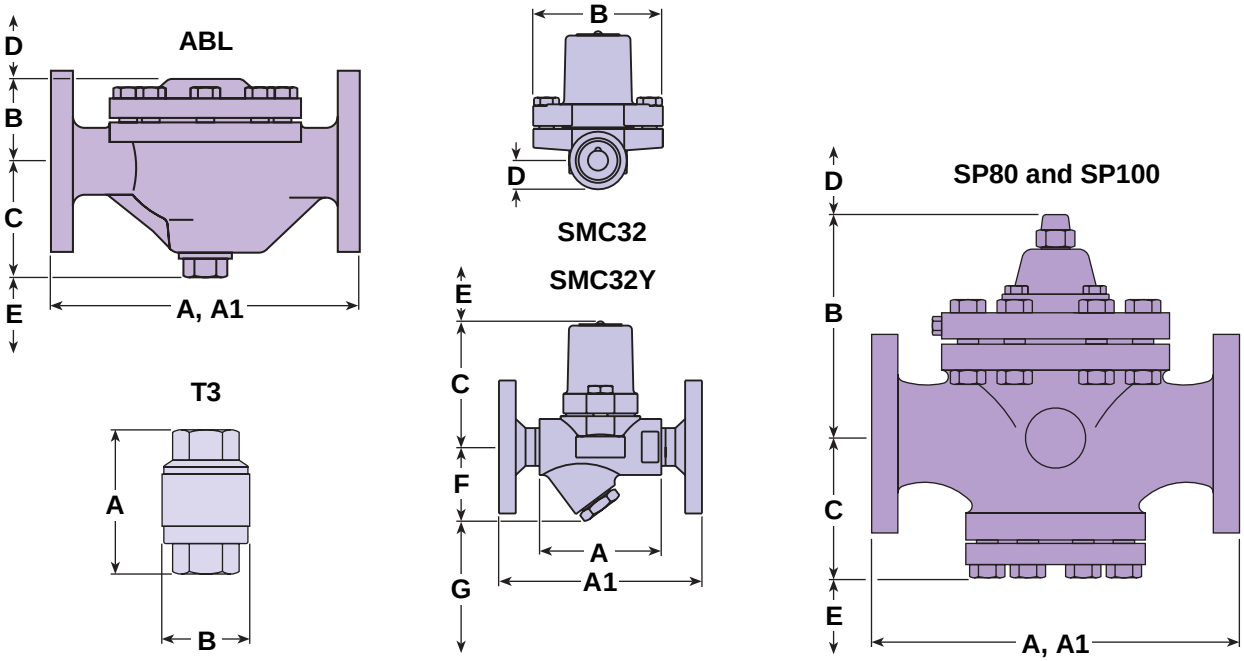
Body design conditions Class 300 to ANSI B 16.34
PMA - Maximum allowable pressure:
SP80N and SP100N 3 bar g
TMA - Maximum allowable temperature 300°C
Designed for a maximum cold hydraulic test pressure of 100 bar g

Limiting conditions (ISO 6552)

Body design conditions Class 300 to ANSI B 16.34
PMA - Maximum allowable pressure:
SP80E and SP100E 21 bar g
TMA - Maximum allowable temperature 300°C
Designed for a maximum cold hydraulic test pressure of 100 bar g

Dimensions/weights (approximate) in mm and kg

Product		T3			SMC32			SMC32Y			ABL		SP80	SP100
Size		DN8 ¼"	DN10 2"	DN15 ½"	DN15 ½"	DN20 ¾"	DN25 1"	DN15 ½"	DN20 ¾"	DN25 1"	DN40 1½"	DN50 2"	DN80 3"	DN100 4"
A	BSP/NPT/SW	70	70	70	95	95	95	95	95	95	270	270	350	400
A1	PN40	-	-	-	150	150	160	150	150	160	270	270	350	400
	PN64	-	-	-	-	-	-	-	-	-	290	290	-	-
	ANSI 150	-	-	-	150	150	160	150	150	160	270	270	350	400
	ANSI 300	-	-	-	150	150	160	150	150	160	270	270	350	400
	ANSI 600	-	-	-	-	-	-	-	-	-	290	320	-	-
	JIS/KS 10K	-	-	-	150	150	160	150	150	160	-	-	-	-
	JIS/KS 20K	-	-	-	150	150	160	150	150	160	-	-	-	-
B		42.5	42.5	42.5	94	94	94	94	94	94	75	75	210	210
C		-	-	-	92	92	92	92	92	92	100	100	132	132
D	Withdrawal distance	-	-	-	17	19	23	-	-	-	150	150	150	150
E	Withdrawal distance	-	-	-	51	51	51	51	51	51	100	100	100	100
F		-	-	-	-	-	-	53	54	56	-	-	-	-
G	Withdrawal distance	-	-	-	-	-	-	28	28	28	-	-	-	-
Maximum weight	Screwed, SW, BW	0.4	0.4	0.4	1.7	1.7	1.8	1.9	1.9	2.0	13.0	13.0	41.0	50.0
	Flanged	-	-	-	3.1	3.7	4.4	3.3	4.0	4.7	20.0	21.0	48.0	60.0



How to order

Example: 1 off Spirax Sarco DN15 SMC32 carbon steel bodied maintainable bimetallic steam trap with an integral strainer screen and having flanged EN 1092-1 PN40 connections.

SMC32Y option

The SMC32Y is also available with Spiratec sensors fitted to detect steam leakage and/or system waterlogging. For further details of the Spiratec steam trap monitoring system consult Spirax Sarco.

Some of the products shown may not be available in certain markets.

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